# RSGB BULLETIN

JUNE, 1963

VOL. 38, No. 12

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN



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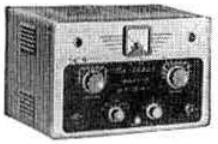
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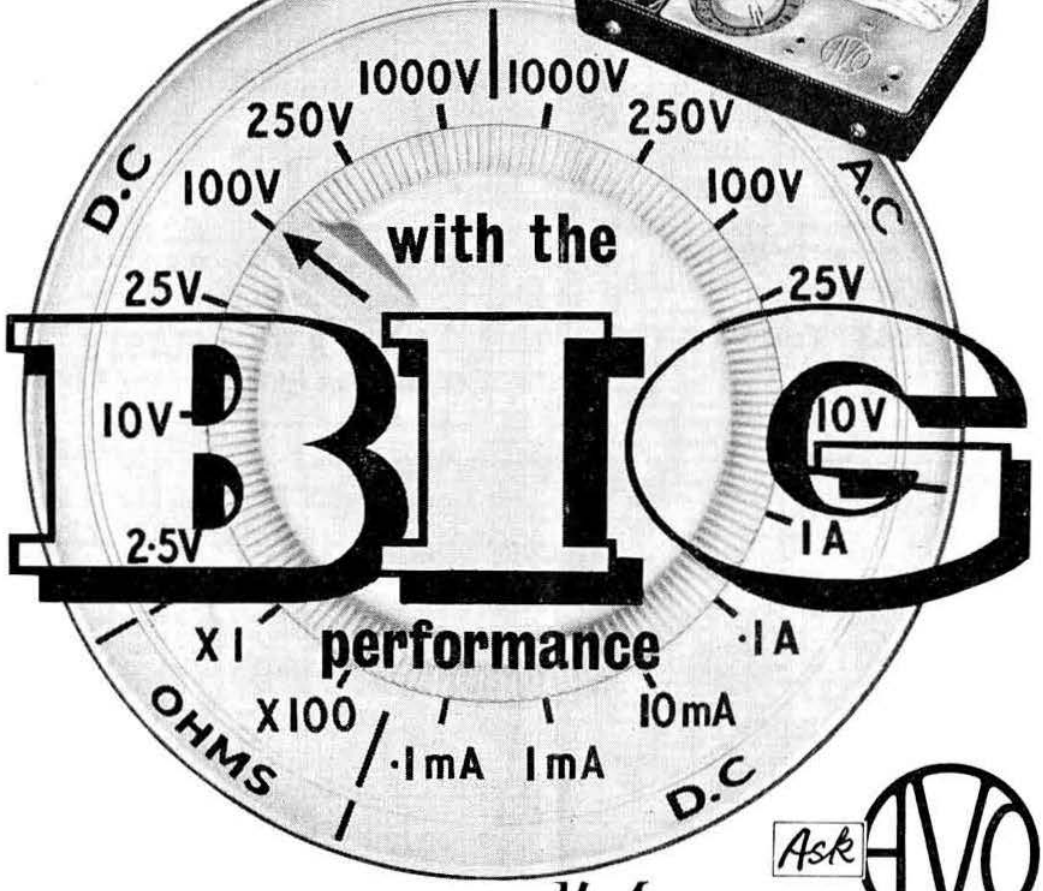


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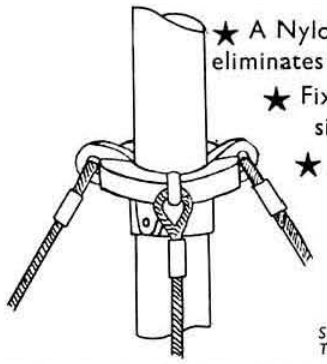

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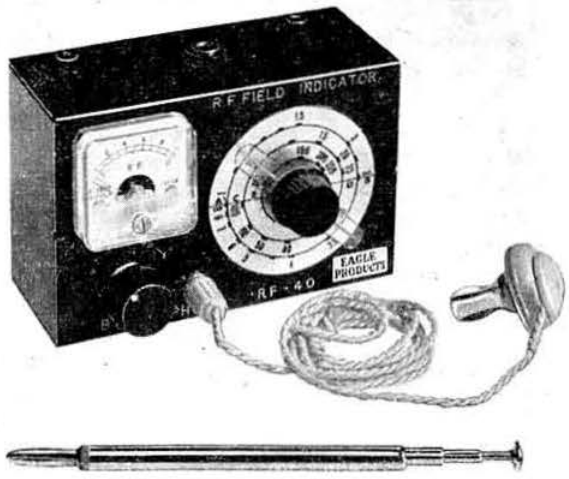


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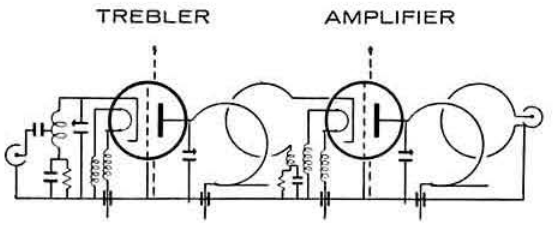


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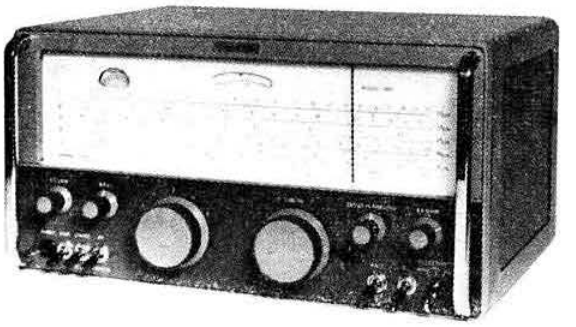

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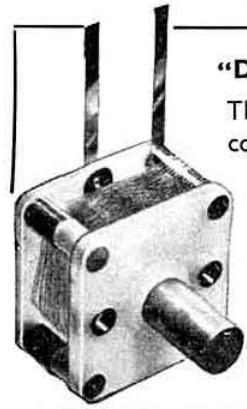

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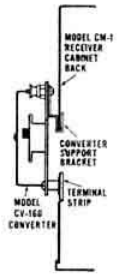


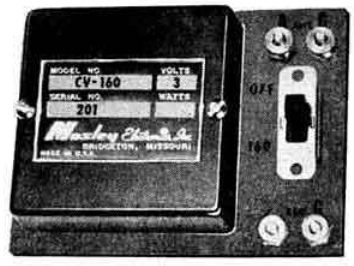


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# RADIO SOCIETY OF GREAT BRITAIN
# GOLDEN JUBILEE CELEBRATIONS

## 1913 1963

*Programme of Events*

**Monday, July 1, 1963**

1 p.m. Coaches leave Allsop Place, adjoining the London Planetarium, for visit to Radio Research Station.
2 p.m. Tour of Radio Research Station begins.
5 p.m. Coaches leave R.R.S. for return journey.
2.30 p.m. Technical visit to the B.B.C. Television Centre.
6 p.m. Open House at Mullard Ltd., Torrington Place, Tottenham Court Road, London, W.C.1.

**Tuesday, July 2, 1963**

1 p.m. Coaches leave Allsop Place, adjoining the London Planetarium, for visit to Radio Research Station.
2 p.m. Tour of Radio Research Station begins.
5 p.m. Coaches leave R.R.S. for return journey.
2.30 p.m. Technical visit to the B.B.C. Television Centre.
3 p.m. Open House at Mullard Ltd., Torrington Place, Tottenham Court Road, London, W.C.1.

**Wednesday, July 3, 1963**

12 noon London Members' Luncheon Club at Bedford Corner Hotel, Bayley Street, Tottenham Court Road, London, W.C.1.
6.30 p.m. Official Reception at the London Planetarium, Marylebone Road, London, N.W.1 (adjoining Madame Tussaud's). During the course of the evening there will be a Special Programme in the Planetarium conducted by Dr. H. King.

**Thursday, July 4, 1963**

10 a.m. Private launch leaves Westminster Bridge Pier for Hampton Court.
8 p.m. London U.H.F. Group Social Evening at White Hall Hotel, Bloomsbury Square, London, W.C.1.

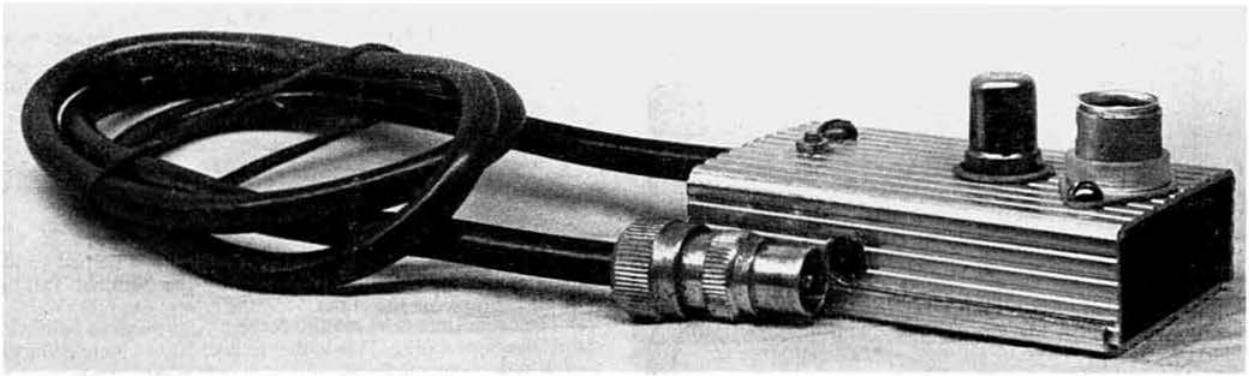
**Friday, July 5, 1963**

6.30 p.m. Golden Jubilee Dinner at the Connaught Rooms, Great Queen's Street, Kingsway, London, W.C.1. *Bookings cannot be guaranteed if received after June 20.*

***Celebrations Rendezvous***

From Wednesday, July 3, to Friday, July 5, there will be a Celebrations Rendezvous for members and visitors at the Kingsley Hotel, Bloomsbury Way, London, W.C.1. No tickets required.

*Admission to all the events will be by ticket only obtainable by completing the order form on page (ii) of the Supplement to the April issue of the* BULLETIN *and sending it, with a remittance to cover the total cost, to Frank Fletcher, G2FUX, Honorary Business Manager, Golden Jubilee Celebrations, 11a Ickenham Road, Ruislip, Middlesex. Members are asked to note that some of the events take place simultaneously. Mr. Fletcher can deal only with correspondence relating to the Golden Jubilee Celebrations. Additional copies of the order forms are available on request.*



# The Mini-Mus R.F. Pre-amplifier

By JOHN D. HEYS (G3BDQ) *

THERE are no doubt many ex-Government and pre-war communications receivers using octal based valves still in use and, during the present decline in sunspot numbers, the performance of these receivers leaves much to be desired above 12 Mc/s. Below this frequency incoming or aerial noise is high and older receivers with noisy front-ends perform quite satisfactorily, but on 14, 21 and 28 Mc/s receiver noise itself becomes the limiting factor when tuning for weak signals.

The valve noise problem becomes even more acute on the v.h.f. bands and amateurs using these frequencies have for long abandoned multi-grid valves as amplifiers and now use specially developed low noise triodes. The RCA Nuvistor series of valves have proved popular owing to their relative cheapness, small size and low noise figures. On the 144 Mc/s band receiver noise figures of about 3db can be achieved using the 6CW4 Nuvistor and there is no reason why the inherent virtues of this valve should not be used to enhance the overall performance of older h.f. band communications receivers.

It was with this in mind that the Mini-Mus amplifier was designed. This small mouse-like (it has a long co-axial " tail ") unit may be used ahead of any veteran station receiver on each of the 14, 21 or 28 Mc/s bands and will provide about 10db gain with a noise figure of approximately 3db. In this way the signal gain of the receiver will be raised by about one S point without an increase in receiver noise, so allowing the r.f. and i.f. gain controls to be backed off considerably. Such a reduction of the main receiver gain levels also reduces the likelihood of blocking and cross-modulation effects which are often produced by strong signals.

## Circuit

The Mini-Mus circuit (Fig. 1) uses the minimum of components and by employing the 6CW4 in the grounded grid mode, feedback or instability will not be encountered. Grounded grid amplifiers are broad band devices and no tuning control is needed. The tuned anode circuit comprising L1 and C3 is set to mid-band position by adjustment of the coil core. A link winding couples the output to the main receiver and may be of two or more turns depending upon the impedance required. Older receivers such as the HRO have an input impedance around 400 ohms and three or four link turns may be needed if maximum gain is to be realized.

The power requirements of the unit are very small and may be obtained from the main receiver power pack. A suitable

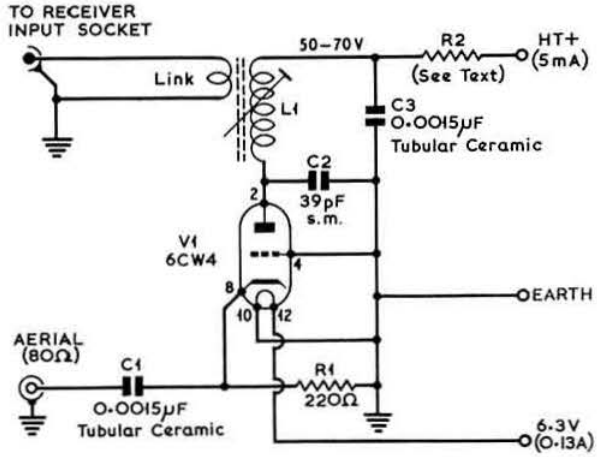



**Fig. 1. Circuit diagram of the Mini-Mus pre-amplifier. For 14 Mc/s, L1 16 turns 24 s.w.g. enam. copper on Salford type S34 former. The link winding, see text, is wound over the h.t. end of L1. For 21 Mc/s and 28 Mc/s, L1, 12 and 8 turns respectively. C1, C3, 0·0015 μF tubular ceramic types; C2, 39 pF silvered mica; R1, 220 ohms; R2 is chosen to suit the h.t. supply voltage (see text).**

* *201 London Road, St. Leonards-on-Sea, Sussex.*

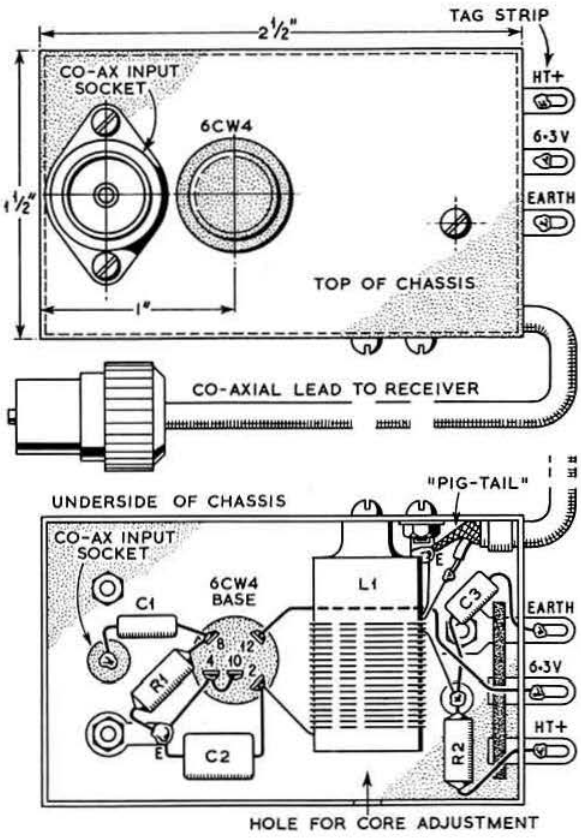



**Fig. 2 (a). Top plan view of the Mini-Mus. The chassis is made from thin gauge corrugated aluminium and a slide-on base cover is made from the same material. Corrugated aluminium is available from "do-it-yourself" shops. (b) Underside view showing the location of the components and wiring. The output coax is clamped to the chassis wall and the link winding is made from p.v.c. covered flexible wire. R2 is connected to a small stand-off insulator.**

dropping resistor R2 must be used in the h.t. feed, for an h.t. supply of somewhere between 50 volts and 70 volts at 5 mA is required. With a supply voltage of 200 volts a suitable value for R2 is 30 K ohms. A low impedance aerial input (preferably from an aerial tuning unit) is coupled through C1 to the 6CW4 cathode.

### Construction

Because of the small size of the Nuvistor valve the whole amplifier can be reduced to just over match box size, and careful layout allows the use of a chassis measuring only $2\frac{1}{2}$ in. $\times$ $1\frac{1}{2}$ in. $\times$ $\frac{5}{8}$ in. (See Fig. 2). Although intended to be used as an "outrider" to the main receiver there is no reason why the Mini-Mus could not be incorporated within the receiver and suitable switching arranged to transfer the aerial input to the normal receiver input socket when the lower frequency bands are being used.

The original Mini-Mus pre-amplifier was designed for 14 Mc/s. Its operation on this band has been tested ahead of several communications receivers and the signal-to-noise improvement was marginal when used with the modern Drake 2B and the K.W. Electronics KW77. The advantages of the amplifier became very noticeable when operated in conjunction with both a good AR88 and an SX28, and no doubt the same would apply in respect of many of the older receivers in use today in many shacks.

### Nuffield Talking Book Library

FOR SOME YEARS, MEMBERS of the Society have helped in the maintenance of machines provided by the Nuffield Talking Book Library for the Blind.

The organizers now require further volunteers to help with this excellent work. This is due in part to the increasing use of a new tape machine which is being produced in large numbers. Offers from members in all parts of the country will be most welcome, but are particularly urgently required from those living in the Tunbridge Wells area, northern Lancashire, the northern areas of Essex, Sussex and Staffordshire, Wales, the North Riding of Yorkshire, Shropshire and Northampton.

Offers should be addressed to the Honorary Organizer of Servicing Volunteers, Mr. D. Finlay-Maxwell, A.M.I.E.E., GM3BGA, Nuffield Talking Book Library for the Blind, Galashiels, Scotland.

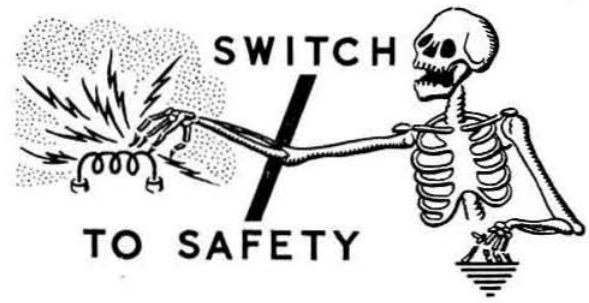
### The Use of Electronic Valves

A CODE of practice on *The use of electronic valves*, CP1005, was first published in four separate parts. These have now been combined into one document in the revised version of the code issued recently.

The code is intended to give guidance to designers of equipment using electronic valves so that they may obtain optimum performance and life from valves. Apart from one section applicable to all electronic valves, specific recommendations are made in separate sections for the following classes of valve: domestic receiving valves, cathode-ray tubes, rectifiers including grid controlled rectifiers (thyratrons), photocells, transmitting valves, cold cathode tubes, magnetrons and special quality valves. The recommendations cover all valve applications, but additional or more stringent precautions may be necessary in cases where a higher degree of reliability is needed, as in some industrial and communications equipment.

Although the code does not include recommendations for the safety of personnel, the attention of designers is particularly drawn to information which a valve manufacturer may publish about ionizing radiation, because of the possible necessity of shielding in equipment.

Copies of CP1005 may be obtained from the B.S.I. Sales Branch, 2 Park Street, London, W.1, price 12s. 6d. each plus postage.



*Test Report*

# The Heathkit Model RA-1 Basic Amateur Bands Receiver

**Reviewed by D. V. NEWPORT (G3CHW)** *

THE Heathkit Model RA-1 is the first amateur bands only receiver to be produced in the U.K. by Daystrom Ltd. It is available either in kit form or assembled and is housed in a cabinet measuring 13¾ in. wide × 11½ in. deep and 6½ in. high.

The receiver supplied for review was ready built, but the instruction manual is typical of the Heathkit standard and is designed to make construction as simple as possible. Assuming the ability to solder, no difficulty should arise, particularly as the complete front-end is supplied aligned and tested.

Including the h.t. rectifier and voltage stabilizer, a total of eight valves are used (two of them dual purpose), plus two germanium diodes for a.g.c. rectification and the second detector.

The RA-1 is a single conversion superhet in which an ECH81 is used as a combined mixer/oscillator. This arrangement is always prone to " pulling " to an extent dependent on frequency and amplitude of the incoming signal. Rotation of the r.f. gain control is also likely to produce a slight change of oscillator frequency. The use of separate oscillator and mixer valves are, for these reasons, preferred,† but were not incorporated in the RA-1 for economic reasons and because the frequency shift was not considered to be excessive. This appears to be true in practice and no embarrassment was noticed when listening during the 1963 B.E.R.U. Contest. Such as it is, the frequency pulling is much more evident when the receiver is in an overloaded condition, which may occur when " netting " with a high level v.f.o. adjacent to the receiver.

The heart of this receiver is the coil-pack which has been specially produced for Daystrom Ltd. by Electroniques (Felixstowe) Ltd. This, combined with a modern EF183 r.f. amplifier and the ECH81 mixer/oscillator, enables a sensitivity and signal-to-noise ratio equal to many more expensive receivers to be obtained. In this respect the measured performance was at least twice as good as that claimed by Daystrom.

The mechanical indexing‡ of the bandchange switch was checked and a figure as low as 10 c/s at 30 Mc/s was measured. It was noted, however, that although the receiver settled down to reasonable stability within about 10 or 15 minutes, switching to one of the three h.f. bands produced another warm-up drift period. The maximum amount observed was 5 kc/s in five minutes after which the receiver settled down again. This may be a function of the negative temperature coefficient of the capacitors used on each oscillator range. Most of the drift occurred during the first minute or so and was not therefore unduly trying. It may be mentioned here that these tests were made with a highly accurate frequency

**The Heathkit Model RA-1 amateur bands receiver. The cabinet is finished in silver and green. The panel controls (reading from the top left) are aerial trimmer, calibration adjustment, r.f. gain, bandswitch, b.f.o. on/off, sideband selection switch, main tuning, a.v.c. on/off, noise limiter and a.f. gain. The phones jack is at the bottom right-hand corner of the front panel.**
*(Photo by courtesy of Daystrom Ltd.)*

counter capable of discriminating to within ± 0·1 c/s up to 220 Mc/s. On this type of equipment, drift is seen which otherwise is seldom noted. Ambient temperature was 68°F.

A mechanical shock test was also applied with remarkably good results: excluding crystal controlled receivers, in the writer's experience only the Racal RA.17 is better. An s.s.b. station was tuned in at 3·7 Mc/s and blows of some force aimed at the mains transformer, that component being the one least susceptible to physical damage. The s.s.b. signal was copied throughout the shock period with reasonable ease. A similar series of tests applied to the station AR88 produced inferior results. In fact, when pounding the RA-1, the frequency shift of the AR88 (on the same bench) was greater. Try this test on your receiver and v.f.o.!

The counter was also used to determine the degree of oscillator shift with no input signal. Complete rotation of the r.f. gain control produced a change of 100 c/s at 30 Mc/s and 30 c/s at 21 Mc/s. On all other bands no significant change was recorded.

An oscillator trimmer is brought out to the front panel for scale set purposes and provision is made for the installation of a plug-in 100 kc/s crystal calibrator which is available as an accessory.

As only one r.f. stage is used, an i.f. of 1620 kc/s has been adopted to ensure reasonable image rejection. The aerial input is suitable for both balanced (80 ohm) feeders and end-fed wires. Two i.f. amplifiers, employing an EF183 and the pentode portion of an ECF82, provide high gain and a half-lattice crystal filter utilizing two Cathodeon crystals helps to shape the response curve. In this respect s.s.b. requirements have been favoured and the designer, an active amateur, would seem to have given s.s.b. considerable thought.

The b.f.o. (the triode portion of the ECF82) is fitted with a three position switch permitting selection of upper or lower sideband with the centre position as b.f.o. zero. This facility can therefore be used to assist in single signal reception of c.w. and is probably a better operating aid than a continuously variable b.f.o. In the test receiver the b.f.o. beat note on either sideband was a little too high for concentrated reception of c.w. and the writer preferred to use the centre zero and slightly detune the receiver until a suitable heterodyne note was obtained. This point has now been dealt with by the manufacturer and capacity values across the switch adjusted to produce a more favourable beat note.

An OA81 is used as a conventional diode detector and provision is made to adjust the level of b.f.o. injection to

* *38 Huckford Road, Winterbourne, Bristol.*

† R.S.G.B. *Amateur Radio Handbook*, pages 83 and 84.

‡ Indexing refers to the location of the switch contacts by the switch mechanism and is a measure of how much oscillator tuning is affected by switching from one band to another and then back to the original point of measurement.

**TABLE 1**

**Performance**

| | Claimed | Measured |
|---|---|---|
| **Sensitivity** | 2 microvolts for 10db signal to noise ratio | 1 microvolt or better for 10db signal to noise ratio at 30 per cent modulation |
| **Image Rejection** | 40db or better | 42 db at 30 Mc/s<br>61db at 21 Mc/s |
| **Selectivity** (Total Bandwidth) | No claims | — 6db 2·4 kc/s<br>—10db 3·4 kc/s<br>—20db 5·8 kc/s<br>—30db 7·8 kc/s<br>—40db 9·8 kc/s<br>—50db 12·0 kc/s<br>—60db 14·1 kc/s<br>—70db 16·5 kc/s<br>—80db 19·0 kc/s<br>One hump, the peak of which was 52db down, was spaced 27·7 kc/s h.f. of the centre frequency. |

**Valve and Semiconductor Complement**

| | |
|---|---|
| R.F. Amplifier EF183 | A.G.C. Rectifier OA81 |
| Mixer/Oscillator ECH81 | Noise Limiter EB91 |
| First I.F. Amplifier EF183 | First Audio Amplifier and Output Stage ECL86 |
| Second I.F. Amplifier and B.F.O. ECF82 | H.T. Rectifier EZ81 |
| Detector OA81 | Stabilizer OA2 |

**Frequency Ranges**

| | |
|---|---|
| 1·7 to 2 Mc/s | 14·0 to 14·5 Mc/s |
| 3·5 to 4 Mc/s | 21·0 to 21·5 Mc/s |
| 7·0 to 7·3 Mc/s | 28·0 to 30·0 Mc/s |

suit the operator's favourite band. This is achieved by fitting a value of h.t. dropper resistor in the b.f.o. anode circuit dependent on the sensitivity of the band for which optimum results are required. This is of especial interest for s.s.b. reception and is a desirable facility to cover the almost absolute certainty of sensitivity variation from 1·8 to 30 Mc/s. Ideally, perhaps, continuously variable injection should be the aim but, due to Miller effect, the h.t. dropper cannot be replaced by a simple variable resistor. If it were, the b.f.o. centre zero would shift. More complex circuitry to avoid this would not be economical but as in other receivers a reasonable compromise can be made. Daystrom Ltd. recommend and supply suitable values with the kit for any required characteristic and information is detailed in the instruction book.

Another OA81 diode is used as the a.g.c. rectifier and an on/off switch is fitted. An S meter is also incorporated, but this is of limited range and, in the writer's opinion, can only be regarded as a tuning meter.

An EB91 double diode is used in the variable noise limiter which was found to be effective on impulse noise and Loran.

An ECL86 acts as first audio amplifier and power output stage and provides adequate power. The speaker output impedance is 3 ohms and a 600 ohm outlet is provided for 'phones. When the latter are plugged in, the speaker is automatically disconnected. An external speaker is required.

Receiver muting is achieved by applying heavy negative bias to the r.f. and i.f. stages. This is short-circuited to earth during receive periods, terminals being provided at the back of the receiver for this purpose. These would normally be closed by a pair of contacts on a transmit/receive relay or by a permanent shorting link where there are no transmitting requirements. The advantage of this arrangement is that all the receiver valves are left running in a normal condition and risk of drift due to h.t. switching is avoided.

The internal power supply employs an EZ81 rectifier and resistance-capacitance smoothing. The receiver is designed for mains inputs of 110-240 volts a.c., 50-60 c/s. The a.c. consumption is 50 watts.

In view of its comparatively small size and weight the RA-1 should have an especial appeal to those who are interested in portable operation or do not wish to be lumbered with a large and heavy receiver. For portable or mobile operation a supply of 250 volts h.t. at 65 mA and either 6 or 12 volts l.t. at 3·5 A is required. The h.t. and l.t. lines are brought out to an octal socket which is arranged so that the internal power supply is disconnected when the receiver is in use with a separate power pack. Since the RA-1 is small enough to be fitted into many vehicles, this facility should be attractive to mobile operators, especially as the mechanical stability is of a very high order.

Performance figures and other relevant data are given in Table 1.

## Operation

For comparison it was felt desirable to use a good quality receiver that is as familiar as possible, and recourse was made therefore once again to the AR88. This particular receiver is maintained at a high standard and, the writer likes to think, is above average.

Any signal heard on the AR88 was heard at least as well on the RA-1, except under conditions of severe QRM. The low frequency end of 7 Mc/s is regarded as " QRM Alley " and it is apparent that whilst the selectivity of the RA-1 is adequate for most purposes it is insufficient for the serious c.w. operator. However, a socket on the rear apron is provided for the connection of a *Q*-multiplier. The writer has no doubt that with the addition of this accessory the receiver will give a very good account of itself under most conditions.

During listening tests, no greater difficulty was found in resolving s.s.b. than any other mode of transmission, although it must be admitted that the writer is not new to s.s.b. reception techniques. No actual reception tests were possible on 10m due to the poor state of the band and lack of signals.

A slide rule tuning dial provides about 5 in. of scale length on each frequency range and with a dual 5 : 1 and 25 : 1 reduction drive, tuning was found to be smooth and adequate. On the model tested the drive was a little stiff, but freed after a short period of operation. Despite the inevitable use of a nylon cord drive in a receiver in this price range, no backlash whatsoever was apparent or indeed measurable.

## Accessories

Accessories available for the RA-1 are a plug-in crystal calibrator (Model CL-1) providing calibration signals at 100 kc/s intervals, a *Q*-multiplier for 1620 kc/s and a matching loudspeaker cabinet and 7 in. × 4 in. speaker.

The Heathkit Model RA-1 basic amateur bands receiver is manufactured by Daystrom Ltd., Gloucester, and costs £39 6s. 6d. in kit form or £52 10s. assembled.


**XYLs and YLs!**

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**Booked your seat at the**
**GOLDEN JUBILEE DINNER**
**at the Connaught Rooms, London,**
**on July 5?**

**Make sure he does before June 20.**

***See page 645 for details***

# A Desk for the Amateur Station

By C. A. HOGG (G3NRZ)*

IN designing the operating desk to be described it was found that if it was made to the size and shape required, it would be impossible to get it through a normal doorway. It was therefore decided to make the desk in three sections: two drawer units and the table top. This arrangement is not only more convenient but it provides more general flexibility in the layout. All the dimensions of the desk are shown in Fig. 1.

* 20 Sunbury Avenue, Mill Hill, London, N.W.7.

The drawers should be made up first, followed by the drawer unit which can then be constructed accurately so that no fitting or planing of the drawers is required. The drawers for the side units are quite simple to assemble once their front panels have been prepared. The sides and back are made of $\frac{3}{8}$ in. thick timber and the bottoms of $\frac{1}{4}$ in. or $\frac{3}{16}$ in. plywood. The centre drawer should also be made up. If desired, the inner surfaces of the sides of the drawers can be grooved to allow plywood divisions to be fitted. This operation should of course be done before final assembly. The sides and ends should be glued and screwed and the bases glued and pinned.

### Drawer Units

The drawer units are made from $1\frac{1}{8}$ in. $\times$ $1\frac{1}{8}$ in. timber as shown in diagram 7. The dimensions of the drawers are shown in diagram 8. The jointing is quite easy as half the

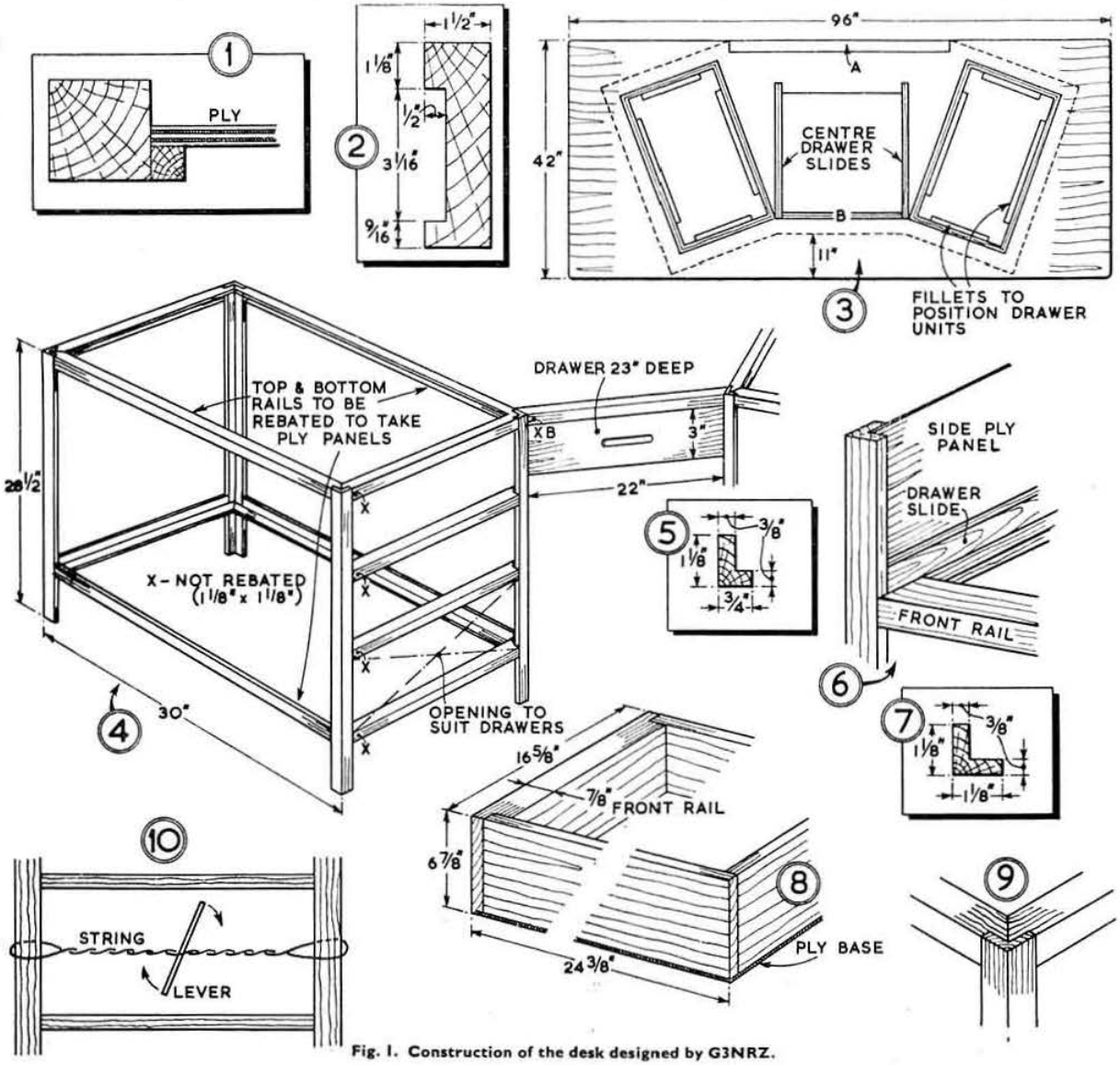



Fig. 1. Construction of the desk designed by G3NRZ.

joint is already made by the rebates in the timber. The front rails are not rebated. The four sides are made first, complete with the $\frac{1}{4}$ in. panels (ply or hardboard).

The drawer units can now be completed, using the drawers to space the front rails both for width and height, clearance being allowed to enable the drawers to slide freely. The rear rails and the plywood are then fitted. A fillet $\frac{3}{8}$ in. $\times$ $\frac{3}{8}$ in. is required to be glued and pinned to the bottom drawer rail to take a plywood base in order to prevent racking, the method of assembly being shown in diagram 1. When the glue has set the drawer rails in diagram 5 should be screwed and glued into position, the drawers again being used to get the correct spacing, the assembly being illustrated in diagram 6.

The top of the drawer units are not covered with ply-wood as they are held by the positioning fillets as shown in diagram 3.

### Desk Top

The top consists of a sheet of $\frac{3}{4}$ in. ply-wood, the actual size depending on the area of desk required. The centre drawer slides (diagram 2) are fixed to the underside. Fillets $\frac{3}{4}$ in. $\times$ $\frac{3}{4}$ in. are also attached to position the drawer units with a fixed rail $1\frac{1}{8}$ in. $\times$ $1\frac{1}{8}$ in. forming the top of the centre drawer.

