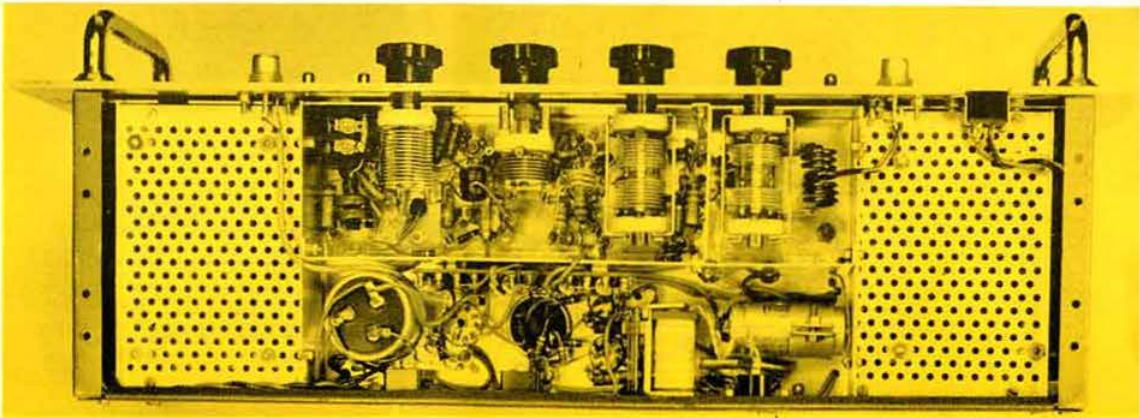
# RSGB

# BULLETIN

AUGUST 1966
VOL. 42, No. 8

## NFD

## 1966



THE 2N4

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

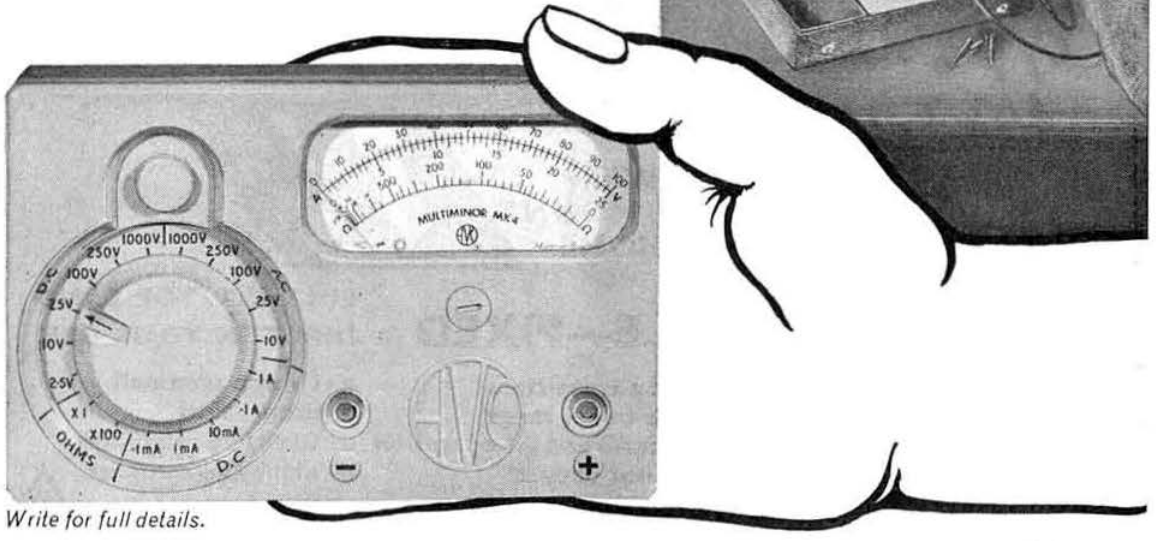
# AVO MULTIMINOR *Mk4*

## Inexpensive Easy-to-use Pocket Size

The Avo Multiminor Mk4 is the latest version of this well-proven multi-range measuring instrument. Designed and assembled to high standards of reliability, the Avo Multiminor offers simple yet instant range selection with a single rotary switch. There is only one pair of sockets for all measurements, and the scale plate is clearly marked for easy reading.

Accuracy is within the limits laid down in B.S.S. 89/1954 for up to $3\frac{1}{4}$" scale length industrial portable instruments.

*Panclimatic construction enables the Multiminor to be used in all types of climatic conditions. The instrument is supplied in an attractive black carrying case, complete with interchangeable test prods and clips, and a multi-language instruction booklet.*




*Write for full details.*

**AVO LIMITED** AVOCET HOUSE · DOVER · KENT *Telephone: Dover 2626*

**Volume 42 No. 8**

**August 1966**

**4/- Monthly**

# RSGB BULLETIN

## CONTENTS



EDITOR:

*John A. Rouse, G2AHL*

EDITORIAL ASSISTANTS:

*Trevor R. Preece, G3TRP*
*John J. Adey, A4663*

EDITORIAL OFFICE:

*RSGB Headquarters, 28 Little Russell Street, London, W.C.1.*
*Telephones: HOLborn 7373*
*HOLborn 2444*

ADVERTISEMENT MANAGER:

*Mrs. P. D. Harvey,*
*Sawell & Sons Ltd.,*
*Ludgate Circus, London, E.C.4.*
*Telephone: FLEet Street 4353*

*The RSGB Bulletin is published on the first Wednesday in each month by the Radio Society of Great Britain as its official journal and sent to all members.* 
*The closing date for copy for the September issue is 12 August*

# LAFAYETTE 10-80 Metre SSB/AM/CW Amateur Receiver

**75GNS.**

5 HAM BANDS PLUS WWV

3·5– 4·0 Mc/s
7·0– 7·5 Mc/s
14·0–14·5 Mc/s
21·0–21·5 Mc/s
28·0–29·7 Mc/s
WWV at 15 Mc/s

EXTRAS
100 kc/s xtal **35/-**
Speaker Mate **55/-**

- Mechanical Filter for Exception Selectivity
- 12 Valves Dual Conversion
- Automatic Noise Limiter
- Product Detector for Selectable Upper and Lower Sideband Reception
- Complete with Crystals for 80, 40, 20, 15 and 10 Metres
- 100 kc/s Crystal Calibrator and Crystal BFO
- "S" Meter-Calibrated in "S" Units 1-9 and to +40 db

**MECHANICAL FILTER**

Ultra-sharp selectivity is achieved by means of a true mechanical band-pass filter in the 455 kc/s IF section. The filter consists of three sections —an input transducer, 6 non-corrosive nickel alloy resonators and an output transducer.

MODEL HA.350 Lafayette's newest and most advanced communications receiver. Dual conversion circuitry features an image and IF rejection of more than 40 db. A product detector, providing selectable upper or lower sideband, solves the problems in SSB reception. Tuneable preselector circuit gives sensitivity of less than 1 microvolt for 10 db signal-to-noise ratio. Selectivity: Bandwidth of 2 kc/s at 6 db down and 6 kc/s at 60 db down using mechanical filter. Front panel 100 kc/s crystal calibrator reset control used in conjunction with the 15 Mc/s WWV station assures accurate calibration. CHECK THESE SPECIFICATIONS- Audio output: 1-watt maximum. Speaker impedance: 8; 500 ohms (speaker not supplied). Front panel controls; Preselector; Cal—On/off; Band Selector; Receive/Send; Tuning Cal Reset; Function—Off/AM/SSB1–CW/SSB2; RF gain; AF gain; ANL; Phone jack. Valves: 6BZ6—RF amp; 6BL8—Xtal controlled 1st mixer; 6BE6—2nd mixer; 6BA6—VFO; 6BA6—1M amp.; 6BA6—IF amp.; 6AL5—AVC rectifier and AM noise limiter; 6AQ8—product detector and crystal calibrator; 6AV6—1st audio amplifier; 6AQ5—audio output; 6BA6—BFO; OB2—regulator. Silicon Full Wave Rectifier. Size: 15in. wide by 7¼in. high by 10in. deep. For 230v. 50/60 cps AC. Wt., 25 lb. Less Calibrator Crystal.

**IMMEDIATE DELIVERY**
**PART EXCHANGES**

# LAFAYETTE KT340
## COMMUNICATION RECEIVER
### SEMI-KIT

Build this wonderful receiver and save pounds. Supplied semi completed, main components ready mounted, RF section already wired and aligned. Full and precise instructions supplied. Specification: 8 valves + rectifier, 4 bands covering 550 kc/s-30 Mc/s. Incorporates 1 RF and 2 IF stages, "Q" multiplier, BFO, ANL, "S" meter, bandspread, aerial trimmer etc. Operation 115/230v. AC.

Price **25 GNS.** carr. 10/-.

## CLEAR PLASTIC PANEL METERS.

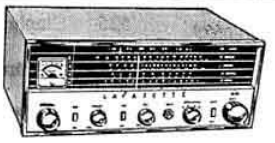
First grade quality, Moving Coil panel meters, available ex-stock. SAE for illustrated leaflet. Discounts for quantity. Available as follows. Type MR. 38P. 1·21/23in. square fronts.

| | | | | | |
|---|---|---|---|---|---|
| | | | 100mA .. | 22/6 | 20V DC .. 22/6 |
| | | | 150mA .. | 22/6 | 50V DC .. 22/6 |
| | | | 200mA .. | 22/6 | 100V DC .. 22/6 |
| | | | 200mA .. | 22/6 | 150V DC .. 22/6 |
| | | | 300mA .. | 22/6 | 300V DC .. 22/6 |
| | | | 500mA .. | 22/6 | 500V DC .. 22/6 |
| "S" Meter | 29/6 | 500-0-500μA | | 29/6 | 750mA .. 22/6 15V AC .. 22/6 |
| 50μA .. | 32/6 | 1mA .. | | 22/6 | 1·0-1mA .. 22/6 50V AC .. 22/6 |
| 100μA .. | 29/6 | 2mA .. | | 22/6 | 1A DC .. 22/6 150V AC .. 22/6 |
| 200μA .. | 27/6 | 5mA .. | | 22/6 | 2A DC .. 22/6 300V AC .. 22/6 |
| 500μA .. | 25/- | 10mA .. | | 22/6 | 5A DC .. 22/6 500V AC .. 22/6 |
| 50-0-50μA | 29/6 | 20mA .. | | 22/6 | 3V DC .. 22/6 "S" Meter |
| 100-0-100μA | 27/6 | 50mA .. | | 22/6 | 10V DC .. 22/6 1mA .. 29/6 |

POST EXTRA Larger sizes available—send for lists.

## PCR1-PCR3 RECEIVERS

BRAND NEW CONDITION—FULLY TESTED AND CHECKED BEFORE DESPATCH. 3 WAVEBAND WITH RF STAGE—WONDERFUL VALUE. PCR1: 860–2080 metres, 190–570 metres, 5·6–18 Mc/s with internal speaker. PCR3: 190–570 metres, 2·2–7·3 Mc/s, 7·0–23 Mc/s no internal speaker. Either model **£8.19.6**, carr. 10/6 with circuit. Plug in external power units for either above. 230v. AC **35/-** or 12v. DC **19/6**.



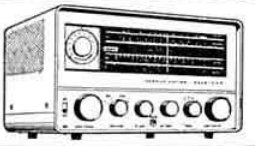
## HAM-I 4 BAND COMMUNICATION RECEIVER

4 wavebands covering 535 kc/s-30 Mc/s. 5 valve superhet circuit. Incorporates S meter, BFO, BAND-SPREAD TUNING, BUILT IN 4in. SPEAKER, FERRITE AERIAL AND EXTERNAL TELESCOPIC AERIAL. Operation 220/250v. AC. Supplied brand new with handbook. **£16.16.0.** Carr. 10/-.

## SWAN 350 10-80 METRE TRANSCEIVER

400 watts PEP. Complete with AC Power Supply Consul. **£250** ex-stock. SAE for details.

## HA-63 GENERAL COVERAGE RECEIVER



7 valves + Rectifier. 4 Bands 550 kc/s-31 Mc/s. "S" Meter-BFO-ANL-Bandspread Tuning 200/250v. AC. Brand new, **24 GNS.** carr. paid.