### Method of Assembly

The ply-wood top should be placed on the floor and the drawer units (upside down) positioned to suit the required size and shape of the finished desk. The centre drawer, with slides, and the $1\frac{1}{8}$ in. $\times$ $1\frac{1}{8}$ in. rail should also be placed in position (B in diagrams 3 and 4). When this has been done, pencil round the drawer units, the centre drawer slides, and the $1\frac{1}{8}$ in. $\times$ $1\frac{1}{8}$ in. front rail, together with the final shape of the top (indicated by dotted line in diagram 3). A 1 in. overlap was allowed over all edges on the writer's desk. The units can then be removed, the centre drawer slides and the $1\frac{1}{8}$ in. $\times$ $1\frac{1}{8}$ in. front rail subsequently being glued and screwed. The $\frac{3}{4}$ in. $\times$ $\frac{3}{4}$ in. fillets should be fixed to position the drawer units with a rail about $1\frac{1}{2}$ in. $\times$ $1\frac{1}{2}$ in. fixed to the rear to give extra strength (A in diagram 3). Finally, the top can be cut to the required shape.

### Finish

The writer chose to cover the top of his desk and the fronts of the drawers with black Formica, the rest being painted grey. The edges of the top are finished with gold coloured aluminium moulding, plastic filling being used to cover the fixing screws. The drawer pulls are made of plastic, of the type fitted with a thin piece of coloured material which, when sprung into position, covers the fixing screws.

The adhesive used for fixing the Formica was Bostic 1430, both surfaces being coated and allowed to get tacky. When the Formica is being applied to the wood surface, it must be correctly positioned as the join will not slide after contact. The wood work was given two coats of grey undercoat to fill the grain, and one coat of finishing.

### General

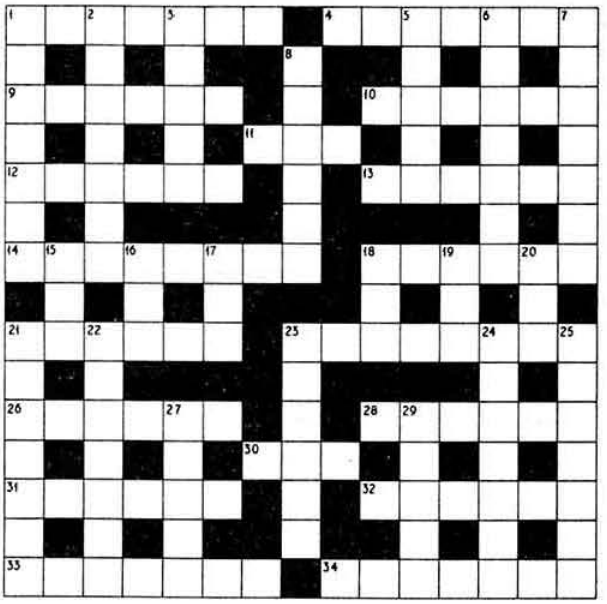
When the assembly is complete small blocks of wood should be glued into the drawer slides to prevent the drawers from penetrating too far. It will be noticed that the drawers are not the full depth of the drawer units, the sizes given being considered adequate. The space at the back of the drawers was used by the writer to keep spares for the transmitter and receiver such as valves, the space being divided by laying a piece of ply-wood across the drawer slides. This provides two shelves per unit.

A strip of brass with several terminals was screwed to the $1\frac{1}{2}$ in. $\times$ $1\frac{1}{2}$ in. rail (A in diagram 3) for earth connections.

The timber used was close grained beech, which is easy to work and is also suitable for polishing if desired. A timber with a deeper grain would require more filling to get a good finish. The rebates to the timbers are quite easy to cut with the aid of a small circular saw with appropriate guides.

## AMATEUR RADIO CROSSWORD

**Compiled by G. C. Moore (G3MCY)**



**ACROSS**

1. A coil does in Italian rulers (7).
4. Write differently about Costa Rica—more aptly (7).
9. Property of an ideal feeder (2, 4).
10. Slave change after five (6).
11. The Roman therefore loses nothing for power (3).
12. I tuned around for the States (6).
13. They are frequently part of 10 across (6).
14, 18. Steeping Values (*Anagram*) (8, 6).
21. Headgear for a big wheel in the /M world? (3, 3).
23. This receiver sounds as if it should eat (8).
26. Call constituent (6).
28. Picturesque version of sine 200 (6).
30. Help! (3).
31. Teleprinters beliefs, perhaps (6).
32. A1 and I leave another voltage. Strong (6).
33. Royal Engineers shortly involved in a new delay (7).
34. Valet in address error (7).

**DOWN**

1. No trap can spot the tube thus (3, 4).
2. Digging from 55 in England (7).
3. VU station (5).
5. Mobile with wet end (5).
6. Sad vine (*Anagram*) (7).
7. R does this (7).
8. Neon assault? (6)
15. VK Special (3).
16. Light curve? (3).
17. Impedance part (3).
18. This is below . . . (3).
19. . . . and this on top (3).
20. One age (3).
21. Type of winding for a whid (7).
22. Power for a punch-up? (7)
23. Ornaments the aerials? (6).
24. Modern yokes in U.S.A.? (7).
25. Transmitter stage for higher pulse rate? (7).
27. O.T. (5).
29. Dual purpose component for /M? (5).

(*Solution on page 657*)

# TECHNICAL TOPICS By PAT HAWKER (G3VA)

*" Plug-in Appliance Operators " · Battery Tips · Cool-running VFOs*

*Power Supply Ideas · More on Electronic Keys · Epitaxial and Planar Transistors*

*L and Pi-L Matching Networks · Portable S.S.B. Transistor Transceivers*

RECENTLY, *QST* stirred up a hornet's nest (to the buzz of some 1,200 letters and comments) with an editorial on the pros and cons of " incentive licensing "—that is providing additional facilities to those taking further and more difficult technical examinations. American licensing conditions are no direct concern of *Technical Topics* but the controversy engendered by *QST*'s use of the term " plug-in appliance operators " has thrown up some interesting sidelines.

While many amateurs took the use of this term as a reopening of the hoary argument about home-built versus factory-built equipment (long settled by " each to his own taste"), a more sophisticated view was expressed by W2LYH. " There are many good reasons " he wrote, " for using manufactured gear, but there can be no excuse, in amateur radio, for not even knowing what's behind all those expensive panels."

K0HGH claimed that the average American amateur today was " ignorant of how a transmitter really works, why it doesn't get out, or what to do when harmonics pop up." Another writer, K1CLD, suggested that the British licence examination demanded a sounder technical understanding.

Our own view in this matter has always been that it should not be made too difficult for a newcomer to obtain an amateur licence and that the use he makes of it—within limits—is his concern. Amateur activity is internationally defined as a form of " self-training " and this would be vitiated if a high standard were demanded before allowing anyone to operate. But this is not to say that we should be content to regard our equipment as " black boxes " without making some effort to understand the basic principles of how they operate. We do not want to see amateur radio reduced to the level of TV viewing, just switching the equipment on and off with an occasional adjustment of the brightness knob.

Pre-war British amateurs did not take any technical examination but—because of the limited amount of commercial equipment—were soon forced to cram up a modicum of theory, and this has remained largely true with factory-built equipment requiring the installation of auxiliary items, coupling units and the like.

But we must recognize that the availability of complete " plug-in " stations—and very convenient ones at that—as represented by the large number of packaged s.s.b. transceivers now marketed in the States has really left the way clear for the " operator-only " type of activity, using the most advanced circuitry but in practice just plugging in and talking.

Whilst studiously refraining from making any snap judgments, and recognizing that a good case can often be made for non-technical amateur activity, we feel it worth drawing attention to this change in the traditional concept of experimental Amateur Radio. It could have far-reaching effects on our hobby.

### Choosing Batteries Wisely

The development of the transistor with its great power saving compared with valves has, paradoxically, led to far greater consumption of batteries. Today, portable stations can operate economically without all the paraphernalia of car batteries, vibrator packs and petrol generators so redolent of N.F.D. But there is much more to battery technique than is suggested by the deceptively simple appearance of their containers. Even with transistors, the unwary can spend an unnecessarily large amount on renewing batteries.

Those who entered radio via the old h.t. battery and wet accumulator may well find the present plethora of battery types confusing. Is it cheaper to use a layer battery than mercury cells? Why do batteries sometimes appear to give so much better service than at other times?

The following notes, though brief, may help the amateur to avoid some pitfalls and to obtain economic use of his batteries.

The h.t. battery of the 'twenties and 'thirties was developed from the original Leclanché cell dating back some hundred years. They were based on round cell construction, similar to that developed for torches. During the 'forties a new form of construction—the layer battery—came into general use for h.t. and often—in conjunction with 1·4 volt filament valves—for l.t. also. Since the layer cells are rectangular or square in section they can be grouped together with a minimum waste of space; they also tend to suffer less deterioration with time than round cells. On the other hand, they are relatively low current devices and the round cell is usually better where fairly heavy consumption (30-300 mA per cell) is required over long periods.

For substantial currents the layer cell tends to be uneconomic and every effort should be made to use such batteries within the rate of discharge for which they are intended. Examples from the Ever-Ready range of batteries for transistor equipment are: PP8 20-150 mA; PP10 15-150 mA; PP1, PP9, PP11 5-50 mA; PP6 2·5-15 mA; PP3, PP4 less than 10 mA; PP5 less than 8 mA. The rule here is that the larger the size of the cells, the more suitable it is for heavy discharge. A PP10, which will give 150 mA at 9 volts reasonably comfortably, weighs 2 lb. 12 oz., compared with the $\frac{5}{8}$ oz. PP5. It is worth noting that, for example, a PP4 discharged at 5 mA should have a life six to seven times as long as for a 15 mA discharge. This striking difference decreases with larger batteries. Since the output stages of many transistor receivers use class B push-pull, it should not be forgotten that running a set with high audio output greatly increases the battery drain.

Size of the cell, however, is not the only factor which governs the total amount of power which can be obtained from a dry cell of the Leclanché type. Other considerations include the period of use compared with the rest periods (the old house-bell batteries handled large currents economically because of their very long rest-to-use ratio); the temperature (optimum temperature is about 20°C); care taken in manufacture (one of the consumer magazines recently published a very illuminating article which showed considerable differences between batteries made by different firms); age (all cells—except the special inert type which are activated by filling with water—deteriorate with storage, generally the larger the cell the less the wastage); and finally the minimum voltage suitable for the particular application.

The Leclanché cell starts with about 1·5 to 1·6 volts and this drops fairly steadily with use (with some recovery during rest periods) so that in many cases the battery has to be thrown away while there is still some energy left in it. With transistor receivers the discard voltage is often governed by the amount of cross-over distortion which can be tolerated. With valves, h.t. batteries are usually limited by the oscillator failing below a critical voltage.

Most amateurs will be well aware of the damage which can result from leaving batteries in equipment for long periods. The outer zinc container is gradually eaten away by electrolytic action which continues after discharge. There are various leak resistant batteries available but even these should not be left too long.

Some years ago it was shown that the life of small h.t. batteries could be usefully extended by regularly applying a small " recharging " current of about 5 mA, and at least one small combined battery/mains broadcast receiver incorporated a simple " charging " arrangement which operated when the set was working on mains. The idea is worth considering since it is easy enough to connect h.t. or transistor batteries across a suitable d.c. source in the shack.

The internal resistance of a Leclanché cell rises steeply as it deteriorates, and a high-value electrolytic capacitor across the battery line will often improve matters.

While the Leclanché cell is still probably the most economical type for fairly regular use in applications having a wide voltage tolerance, the amateur often uses batteries in equipment and test instruments required only infrequently. For such uses, the mercury cell has decided advantages.

The mercury cell has a zinc anode, a caustic alkali (potash) electrolyte and a cathode of compressed mercuric oxide-graphite in contact with a steel container which forms the negative electrode. The no-load voltage is about 1·3 and on load this drops to about 1·2. Unlike the Leclanché it stays almost steady at this throughout by far the greater part of its life, then finally falling away with increasing rapidity to 1 volt and below.

The mercury cell does not recover to any marked extent during rest periods and thus shows little difference in total energy supplied in intermittent or continuous service. Apart from their steady voltage, mercury cells retain a substantially constant internal resistance during their lifetime. The total energy which can be taken from a cell of given size is several times that of the corresponding Leclanché cell, and they can remain unused for long periods with only little deterioration and without leaking. To set against all these important advantages, it must be pointed out that their price is several times that of the Leclanché.

Until quite recently, mercury cells were available mainly in the form of compact " button " cells. Nowadays, however, a full range of 1·35, 2·5, 4 and 8 volts mercury batteries similar in appearance and contacts to standard batteries are marketed in the United Kingdom by Mallory Batteries Ltd., Crawley, Surrey. As with the Leclanché, care should be taken to use mercury cells within the discharge rate for which they are intended. Because of the low internal resistance they can be rapidly discharged by an accidental short-circuit.

We feel that the amateur would find these particularly attractive for the odd transistorized unit used only occasionally, or alternatively for applications calling for long periods of continuous discharge—though for the latter an attractive alternative power source is the sealed rechargeable nickel cadmium storage battery.

### Cool-running V.F.O.s

In the April *T.T.* some of the advantages of keeping the frequency-determining tuned circuits of a v.f.o. right away from heat sources were mentioned. Since then we have come across two recent practical designs using this technique. One is " De Melkkoker V.F.O." by PA0CX (*Electron*, September, 1962) using an EF80 with a 3·5-3·8 Mc/s tuned circuit in a separate aluminium container, with the same basic Clapp circuit used by W1DX (*QST*, September, 1949). The other is a Colpitts oscillator by W4AMN (*QST*, April, 1963) covering a 100 kc/s segment of the 3·5 Mc/s band, with a coil slug adjustment to select the part of the band required—covering the full 3·5 Mc/s band always degrades the tuning rate on the higher frequency bands and shifts of more than 100 kc/s are seldom required in a hurry. The circuit is shown in Fig. 1. Careful anchoring of the co-ax inside the tuned circuit unit is advised together with care to solder completely the outer sheaths of the co-ax at the valve end. The output, using a cathode-follower connection, may be rather low and since the connection is at a slightly " hot " point with reference to the tuned circuit the loading presented should be constant, indicating the need for a class A isolating stage.

Oscillator tuned circuits should also be carefully isolated from mechanical vibration and we recently came across an instance where shock waves from the action of a straight

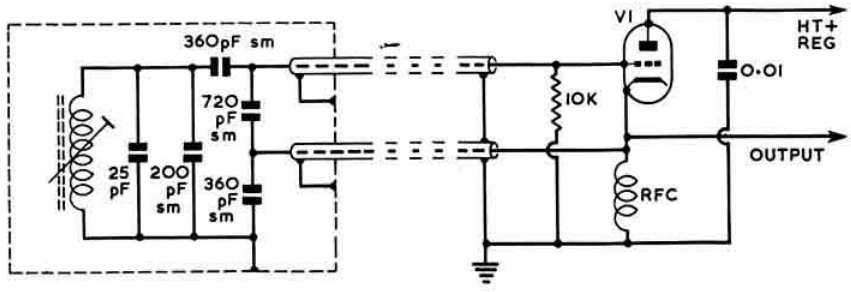



**Fig. 1. W4AMN's VO-Can v.f.o. places the tuned circuit out of reach of valve heat. The coil consists of 23 turns of No. 24 B. & S. wire close-wound on a ¼ in. diameter former with slug adjustment brought out to panel if operation over the full 3·5 Mc/s band is required.**

Morse key near the v.f.o. were apparently sufficient to cause a wobble on the note; it is often easier to overcome such troubles by a rubber or similar support than to attempt to improve the rigidity of the v.f.o.

### Power Supply Ideas

It is surprising how many recent *T.T.* items have been concerned with power supply circuits, a part of the equipment which a few years ago would have been considered pretty well standardized. Fig. 2 shows an idea from the "New Patents" columns of *Radio-Electronics* (May, 1963), for obtaining a boosted h.t. rail in addition to a conventional

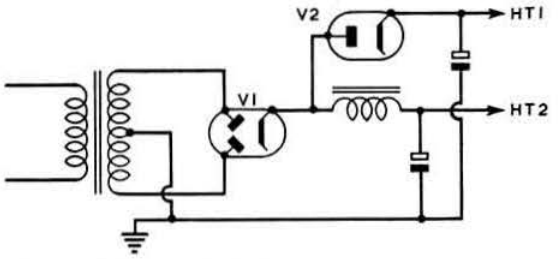



**Fig. 2. Dual power supply (U.S. patent 3053991). Note that if valve rectifiers are used V1 and V2 heaters should be fed from separate heater windings unless there is no danger of their cathode/heater insulation ratings being exceeded.**

full-wave line which must have a choke-capacitor ripple filter. V2, which could be any type of diode, connected to the pulsed d.c. output of V1 provides an output about 40 per cent higher (for low currents) than the HT2 line. The p.i.v. rating of V2 need be only half the peak rating of the transformer and the ripple frequency of HT1 will presumably be 100 c/s.

From the same issue of *Radio-Electronics* comes Fig. 3, showing the use of disc ceramic capacitors as transient suppressors with a high voltage bridge circuit using silicon diodes. The capacitor ratings are for a transformer with a 2 kV r.m.s. secondary but these could be scaled for lower voltage transformers.

As the power of transistorized equipment increases so does

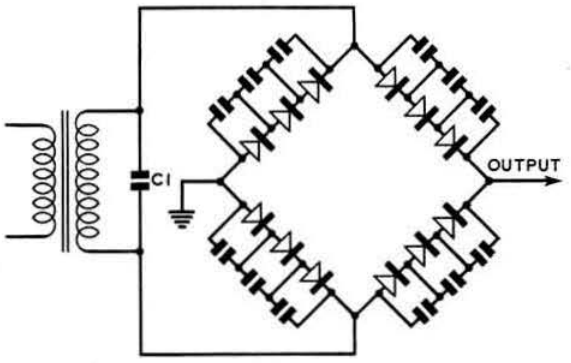



**Fig. 3. Disc ceramic capacitors used as transient suppressors in high-voltage silicon diode power supply. For a 2 kV transformer C1 would be 0·005 μF (5 kV) and the remaining capacitors 0·002 μF (1·2 kV). The actual number of diodes in each string would depend on their p.i.v. ratings.**

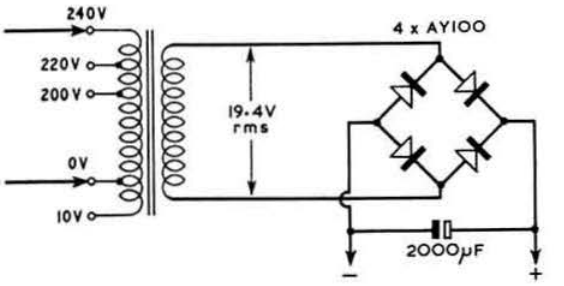



**Fig. 4. This 25 volt, 2 amp. power supply for a 40 watt transistorized public address amplifier would be useful for running mobile QRO transistor modulators in the shack.**

the need for husky low-voltage mains units for fixed operation of such equipment. A 40 watt public address amplifier using a pair of OC28 in the output stage is described in *Mullard Outlook* (April, 1963) and this has a 26 volt power unit (25 volts at 2 amps) using four AY100 rectifiers: Fig. 4.

### More on Electronic Keys

The note on relays for the ZL2AMW two-transistor el-key circuit (*T.T.* February, 1963) brought forth a quick and encouraging response in the form of letters, telephone calls and a working example brought round by G3PJB. All reported that little or no difficulty had been experienced in getting the key to work using assorted and junk box relays, and everyone seemed very satisfied with results. G3ORH reports that a G.P.O. type 3,000 doublepole changeover relay with 200 or 300 ohms coils works well, though one with 870 ohm coils would not work. G3GNM uses a "250 ohm telephone type relay—the small type with a coil diameter of § in." giving dot speeds up to well over 35 w.p.m. with two unmarked and unknown transistors. G3NIV also uses a P.O. relay with 300 ohm d.c. windings. G3RWL with two OC71 transistors uses a G.P.O. type 600 relay with two 500 ohm coils connected in parallel (fields adding), total current from 9 volt battery about 35 mA. He stresses the importance of having the tension of the break contacts correct to achieve good symbol lengths.

Some time ago (*T.T.* April, 1961) we gave a circuit for an el-key using a single transistor published by OE8KI and also in *DL-QTC*. In *Radio-ZS* (March, 1963) ZS4MG reports some minor modifications and refinements to this unit. He has found that interchanging the position of the 1K and 2K ohms potentiometers gives a better range of speed adjustment, and also that a 5 K ohms potentiometer can be added across the 400 ohm relay winding to provide a weighting control. A switch across the leads to the transmitter provides a tune-up switch (always needed with el-keyers). ZS4MG also points out that the original diagram showed "dots" to the left but advises the standard practice of making this the "dash" contact.

All of which goes to prove that there are still plenty of amateurs around who like building gear . . . and are then prepared to adjust component details and values until they get precisely the results they want.

### Epitaxial and Planar Transistors

For the past year or two, many of the most interesting new transistors have been "planar" or "epitaxial planar" types. As we cannot recall having seen any explanation of

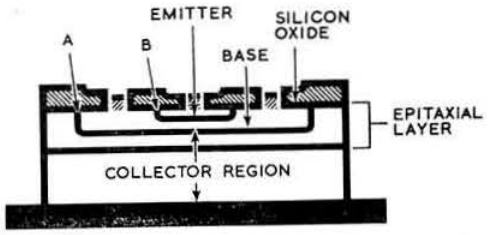



**Fig. 5. Cross-section sketch of an epitaxial planar transistor. A indicates the collector/base junction boundary and B the emitter/base junction boundary.**

these terms in BULLETIN articles, some members may still be wondering how these types differ from earlier transistors. So, helped by some S.T.C. notes, here goes:

Briefly, both terms refer to the form of construction of these transistors, designed as an alternative way of obtaining the advantages associated with h.f. mesa silicon transistors, and overcoming a number of the difficulties in manufacturing the mesa transistors. In the basic planar transistor the silicon collector forms the mechanical support. On top of this an oxide mask is built up, and through a hole in this the appropriate impurity is diffused to form the base region. Since the collector/base junction is formed under the silicon oxide coating it is protected against contamination. Then another oxide mask is built up, and an emitter region formed by diffusion. Transistors formed in this way are known as planar types.

A further technique, which can be applied to both planar and mesa transistors, is the formation of an epitaxial layer of high resistivity along a narrow section of the collector region and the junctions are then formed entirely in this layer. Fig. 5 shows an epitaxial planar transistor.

The details of the method of construction are perhaps of less importance to most of us than the fact that this is a relatively simple and therefore inexpensive form of construction, yet providing reliable transistors with very good performance for many h.f. and v.h.f. applications.

A good example of their use is the 18 watt, 7 Mc/s transmitter by G3NWF (BULLETIN, May, 1962). Incidentally the type TK202A transistors used in the p.a. stage of this design are now redesignated the BUY10, and the TK252A has become the BSY24.

## L and Pi-L Matching Networks

With most transmitters using pi-network output circuits designed to operate into low-impedance co-ax, problems can arise when using aerials of more than several hundred ohms impedance (assuming that the TVI question does not make a aerial coupling unit obligatory). A simple solution is the external *L*-network and a handy unit of this type was described by W4JA in *QST* (January, 1963): Fig. 6. The capacitor is a high voltage type and in the W4JA design switched shunts are connected across the r.f. ammeter. The combination of this unit with the pi-network provides in fact an alternative form of the pi-*L* network (see *T.T.* August, 1962) but ending up with *C* instead of *L*. In the other form of pi-*L* no additional capacitor is needed since the existing output capacitor performs a dual function.

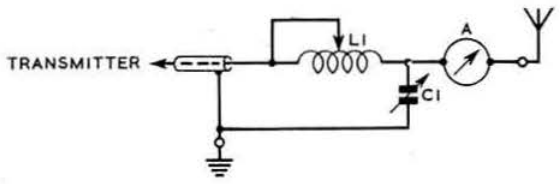



**Fig. 6. W4JA's Easy-Match L-Network for feeding single-wire aerials from a low-impedance transmitter output. L1 is 40 turn rotary coil (or 32 turns, 3 in. diameter, winding length 4 in. with tappings). C1 maximum 250 pF high voltage type. First tune transmitter with 75 ohm dummy load, then adjust L-network. If low pass filter and/or s.w.r. meter is used these should be inserted between transmitter and matching unit.**

In connection with the type of pi-*L* network discussed last August, we have recently been using one on 14 Mc/s and find the simplified design approach of W6KEV entirely satisfactory. This is simply to consider the component values in relation to a conventional pi-network: see Fig. 7. Then C1b will be the same as C1a; L1b about 25 per cent greater than L1a; C2b about $\frac{1}{2}$ to $\frac{2}{3}$ of C2a with a voltage rating three or four times as great; L1b uses the same size of wire as L1a, L2b can be considerably smaller gauge and should be preferably mounted at right angles to L2a. In this way an existing pi circuit can be converted quite simply to a pi-*L* network without any mathematical headaches.

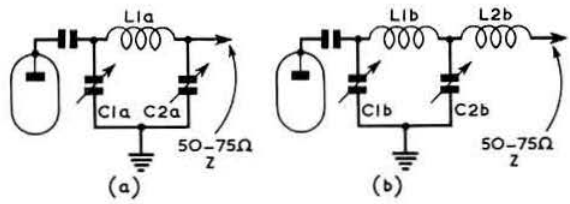



**Fig. 7. W6KEV's simple approach to pi-L network design. (a) Conventional pi-network. (b) pi-L network for low impedance output, changes in values are described in the text.**

## S.S.B. Transistorized Transceivers

Our earlier remarks about easily-operated s.s.b. transceivers were brought home to us very vividly recently when we had an opportunity of trying out fully transistorized, s.s.b. battery-operated, h.f. transceivers claimed to be "the world's most advanced military pack-set in production" (see *Electronics Weekly*, May 15). These compact stations ($3\frac{1}{2}$ in. × 11 in. × 15 in.) weigh only 20 lb., including batteries, and yet have a frequency synthesizer allowing them to be set immediately to any of 10,000 channels at 1 kc/s spacings between 2 and 12 Mc/s and give a very useful 15 watts p.e.p. output (a 100 watt add-on *transistorized* linear amplifier has been developed).

The 15 watt sets had been brought over by two Hughes engineers (one of whom was WA6OLZ) during a world-wide demonstration tour. Although of course not intended as an amateur rig we were able to work GB2SM (20 miles) and G3PQJ (80 miles) without difficulty using a loaded whip aerial on 3780 kc/s, and can confirm that the setting up and operating of such rigs is every bit as easy as dialling a telephone call—one just sets the digital switches to show the required frequency and that is it.

A few years ago the idea of one man being able to carry around complete and flexible s.s.b. stations of real talk power would have seemed incredible. In fact, we were able to carry two quite easily. We were relieved to learn that

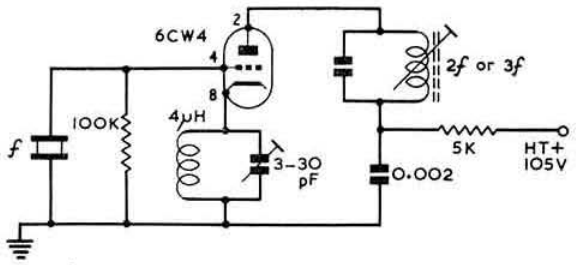



**Fig. 8. This is the Nuvistor version of W6AJF's overtone-harmonic oscillator (CQ, February, 1963) mentioned in the article "Using H.F. Crystal Oscillators" (*Bulletin*, March, 1963) for third-overtone harmonic crystals (35-48 Mc/s). The cathode circuit is tuned between 20-30 Mc/s.**

WA6OLZ still uses a BC348 in his own station, since we must admit that the bulky home-brew equipment at G3VA now seems as obsolete as spark.

### Here and There

A new valve type noted in various European publications is the ECLL800 which is a triode with two output pentodes in a single envelope, making possible a single-valve compact and economical modulator with an output in class AB of around 8·5 watts. The pentodes are similar to those in the ELL80.

We have all heard of Californian kilowatts but really it seems to be carrying things a bit far to find advertisements in *QST* for transmitters with an output of 200 kW.

### Enquiries Regarding Bulletin Articles

MEMBERS WHO WRITE TO THE authors of BULLETIN articles are asked to enclose stamped addressed envelopes if they require replies.

### Solution to the Crossword on page 652

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### Bulletin Contributors

MEMBERS who are prepared to contribute articles to the Society's Journal are reminded that some notes are available to help them prepare manuscripts in a form that will assist in securing uniformity of presentation, simplify the work of the Society's printers and draughtsmen and help ensure that their instructions are easily understood. A copy of *Hints to Contributors* can be obtained on application to the Editor.

All contributions to the Society's Journal including those for the *Regional and Club News* and *Forthcoming Events* features should be typed with double spacing between lines using one side of the paper only. Information for the R.S.G.B. BULLETIN should not be included on the same sheet of paper as material for news bulletins.

Photographs should be clear and sharply focused. Prints should preferably be glossy and should contain information of general interest to members. Captions should be written on a separate sheet of paper.

The amount of the copyright fee paid to contributors to the R.S.G.B. BULLETIN ranges from £2 2s. to £5 5s. per 1,000 words.

### Saundersfoot Bucket and Spade Party

A GOLDEN JUBILEE BUCKET and Spade Party will take place at Saundersfoot on Sunday, June 30. GW2OP and GW3LXI will be active on 1876 kc/s as talk-in stations. Tickets, price 5/- (2/6d. for children) including tea may be obtained from G. Courtenay Price (GW2OP), Hillcourt, Freshwater East, Pembroke, South Wales, or from GW3LXI or GW3RPR, at least six days before the event. For those who intend to spend the whole day by the sea, arrangements can also be made, if desired, to provide lunches.

### GB3MYA Exhibition

IN CONNECTION WITH the Midlands Youth Assembly to be held at Peterborough, Northants, from June 28-30, 1963, the World Association of Methodist Radio Amateurs and Clubs will be operating an exhibition station under the call-sign GB3MYA on all bands from 10 to 160m. Equipment in use will include a K.W. Vanguard transmitter and an Eddystone 888A receiver. The Peterborough Amateur Radio Society will be exhibiting home constructed gear.

### 1250 Mc/s Tests

DURING THE R.S.G.B. 1250 MC/S TESTS on June 23, 1963, G3HBW/P will be operating from Worcestershire Beacon on 1297·467 Mc/s or 1297·935 Mc/s, with 144 Mc/s and 430 Mc/s links. Skeds will be welcome.

G3HBW/P will be active from 09.00 to 23.00 G.M.T.

**BOOKINGS FOR THE**

**GOLDEN JUBILEE CELEBRATIONS**

**CANNOT BE GUARANTEED IF RECEIVED LATER THAN**

**JUNE 20, 1963**

# A Sweep Oscillator for Crystal Filter Alignment

By R. G. H. ROBERTSON (A.3518)*

THE proper alignment of a crystal filter can be carried out by adjusting it a little at a time and plotting its response for every adjustment, but this is tedious and the use of a sweep generator (or " ganging oscillator ") and oscilloscope will enable it to be done instantaneously many times a second. There is no need to use a very high quality generator for single frequency small deviation work such as crystal filter testing, and the low cost transistorized generator described here does the job excellently.

In use transistor Q1 (which may be any inexpensive r.f. transistor, such as the OC45 or probably even a " white spot ") oscillates at the intermediate frequency determined by L1C3. When a voltage is applied across VR1 the base bias on

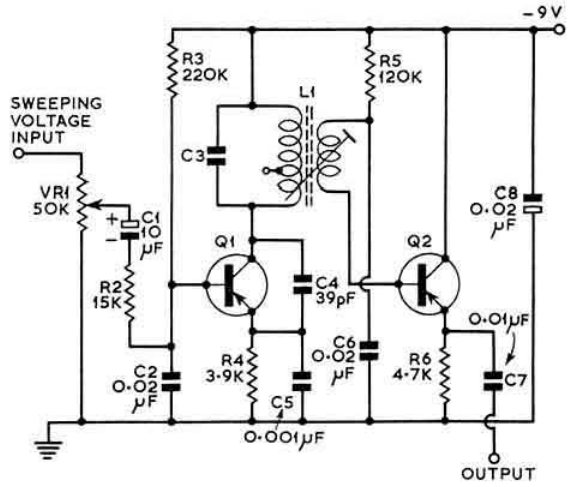



**Fig. 1. Circuit diagram of the transistor sweep oscillator.**

the transistor varies in sympathy with it and as the frequency of oscillation is strongly dependent on the emitter current, frequency modulation occurs. Very little amplitude modulation, however, takes place (most important in sweep generators) because the transistor saturates when oscillating, making the output voltage virtually independent of the average collector current.

L1 is a standard transformer intended for use as the first i.f.t. in miniature superhets. If the transformer is supplied with an integral tuning capacitor, it should be removed and replaced (not necessarily in the can) with one of somewhat lower value (C3). A 200 pF capacitor will have to be reduced to about 120 pF. Note that the whole of the primary winding is used.

To prevent resonant circuits connected to the output pulling the oscillator frequency a common-collector stage using a similar transistor Q2 has been added to the sweep generator. In some cases this may be omitted.

The value of C5 is somewhat critical—it should be large enough to prevent blocking due to excessive feedback, but not so large that the oscillator stops when the emitter current is reduced in the course of modulation, which results in a restricted deviation. Values should be tried so that VR1 may be increased to cause enough deviation to sweep the frequency through the required band yet to give an essentially " clean " output when viewed directly on an oscilloscope. When the sweeping voltage at the base is large the oscillator will be cut off for part of the cycle or will be at least partly amplitude modulated and may give misleading results.

In the writer's model a 1 volt r.m.s. sine wave at 50 c/s gives a deviation of about 20 kc/s peak-to-peak before cut-off occurs, and delivers 1·5 volt r.m.s. on open circuit. When this is applied to a crystal filter (deviation reduced to about 6 kc/s) some ringing appears and this, coupled with the fact that the oscilloscope time base is linear while the sweeping voltage is sinusoidal, calls for very careful interpretation of results. If the time base voltage is available, it would be much better to use this (perhaps inserting series resistors to prevent loading it) for sweeping the oscillator, and set it to a frequency of about 20 c/s. It is not recommended that a demodulator be used unless the oscilloscope will not function at 450 kc/s. Viewing the envelope gives a " zero line " and makes possible more accurate adjustment for best performance.

The basic circuit may be useful as a n.b.f.m. generator (at a higher frequency with smaller deviation) of quite good linearity.

* *Oriel College, Oxford.*

## SOUTH WALES GOLDEN JUBILEE CONVENTION

### NATURAL HISTORY WING, UNIVERSITY COLLEGE, PARK PLACE, CARDIFF

**Saturday, September 14, 1963**

*Programme*

| | |
|---|---|
| 11.00 a.m. | Lectures and Demonstrations of Equipment |
| 2.30 p.m. | Business Meeting and Official Opening |
| 5.0 p.m. | High Tea |
| 6.0 p.m. | Raffle and Official Lecture |

*In addition to the formal programme, there will be competitions for home-constructed equipment and various prizes for mobile entries.*

*A free car park for up to approximately 100 vehicles will be within the College grounds. Lunch in the College will be available, the cost of which is not included in the ticket price below. Full details will be circulated within the Region as soon as they are available.*

*Tickets, price 13/6d. each including high tea, are available from Mr. D. J. C. Green, GW3MRI, 36 St. Augustine Road, Heath, Cardiff. No applications can be accepted after September 7, 1963.*

*The Council will be represented by the President, Mr. Norman Caws, G3BVG, the Zonal Representative, Mr. A. C. Williams, GW5VX, and the General Secretary, Mr. John Clarricoats, O.B.E., G6CL.*

# Single Sideband

By G. R. B. THORNLEY (G2DAF) *

WITHIN the last few months two types of mechanical filter have become available in the U.K. at competitive prices that put them within the price range of many sideband workers. These are the Collins F455 FA-21 filter with a 6db bandwidth of 2·1 kc/s and the Kokusai MF455-10K and MF455-15K with 6db bandwidths of 2·0 and 3·0 kc/s respectively.

Increased interest in the use of mechanical filters has resulted in a number of requests for technical information and circuit detail. The following letter is typical: " Since becoming interested in sideband I have read with interest your column in the BULLETIN. Unless I have missed it, I don't believe I have seen mechanical filters referred to in any detail. . . . I am sure that something on this subject would be appreciated by many people interested in s.s.b., particularly as the price of these filters is now becoming competitive with that of the half dozen or so crystals required in a conventional filter."

The MK.II receiver at G2DAF uses Collins mechanical filters; however, there was no past experience of the Japanese variety. This has now been rectified and the Kokusai mechanical filter has been subjected to individual test and measurement and finally fitted into the station exciter and used on the air.

### The Kokusai Mechanical Filter

The Kokusai filter is available with a nominal centre frequency of 455 kc/s with 6db bandwidths of either 2·0 kc/s or 3·0 kc/s. The case style is a spun aluminium cylindrical can approximately 2⅝ in. high and 1⅜ in. diameter with two threaded mounting studs and four insulated feed-through connecting tags. Mounting is intended to be vertical with the connecting tags going through the chassis, and as an aid to installation a rectangular, ready-drilled, mounting plate is provided with each filter, together with a small cross screen.

Also provided are (i) a leaflet giving technical information and circuit diagrams showing methods of connecting in the i.f. circuits of a typical communication receiver, (ii) an individual test specification quoting the filter serial number and giving a plotted passband characteristics curve and (iii) a table giving the filter centre frequency, the 6 and 60db bandwidth and upper and lower carrier crystal frequencies.

The filter tested was the type MF455-15K with a nominal bandwidth of 3·0 kc/s. In the technical specification an illustration of the basic circuitry shows disc resonators excited by quartz crystal transducers. For initial measurement the filter was built into a test rig incorporating a voltage amplifier stage, and connected between the oscilloscope and ganging oscillator. Inspection of the ripple in the passband indicated that there were six resonant discs. The skirt response showed a clean, perfectly symmetrical response with a straight base line and no evidence of out-of-passband spurious responses.

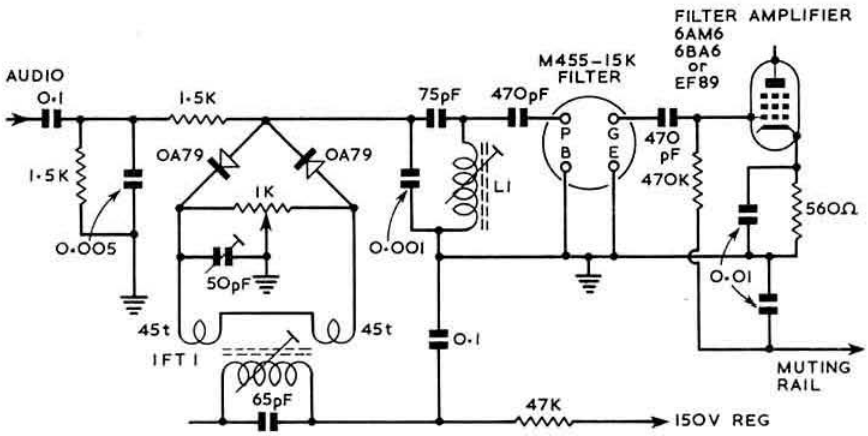



**Fig. 1. Circuit details showing the method of using the Kokusai mechanical filter in the G2DAF Mk. II transmitter. IFT1 is a standard Maxi-Q IFT 11/465 i.f. transformer with the secondary removed and replaced with a scramble winding of 90 turns of the original wire, tightly coupled each side of the primary coil as shown. For details of L1 see text. It should be noted that the terminal marked " E " on the filter is internally connected to the case—it is important that the filter is wired the right way round. Terminals are shown looking at the pins from underneath the chassis. Feed a 1-1·5 kc/s tone into the microphone socket and resonate L1 for maximum output at the anode of the filter amplifier valve.**

Finally the test rig was connected between the BC221 and a valve voltmeter and the passband plotted on graph paper—this included exploring the frequencies to at least 30 kc/s out on either side of the skirts to a level 60db down in relation to the centre passband response. The curve obtained was compared with the curve supplied by the manufacturer and found to be identical. The measured 6 and 60db bandwidth were 3·1 kc/s and 6·0 kc/s, and the maximum ripple in the passband 3·5db. There were no out-of-passband spurious responses measurable within the range of the test equipment used. Insertion loss was between 10 and 12db.

Unlike the Collins mechanical filter the transducer coils are not resonated with an external capacitor at the operating frequency and appear to have a much lower transfer impedance. This presented a problem in so far as the G2DAF exciter is concerned, because it is not possible to use the usual series resonated connections necessary when the filter is following a low impedance balanced modulator. Attempts to connect the filter directly across the balanced modulator output resulted in zero signal, and inspection of the r.f. envelope at the filter amplifier anode showed that two-tone

* *5 Janice Drive, Fulwood, Preston, Lancashire.*

input into the microphone socket produced pure c.w.—unfortunately without any modulation! It appeared obvious that the audio frequencies at the junction of the two germanium rectifiers were being short-circuited to chassis by the filter transducer coil. However, a little experimental work produced a satisfactory method of obtaining the required low impedance to the carrier and high impedance to the audio required by the modulator, and at the same time appeared to be the optimum match into the mechanical filter.

This Kokusai filter has been in use in the G2DAF transmitter for the past month and all stations report very acceptable and natural speech quality, no discernible carrier, and excellent sideband suppression in the range 40-45db down. It should be understood that these suppression figures are the performance of the filter under normal voice modulation conditions. The suppression under tone-input modulating conditions was measured by taking the exciter output from the 6146 driver valves via a pick-up loop and co-axial cable into the station receiver, and switching sidebands by selection of the Collins F455-Z4 or F455-Z5 filters in the receiver i.f. amplifier. Readings were taken from the calibrated S meter and indicated a transmitter suppression to all modulating audio frequencies of 1 kc/s or above, of better than 60db. The circuit detail as used is shown in Fig. 1. The coupling coil L1 is one pie of a standard Maxi-Q Type IFT.11/465 miniature i.f. transformer with the internal 65 pF resonating capacitor removed.

A mechanical filter will give a high level of selectivity in a small package that takes up a lot less room than two or three half-lattice crystal filter sections. This makes it particularly suitable for incorporation in the older communication receivers such as the AR88, HRO and CR100 etc. It is also relatively simple to arrange to switch the filter in or out of circuit so that the normal selectivity can be used for a.m. and the filter for s.s.b. and c.w. A circuit suitable for most receivers is shown in Fig. 2.

The writer's general impression after testing and using the

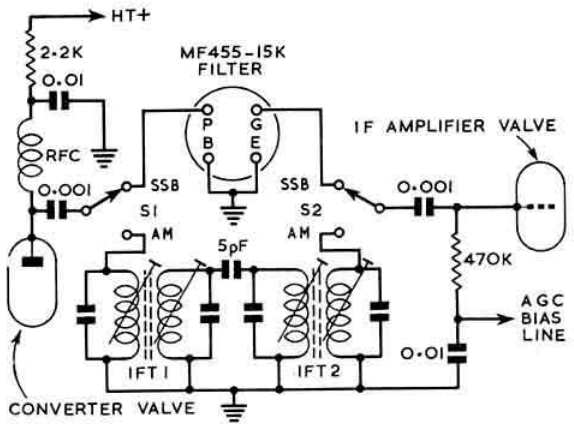



**Fig. 2. Suggested circuit for the use of the Kokusai filter in an existing communication receiver to improve the s.s.b. selectivity. S1 and S2 can be switch banks fitted to the existing selectivity switch assembly, and should be of the type incorporating shorting plates. The shorting plate pole must be earthed. If the filter selectivity is not to be degraded, the two banks must be isolated from each other with an earthed cross screen. IFT1 and IFT2 are standard Maxi-Q IFT 11/465 i.f. transformers or similar.**

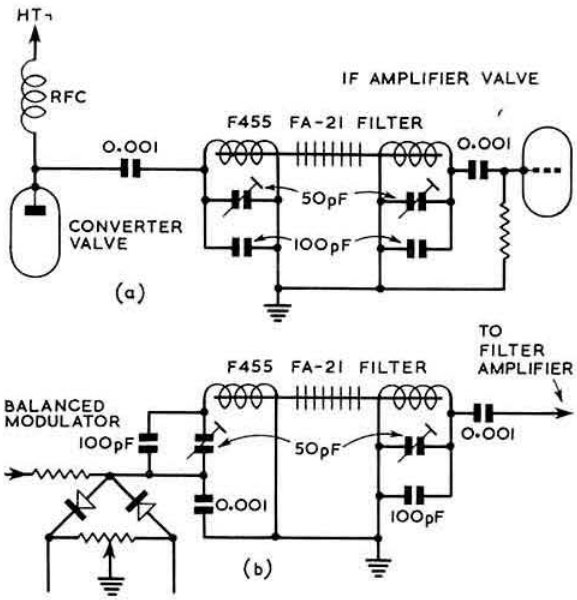



**Fig. 3. Basic circuits for the Collins mechanical filter type F455 FA-21 showing at (a) a parallel resonated transducer coil following a high impedance load, and, at (b), a low impedance load. The resonating capacitors are adjusted for maximum signal through the filter at the centre passband frequency.**

Kokusai mechanical filter is that this product is mechanically stable, well engineered, performs as claimed by the manufacturer, will give an unwanted sideband suppression generally adequate for amateur requirements and at the current market price represents good value for money.

### The Collins Mechanical Filter

The Collins mechanical filters have been in use for a number of years and are now well known. Currently listed are filters operating over a range from 60 kc/s to 500 kc/s with 6db bandwidths from 0·5 kc/s to 35·0 kc/s—in fact Bulletin 1007 obtainable from Collins Radio Co. of England Ltd. lists no fewer than 92 different types. Recently Collins have released a Low-Cost 455 kc/s Mechanical Filter* designed specifically for the amateur market. This is the Type F455 FA-21 with a nominal 6db bandwidth of 2·1 kc/s and a 60db maximum bandwidth of 5·3 kc/s providing a shape factor of just over 2·5 to 1. It should be noted that although the shape factor is not so good as the more expensive 3·1 kc/s filter (shape factor 2·1) the slope is marginally better—in fact the F455 FA-21 filter in regard to passband characteristics and unwanted signal rejection is identical to the F455 Y-21 fitted in the " S Line " equipment.

This filter is fitted in the FA rectangular case 2½ in. long, just over ½ in. wide, and ½ in. high and is intended for horizontal mounting. The centre frequency is 455 kc/s nominal; 6db bandwidth 2·1 kc/s nominal; 60db bandwidth 5·3 kc/s maximum; passband ripple 3db maximum; transfer impedance 5·0 K ohms plus or minus 2·25 K ohms; resonating capacity 130 pF ± 5 pF; transmission loss 9·5db and spurious response attenuation (405 to 505 kc/s) 60db

*(Continued on page 686)*

* R.S.G.B. BULLETIN, February, 1963.

# Mobile Column

**BY C. R. PLANT (G5CP)***

THE Rally Season is upon us once again and by the time this is published at least nine rallies will have taken place. A further four are still to be held this month, two in July, three in August and four in September. The picture is now clear—May and June are the " heavy " months with September as the runner-up.

In our unpredictable climate it is hard to say which month offers the best prospects for fine weather—in the writer's experience September has often proved to be a very good one and even the first two weeks in October often are surprisingly sunny but, of course, the daylight hours are short.

Rally secretaries are asked to forward details of their arrangements as soon as possible—the information must be available at least five weeks prior to the publication date. It will also be helpful if a full report giving prize winners and any interesting information, is forwarded to the writer immediately after the rally.

The new chairman of the R.S.G.B. Mobile Committee is C. L. Fenton, G3ABB (Danbury, Essex) and the committee has been strengthened by the addition of Messrs. MacBrayne, G3KGU, and Winsford, G4DC. Our best wishes go to these members in their efforts; the Wethersfield programme is itself proof, if this is necessary, of the good work being done by the committee.

### Forthcoming Rallies

The **Wolverhampton Amateur Radio Society** is holding a Mobile Rally on Saturday, June 15, at the Hobson Sports Ground, Fordhouses, Wolverhampton, commencing at 2 p.m. The rally is being held in conjunction with the Sports Clubs of three local companies, H. M. Hobson Ltd., Boulton & Paul Ltd., and Marstons Excelsior Ltd. Prizes will be awarded to the owner of the mobile car travelling the farthest distance, for neatness and safety, for both v.h.f. and l.f. installations. There will be a demonstration of equipment and the usual raffle. The juniors and ladies will also be well catered for: a circus, concert party and side shows have all been arranged. For further information write to J. Rickwood, 738 Stafford Road, Wolverhampton. This is an example where the advantage of joining in with a larger organization has made it possible to offer a great variety of " other attractions."

The Fourth **A.R.M.S. Mobile Rally** is once again to be held at the U.S.A.F. Base, R.A.F. Station, Barford St. John, Oxon, on Sunday, June 16. Talk-in stations will open at 9.30 a.m. but it is anticipated that a lot of people will be arriving the previous evening to join in the festivities which will include a Barbecue Supper—this was a great success last year. The U.S. Third Air Force Band, by the kind permission of Major-General Ives, will be in attendance on the Sunday and the usual games, with a large selection of prizes, will be played. The base stations will be G3NMR on 144 Mc/s and G3NMS on Top Band. There will also be an s.s.b. station on 3·5 Mc/s and 14 Mc/s in operation. It is hoped to have a train available for the children and other attractions for the ladies. Given good weather this should be a fine event.

The **Bridlington Rally** which was to have been held on June 23 has been cancelled.

**Longleat Mobile Rally** is to take place on Sunday, June 30 at Longleat House, near Warminster, Wilts. Mobile stations will be able to contact the Rally Control on 144 Mc/s and on 1·880 Mc/s (call-sign G3JMY). Cars converging on Longleat should come from the north, east and south via Warminster and from the west via Frome. The one entrance to the estate lies on the Warminster/Frome road A362, and Mobile Rally signs will be erected near this entrance. A small charge is made for admission and ample space is available for parking and picnicking. An exhibition of Morris Folk Dancing will be given on the lawn above the " Half Mile Pond " and a Children's Playground should keep the youngsters occupied. The rally, organized by the Bristol R.S.G.B. Group, will feature several events and prizes will be awarded for the longest distance contact with the Control Station, the highest field strength measured on 1·880 Mc/s from a pre-arranged site, the longest journey to and from the rally on the day and also the most effective installation consistent with safety and other factors. A raffle with really good prizes will also be run.

The **Pembroke Radio Club** has also organized a rally for Sunday, June 30 to be held at the Regency Parish Hall, Saundersfoot, Pembrokeshire. Talk-in stations will be GW2OP/M and G3LXI/M on 1·876 Mc/s. The charge for tea will be 5/- for adults, half price for juniors. Luncheon facilities are available locally if required. Please book in advance to GW2OP, Honorary Secretary, Pembroke Radio Club, Hillcourt, Freshwater East, Pembrokeshire, West Wales, before June 25.

The **South Shields Mobile Rally** will take place on Sunday, July 7 at Bents Park Recreation Ground, Coast Road, South Shields, Co. Durham. The Control Station will open at 11 a.m. and will operate on Top Band—a special lookout will be kept for long distance contacts so that a prize may be awarded for the longest distance QSO on the day of the rally. At 2 p.m. rally competitive events will commence; these will include a driving competition, odd sounds quiz and transmitter test. Light refreshments will be available at the site. For further particulars write to D. Forster, Honorary Secretary, 41 Marlborough Street, South Shields, Co. Durham.

### Rally Reports

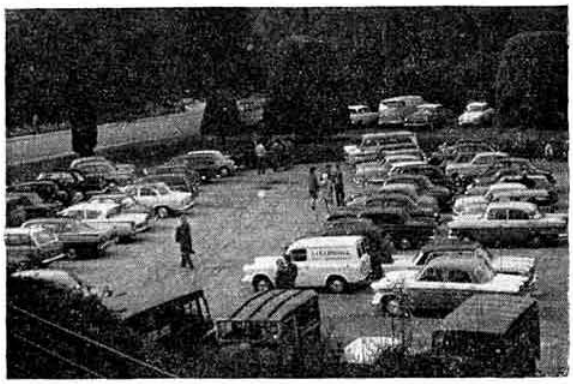
The **Trentham Rally** was, as usual, a great success and was attended by over 450 mobiles and about 2,500 people. The weather was reasonably good—there were a couple of showers—but the enthusiasm of the visitors was not in the least dampened! The O.R.M. was held during the afternoon and attended by about 90 members. The Council was represented by Norman Caws (G3BVG) (President), John Clarricoats (G6CL) (General Secretary), Ray Hills (G3HRH) and Fred Parker (G3FUR).

The rally was officially opened by the Lord Mayor and Lady Mayoress of Stoke-on-Trent and the party included the R.S.G.B. Council Representatives and the presidents of the two societies organizing the event. Phil West, the rally chairman, presided. The Lady Mayoress was presented with a floral bouquet by Miss Sherratt.

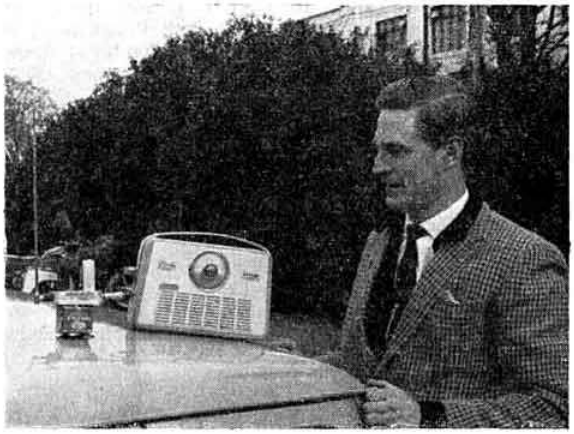
To guide the visitors to the rally two talk-in stations were set up at the site and in addition there were two out-stations on each band to cover the long haul contacts. The Stoke-on-Trent A.R.S. covered the Top Band side with G3GBU/A using a vertical, loaded aerial on the control station as suggested in a recent issue. M.A.R.S. operated G3MAR/A on 144 Mc/s and used the new J-Beam omni-directional turnstile with very good results.

The organizing committee decided to concentrate on the exhibition this year as it is not possible to run rally-type of events within the grounds. There were 35 stands and their content was chosen to be as varied as possible to interest the XYLs and radio amateurs alike. The outside events included a water ski-ing competition and continuous exhibitions of

* " *Lynton,*" *12 Nottingham Drive, Wingerworth, Chesterfield, Derbyshire.*



**Part of the 144 Mc/s car park at the North Midlands Mobile Rally at Trentham Gardens on April 21, 1963.**
*(Photo by G5CP)*



**R. Roberts, B.R.S.24613, demonstrating his VK2SG-type transistorized converter described in Mobile Column in June, 1962.**
*(Photo by G5CP)*


**The M.A.R.S. 2m talk-in station with G3JPN.**
*(Photo by G3KNF)*

control line model aircraft flying. Many radio societies contrived to put on display models covering the type of work which interested their particular society members.

The grand raffle was a big attraction, approximately 70 prizes being distributed, many being for the YLs. The raffle was organized by Bob Palmer, G5PP, and Mrs. Palmer assisted by Howard Parker.

Visitors came from all parts of the country including London and South Wales. The cars were organized in the main into two parks, one for v.h.f. and the other for h.f. Although s.s.b. was not used for mobile contacts the N.W. V.H.F. Group had several s.s.b. v.h.f. combinations on view showing how relatively easy it is for this mode to be used on 144 Mc/s. The aim of the organizers was to let people " get together," to have plenty of space and time to talk to each other. The rally was without doubt the best yet at Trentham: can they keep it up? The committee believes it can do just that—congratulations on this year's effort and good luck and best wishes for 1964.

The first news of the **Verviers Mobile Rally** held on April 28 in Eastern Belgium was received from DL2DJ during a QSO the same evening—Don told of the excellent arrangements made by the organizers, but reported sadly on the weather which did its best to spoil everything. Continuous and often heavy rain fell incessantly and a heavy mist contrived to hide some of the beauty spots during the Treasure Hunt. The temporary licence arrangements organized by ON4PL and ON4VY for Belgium and PA0ZD in Holland were a great success from a British point of view, in particular, for out of 30 issued 22 were for the British contingent. The calls (ON5s and PA9s) certainly had an unfamiliar sound. The holders of this unique distinction included G3BID, G3FPK, G3NMR, G3NUY, G3EHK, G3BHT and G3PAH. A presentation by A.R.M.S. was made to M. Leon Peters,

**MOBILE RALLIES 1963**

| | |
|---|---|
| June 16 | A.R.M.S. Rally, Barford St. John, Oxon. |
| June 16 | Cornish Radio and Television Club Hamfest and Mobile Rally. |
| June 30 | Longleat Mobile Rally, Longleat, near Warminster, Wilts. |
| July 7 | Harlow and District Radio Society Mobile Rally at Magdalen Laver. |
| July 7 | South Shields and District Mobile Rally, South Shields, Co. Durham. |
| July 14 | Chiltern Amateur Radio Society Mobile Rally, West Wycombe Park, Bucks. |
| July 28 | R.A.F. Stradishall Mobile Rally, near Newmarket, Suffolk. |
| August 11 | Torbay A.R.S. Mobile Rally, Naval College, Dartmouth. |
| August 18 | Derby Radio Societies Mobile Rally, Rykneld School, Derby. |
| August 25 | Reading A.R.C. Mobile Rally, Pangbourne, Berks. |
| September 8 | Thames Valley Amateur Radio Transmitters' Society Mobile Rally. |
| September 15 | Lincoln Hamfest and Mobile Rally, Kesteven Grammar School, North Hykeham, Lincoln. |
| September 22 | R.S.G.B. Woburn Abbey Mobile Rally. |

ON4PL, M. Rene Vanmuysen, ON4VY, and Dr. Hans Ten Herkel PA0ZD for the part they played in getting licence permission for foreign visitors. In this, the first International Mobile Rally, the first non-reciprocal issue of temporary mobile licences has taken place, undoubtedly a move in the right direction.

A further report from G2DHV (Sidcup), tells of the rally and gives the following call-signs of people attending: ON5ZA/G3KVF, ON5ZC/G3NMR, ON5ZD/G3MSS, ON5ZF/G2FUX, ON5ZG/G3KZI, ON5ZL/G3BNL, ON5ZM/G3OSS, ON5ZQ/G2DHV, ON5ZU/G2AMO, F2BO, DL9ZV, DL1KN, DL2DJ, DL1OY, DL9RE, PA0BU, PA0LX and PA0CYM. The British contingent also included the following who also went to Verviers: G3FHK, NUY, BXI, EHK, BHT, PAH, DHK, FPK, IYF, BID and G3HGE and G8QW. In all, including families and friends, about 100 people from Britain attended.

In response to last month's request for information regarding licence facilities in Europe for British amateurs, a letter has been received from G3NDI (Solihull), in which he says that in 1961 he was issued with a licence for one month at a cost of a few shillings by simply applying in person at the Headquarters of the Austrian Postal Services. He feels that there would not be any difficulty in getting a mobile licence provided a photostat copy of the home station licence was sent to Post und Telegraphendirektion, Parteieuverkehr, WEIN, 1, Fleischmarkt, 19, Austria. It certainly seems worth trying if anyone is to visit Austria this year.

During a QSO with G5UG he stated that the proposed mobile rally in Weston-super-Mare for which a tentative date had been reserved, will not now take place. It seems that the intention is to hold the rally every other year, so we shall look forward to hearing of the arrangements for 1964.

### Operating Notes

**G6SN** (Birmingham) has just returned after a three month holiday abroad during which he visited the Canary Islands and South Africa. He reports that he will be active on 144 Mc/s during the summer months.

A letter from **G3IXO** (Winscombe, Somerset), tells of a change of car—the new one is a Morris 1100—and of the problems met when installing the mobile equipment. The station operates on Top Band only, running at one watt input to the final stage. The line-up is 12AU7 v.f.o./buffer, driving a 5763 p.a. modulated by 12AX7, 6AM6, and 6BW6.


**The President, Mr. Norman Caws, G3BVG, with the Lord Mayor of Stoke-on-Trent, left, and the General Secretary, Mr. John Clarricoats, O.B.E., G6CL, at the Region 3 O.R.M. at Trentham Gardens on April 21, 1963.**

*(Photo by G3JPN)*

**G3ASC, G3IOO, G3KEK and G3LGN at the North Midlands Mobile Rally at Trentham Gardens.**

*(Photo by G5CP)*

The receiver is a much modified Master Radio miniature broadcast set which gives excellent results. A Minimitter whip aerial is fitted to the off-side rear bumper by the simple expedient of removing the over-rider and enlarging the bolt hole to take the base of the whip. Both the transmitter and receiver are suspended under the dash board, the PCR3 power pack being fixed to the floor on the near side of the car immediately under the parcel compartment (Hugh obviously has a very co-operative XYL!). Noise suppression has not been difficult to overcome, tyre static is slight, accessories generally are clear and the ignition and generator responded to normal treatment. The main problem was found to be poor connections to the plugs due to the copper clips making indifferent contact. QSOs have been made whilst in motion with stations over a radius of 25 to 30 miles, a highly satisfactory performance for such a low input.

**G3OCB** (nr. Truro, Cornwall) is in the process of building a mobile transmitter-receiver for 144 Mc/s using transistors in all but the transmitter r.f. stages. The converter line-up and the 4 to 6 Mc/s tunable i.f. are built into the smallest size Eddystone die-cast box, the latter using OC171 r.f. and mixer and an OC170 oscillator. Tuning is by means of capacitors from RF27 units. The i.f. amplifier, detector and b.f.o. are built on a board 3 in. square and doubled tuned i.f.t.s are used; the line-up is AF117 i.f. amplifiers, diode detector, XB103 b.f.o. (crystal controlled). The a.f. strip uses an XA103 driving an XC131 delivering 750 milliwatts into a 15 ohm speaker. The transmitter will have a QQV03-20A in the p.a. driven by a normal chain from an 8 Mc/s V.X.O. so as to obtain some flexibility in the Zone 1 segment. The modulator employs two OC71s, OC81, XC142 and a pair of XC142s giving an output of about 12 watts. The driver and modulation transformers were specially made by Gardners to the specification given on page 427 in the current R.S.G.B. *Amateur Radio Handbook*. The power supply unit has been built and tested—it uses a pair of OC28s and a home built transformer and gives a full 55 watts output at 80 per cent efficiency. Taps are provided to give voltages between 200 and 350 volts.

A letter has been received from a student, Andrew Thompson (A.3562) of King Edwards School, Witley, Surrey, asking if, during the school " Initiative Week " July 18 to 25, he and a friend, both keen S.W.L.s, could find an amateur " going mobile " would would allow them to accompany him, and " do the dirty work." The school provides the boys with a food allowance and they would be prepared to join up anywhere in the south of England. Anyone interested is asked to write to Andrew at the school address as soon as possible.

# Ultra-linear Use of the Woden Modulation Transformer

BY G. D. ROE (G3NGS)*

AT the present time it is rare to find amateurs making use of an ultra-linear or distributed load output stage in modulators, although the advantages which have made this system universally accepted among audio enthusiasts appear attractive to the phone man who takes a pride in his signal.

The ultra-linear output stage uses tetrode or pentode valves operating under conditions intermediate between triode and tetrode, the screen grid being connected to a tapping point on the output transformer primary as shown in Fig. 1. The circuit approaches that of a triode output

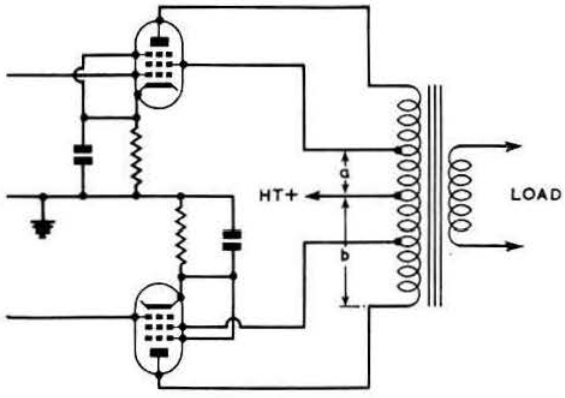



**Fig. 1. The basic ultra-linear output circuit.**

stage with negative feedback applied internally via the screen grids. In hi-fi amplifiers the tapping ratio $a : b$ normally lies between 20 per cent and 43 per cent, the 20 per cent limit being set by conditions of the highest power output compatible with acceptable distortion levels and the 43 per cent limit representing the minimum acceptable power with optimum distortion figures. It should be noted that, with the circuit configuration of Fig. 1, the anode and screen d.c. potentials are effectively equal. If it were desired to run the valves at a lower screen potential, a more complicated output transformer, with an auxiliary winding for screen supply purposes, would be required.

In making use of the Woden modulation transformer the tapping ratio is automatically fixed at 57 per cent which leads to operating conditions on the triode side of those normally acceptable. These conditions yield an output power approximately 60 per cent of that obtainable from similarly run tetrodes while the distortion is almost as low as in a triode output stage. The distortion in the ultra-linear stage is therefore two to three times less than in the corresponding tetrode stage and it remains at this low value when the modulator is delivering full power. Such low distortion in a modulator output stage often obviates the necessity for further feedback loops which, in any case, many amateurs seem loath to install.

A further advantage of these near-triode operating conditions is that neither the output power nor the distortion depend to any great extent on the load impedance, a 30 per cent mismatch having negligible effect on either. In an amateur transmitter the modulating impedance is rarely accurately determined and the use of an ultra-linear modulator should remove nagging doubts about matching.

The anode-to-anode load for an ultra-linear stage employing a Woden modulation transformer may be taken as 20 per cent greater than the value quoted in valve tables for the tetrode used or, if figures for both triode and tetrode operation are available, the mean value should be taken. Under class A or AB1 ultra-linear conditions cathode derived bias is generally used, performance being as good as that obtainable with fixed bias.

### Connections for the Woden Transformer

Connections to the Woden series of modulation transformers are as shown in Fig. 2. The primary connections must always be as shown since similar connection of terminals 7 to 12 will yield a tapping ratio of 70 per cent reducing the power output with little improvement in distortion figures. Secondary connection depends on modulating impedance and the anode-to-anode load and should be selected by reference to the transformer manufacturers' data. This is given on page 502 of the *Amateur Radio Handbook*. Even with fixed primary connections there is a sufficiently wide range of ratios available to obtain a match in almost all cases. Using the circuit shown in Fig. 2 the writer has obtained satisfactory results in modulating a QQV06/40 running 100 watts input. Earlier stages of the modulator follow the conventional pattern of design for hi-fi amplifiers or modulators. A suitable driver stage is that employed in

*(Continued on page 670)*

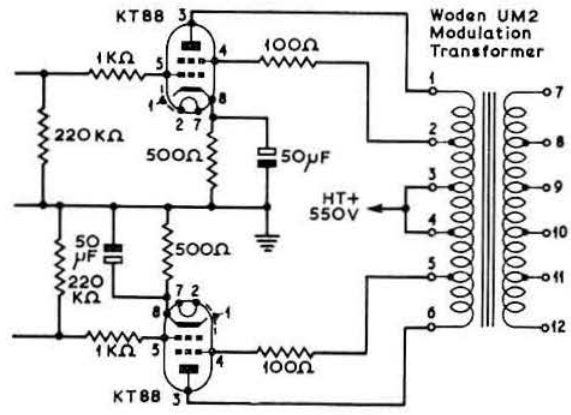



**Fig. 2. The ultra-linear stage employing KT88 valves used by G3NGS.**

* *16 Dorchester Drive, Herne Hill, London, S.E.24.*

# THE MONTH ON THE AIR

## A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)*

AFTER wrestling with the problem of raising the height of a vertical aerial by a further 10 ft., a deck-chair was brought into the scheme of things and whilst studying a recent copy of Don Chesser's (W4KVX) *DX* a description of the aerial installation at W2VCZ was read with considerable wonder and not a little envy. Apparently the king pin of the system is a 110 ft. self-supporting steel tower, 2 ft. above the top of which is a full size rotatable 7 Mc/s dipole; 5 ft. above this is a six element 14 Mc/s Yagi with a 46 ft. boom and a further 5 ft. up at the 122 ft. level is a five element array for 21 Mc/s. At 127 ft. there is a five element beam for 28 Mc/s, and capping this mass of aluminium, a 20 element 144 Mc/s beam at a height of 132 ft. Not to be outdone, W6HJT boasts a full sized five element 7 Mc/s beam carried on a 100 ft. boom! Worked any DX on 1296 Mc/s recently?

* * *

During the period May 25 to June 16 the writer will be on holiday followed by a week at the Region I I.A.R.U. Conference at Malmo, and it would greatly assist if correspondence requiring more than an acknowledgment could be deferred until after the latter date.

### News from Overseas

During the period June 9 to 16 **SM7IARU** will be in operation from the Region I I.A.R.U. Conference at Malmo. The station will be continuously in operation on c.w. and s.s.b. on 3·5, 7, 14 and 21 Mc/s. Requests for schedule QSOs should be sent to SM5KV, Olle Ekblom, c/o SSA, Enskede 7, Sweden.

The last *160 meter Bulletin* from **W1BB** summarizes the activity of the preceding months, and contains details of an impressive number of "firsts" on this band. W1PPN concluded his W.A.C., No. 4 on 160m, by a QSO with North Africa. W1BB mentions a visit to the QTH of W1FZJ/W1HOY where the aerials for 160m are supported on two towers each 180 ft. high located in a 150 acre estate with little habitation for several miles.

A combined **C.H.C.** and **A.R.R.L. Convention** will take place at Cleveland, Ohio on October 4, 5 and 6. No effort has been spared to make this event an outstanding success and the organizers hope that any U.K. amateurs who may be in the U.S.A. will endeavour to attend. There will be a separate section devoted to s.w.l. interests under the guidance of Fred Woodley, VE3-9301, the 1963 President of SWL-CHC, who offers assistance to any U.K. listeners who may require further details on membership. The Convention will be under the chairmanship of K6BX with W8AJW as programme chairman.

The latest news on **VR6AC** is that he is still seriously ill in Ward 14, Gorgas Hospital, Balbao, Canal Zone, but that a major operation may yet be avoided. Best wishes for a speedy recovery have been sent but readers may care to send a QSL card with a brief message to the above address.

**W4KVX,** Don Chesser, the publisher of *DX Magazine* has decided to inaugurate an *Express Bulletin* to supplement the weekly magazine. This bulletin will contain details of short notice dxpeditions and similar events and the cost to recipients outside the U.S.A. will be $15 for 50 issues.

Last month it was reported that the new regulations on **1·8 Mc/s** in the U.S.A. barred s.s.b. operation, but the F.C.C. has now cancelled this restriction, and this mode may be used between 1800 and 2000 kc/s.

**VS1LX** is the call of GM3OEV, now stationed at R.A.F. Changi. His K.W. Vanguard has been well heard in the U.K. and the peak time for QSOs is about 16.30Z, 00.30 in Singapore. VS1LX will be looking for U.K. stations particularly during the N.F.D. weekend, but portable operation is not permitted in VS1.

Although the prefix for **Jamaica** has been changed to **6YA,** and this combination is now in use, it is not certain that there has not been a misunderstanding, and that the third letter should not in fact be replaced by a figure. It is understood that this prefix will count only as a new one (for WPX) if Jamaica has not been claimed using the former VP5. Alec A. Hugh, 6YAAH, has kindly forwarded a list of all the active amateurs on the island, and a copy of this may be obtained by sending a s.a.e. to R.S.G.B. Headquarters.

The equipment recently received by **ST2AR** on s.s.b. may be diverted away but Eric hopes to continue operation on this mode with the aid of a 9 Mc/s filter expected soon.

### DXpeditions

**PX1OX** will be the call of DL2OX and a small group who will be operating from a QTH having an altitude of 7,500 ft.


**The special QSL card issued by W4ECI to commemorate the first anniversary of the DXpedition sponsored by the World Radio Propagation Study Association.**

* Please send all news items to R.S.G.B. Headquarters to arrive not later than **June 10** for the **July** issue and **July 12** for the **August** issue.

in the Pyrenees. The period of operation will be from June 25 to July 6 and the licence has already been obtained. The equipment will consist of a K.W. Viceroy operating on bands from 3·5 to 21 Mc/s. It is hoped that the location will overcome some of the disadvantages suffered by previous trips to Andorra, when signals to some parts of the world were screened by the mountain ranges.

**G2HFD** will be operating from **Alderney** during the period August 11 to 30, mainly on 14 Mc/s, but possibly also on 1·8 and 3·5 Mc/s. Operating hours will be usually around midday and during the evening, as this is a combined holiday/dxpedition with the former taking first place. Howard asks that QSLs should be sent to his home QTH at 20 Lock Chase, Blackheath, London, S.E.3.

**OH1AD/0** will commence operation on June 2 for a short period using a s.s.b. frequency of 14,115 kc/s plus the usual c.w. and a.m. spots. This trip is headed by OH2PM. This information comes from ST2AR who also reports **ZA** land intentions of **SM5BLA** using s.s.b.

It is hoped that the long awaited trip to Kamaran Is. will take place during the first half of June. Operation will be mainly on s.s.b. with **VS9AAA** heading the group.

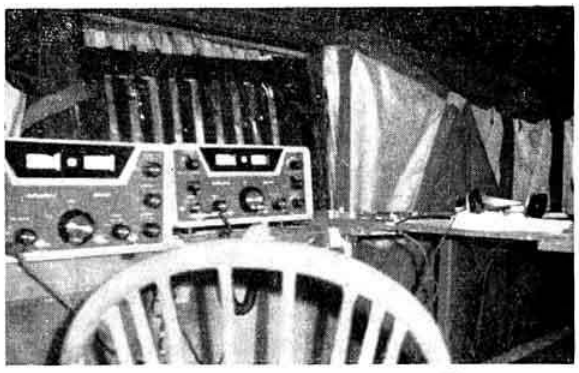
The **HC8CA** operation of WA2WUV ceased around May 12 after satisfying several thousand customers. A note from W2MES, the QSL manager for this trip, records that very heavy QRM prevented Virgil from contacting European stations on many occasions when he had been told that they were hearing and calling HC8CA. It is believed that the low end operation eventually satisfied most of the European operators.

It is hoped that the trip to **Mongolia** (JT1) will be made by UA3CA during June, but there is no definite news at the present time. It is intended that the favoured mode will be s.s.b.