# CODAR EQUIPMENT

**MAIN LONDON AGENTS - ALL EQUIPMENT STOCKED**

## HAMMARLUND SP.600JX RECEIVERS

Dual conversion 540 kc/s-54 Mc/s. Few left only. In excellent condition at **£100**.

| | |
|---|---|
| BUG KEYS | £4.10.0 |
| ELECTRONIC KEYS | £16.10.0 |
| MECHANICAL FILTERS AS USED IN HA-350 | £9.19.6 |
| NUVISTOR GRID DIP METER. 1·7–180 Mc/s | £12.10.0 |
| KYORITSU GRID DIP METER 360 kc/s–220 Mc/s | £12.10.0 |
| LAFAYETTE DE-LUXE V.F.O. 10–80 METRES | £13.19.6 |
| PARTRIDGE JOYSTICK AERIALS IN STOCK. | |
| FIELD STRENGTH METERS 1–250 Mc/s | £3.12.6 |
| TRANSISTORISED FIELD STRENGTH METERS 2·5–57 Mc/s | £4.19.6 |

## LONDON COAXIAL AERIAL CHANGEOVER RELAYS

24 volt DC. Complete junction box as used for TR 1985 TX. Brand new boxed **39/6** Carr. 4/6.

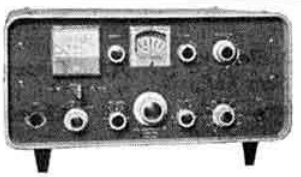
## SILICON RECTIFIERS

| | |
|---|---|
| 200 P.I.V. 200 mA .. .. .. | 2/6 |
| 200 P.I.V. 6 amp .. .. .. | 5/6 |
| 400 P.I.V. 3 amp (S.C.R.) .. | 10/- |
| 400v. P.I.V. 3 amp .. .. .. | 7/6 |
| 1,000v. P.I.V. 650 mA .. .. | 7/6 |
| 800v. P.I.V. 500 mA .. .. .. | 5/6 |
| 400v. P.I.V. 500 mA .. .. .. | 3/6 |
| 800v. P.I.V. 5 amp .. .. .. | 7/6 |
| 70v. P.I.V. 1 amp. .. .. .. | 3/6 |
| 150v. P.I.V. 165 mA .. .. .. | 1/- |

Discounts for quantities. Post extra.

## NATIONAL H.R.O. COILS

Set of 9 general coverage coils covering 50 kc/s-30 Mc/s. **£10.10.0.** Carr 10/-. Also H.R.O. dials **27/6** P. & P. 1/6.



## APPOINTED LONDON AGENT FOR K.W. EQUIPMENT

### VESPA TRANSMITTER

10-160 metres SSB, CW and AM **£110.** Power Supply **£25.**

IMMEDIATE DELIVERY.

Also available:
KW 2000 **£173**. PSU **£32**. KW 2000A **£195**. PSU **£40**. KW 600 Linear amp. **£115**

## STAR SR.600 AMATEUR COMMUNICATION RECEIVER

New crystal controlled triple conversion de luxe 80-10 metre band receiver. Extremely high sensitivity, selectivity and stability. Special features include 3 IF stages, crystal controlled oscillator, 4 section L/C filter, "S" meter, BFO-ANL, 100 kc/s crystal calibrator, etc. Supplied brand new and guaranteed. New **£95.** SAE for full details.

**Open: 9 a.m.-6 p.m. Every day Monday to Saturday**

# G. W. SMITH & CO. (RADIO) LTD.

3 and 34 LISLE STREET, LONDON, W.C.2

*Telephone: GERRARD 8204/9/55* *Cables: SMITHEX, LESQUARE*

**Part exchanges welcome**

# RADIO SOCIETY OF GREAT BRITAIN

INCORPORATED 1926

MEMBER SOCIETY INTERNATIONAL AMATEUR RADIO UNION

**PATRON** — H.R.H. THE PRINCE PHILIP, DUKE OF EDINBURGH, K.G.

## COUNCIL 1966

| | |
|---|---|
| **PRESIDENT** | R. F. STEVENS, G2BVN |
| **EXECUTIVE VICE-PRESIDENT** | A. D. Patterson, BASc, GI3KYP |
| **IMMEDIATE PAST PRESIDENT** | E. W. Yeomanson, G3IIR |
| **HONORARY TREASURER** | N. Caws, FCA, G3BVG |
| **ORDINARY ELECTED MEMBERS** | J. Etherington, G5UG<br>J. C. Foster, G2JF<br>E. G. Ingram, GM6IZ<br>L. E. Newnham, BSc, G6NZ<br>W. A. Roberts, MIEE, G2RO<br>G. M. C. Stone, AMIEE, AMIERE, G3FZL<br>J. W. Swinnerton, TD, BSc(ECON)(HONS), AIL G2YS<br>Louis Varney, AMIEE, AIL, G5RV |
| **MEMBERS ELECTED BY ZONES** | L. N. Goldsbrough, BSc(OXON), MA, G3ERB<br>J. C. Graham, G3TR<br>F. K. Parker, G3FUR<br>J. F. Shepherd, GM3EGW<br>G. Twist, LLM, G3LWH |

**GENERAL MANAGER AND SECRETARY** — John A. Rouse, G2AHL
**ASSISTANT SECRETARY** — P. C. M. Smee

## REGIONAL REPRESENTATIVES

| | |
|---|---|
| Region 1.—North Western. | B. O'Brien, G2AMV, 1 Waterpark Road, Prenton, Birkenhead, Cheshire. |
| Region 2.—North Eastern. | K. Sketheway, BRS20185, 51 Baret Road, Walkergate, Newcastle-upon-Tyne. |
| Region 3.—West Midlands. | Office vacant. |
| Region 4.—East Midlands. | F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby. |
| Region 5.—Eastern. | S. J. Granfield, G5BQ, St. Lukes, 47 Warren Road, Cambridge. |
| Region 6.—South Central. | L. W. Lewis, G8ML, 34 Clevelands Avenue, Cheltenham. |
| Region 7.—London. | P. A. Thorogood, G4KD, 35 Gibbs Green, Edgware, Middlesex. |
| Region 8.—South Eastern. | D. N. T. Williams, G3MDO, Seletar, New House Lane, Thanington, Canterbury, Kent. |
| Region 9.—South Western. | R. E. Griffin, G5UH, 13 Alexandra Road, Uplands, Bristol 3. |
| Region 10.—South Wales. | C. H. Parsons, GW8NP, 90 Maesycoed Road, Heath, Cardiff, Glam. |
| Region 11.—North Wales. | Office vacant. |
| Region 12.—North-East Scotland. | J. MacIntosh, GM3IAA, Broom Park, Cradlehall, Inverness. |
| Region 13.—South-East Scotland. | G. P. Millar, GM3UM, 8 Plewlands Gardens, Edinburgh 10. |
| Region 14.—West Scotland. | A. F. Hunter, GM3LTW, 4-5 Cassillis Road, Maybole, Ayrshire. |
| Region 15.—Northern Ireland. | L. M. Lyske, GI3CDF, 63 Church Street, Portadown, Co Armagh. |
| Region 16.—East Anglia. | P. J. Naish, G3EIX, 6 Mildmays, Danbury, Chelmsford, Essex. |
| Region 17.—Southern. | L. Southwell, G3JLS, 15 Hollybank Road, Hythe, Southampton, Hants. |

## QSL BUREAU MANAGER

A. O. Milne, G2MI, 29 Kechill Gardens, Bromley, Kent

# Current Comment

## *discusses topics of the day*

RECENT issues of the BULLETIN have contained detailed and informative reviews of equipment designed for the amateur, a feature in demand by members for many years. The fact that this type of article has not appeared before has not been a mere slowness in meeting the wishes of members but rather a reluctance to tackle a difficult task unless it was known that the necessary tools were available.

It has always been our view that a carbon copy of portions of the manufacturers' equipment manuals together with odd phrases culled from sales literature would not adequately fulfil the requirements. At the present time the resources and accommodation at Headquarters do not permit the establishment of a test laboratory, although this project has not been forgotten and forms part of the Society's planning for the future. In these circumstances it was necessary to find an outside organization which was both competent and willing to carry out the task, not an easy specification to meet. Through the good offices of a member of the Society's Technical Committee, however, we now have access to a laboratory which possesses first class equipment and staff, and moreover where the purpose of the work is fully understood. This is the manner therefore in which the recent equipment reviews have made their appearance and it is in this way that it is hoped to continue the work. Even with such excellent facilities these reviews cannot be produced unless manufacturers are willing to submit samples of their products for evaluation. Here again the Society is dependent upon the goodwill and co-operation of outside organizations but so far this has not been lacking as will be evident from the material already published. The present series is only the beginning and with continued co-operation from manufacturers and dealers it is hoped that this feature will provide interesting reading and guidance for a considerable time ahead.

Members will certainly have noted the increasing frequency of the appearance of an 80 page BULLETIN, and, provided the cost can be held within our budget, it is intended to continue this trend until the time arrives when every issue of the Society's journal can be at least of this size. Pages alone are not sufficient and to justify the publication of a larger BULLETIN the additional space must contain worthwhile material which will be of interest and value to the majority of our membership. To this end you are invited to submit to Headquarters articles covering the construction of equipment of all types, e.g. transmitters, receivers and test gear. This is not entirely one-way traffic, for not only will the writer have the pleasure and prestige of seeing his project described in the BULLETIN but a modest return will result which may enable bigger and better equipment to be built. If there is doubt as to the suitability of an article it is suggested that a summary should be sent to the Editor who will be pleased to advise on any particular project.

Greater space in the BULLETIN also means we need more photographs of *Amateur Radio* interest for illustration purposes. Prints should preferably be of half-plate size and glossy but we will consider any photograph which is clear and sharp from which a half-tone block can be made.

R.F.S.

# News from Headquarters

### Mr F. K. Parker, G3FUR

The Council has accepted with regret the resignation of Mr F. K. Parker from the office of Executive Vice-President for health reasons. The Council has also granted Mr Parker, who remains Council Member for Zone B, six months' leave of absence from meetings of the Council.

### Mr A. D. Patterson, GI3KYP appointed Executive Vice-President

At its meeting on 11 July, 1966, the Council appointed Mr A. D. Patterson, GI3KYP, to fill the vacancy in the office of Executive Vice-President caused by the resignation of Mr F. K. Parker. Mr Patterson is the Council Member for Zone F (Northern Ireland).

### Professor Martin Ryle, FRS

Professor Martin Ryle, FRS, has joined the small group of radio amateurs who have been honoured by the award of a Knighthood. Licensed before World War II as G3CY, Martin Ryle delivered one of the first public lectures ever given on radio astronomy when he addressed a crowded meeting of RSGB members at the Institution of Electrical Engineers on 9 April, 1948. G3CY has been for many years the man in charge at the Mullard Radio Observatory, Cambridge.

### National Field Day

The Council has accepted a recommendation that the wording of the rule governing power permitted for stations taking put in NFD should be revised with effect from the 1967 event. The new rule is as follows:

*Power Input.* Total d.c. input power to the valve, valves or other devices energizing the aerial, or to any previous stage of the transmitter, shall not exceed 10 watts. The valve or valves energizing the aerial shall have total maximum rated anode dissipation not exceeding 13·5 watts. Where semi-conductor devices are used, the total maximum rated dissipation (at an ambient temperature of 25°C) of the device or devices energizing the aerial shall not exceed 20 watts for the purpose of this rule. Manufacturers' published ratings only will be accepted.

### WWV

WWV moved last month from Greenbelt, Maryland, to Fort Collins, Colorado where three 20kW transmitters are now radiating 10kW on 5, 10 and 15 Mc/s with a fourth on standby. Similarly four 5kW transmitters are operating at 2·5kW on 2·5, 20 and 25 Mc/s. Two identical general-purpose aerials are on standby to meet any emergency. The new site is near to the National Bureau of Standards, Radio Standards Laboratory at Boulder, Colorado.