A group comprising G3OUF, G3PCL, G3PCR, G3PSH, G3ROP and two s.w.l.s. intend to visit Sark, Alderney and Jersey during the period August 8 to August 21, and the call-sign to be used will be **GB2GC.** There will be a.m. operation on 1·8 and 144 Mc/s, with c.w. to be used on the remaining bands. QSLs should go to G3OUF at 80 Argyle Road, Ealing, London, W.13. The complete operating schedule will be given in a later issue.

During an eight day period in April, G3RFS, G3NQF and G3RPB operated from Sark on bands between 1·8 and 14 Mc/s. A B2 transmitter and a home-built unit for 1·8 Mc/s were used in conjunction with 320 ft. wire aerial. A total of 414 stations were worked in 40 different countries and QSLs may be sent direct or through the Bureau.

The **Yasme Foundation** has announced plans for operation from Willis Island during May and later from Christmas Island. The operator will be **ZS6LM** who will use the calls VK6ZS/VK4 and VK6ZS/VK9 respectively. The equipment in use will be a KWM-1 and QSLs should go to



**The operating position at VS9ALD/P in the Yemen.**

**CR8AA in Portuguese Timor is operated by W9JJF.**

KV4AA. It is hoped that this trip will materialize but it has been noted that it has not been an easy matter for Australian operators to obtain permission to operate from these spots, and possibly there may be some snags. It has been heard that there will soon be a permanent station on Willis Island and for that reason the proposed trip by VK5AB may not now take place.

**VR1N,** Ocean Island, the first QTH of the Hammarlund Dxpedition of the Month series, was worked by several U.K. stations on May 18. Incoming signals were not good and it is hoped that a linear amplifier will have been available before the operation closed. Nauru Is., next on the list for activation, will be followed in due course, by the Solomon Is., VR4. QSLs should go to the address given on page 614 of the May Bulletin.

Gus, **W4BPD,** continues his travels and FR7ZC/E was call No. 28 under which he had operated. Having suffered from an attack of malaria Gus hopes to take a brief rest in Kenya after which he will recommence his journeying, probably with a period at French Somaliland. FR7ZC/J QSLs are now being distributed, and the QSL to be sent for contacts from Tromelin Island and celebrating the first anniversary of the world's greatest dxpedition will undoubtedly become a collector's piece. Gus has requested that operators do not make more than two contacts on any mode with him at any one spot. It is realized that QRM and QRN may make a QSO doubtful but two entries in the log is ample insurance against accidents, and Gus is anxious to give as many stations as possible a new country.

Further representations to the responsible authorities in this country (**not** the G.P.O.) for permission for W4BPD to operate from the VQ8 territories have so far met with failure. This has not been due to any lack of approaches from interested parties, but rather due to an unwillingness to concede a point. There are many precedents for such permission, and stations operated by U.S. citizens may be heard daily from VP5 (Turks Is. etc.), VP7 and VP9. It is to be regretted that we in the U.K. are unable to help W4BPD in his travels.

## DXCC News

A.R.R.L. announce the addition of the **Glorioso Is.** to the countries list w.e.f. June 25, 1960. DXCC credit claims may be made commencing August 1, 1963. These islands are located off the Northern tip of the Malagasy Republic which separates them from Reunion Is.

It has now been decided by *CQ Magazine* that contacts with **VQ9A/8C** will **not** count towards the S.S.B. Awards.

So far nothing has come from A.R.R.L. which suggests that Europa Is. will be counted separately from Juan da Nova.

## Contests

The **Ninth European (WAE) DX Contest** will take place as follows: c.w. 00.00 on August 10 to 24.00 on August 11. phone 00.00 on August 17 to 24.00 on August 18.

The rules of this contest follow those of previous years, and copies of the rules and log examples can be obtained by sending a s.a.e. to G2BVN.

The results of the c.w. section of the **CQ World Wide DX Contest** include the following listings:

### Top Ten
### All Band—Single Operator

| | | | |
|---|---|---|---|
| **HL9KH** | **1,142,748** | UF6FB | 721,112 |
| 4X4KK | 1,039,724 | W3GRF | 445,884 |
| HK1QQ | 1,002,042 | 5A1TW | 437,376 |
| UT5AA | 816,408 | W4DHZ | 436,322 |
| HC1DC | 759,000 | W4YHD | 405,876 |

### Continental Leaders
### Single Band

**28 Mc/s**

HK7ZT .. .. 3,276

**21 Mc/s**

| | | | |
|---|---|---|---|
| ZS6IW | 153,200 | JA0SU | 27,156 |
| W2HTI | 50,730 | PY4EC | 11,254 |
| OK3DG | 48,108 | VK3RJ | 1,664 |

**14 Mc/s**

| | | | |
|---|---|---|---|
| **PY4OD** | **219,230** | ST2AR | 166,635 |
| W4KFC | 187,142 | VK5NQ | 137,917 |
| UC2AA | 183,580 | JA1BWA | 107,064 |

**7 Mc/s**

| | | | |
|---|---|---|---|
| VK3AZZ | 82,284 | JA1YL | 60,532 |
| K2DGT | 71,040 | OK2KOJ | 57,024 |
| | YV5ANT .. .. 34,476 | | |

**3·5 Mc/s**

| | | | |
|---|---|---|---|
| OK1MG | 21,000 | ZL2GS | 1,417 |
| W1BU | 12,349 | JA2WB | 990 |

**1·8 Mc/s**

| | | | |
|---|---|---|---|
| DJ2KS | 2,576 | W2FYT | 416 |

### U.S.A.
### Runners-up

| | | | |
|---|---|---|---|
| All Band | K6VTQ | | 372,252 |
| 21 Mc/s | W3LSG | | 39,900 |
| 14 Mc/s | W4WDI | | 129,220 |
| 7 Mc/s | W6JZH/6 | | 43,068 |
| 3·5 Mc/s | K6RPR | | 4,832 |
| 1·8 Mc/s | WCCDP | | 171 |

### England

| | | | | | |
|---|---|---|---|---|---|
| **G2DC** | **A** | **157,170** | **408** | **52** | **134** |
| **G3DYY** | **A** | **57,057** | **265** | **44** | **99** |
| G6VC | A | 33,939 | 210 | 26 | 55 |
| G3FTQ | A | 21,762 | 162 | 26 | 67 |
| G3JKY | A | 19,320 | 154 | 25 | 59 |
| G3GJQ | A | 16,502 | 144 | 22 | 52 |
| G3MGL | A | 13,110 | 180 | 15 | 54 |
| G3PVS | A | 12,383 | 129 | 17 | 44 |
| G2NH | A | 11,016 | 136 | 21 | 47 |
| G3JVJ | A | 10,795 | 88 | 27 | 58 |
| G3MWZ | A | 8,460 | 79 | 24 | 36 |
| G3JFY | A | 2,923 | 61 | 10 | 27 |
| **G4CP** | **14** | **102,600** | **480** | **27** | **68** |
| G3HDA | **14** | 69,468 | 407 | 25 | 59 |
| G2AJB | **14** | 18,966 | 209 | 18 | 40 |
| G3MEA | **14** | 9,400 | 132 | 13 | 34 |
| G8DI | **14** | 5,180 | 108 | 9 | 28 |
| G3WP | **14** | 1,827 | 45 | 7 | 22 |
| G2KW | **14** | 576 | 26 | 5 | 11 |
| **G3EYN** | **7** | **16,701** | **260** | **12** | **45** |
| **G3ORB** | **3.5** | **1,541** | **78** | **5** | **18** |
| **G3IGW** | **1·8** | **1,098** | **57** | **5** | **13** |
| G5MP | **1·8** | 448 | 33 | 3 | 11 |

### Scotland

| | | | | | |
|---|---|---|---|---|---|
| **GM3EOJ** | **A** | **35,750** | **211** | **31** | **79** |
| **GM3JDR** | **14** | **32,430** | **345** | **19** | **50** |

### Multi-Operator

### England

| | | | | |
|---|---|---|---|---|
| **GB2KW** | **83,616** | **445** | **44** | **90** |
| | | (Radio Club) | | |
| G3PPG | 11,200 | 111 | 20 | 44 |

(G3PPG, PFC, KLZ, DEF, PDX, POM)

Number groups after call letters denote the following: Band (A-all), Final Score, Number of QSOs, Zones and Countries. Certificate winners are listed in **bold** face.

The results of the **1962 VK/ZL Oceania DX Contest** show that the leading English station in the c.w. section was **G4CP** with 847 points, with **G8PO** occupying the same position in the phone section with a score of 2,070 points, the latter figure being the highest in Europe.

### QTH Corner

| | |
|---|---|
| **CE8CG** | J. R. Nock, Casilla 783, Punta Arenas, Chile. |
| **DL2AI** | Sgt. E. Bright, 25 Field Sqdn., Royal Engineers, Alanbrooke Barracks, Paderborn, B.F.P.O. 16. |
| **EL2PN** | via W4MZW. |
| **EL3A** | via W3NNC. |
| **EL4A, EL4YL** | via W2GHK. |
| **FG7XP** | D. Julien-Esnard, 13 rue Lamartine, Pointe-a-Pitre, Guadeloupe. |
| **FG7XT** | via K5AWK. |
| **FR7ZI** | J. J. Terrasson, B.P. 253, St. Denis, Reunion. |
| **FU8AG** | via VK2QJ (home call). |
| **HC8CA** | via W2MES, 65-33 78 Street, Middle Village 79, N.Y., U.S.A. |
| **HI8AKU** | P.O. Box 1213, Santo Domingo, Dominican Rep. |
| **ex-HI8DGC** | D. Crowe, 1454 Windemere Crescent, Sarnia, Ontario, Canada. |
| **HK4PX** | P.O. Box 1503, Medellin, Colombia. |
| **W6ZDF/KM6** | J. H. Ross, Navy 3080, Box 23, FPO, San Francisco, Calif., U.S.A. |
| **OX3JV** | via SM7ACB, G. Stenvall, Kopenhamnsv 47A, Malmo V, Sweden. |
| **TC3ZA** | via W2JXH. |
| **TU2AJ** | O. Kone, R-T Ivoirienne, B.P. 22-61, Abidjan, Ivory Coast. |
| **VR3E** | c/o APO86, Task Group 815, c/o Postmaster, San Francisco, Calif., U.S.A. |
| **VR6TC** | via W4TAJ. |
| **VS1LJ** | M. McIntosh, CCS, R.A.F., Changi, Singapore, 17. |
| **YJ1JB** | via VK2QJ (home call). |
| **ZD3A** | Box 285, Bathurst, Gambia. |
| **ZD6HK** | via W2ELW. |
| **6O2HH** | via W2CTN. |
| **6W8CU** | P. Goriot, Nosoco, B.P. 791, Dakar, Senegal Rep. |
| **7X2VX** | via W4UWC. |
| **9A1IR** | via K7BVZ. |
| **9G1EO** | via VE4OX. |
| **9G1GN** | via VE4OX. |
| **9N1DD** | Lt. Col. W. Gresham, U.S. Embassy, Kathmandu, Nepal. |
| **9N1ME** | Expedition HQ, 514 Latimer Rd., Santa Monica, Calif., U.S.A. |
| **5B4JW** | J. T. Worrall, CAFSO Branch, HQ NEAF, B.F.P.O. 53. |
| **9Q5CA** | via VE3BCL (home call). |

* * *

**R.S.G.B. QSL Bureau: G2MI, Bromley, Kent.**

A reminder that the logs for the **C.H.C./H.T.H. 1963 QSO Party** should be sent to K6BX postmarked prior to August 1, 1963.

The full results of the **1962 Scandinavian Activity Contest** are not yet available but **G5GH** was leading English station in the c.w. section for the second year running, whilst **GM3OEV** (now VS1LX) was the leading GM on phone for the third year running and fifth highest in the world on this mode.

### Awards

The certificate offered by the **Libyan Amateur Radio Society** may be claimed by operators who can produce proof of contact with eight Libyan stations on three bands. The same station on more than one band is eligible. QSLs, or a list certified by two other amateurs, should be sent to 5A5TW, P.O. Box 372, Tripoli, Libya, together with 10 I.R.C. or $1 to cover costs (From G8TS).

G8TS also mentions the Worked All Eleuthera "certificate" issued by VP7CW and VP7LG. Although not a certificate in the true sense this small but amusing offering may be claimed by stations working these two VP7s. It is necessary only to mention the certificate during the QSO with the second station, and it will be sent automatically.

For those operators needing contacts for the **Lion's Head Award,** ZS1ACD mentions that he, ZS1VM and ZS1AB

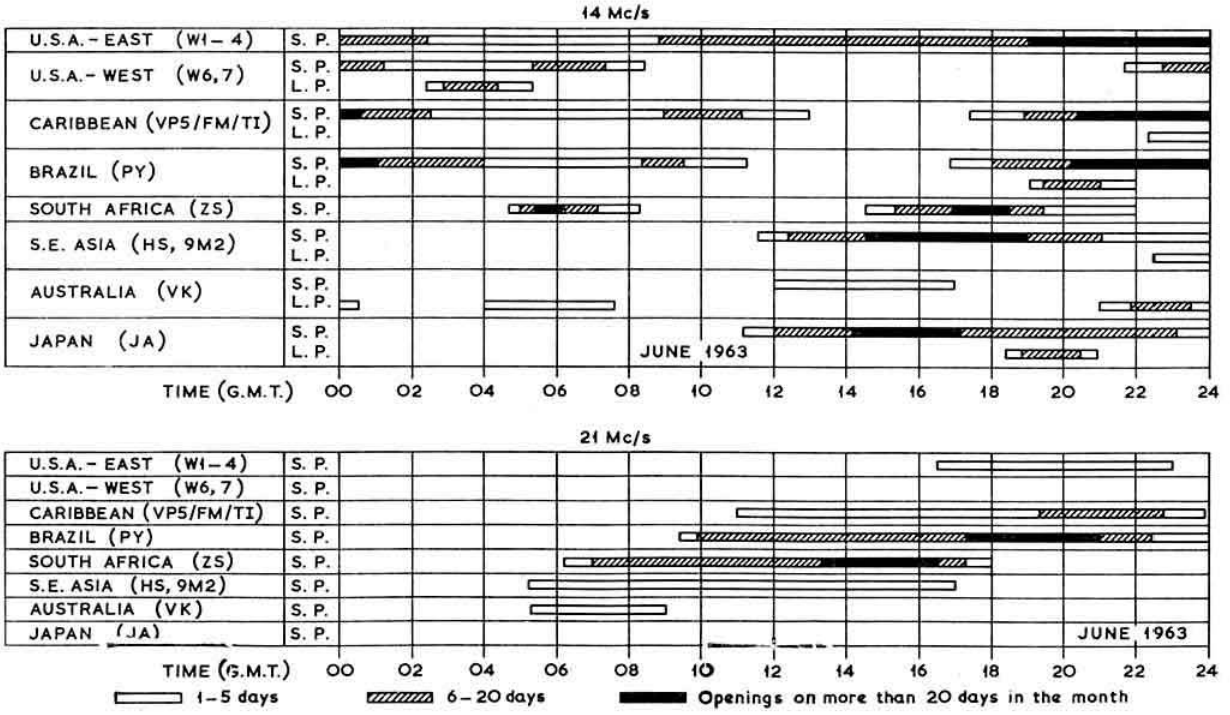
## PROPAGATION PREDICTIONS

Conditions during June will be such that only on exceptional occasions will 28 and 21 Mc/s carry DX traffic. Occasionally 28 Mc/s may be open to Africa between 14.00 and 18.30, and to South America between 18.00 and 21.00. The same paths will be workable on 21 Mc/s with signals from North America being heard on exceptional occasions. Both 28 and 21 Mc/s will permit contacts by the sporadic-E layer over distances of 300 to 1,200 miles. These short skip contacts should not be confused with European contacts provided by auroral reflection, which however will be less frequent during the period of low sunspot activity. In this connection mention is again made of the beacon station DL0AR which is now operating on 29,000 kc/s beaming to the North. Any reports of reception of this station would be appreciated.

The 14 Mc/s band will continue to carry the bulk of the DX traffic with considerable activity during the evening and early morning hours. Summer conditions will allow contacts over the long path, with particular indications for the West coast of North America, Australia and Japan. It is forecast that contacts with Hawaii over the long path will be possible at times between 05.00 and 09.30. Contacts on 3·5 and 7 Mc/s will be theoretically possible when the greater part of the transmission path lies in darkness, but however the atmospheric noise level reaches its highest level during June and July and 3·5 Mc/s will seldom produce DX signals. For local working it is expected that 3·5 Mc/s will be more reliable than 7 Mc/s. Conditions on the latter band have good possibilities despite the masking of the weaker signals by commercial interference. The path to Antarctica has been workable around 22.30 with signals from the Antipodes appearing around 06.30-07.00.

The provisional sunspot number for April, provided by the Zurich Observatory, is 29·7, with the period of greatest activity lying between April 6 and 18. The predicted smoothed numbers for August and September are 17 and 16 respectively.

It will be noted that the symbols adopted in the charts for 14 and 21 Mc/s have been amended, and it is hoped that these will provide clearer indications of the periods during which propagation will be at its most favourable.



**VR2EH in Fiji uses a Panda Cub transmitter and a Hammarlund receiver.**

are active on 14 and 21 Mc/s, the first two on c.w. and 'AB on a.m.

Latest additions to the list of holders of the **USA-CA** include: 205, GB2SM: 215, G2FFO, and 216, GI6TK.

The latest **Directory of Certificates and Awards** may be ordered through G2BVN at a cost of 30s., with a three ring binder available for 7s. 6d. Other publications available from K6BX include the quarterly ***DX-QSL-NL***, the ***Revision*** supplements for those having older copies of the Directory and the ***Extra News Letter***. Each of these is available at a yearly subscription of 11s. 6d., and it should be pointed out that all the publications are produced and handled on a non-profit basis. Stocks of the *Directories* are not kept in the U.K. but the books are despatched direct from the U.S.A. to ensure that only up-to-date copies are in circulation.

### Around the Bands*

Reports for the **1·8 Mc/s** band have decreased considerably this month reflecting the poorer DX conditions resulting from the advent of Spring. The main effect on the band has been a marked replacement of transatlantic contacts with European and Mediterranean activity. **B.R.S. 20317** (Bromley) reports good signals from Malta—ZB1BX and BY at 22.30-23.15 around 1·825 Mc/s and ZC4TJ on 1·837 Mc/s. Other European DX logged was PA0VB, OH2YV, OH2BNY (20.00 G.M.T.). **A.2340** (Plymouth) returns an interesting log which includes DL1FF (05.40), GC3RFS (00.08), GC3NQF/A on Sark (23.36), GD2BUL/A (23.30), OH3NY (01.30), OK1BM (22.39), OK1KRM (21.00), PA0PN (20.20), PA0RTR (22.50), W1BB (04.10), W1BU (04.17), W3GQF (04.15), ZB1BX (00.15). **B.R.S.20317** (Bromley) confirms the transatlantic decline although he logged K4HJJ calling K4JIF at 22.10 G.M.T. but calls by G3CMJ produced no response. On the morning of April 28 W1BB was heard at S8 in QSO with G6BQ whilst W2IU and W3GQF were heard at S3 only.

**G3MWZ** operated /P from Merioneth, Cardigan, Brecon and Radnor at the commencement of May, and the equipment was located in a car driven to selected vantage points, e.g. at 1,500 ft. a.s.l. in Berwyn Mountain, Merioneth. Operation was confined to between 20.00 and 23.30 but contacts were plentiful, although no Welsh stations were heard. Radnor proved to be the most popular county, but conditions at Brecon were very poor. The aerial was a 132 ft. end-fed fixed to the car roof rack at one end and to whatever support could be found at the other. Contacts will be QSLd 100 per cent through the R.S.G.B. QSL Bureau.

* Compiled by J. G. Cottrell (G3PSY)

The only report this month for **3·5 Mc/s** is from **B.R.S.20317** who says that despite frequent listening spells very little of note from the U.S.A. is to be heard. However, good signals were received from M1VU, UA9PP at Novo Sibirsk in Zone 18 (21.50) and EP2RC (19.30). DL7AA was heard to say that he had worked JA6AK on the evening of April 20 although his signals were weak.

Variable conditions on **7 Mc/s** seem to be prevailing with some good openings often occurring, especially to New Zealand at 05.00 to 06.00 G.M.T. **G3JAG** (Rochdale) reports (c.w.) HK7AJP (06.15), IS1MM (06.45), KV4DB (23.25), M1VU (01.25), OY7S (18.20), PY1CCP (05.50), UM8KAA (23.15), VE8AG (06.15), VP2AC (22.50), VP5XG (23.35), VP6AT (22.50), VP8KH (05.30/06.00), VK5KO (19.45 to 22.00), VU2GG (01.40), YV7AL (06.40), ZL4JF at S7/8 around 7010 kc/s and ZL3GU outstanding both between 05.00 to 06.00, ZS6BFD (22.25). Finally, G3JAG heard DU1XN at S5/6 working into Japan but was unable to raise him (17.15/17.45) and reports many North American stations (W6, KP4, VE7, etc.) and VKs and ZL1-4 audible between 05.00 and 07.00 G.M.T. **G3LPS** (Blackburn) has also made some useful contacts on c.w. as his log indicates: KP4AOO (00.04), M1VU (00.30), PY2GDB (23.13), PY4BEN (23.14), PY8DI (00.14), VE7BAX/W7 (06.30), VK3XB (07.14) and ZL4JF (06.45).

**B.R.S.20317** (Bromley) has found the volume of DX down but heard both Montserrat and Reunion for the first time on this band during the month. He summarizes conditions as follows:

*Europe*—3A2BA (22.50) and TF5TP (23.50) with strong signals.

*Asia*—Japan still coming through the QRM between 17.50-20.30 with JA1AEA, 3ALO, 5PL and 6AK, S4/5 but hard to copy. VS9ARC (23.40), UA0BN (23.25), UM8KAA (18.25 to 23.40), UI8ZE (16.10). The VK/ZL path poor but VK3ABD and ZL2GS heard at 07.30.

*Africa*—9Q5AB at S7 (22.30) and FR7ZI (23.30) but little else of note.

*Central/South America*—VP2MV at 23.32 on 7013 kc/s, CM2QN, VP7BC, HI3PC, KV4DB, all between 23.30 and 00.30. VP8GQ (22.50), YV7AL (00.10) and all stations received at good strength (up to S7).

*North America*—Plenty of east coast Ws and VE3s to be heard although QRM up to 24.00 but clearing by 01.30. K4POA was heard at 459 as late as 08.45.

**A.2340** confirms the findings of other reports and has logged (c.w.) LX1CF (14.46), KP4BMK (22.31), PY6OD (23.50), UA9TW (17.10), UI8CO (23.40), VP2APA (21.40), VP8GQ (23.10), VP9KJ (22.50), VS9AJA (21.45), YA1WW (05.50), YV4AV (23.54), 9G1ES (23.10).

DX conditions on **14 Mc/s** are now so good that one can work into almost any area by choosing the right time of day. The number of reports has reached an all-time high. Readers are thanked for their contributions, all of which build up the picture of activity, and are asked to bear with your compiler if, in the interests of space (and writer's cramp!) their lists have to be pruned or omitted.

**G3YF** (Chingford) submits a fine list of stations worked on s.s.b. which includes AP5DC (08.20), BV1USF (13.40), CR9AH (14.05), DU1AA (08.16), FR7ZC/G on Glorious Island (21.23), HC8CA (22.00), JA6AV (15.42), KP6CP (08.30), KP6CQ (08.50), KH6EJY (07.00), K6CQV/KS6 (08.25), KX6BQ (08.50), KW6CV (09.15), TA1AH (17.00), VK7A1 (07.20), VS1LW (14.15), VR2DS (07.30), VP2SY (22.15), 9M2GV (14.40), 9N1DD (15.20) and 9N1MM (14.45) whilst c.w. yielded many contacts in same areas plus VS4RS (14.50), VP5RD (15.20), ZL1ABZ (08.35), ZK1BV (07.25), JT1AB (08.35) VS9AB (17.15) and 6O1ND (22.45). Support for these conditions comes from **G3HCT** (Henley-in-Arden) who keyed with FO8AA (06.45), FR7ZC/T (16.08), FR7ZC/G (17.30), FR7ZC/E (17.15), HC8CA

(21.30), VR2EH (07.15), W6ZDF/KM6 (07.45), ZK1BV (06.30), ZK1AR (08.00), ZD3A (20.30), 4W1AA (15.30). **G3AAE** (Loughton) further illustrated the wide field of possibilities by working AP2AR (18.10), BV1USB (13.30), FB8ZZ (16.30), HI8MVF (19.50), HL9KB (11.45), HV0UZ (08.00), KC6PE (14.45), VQ9HB (18.20), YI2WS (18.45), 6O1ND (19.20), 9U5JH (18.45), and many other areas.

**G3LPS** (Blackburn) worked c.w. with CE2CR (22.50), KL7MF (19.20), UW0IN (14.30), VP8HD (19.50), XZ2ZZ (18.21), ZE3JJ/VQ1 (19.40), 5X5IG (19.03), 5R8CM (20.00), 6W8DE (18.30). **G3PVS** (Woking) found KA2KS and BY1PK at 10.38 on the same frequency, VP5XG (12.00) and ZL1AW (09.15). Paul Baker, **A.2114** (Richmond) submits an interesting s.s.b. log which includes ZK1BS (06.50), K6CQV/KS6 (07.00), UA0BN (07.00), KX6AA (07.15), KH6PD/KG6 (07.20), KW6CV (07.22), VR2BZ (07.15), UL7FA (07.25), VR3R (07.33), BV1US (07.35), OH0NC (07.40), UW9CC (12.35), JA6MW (13.52), UM8KAB (14.50), EP2BR (15.02), YA1AK (15.05), KA5RB (15.20), KR6AF (15.30), TA1AH (16.00), 5X5FS (16.10), KG4BQ (16.30), FR7ZC/E (16.40), 9NIDD (16.45), KC6BO (16.53), 5H3GC (17.00), 4S7IW (17.07), DU1AA (17.25), 5U7AH (17.40), TI2LA (18.03), YN1AW (18.10), EL7A (18.57), 4U1SU (19.25), 6YABL (19.30), EL2A (19.37), ET3JK (19.40), 9Q5RK (19.45), HC8CA (19.50), EL3A (20.00).

**OE1ME** (Vienna), although finding his time very limited, has worked s.s.b. with HI8XAA (21.12), WA4LTX/KJ6 (06.45), K6CQV/KS6 (05.55), VR3O (06.43), FM7WQ (20.35), CR6FY (17.14), KC6BO (17.00), ST2AR (15.45), 6YABL (19.57), YS1O (22.00), VR3E (06.45), YS2SA (20.40) and all his contacts have been received at S8 and S9 levels.

**A.3699** (Renfrewshire) adds additional areas—CT3AV (19.47), UG6AW (13.39), 3A2BD (13.03), ZD6HK (17.42), KP4ADY (21.35), PJ5CG (21.20), OX3GK (22.01), ZP5OG (20.15), all also on s.s.b. **A.3532** (Cumbernauld) adds s.s.b. 9K2AU (10.20), OD5LX (07.55), CX2CO (21.45), PZ1AX (21.50), TG5SC (22.15), 7X2VX (18.20). Detailed reports from **A.3692** and **A.3498** list stations from all the above areas and many others nearer at hand. Finally **G3NXU** reports mobile operation on this band with many European contacts achieved.

The **21 Mc/s** band has produced some good contacts for **G3LPS** (Blackburn) who worked c.w. with 6W8DF, UD6DU, ZS1OA, CR7IZ, 6O1ND and 9Q5CA whilst a.m. yielded ZS1BV, ZS1AB, ZS1MW, 4X4HD, CR7GJ, ZE7JR. **G3PVS** (Woking) found OD5LX (15.00) and ZD3A. **G3AAE** (Loughton) records c.w. with EL0J (09.45), EP2RH (12.40), FB8XX (13.00), LU5ZI (17.30), TN8AA (18.05), TT8AL (10.25), 5U7AC (10.15), 5H3HZ (15.20), 5R8AB (10.30), FR7ZD (10.10), M1VU (10.00).

Finally one report from **G3PVS** (Woking) for 28 Mc/s recording a contact with ZE1BK at 12.30 G.M.T. indicating that the North to South path is opening occasionally as reported from Cyprus last month.

### DX Briefs

QSLs for **VK0VK** may be sent to K5ADQ, but the logs will not be available until the operator returns from the Antarctic in 1964.

Following some delay due to non-availability of QSL cards, the operators at **VS9MB** now have a fresh supply and will be able to deal with future commitments.

Cards for **HS5OSQ** and **XW8AS** may be claimed from KH6FBJ, 1132 Morris Drive, Honolulu, who has the logs for his operation from these spots.

Activity from Macquarie Is. under the call **VK0DM** has been reported on c.w. and a.m.

Following extensive delay it is hoped that QSLs for the Anguilla operation of **VP2KP/A** may be soon available from PJ2AA.

Cards for all contacts from **GB3RAF** during the *CQ* S.S.B. Contest have been sent out via the Bureau, but direct requests will be answered if accompanied by s.a.s.e. or IRC, and should be sent to G2BVN.

**VK9LA** will be active until December, 1963, using an HT37 and a TH4 beam, and hopes that there will soon be a second station heard from Christmas Island.

**WA6LGF,** a prominent member of the **Ex-G Club** will be in London between June 1 and 10. The 14 Mc/s net of the Club on Sundays at 19.00 has many U.K. stations checking in with good signals. New members of the Club include VE3AQO, VE3CIH and VQ2AF.

**TI9RC,** operated by W0MLY, came on the air from Cocos Island on May 20, using 14 Mc/s s.s.b. and c.w. and was contacted by a number of U.K. stations.

**VQ2CW,** C. D. S. Wintle, has returned to the U.K. permanently after 10 years in Lusaka and is now licensed again under his old call-sign of **G4GG,** at Cherry Tree Cottage, Buxted, near Uckfield, Sussex.

The 13th French Antarctic Expedition which will be in that area until 1964 includes a radio operator, Guy Gaucher, but it is not known if FB8YY will be active this year.

**LA8SE/P** on Jan Mayen now active on s.s.b., usually on the low end of 14 Mc/s, will be returning to Norway during July, 1963.

**ZB2I,** the QSL manager for Gibraltar will be relinquishing his duties w.e.f. May 31, for he is returning to the U.K.

* * *

The numerous correspondents are thanked for their reports and information, and co-operation from the following is acknowledged: *DX'press* (PA0FX), the West Gulf DX Club *Bulletin* (K5ADQ), *The DX'er* (WA6TGY). The *LIDXA Bulletin* (W2MES) and *DX* (W4KVX). Please send all items to R.S.G.B. Headquarters to arrive not later than **June 8** for the July issue and **July 13** for the August issue.

### Publicity

AN EXCELLENT EXAMPLE of publicity for Amateur Radio recently appeared in the *Reading and Berkshire Chronicle.* An article, entitled " Talking Around the World for no more than Ten Pounds " was given half a page and included four photographs.

The article emphasized that the hobby need not be expensive, and the photographs illustrated how much enjoyment can be gained with simple apparatus. Following a summary of the activities of amateurs, advice was given on how to obtain a transmitting licence, and the help which local clubs can give.

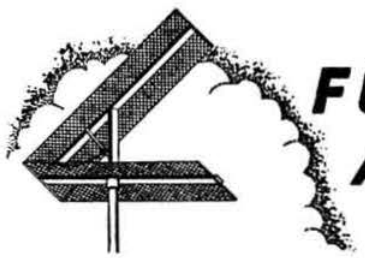
### Ultra-linear Use of the Woden Modulation Transformer (Continued from page 664)

" The Beginner's Low Power Modulator " described on page 289 of the *Amateur Radio Handbook.*

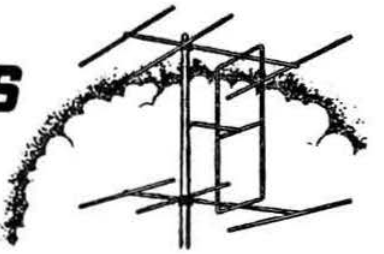
The ultra-linear output stage is applicable not only in so-called high quality modulating systems but also where speech clipping is employed, since a tetrode output stage could introduce considerable distortion at the high mean signal levels present under such conditions and could lead to incorrect conclusions about speech clipping.

* * *

It is hoped that this article will encourage more members to try ultra-linear modulators which can, as it has been shown, be constructed without expensive, specially wound, transformers. The article has been written as an introduction to the ultra-linear technique, practical details and mathematical explanations of which are readily available in text-books on high fidelity amplifier design.



# FOUR METRES AND DOWN



By F. G. LAMBETH (G2AIW)*

THE 144 Mc/s Portable Contest which took place on Sunday, May 5, aroused much interest, despite adverse conditions. The usual troubles when operating portable showed up, but, as the following reports indicate, enthusiasm was not daunted.

**G3EMU/P** (Canterbury) was again active from near Folkestone, the second operator being G3LCK. After erecting all the gear, it was found that the exhaust pipe and silencer for the petrol engine had been forgotten! A hurried phone call to G4WK, and some fast motoring, however, had everything in order only five minutes after starting time.

Conditions were as changeable as the weather. Following a 15 minute contact with a PA, for example, the band rapidly closed up completely. Many portable and mobile stations were worked, few fixed G stations being heard. As G3EMU now has the European QRA Locator Map (1 cm = 25 km), the QRA Locator problem has been alleviated and there are now no complaints. G3EMU wonders how often operators measure the d.c. resistance across the co-ax lead to their beams; for a few days ago, his measured 15 ohms, and the beam had to come down for a clean-up.

**B.R.S.24455** (Colwyn Bay) sent a listener log, which he admits is rather sparse, owing to poor conditions and his inferior location. Nevertheless, some strong signals were heard, although the distances were not spectacular; the best being G3AYT (nr. Macclesfield) at about 70 to 80 miles. The gear consists of an indoor, hand-operated five element Yagi 20 ft. high, feeding a Nuvistor pre-amplifier into a cascode converter, followed by an MR 44/II receiver. The location is approximately 50 ft. a.s.l., with 400 to 500 ft. hills to the South-West and East. Only to the North and East is there a reasonable sweep. GB3VHF cannot yet be heard.

The East Cheam Wireless Group were out portable, the operators being G3OSC, G3OJE, G3PHS, G3PIZ, G3RDQ, and G3MEH. They considered conditions were only average. The station, located at Kithurst Hill, eight miles north-west of Worthing, used a transmitter with a QQV03-20A running 15 watts input, and on the receiving side a converter fed a CR100. The aerial was a 6-over-6 at 700 ft. a.s.l. Weather was poor, being windy with a little rain. Activity seemed to be quite high, and many portables were heard and worked. G5ZT (Devon) and GC2FZC were heard, and F3LP (Le Havre) was also worked. G3OJE tells us that the East Cheam expedition withstood the gales and heavy rain, to say nothing of the usual generator troubles. A total of 66 contacts were made, none, however, exceeding 100 miles. He wonders how many clubs take two generators to a site because of lack of confidence in either! Among the better DX heard in the Home Counties was **G3XC/P**, near Newquay, Cornwall.

**GM3POK** (Edinburgh 10) was active from the top of Soutra Hill, 20 miles south of Edinburgh. Eight stations were worked, the best being GM2FHH/P (nr. Aberdeen). The transmitter had a power of 1 watt, and the aerial was a 4-over-4. Other stations heard were G3JYP, GM3JRP, GM3ODP, and GM3JFG, to name but a few. The weather was ideal; snow, hail, rain, wind and sunshine!

The **G3FDW/P** (Gosforth, Cumberland) party went to considerable trouble to place a station on a 2,000 ft. mountain. They were delighted when the first S9+ signal ever was received, and thereupon all signals heard were worked. The only exceptions were about 30 S2 phone stations that refused to use c.w. The best DX was 117 miles. At the close of the contest, however, the party was shattered to learn that the first Nuvistor amplifier was passing no heater current! To remedy this failure, another attempt will be made on July 6-7, on c.w. The frequency will be just below 146 Mc/s.

### Moonbounce

The idea of moonbounce propagation has induced **G2HCJ** (Liverpool) to begin research into the techniques involved in an " unconventional " method of achieving Moon reflection on 144 Mc/s (the method to be used by the U.K. Space Communications Group, the North Wales V.H.F. Group, and G2HCG being regarded by G2HCJ as " conventional "). His system is based on an article in the September, 1962, issue of *73 Magazine*, which notes that, by means of synchronous detection, a 30db improvement in signal to noise ratio for the reception of slow c.w. can be achieved. References to moonbounce are not readily available, but the help of GM3NZI has proved invaluable in this respect. Should any reader know of any sources of information, or of anyone who could co-operate in this programme, would they please communicate with G2HCJ, 822 Warrington Road, Rainhill, Liverpool, or alternatively with G2AOX, who is co-ordinator for the recently formed U.K. Space Communication Group.

### Two Metre News

**G3CCA** has sent a further report on his experiments in which he mentions that his aim is ultimately to be able to maintain reliable communication over a 300 mile path in any direction at any time. During most of April, his activities were primarily concerned with a building programme, and he has been able to complete his s.s.b. unit adaptor (Heathkit SB10-U). A 14 Mc/s crystal in a Cathodeon oven at 75° C has been fitted inside the unit, and the output locked on 14 Mc/s. A ribbon microphone is now in use, and a very neat, miniature audio amplifier is employed as the pre-amplifier. The one in use is a modified sample of one of a series being manufactured by Newmarket Transistors Ltd. The PC2 is a low impedance input model; the PC3 a medium impedance type, and the PC4 is designed for high impedance inputs. The PC3 was chosen, as the value of 2000 ohms is the correct match for the output of the microphone transformer.

In his receiving converter (Fig. 1), it has been found necessary to substitute a 6DS4 Nuvistor for the output cathode

* *21 Bridge Way, Whitton, Twickenham, Middlesex.* *Please send all reports for the* July *issue to arrive by* June 8 *and for the* August *issue by* July 13.

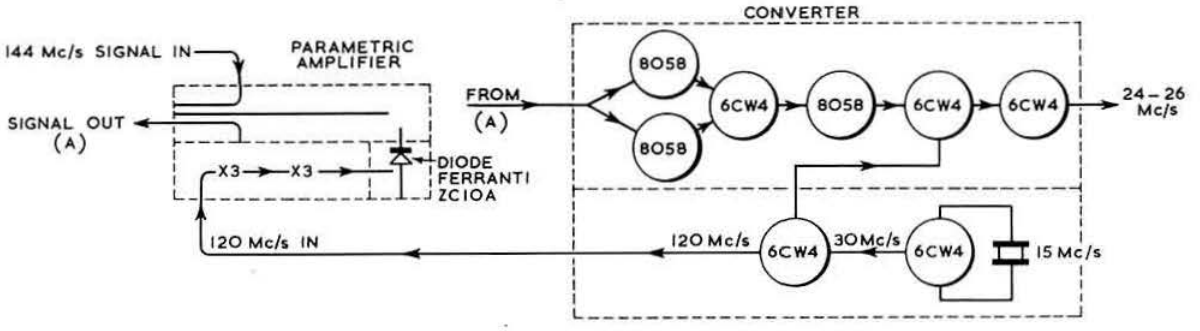



**Fig. 1. Block diagram of G3CCA's receiving system.**

follower, originally a 6CW4, as overloading was apparent on strong local signals. With a push-pull amplifier consisting of two 8058 Nuvistors, the noise level is 1·9db, and the converter requires 0·09 microvolts input for 50 mW output from the complete receiving system. Most of the wiring has been carried out with heavy gauge silver plated copper wire, which makes for rigid construction and low losses. The coils are also silver plated, and Polar (Wingrove and Rogers) miniature air-spaced trimmers are used in the r.f. and mixer stages. Ceramic capacitors were used in the oscillator. Mu-metal screens are successfully employed, and the chassis is aluminium alloy, which is not silver plated. The converter is intended to be part of the complete v.h.f. receiver mentioned last month.

The receiver is intended to be coupled to a parametric amplifier with the gain of the first r.f. stage reduced to 1 to provide isolation. The first tests with this receiver will, however, be carried out without parametric devices in order to be able to appreciate its capabilities. Apart from the 8058 valves, the cost of the receiver is not very high when compared with present day standards.

G3CCA goes on to say that up to now the necessary diodes have cost £7 each—expensive for the ordinary amateur. However, there have been two developments recently: (i) a new type of parametric diode is being produced which will retail at between 20s. and 30s.; (ii) G3CCA has himself designed a parametric amplifier using a 12s. 6d. diode. Claimed noise figure is approximately 0·6db, i.e. 0·13 greater than the ZO20C. Due to its higher junction capacity the co-axial lines are shorter and the alignment is not so troublesome. It can be pumped up to 2000 Mc/s and could be used at 432 Mc/s. The oscillator system is very simple; it takes the 120 Mc/s from the converter which is multiplied to 360 Mc/s then times three again to 1080 Mc/s with no tuning control. This means that parametric amplification is as cheap as, if not cheaper than, noisy valve devices. Both items can be built in large Eddystone diecast boxes. This new system is at present being tested and results are very encouraging, giving the noise figure stated with 16db gain.

An interesting operational check was carried out during the laboratory test, when the 4-over-4 slot aerial at Melton Mowbray, beaming South-West, picked up G4LU (Oswestry) working G3CO (Kent). The receiving aerial was end-on, and G4LU must have been at least in the half power node, but signals, nevertheless, were S9+ (measured), which showed that G4LU's signal strength under such poor aerial conditions to be 1·28 microvolt. Observations were made on April 26 at approximately 13.00 G.M.T.

**F9OE** (Secretary General of R.E.F.), will be at Brest (Finistere), QRA Locator XI48, during July, and hopes to make many QSOs with British stations. The frequencies in use will be 145·270 and 145·350 Mc/s.

**G2XV** (Gt. Shelford) will be operating portable on 144·680 Mc/s during most evenings of the week commencing June 24. The location will be the Devon/Dorset border, and contacts and reports will be welcomed.

**G3KXA** (Solihull) reports that he and G3RMB will be going to Northumberland for seven days, commencing on June 7. If conditions and results warrant, operation will also take place from Roxburgh, Cumberland, and Westmorland. The equipment they hope to take will run 50 to 60 watts a.m., with a slightly greater e.r.p. on c.w. The beam will be an 8-over-8. Operation should be continuous on the afternoon of June 8, the whole of June 9, and thereafter commencing each evening at 17.30 G.M.T. The frequency of 145·98 Mc/s will be first choice, as QRM from North Midland stations might prove troublesome to the area, should they move higher. A band plan crystal will, however, also be carried.

We welcome **G3RZG**, ex-A.1795 (Weymouth), who appeared on 2m on April 27, with four watts modulated by a 6L6. The receiver is a 6BQ7A cascode and the aerial a five element Yagi. Six counties have been worked already, the best DX being GC2FZC. There are high hopes for this little rig, but, nevertheless, a more ambitious one is being considered. Good luck anyway!

**B.R.S.25194** (Staines) is a welcome listener on 2m. His first report states that April 26 (21.00/23.30 G.M.T.) brought fairly good conditions to the North, and round to the West. Eight stations were heard that evening at a distance of around 100 miles, the most consistent being G3CCA (Oadby, Leics.), G3MNQ (nr. Nottingham) and G3NBQ (nr. Coventry). Good signals with some fading were received from G3RND (Pontefract) and G5HA (Hull). G6GN (Bristol) was strong, and fairly good signals were received from GW3MFY (Bridgend) and GW8UH (Cardiff). The 2m receiver is a home-built double superhet, with i.f.s of 11 Mc/s and 470 kc/s, and an E88CC cascode front-end. The aerial is a five element Yagi at 25 ft.

**G2DCG** (Margate) who is slowly recovering from a recent illness, has a transmitter running 3 watts (12AT7/6BW7/EF80) with a 12AU7/ECL82 modulator. The converter is crystal controlled; a 6CW4 r.f. stage, EF95 mixer with an ECC91/EF95 oscillator chain feeding an HRO on 29 Mc/s. A 6-over-6 slot aerial is at about 80 ft. a.s.l., with the sea only 400 yd. away. A clear take-off is therefore provided from West to East, out to sea. The second station heard by G2DCG was a PA, only 20 kc/s away from G2JF who was the first one heard. French stations were also readable.

We are always glad to receive news from the rarer areas, and a letter from **G3FDW** (Gosforth, Cumberland) gives a wryly humorous aspect of 2m life in that county. They have *never* had a case of cross-modulation, and neither is this likely under present conditions. High power is mentioned together with possibilities of other changes to overcome the two obstacles of 2,000 ft. mountains, and the back-to-front ratios of the beams which are always turned away from Cumberland.

### V.H.F./U.H.F. BEACON STATIONS

| Call-sign | Location | Nominal Frequency | Emission | Aerial Direction |
|---|---|---|---|---|
| GB3CTC | Redruth, Cornwall | 144.10 Mc/s | A1 | North East |
| GB3VHF | Shooters Hill, London | 144.50 Mc/s | A1 | North West |
| GB3GEC | Hammersmith, London | 431.5 Mc/s | A1 | East |

### R.S.G.B. V.H.F. BEACON STATION GB3VHF

The frequency of the Society's stand-by v.h.f. beacon transmitter at Shooters Hill, South East London, when measured by the B.B.C. Frequency Checking Station, was as follows (nominal frequency 144.50 Mc/s).

| Date | Time | Error |
|---|---|---|
| April 9, 1963 ... ... ... | 14.00 G.M.T. | 310 c/s low |
| April 16, 1963 ... ... ... | 19.30 G.M.T. | 348 c/s low |
| April 23, 1963 ... ... ... | 12.20 G.M.T. | 360 c/s low |
| April 30, 1963 ... ... ... | 10.16 G.M.T. | 300 c/s low |
| May 7, 1963 ... ... ... | 17.17 G.M.T. | 382 c/s low |
| May 14, 1963 ... ... ... | 19.15 G.M.T. | 400 c/s low |

A brief report from **G3SAR** (nr. Sevenoaks) says that he received his licence on May 7, and immediately went on 2m with a small 6 watt transmitter (QQV02-6) completed a few evenings before. The aerial is a five element Yagi in the loft, although it will soon be transferred outside, the site being 600 ft. a.s.l. The receiver is a Nuvistor converter coupled to a simple 10·7 Mc/s receiver. Everything is home-brewed except the aerial. The first contact, needless to say, was with G2JF! Altogether, 20 stations and eight counties were worked in the first two evenings, the best DX being G3FAN (I.o.W.), who gave a report of RS55/8 at about 70 miles. G3SAR is, incidently, one of our youngest contributors—16 years old.

**G2JF** (Wye, Ashford) reports he is very pleased to have won the PZK Cup in the 1962 September I.A.R.U. Contest, and mentions that his co-operators (G2QT and G8RK) should share the glory. April was a very ordinary month with no particular highlights. The schedule with DL2XM terminated on April 8 after a very interesting and successful period of 18 months. The following new G stations have been worked: G3LZR, G2DCG/A, G3KBO, G3HWO, G3PZN/A, G3ITV, G3RKH, G3MU, G3RAE, G3RWB, G5SN, G3PBO, G3SZ, G3RXF, G3MVM, G3HKA, and G3FMP. An interesting contact was with ON4LF/M who was mobile 10 km south of Brussels; his input was 1 watt to a 6AK5, with an aerial system described as a " double L."

**GI3OFT** (Belfast) states that for some time there has been little of news value to report from Northern Ireland. Few contacts have been recorded since January, except for the regular skeds (viz. G3JYP, G3CCH, and G3EHY), but there is always a certain amount of activity on Sunday mornings between 11.00 G.M.T. and mid-day in Scotland. Following last summer's tremendous surge of activity, many new operators became frustrated owing to the great difficulty of obtaining QSOs outside Ireland under poor or average conditions. QRM also presents problems under good conditions, when the whole of Zone 9 (Northern Ireland, Scotland and Northern England) is compressed into the top 200 kc/s of 2m. However, it is to the credit of all that the Band Plan has been rigidly adhered to. The active operators appear to be: GI3RMD (Belfast, Co. Antrim), GI3OFT (Belfast Co. Antrim), GI5AJ (Bangor, Co. Down) (s.s.b.), GI3GXP (Kilkeel, Co. Down), GI3ONF (Portadown Co. Armagh) during home spells from seafaring, and GI3IEO (Portadown, Co. Armagh).

**GI3RMD** has recently built and tested a new mobile rig with which he hopes to visit some of the rarer counties and mountain sites during the year. New Eire stations recently worked include EI7AF (nr. Birr, Co. Offaly) and EI2AG (Co. Louth).

**EI6AI** (Killybegs, Co. Donegal) is active and transmits a fine signal. **EI6X** (Limerick) is now QRT after a brave effort over a distance of 100 miles to his nearest 2m neighbour!

**Almost blinded by the photographer's flash as they came away from judging the Constructors' Competition at the Ninth International V.H.F./U.H.F. Convention on May 18, 1963, were Dr. R. L. Smith-Rose (left), past president of the R.S.G.B., and Ed Tilton, W1HDQ (right), in company with Geoff Stone, G3FZL, Executive Vice-President.**

*(Photo by G5UM)*

The commencement of the News Bulletin service from Belfast has attracted a considerable listening audience in both Northern Ireland and Eire and it is hoped that more GI and EI stations will report on the quality of reception. Reports from Scotland indicate fairly good coverage of the Ayrshire Coast, but Glasgow and district is not receiving it as well as was hoped, owing to the difficult terrain. More reports are therefore sought, especially from GI. All notes on reception, both local and DX, will be appreciated so that coverage can be evaluated and improved if possible.

### Four Metres

**GI3OFT** reports that GI3NFM (Pomeroy, Co. Tyrone) and GI3HJA (Gortin, Omagh, Co. Tyrone) have now joined forces with pioneer GI3HXV (Belfast, Co. Antrim) on 4m. EI6AI (Co. Donegal) has also been heard, and all the above recently worked GD3CUW.

**G3OJE** (London, S.E.20) is now active on 4m running 30 watts to a QV06/20, and is looking for contacts most

**Eleventh Annual**

**SCOTTISH V.H.F. CONVENTION**

**CARLTON HOTEL, NORTH BRIDGE, EDINBURGH**

**SATURDAY, JUNE 15, 1963**

**Commencing at 2.30 p.m.**

The programme will be the usual blend of lecture, discussion and ragchew.

Tickets, price 22/6d. including the cost of tea at 4.30 p.m. and dinner at 7 p.m. may be obtained from W. B. Miller, GM3PMB, 14 Clamps Wood, East Kilbride, Glasgow. Mr. Miller can also arrange lunch and accommodation for visitors if required.

evenings in order to test thoroughly tne newly constructed gear. The aerial is a bi-square. Local interest has apparently been stimulated by the inclusion of 4m in the V.H.F. N.F.D.

### Seventy Centimetres

The first claims received for the 70cm list of " firsts " are from **G3JMA,** who says that he worked OZ9AC on December 3, 1962, and GM3FYB, who mentioned that the late GM6WL made the first GM/GI contact on September 12, 1958, with GI3FWF. **GM3FYB** himself claims the first GM/G (with G5YV on August 30, 1962), and the first GM/EI with EI2W on October 16, 1962. GM3FYB has also worked G3LTF for possibly the longest internal British Isles contact, approximately 340 miles on October 7, 1962. A sked is now running with G2XV who was heard on April 16, at RST229. The sked time is 22.45 to 23.15 G.M.T. at five minute intervals, starting with GM3FYB transmitting at 22.45 G.M.T. The gear at **GM3FYB** is 4X150 running 100 watts input to a 64 element J-beam aerial. The receiver is a grounded grid A.2521, G2DCI converter, with an NC303 as the i.f. The QTH is 400 ft. a.s.l. with a good path in most directions. Experiments are under way with a parametric amplifier. Other GMs active on 70cm are GM3BCD, GM3DDE, GM5VG, GM3GUO and GM6ZV. GM3FYB would like to get in touch with an active GW on this band with a good path to the North, and also GI stations.

**G5QA** (Exeter) is concentrating solely on 70cm and has regular skeds with GW3ATM, G3OYM, and G3KFD. The latter is almost 180 miles from Exeter, and it is thus surprising what valuable experimental work can be done by regular skeds. Herb has one tip for all 70cm enthusiasts: his advice is to spend considerable time on the aerial coupling loop, and not to take too much notice of " what it says in the book." The loop at G5QA is $\frac{3}{4}$ in. long, spaced $\frac{1}{4}$ in. from the anode, and is untuned.

**G2XV** (Gt. Shelford) gives the frequencies used in his sked with GM3FYB. The Scottish frequency is 433·06 Mc/s, and G2XV's is 433·95 Mc/s. Any stations within the path are invited to report on the signals heard.

### Manchester V.H.F./U.H.F. Convention

The North-West V.H.F. Group is planning to hold another V.H.F. Convention in Manchester later this year, probably at the end of September or early in October. It is hoped that the programme being arranged will attract v.h.f. enthusiasts from all over the country. Full details next month.

The Golden Jubilee Dinner will be held at the Connaught Rooms, Holborn, London, W.C.1, on Friday, July 5, 1963, at 6.30 p.m. for 7 p.m. Tickets, price 32/6d., may be obtained from the Honorary Business Manager, Frank Fletcher, G2FUX, 11a Ickenham Road, Ruislip, Middlesex. Bookings cannot be guaranteed if received later than June 20, 1963. At the Golden Jubilee Dinner tables to accommodate groups of about 10 people will be used in place of the long tables shown in this photograph.

*(Photo by courtesy of the Connaught Rooms Ltd.)*

# Ed Tilton Guest of Honour at Ninth International V.H.F./U.H.F. Convention

By JACK HUM (G5UM)

FEW men have done more to translate v.h.f. from the esoteric to the every day than Ed Tilton, W1HDQ. For something like a quarter of a century his famous column in *QST* brought to tens of thousands of amateurs all over the world news of the latest development in the v.h.f. field under the title " The World Above 50 Mc/s."

For let us not forget that there was a time when " metre-wave stuff " really did seem to be hard to tackle by the average radio amateur. What was needed was a man with " green fingers " in the v.h.f. sense to show that it was not so difficult after all. That man was Ed Tilton, the world's best-known v.h.f. columnist.

Recognising these facts, the V.H.F. Committee of the R.S.G.B. had long cherished a hope that one of these years it might be possible to persuade Ed to cross the Atlantic to attend an International V.H.F./U.H.F. Convention in London, annually the mecca for all British v.h.f. workers and a good many European ones as well. This year their wish was fulfilled, and Ed was at the Kingsley Hotel in London, on May 18, 1963.

It would have been pleasant to meet W1HDQ at any V.H.F. Convention. That he should have been able to attend the one held in Golden Jubilee year was indeed appropriate. And, of course, it was Ed whom all those (all 172 of them!) thronging the Kingsley that Saturday afternoon wanted to get to know as quickly as possible. To introduce him to them was the first duty of the Chairman, Ray Hills, G3HRH, when the proceedings began with the afternoon's technical symposium. No better title could have been chosen for W1HDQ's talk than " The World Above 50 Mc/s—Past and Present." During his talk, Ed referred to those very early v.h.f. men, Hertz and Marconi, and recalled the pioneer work of Ross A. Hull.

From the talks that followed in this technical symposium Ed himself must have derived a pretty good notion of how the future looks to those on this side of the Atlantic, for they covered such forward looking devices as parametric amplifiers and transistors at v.h.f., receiver front-ends, transmitter design and a new turnstile aerial array. And from the exhibition which had been running during the morning, and throughout the afternoon while the symposium was in session, our guest of honour had been able to see in the form of actual hardware some of the products which several British specialist manufacturers now market to cater for the ever increasing interest in—so far as *we* are concerned—" The World above 70 Mc/s." There was also a fine display of home-built equipment for 70, 144, 430 and 1296 Mc/s which left no-one in doubt as to the skill and earnestness of purpose of British v.h.f. enthusiasts.

Climax to every one of the London International V.H.F./U.H.F. Conventions is the banquet in the evening. It would have been unthinkable not to see the name of Ed Tilton on the toast list, and there it was: W1HDQ, replied to the toast of " The American Radio Relay League " proposed by Geoff Stone, G3FZL, who is R.S.G.B. Executive Vice-President during this Golden Jubilee year of 1963.

It is sometimes said that journalists have " the gift of the gab," though this is often quite untrue. Many can express themselves far better writing than speaking. Those v.h.f. diners-out on May 18 were fortunate enough to hear no fewer than three very persuasive speaker-writers from Ed himself in the aforementioned toast to Austin Forsyth, G6FO, of *Short Wave Magazine* which has long been a noted supporter of the v.h.f. art, through to John P. Wilson, G3BGP, whose *Electronics Weekly* must be one of the brightest and most successful electronic trade journals in the world. (How he manages to fill such an enormous number of pages so interestingly each week is a secret many of us in the journalistic business would like to crack).

Mr. Forsyth proposed " The London U.H.F. Group," that body whose year-by-year association with the Society's V.H.F. Committee has done so much to make the annual V.H.F. Convention the success it always is. To reply to this toast no more fitting person than Phil Thorogood, G4KD, (Chairman of the Group), could have been chosen, for Phil has been a prime mover in the progress of the London U.H.F. Group ever since it began. In his reply, G4KD mentioned the Group's pride in being affiliated to R.S.G.B.

John Wilson, G3BGP, responded to the toast " The Visitors and Guests " aptly put by a new member of the V.H.F. Committee, D. N. Biltcliffe, G6NB, but an old timer in matters v.h.f., holder of many records and one of the top flight exemplars of intelligent operating. G3BGP himself confided that he was one of the newest recruits to 144 Mc/s—he had had the equipment for a week but had so far made no contacts, a situation we feel sure was remedied the following morning, for John was heard to be making skeds from 8.30 a.m. on!

Another person at the dinner that evening who in his own manner of quiet advocacy (not least as Honorary Treasurer of the London U.H.F. Group) has done an immense amount of work for the v.h.f. cause (and no pun intended) was the President himself, Norman Caws, G3BVG. To put it this way makes him sound as though he were just " among those present," which is probably the way he would like it. In fact, he is the most important man in the Society in this most important year in its history—the Golden Jubilee Year—and the Convention organizers felt honoured to have him in the chair throughout the proceedings.

Besides opening the speech rota with the Loyal Toast Mr. Caws had the pleasant duty to perform of replying to " The Radio Society of Great Britain " proposed by one of the most distinguished radio scientists in the country—indeed in the world—and one who in a previous year had worn the Presidential chain, Dr. R. L. Smith-Rose, who recalled that he had been a member of the Society since 1913.

After the speeches were over Mr. Hills presented a special " Four Metres and Down " certificate to Mr. Tilton for personal QSOs with amateurs in six countries. Mr. Stone had earlier suggested *Short Wave Magazine* might care to present a special " V.H.F.C.C." certificate to W1HDQ for more than 100 similar QSOs with amateurs at the Convention.

The " 1962 V.H.F. Committee Cup " for the most meritorious piece of equipment entered in the Constructors' Competition (which throughout the day had so demoralized those who are not much good with the soldering iron) was presented by Mr. Caws to K. L. Bond, G3NUV, for his excellent self-contained 15 watt 2m station. Runners-up, who received *Short Wave Magazine* vouchers, were W. D. Sellars, G3PBV, for his 144 Mc/s f.m. transmitter and Arnold Mynett, G3HBW, for his field day 430/1296 Mc/s transmitter.

Finally, Mrs. G5UM whipped out of the box the lucky number ticket which meant a Cosmoscord dynamic desk microphone for its holder. The man who will exercise his larynx on it in future is L. V. Dent, G3GDR.

And so to the official conclusion of the Golden Jubilee V.H.F. Convention, productive of much good will plus a certain healthy discontent that " the heap " at home would work a lot better if one really tried!

# London Single Sideband Dinner

THE London Single Sideband Dinner, held on May 11, 1963, at the Waldorf Hotel in London, was preceded by a display of radio communications equipment for both the amateur and professional user. Amongst the new s.s.b. equipment on show was the Mosley "Commando II" transmitter and the American Sonar four band transceiver.

K.W. Electronics took the opportunity to show the prototype of a small s.s.b. transceiver. Other items of interest on the combined K.W. Electronics/Hammarlund stand were the Miniphase M1A receiving adaptor which was reviewed in the December 1962 issue of the BULLETIN and the Hammarlund HX-50 s.s.b. transmitter, together with K.W. and Hammarlund receivers. The IIHC 144 Mc/s curtain array with 16db gain was also on show on this stand. Other exhibitors included Labgear/Pye and Redifon who featured professional s.s.b. equipment.

The guest of honour at the Dinner was the President of the Society, Mr. Norman Caws, G3BVG. The attendance of about 200 included 60 British Isles amateurs while overseas guests included HB9TL, HV1CN, I1HC, I1SVZ, K7BGS, MP4BBW, OD5CT, PA0CS, PA0ZD, SM5MC, W2BIB, W2GHK, W2JXH, W7TNA, 4S7ES, 4X4CJ, 5N2AMS, 5N2DMS and 5N2HJA.

After dinner speakers were the President, Mr. Norman Caws, G3BVG, Mr. Rowley Shears, G8KW, Mr. John Savage, G3MSS, who proposed the toast to the Ladies, to which Mrs. Doris Murray-Stone, 5N2DMS, responded very wittily, Mr. Frank Fletcher, G2FUX, who proposed "The Overseas Visitors" and Mr. Stuart Meyer, W2GHK, president of the Hammarlund Manufacturing Co. who replied.

During the evening, an Electrovoice microphone donated by Dale Electronics Ltd. was presented to Mr. T. A. St. Johnston, better known as G6UT, Uncle Tom, who, it is understood, celebrates his eightieth birthday this year.

A Hammarlund HX-50 transmitter, donated by the manufacturer, was won in the raffle by Maurice Margolis, G3NMR. The second main prize, a K.W.77 receiver, was won by F. H. Bliss, G3IFB. Other prizes included two bug keys, donated by Dale Electronics Ltd. which were won by Beryl Fletcher (B.R.S.20988) and W2JXH and a Mosley four band vertical aerial presented by them akers. The tickets were drawn by Mrs. Caws.

**Mrs. Doris Murray-Stone, 5N2DMS, replied to the toast of "The Ladies."**

*(Photo by G3NMR)*

**The President of the R.S.G.B., Mr. Norman Caws, G3BVG, was guest of honour at the Dinner.**

*(Photo by G3NMR)*

The excellent cabaret included an exhibition of ballroom dancing by Stan Dudley and Christine Norton, the comedy trampoline act Beryl and Bobo, and the Vernons Girls. Dancing was to George Fierstone and his band until midnight.

The organizers were Joe Steele, G3KZI, and Norman Fitch, G3FPK, who planned the whole affair as a private venture. It is hoped that the event will be the first of an annual series in London which will become a focal point for European s.s.b. enthusiasts each year. N.F.

## Special Activity Stations

THE BASINGSTOKE AMATEUR RADIO SOCIETY will be operating **GB3BCW** from the Memorial Park, Basingstoke, on July 6 and 13, as part of the Basingstoke Carnival Week. Operation will be on Top Band, the h.f. bands, and on 2m.

A number of events will be taking place in the Halifax area in the near future at which the Northern Heights Amateur Radio Society will be operating demonstration stations under the call-sign **G3MDW/A:** June 15—Halifax Gala; August 3—Warley Gala; August 10—Halifax Agricultural Show; August 17—Forset Cottage Community Centre Gala, near Halifax. Special QSLs will be sent to all contacts on the h.f. bands.

The Royal Signals Amateur Radio Society will be operating **GB3RCS** from Catterick Camp during the period June 28 to 30 inclusive, in connection with "Princess Royal Day" on June 28 and "Old Comrades Reunion Weekend" on June 29-30. Contacts with past and present members of the Corps and Commonwealth Signal Corps will be especially welcome during this period. A1, A3 and A3a will be used in the 3·5 to 21 Mc/s bands.

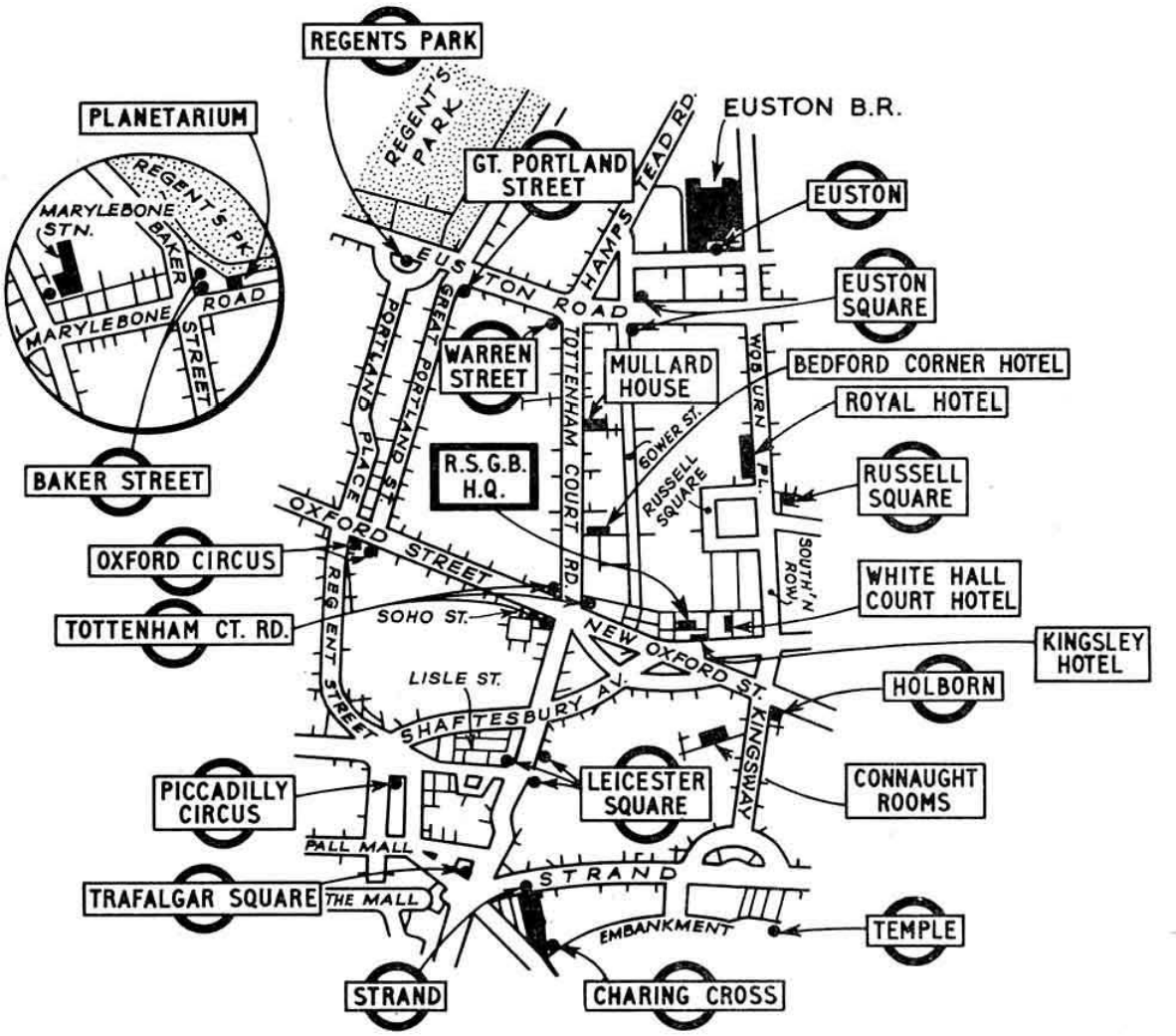
The Reigate Amateur Transmitting Society will be operating **G3REI/A** at the Reigate Borough Carnival and Fete at Redhill Sports Ground on Saturday, June 22. G3REI/A will be active on Top Band and 2m.

The Southampton R.S.G.B. Group will be operating **GB3SS** on all the h.f. bands and on 2m at the Great Southampton Show on July 12 and 13. Mobiles visiting the area will be most welcome on the latter day, when talk-in stations will be active on 160m and 2m. The show will have a wide scope, and should have attractions to interest everyone, including horticultural and animal exhibitions, show jumping, arts and crafts and fashion shows.

## Golden Jubilee Celebrations Information Centre

FOR THE BENEFIT OF PROVINCIAL and overseas members visiting London for the Society's Golden Jubilee Celebrations from July 1 to 5, 1963, an Information Centre is being established in the Council Room at Headquarters. The Centre will be staffed by Frank Fletcher, G2FUX, Honorary Business Manager for the Celebrations, members of the Council and members of the Headquarters staff.

Information and advice may be obtained by calling at Headquarters in person or by telephoning HOLborn 7373 or HOLborn 2444.




This sketch map shows the location of the various places at which Golden Jubilee functions will be held. Because of the intricate one-way streets in the area around R.S.G.B. Headquarters, members travelling by road are recommended to obtain a copy of the A.A. map of London. For example, Tottenham Court Road is a one-way street running north and Gower Street, which runs parallel, is one way in the southward direction. Members using Charing Cross main line railway station are reminded that Strand is the nearest underground station. The inset shows the position of the London Planetarium. The Kingsley Hotel, the Celebrations Rendezvous, is on Bloomsbury Way which runs parallel to Little Russell Street. The hotel is about two minutes' walk from R.S.G.B. Headquarters.

# Society News

### Zone A Representative

THE RESULT OF THE BALLOT for a new Zone A Representative was as follows:

Mr. A. C. Dunn, G2ACD .. .. 40 votes
Mr. L. N. Goldsbrough, G3ERB .. 46 votes

Mr. Goldsbrough has therefore been elected to fill the casual vacancy caused by the death of the late P. H. Wade, G2BPJ.

The ballot was scrutinized by Mr. P. A. Thorogood, G4KD.

### Honorary Publicity Manager

THE COUNCIL WILL BE PLEASED to receive offers from suitably qualified members willing to act as the Honorary Publicity Manager to the Society.

### Hints and Tips

COPIES OF SOCIETY PUBLICATIONS are offered as prizes for the best ideas submitted by members for use in a new series of *Hints and Tips for Radio Amateurs* to be published in the new volume of the BULLETIN. Contributions should be sent to the Editor at R.S.G.B. Headquarters.

### Death of Mr. Stanley Vanstone, G2AYC

IT IS WITH DEEP SORROW we record the death suddenly on May 22, 1963, of S. E. Vanstone, G2AYC, Chairman of the London Members' Luncheon Club and President of the Sutton and Cheam Radio Society.

### Death of Mr. T. W. Bennington

IT IS WITH REGRET that we record the death, on March 13, 1963, of Mr. T. W. Bennington of the B.B.C. Research Department at the age of 63.

Mr. Bennington joined the Corporation in 1934 at the Moorside Edge transmitting station, and two years later transferred to the then Overseas and Engineering Information Department. In that department and later in the Research Department, which he joined in 1953, Mr. Bennington was chiefly engaged in work connected with wave propagation via the ionosphere. He became an acknowledged international expert in this field and was well known for his reports and publications on short-wave propagation and on the influence of the Sun on the ionosphere.


### Vacancy on the R.S.G.B. Bulletin

There is a vacancy at Headquarters for a keen licensed (or prospective) amateur to join the editorial staff of the R.S.G.B. BULLETIN. Enthusiasm, coupled with good command of English, is more important than experience. The ability to mix well would be an advantage.

The continuing programme of expansion of the Society's activities in the publishing field make this a challenging opportunity to gain wide experience of editorial production.

Write in confidence, giving details of career to date and salary required, to the General Secretary, Radio Society of Great Britain, 28 Little Russell Street, London, W.C.1.


### Assistance Required

GUNNAR ESBJORNSSON, SM2BZU, who received special permission to operate GB3SMG at the Stoke Mandeville Games in July, 1962, recently appeared on television operating a "suck and blow" typewriter called "Possum." SM2BZU would like to hear from any member or group of members willing to build him an electronic bug-key for use when he returns to Sweden later this year. The operating unit would have to be specially adapted to his requirements as he has practically no movement in his hands.

SM2BZU is in Ward 5, Stoke Mandeville Spinal Injuries Centre, near Aylesbury, Bucks., where he is always pleased to see visiting amateurs. He will also be pleased to receive QSL cards.

## Silent Key

### W. G. L. CREATON (G3ANB)

It is with deep sorrow that we record the death of William Creaton (G3ANB) on April 8, 1963.

Bill had been ailing for some years, but remained active on the amateur bands, especially 2m and 160m, until the day prior to his death. He was licensed in 1946, and was a keen c.w. enthusiast, initially operating mainly on 80m. Following the allocation of the 2m band, however, he turned his attentions to v.h.f. and became one of the most active and successful operators in North Essex.

We offer our sympathies to his widow, and daughter Heather.

F.R.H.

### WILLIAM GILMOUR (GM3FPX)

His many friends, particularly in the Glasgow area, will be grieved to hear of the passing, on April 19, 1963, of William Gilmour (GM3FPX).

Bill, as he was known by all, was a keen amateur for many years and gave the helping hand to others willingly. He has been a Society member for more than 14 years.

His cheerful conversation will be greatly missed by local members. Bill's health of late had not been good although this did not prevent his operating his station.

The funeral service, followed by cremation, took place at the Western Necropolis on April 22. The Society was represented by GM2FKG, GM3FPU and GM6MD.

To his widow and two daughters we extend our sincere sympathy.

D. R. M.

### B. G. LOGAN (G5GA)

We record with sorrow the sudden death on April 14, 1963, of Benjamin George Logan (G5GA) aged 81 years.

It was only recently that he had recovered from an operation, and had been anticipating a return to the air. He was first licensed just after the 1914-1918 war, and was an Honorary Member of the East Kent Radio Society.

We extend our deepest sympathy to his widow and daughter.

G3MDO

### W. E. L. MALINGS (G3TM)

It is with regret that we report the death of "Ted" Malings (G3TM), who died in hospital on April 25, 1963.

Since he acquired his licence, Ted had been very active in Amateur Radio. It was always difficult to forecast what band he would be working, or whether, in fact, he would be /P or /M. He had numerous friends in the Warrington area, and was for some time the T.R. for the district.

He will be greatly missed by all. To his widow, Edna, we offer our deepest sympathy.

G8TR

### W. MILLAR (GM3CCT)

It is with very great regret that we have to report the death of William Millar (GM3CCT), on April 16, 1963, at the age of 58 years.