### REF QSL Bureau

The address is now PO Box 26, Versailles, which is different to the address of REF Headquarters.

## REGION 12
## OFFICIAL REGIONAL MEETING
## 20-21 August, 1966
## ELGIN - FOCHABERS - LOSSIEMOUTH

***Full details were published on page 483 of the July issue. Reservations for events and hotel accommodation must be received by GM3AEL, GM3GUJ, GM3KHH or GM3OWG by 9 August.***

# Aerials and Planning Permission

THE Council has been advised that it is possible that in certain circumstances it may not be necessary to obtain planning permission for the erection of aerials within the boundaries of an amateur's residence. Bearing in mind the importance of this question so far as members of the Society are concerned, and the number of cases which in recent times have come to the notice of the Council where planning permission for aerials has been refused, the Council is seeking the advice of Counsel on this question. So soon as Counsel's Opinion has been obtained a further note will appear in the RSGB BULLETIN. In the meantime, it is suggested that any member contemplating altering his existing aerial arrays or proposing to erect aerials on his property should, before taking any steps whatever, communicate with Headquarters giving full details of what is proposed.

Apart from the question of whether or not planning permission is required in any particular case, it may be that if you are the owner of the freehold of your house it is subject to covenants, or if you are a tenant that your Lease or Tenancy Agreement contains covenants which might prevent the erection of aerials. Therefore, before taking any steps or incurring any expenditure, you should ensure that there are no covenants which might prevent the aerial being erected.

Members who are proposing to purchase or take a tenancy of a house should ask their Solicitor to pay particular attention to the question as to whether or not there is anything likely to prevent the erection of aerials.

### Ten Metre RTTY

The ARRL has requested the Federal Communications Commission to permit the use of radioteletype emission on frequencies in the band 28·0 to 28·5 Mc/s thus bringing privileges into line with other h.f. amateur bands.

### Maritime Mobile Conference

A World Administrative Radio Conference to deal with matters relating to the Maritime Mobile Service is scheduled to be held in Geneva from 18 September to 4 November, 1967. Enquiries that have been made revealed that the agenda does not contain any item affecting amateur frequency allocations.

## Silent Keys

We record with sorrow the passing of the following amateurs:

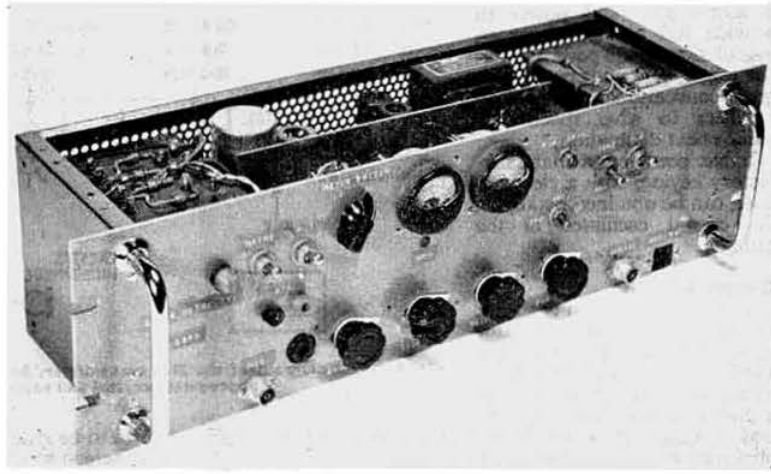
John Elliott, G3IUU, of Alton, Hampshire.
Thomas Hope, G3TIV, of Brentwood, Essex.
J. C. Downie, GM3LVS, of Methil, Fife.
L. W. G. Willis, BRS20729, of Sleaford, Lincs.

## Obituary

### Rupert Winstone Featherstone, FRSCS, G3UIM

The unexpected death of Rupert Winstone Featherstone (Win), G3UIM at the comparatively early age of 56, came as a great shock to all who knew him. Born in Luton, and educated in London, Mr Featherstone came from a well-known newspaper family. His great-grandfather, Mr Richard Gibbs, founded the "Hertfordshire Advertiser" at St Albans more than 100 years ago. Mr Featherstone moved to Derby in 1958 as Estates Manager to Derby Corporation. Being a keen short wave listener, his one ambition was to obtain his Amateur Licence, this he achieved last year. Although his spare time was extremely limited he was a most conscientious supporter of both our National and Local Radio Societies. His contacts over the air were few and it is sad to record that one of his last was with fellow members of the Derby Society at an exhibition station less than 24 hours before he died. To his widow and family we extend our deepest sympathy.

F.C.W.



The 2N4 v.h.f. transmitter designed and built by G8PD. It can deliver about 15 watts to an aerial on 4m or 2m from a QQV03-10. The panel is a standard 19 in. rack panel, and the chassis is constructed with Lektrokit.

# The "2N4" V.H.F. Transmitter

By A. J. Bayliss, B.Sc., G8PD*

AT the local radio club the writer was frequently challenged: "Why don't you come on v.h.f.?" Gradually enthusiasm was gained and the hard work of designing and building suitable gear had to be faced! After hearing about the relative merits of 2m and 4m it was clear that both had to be catered for but, quite apart from the space they would take up, the prospect of constructing a separate transmitter for each band was very unattractive. As a result, the two-band rig described in this article was born; it is a transmitter which is a little different from the usual form in that both bands are covered without coil changing. Just plug in the appropriate crystal, set four tuning capacitors, switch to RUN and talk!

## The Initial Design

The requirement was for a 2m and 4m transmitter without band switching which would mount on a 19 in. rack, be completely self contained, with modulator and power pack and taking up as little space as possible. An r.f. output of some 10 to 15 watts was aimed at; sufficient to be heard on its own or ample to drive a separate amplifier at a later date at the maximum permitted input power. Such an "add on" power amplifier would be simple to make and could use the power supply and modulator belonging to the station h.f. transmitter.

## Description of the Transmitter

The unusual aspect of the 2N4 transmitter design lies in the arrangement for covering 2m and 4m without coil changing or any other form of band switching. Much has been said and written about the desirability of keeping tuned capacities to an absolute minimum in v.h.f. transmitters in order to obtain a high L to C ratio for efficiency. This has, in general, led to most amateur v.h.f. transmitters being simple single band affairs.

Now modern v.h.f. twin tetrode valves have such small stray capacities that for 2m and 4m it appeared feasible to cover the approximately two-to-one frequency range by variable capacitor tuning without running up against an excessively high capacity on 4m. For success with this arrangement at v.h.f. every effort must be made to keep the wiring, and tuning capacitor minimum capacities to the absolute minimum remembering that whatever capacity is used to tune to 146 Mc/s, something just over four times that capacity will be required to tune to 70·1 Mc/s. To minimise the effect of strays and enable reasonable size coils to be used push-pull circuits have been used in the penultimate tripler stage as well as the power amplifier.

In practice the arrangement described has proved very satisfactory, the output being only marginally less on 4m than on 2m. On the latter band the output is quite in keeping with the figures given in the valve manufacturer's literature.

The general r.f. line up can be seen in the block diagram of Fig. 1. On 4m a crystal in the range 7788·8 to 7855·5 kc/s is used with an overall multiplication of nine, and on 2m the crystal frequency lies between 8000·0 and 8111·1 kc/s with a multiplication of 18 times. On 4m the oscillator anode is tuned to the crystal frequency, and although admittedly this is alleged to be a bad practice, no ill effects have ever been noticed in the circuit used, and on 2m the circuit tunes to double the crystal frequency. Typical frequencies for each of the four tuned circuits A, B, C and D in the transmitter are shown in Fig. 1.

In the audio section a twin triode two stage speech amplifier is transformer coupled to a push-pull modulator. There

* 99 Watford Road, Wembley, Middlesex.

is ample gain and power to provide full plate and screen modulation of the power amplifier stage. The power supply is quite conventional with silicon rectifiers to save space and reduce heat dissipation.

It has been found that satisfactory keying, with a clean T9 note, can be obtained by keying the crystal oscillator in the cathode.

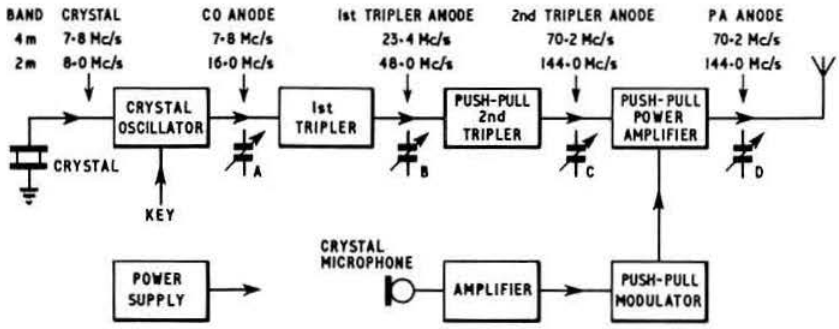



**Fig. 1. Block diagram of the 2N4 transmitter. Band changing is achieved simply by inserting an appropriate crystal and resetting four tuning capacitors.**

### Circuit Details

The circuit diagram is shown in Fig. 2. The crystal oscillator stage uses a Z77 pentode. The anode coil is wound on a $\frac{7}{16}$ in. diam. Aladdin former without a dust iron core (see Table 1), and is tuned by a 100pF tuning capacitor C1 of 10pF minimum capacity, a Jackson Bros. type C804.

The crystal oscillator circuit used is very stable and keys well, as shown, in the cathode lead. A test point is provided at the earthy end of the grid leak so that oscillation of the crystal may be checked by connecting a 0-1 mA meter between the test point and chassis across the 2·2K ohms resistor. A current of about 100 $\mu$A will be indicated when the crystal is oscillating.

The first tripler stage uses a 6CH6 valve which is provided with some cathode bias to limit the anode current to a safe value under key-up conditions. A 0-2 mA meter is included in the transmitter panel for measuring grid currents in the tripler and p.a. stages. A five-way rotary switch connects the meter with the appropriate grid circuits; the first tripler grid current being indicated when the switch is in position 1.

A push-pull output is obtained from the anode circuit of the 6CH6 tripler and circuit balance is preserved by the 4·7pF capacitor connected between earth and the end of the tuned circuit remote from that to which the anode is connected. The centre tap of the anode coil, see Table 1, is by-passed to earth and h.t. is supplied through a 220 ohm decoupling resistor. The tuning capacitor C2 (Jackson Bros. type C801) is very similar to that used in the oscillator anode circuit, but is of the pre-set type to which an insulated shaft has been added. Some vanes have been removed so that seven fixed and seven moving plates remain.

The second tripler stage is of the push-pull type and uses a QQV02-6 valve which has very low input and output capacities allowing a reasonable L to C ratio to be maintained on both 2m and 4m. Cathode bias is provided to limit the anode current to a safe value under key-up conditions. The grid current of each half of the valve may be checked by setting the grid current meter switch to positions 2 and 3. The screen grid feed to the valve is taken from a potentiometer so that the drive to the p.a. may be controlled. Because the dynamic resistance of the tuned circuits is much lower on 4m than 2m, the drive, which is sufficient on 4m, is excessive on 2m and may be reduced to the correct value by adjusting the screen potentiometer accordingly.

The push-pull anode circuit of the second tripler is tuned by a split stator capacitor C3, a Jackson Bros. type C808, 5-70pF, stripped down so that it has eight moving and seven fixed plates per section. With the capacitor thus modified the circuit just covers the range necessary to cover both 4m and 2m.

The push-pull p.a. stage uses a QQV03-10 twin tetrode valve. Battery bias of −15 volts is used although a small negative bias supply derived from the mains could be used instead. Grid current in the two halves of the valve may be measured by setting the meter switch to positions 4 and 5. A TUNE-RUN switch arranges for the screen voltage of the p.a. valve to be reduced while tuning up the transmitter. Anode and screen modulation is used and the anode current of the p.a. is measured on a 0-150 milliammeter.

The tuning capacitor in the anode circuit of the p.a. is of the same split stator type as in the previous stage but with only five moving and six fixed plates per section. Tank coil details are given in Table 1. A single turn link coil is coupled to the aerial socket.