Mr. Millar, a Marconi veteran, first became an amateur in 1946 after being invalided out of the Merchant Service, in which he had a distinguished and eventful career. As a result of his war service, Bill's health was seriously impaired but this never dampened his enthusiasm for Amateur Radio, especially the art of c.w. operating, of which he was a past master. Despite a great deal of ill heath he remained cheerful, and was always ready to give help to all those who sought it. To those of us who had the privilege of calling him friend, his death came as a great blow.

To his widow we extend our deepest sympathy.

GM3IQL

## R.A.O.T.A. Reunion 1963

HUGH POCOCK, for many years Editor and in later years Managing Editor of *Wireless World*, was the guest of honour at the fifth Annual Reunion of the Radio Amateur Old Timers' Association held at The Horse Shoe Hotel, Tottenham Court Road, London, W.1, on Friday, May 3, 1963.

The chair was taken by Herb. Bartlett, G5QA, a Past President of the R.S.G.B. who had the support of six other past presidents (Ernest Gardiner, G6GR, Vic. Desmond, G5VM, "Dud" Charman, G6CJ, Arthur Milne, G2MI, Reg. Hammans, G2IG and Eric Cole, G2EC) and four Vice-Presidents (T. A. St. Johnston, G6UT, J. W. Mathews, G6LL, D. N. Corfield, G5CD and W. H. Allen, G2UJ).

The toast to the Association was proposed by Kenneth Alford (G2DX, ex-TXK) who at the conclusion of his speech presented an insignia to the Association—an AT100 valve (vintage 1920) suitably "powered" and mounted on a mahogany plinth. The Founder-Secretary (John Clarricoats, G6CL) in accepting the insignia on behalf of the Association thanked Mr. Alford for his kindly gesture and expressed the hope that it would indeed become, as the donor had suggested, a "lamp of remembrance."

Mr. Clarricoats reported that membership had increased to 136 with 21 new names added to the roll since the previous Reunion. The finances were sound with the Benevolent Fund in a position to render help whenever the need arises. His proposal that Hugh Pocock should be elected an Honorary Member in appreciation of his services to the Amateur Radio movement met with unanimous approval.

W. E. F. (Bill) Corsham, G2UV, in offering a toast to the guest of honour, spoke of the great help *Wireless World* gave to the Wireless Society of London (from 1913 until 1922) and to the R.S.G.B. (from 1922 until the *T. & R. Bulletin* was founded in July, 1925). Replying, Mr. Pocock referred to his early experimental activities and gave pleasure to the gathering by displaying his 1913 transmitting licence. He spoke about some of the problems that had faced the Society in the years just after World War I and of the happiness he had experienced that evening from meeting, for the first time in 35 to 40 years, some of those with whom he had been closely associated in the early days of Amateur Radio.

Later in the evening the Chairman made the first award of the Marcuse Memorial Prize—to A. J. Shepherd, G3RKK, whose description of a home-constructed communications receiver had earned for him very high praise from the judges (all members of the R.S.G.B. Technical Committee). The prize took the form of a book token, with specially prepared book plates, presented to the Association by old timer Ralph Royle, G2WJ.

Arthur Milne, G2MI, was responsible for the Nostalgia feature and Silent Keys (G2AX, G2BZ, G2LZ and G6OT had passed on since the previous Reunion) were remembered during the evening.

Telegrams and messages were received from nearly 50 members who had been prevented from attending the Reunion. In addition, a letter of greetings, brought by W. E. D. (Bill) Parker, G6BY, was read from the officers of The Old, Old Timers' Club of the U.S.A.

### Roll Call

For the record the following attended the Reunion: G2DC, DX, EC, HP, IG, JF, KI, KJ, MI, MR, NG, NH, NN, SC, UJ, UV, VB, XV, G3HT, G5BC, BV, BZ, CD, DJ, GR, MA, ML, MR, PP, QA, VM, WP, GW5BI, G6BY, CJ, CL, FI, GR, HR, IO, JI, LL, LQ, MN, OH, OX, PA, QM, SC, SN, UT, XL, G8KS, KW, NY, TY, "G1YL," Hugh Pocock, G3RKK.

J. C.

### Kent Summer School

AT THE KENT SUMMER SCHOOL in Folkestone from July 25 to August 9, **GB3KEC** will be active on phone and c.w. on all bands from 160 to 10m and on 2m. Contacts will be most welcome, especially with teachers and pupils. QSL cards from U.K. and near-European stations may be sent direct to the Kent Summer School, Folkestone, or via the R.S.G.B. QSL Bureau. Further information may be obtained from D. J. Bradford (G3LCK) 42 Mount Road, Canterbury, Kent, who will be pleased to arrange skeds.

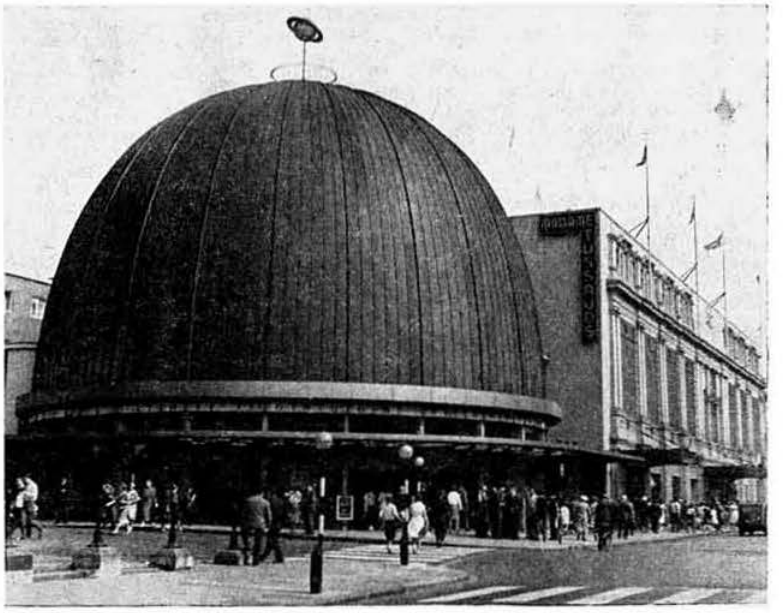
## Golden Jubilee—See You Here

### The Universe of Stars

UNTIL QUITE LATE IN HIS long history Man has regarded himself as occupying a central position in the physical universe. This comforting but mistaken notion was not completely cast aside until the late 1920s. The work of Shapley, Lindblad, Oort and others showed that the Sun (and therefore the Earth) was far removed from the centre of the great system of stars known as the Galaxy. Since then astronomers have come to regard the Galaxy as one stellar system among at least two thousand million others. Further, they realize that although the Galaxy seems to have a central position the universe of galaxies has no absolute centre.

Using the Zeiss planetarium instrument Dr. King will outline some of the highlights in our present knowledge of the structure of the universe of stars during the special programme at the London Planetarium, following the Golden Jubilee Celebrations Reception on Wednesday, July 3, 1963. The medium, an optical one, will require him to keep mainly to optical discoveries but he will, whenever possible, deal also with those in radio astronomy.

Admission will be by ticket only. For details see page 646.



# Society Affairs

*A digest of the business discussed at the March, 1963 meeting of the Council.*

THE March meeting of the Society's Council was held on March 25, and was attended by Messrs Norman Caws (President), D. A. Findlay (Honorary Treasurer), R. C. Hills, E. G. Ingram, J. Douglas Kay, A. O. Milne, L. E. Newnham, F. K. Parker, A. D. Patterson, R. F. Stevens, J. W. Swinnerton and E. W. Yeomanson (Members of Council), John Clarricoats (General Secretary) and John A. Rouse (Editor).

Apologies were presented for the absence of Mr. H. A. Bartlett, Major-General E. S. Cole, Mr. G. M. C. Stone and Mr. A. C. Williams, who was indisposed.

* * *

### Gavel Plate

Mr. Caws opened the proceedings by asking Mr. Parker to thank his father for making a new gavel plate for use at meetings of the Council.

### Small Lotteries and Gambling Act 1956

In connection with a proposal from Mr. P. A. Thorogood that the Society should hold a small lottery in aid of the Headquarters Building Fund, it was agreed to set up an ad hoc committee comprising Messrs Caws, Findlay, Parker and Yeomanson to consider the suggestion in detail.

### New Members and Affiliated Societies

A total of 113 applications for membership were approved: 87 Corporate and 26 Associate. In addition, 10 applications from Associates for transfer to Corporate grade were accepted.

Four applications for affiliation by local radio societies were also approved: Bradford Institute of Technology Students' Union Amateur Radio Society, Isle of Wight Radio Society, Northern Amateur Radio Mobile Society, 50 (N) Signal Regt. (T.A.) Amateur Radio Society.

### Casual Vacancy on the Council

In a ballot, Mr. J. C. Graham, G3TR, obtained the greatest number of votes and it was resolved to invite him to fill the vacancy. (Mr. Graham has since accepted the invitation.)

### Vacancies on Committees

It was agreed to invite Mr. P. W. Winsford, G4DC, to serve on the Mobile Committee and Mr. J. C. Graham, G3TR, to serve on the Exhibition Committee.

### Title of the Society's Journal

From time to time there have been suggestions that the title of the Society's journal should be changed, and during recent months consideration has again been given to the idea. At this meeting, however, it was decided to make no change for the time being.

### Contest Claimed Scores

The checking of entries received for contests and the preparation of reports for publication inevitably takes some time. The Council decided, therefore, to inform the Contests Committee that claimed scores may be published as soon as possible after a contest has taken place.

### News Bulletin Service

For some time, certain items of v.h.f. interest have been read only on the v.h.f. transmissions of the News Bulletin. This policy was reconsidered at the meeting and it was decided that such items will in future be included in all transmissions.

### Hallicrafters QST Advertisement

An offer had been received from Hallicrafters to devote one of their advertisements in *QST* for June, 1963, to the Society's Golden Jubilee. Mr. Clarricoats was asked to write the article which would be from 250 to 400 words in length.

### Articles of Association

The Society's present Articles of Association—the rules under which the Society operates—have sometimes proved difficult to interpret and to implement. For this reason, a considerable amount of time and thought has been, and is being, devoted to bringing them up to date.

Most recently the Board of Trade had expressed its views and at this meeting Mr. Caws submitted his own comments on the Board's observations. After considering the points raised by the Board of Trade, it was agreed to refer the contentious items to the Society's solicitors.

Mr. Caws said he felt every effort should be made to present the revised Articles to the membership at a Special General Meeting after the A.G.M. on December 20, 1963.

### Ghana Amateur Radio Society

It was agreed to cast the Society's vote in favour of the admission of the Ghana Amateur Radio Society to membership of the International Amateur Radio Union.

### Short Wave Magazine

Mr. Caws said that he had sent to the *Short Wave Magazine* a copy of a letter received from the B.B.C. after he had protested to the Corporation concerning derogatory comments about radio amateurs in a recent play, "Crack of Doom." The Editor of *Short Wave Magazine*, Mr. Austin Forsyth, G6FO, had written to thank Mr. Caws for his action.

### Closing Date for Classified Advertisements

It was agreed that the closing date for classified advertisements should be kept as near to the date of publication as possible. During the discussion, it was mentioned that the closing date was, of course, very much later than the date by which contributions for such features as *Regional and Club News* have to be submitted.

### Committee Meetings

Reports were received from a number of Committees.

The Golden Jubilee Celebrations Committee, which met on February 23 and again on March 6, reported that it had drawn up a firm programme for the Golden Jubilee Week (details were published in the April issue of the BULLETIN) and dealt with a multitude of items of detail.

The R.A.E.N. Committee also met on February 23 and dealt with the organization of the Network in Lincolnshire, the appointment and resignation of some local officers of the Network, Network procedure and a paper for the Region I Conference in Malmo.

The Contests Committee met on February 28 to deal with correspondence from members and other societies, the results of the R.S.G.B. 21/28 Mc/s Telephony Contests, 1962, arrangements for the checking of the First 1·8 Mc/s, 144 Mc/s Open and Listeners' V.H.F., and the Affiliated Societies' contests. The rules for the 70 Mc/s and 7 Mc/s DX contests were approved for publication.

When the Mobile Committee met on March 8, plans for the Golden Jubilee Rally at Wethersfield on June 2 were considered at length. Plans for the Woburn Abbey Rally were also discussed and arrangements made for the Committee to be represented at the North Midlands (Trentham Gardens) and Penzance rallies. The Council accepted a recommendation that 5,000 Golden Jubilee badges should be printed for use at mobile rallies.

* * *

The Council was in session for just over four hours.

**HEADQUARTERS TELEPHONE NUMBERS**

**HOLborn 7373 and 2444**

# CONTEST NEWS

RESULTS — REPORTS — RULES

## First 1·8 Mc/s Contest 1963

THE FIRST 1·8 MC/S CONTEST 1963 attracted increased support once again, 93 entries being received, together with two check logs and two from listeners.

D. J. Andrews, G3MXJ, in Kent, who did not enter last year but was fourth in 1961, was the winner of the Somerset Trophy with 668 points. He had a margin of 33 points over M. G. Whitaker, G3IGW, in Yorkshire, who was joint fourth in 1962 and eleventh the previous year. Third place was taken by D. G. Alexander, G3KLH, in Oxfordshire, the position he held the two previous years while H. J. M. Box, G6BQ, in Kent, second last year and winner in 1961, was a very close fourth.

Less than one quarter of the contestants sent in comments with their entries. All appear to have enjoyed the contest and the majority were in favour of the scoring system. Other points raised will be studied when considering the rules for the next contest. With one exception, all logs were clearly typed or written for which the Contests Committee extend their thanks.

Contestants will note that extra information has been included in the table of results this year, and it is hoped it will be of interest to all. The Contests Committee would have liked to have included in this report comments on facts demonstrated by the table. That would have delayed publication of the results by a month and as it was felt entrants would like to know the result of the contest as soon as possible the comments will be published later.

The Maitland Trophy, for the Scottish station with the highest aggregate score taken with the Second 1·8 Mc/s Contest 1962, was won again by W. Robertson, GM6RI, in Angus, with a total of 870, followed by W. A. F. Davidson, GM3NYY, in Ayrshire, runner-up with 856 points. These

**MAITLAND TROPHY**

| Posn. | Call-sign | November 1962 | March 1963 | Total |
|---|---|---|---|---|
| 1 | GM6RI | 548 | 322 | 870 |
| 2 | GM3NYY | 357 | 499 | 856 |
| 3 | GM3KMR | 359 | — | 359 |
| 4 | GM3KLA | 254 | — | 254 |
| 5 | GM3AEY | 253 | — | 253 |

were the only entries received from Scotland and the Contests Committee wonders if the lead of 189 points over GM3KMR and 191 points over GM3NYY gained by GM6RI in the first leg had anything to do with it.

A certificate of merit has been awarded to M. Harrison, B.R.S.24733, for his very accurate and extensive check log which was of great use to the Contests Committee.

Check logs from G3AKY, OK1ZW and B.R.S.24842 are acknowledged with thanks.

**RESULTS—FIRST 1·8 Mc/s CONTEST 1963**

| Posn. | Call-sign | County | Contacts 3 Pts. | Contacts 5 pts. | Aerial‡ | Points |
|---|---|---|---|---|---|---|
| 1 | G3MXJ | KT | 65 | 96 | A | 668 |
| 2 | G3IGW | YS | 29 | 112 | A | 635 |
| 3 | G3KLH | OX | 11 | 114 | A | 589 |
| 4 | G6BQ | KT | 53 | 85 | A | 582 |
| 5 | G3FM | SY | 55 | 78 | A | 554 |
| 6 | G3OIT | EX | 43 | 82 | A | 534 |
| * | G3RBP | BE | 23 | 91 | A | 523 |
| 7 | G3LBA | SY | 56 | 69 | A | 518 |
| 8 | GM3NYY | AY | 2 | 101 | A | 499 |
| 9 | G5LR | HE | 24 | 85 | A | 496 |
| 10 | GW3JI | CV | 6 | 94 | C | 488 |
| 11 | G2MJ | LE | 32 | 77 | A | 481 |
| 12 | G3NHE | YS | 27 | 80 | A | 479 |
| 13 | G3ERN | EX | 49 | 66 | A | 475 |
| 14 | G3KSL | KT | 55 | 57 | B | 447 |
| 15 | G3OSW | ND | 5 | 84 | A | 433 |
| 16 | G3OLN | GR | 10 | 79 | A | 421 |
| 17 | G3GGS | LE | 17 | 73 | B | 416 |
| 18 | G2AFV | YS | 14 | 70 | A | 392 |
| 19 | G3PRM | DY | 11 | 72 | A | 391 |
| * | G3RSR | WR | 8 | 78 | A | 386 |
| 20 | G3MEH | SY | 48 | 46 | A | 374 |
| 21 | G3BIK | ND | 7 | 70 | B | 371 |
| 22 | G3KZZ/A | DH | 12 | 66 | A | 366 |
| 23 | G3FHN | KT | 37 | 49 | A | 355 |
| 24 | G3DCZ | SY | 49 | 41 | A & C | 352 |
| 25 | G2DC | HE | 18 | 59 | A | 349 |
| 26 | G3JKO | SX | 27 | 53 | A | 346 |
| 27 | G3PVK | SY | 48 | 40 | B | 342 |
| 28 | G3HLW | HE | 20 | 56 | B | 340 |
| 29 | G3OHX | ND | 4 | 65 | A | 335 |
| 30 | G3KDV | DN | 7 | 63 | A | 332 |
| 31 | G3BJD | CD | 11 | 59 | A | 328 |
| 32 | G3HIW | EX | 36 | 44 | B | 326 |
| 33 | G3NWU | DH | 11 | 59 | A | 323 |
| 34 | G3QD | NM | 14 | 55 | A | 322 |
| | GM6RI | AS | 2 | 64 | A | 322 |
| 36 | G3OYU | KT | 30 | 47 | A | 321 |
| 37 | G3LAS/A | LD | 48 | 36 | C | 320 |
| 38 | G3BTU | NH | 13 | 55 | C | 311 |
| 39 | G2QT | KT | 41 | 32 | D | 305 |
| 40 | G3DDM | HE | 19 | 49 | A | 301 |
| 41 | G3HQT | SY | 44 | 33 | C | 295 |
| 42 | G3PSB | YS | 15 | 49 | B(L) | 287 |
| 43 | G2BLA | HF | 13 | 48 | C | 279 |
| 44 | G3KSH | MX | 41 | 31 | C | 278 |
| | GI3NEB | AM | 2 | 55 | C | 278 |
| 46 | G3GWX | WK | 7 | 51 | A | 276 |
| 47 | G3OVL | SY | 52 | 23 | C | 270 |
| 48 | G3TR | SY | 40 | 29 | A | 263 |
| 49 | G3AHB | BS | 21 | 40 | D | 262 |
| 50 | G3KKQ/A | WR | 7 | 49 | C | 261 |
| 51 | G3GNS | ST | 5 | 49 | C | 260 |
| 52 | G3PHG | SX | 31 | 32 | C | 250 |
| 53 | G3PEO | GR | 8 | 45 | C | 247 |
| 54 | G3EMO | LE | 7 | 45 | B | 246 |
| | G3NKX | EX | 41 | 27 | D(L) | 246 |
| 56 | G3RDQ | SY | 37 | 23 | C | 225 |
| 57 | G3BZM | BS | 15 | 37 | D(L) | 224 |
| 58 | G2ZZ | LD | 44 | 18 | D | 221 |
| 59 | G3EUE | SY | 34 | 23 | A | 217 |
| † | G3FVW | YS | 10 | 37 | A | 212 |
| 60 | G3VW | MX | 29 | 24 | C | 207 |
| 61 | G3KTA | SY | 40 | 17 | C | 205 |
| 62 | G3LMT | MX | 28 | 24 | A | 203 |
| 63 | G2HPF | EX | 26 | 25 | C | 201 |
| 64 | G3JNJ | MX | 33 | 20 | C | 199 |
| 65 | G8IM | LD | 30 | 22 | C | 198 |
| 66 | G3OGP | EX | 35 | 18 | C | 195 |
| 67 | G3KPU | NM | 8 | 34 | C | 193 |
| 68 | G3YF | LD | 47 | 10 | C | 191 |
| 69 | G2GM | HE | 5 | 34 | C | 185 |
| 70 | G3KUG | SD | 6 | 32 | C | 178 |
| | G3RSF | EX | 38 | 13 | D(L) | 178 |
| 72 | G3PRT | KT | 36 | 16 | B | 173 |
| 73 | G3HKO | YS | 7 | 29 | C | 164 |
| 74 | G3JKY | KT | 34 | 12 | C | 162 |
| | G3ODK | LE | 6 | 29 | C | 162 |
| 76 | G3GRK | SY | 37 | 10 | C | 160 |
| 77 | G3MWZ | LN | 9 | 26 | C | 157 |
| 78 | G3IMO | LD | 40 | 7 | C | 154 |
| | G3PJB | LD | 30 | 13 | C | 154 |
| 80 | G3KWH | HF | 10 | 24 | D(L) | 150 |
| 81 | G3RFT | LE | 9 | 23 | D | 142 |
| 82 | G3GOX | MX | 22 | 14 | C | 136 |
| 83 | G3JWB | LD | 31 | 8 | C | 133 |
| 84 | G3GRQ | EX | 27 | 10 | D(L) | 131 |
| 85 | G2DHV | KT | 22 | 11 | B | 121 |
| 86 | G3JXZ | LD | 26 | 7 | D | 110 |
| 87 | G8BN | BS | 3 | 17 | C | 94 |
| 88 | G3MCX | SY | 21 | 2 | C | 70 |
| 89 | G3PED | EX | 17 | 1 | D | 56 |
| 90 | G6OO | LN | 3 | 9 | C | 54 |

* Multi-operator. † Late entry. ‡ Aerial grouping.
A. 250 ft. and over. B. 150 ft. to 249 ft. C. 100 ft. to 149 ft. D. Under 100 ft. and random lengths. (L). Loaded.

## Second 144 Mc/s Portable Contest 1963

R.S.G.B. MEMBERS THROUGHOUT Europe are invited to take part in this contest, the details of which are as shown below. Contestants are strongly recommended to operate in accordance with the British Isles Two Metre Band Plan.

**1. When:** 10.00 G.M.T. to 19.00 G.M.T. on **Sunday, July 7, 1963.**
**2. Eligible Entrants:** All fully paid-up members of the R.S.G.B. resident in Europe. Multi-operator entries will be accepted provided only one call-sign is used.
**3.** The General Rules relating to R.S.G.B. Contests, as published in the January, 1963 issue of the *R.S.G.B. Bulletin*, will apply except as superseded by the rules of this Contest.
**4. Power Supplies:** Power for any part of the station shall not be derived from supply mains.
**5. Contacts:** May be made on either A1, A3, A3a or F3 with an input not exceeding 25 watts to any stage in the transmitter.
**6. Scoring:** Points will be scored on the basis of one point per mile for contacts with fixed stations and two points per mile for contacts with other portables or mobiles.
**7. Contest Exchanges:** RST or RS reports followed by the contact number and location (e.g. RST559001 5NE Luton). This location must be identifiable on the 10 mile to the inch Ordnance Survey Map. QRA locator details may be exchanged with continental stations. It is the responsibility of the receiving operator to obtain the information he requires to calculate distances correctly.
**8. Logs:** (a) Must be tabulated in columns headed (in this order) " Date/Time (G.M.T.)," " Call-sign of station contacted," " My report on his signals and serial number sent," " His report on my signals and serial numbers received," " Location of station contacted as received," " Distance," " Points claimed."
(b) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed. The QTH as sent and National Grid Reference (full six figure grid reference) must be recorded on the cover sheet for entries from G, GD, GM and GW. In all other cases, entrants must show latitude and longitude.
(c) Entries must be postmarked not later than **Tuesday, July 23, 1963.**
**9. Awards:** At the discretion of the Council, a **miniature cup** will be awarded to the winner and **certificates of merit** to the runner-up and to the non-transmitting member submitting the best check log in the opinion of the Contests Committee.

### D/F Qualifying Events

DETAILS OF D/F QUALIFYING EVENTS are as follows:

#### HIGH WYCOMBE

**Sunday, June 16, 1963**
**Organizer:** G. T. Peck (B.R.S.15402), Dell Cottage, Horsleys Green, Stokenchurch, Bucks.
**Frequencies:** 1898 and 1874 kc/s.
**Call-signs:** G8VZ/P and G3MPL/P.
**Map:** Ordnance Survey, New Popular Edition, Sheet No. 159, Chilterns.
**Assembly Point:** Wheeler End Common (Brickmakers' Arms), N.G.R. 803931.
**Assembly Time:** 13.00 B.S.T.
**Entries and Tea:** Intending competitors should notify the Organizer by June 9, stating the number in their party requiring tea which will be at the Little Abbey Hotel, Great Missenden, N.G.R. 905997.

#### SOUTH MANCHESTER

**Sunday, June 23, 1963**
**Organizer:** J. A. Elliot (G3KIQ), 2 Pennine Close, Higher Blackley, Manchester 9.
**Frequencies and Call-signs:** 1825 kc/s—G3FVA/P.
1835 kc/s—to be announced at the start.
**Map:** Ordnance Survey, New Popular Edition, Sheet No. 101.
**Assembly Point:** Werneth Low, Joel Lane, Gee Cross, Hyde, Cheshire. N.G.R.955924.
**Assembly Time:** 13.00 B.S.T.
**Entries and Tea:** Intending competitors should notify the organiser by June 17, stating the number in their party requiring tea. The tea rendezvous will be supplied in a sealed envelope at the start.

#### DERBY

**Sunday, June 30, 1963**
**Organizer:** F. Allsopp (G3IFA), 221 Portreath Drive, Allestree, Derby.
**Frequencies and Call-signs:** G3IFA/P and G3ESB/P. Frequencies to be announced at the start.
**Map:** Ordnance Survey, New Popular Edition, Sheet No. 121.
**Assembly Point:** N.G.R. 402379 (Entrance to Loco Park).
**Assembly Time:** 13.00 B.S.T.
**Entries and Tea:** Intending competitors should notify A. Hitchcock (G3ESB), who is joint organizer, at 38 West Road, Spondon, Derby, not later than June 22, of their intention to participate, stating the number in their party requiring tea.

#### WIRRAL

**Sunday, July 21, 1963**
**Organizer:** J. P. G. Jones (G3IGG), 26 Hooton Way, Hooton, Little Sutton, Wirral, Cheshire.
**Frequencies and Call-signs:** To be announced at the start.
**Map:** Ordnance Survey, New Popular Edition, Sheet 109, Chester.
**Assembly Point:** Crown Hotel, Tarporley, Cheshire. N.G.R. 554623.
**Assembly Time:** 13.00 B.S.T.
**Entries and Tea:** Intending competitors should notify the organizer by July 17, 1963, stating the number in their party requiring tea (price 7/6d. each) which will be at the Crown Hotel, Tarporley, Cheshire.

### Grafton Top Band Contest

THE " G2AAN " CONTEST, held on March 23 and 30 was as usual a very successful event. The top four in each section were as follows:

| Open Section | Members' Section |
|---|---|
| (i) G3NFV—140 points* | (i) G3RPB‡ |
| (ii) G3IGW—128 points† | (ii) G3NYK/A |
| (iii) G3ERN—124 points | (iii) G3PIH |
| (iv) G3RBP—111 points | (iv) G3RJN |

* Phone Winner
† C.W. Winner
‡ Phone and C.W. Winner.

### H.S.C. v. Tops Contest 1962

THE ANNUAL CONTEST between the German High Speed Club and the Tops C.W. Club was won for the third time in succession by Tops on November 17, 1962. The margin of 42,697 points did, however, show a reduction over previous years.

Teams of 21 a side competed against each other and the total scores of each team decided the winning position. (Tops score was 163,430 points and the H.S.C. score 120,733 points.) As usual, points were allowed for QSOs with non-members of either club. As a point of interest 24 non-members participated and the total combined score of their first 21 scores equalled 94,172 points.

The leading station in each section was as follows: Tops OK1GT with 24,780 points, H.S.C. DJ1PN with 16,185 points. The highest scoring non-member was OK1PG with 13,559 points.

The contest is held on 3·5 Mc/s in the late autumn and other c.w. operators are welcome to take part. The 1963 event will be under the auspices of the Tops Club.

## CONTESTS DIARY

| | | |
|---|---|---|
| June 8–9 | – | National Field Day. (For rules, see page 308, December, 1962.) |
| June 15–16 | – | 70 Mc/s Contest. (see page 625, May, 1963.) |
| June 16 | – | D/F Qualifying Event (High Wycombe). (See this page.) |
| June 22–23 | – | 1250 Mc/s Tests. (see page 625, May, 1963.) |
| June 23 | – | D/F Qualifying Event (South Manchester). (see this page.) |
| June 30 | – | D/F Qualifying Event (Derby). (see this page.) |
| July 6–7 | – | Second 144 Mc/s Portable Contest.* (see this page.) |
| July 21 | – | D/F Qualifying Event (Wirral). (See this page.) |

| | | |
|---|---|---|
| August 10-11 | — | WAE DX (c.w.). |
| August 11 | — | D/F Qualifying Event (Newbury). |
| August 17-18 | — | WAE DX (phone). |
| September 7-8 | — | V.H.F. National Field Day (For rules, see page 373, January 1963). |
| September 15 | — | D/F National Final. |
| September 22 | — | Low Power Field Day. |
| October 6 | — | R.A.E.N. Rally. |
| October 19-20 | — | 7 Mc/s DX Contest (phone). |
| October 27 | — | Second 420 Mc/s Contest. |
| November 2-3 | — | 7 Mc/s DX Contest (c.w.). |
| November 9-10 | — | Second 1·8 Mc/s Contest. |
| November 16-17 | | R.S.G.B. 21/28 Mc/s Telephony Contests. |

* *To coincide with Region 1 I.A.R.U. Contest dates.*

# Letters to the Editor

*Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents. Letters for inclusion in this feature should be concise and preferably not more than 200 words in length.*

### Co-operation or Chaos?

DEAR SIR,—May I register my approval of the above Plan and refer all users of the band to the *Current Comment* in the May, 1963 BULLETIN.

Never was it more obvious to me (and I could not be alone) than during the first 144 Mc/s Portable Contest on May 5 this year, that the plan is a must! I have since wondered if the answer was given that day that the Plan will never really be accepted. When one listened around 144-144·1 Mc/s, stations in Wiltshire, Cheshire, Shropshire and other counties could be heard, all a long way out of step, and causing stations operating in their proper zone day long unnecessary QRM.

Maybe a contest is different to normal working, but the Contests Committee might care to vary the rules to assist stations in the back of beyond and stipulate Band Plan frequencies only. This would then give everyone an equal chance and also help to make DX possible rather than impossible.

Yours faithfully,
W. J. COLCLOUGH (G3XC)
Indian Queens, St. Columb, Cornwall.

DEAR SIR,—In the *Current Comment* (in the May, 1963 issue), the question " Co-operation or Chaos?" is posed in regard to 2m operation.

I believe that we in Great Britain should be proud of the extent to which the entirely voluntary Two Metre Band Plan has worked over the past 14 years. It is not, however, without its injustices. How many of us in the North West, observing our allocated frequencies, have been frustrated on the rare occasions when Continental DX breaks the Pennine barrier to find that the stations occupying the lower megacycle are making all the contacts?

While it is undeniable that the Plan has aided 2m operation has it not also inhibited development of modern operating techniques? The QHL and QLH techniques encourage interminable calling with two megacycles to tune and really the whole business is reminiscent of the thirties. Except for the self discipline of the Band Plan we should have band edge crowding too. If common channel operation has done nothing else it has spread the occupancy of the bands on which it is the recognized practice. Contemporary operating technique, particularly among s.s.b. stations, has a great deal to commend it and no one can complain of prolonged frequency occupation and unnecessary interference due to long calls. These techniques are equally applicable to A1 or A3 operation for those who think s.s.b. on two is difficult.

Apart from the availability of better valves for the first stage of converters I contend that 2m equipment and operation in general has not progressed at all since the band first became available. Only when operating s.s.b. does one appreciate how many stations are ill equipped to take advantage of stable, narrow band transmissions. Broad i.f.'s, tunable converter oscillators and even unstable i.f. receivers are much more prevalent than one appreciates when working A3.

I think that the most satisfactory solution to 2m operation to suit present conditions and to allow progress would be to allocate 144-145 Mc/s (or 145-146 Mc/s if shared band considerations demand it) to a Band Plan as we understand it today. The other megacycle could then accommodate more modern techniques: common channel operation—A1, A3 or A3a, voice control or push-to-talk instead of monologues, space communications, RTTY, slow scan TV, meteor scatter, use of specially licensed 1 kW transmitters.

If anyone complains that 1 Mc/s is too narrow for U.K. occupancy under a Band Plan let him look to his receiver bandwidth and overload characteristics. With modern techniques 1 Mc/s is wide enough for everyone active on the band at present and for many years to come. We would also need less 200 per cent modulation to live with such a proposal.

What about it fellows? Ray Hills asks " Co-operation or Chaos? " I ask " Progress or Stagnation? "

Yours faithfully,
GORDON S. BRACEWELL, B.SC., A.M.I.E.E. (G3EGK)
Hale, Cheshire.

DEAR SIR,—For some years now we have been constantly exhorted to build stable v.f.o.s and to use them to the full to help reduce the amount of QRM on our bands. On following this excellent advice to great success, we find that the ideas of the day have changed: the advice now is not to use v.f.o. tactics as they are likely to cause " Chaos " (*Current Comment*, May, 1963).

As a low-frequency addict recently converted to v.h.f., I fail to see how anybody can possibly conceive " chaos " on a band which is *two thousand kilocycles* wide. As more and more people take to v.h.f., and the gaps between QSOs become not quite so vast as they are at present, it is going to be more and more difficult to find a station replying to a call because of the necessary time delay in searching each signal to decide whether or not it is valid. Replies in accordance with the Band Plan already need to be as much as seven or eight times as long as zero-beat calls to ensure success, especially for a station on the wrong end of the receiving " sweep." Further, when the contact is in course the two stations are intermittently occupying two frequencies, whereas a netted QSO only uses one channel. So, contacts take up more room, more time—hardly the way to decrease QRM and prevent " chaos."

By all means let stations originating a contact call in accordance with the Band Plan, but there should be no restriction, especially not a false moral one, placed on the replying station. Under the Plan, it is the correct efficient operator with a quick changeover system who is attacked on all sides as " not playing the game " or as " selfish " (heard on 2m recently). I suggest the BULLETIN editorials should not be used to support these strange and reactionary sentiments, and would welcome the views of other members on this controversial subject.

Yours sincerely,
R. L. DILWORTH (G3NWD)
Beckenham, Kent.

DEAR SIR,—Anyone who has always observed the Two Metre Band Plan must have some doubts raised in his mind by the *Current Comment* in the May issue.

The words used appear, as in the political sphere, to be for effect rather than fact.

One must ask, what pleasure and benefits has the ordinary band user enjoyed, because of the Plan?

What is the nature of the chaos with which we are threatened if we don't keep to the Plan?

Who is able to claim that the Band Plan has secured them " survival " against the " strongest "?

Have members observed the Plan because it is the " done thing " and not asked why? Have the past 14 years produced an unquestioning habit rather than the intelligent enquiry?

Have the allocated frequencies any relationship to the density of band users in any particular Zone?

The household scouring powder suggestion is based on a myth—what use would it have been in this Zone for the regular users, during the First Portable Contest? Coming from the crystal grinding age I would warn any hopeful of being too optimistic.

Haven't we been given to understand that the present plan is restrictive on amateurs for the benefit of other users of the band?

Is the Plan kept alive only for those " on the blower " for the rather rare occasions when DX appears?

If the Band Plan has any real uses for contestants, then it could be written into the rules to apply on the relatively few days in the year and not be a permanent institution as it is now.

Enough questions have been stated here to encourage thought on the Plan—no doubt many not now raised will occur to the reader: the present chaos is in question.

Yours faithfully,
W. H. MATTHEWS (G2CD)
Seven Kings, Essex.

## Is " Bulletin " Outmoded?

DEAR SIR,—*Webster's New International Dictionary of the English Language* gives two meanings of the word " bulletin." One is substantially that quoted by G6JP. The other definition runs as follows: " A periodical publication, esp. one containing the proceedings of a society." What more fitting description could be applied to our journal? " *Webster* " is of course an authoritative work of reference.

" *The Bull* " has been an affectionate abbreviation for many years; it is hoped that there will be no change of title.

Yours faithfully,

A. E. J. COOPER (G5VT)

Bishop's Stortford.

## Radio Amateurs' Examination

DEAR SIR,—I heartily agree with the letter from G5UH (in the May issue) and all that is done in this locality for the intending amateur.

I would like here to appeal to all those intending amateurs who have in the past asked for courses, to enrol and attend them. No more excuses, please, such as " Oh, that night it's my so and so club night." If you really want a licence you can get one with, in this locality, plenty of assistance.

Yours faithfully,

B. BOOTH (G3NXU)

Keynsham, Bristol.

## Courtesy and Good Operating

DEAR SIR,—One reads a lot about what is or is not Amateur Radio and of intolerance to others activities, modes, expeditions, contests and commercial gear. We do not hear much these days about courtesy and good operating.