The modulator stage uses a pair of N78s in push-pull with transformer input. A 12AT7 twin triode with both halves in cascade forms the speech amplifier and provides ample gain to give full modulation from a crystal microphone.

The power supply is quite straightforward and provides 275 volts h.t. on load. The auxiliary equipment switch simply allows the power supply and modulator to be used to run a separate 432 Mc/s tripler amplifier similar to that described in the RSGB *Amateur Radio Handbook*. A send-receive relay RLA has a contact in parallel with the h.t. on-off switch.

### Adjustment

Set the TUNE-RUN switch to TUNE and plug in a suitable crystal for 2m. Check that the crystal is oscillating by connecting a milliammeter between the test point and earth in the oscillator grid leak lead. As with other stages, typical grid currents will be found in Table 2.

Tune the anode circuit of the oscillator until maximum grid current is obtained in the 6CH6 stage with the meter switch set to 1. The tuning position should be with the tuning capacitor nearly at minimum capacity. Check that the frequency is twice the crystal frequency by means of an absorption wavemeter.

Next tune the anode circuit of the 6CH6 stage for maximum grid current in the QQV02-6 first tripler stage with the meter set to 2 or 3. Again, the tuning point should be near minimum capacity of the variable capacitor and a check should be made that the circuit is tuned to six times the

**TABLE 1**

*Coil Details*

| | |
|---|---|
| L1 | 22 turns, 30 s.w.g. enam., wound on 7/16 in. diam. Aladdin former. |
| L2 | 10 turns, centre tapped, 22 s.w.g. enam., wound on 7/16 in. diam. Aladdin former with dust core. |
| L3 | 3 turns, centre tapped, 18 s.w.g. tinned, $\frac{1}{2}$ in. i.d., $\frac{1}{2}$ in. long, self-supporting. |
| L4 | 6 turns, centre tapped, 14 s.w.g. tinned, $\frac{1}{2}$ in. i.d., $\frac{7}{8}$ in. long, self-supporting. |
| L5 | 1 turn in centre of L4. |
| RFC1 | 500$\mu$H r.f. choke. |
| RFC2 | 50 in., 36 s.w.g. wound on $\frac{1}{2}$ watt Erie resistor. |

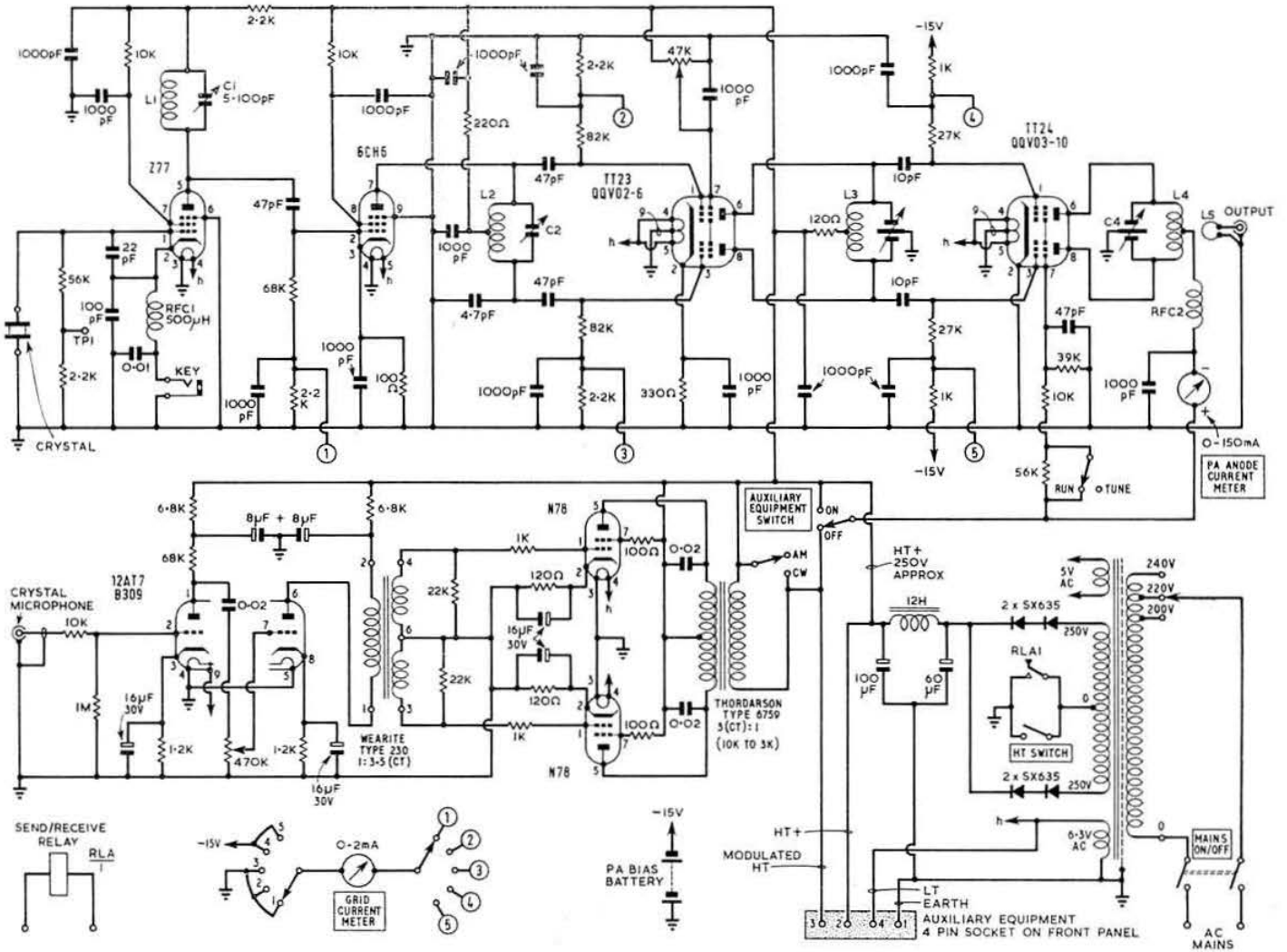



**Fig. 2. The complete transmitter circuit. C1, 10–100pF Jackson Bros. C804. C2, 10–100pF Jackson Bros. C801, with vanes removed to leave 7 rotor and 7 stator vanes. C3, 5–70pF Jackson Bros. C808, with vanes removed to leave 8 rotor and 7 stator vanes per section. C4, 5-70pF Jackson Bros. C808, with vanes removed to leave 5 rotor and 6 stator vanes per section. The modulation transformer used by the writer is an American Thordarson type 6759 matching 10 K ohms to 3 K ohms. The key jack socket in the cathode lead of V1 must short-circuit when the plug is withdrawn.**

crystal frequency using the absorption wavemeter. The grid currents in the two halves of the QQV02-6 should be nearly equal. If they are widely different try altering the value of the 4·7pF balancing capacitor.

Next tune the anode circuit of the QQV02-6 (second tripler) stage for maximum grid current in the p.a. valve with the meter set to 4 or 5. Again the capacitor should be near minimum. Check the correct multiplication with the wavemeter. Set the grid current to about 1·5 mA in each half of the valve by means of the screen potentiometer in the second tripler screen grid feed circuit.

**Table 2**
*Valve Currents*

| Stage | Current 4m & 2m |
|---|---|
| Oscillator grid | 100μA |
| First tripler grid | 1mA |
| Second tripler grid | 1mA* |
| P.a. grid | 1·5mA* |
| P.a. anode | 60mA |

* each half

Finally tune the p.a. to resonance with no load by setting the p.a. anode tuning capacitor for minimum anode current. The tuning point should be with the capacitor very near minimum capacity; some adjustment of the coil inductance may be necessary, and this is easily accomplished by squashing the turns together or pulling them apart. Switch from TUNE to RUN and connect the load. The output link may then be adjusted so that at resonance the p.a. valve draws the desired anode current.

The same procedure should then be followed using a crystal suitable for 4m. The correct tuning points will be found with the tuning capacitors set near their maximum capacity. Having once determined the tuning points for 2m and 4m marks can be made on the front panel and band changing simply consists of plugging in the appropriate crystal and setting the four capacitors to the correct marks.

### Conclusions

The transmitter works quite satisfactorily on both bands and has given quite a good account of itself in the 4m contests during the four years it has been in operation. It should be simple to duplicate the performance provided attention is paid to the points regarding stray capacitance. Constructional details are not included, as most constructors will probably wish to use components to hand, but this should not be any inconvenience to most amateurs. The general layout can, however, be seen in the accompanying photograph of the front panel and the photo of the chassis on the front cover of this issue.

# Radio Amateurs' Examination

## *Courses of Instruction*

Courses in preparation for the City and Guilds of London Institute Radio Amateurs' Examination will be held at the following centres during the session beginning in September 1966.

**Barry.** College of Further Education, Colcot Road, Barry.
Enrolment: 7 and 8 September, 6-8 p.m. Tuesdays (theory) and Thursdays (Morse practice and practical work); 7.30 p.m. to 9.30 p.m.

**Basildon.** Basildon Evening Institute, Pattiswicke Square, Basildon.

**Birkenhead.** Birkenhead Technical College.
The course will be conducted on Thursday evenings by L. Roberts, G3EGX.

**Brentford** Brentford Centre for Adult Education, Clifden Road, Brentford.
Enrolment: 15, 16, 19, 20 and 21 September. Monday evenings, 7-9 p.m. Fee 30s. for three terms.

**Bristol.** Bristol Technical College, Ashley Down, Bristol 7.
Enrolment: 8, 9 and 12 September, 2.30-4.30 p.m. and 6-8 p.m. Monday evenings, 6.45-9.15 p.m. Fees- under 18 years, £1; over 18 years, £2 10s.

**Carshalton.** Carshalton College of Further Education, Nightingale Road, Carshalton, Surrey.
Enrolment: 12-14 September, 6.30-8.30 p.m. Friday evenings, 7-9.30 p.m.

**Crawley.** Sarah Robinson Evening Institute, Ifield, Crawley, Sussex.
Further details from A. J. Gibbs, G3PHG, 6 Dairyfields, Gossops Green, Crawley, Sussex.

**Halifax.** Percival Whitley College, Halifax.

**Harlow.** Essex County College of Further Education, Harlow.
Instruction by P. Essery, AMIEE. Further details from G. O'Donald, " Great East," Harlow Road, Roydon, Harlow, Essex.

**Ilford.** Ilford Literary Institute (County High School for Girls), Cranbrook Road (adjacent to Gants Hill station).
Enrolment: 5-8 September, 7-8.30 p.m. Wednesday evenings, 7.15-9.15 p.m. (RAE). Morse classes will also be conducted. For further details and reservations contact W. G. Hall, G8JM, 48 Hawkdene, N. Chingford, London, E4.

**London.**

**E6.** East Ham Technical College, High Street South, E6.
Enrolment: 12-14 September, 7-9 p.m. Mondays (Morse code and practical), Wednesdays (RAE).

**E14.** Lansbury Adult Education Institute, Poplar Branch, New Technical Block, Byron Street, London, E14.
Enrolment: 19-23 September, 7-9 p.m., or by post to The Principal, Bow and Poplar Institute, Marner School, Devas Street, E3. Thursday evenings, 6.45-8.45 p.m. Fee: 25s.

**Sheffield.** Western Road Evening School, Sheffield 10.
Wednesday evenings, commencing 7 p.m. Further details from J. Bell, G3JON, 25 Edale Road, Sheffield 11.

**Stoke-on-Trent.** Northern College of Further Education, Longton Annexe, Trentham Road, Longton, Stoke-on-Trent.
Enrolment: 5-9 September at the New College, Moorland Road, Burslem. The course will be conducted on Monday evenings at 6.30-8.30 p.m. by K. H. Parkes, G3EHM.

### Can You Help?

A. J. Dixon, 27 Kingscourt Road, London, SW16, who requires a manual for the Pye Service Workshop Pack, reference 940020?