What does a newcomer hear when he first tunes our bands?

599 OM PSE UR NAME ES QTH AGN, a DX station trying to enjoy a decent QSO under appallingly bad mannered QRM, the rubber stamp QSO and QSL worship. If he is very lucky he may hear the rare QSO between stations with clean efficient signals exchanging news and views with good humour thrown in.

May I suggest that we hear more of the famous " ham spirit " in the BULL and some honest reporting and good manners on the air.

Yours sincerely,

RON SKELTON (VS4RS/G3IHP)

Sibu, Sarawak.

## QSL'ing

DEAR SIR,—May I as an old timer constantly active on the amateur bands be permitted to add a few words to this interesting subject.

I enjoy my hobby of communicating with my fellow men in different parts of the world. I enjoy chasing new countries and rare prefixes, and I like getting QSL cards from them, if they will send them to me. I collect awards and postage stamps and as a fisherman fishes for fish, so also do I fish for the rare ones and also for their QSL's. This is fun and good sport; there is no need to get mad at anyone. I find that the majority of amateurs do QSL and some countries have QSL'd 100 per cent. British amateurs often QSL as high as 70 per cent. and Russians and Germans are higher than that. I have no complaints against my fellow amateur. Of 282 countries worked I have 280 confirmed. The others are probably phoneys, otherwise they would QSL too.

Some amateurs expect to get a card via the Bureaux in a few months, but the truth is that some cards take three to five *years* to trickle through. Some of the Eastern Europeans and South American countries are particularly slow.

It takes all types to make the world of Amateur Radio, and I have found over a long innings that the majority are glad to send a card without I.R.C.'s or dollar bills. Some even admit over the air that they do not QSL, which is an honest approach. We are not compelled by any amateur law to QSL, but I think it is in the best traditions of the hobby to do so, and I want to be found friendly to my fellow amateur. Why not? Some of the SWL's behind the iron curtain get a tremendous thrill from getting cards and it is a way to them getting a full licence. Some of the Russian club stations have many operators and each desires his personal card. It doesn't cost me much in time or money to do this international act of friendliness. If someone tells me they have not received my card because it was lost on the way, I hasten to send them another. There may not be much in it, but neither is there in an air cushion.

I think the R.S.G.B. QSL Bureau has always been the perfect pattern, and is run with selfless efficiency. May it long continue under the able leadership of my old timer friend G2MI.

With 73 and no grumbles,

HAM WHYTE (VE3BWY ex-G6WY)

Toronto, Canada.

## Technical Standard

DEAR SIR,—Letters recently published on " Is It Still Amateur Radio? " and the technical standard of the BULLETIN seem to have ignored the original issues. Surely, the criterion in the Amateur versus Non-Amateur Radio argument is the standard of signal radiated. I would far rather hear a well-keyed T9 signal coming from a commercial transmitter than a chirpy, T7 one, with clicks, emanating from one which the " owner-driver " proudly proclaims to all and sundry as " home-brew." And there are plenty of these to be heard on the air!

Regarding the technicality of the BULLETIN I would just say that a B.Sc. can, if he so chooses, always appreciate the humorous, or simpler technical article, but that one needs to be a B.Sc. to understand some of those which confront us at present. Let us not fall into the way of thinking, all too common today, that the only worthwhile aspects of Amateur Radio are DX and highly technical articles laced with complicated formulae.

No one has suggested dropping completely the technical side of the BULLETIN, or that we should fill our journal with frivolous trifles, but merely that a good balance between technical and non-technical (or " interest ") items should be maintained.

Finally, a word to those progressives who would discount the pre-war world of Amateur Radio. Our whole hobby, as we accept it today, stems from those times, so please bear in mind the fact that the world did not start in 1945!

Yours faithfully,

F. ALLEN HERRIDGE (G3IDG) (*Life Member*)

Basingstoke, Hants.

## More on Bottom Band

DEAR SIR,—I read with interest the article by Mr. Smith (G3MTI) on Bottom Band (April 1963, issue). I would like to suggest two modifications to the equipment described in that article, one complicating and the other simplifying the system. I used both of these systems several years ago.

(a) The receiver pre-amplifier, which Mr. Smith is seen holding in the photo in his article, can be used to give a very narrow beamwidth if used in the " back-to-front " mode and matched into the transmitter output.

(b) Instead of using the untuned cavity suggested by Mr. Smith I would advise the use of a parabolic reflector with the emitter placed at the focal point—in fact, an old motor headlamp will do admirably. This system shows a considerable increase in forward gain over the original and there is no need for the beaming lens.

The three following comments are worthy of note:

(i) At such high frequencies the antenna front-to-back ratio can be made infinite.

(ii) If operation is restricted to mid-band greater range can be achieved in conditions of high humidity.

(iii) I would advise that slow Morse be used on summer nights when working DX across country otherwise the " shimmer effect " will cause undue interference with signals.

Yours faithfully,

JIM T. LEVISTON (G3NFB)

Letchworth, Herts.

DEAR SIR,—I am extremely interested in the article by G3MTI " Getting Going on Bottom Band " as I did this as a schoolboy (circa 1920) with the help of similar young neighbours in London.

We found that we could transmit receivable signals on the 400,000-750,000 Gc/s band with apparatus considerably less refined than that described, by the use of a valve with a high voltage filament (240 volts) of the coiled coil variety. We found that the older variety of carbon filament valve produced signals at the l.f. end of the band which were less distinguishable from solar noise during daylight hours.

The cavity had a built-in intensifying screen composed of two transparent ceramic lenses in series which had been removed from a child's epidiascope. It was placed *in front* of the valve filament and it was found that the director/driven element distance was critical if best daylight results were to be obtained.

In view of the high voltage, keying was effected by a mains

toggle switch in the interests of safety, and this inevitably reduced the speed of transmission of c.w.

At night, with the absence of solar noise on this band, the signals could be read at a considerable distance though we Londoners had not the facilities to test this to the limit.

At the turn of the century, it will be recalled, much use was made by military organizations of solar noise itself during bright sunlight to transmit c.w. by means of a reflector-director combination, the former being of plane transparent ceramic making use of a thin layer of deposited silver on its back, or posterior, side. This was screened from the atmosphere by paint or dope and was found to be superior to copper especially at the h.f. end of the band. The director was a similar plane reflector and the beam was directed on the receiver by peering through a hole in the centre of the reflector. The c.w. was effected by tilting the reflector through a few degrees for the spacer and back for the marker signal.

Although the use of solar noise meant that the whole band was utilized for the transmission, interference was obviated by the very narrow beam which was transmitted.

It will be seen that this combination is " driven reflector director " and so is somewhat unusual by modern standards.

Another method on this band, originated by Aldis, was a reflector driven element combination not unlike G3MTI's cavity apparatus, except that the filament heater was directly interrupted by the key and no use was made of his relay circuit. The reflector was silvered concave ceramic and there was an aperture-type of sight mounted on the cavity for directing the beam visually.

G3MTI is to be congratulated on directing our attention to this interesting mode for the transmission of intelligence, and, while he is not the first in this field, his modern apparatus will, I feel sure, encourage many to get going on the band.

Yours faithfully,
T. R. STEVENS (G3DUQ)

Dorchester, Dorset.

DEAR SIR,—We were most interested in the account of " Bottom Band " operation by G3MTI, because we used this band as a part of our exhibit in the Worksop Rotary Club Hobbies Exhibition (GB3RCW) last year. As the display was intended for the general public, however, we used a.m./f.m. instead of c.w. and f.s.k., as the author suggests. By using a detector with response higher in frequency than the carrier, slope detection can make use of the f.m. component. We found it an advantage to use a 30 cm. length (not critical) of circular waveguide in the input to the detector, which appreciably cuts down the QRM from solar noise. The detector was followed by a cascaded pair of OC71's and fed to both a loudspeaker and a monitoring oscilloscope.

Atmospheric attenuation can be reduced considerably by working well outside the lower edge of the band quoted, and for once, in a way, there is no legal objection to this. Our first attempts at this were made by reducing the transmitter heater voltage, but this too readily leads to overmodulation, with considerable distortion at the receiver. A better plan is to use a half-lattice filter of the type used in the ruby laser.

The exhibit was received with enthusiasm by schoolboys and Rotarians alike, after which the acclaim of G3MTI does not surprise us.

Yours sincerely,
H. S. CHADWICK (G8ON)
M. DANN (G3NHE)

Worksop, Notts.

DEAR SIR,—Many members will have read with enjoyment the article on this band by Mr. Smith in the April issue. It is a little unfortunate, however, that the space available did not allow the author to deal more fully with the historical aspect, and with long range, high power transmission. There was also no mention of solar powered equipment. Some of the omissions are no doubt due to the fact that the experiments described were carried out in the U.K., an area which does not give results comparable with those obtained in tropical areas where propagation paths are considerably easier.

If I may quote from personal experience, during the last war I several times established night-time communication with a station hidden by the curvature of the earth. This was achieved by using the low reflecting layer mentioned by Mr. Smith, and took place at the mouth of the Persian Gulf. My own equipment consisted of a filament lamp and 10 in. reflector, and the other station is believed to have used a QRO equipment consisting of an arc transmitter with a 6 ft. reflector. Both stations used f.s.k. which was achieved by means of an arrangement resembling a Venetian blind. Many other transmissions over such ranges are on record.

As far as solar powered equipment is concerned, this was in common use for long range civil and military communication during the last century, particularly in India and the Sudan. It was also successfully used in North America during the final campaign against the Apache Indians. One station of this type was still in use at Abadan as late as 1944 although owing to bad beam alignment and a poor receiver, communication with this particular station was always difficult. There were those who claimed that the operator was a direct descendant of the Mad Mullah, but this has never been proved. As a point of interest, a bottom band operator called Aldis produced a battery powered version of the original solar type apparatus which still gives very satisfactory service. Ranges of up to two miles in bright sunlight are commonly achieved with this model.

In conclusion, one must in fairness mention the early North American pulse transmissions on this band. While signalling rates were slow, very good ranges were obtained and the apparatus was very simple. It consisted of a wood fire and a blanket.

Yours faithfully,
A. D. TAYLOR (GW8PG).

Greasby, Upton, Wirral.

(This correspondence is now closed.—*Editor.*)

# NEW BOOKS

**WIRELESS AND ELECTRICAL TRADER YEAR BOOK:** Radio, Television and Electrical Appliances 1963. 34th Edition. Published by Iliffe Books Ltd. Price 21s. (postage 1s. 6d.). Size 8½ in. × 5¾ in. 444 pages.

This *Year Book*, which was first published in 1925, has become a most important reference book to the radio and electrical industries. It is the standard guide for all connected with sales or services, and of great assistance to overseas buyers wanting to contact British sources of supply. The Technical Literature section gives brief reviews of approximately 250 books on radio and television.

One of the principal aims of the *Year Book* is to assist traders to keep abreast of the constant changes in names, addresses, telephone numbers and products of the firms engaged in the radio and electrical industries. Since the 1962 edition was published over 300 changes of address and telephone number have been recorded and more than 200 firms are included for the first time.

## FOR THE AMATEUR STATION

**BRITISH ISLES TWO METRE BAND PLAN MAP.** A reprint on stiff card of the map published in the February, 1963, issue of the R.S.G.B. BULLETIN. Details are also given of the 70cm Zones. **Price 6d. post paid.**

**QRA LOCATOR MAP.** Outline map of the British Isles superimposed with the QRA Locator grid. **Price 2s. 6d. post paid in stout tube.**

**R.S.G.B. COUNTRIES LIST.** Duplicated list of call-sign prefixes in alphabetical order. Also contains list of call areas in each of the 40 Zones. **Price 9d. post paid.**

**WEBB'S RADIO LOG BOOK.** Inexpensive paper-backed log book conforming with G.P.O. requirements. **Price 6s. post paid.**

**PANEL-SIGNS.** Transfers for neatly lettering home-built equipment. Set No. 1 for receivers and amplifiers, Set No. 2 for test equipment, Set No. 3 (white lettering) for receivers, amplifiers, transmitters, test equipment, Set No. 4 as Set No. 3 but black lettering. Published by Data Publications Ltd. Price **4s. per set post paid.**

**R.S.G.B. Publications (Dept. B),**
**28 Little Russell Street, London, W.C.1.**

# R.A.E.N. Notes and News

**BY E. ARNOLD MATTHEWS (G3FZW)***

A MEETING was recently held at B.R.C.S. Headquarters in **Bedford** to discuss the possibility of forming a group in the district. About a dozen amateurs attended, including G4SC, G4OL, G2DVQ and G3CWV. The Buckinghamshire C.C., G3HUI, addressed the meeting, and G4SC is now enrolling members preparatory to the formal inception of a group. Society members and others wishing to join may contact G4SC at 52 Waterloo Road,

**G. A. Allcock, G3ION, County Controller for Hampshire and Chairman of the R.A.E.N. Committee, filling the Raynet Trophy with champagne at a meeting celebrating its award to the Hampshire R.A.E.N. Group.**

Bedford. We are sure that the county B.R.C.S. will welcome this development since they have been most anxious to make use of R.A.E.N. services for some years.

### Group Activity

Following the comment made in the April issue we learned that the **Cheshire** Group have acquired, through the good offices of G2AMV, the whole of the Mersey Docks and Harbour Board surplus radio equipment. This included 40 watt base stations, 10 watt transportable sets and ¾ watt transceivers totalling very nearly 100 stations! It has been disposed of to Cheshire members and to members of Wirral A.R.S. The equipment is readily modified for 144 Mc/s and several of the sets have been on the air in that band for three months.

The **Wirral** group held a very successful exercise on April 16, with the newly-appointed A.C., G2FOS, in control. Further exercises, using 1·8 Mc/s mobiles and 144 Mc/s for fixed and portable stations are planned.

The C.C. for **Cornwall**, G2AYQ, reports the group quietly active, with nets on 1·8, 3·5, 21, and 144 Mc/s, which should give the requisite flexibility for the county's difficult terrain. There are six mobiles, G3AET, G3XC and G3BHW on 1·8 Mc/s and G3OJY, G3CZZ and G3OCB on 144 Mc/s.

* *1 Shortbutts Lane, Lichfield, Staffs.*

The Group also has some 1 watt portable gear. There are links with other counties via South Wales (GW3LXI and GW2OP) and G4IV has a c.w. link into Dorset. **Hampshire** Group recently held a meeting during which the members celebrated the award of the Raynet Trophy. The cup itself was put to practical use as a means of dispensing champagne!

With the approval of Council, the Committee has decided that the **Grimsby** area shall be constituted as an independent group separate from **Lincolnshire** County Group.

### East Midlands R.A.E.N. Meeting

A meeting of East Midlands R.A.E.N. members will be held at North Hykeham, Lincolnshire on September 15. The place and date will coincide with the Lincoln Hamfest.

### Personnel

*Change of Address:* The Honorary Registrations Secretary, F. C. P. Flanner, G3AVE, has moved to 40 Parkhouse Drive, Birmingham 23.

*Appointments:* W. J. Perkins, G3PFL, has been appointed County Controller, Essex. The following have been appointed Area Controllers: D. A. Bemister, G3OBX (South Essex); K. Birch, G2FOS (Wirral).

*Resignations:* T. H. Felton, G2ATS, has resigned the office of C.C., Lincolnshire.

*Correction:* The reference in the April BULLETIN to the appointment of E. C. W. Beale, G4HZ, should be deleted.

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**Single Sideband** **(Continued from page 660)**

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minimum. The resonating discs are driven by magnetostrictive transducers employing polarized biasing magnets; for this reason it is not permissible to have any d.c. at all flowing through the coil and shunt feed to the valve anode is essential. The two transducer coils are identical, are isolated from the case, and are balanced to earth—therefore either coil may be arbitrarily designated as input or output and the filter can be coupled to the two anodes of a balanced modulator, or may be used to feed the two grids of a following balanced converter.

Installation is simple but it is important to provide screening between the input and output connections (a small cross screen underneath the chassis) and the filter case must be earthed. Drive level should be kept below 2 volts r.m.s. For best performance the input and output transducer coils should be carefully resonated at the filter's centre frequency. The two basic circuits (a) filter following a high impedance load such as the converter valve in a receiver, and (b) following a low impedance load such as the modulator in a transmitter, are shown in Fig. 3.

In regard to positioning the carrier crystal frequency this is usually stated by the manufacturer. If it is not, the best procedure is to use a BC221 frequency meter as a variable carrier oscillator and get reports from other stations until the best balance of audio quality is obtained. The frequency is then obtained from the dial reading of the BC221 and a crystal ordered from a BULLETIN advertiser, stipulating that the crystal is required for oscillation on the parallel resonant mode with 30 pF shunt capacity—or alternatively an FT241 crystal is edge ground or plated so that it oscillates *in situ* on the required frequency. The correct position will usually be found to be 20 to 30db down the skirt response; however, the narrower the filter the more critical the positioning becomes. Usually practical experiment is preferable to an arbitrary selection.

# Regional and Club News

**A.E.R.E. (Harwell) Amateur Radio Club.**—Recent events have included a talk on TVI by G.P.O. engineers and participation, fairly successfully, in the first 144 Mc/s Portable Contest under the club call G3PIA. Meetings are held regularly at the Social Club, A.E.R.E., on the third Tuesday of each month. *Hon. Secretary:* C. Sharpe (G2HIF), 20 Harcourt Road, Wantage, Berkshire.

**Basingstoke Amateur Radio Club.**—With twelve stations active on 2m, a v.h.f. club net is now held every Friday evening at 8 p.m. More participants are, however, being sought. During the Basingstoke Carnival Week from July 6 to 13, the club will be operating GB3BCW on the h.f. bands and on 2m. *Hon. Secretary:* P. Jackson, 11 Oaklands Way, Basingstoke, Hants.

**Bridlington and District Radio Society.**—The former chairman J. H. Jones (G3GBH), reports that owing to lack of support, it was decided at the recent A.G.M. to wind up the society forthwith. In view of this, the Mobile Rally and Hamfest scheduled for June 23 have been cancelled.

**Bristol Group.**—The meeting held at the Royal Fort, University of Bristol, on Friday, April 26, was attended by 50 members and visitors. A talk on transistors was given by R. Griffin (G5UH), Regional Representative, and was illustrated with several items of equipment made specially for the occasion. A transistorized closed-circuit television system was in use throughout the evening. *Hon. Secretary:* E. C. Halliday (G3JMY), 4 Parkside Avenue, Winterbourne, Bristol.

**Cambridge and District Amateur Radio Club.**—Two recent events attracted good attendances. On April 14 a sale of surplus equipment was held, at which members of the Shefford and Peterborough clubs were present. On May 3, Fred Parker (G3FUR) promoted a lively discussion on the R.S.G.B. which lasted so long that a second lecture on Communication Receivers had to be postponed. *Hon. Secretary:* H. L. Lowe (G3PEI), 34a Verulam Way, Cambridge.

**Cornish Radio and Television Club.**—The meeting on May 2 attracted a good attendance. The subjects discussed included N.F.D. and the recent Affiliated Societies' Contest. The rules of the Cornish Award were also amended to include listeners and licensed amateurs resident in the county of Cornwall. G3EHT concluded the meeting with a film show. The R.A.E.N. net will, in the future, be on 1·8 Mc/s on Mondays at 8.30 p.m. The subject for discussion at the meeting on June 6 will again be N.F.D. *Hon. Secretary:* W. J. Gilbert, 7 Poltair Road, Penryn, Cornwall.

**At the Annual Dinner of the Torbay Amateur Radio Society held at the Abbey Lawn Hotel, Torquay, on March 2, 1963: (back row, left to right) B. Symons, G3LKJ (A.S.R. and P.R.O.), D. Morris, G3REW, L. Webber, G3GDW (Vice-President), E. J. Hayman, G3ABU (Chairman), D. Webber, G3LHJ (Contest Manager and Vice-Chairman), R. Pavey, G3PXM, H. Cockrem, G3ZC (Honorary Treasurer) and R. Western; (front row, seated, left to right) F. Wadman, G2GK (Vice-President), Mrs. G. Western, G3NQD (Honorary Secretary) and W. Sydenham, G5SY (President).**

**Clifton Amateur Radio Society (G3GHN).**—Some slides of historical G.P.O. equipment were a particularly interesting feature of a talk by C. E. Godsmark (G3IWL), on April 19. A nocturnal D/F outing is planned for the night of June 22-23, and further D/F and transmitting field days will take place on July 14, August 11, 25, September 14-15 and 22. *Hon. Secretary:* C. E. Godsmark (G3IWL), 211 Manwood Road, London, S.E.4.

**Crawley Amateur Radio Club.**—Preparations for the club's entry in N.F.D. and for the V.H.F. event later in the year, are both well in hand. There has been much s.s.b. and v.h.f. constructional activity amongst members recently, and it is hoped that some of the results will be on show at the Members' Evening on June 26, at the West Green Centre, at 8 p.m. At this meeting will be a second showing of the film " Spurious Emissions." The Chairman, J. C. Graham (G3TR) is now a member of the Council of the R.S.G.B. *Hon. Secretary:* R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley, Sussex.

**Crystal Palace and District Radio Club.**—The final round of the quiz contest with Clifton resulted in a win by a very small margin for Crystal Palace, the scores being 279 to 258 respectively. As a result of the success of a recent informal discussion another similar meeting will again be held on July 20. On June 15 there will be a sale of surplus equipment; and on August 17 M. C. Pavely (G3GWD) will lecture on " Electric Colour Separation." Meetings commence at 8 p.m., and are held at the C.D. Training Centre, Bromley Road, Catford. *Hon. Secretary:* G. M. C. Stone (G3FZL), 10 Liphook Crescent, London, S.E.23.

**Cray Valley Radio Society.**—There was an attendance of 42 at April meeting to hear Bill Sutton (G3FWI) present his second " Audio Evening." Various interesting tape recordings were played, and G3FWI subsequently described the methods he used to record them. *Hon. Secretary:* S. J. Coursey (G3JJC), 49 Dulverton Road, London, S.E.9.

**East Worcestershire Group.**—On June 13, short talks entitled " The Other Man's Station " will be given by members. All meetings will in future be held at the Old Peoples' Centre, Park Road, Redditch, on the second Thursday of each month at 8 p.m. *Hon. Secretary:* L. Hickingbotham (G3HZH), 95 Oakenshaw Road, Redditch, Worcs.

**Grafton Radio Society (G3AFT).**—The society's annual Field Day will be held on Sunday, June 16, at Tumulus Field, Hampstead Heath. It is hoped to have GB3AFT operational on most bands. *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

**Halifax and District Amateur Radio Society.**—Mr. B. Crisp addressed a meeting on May 7 on the subject of " Working Mobile " and promoted considerable discussion. On July 2, Mr. Ingham (G3RMQ) will describe his " First Six Months on the Air." Meetings take place on the first Tuesday of each month at the Beehive and Crosskeys Inn, commencing at 7.30 p.m.

**Midland Radio Contest Club.**—The club has been formed particularly to take part in all contests and has recently launched a construction project for electronic keyers. The club has its own club room and call-sign, G3RSR. *Hon. Secretary:* J. Lockyer (G3OVA), 153 Ivor Road, Birmingham, 11.

**Mid-Lanark.**—The meeting of the Mid-Lanark R.S.G.B. Group held in the Carfin Hall, Motherwell, on April 19, took the form of a Visitors' Night, which was extremely well attended. In all, 80 members were present. All of the groups in Central Scotland were represented, and much time was spent in ragchewing. " Auld Acquaintances " were renewed, and numerous new friendships made. The Regional Representative, D. Macadie (GM6MD), had the opportunity to meet and talk with members of his own area as well as those from Region 13. The club transmitter, GM3PXK, was on the air as a talk-in station, and proved invaluable in directing visitors to Carfin Hall with the minimum of time and trouble. After tea, which was supplied by members' wives, a most interesting address was given by J. Jeffrey (GM2DI), dealing with both commercial and Amateur Radio in retrospect. Mr. Jeffrey displayed many appropriate photographs, which

drew much comment from the audience. The meeting was voted a great success, and may well set a pattern for the future in Scotland.

**Northern Heights Amateur Radio Society.**—The A.G.M. was held recently, and the following were elected: *Chairman*—W. Childs (G3RFV); *Hon. Secretary/Treasurer*—A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax; *Minutes Secretary:* Mrs. M. I. Shaw (G3OMM). An increase in membership during the past year was reported at the meeting. The remainder of the evening was devoted to a discussion of the Amateur (Sound) Licence for those taking the R.A.E. On June 12, there will be a sale of the late G2SU's equipment; on June 19 a ragchew is scheduled; members will visit the Ellend Power Station on July 3. The first of four demonstration stations will be manned by members on June 15 at the Halifax Charity Gala, under the call G3MDW/A.

**Peterborough Amateur Radio Society.**—Norman Chapman, assisted by R. Harrop and K. Sparrow, gave a practical demonstration of the alignment of communications and TV receivers at the April meeting. C. J. Guscott (G3HXR) gave a practical demonstration of 2m operation on May 3. *Hon. Secretary:* D. Byrne (G3KPO), Jersey House, Eye, Peterborough.

**Plymouth Radio Club.**—The A.G.M. was held on May 7, and the following officers were elected: *President:* H. Jones (G5ZT); *Vice-Presidents:* E. Diggle (G3LSD) and L. J. N. Kirkby (G3BRJ); *Chairman:* E. Fallon; *Hon. Secretary and Vice-Chairman:* R. Hooper (B.R.S.22861), 2 Chestnut Road, Peverell, Plymouth, Devon; *Assistant Hon. Secretary:* B. Curnon (A.2340) *Hon. Treasurer:* N. Leworthy; *Assistant Hon. Treasurer:* K. Pengelly. It was reported that, in view of the club's financial position, efforts will be made to acquire a transmitter for the club station. Future events include a talk on aerials by Bob Ellis (G3SN), and a visit to the City of Plymouth Power Station.

**Reading Amateur Radio Society.**—Rowley Shears (G8KW) of K.W. Electronics Ltd., will describe the K.W. range of amateur equipment at a meeting to be held on June 29 at the Palmer Hall, West Street, commencing at 7.15 p.m. It is hoped to arrange an R.A.E. course and those interested are asked to write to the *Hon. Secretary:* R. G. Nash (G3EJA), 9 Holybrook Road, Reading.

**Reigate Amateur Transmitting Society.**—The April meeting included short talks by C. Cowan (G3NKS) and G. E. Mac'Krell (G3KAX). K. J. Wheatley (G3BBR) played some tape recordings of QSOs with G3NKS/M, G3PWW/M and G3RAE/M. The annual junk sale will be held at 7.30 p.m. on June 15 at the clubroom at The Tower, Redhill. An exhibition station (G3REI/A) will be active on 160 and 2m on June 22 during the Reigate Centenary Carnival and Fête at the Sports Ground, Redhill. *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill, Surrey.

**Royal Naval Amateur Radio Society.**—A new design for the society badge has recently been approved by the committee. The cost will be 5/- post free to new members, or 4/6 on the return of old badges. The range of QSL cards is being extended to include pictures of a cruiser, an aircraft carrier and a guided missile destroyer. Further information may be obtained from the *Hon. Secretary*, Royal Naval Amateur Radio Society, *H.M.S. Mercury*, Leydene, Petersfield, Hants.

**Southampton Group.**—The group will be operating GB3SS on all the h.f. bands and on 2m at the Great Southampton Show on July 12 and 13. Visiting mobiles will be particularly welcome on the Saturday, when talk-in stations will be operating on 160 and 2m.

**South Dorset Radio Society.**—The A.G.M. was held in April, and the following were elected: *President*—T. R. Stevens (G3DUQ); *Chairman*—W. Burden (G3EAT); *Hon. Secretary*—C. E. Biggs (G2TZ), 54 Prince of Wales Road, Dorchester, Dorset; *Hon. Treasurer*—M. Box; *Committee Members:* G. Short (G2DGB) and T. Hughes (B.R.S.23052). Thanks were extended to the retiring Chairman, P. Dean (G3FNT), for his services to the society. The society's future programme was also discussed.

**South Yorkshire Amateur Radio Society.**—The usual arrangement of weekly formal meetings has been altered to fortnightly formal meetings alternating with fortnightly operational and constructional evenings. All the evening events are held on Thursdays at 8 p.m. at the Lord Nelson Public House, Cleveland Street, Doncaster. Future outings include a visit to the Holme Moss TV Station on June 20. *Hon. Secretary:* V. J. Ludlow (G3JLZ), 50 Wellington Road, Lindholme, Hatfield, Doncaster, Yorks.

**Spen Valley Amateur Radio Society.**—The society's annual dinner was held on April 27 at the Batley Park Cafe. An attendance of 66 members and friends was recorded. Mr. Gardner of Mullard Ltd. was the guest speaker, and he related some of his experiences during his long association with radio. Some coloured slides of Switzerland were also shown during the evening by Jack Bateman (G6BX), and these were much appreciated by all present. The Swindon Cup, for outstanding services to the society, was presented to J. Buckley (G3NAO). *Hon. Secretary:* L. A. Metcalfe, la Moorlands Road, Birkenshaw, near Bradford.

**Stoke-on-Trent.**—During the period April 25 to 27, groups in and around Stoke-on-Trent joined forces to operate GB3RIW at the Newcastle-under-Lyme " Festival of Leisure " organized by the Rotary and Inner Wheel clubs. Members of the Stoke-on-Trent A.R.S., Burslem A.R.S., University of Keele R.S. and Stoke-on-Trent R.S.G.B. Group took part. The majority of the contacts were relatively local, but a large number of QSOs were exchanged. Two h.f. transmitters were in use. The s.s.b. station, using G3LLJ's G2DAF-type transmitter, made the most contacts.

**Stourbridge and District Radio Society.**—At Foley College, Stourbridge, on May 7, members and visitors heard the R.S.G.B. recorded lecture on " Semiconductors." Arrangements were discussed for the society's participation in an exhibition to be held at the Town Hall, Stourbridge, between 2 and 9 p.m. on June 12 to 15. Admission will be free. A station will also be active in Mary Stevens Park on June 15. *Hon. Secretary:* R. A. G. MacIntosh (B.R.S.20894), 50 Field Lane, Oldswinford, Stourbridge, Worcestershire.

**Surrey Radio Contact Club.**—At the meeting on June 11 at the Blacksmith's Arms, South End, Croydon, G. Snashall, B.Sc., of Mullard Ltd., will give a talk on " Recent Developments in Transmitting Valves." A Motor Rally and Treasure Hunt will take place on June 26. The July meeting, the 250th, will be informal, and it is hoped that some founder members and many past members will attend. A short talk on " Australian Amateur Radio " will be given at this meeting by David Wardlaw, VK3ADW/G3RYW. *Hon. Secretary:* S. A. Morley (G3FWR), 22 Old Farleigh Road, Selsdon, Surrey.

**Torbay Amateur Radio Society.**—The June meeting will be held on June 15, and not on the second Saturday of the month as is usual. This is to avoid a clash with N.F.D.

**Verulam (St. Albans) Amateur Radio Club.**—The April meeting attracted 25 members, who discussed preparations for N.F.D. and V.H.F. N.F.D. The club meets regularly on the third Wednesday in each month at the Service Division, Headley Road, Fleetville, St. Albans. Further details may be obtained from the *Hon. Secretary:* B. Cockell, 119 Gurney Court Road, St. Albans, Herts.

**West Kent Amateur Radio Society.**—At the A.G.M. held on April 5, the following were elected: *President*—W. H. Allen, M.B.E. (G2UJ); *Senior Vice-President*—L. S. King (G4IB); *Junior Vice-President*—R. Delves; *Hon. Secretary*—H. F. Richards; *Hon. Treasurer*—W. Dobson; *Editor of QLF*—R. Trevitt; *Assistant Editor*—P. Welton; *Competition Secretary*—D. Colwell.

**Wirral Amateur Radio Society.**—The Constructional Contest held on April 17 was won by R. Blain (G3NTI) with a 160/80m


## BACK ISSUES AVAILABLE

At the time of going to press **only** the following back issues of the BULLETIN were available:

| | |
|---|---|
| 1955 | May |
| 1958 | October |
| 1959 | March, June and December. |
| 1960 | November and December. |
| 1961 | January, February, March, April, May, June, July, August, September, October, November and December. |
| 1962 | January, February, March, April, May, June, July, October, November and December. |
| 1963 | January, February, May. |

Price **2/6** per copy. Five different issues (Headquarters' selection) **7/6**

*Prices include postage*

**R.S.G.B. PUBLICATIONS**

**28 Little Russell Street, London, W.C.1**

transmitter. Second and third prizes were both won by Peter Jones (G3PYU). The D/F Contest held on April 28 attracted a good turnout, and was won by L. Roberts and his team. A R.A.E.N. exercise on April 20 proved very instructive. The programme for forthcoming meetings includes an Open Night on June 5, and an N.F.D. " Inquest " on June 19. L. Flint (G3IIH), has offered to give a talk on " Metals " on July 3. *Hon. Secretary:* A. Seed (G3FOO), 31 Withert Avenue, Bebington, Wirral, Cheshire.

**Wolverhampton Amateur Radio Society.**—Following a successful run of operational stations at the annual Associated Sports Day of Messrs. H. M. Hobson, Marston Excelsior and Boulton Paul Aircraft Ltd., the society is expanding its activities this year by organising a mobile rally at the event. The Sports Day will take place at the Hobson Sports Ground on June 15. *Hon. Secretary:* J. Rickwood (G3JJR), 738 Stafford Road, Fordhouses, Wolverhampton.

**Wolverton District Radio Club.**—The club can make no complaints about lack of publicity, for it recently exhibited at a three-day hobbies exhibition, which attracted over 4,000 visitors. Stations were active on 160, 80, 20, and 2m. A further item of interest was a mock-up of last year's Bristol Trophy winning station, complete with tent. The R.R., L. W. Lewis (G8ML) visited the exhibition on the Saturday.

**EX-G Radio Club.**—The Canadian net is active regularly at approximately 16.00 G.M.T. on Sundays, and the club welcomes any U.K. stations who care to participate. The *Ex-G Bulletin* is available through H. J. Basterfield (G4MJ), 1 Manor Abbey Road, Quinton, Birmingham, 32. Applications for certificates are handled by C. K. Haswell (G2CWL), 114 The Hillway, Porchester, Fareham, Hants.