**Second International Convention**

**KNOKKE, BELGIUM**

**16-18 September, 1966**

Full details may be obtained from V. Claeys, ON4UM, Hoogstraat 68, Beersel, Belgium, or from Bob Fevery, ONL1322, Meerminlaan 22, Knokke, Belgium.

# The G3JJG S.S.B. Exciter

## *Part 2*

By G. F. GEARING, G3JJG*

PART 1† of this article described in detail unit 1 of the G3JJG exciter which delivers an upper sideband s.s.b. signal, based on a nominal carrier frequency of 2 Mc/s, at a level of 1·4 volts r.m.s. maximum when loaded with 4·7K ohms. Unit 2, described below, translates the 2 Mc/s signal to the variable tuning range of 5 Mc/s to 5·5 Mc/s; its output is suitable for conversion to the final signal frequencies required. A block diagram of this section is given in Fig. 1.

The unit will be considered as four small sections:

(i) A variable frequency oscillator covering 3 Mc/s to 3·5 Mc/s and its associated buffer amplifier;
(ii) A d.c. stabilizer formed by a Zener diode reference source and d.c. amplifier;
(iii) A half-Cowan type diode balanced modulator;
(iv) A class A broadband amplifier with a response level to within 1db over the range 5 Mc/s to 5·5 Mc/s.

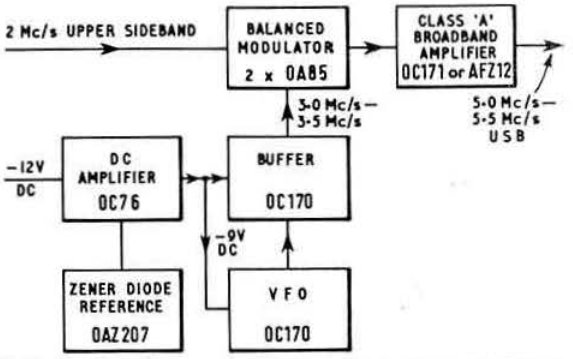



**Fig. 1. The block diagram of unit 2, the mixer and v.f.o. providing a tunable sideband output over 5 to 5·5 Mc/s.**

the h.f. end by the setting of C4. Capacitors C7 and C8 form a capacitive divider and C6 couples the tuned circuit to the transistor.

If the drift due to the change in capacitance of C1 to C5 is disregarded at this stage, drift will result from the increase in L1 inductance with increasing temperature, from the change in TR1 input capacitance as the base/emitter junction warms up and from the capacitive increase of C6, C7 and C8. The first model of the complete unit was built using good

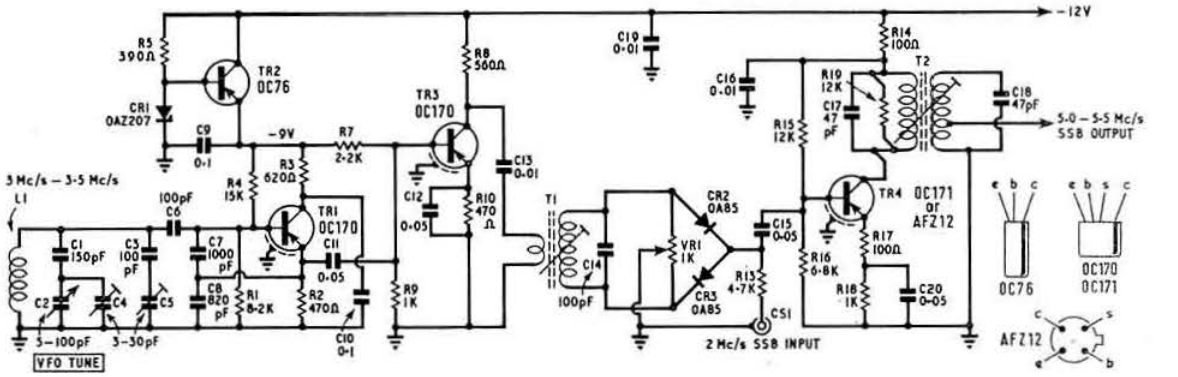



**Fig. 2. The complete circuit of unit 2. R6 was a resistor originally used in the prototype, but was not included in the final design.**

### Variable Frequency Oscillator

More work and time was devoted to the development of the v.f.o. tuned circuit than to any other stage in this exciter. Because the exciter must fit inside the original Princess‡ transmitter, the v.f.o. box is located adjacent to the screening box of the 300W p.e.p. linear amplifier and the heat rise above ambient can be as much as 30°C. Great attention was given therefore to choice of component types to restrict drift due to this rise in temperature.

The basic v.f.o. circuit, TR1 in Fig. 2, is very similar to the valved oscillator used in the Princess transmitter and can be regarded as a Colpitts-type circuit or the W3JHR " synthetic-rock " circuit§. No core is fitted to L1; the tuning range is adjusted at the l.f. end of the range by the value of C1 and at the h.f. end by the setting of C4. Capacitors C7 and C8 form a capacitive divider and C6 couples the tuned circuit to the transistor.

If the drift due to the change in capacitance of C1 to C5 is disregarded at this stage, drift will result from the increase in L1 inductance with increasing temperature, from the change in TR1 input capacitance as the base/emitter junction warms up and from the capacitive increase of C6, C7 and C8. The first model of the complete unit was built using good quality silver mica capacitors throughout the tuned circuit but with C2, C4 and C5 set to minimum capacitance. At an ambient temperature of 10°C, the circuit oscillated at a nominal frequency of 3500 kc/s. Heat was applied to the closed box to give a temperature rise of 5°C per 10 minutes falling slightly so that the total rise in 1 hour was 25°C. In this time, the drift amounted to 11 kc/s l.f., with the drift curve following the temperature curve closely.

To reduce this l.f. drift, C5 was set to maximum and a ceramic capacitor with a negative temperature coefficient of 750 parts per million was fitted at C3. The effect on the drift curve was obvious but the l.f. excursion still amounted to 8 kc/s. Presumably, by using more and more capacitance with a negative temperature coefficient, the drift could have been cancelled, but the thermal inertia of the capacitance might have resulted in severe frequency jumping.

Research into the problem revealed that silver mica capacitors have an inherent positive temperature coefficient

* 65 Ringwood Close, Furnace Green, Crawley, Sussex.
† RSGB Bulletin, July 1966.
‡ RSGB Bulletin, July and August 1964.
§ *Technical Topics for the Radio Amateur*, page 49.

of about 40 parts per million, which adds to the effect of L1 to produce the severe drift encountered. However, polystyrene capacitors now available have a negative temperature characteristic of about 150 parts per million and by using these components at C6, C7 and C8, the drift is dramatically reduced. With C5 at maximum and C3 at 1500 parts per million, the drift for a 25°C temperature rise is restricted to about 1 kc/s.

Drift is illustrated in Fig. 3; curve A shows the temperature rise and curve B shows the drift with C2 at minimum (3505 kc/s). C1 is also a polystyrene type to counteract the increasing effect of C2 and C4 as the v.f.o. is brought towards the l.f. end of its range. The " cold " drift of the oscillator, i.e. the drift due to the warming of the base/emitter junction only, exceeds 1 kc/s but the initial temperature rise tends to offset this drift. Little further improvement could be obtained without running the transistor at very low levels and this might well necessitate a further stage of amplification.

The transistor, TR1, is connected in the common-emitter configuration, with the d.c. working point determined by R4, R1 and R2. The collector is decoupled to earth by C10 and r.f. output is taken from the emitter of TR1. This signal is amplified by TR3 and matched to the primary of T1.

### D.C. Stabilizer

The oscillator is fed from a low-impedance d.c. source at the emitter of TR2. It is not sufficient merely to provide Zener diode stabilization as the current required by TR1 and TR3 base would approach the permissible Zener current, with consequent poor regulation. For this reason, the d.c. amplifier TR2 is added, with its base potential controlled at −9 volts by CR1, to limit the Zener current to 5mA while permitting up to about 15mA drain by the oscillator.

### Balanced Modulator

The 2 Mc/s s.s.b. signal input is passed through R13 to the balanced modulator, CR2 and CR3, and the switching signal, between 3 Mc/s and 3·5 Mc/s, appears across the secondary of T1. This transformer is broadly resonated to 3·25 Mc/s by C14, although the tuning is heavily damped by VR1. The output of the balanced modulator is taken through C15 to the base of TR4.

The sum and difference of the modulator input signals are present in equal strength at the base of TR4, together with the attenuated v.f.o. signal. About 20db attenuation is possible by the adjustment of VR1; if the layout is good, only about 6db more is available by the addition of capacitive balance on one side of the secondary of T1 and is therefore not essential.

### Broad-band Amplifier

TR4 is connected as a common-emitter amplifier with negative feedback across R17 and a broadband output transformer, T2, which selects the sum of the v.f.o. and s.s.b. signals to give output from 5 Mc/s to 5·5 Mc/s. The transformer T2 was designed in the same way as the transformers in the original Princess design. The primary and secondary windings are calculated on a common $Q$ value for the two coils which is attained by the intrinsic $Q$ of each winding in parallel with its external damping resistor. Knowing this figure, it is then possible to calculate the value of mutual inductance necessary for the desired response and thus the spacing of the windings on the former. See Fig. 5.

Output from the secondary of T2 is suitable for a high-impedance load, such as is offered by a series resistor feeding a half-Cowan diode modulator, similar to that previously used. The unit has 10db power gain but, because of the lower output impedance, the maximum output is about 0·7V r.m.s. in 1·5K ohms over the range 5 Mc/s to 5·5 Mc/s.

### Construction

The unit is built in an Eddystone diecast box, Cat. No. 650, which has internal dimensions of 4½ in. × 3½ in. × 2 in. Two screens made of 20 s.w.g. aluminium (Fig. 4) divide the available space into three separate areas. When the unit is associated with the complete exciter, it is mounted above the chassis plate, next to Unit 1; the spindle of the v.f.o. tuning capacitor C2 must coincide with the Eddystone 898 dial on the front panel of the transmitter.

The layout of the unit is shown in Fig. 4, together with detail views of the area around TR4. Earthing in the v.f.o. tuned circuit is returned to two solder tags between C5 and L1, using 18 s.w.g. tinned copper wire in modest loops; do not stretch the wire between points tightly as it could spring with increasing temperature and cause a jump in the oscillator frequency. Great care should be taken when soldering the polystyrene capacitors because it is easy to damage them with direct heat. It is a good idea to use a suitable " heat sink " such as a pair of pliers or a crocodile clip.

All components associated with TR1, TR2 and TR3, with the exception of the tuned circuit, are carried on tag strips mounted on the back of the box and at right angles to each other. The actual wire-by-wire layout is not critical and can logically follow the circuit. Three feed-through insulators pass through screen A, carrying −12V d.c., and the v.f.o. and s.s.b. signals to the balanced modulator.