Closing date for July issue

**June 7**

# R.S.G.B. Slow Morse Practice Transmissions

**The following Slow Morse Practice transmissions are sponsored by the R.S.G.B. Alterations and additions to this list should be sent to Headquarters immediately.**

| Time | Call-sign | kc/s | Town |
|---|---|---|---|
| **Sundays** | | | |
| 09.30 | G3HNJ, G3OFP, G3OMJ | 1840 | Doncaster |
| 09.30 | G3KZZ | 1920 | South Shields, Co. Durham |
| 10.15 | G3CGD | 1875 | Cheltenham |
| 10.30 | G3NCZ | 1920 | Blackburn, Lancs. |
| 11.00 | G3GZE | 1840 | Blackburn |
| 11.00 | G2FXA | 1900 | Stockton-on-Tees |
| 11.00 | G3NXQ | 1850 | Warndon, Worcs. |
| 11.00 | GW3PCK, GW3PEX | 1850 | Cefncoed, Breconshire |
| 12.00 | GM3HBY | 1903 | Glasgow |
| 12.00 † | G3HVI, G3IVB, G3OGD | 1920 | Stoke-on-Trent |
| 12.00 | G3IGW, G3LHQ | 1900 | Halifax |
| 12.00 | GI5UR | 1860 | Belfast |
| **Mondays** | | | |
| 18.30 | G3NC | 1825 | Swindon |
| 18.30 | G3NCZ | 1920 | Blackburn, Lancs. |
| 19.00 | G3EEL | 1960 | Peterborough |
| 19.00 | G3KTP | 1850 | Heanor, Derby |
| 19.00 | G3MXS | 1915 | Wirral |
| 20.00 | G3GZE | 1840 | Blackburn |
| 20.00 | G3HJG | 1825 | Manchester |
| 20.00 | G3NIM | 1910 | Southampton |
| 20.30 | G3AGN | 1875 | Felixstowe |
| 20.30 | G3RQT | 1850 | Basildon, Essex |
| 21.30 | G3HZG | 1870 | Redditch, Worcs. |
| 21.30 † | G3IRM, G3MWO | 1981 | Bury St. Edmunds |
| 22.00 | G3PRM | 1916 | Alvaston, Derbys. |
| **Tuesdays** | | | |
| 18.00 | G3GZE | 1840 | Blackburn |
| 18.30 | G2FXA | 1900 | Stockton-on-Tees |
| 18.30 | G3REG | 1920 | Blackburn |
| 19.00 | G3ONB | 1850 | Kirkby-in-Ashfield |
| 19.00 | GW3BQY, GW5VX | 1918 | Port Talbot |
| 20.00 | G3NBV, G3PJI | 1910 | Southampton |
| 20.00 | G3NHR | 1900 | Hounslow |
| 20.30 | G3NKX | 1915 | Loughton |
| 20.30 | G3RQT | 1980 | Basildon, Essex |
| 21.00 | G3LSC, G3MKN, G3NUN | 1875 | Poole |
| 21.30 | G3HZG | 1870 | Redditch, Worcs. |
| 21.45 | G2UK | 1875 | Lowestoft |
| 22.00 † | G2CZU, G3LLM | 1820 | Bath |
| 22.00 | G3AWL | 1980 | Wingate, Co. Durham |
| 22.00 | G3HZM | 1925 | Manchester |
| 22.30 | G3KWH | 1900 | Welwyn Garden City |
| **Wednesdays** | | | |
| 19.00 | G8RQ | 1850 | Chesterfield |

| Time | Call-sign | kc/s | Town |
|---|---|---|---|
| **Wednesdays** | | | |
| 19.30 | G2BSQ | 1930 | Ashtead, Surrey |
| 19.30 | G3NQR | 1875 | Harrow Weald |
| 20.00 | G3KFE and G3FAU | 1980 | Stevenage |
| 20.00 | G3IBJ | 1910 | Southampton |
| 20.00 | G3GZE | 1840 | Blackburn |
| 20.30 | G3LCK | 1910 | Canterbury |
| 20.30 | G3KGU | 1920 | Theydon Bois, Essex |
| 21.00 † | G3HVI, G3IVB, G3OGD | 1920 | Stoke-on-Trent |
| 21.00 | G3LSC, G3MKN, G3MXF | 1875 | Poole |
| 21.00 | G3AGX | 1920 | Hull |
| 22.00 | | | |
| 21.30 | G3HNJ, G3OFP, G3OMJ | 1840 | Doncaster |
| 21.30 | G3HZG | 1870 | Redditch, Worcs. |
| 22.00 | G3NXQ | 1850 | Warndon, Worcs. |
| **Thursdays** | | | |
| 18.30 | G3NC | 1825 | Swindon |
| 19.00 | G3EEL | 1960 | Peterborough |
| 20.00 | G3KLT | 1838 | Birmingham |
| 20.00 | G3NBV | 1910 | Southampton |
| 20.00 | G3NHR | 1900 | Hounslow |
| 20.00 | G5XB | 1890 | Reading |
| 21.15 | G3LGK | 1916 | Ilkeston, Derbys. |
| 21.30 | G3HZG | 1870 | Redditch, Worcs. |
| 21.30 † | G3IRM, G3MWO | 1981 | Bury St. Edmunds |
| 22.00 † | G2CZU, G3LLM | 1820 | Bath |
| 22.00 | G3AWL | 1980 | Wingate, Co. Durham |
| 22.30 | G3KWH | 1900 | Welwyn Garden City |
| **Fridays** | | | |
| 18.30 | G3DMN, G3FVP | 1880 | Ipswich |
| 18.30 | G3NCZ | 1920 | Blackburn, Lancs. |
| 19.00 | G3PGS | 1850 | Kimberley, Notts. |
| 20.00 | G2BOJ, G3NXZ | 1840 | Doncaster |
| 20.00 | G3JQS | 1915 | Totton |
| 20.00 | G3NYB, G3NXZ | 1980 | Doncaster |
| 20.30 | G3ICX | 1915 | Sutton Coldfield |
| 20.30 | G3PED | 1920 | Goodmayes, Essex |
| 21.30 | G3HZG | 1870 | Redditch, Worcs. |
| 21.30 † | G3OVU, G3KSS | 1900 | Bradford |
| 23.00 | GM3HBY | 1903 | Glasgow |
| **Saturdays** | | | |
| 13.00 | G2FXA | 1900 | Stockton-on-Tees |
| 14.30 | G3NQA | 1925 | Birmingham |
| 19.30 | G3KPO | 1960 | Peterborough |
| 20.30 | G3HZG | 1870 | Redditch, Worcs. |

† *Alternately*

# Forthcoming Events

**Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the first of the month preceding publication. T.R.s and club secretaries are reminded that the information submitted must include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out the copy, preferably typed double spaced, in the style used below. Standing instructions for more than three months ahead cannot be accepted.**

## REGION 1

**Ainsdale (A.R.S.).**—June 14, 28, 37 Hawthorne Grove, Southport.
**Blackburn.**—Fridays, 8 p.m., West View Hotel, Revidge Road.
**Blackpool (B. & F.A.R.S.).**—Mondays, 8 p.m., Pontins Holiday Camp, Squires Gate.
**Bury (B.R.S.).**—June 11 (Annual Junk Sale), July 9 (Discussion Night), 8 p.m., Knowsley Hotel, Kay Gardens.
**Chester.**—Tuesdays, 8 p.m., Y.M.C.A.
**Eccles (E. & D.R.C.).**—Tuesdays, 8 p.m., The Congregational Mission Church, King Street.
**Liverpool (L. & D.A.R.S.).**—June 4 (" N.F.D. Preparations "), June 11 (" N.F.D. Post-Mortem "), June 18 (" Mobile in Cornwall "), June 25 (Junk Sale), July 2 (Open Meeting), 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
**Macclesfield.**—June 11 and 25, 42 Jordongate.
**Manchester (M. & D.A.R.S.).**—Wednesdays, 7.30 p.m., 203 Droylsden Road, Newton Heath, Manchester 10. **(S.M.R.C.).**—Fridays, 7.45 p.m., Rackhouse Community Centre, " Rackhouse," Daine Avenue, Northenden.
**Morecambe.**—June 5, July 3, 125 Regent Road.
**Preston.**—June 11, 25, St. Paul's School, Pole Street. Meetings start with Morse practice at 7.30 p.m.
**Southport (S.R.S.)**—Wednesdays, 8.30 p.m., Sea Cadets Camp, The Esplanade.
**Stockport.**—June 5, 19, July 3, 8 p.m., The Blossoms Hotel, Buxton Road.
**Wirral.**—June 5 (Open Meeting), June 19 (" N.F.D. Inquest "), July 3 (" Metals " by G3IIH), 7.45 p.m., Harding House, Park Road West, Claughton.

## REGION 2

**Barnsley.**—June 14 (TV Lecture by Harry Green), June 28 (Visit to Sheffield A.R.C.; details from Hon. Secretary), 7 p.m. King George Hotel, Peel Street.
**Catterick Camp.**—Tuesdays and Thursdays, 7.30 p.m., Vimy Road, Catterick Camp.
**Halifax.**—July 2 (" My first Six Months on the Air " by G3RMQ), 7.30 p.m., Beehive & Cross Keys Inn. **(Northern Heights A.R.S.).**—June 5 (Any Questions?), June 6 (Visit to Emley Moor TV Station (Prov), June 19 Ragchew, Sportsman Inn, Ogden.
**Scarborough.**—Thursdays, 7.30 p.m., Chapman's Yard, North Street.
**Sheffield.**—June 14 (" Radio-teleprinting " by G3LLV), June 28 (Visit from Barnsley Club), 7.30 p.m., 8 Sandbeck Place.
**Heckmondwike (Spen Valley A.R.S.).**—June 13 (Junk Sale), June 27 (Open and Final Meeting), 7.15 p.m., Grammar School, Heckmondwike.

## LOOKING AHEAD

**June 10-15.**—Region 11.A.R.U. Conference, Malmö, Sweden.
**July 1-5.**—R.S.G.B. Golden Jubilee Celebrations. See page 646.
**July 5.**—R.S.G.B. Golden Jubilee Dinner.
**September 8.**—G6UT's Ham Party.
**September 15.**—Region 10 Regional Meeting, Cardiff.
**September 22.**—Region 1 Field Day.
**September 22.**—Woburn Abbey National Mobile Rally.
**September 22.**—Surrey Radio Contact Club 144 Mc/s D/F Hunt.
**October 30-November 2**—R.S.G.B. Radio Communications Exhibition.
**December 20.**—R.S.G.B. Annual General Meeting.
The dates of mobile rallies are given in *Mobile Column*.

## REGION 3

**Birmingham (M.A.R.S.).**—June 18 (" 70 cms " by G3HAZ), 7.30 p.m., Birmingham & Midland Institute, Paradise Street, Birmingham. **(M.R.C.C.).**—June 7, 7.30 p.m., Windmill House, Weatheroak, Wythall, Birmingham. **(Slade).**—June 14 (" How I got on the Air " by a newly licensed member), June 28 (" Radio Fundamentals " by G3JZF), 7.45 p.m., The Church House, High Street, Erdington.
**Cannock (C.C.A.R.S.).**—June 6, July 4, 7.30 p.m., " Tavern," Bridgetown.
**Coventry (C.A.R.S.).**—Mondays, 8 p.m., Willenhall Scout H.Q., Little Farm Buildings, Littlethorpe, St. James's Lane, Willenhall, Coventry.
**Lichfield (A.R.S.).**—June 18, July 2, 7.30 p.m., " Swann Inn," Lichfield.
**Stourbridge (S.T.A.R.S.).**—July 2 (" Mobile " by G3BMN), 7.45 p.m., Foley College, Stourbridge.
**Sutton Coldfield (A.R.S.).**—June 14, 28, 7.30 p.m., 92 The Parade, Sutton Coldfield.
**Wolverhampton (W.A.R.S.).**—June 15 (Hobson's Sports Day), June 17, 8 p.m., Neachells Cottage, Stockwell End, Tettenhall.

## REGION 4

**Burton-on-Trent (A.R.S.).**—Wednesdays, 7.30 p.m., Club Rooms, Stapenhill Institute, Burton-on-Trent.
**Chesterfield (C. & D.A.R.S.).**—June 12, July 10, 7.30 p.m., Newbold Observatory, Newbold Road, Chesterfield.
**Derby (D. & D.A.R.S.).**—June 5 (Surplus Sale), June 12 (Proposed Visit), June 19 (Open Evening), June 26 (D/F Practice Run), July 3 (Surplus Sale), 7.30 p.m., Room No. 4, 119 Green Lane, Derby. **(D.S.W.Exp.Soc.).**—Fridays, 7.30 p.m., Sundays, 10.30 a.m., Club Rooms, Nunsfield House, Boulton Lane, Alvaston, Derby.
**Grantham (G. & D.A.R.S.).**—Mondays, 7.30 p.m., Club Rooms, rear of Manners Arms, London Road, Grantham.
**Grimsby (G. & D.A.R.S.).**—June 6 (N.F.D. Arrangements), June 20 (Visit G.P.O. Telephone Exchange), July 7 (Discussion on Direction Finding), 8 p.m., Club Rooms, Grimsby Model Engineers, Fletchers Yard, Wellowgate, Grimsby.
**Leicester (L.R.S.).**—Mondays, 7.30 p.m., Club Rooms, Old Hall Farm, Braunstone, Leicester.
**Loughborough (R.C.L.).**—Fridays, 7.30 p.m., Corporation Hotel, Wharncliffe Road, Loughborough.
**Lincoln (L.S.W.C.).**—First Wednesday in each month, 7.30 p.m., Lincoln Technical College, Cathedral Street, Lincoln.
**Mansfield (M.R.C.).**—Fridays, 7.30 p.m., Hope & Anchor, Union Street, Mansfield.
**Nottingham (A.R.C.N.).**—Tuesdays, Thursdays, Room No. 3, Sherwood Community Centre, Woodthorpe House, Mansfield Road, Sherwood, Nottingham.
**Northampton (N.S.W.C.).**—Thursdays, 7 p.m., Allen's Pram Works, 8 Duke Street, Northampton.
**Peterborough (P. & D.A.R.S.).**—June 7, July 5, 7.30 p.m., Room No. 14, Peterborough Technical College.
**Worksop (N.N.A.R.S.).**—Tuesdays (Beginners), Thursdays (Informal), 7.30 p.m., Club Rooms, Victoria Institute, Eastgate, Worksop, Notts.

## REGION 5

**Cambridge (C. & D.A.R.C.).**—Fridays 7.30 p.m., Club Headquarters, Corporation Yard, Victoria Road, Cambridge. June 7 (discussion on " Grid Dip Oscillators "—members are requested to bring their own), June 23 (Picnic at Houghton Mill with Peterborough and Shefford Clubs).
**March (M.A.D.R.A.S.).**—Tuesdays, 7.30 p.m., Police Headquarters, High Street.
**Shefford (S. & D.A.R.S.).**—June 6 (" N.F.D. Preparations "), June 8-9 (" National Field Day "), June 13 (" N.F.D. Post Mortem "), Thursdays, 7.45 p.m., Digswell House, Hitchin Road.

## REGION 6

**Cheltenham.**—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
**High Wycombe (C.A.R.C.).**—Last Thursday in each month, 8 p.m., British Legion, St. Mary Street, High Wycombe. June 27, " Choosing the Right Valve," by A. H. Morser, B.Sc.

## REGION 7

**Acton, Brentford & Chiswick (A.B.C.R.C.).**—June 25 (" Field Day Inquest "), 7.30 p.m., A.E.U. Club, 66 High Road, Chiswick.
**Bexleyheath (N.K.R.S.).**—June 13 (N.F.D. Inquest), June 23 (Open Meeting), The Congregational Hall, Chapel Road, Bexleyheath.
**Barnet (B.R.C.).**—June 25, 8 p.m., Red Lion Hotel, Barnet.
**Croydon (S.R.C.C.).**—June 14, 7.30 p.m., Blacksmiths Arms, South End, Croydon.
**Dorking (D. & D.R.S.).**—June 11, July 9 (Informal Meetings), 8 p.m., Wheatsheaf, Dorking. June 25, 8 p.m. (Informal Meeting), Barley Mow, West Horsley. July 23, 8 p.m., Black Horse, Gomsall.
**East Ham.**—Tuesdays fortnightly, 8 p.m., 12 Leigh Road, East Ham.
**East London.**—July 5, 6, 7, Dagenham Town Show with GB3DTS on a.m., s.s.b., v.h.f.
**East Molesey (T.V.A.R.T.S.).**—June 5 (Final N.F.D. Arrangements), 8 p.m., Carnarvon Castle Hotel, Hampton Court.
**Edgware & Hendon (E. & D.R.S.).**—June 10 (N.F.D. Inquest), June 24 (D. C. Jardine, B.I.C.C. Cables), 8 p.m., John Keble Hall, Church Close, Deans Lane, Edgware.
**Enfield.**—June 18 (Talk by D.W. Furby, G3EOH), George Spicer School, Southberry Road, Enfield.

**LONDON MEMBERS' LUNCHEON CLUB**

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

**at 12.30 p.m. on Friday, June 21, Wednesday, July 3, and Friday, July 19, 1963**

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

**Gravesend (G.R.S.).**—June 14 (Metal Bending by G3NZR), Thursdays, 7.30 p.m., R.A.F.A. Club, 17 Overcliffe, Gravesend.
**Guildford (G. & D.R.S.).**—Second and fourth Friday in each month, 8 p.m., City Cafe, Onslow Street, Guildford.
**Harlow.**—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
**Harlow (S.R.C.).**—Wednesdays, 7 p.m., Edinburgh Way, Harlow.
**Harrow (R.S.H.).**—June 7 (Jumble Sale), June 21 (" Semiconductors," by J. G. Wilkes, G3OKJ), alternate Fridays—Morse classes, 8 p.m., Roxeth Manor County School, Eastcote Lane, Harrow.
**Holloway (G.R.S.).**—Mondays and Wednesdays (R.A.E. and Morse), 7 p.m., Fridays (Club), 7.30 p.m., Montem School, Hornsey Road, N.7.
**Hounslow (H.A.D.R.C.).**—Mondays, 7.30 p.m., Isleworth Town Hall, Twickenham Road, Hounslow.
**Ilford.**—Thursdays, 8 p.m., 579 High Road, Ilford. (near Seven Kings Station).
**Kingston.**—Alternate Thursdays (Lectures), 8 p.m., Y.M.C.A., Eden Street, Kingston. (Morse Classes weekly at 2 Sunray Avenue, Tolworth).

**Loughton.**—June 14, 28, 7.30 p.m., Loughton Hall, near Debden Station.
**Mitcham (M. & D.R.S.).**—June 28, 7 p.m., "The Canons," Madiera Road, Mitcham.
**New Cross (C.A.R.S.).**—8 p.m., 225 New Cross Road, S.E.14.
**Norwood & South London (C.P. & D.R.C.).**—June 15 (Junk Sale), C.D. Training Centre, Bromley Road, Catford.
**Paddington (P. & D.A.R.S.).**—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.
**Purley (P. & D.R.C.).**—June 14, 8 p.m., Railwaymen's Hall (side entrance), Whytecliffe Road, Purley.
**Reigate (R.A.T.S.).**—June 15 (Junk Sale), 7.30 p.m., The Tower, High Street, Reigate.
**Romford (R. & D.R.S.).**—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
**Science Museum (C.S.R.S.).**—June 17, July 1 (Informal Meetings), Science Museum, South Kensington.
**Sidcup (C.V.R.S.).**—June 6 ("V.H.F. Equipment" by Tom Withers), 7.30 p.m., Congregational Church Hall, Court Road, Eltham.
**Slough (S.A.R.S.).**—First Wednesday in each month, 8 p.m., United Services Club, Wellington Street, Slough.
**Southgate and District.**—June 13, 8 p.m., Arnos School, Wilmer Way, N.14.
**St. Albans (Verulam A.R.C.).**—June 19 (Film Show and Junk Sale), 7.30 p.m., Headley Road, St. Albans.
**Sutton and Cheam (S.C.R.S.).**—June 16 (film show by Mullards on "Transistors,"), 8 p.m., "The Harrow," High Street, Cheam.
**Uxbridge (U.D.R.S.).**—Fortnightly from June 10, 7.30 p.m., Central Hall, corner of Park Road and Uxbridge Road. Newcomers welcome.
**Welwyn Garden City.**—June 13, 7.30 p.m., Conference Room, Murphy Radio, Bessemer Road, Welwyn Garden City.

### REGION 8

**Canterbury (E.K.R.S.).**—June 11 (Junk Sale), June 18 (Open Night), June 25 (Recorded lecture on "Two Metres," by W. H. Allen, M.B.E., G2UJ), July 2 ("Amateur Radio in a Car," by D. N. T. Williams, G3MDO), July 9 (Film), 7.30 p.m., Canterbury Technical College.
**Crawley (C.A.R.C.).**—June 12, Informal meeting, for details contact G3FRV. June 26, 8 p.m., Members' Evening, West Green Centre.
**Tunbridge Wells (W.K.A.R.S.).**—June 14 ("Two Metre Converters" by G2UJ), June 28 ("Modulators" by G4IB), 7.30 p.m., K.C.C. Adult Centre, Culverden House, Culverden Park Road, St. John's, Tunbridge Wells.

### REGION 9

**Bath.**—June 17, 7.30 p.m., Committee Room, Technical College, Lower Borough Walls, Bath.
**Bristol.**—June 28, 7.30 p.m., Royal Fort, Bristol University, Woodland Road, Bristol 8.
**Burnham-on-Sea.**—Second Tuesday in each month, 8 p.m., Crown Hotel, Oxford Street, Burnham-on-Sea.
**Camborne (C.R. & T.C.).**—First Thursday in each month, Staff Recreation Hall, S.W.E.B. Headquarters, Pool, Near Camborne.
**Exeter.**—First Tuesday in each month, 7.30 p.m., Y.M.C.A., St. Davids Hill, Exeter.
**Plymouth (P.R.C.).**—First Tuesday in each month, 7.30 p.m., Guild of Social Service Building, Plymouth. Other Tuesdays, Virginia House Settlement, St. Andrews Cross, Plymouth.
**South Dorset (S.D.R.S.).**—First Friday in each month, 7.30 p.m., alternately at Waverley Hotel, Westham, Weymouth, and Labour Rooms, West Walks, Dorchester (June meeting at Weymouth).
**Torquay (T.A.R.S.).**—June 8 ("BCI and TVI" by B. Symons, G3LKJ), Club H.Q., Belgrave Road, Torquay.
**Weston-super-Mare.**—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road.
**Yeovil (Y.A.R.C.).**—Wednesdays, 7.30 p.m., Park Lodge, The Park, Yeovil.

### REGION 10

**Cardiff.**—June 10, 7.30 p.m., July 8 ("Alignment of I.F. Amplifiers," with demonstration, by J. Wylie, GW3LEF, and F. J. Church, GW3HCH), 7.30 p.m., T.A. Centre, Park Street, Cardiff.
**Port Talbot.**—July 2, 8 p.m., Trefelin Workmen's Club and Institute, 8-10 Jersey Street, Port Talbot.

### REGION 14

**Glasgow.**—First and third Friday in each month, 7.30 p.m., Christian Institute, 70 Bothwell Street, Glasgow.
**Motherwell.**—Third Friday in each month, 7.30 p.m., Carfin Hall, Motherwell.

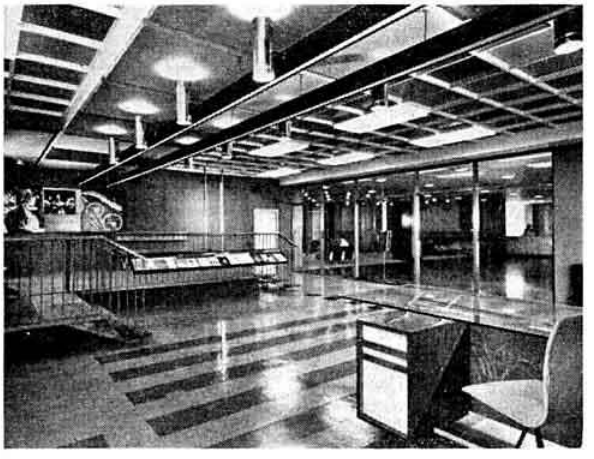
### REGION 16

**Basildon (B. & D.A.R.S.).**—June 6 at Wickford, July 1 at Basildon. Further details from G3RQT, 472 Long Riding, Basildon.
**Chelmsford (C.A.R.C.).**—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
**Southend (S. & D.A.R.S.).**—Alternate Fridays at 7.30 p.m., in Canteen of E.K. Cole Ltd., Priory Road, Prittlewell, Southend. Further details from G3NPF, 2 Edith Road, Prittlewell.

## Book Review

**TRANSISTOR RADIOS, CIRCUITRY AND SERVICING.** Mullard Ltd., Mullard House, Torrington Place, London, W.C.1. Page size 5½ in. x 8¼ in. 71 pages. (Available from R.S.G.B. Headquarters. Price 5s. 9d. post free).

The material in this book first appeared as a series of articles in *Mullard Outlook*, and as a result of the interest aroused it was decided to produce the series in book form. Additional material has been added and the book deals first with the principles of transistor action and manufacture, followed by chapters on printed wiring and receiver circuits. The final chapters deal with the servicing of transistor radios and briefly reviews the test equipment necessary. The book is attractively produced in semi stiff covers and can be recommended to all those interested in the use of semiconductors.



**The Reception Area of the Electronics Centre at Mullard House, Torrington Place, London, W.C.1, which will be the venue for the Open House arranged by Mullard Ltd. on July 1 and 2, 1963, in connection with the Society's Golden Jubilee Celebrations. Admission will be by ticket only. For details, see page 646.**

## Can You Help?

● E. A. Bovey (B.R.S.19530), 1 Chapel Lane, Dartmouth, Devon, who wishes to know the American equivalents of the CV112 diode and the voltage rating of the CV981 neon indicator? He also requires the circuit diagram of the ex-Air Ministry Modulator type MP28B which uses a 6N7, 6F6 and two 807?

● Michael D. Bond (A.2986), 100 Huntly Grove, Peterborough, Northants., who wishes to obtain information on the Marconi V.H.F. Transceiver R220/B43?

● L. O. Tully, 120 Victoria Street, Fairfield S3, Brisbane, Queensland, Australia, who requires the leaflet AP1186/B86 dated July 8, 1943, describing the method of calibrating certain R.1155 receivers? Mr. Tully also requires the circuit diagram of the Oscillator (Beat Frequency) type 204 Ref. No. 10V/16001.

## GB2RS SCHEDULE

R.S.G.B. News Bulletins are transmitted on Sundays in accordance with the following schedule:

| Frequency | Time | Location of Station |
|---|---|---|
| 3600 kc/s | 9.30 a.m. | South East England |
| | 10 a.m. | Severn Area |
| | 10.15 a.m. | Belfast |
| | 10.30 a.m. | North Midlands |
| | 11 a.m. | North East England |
| | 11.30 a.m. | South West Scotland |
| | 12 noon | North East Scotland |
| 145·30 Mc/s | 10.30 a.m. | Beaming north west from Sutton Coldfield |
| | 10.45 a.m. | Beaming south west from Sutton Coldfield |
| 145·50 Mc/s | 11.00 a.m. | Beaming north from Leeds |
| | 11.15 a.m. | Beaming east from Leeds |
| 145·8 Mc/s | 11.30 a.m. | Beaming west from Belfast |
| | 11.45 a.m. | Beaming north east from Belfast |
| 145.10 Mc/s | 12 noon | Beaming north from London area |
| | 12.15 p.m. | Beaming west from London area |

News items for inclusion in the bulletins should reach Headquarters not later than first post on the Thursday preceding transmission. Reports from Affiliated Societies and from non-affiliated societies in process of formation will be welcome.


**A larger Eddystone die-cast box,** type No. 903, is a new product of Stratton and Co. Ltd., Birmingham 31. It has the same dimensions as the no. 845, with the exception of the height. The new box measures 7⅜ in. × 4⅛ in. × 3 in. deep and costs 16/8. A further addition to the range of Eddystone miniature microdensers is a 50 + 50 pF differential capacitor (no. 884), price 10/-.

**Ersin Multicore Solder,** incorporating Ersin Flux type 362P, is a new development of Multicore Solders Ltd., Maylands Avenue, Hemel Hempstead, Herts. This latest variety contains less than half the usual quantity of flux and should thus be suitable for wiring miniature components, particularly on printed circuit boards where the spread of flux over a large proportion of the board can be detrimental to its insulating properties. The manufacturers state that precautions have been taken to ensure that the lower percentage of flux does not render the solder inferior during application.

***Ferranti Silicon Semiconductor Devices*** is the title of a booklet issued by Ferranti Ltd., Gem Mill, Chadderton, Oldham, Lancs., describing a range of silicon *n-p-n* transistors (v.h.f. and power), junction diodes, Zener diodes, voltage regulators, voltage variable capacitors, parametric diodes, high voltage rectifiers (to 16,000 volts at 350 mA) and power rectifiers.

Worthy of special note are the ZT202 and ZT402 (smaller case) silicon mesa transistors, for use as switches, oscillators and amplifiers at frequencies to above 100 Mc/s: power dissipation (max.)—300 mW; power gain—18·5db; $h_{FE}$—18 to 42; $V_{CE}$ (max.)—20; reverse current (max.): *CB*—1 μA, *EB*—10 μA. Both types cost 12/- each in small quantities.

**Contemporary styled transparent panel meters,** known as the "Clarity" range, are available from Taylor Electrical Instruments Ltd., Montrose Avenue, Slough, Bucks. It is claimed that the clear case allows maximum light to illuminate the scale, thus reducing errors owing to shadows. The meter movement, which incorporates magnetic shielding, has been designed through the use of a spring bearing system, to safely withstand overloads of 100 times f.s.d. Ranges commence at 10 μA, with scale lengths of 2½, 3, and 4 in.

The Model 191A RC Oscillator, also made by Taylor, has been improved, although the price remains unchanged. Briefly, the instrument covers 10 c/s to 100 kc/s in four ranges, with both sine- and square-waveforms. Indication of the frequency is provided by a hair-line graduation on a transparent cursor. The output can be controlled over a wide (0 to 60db) range The instrument is housed in a two-tone grey metal case.

**"Dis-Boards"** is the name given to a range of bench or wall mounting power distribution multi-way sockets. The manufacturers, Lexor Electronics Ltd., 25/31 Allesly Old Road, Coventry, Warwickshire, offer over 300 combinations of either 5, 13 or 15 amp sockets, mounted in steel trough-shaped cases. Various accessories are also in production. A descriptive leaflet is available on request.

Daystrom Ltd., Gloucester, have published a revised catalogue 83/2 giving details of the complete range of British **Heathkits.** Arrangements have also been made to supply **American Heathkits** direct to customers in Britain. Payment can be made direct to Daystrom Ltd. Import duties are payable when the kit arrives. A comprehensive catalogue of the American range is available, price 1/-.

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H.P. Terms available. Generous trade-in allowance on your used equipment. (Please state age, condition and approximate price required.)

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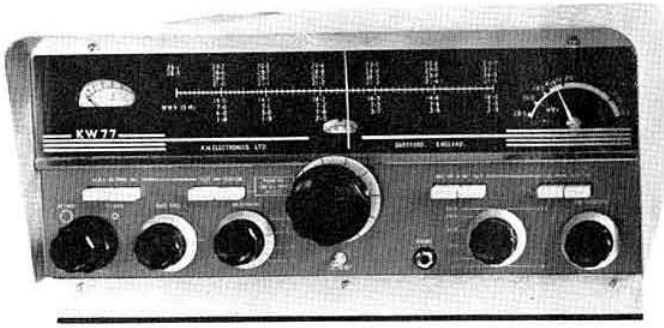


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|---|---|---|---|---|---|---|---|
| DH63 .. | 6/- | ECC84 .. | 8/- | EF55 .. | 8/- | KTZ41 | 6/- U24 .. 12/6 |
| DK92 .. | 9/- | ECC85 .. | 8/- | EF80 .. | 6/- | ML6 .. | 6/- U25 .. 11/- |
| DK96 .. | 7/6 | ECC88 .. | 15/- | EF83 .. | 10/- | MU12/14 | 7/- U26 .. 11/- |
| DL96 .. | 7/6 | ECF80 .. | 10/6 | EF85 .. | 6/6 | N78 .. | 15/- U191 .. 12/6 |
| EI'T .. | 55/- | ECF82 .. | 8/- | EF86 .. | 6/- | PABC80 | 8/6 U251 .. 14/- |
| EABC80 | 7/- | ECH22 | 15/- | EF89 .. | 6/- | PC97 .. | 10/- U281 .. 15/- |
| EAF42 .. | 8/6 | ECH42 | 9/6 | EF92 .. | 3/6 | PCC84 .. | 6/6 U282 .. 15/- |
| EBC21 .. | 7/6 | ECH81 | 7/6 | EF98 .. | 10/- | PCC85 .. | 8/- U301 .. 12/9 |
| EBC41 .. | 7/9 | ECH83 | 8/- | EF183 .. | 10/- | PCC88 .. | 13/- U801 .. 20/- |
| EBC81 .. | 7/- | ECL80 .. | 7/6 | EF184 .. | 10/- | PCC89 .. | 11/- UABC80 8/6 |
| EBF80 .. | 7/6 | ECL82 .. | 8/6 | EFP60.. | 10/- | PCF80 .. | 7/- UAF42 8/- |
| EBF83 .. | 10/- | ECL83 .. | 14/- | EL32 .. | 3/6 | PCF82 .. | 7/- UBC81 8/- |
| EBF89 .. | 8/- | ECL86 .. | 11/- | EL33 .. | 9/- | PCF84 .. | 13/- UBF80 8/6 |
| EBL1 .. | 11/- | EF9 .. | 12/- | EL34 .. | 10/- | PCF86 .. | 11/- UBF89 8/6 |
| EBL21 .. | 12/6 | EF37A .. | 8/- | EL37 .. | 17/6 | PCL81 .. | 9/- UBL21 13/- |
| EC91 .. | 3/- | EF39 .. | 4/- | EL38 .. | 17/6 | PCL82 .. | 8/- UCC84 .. 9/- |
| ECC32 .. | 4/- | EF40 .. | 10/- | EL41 .. | 8/- | PCL83 .. | 10/- UCC85 .. 8/- |
| ECC34 | 10/- | EF41 .. | 8/- | EL42 .. | 8/- | PCL84 .. | 7/- UCH21 .. 9/6 |
| ECC40 | 9/- | EF42 .. | 7/6 | EL81 .. | 9/- | PCL85 .. | 11/- UCH42.. 8/- |
| | | | | EL83 .. | 7/6 | PCL86 .. | 11/- UCH81.. 9/- |
| | | | | EL84 .. | 7/- | PL36 .. | 11/- UCL82 .. 9/- |
| | | | | EL85 .. | 10/- | PL38 .. | 16/- UCL83 .. 12/6 |
| | | | | EL95 .. | 6/6 | PL81 .. | 8/6 UF41 .. 9/- |
| | | | | EL821 .. | 6/- | PL82 .. | 8/- UF42 .. 9/- |
| | | | | EL822 .. | 8/- | PL83 .. | 8/- UF80 .. 7/- |
| | | | | EM34 .. | 9/- | PL84 .. | 8/- UF85 .. 7/- |
| | | | | EM80 .. | 7/6 | PL500 .. | 16/- UF86 .. 12/- |
| | | | | EM81 .. | 8/- | PM84 .. | 10/- UF89 .. 7/6 |
| | | | | EM84 .. | 8/6 | PX25 .. | 10/- UL41 .. 9/6 |
| | | | | EM85 .. | 10/- | PY33 .. | 12/- UL84 .. 8/- |
| | | | | EN31 .. | 10/- | PY80 .. | 6/6 UU6 .. 12/- |
| | | | | EN32 .. | 10/- | PY81 .. | 6/6 UY21 .. 6/6 |
| | | | | EY51 .. | 8/- | PY82 .. | 6/- UY41 .. 6/- |
| | | | | EY81 .. | 9/- | PY83 .. | 7/- UY85 .. 6/- |
| | | | | EY84 .. | 7/6 | PY88 .. | 9/- VR40 .. 10/- |
| | | | | EY86 .. | 7/- | PY800 .. | 10/- VR53 .. 4/- |
| | | | | EZ40 .. | 7/- | PY801 .. | 10/- VR55 .. 6/- |
| | | | | EZ41 .. | 6/6 | PZ30 .. | 15/- VR56 .. 4/6 |
| | | | | EZ80 .. | 6/- | QQV02-6 | 45/- VR57 .. 6/- |
| | | | | EZ81 .. | 6/- | QQV03-10 | VR65 .. 4/- |
| | | | | GS10A .. | 25/- | | 35/- VR100 .. 6/- |
| | | | | GZ32 .. | 12/- | QV04-7 | 7/- VR135 .. 2/6 |
| | | | | GZ34 .. | 12/- | RL18 .. | 12/6 VR136 .. 4/6 |
| | | | | HL23DD | 6/- | | VR137 .. 4/6 |
| | | | | HL41 .. | 4/- | SP2 .. | 3/6 VU120 .. 8/6 |
| | | | | KT33C | 6/- | TT15 .. | 35/- WS1M .. 6/- |
| | | | | KT41 .. | 12/6 | TZ40 .. | 30/- X65 .. 5/6 |
| | | | | KT66 .. | 13/- | U12/14 | 8/- X66 .. 8/- |

**R.C.A. NUVISTORS**

2CW4 (2V htrs.) or 6CW4 (6.3V htrs.) high "mu" triodes for VHF and TV Tuners .. .. .. .. 14/-
6DS4 similar to 6CW4 but with remote cut-off for weak signal areas .. .. 15/-
Bases for the above 2·9 each.

**CATHODE RAY TUBES**

| | | | |
|---|---|---|---|
| 2AP1 .. | 25/- | 3AP1 .. | 22/6 |
| 7BP7 .. | 40/- | 09D .. | 80/- |
| 09J .. | 80/- | ACR10 .. | 20/- |
| VCR138 .. | 50/- | VCR97 .. | 40/- |
| 913 (1 in. screen) | 60/- | DG7-1 .. | 70/- |

**HEADPHONES**

CHR High Impedance .. .. .. 15/-
H830 American miniature earplug type 12/6

**POST OFFICE TYPE ELECTRO-MAGNETIC COUNTERS**

4-digit, 500Ω Coil .. .. .. 8/6

**9 FT. OUTDOOR AERIALS**

Three strong light alloy screw-in sections mounted on an insulated base. Supplied complete with bracket for wall or window sill mounting, and with down lead. 15/- P. & P.

**WIRELESS SETS No. 19 Mk. 2**

Transmitter-receiver assembly consists of 2-8 Mc/s transmitter-receiver, 230-240 Mc/s transmitter-receiver and intercom amplifier. Secondhand, in good condition, without power supply unit. £2/15/- P. & P. 20/-.

**POWER UNITS TYPE WS356A**

Navy version of Type 3 power unit, 19 in. rack mounted. Input 230V. Output 180-270V, fully smoothed H.T. at 80 mA and 6.3V A.C. at 4 amps. Meter for H.T. monitoring. Secondhand, perfect condition, £3/10/- P. & P. 15/-.

**BY100 SILICON RECTIFIERS**

700 p.i.v. at 450 mA .. .. .. 8/-

**TRANSISTORS**

MULLARD OC44, 7/6; OC45, 6/6; OC71, 6/-; OC75, 6/-; OC76, 8/-; OC78, 7/-; OC78D, 7/-; OC81, 7/-; OC81D, 7/-; OC170, 6/6; Set of two matched OC78 or OC81, 13/-; or set of two matched OC81 with one OC81D, 18/-.

EDISWAN X161A equivalent to OC72, 8/-.

R.C.A. 2N410 equivalent to OC45, 5/-; 2N412, equivalent to OC44, 5/-.

SPOT MARKED TRANSISTORS: Red, 2/8; White, 2/8; Yellow, 1/10; Green, 1/6. Germanium miniature Diodes CG12E, 1/6

IF UNDELIVERED Return to:— R.S.G.B., NEW RUSKIN HOUSE, LITTLE RUSSELL STREET, W.C.1

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