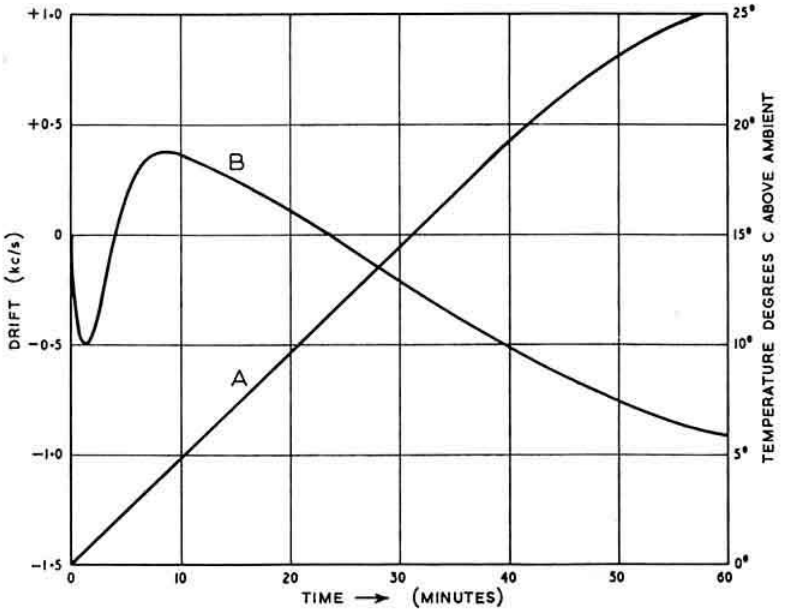



**Fig. 3. Curves of v.f.o. drift and temperature rise. Curve A shows temperature rise over a period of 60 minutes, and curve B is the measured drift over the period with C2 at minimum.**

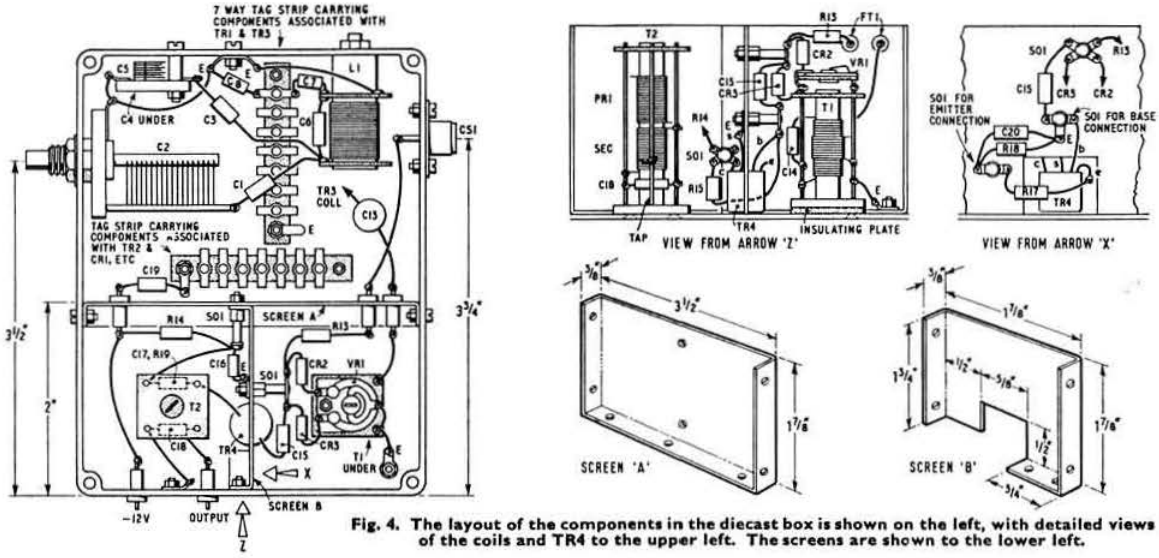



**Fig. 4. The layout of the components in the diecast box is shown on the left, with detailed views of the coils and TR4 to the upper left. The screens are shown to the lower left.**

The balanced modulator layout is simple but seems to be the optimum to reduce stray capacities to a minimum. VR1 is mounted directly above T1 and the diodes are wired to a stand-off insulator on screen B. The primary of T1 is earthed by a short lead and the v.f.o. signal is wired from the primary to the feed-through insulator in screen A. A $\frac{1}{4}$ in. hole in the back of the box is necessary to allow access to the core of T1.

Instability in a transistor amplifier can be avoided in most cases by ensuring that the input and output circuits are completely screened from one another but the common earth is available to both circuits. A cut-out is provided in screen B and TR4 is suspended upside-down by its connections, with the base and emitter on one side of the screen and the screen and collector on the other side. C15 is connected from the modulator stand-off insulator to the base insulator. T2 is located centrally in the remaining compartment, with the supply line connections to another insulator at the join of the two screens.

In the majority of places, 6 BA nuts and bolts are used but the bolts must have countersunk heads where they pass through the back or the base of the box. Two feed-through insulators in the base of the box carry the −12V supply to the unit and the r.f. output to the following unit.

## Alignment

When the unit is completed, it is wise to supply −9V from a type PP1 battery and measure the d.c. voltages on each transistor. This will reveal most inaccuracies in wiring; voltages measured on the prototype with a 10K ohms per volt meter are given in Table 1, using a −12V supply, and can be used as a guide. The potentials on TR3 alter slightly with the oscillator on or off.

To set the coverage of the v.f.o., C2 is set to minimum capacity, C5 to mid-travel and, monitoring the signal on a receiver, C4 is adjusted to bring the oscillator to 3505 kc/s With C2 at maximum, the frequency should then be just below 3000 kc/s; if necessary, the value of C1 can be altered slightly to give the desired coverage. It is not practical to attempt the critical adjustment of C5 until the unit is located in its final environment and has been used for a few hours at an elevated temperature. This is to " burn-in " the components.

**TABLE 1**
**Voltage measurements using a 10K ohms per volt meter. D.c. supply −12V.**

| | TR1 | TR2 | TR3 | TR4 |
|---|---|---|---|---|
| Emitter | −2·5 | − 8·9 | −3·1 (osc. off −2·4) | − 3·6 |
| Base | −2·3 | − 9·1 | −2·6 (osc. off −2·65) | − 3·8 |
| Collector | −5·0 | −12·0 | −8·4 | −11·6 |

With a g.d.o. closely coupled to T1, the circuit should be resonated to 3·25 Mc/s; the indicated dip will be faint because the circuit has a low operating *Q*. After this adjustment, couple the receiver to the secondary of T2 and, monitoring the v.f.o. frequency, adjust VR1 for minimum signal. The potentiometer should be at or about mid-travel. Check that the residual signal cannot be reduced appreciably by touching either side of the secondary of T1, showing that additional capacitive balance of the circuit is not essential.

Load the output of the amplifier with a 1·5K ohms resistor and apply a single-tone signal to CS1, either from Unit 1 or from a signal generator, at a level of about 1V r.m.s. Tune T2 to give maximum output; swing the v.f.o. across the range and make compromise adjustments to T2 until the output is sensibly constant at all frequencies. The outer tuning position of each core of T2 must be used. When a modulated signal is applied to CS1, the monitored speech output should be clear and free from distortion.

The following measurements were made on the prototype, using a Marconi TF1041 valve-voltmeter:

*No input to CS1* TR1 emitter 0·68V r.m.s.
TR3 collector 1·6V r.m.s.
either side T1 sec. 0·75V r.m.s. (allowing for the effect of the probe on circuit balance)

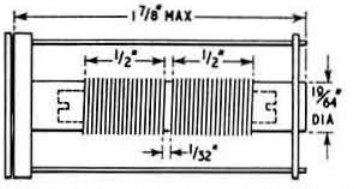



**Fig. 5. Dimensions of the broadband transformer T2.**

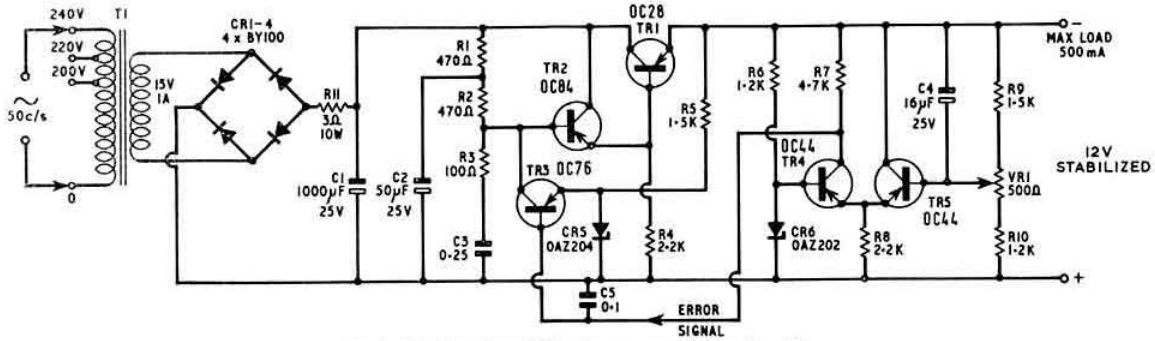



**Fig. 6. The 12 volt stabilized power supply for the v.f.o.**

*Single tone input to CS1, level 1·4V r.m.s.*
TR4 collector 2·6V r.m.s.
Output T2 sec. 0·7V r.m.s.

### Power Supplies

With two units completed and linked together it is no longer practical to use dry batteries and it is worth considering the power supply for the transistorized parts of the exciter. A suitable circuit is shown in Fig. 6 and is admittedly quite complex; however, there is little point in aiming for 50db carrier suppression in the transmitted signal if the a.c. ripple on the —12V supply exceeds about 0·3 per cent.

A transformer T1 with standard primaries and a 15V secondary feeds a full-wave bridge rectifier using four silicon diodes type BY100. The output of the bridge is fed through the current limiting resistor R11 and smoothed by C1. R11 restricts the charging current demanded by C1 at switch-on and also limits the maximum short-circuit current of the power supply.

The stabilizing circuit consists of a variable impedance, TR1 in series with the load and a two-level voltage sensing circuit, and fed from the output, formed by TR3 and the differential amplifier TR4, TR5. Zener diodes CR5 and CR6 provide stable reference voltages against which is compared a fraction of the instantaneous output potential of the power supply. TR2 is used as an impedance transformer between the base of TR1 and the collector of TR3. The output voltage under steady operating conditions is determined by the setting of VR1 and so the potential at TR5 base. If, for example, the voltage at the output falls (due to an increase in load or a fall in supply voltage) then the action of the circuit is as follows:

TR5 base is less negative and so TR5 emitter current is reduced; the voltage across R8 falls so that TR4 emitter potential is less negative; TR4 base potential is held constant by CR6 so that the effect of the change across R8 is to increase the conduction level of TR4. Thus the collector potential of TR4 falls less negative and TR3 conducts less heavily; TR3 collector, and so TR2 base, go more negative, followed by TR2 emitter. Because the base of TR1 is now more negative, the transistor conducts more heavily and its effective resistance falls, increasing the potential at the output and so restoring the circuit to the set voltage.

As the circuit has a high loop gain, oscillation is possible at a frequency determined by the transistors. This can result in a bewildering series of " birdies " in the signal from the s.s.b. exciter; such instability is avoided by use of r.f. transistors at TR4 and TR5 and the addition of the series components R3, C3 and by C4 and C5. C5 must be located close to the base connection for TR3. Even so, it is well to bear this in mind and, if possible, to view the output of the power supply on an oscilloscope.

In the prototype, T1 and the rectifiers were available in the Princess transmitter, although only 12V a.c. can be supplied to the stabilizing circuit. For this reason, it was necessary to omit R11 and to be careful not to short-circuit the output. Apart from this, the circuit operates correctly. The stabilizer circuit is constructed on a small piece of Lektrokit board which is mounted on pillars on the heat sink of TR1. The circuit is then mounted on the chassis plate of the exciter.

Components used in the power supply are quite standard. All resistors with the exception of R11 can be ¼W rating, 10 per cent tolerance; capacitors C1, C2 and C4 are electrolytic and C3, C5 are miniature metallized foil. VR1 has a linear carbon track. Different types of rectifier diode may be used at CR1 to CR4 but should be able to withstand a short term load of 6 amps.

(This article will be concluded shortly)

**THE G3JJG S.S.B. EXCITER—COMPONENTS LIST FOR UNIT 2**

C1, 150 pF polystyrene.
C2, 5-100 pF Eddystone type 585.
C3, 100 pF ceramic N1500.
C4, C5, 3-30 pF air-spaced trimmer.
C6, C14, 100 pF polystyrene.
C7, 1000 pF 5 per cent polystyrene.
C8, 820 pF polystyrene.
C9, C10, 0·1 μF miniature foil.
C11, C12, C15, C20, 0·05 μF miniature foil.
C13, C16, C19, 0·01 μF disc ceramic.
C17, C18, 47 pF 5 per cent polystyrene.
L1, v.f.o. coil, 17μH, Electroniques type VO3C.
R1, 8·2 K ohms. CR1, OAZ207.
R2, R10, 470 ohms. CR2, CR3, OA85.
R3, 620 ohms.
R4, 15 K ohms.
R5, 390 ohms.
R6, not used.
R7, 2·2 K ohms.
R8, 560 ohms.
R9, R18, 1000 ohms.
R11, R12, not used.
R13, 4·7 K ohms.
R14, R17, 100 ohms.
R15, R19, 12 K ohms.
R16, 6·8 K ohms.
T1, 19/64 in. diam. × 1¼ in. former with tag-ring and dust-iron core. Main winding 60 turns 36 s.w.g. enam. copper close-wound; link winding 20 turns 36 s.w.g. enam. over centre of main winding.
T2, 19/64 in. diam. × 1¾ in. former with tag-ring and two dust-iron cores. Primary and secondary each 58 turns 36 s.w.g. enam. close-wound; tap 16 turns from bottom of secondary. Spacing between end of top winding and start of bottom winding ½ in. —see Fig. 5.
TR1, TR3, OC170.
TR2, OC76.
TR4, OC171 or AFZ12.
VR1, 1000 ohms carbon linear pot (skeleton type).

### GB2SM

Walter Davidson, GM3NYY, has joined the staff at the Science Museum and is now an operator of GB2SM.

# THE MONTH ON THE AIR

By JOHN ALLAWAY G3FKM

SINCE the amount of information which has come in this month is considerable your scribe will omit the trailers and move straight on with the substance of the article!

### News from Overseas

Maurice Caplan, 9V1MK, has written to give further information concerning the pending trip to VS5 being undertaken by the Royal Signals Singapore Club. He says that it seems that A3a transmissions are just not catered for in the Brunei licensing regulations which appear to be based on the 1913 Wireless Telegraphy Act! Maurice wondered why the application contained so many references to spark transmission, but says that he now knows why. As far as equipment is concerned it would seem that there are two DX 40's and a LG300 available; the aerials will unfortunately be fairly primitive as although the Hy-Gain Company offered to lend a TH-4 beam and an AVS-13 vertical, due to postal delays it was not possible to take advantage of this kind offer in the time available. QSL cards should be sent via RSGB as 9V1MK will be back in the UK in September, but cards sent to Maurice's 9V1 address will also be answered.

Also from Singapore, 9V1NT (9M8II, G3III) reports that he is now active on c.w. on 7, 14 and 21 Mc/s from Singapore and Sarawak between 11.00 and 16.00 GMT. Greg says that it is some ten years since he was last on the DX end of the business and he notices a great deterioration in manners amongst the stations calling him. His own experience suggests that the OH, SM, and DL gang are the best signals out there, with the Gs a long way down the list. In two weeks' operation from 9M8 he only raised five UK stations. As he says, surely they don't all work every afternoon, including weekends. The W5, 6 and 7 boys appear to be by far the best for quick and to the point QSOs. When in Singapore Greg uses a KW Valiant running 60 watts to a Mosley V-4-6 aerial and a Heathkit RA-1 receiver. In 9M8 he has 135 watts at his disposal, and a half size G5RV aerial. It is emphasized that all QSLs must be sent via the 9V1 bureau for both call-signs, and that direct cards are not acceptable.

Mrs Sheila Stratfull, wife of John, VP2KR, has recently obtained her licence, and is now VP2KQ. Her QTH appears in "*QTH Corner*."

Robin Francis, G3RWU/MP4BFH has just been issued with a licence to operate from Muscat for the duration of his stay there, which is likely to be for about one year. He will be on all bands, c.w. and s.s.b., and says that the transmitter power will be *about* 150 watts as the mains voltage out there varies rapidly between 180 and 230 volts! The call-sign issued, MP4MAW, is believed to be the only legal one currently active from Muscat. In a footnote, Robin says that the last batch of QSLs for his MP4BFH stint will be despatched shortly.

Mike Dransfield, 5N2AAF, has now returned to Nigeria following his recent 10 week leave, which brought him to the UK and also the IARU Conference in Yugoslavia. He reports that there was a sudden flurry of new licence issuing during March and April, and potential amateurs who had applied for permission to operate 18 months ago suddenly found themselves on the air. However, since then things have apparently reverted to their previous state as Mike knows several people who applied for licences five months ago and have obtained no response. It seems that the series of new calls has now reached 5N2AAZ. One of those still waiting is Reg, ex-ZD3A, who now organizes a radio network for an oil company in Nigeria. Mike is concentrating on 15 and 10m for the next few months; he remarks on the apparent absence of signals from the UK on 15m at the time his daily sked with his father is kept (15.00). He thinks that there are many more people listening on 10m than one realizes; at present he is hearing the UK stations quite well until they fade out around 17.00 when their place is taken by the Ws which come through until 19.00. During a QSO on 9 July he passed along the information that the Ghana authorities have now lifted the ban on amateur activity and that the 9G1s have been back on the air since 8 July.

VU2GG has just returned home after spending 13 years in India, the last five of them on the air with a VU call. He hopes to settle down in the UK now and obtain a G call. His old equipment was left in India and is being used by the VU boys. Roy has all the logs for his past operation and will be pleased to QSL to anyone who still needs a card from him. His QTH will be found in *QTH Corner*. He apologizes for the fact that quite a number of cards do not appear to have been surviving the journey through the Indian bureau in either direction and says that they have promised to try to move things on a little faster in that department.

An interesting note, received from W9FKC by G2MI, gives details of the recent Don Miller set-up on Minerva Reef. It seems that the place is a coral reef with a tide of about 2 ft., the whole area apart from a few score rocks being submerged at high tide! These rocks are about the size of a dining table and are about 3 ft. above high tide level. The operating position was a table like shelf between two of them. This supported all of the gear, including the generator and Don himself sitting in a box with his feet in the water. Mike says that to him it seems crazy, but so does mountain climbing!

### Top Band News

One of the group of UK 160m DX enthusiasts, G3RBP, is at present in Kenya, where he is disappointed to find that it is at present impossible to obtain a licence. However, he has been doing some listening and had a pleasant surprise during the Summer 160m Contest. Between 23.20 and 24.00 he positively identified G3IZU, G3LHJ, G3SWT,

**G3FKM Top DX'er**

On behalf of all readers of MOTA we offer our congratulations to Dr John Allaway, G3FKM, on his achievement in winning the 1965 Long Island DX Association Contest. This contest, which ran from 1 January to 31 December, 1965, attracted many entries from all over the world and it is a tribute to the skill of G3FKM that he was able to gain the very handsome trophy for the UK.

* 10 Knightlow Road, Birmingham 17. Please send all reports to arrive by **13 August** for the **September** issue, **5 September** for the **October** issue, and **5 October** for the **November** issue.

G6BQ, EI9J, OK2BOB, and OL4ARM. The OK2 was the strongest signal on the band—amateur or commercial! Roger could hear at least 10 other stations, but QRN plus the fact that they were sending at contest speeds made identification impossible. Calls partly identified included G3?AY/P, G3SS?, G3TI?, G3PDQ (?), GM3KHH (?). These were logged on a Racal RA 17 receiver, with a rhombic aerial, several hundred feet high and directed on Bombay. Signals were improving at 24.00 so it seems very likely that QSOs between the UK and 5Z4 could take place, especially at a more favourable time of year.

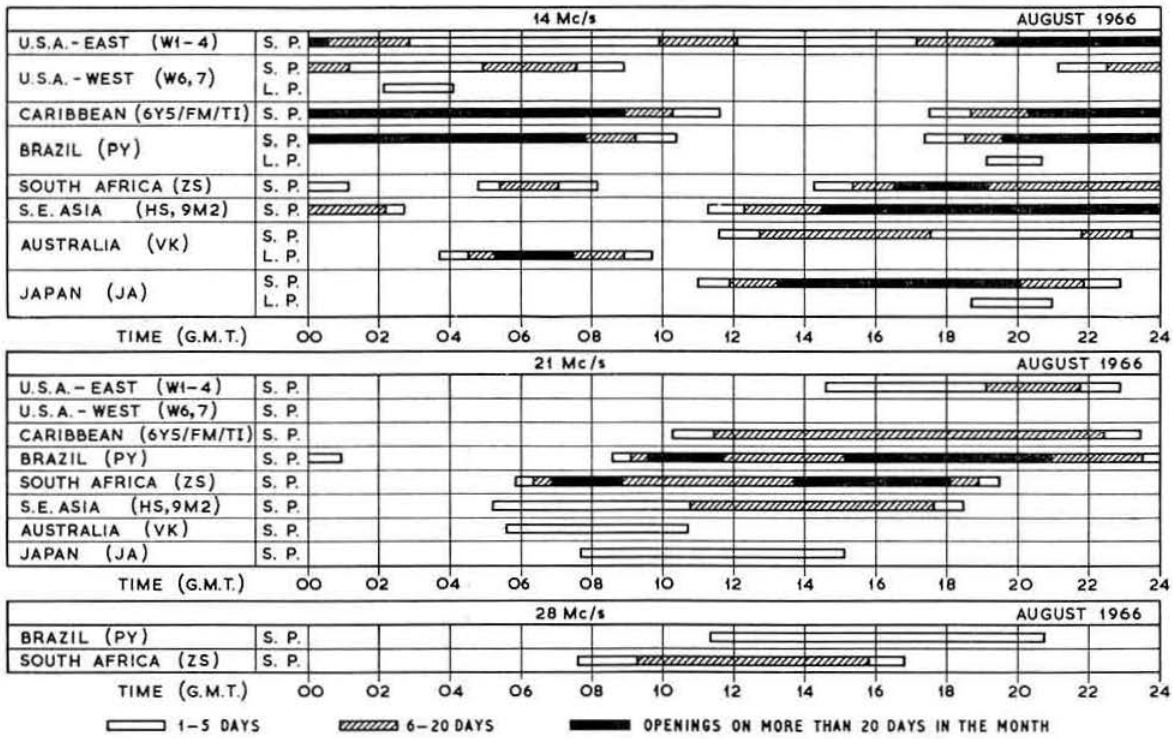
Keen Top Band DX types will also be interested to know that one of *MOTA's* sleuths overheard HI8XAL in QSO one evening recently on 7 Mc/s saying that he is planning big things for the next 160m season. He is planning a new aerial, which will contain a quarter of a mile of wire, and also has ideas about a 500 watt amplifier. Fred was on the band last season, but did not work into Europe, it would seem that this state of affairs may soon be remedied!

GM3SVK mentions that he would be pleased to arrange a sked with anyone who needs a contact with Shetland. His QTH is: Fred L. Curtis, RAF Saxa Vord, Haroldswick, Unst, Shetland.

## Contests

The **VK/ZL/Oceania DX Contest** 1966 will be held as follows: Phone section: 10.00 GMT Saturday, 1 October to 10.00 Sunday, 2 October; C.W. section: 10.00 Saturday, 8 October to 10.00 Sunday, 9 October. The object of the contest is to contact as many stations in Oceania as possible. The usual exchange of serial number of contact and RST or RS should be effected. Non-Oceania stations earn two points per VK/ZL QSO, and one point for an Oceania QSO other than VK/ZL. A multiplier is obtained by adding the total of VK/ZL call areas worked on all bands. (Note that the same call area worked on different bands counts as a separate multiplier.) Logs should show Date, Time (GMT), Call-sign, Band, Serial number sent, Serial number received, Points. Each new VK/ZL area contacted should be underlined, and separate logs should be submitted for each band. A summary sheet showing details of equipment used, and individual band QSO points and VK/ZL areas worked should also be

## PROPAGATION PREDICTIONS




**August is the last month with summertime propagation conditions, which are markedly worse than these of the winter, especially on 21 and 28 Mc/s. In the course of September, however, DX conditions on these bands improve steadily to reach a maximum in the latter half of October and in November. Solar activity has recently shown a sharp increase, so that in spite of the summer season, conditions on 21 and 28 Mc/s should be very much better than in August 1965. On 28 Mc/s under favourable conditions Africa may be heard, and occasionally South America also. On 21 Mc/s only South America and Africa will be heard with certainty and the other DX zones only on days with above average F2 m.u.f's. The summertime short skip conditions will continue this month and European traffic will liven up the 21 and 28 Mc/s bands. This mode can therefore still be used to collect points for WAE, for in September the season for short skip conditions draws slowly to a close. 14 Mc/s will continue as the main DX band and all continents should be workable on this band. Propagation conditions will generally resemble those for last month, except that with the approach of the equinox (day and night of equal duration) traffic with some DX zones via the long path will become more difficult. On 7 and 3·5 Mc/s the summer conditions, as in May, June and July, will continue almost unchanged. In the latter half of the night on 3·5 Mc/s interruption of local traffic by the dead zone will only occur when conditions are disturbed.**

**The provisional sunspot number for June 1966 was 46.4 with activity distributed evenly throughout the month. The predicted smoothed monthly sunspot numbers for October, November and December are 55, 59 and 63 respectively.**

included. The entry should also include a signed statement that all rules and regulations were observed, and should be posted to reach NZART, Box 489, Wellington, New Zealand, before 21 January, 1967. Attractive certificates will be awarded to each country (call area for W/K, JA, SM, UA) on the following basis: (1) Top scorer using all bands; (2) Top scorer on individual bands; (3) Other certificates may be awarded if activity justifies their issue; (4) Separate awards are issued for Phone and C.W.

The **International OK DX Contest** (which is c.w. only) will take place between 00.00 and 24.00 on the second Sunday in November. All bands 1·8 to 28 Mc/s may be used. Stations exchange RST plus a figure denoting the number of years the operator has been licensed. A station may be worked once on each band, complete QSOs counting for one point, and those with OK stations three points. Multipliers consist of prefixes. There are three categories, single operator all bands, single operator one band, and multi-operator all bands. Logs must be sent to the Central Radio Club, Post Box 69, Prague 1, Czechoslovakia, postmarked no later than 31 December. Leaflets giving fuller details of this contest are available from G3FKM.

This year's **WADM Contest** (East Germany) will be held between 20.00 1 October, and 20.00 2 October. This is a c.w. only affair, and covers all bands 3·5 to 28 Mc/s. The usual serial numbers (RST plus QSO number) should be exchanged. Each complete QSO with a DM counts 3 points, incomplete QSOs count 1 point, and each station may be worked only once on each band. Non DM stations count DM districts per band as multipliers; these are identified by the last letter of the call-sign. The contest is open to single operator and multi-operator stations, and also to SWLs. QSOs in this contest may be counted for credits for the WADM and RADM awards. Logs should show date and time of QSO, call-sign of station worked, number sent, number received, district, band, and points claimed, and should be sent to: Radioklub der DDR, DM Contestbureau, 1055 Berlin Box 30, German Democratic Republic, postmarked no later than 15 November.

The **7th All Asian DX Contest** will be held from 10.00 GMT on 27 August to 16.00 on 28 August, on c.w. only, all bands 1·8 to 28 Mc/s. Serial numbers should be exchanged consisting of RST followed by the operator's age—in the case of YL operators this should be sent as 00(!) . For non-Asiatic stations QSOs with Asian stations count one point, and the total number of Asian countries worked on each band is taken as a multiplier. There are single and multi-band classes of entry. Logs must arrive at: JARL Contest Committee, PO Box 377, Tokyo Central, Japan, before 30 December. Leaflets giving fuller details are available from G3FKM. The certificate winners in the UK of last year's contest were **G2DC** (multi-band) with 2100 points, **G3PJW** (14 Mc/s) with 1104 points, and **GM3JDR** (14 Mc/s) with 150 points. Other 14 Mc/s entries were G3EYN (528) and G3JFY (42 points).

## Awards

The Amateur Radio Society of India issues the **Worked Republic of India Award** (WRI Award) to licensed amateurs who are members of societies affiliated to IARU. Requirements are proof of having contacted 50 stations in India since 26 January, 1950, in the form of QSLs or other written evidence. These should show the date and time of the contact, the mode and frequency used, and signal report and location. The QSLs should be accompanied by a list giving full details of the information shown on them, and should be sent, together with 12 IRCs to: "Awards Manager," ARSI, PO Box 534, New Delhi 1, India.

The "**YO-30-YR**" award will be issued by the Central Commission of Radio Sport in Rumania to commemorate the 30th anniversary of the first YO radio society. The award may be obtained by contacting YO stations to obtain "points" during September 1966. European stations may apply for three classes of the certificate—**I** require 200 points, **II** 150 points, and **III** 100 points. During September all YO stations will give a number after their reports denoting the number of years they have been on the air. This number is the points value of the QSO. Each station may be worked only once on each band. This award is also available to SWLs who submit logs showing both call-signs of stations in QSO. Applicants should forward a list of claimed QSOs, plus their QSLs for the YO stations worked and seven IRCs before 30 October, 1966 to: CRC (YO-30-YR), PO Box 1393, Bucharest 5, Rumania. Leaflets about this award are available from G3FKM.

A most attractive certificate issued by Geoff Watts, is the **Islands-On-The-Air Award** (IOTA), which is beautifully printed in red, blue and silver on cream parchment. The rules for this award are quite complicated, and those interested are advised to write to the sponsor at 62 Belmore Road, Norwich, Norfolk, NOR 72 T for full details. A useful directory of islands may be obtained from Geoff for 2s. or four IRCs. This is an essential item for those working for the award or taking part in the **1966 IOTA Contest**.

An "**International Amateur Hall of Fame**" is being organized by the IARC in Geneva, Switzerland. Each year five amateurs will be chosen to have their names inscribed on a plaque which will be displayed on the IARC premises; they will also receive a replica of this plaque. The five will be selected from nominees submitted by fellow amateurs from all over the world to a board of distinguished judges. Nominations will be called for from the following spheres of activity (*a*) Advancements in electronic techniques and equipments; (*b*) Traffic (!) and DX activity; (*c*) Achievements in the more exotic phases of Amateur Radio such as moon-bounce, space probes, and "*OSCAR*"; (*d*) Emergency and Disaster communications; (*e*) Development of Amateur Radio. The five selected may all be in any one of the above categories and not necessarily distributed equally through the five classes. (From the non-US point of view this would seem to be just as well, as some of the categories are not applicable to amateurs outside the United States.) Nominees may be anyone holding an Amateur Radio licence in a member country of the ITU. The plaques will be provided by the Hallicrafters Company. Nominations should be sent to Dorothy Strauber, 12 Elm Street, Lynbrook, NY 11563, USA before 31 December, and should give details of the accomplishment of the person nominated.

## DXCC News

Official Bulletin No. 64 from ARRL announces the addition of two new countries to the ARRL Countries List. These are **Maria Theresa** and **Minerva Reefs.** Maria Theresa, French territory, is located in the South Pacific at approximately 152 degrees West and 36 degrees South. Minerva Reefs are located at 179 degrees West, 24 degrees South. Credit for these two new ones is effective immediately. It would seem that the former practice of announcing a starting date before which QSLs could not be submitted has now been discontinued.

## DXpeditions

The last few weeks have been a rather disappointing period owing to at least two planned sorties not quite coming up to expectations. The trip by **CR7GF** finally got under way and he worked many stations from the Comoro Islands, using the call-sign FH8GF, but when he appeared from Glorieuse Island his signal was very weak, and it was later learned that the equipment was giving trouble and that José had had to abandon the rest of the itinerary and return home. It is

believed that Tromelin and Aldabra Islands will be visited later.

The other great disappointment was the **VK2ADY/VK0** operation by Don Miller (W9WNV) from Heard Island. For some reason Don's signals were very poor indeed in Europe, and there was no evidence of his even being on the band at the normal time for the best propagation between Heard Is. and the UK. This is extremely difficult to understand as signals from the Indian Ocean area were being received well throughout his three day stay. It is understood that he operated only on 14 Mc/s, and did not try 7 Mc/s as has been his custom in the past when he could not work into Europe any other way. No doubt the full story will reach us in due course, but from the European point of view this expedition was an almost complete failure. A news release by Ack, W4ECI, says that Gus Browning, W4BPD, was to have accompanied Don to VK0, but was unable to do so because his wife was taken ill just before Gus was due to leave. We all hope that this was a temporary illness and that her health has now returned to normal. Ack also says that he hopes that Gus and Don will be able to team up for some visits to unspecified rare places in the near future. The writer heard W4ECI telling another W during a QSO that there was a 40 per cent chance of operation from Albania. . . .

Those who needed QSOs with Haiti were delighted to hear the excellent signals being put out by **HH9DL** recently. This was a DXpedition by W8LXU and W8LUZ (who is a member of the Ex-G Radio Club). The pile up on their frequency had to be heard to be believed, and was a vivid demonstration of the difficulty of making short and snappy contacts when stations zero beat with the DX station are contacted. QSLs should be sent to the QTH in *QTH Corner*.

The GB2GC expedition to **Alderney**, by G3POI and G3SHZ, will take place between about 20 August and 2 September. It is planned to use all bands between 160m and 23cm, so this should interest many. The equipment will consist of a KW2000A with a KW600 linear on the h.f. bands, and between 50 and 20 watts a.m./c.w. on the higher frequencies. Aerials will consist of a TA33 beam, V4-6 vertical and 264 ft. inverted V plus stacked Yagis on 70, 144, and 432 Mc/s and a parabolic reflector for 1296 Mc/s. Frequencies will be 1820, 3508, 7003, 14,020, 21,020, 28,020 kc/s on c.w. and 14,110, 14,250, 21,420 kc/s etc. on s.s.b., V.h.f./u.h.f. frequencies will be 70·35, 144·120, 432·150 and 1296·450 Mc/s. The **GB2GC** call-sign will be used above 28 Mc/s, and **GC3POI/P** and **GC3SHZ/P** on the h.f. bands.

The Outer Hebrides (Isles of Lewis and Harris) will be activated by G3NRU between 6 and 13 August. He will be on 160m and 80m. His call will be **GM3NRU/P** and he will be operating mobile while en route.

The **Boy Scouts of Japan** will be establishing an Amateur Radio station at the 4th Nippon Jamboree from 5 to 9 August. It will be active every day between 00.00 and 03.00 and 04.00 and 08.00 GMT, and the call-sign will be **JA1YSS.** Frequencies to be used are as follows: 3535, 7070, 14,130, 14,310, 21,195 and 21,350 kc/s. A special QSL card will confirm all QSOs. Contacts with overseas Scout stations are particularly desired.

The Chester and District Radio Society has organized an expedition to the **Isle of Arran** in the County of Bute which will be on the air between 15 and 18 September. All bands 160 to 10m will be used, and some v.h.f. operation may take place. Operators will include G3ATZ, G3DRB, G3TZO, GW3TOW, GW3LDH, and GW8AOC, and they will be using a KW2000A. Further information may be obtained from G3TZO.

## QTH Corner

| | |
|---|---|
| **AP2AD** | Ahmed Ebrahim, (STE), SUI Northern Gas Pipelines, PO Box 94, Lyalipur, West Pakistan. |
| **CT3AR** | via K6CYG, 11058 Queensland Street, Los Angeles, Calif. 90034. |
| **CR3KD** | CT1KD (Callbook) Manuel Pardal, Rua Marques de Olaho 49, Bairro da Madre de Deus, Lisbon, Portugal. |
| **EA8FF** | Box 860, Las Palmas, Canary Is. |
| **FH8GF** | via W6LDA, 6158 W.74th St., Los Angeles, Calif. 90045. |
| **FR7GF/FR7G** | via W6LDA. |
| **FM7WQ** | Operation by K5AAD—W4OPM, 2208 Dinwiddie Road, Virginia Beach, Va., USA. |
| **FW8RC** | R. Cleret, P. T., Mata Uta, Wallis, via Noumea, New Caledonia. |
| **HB0XBA** | DJ5CQ, Rudolf Mueller, 8601 Ebing bei Bamberg, Nr.122A, Germany. |
| **HH9DL** | Operation by W8LXU, W8LUZ—via W8LXU, 124 Davis Road, Centerville, Ohio. |
| **I0RB** | I1RB, Pier Bavassano, Via Bossolasco 8, Turin, Italy. |
| **KB6CZ** | via K4MQG, (CB) Robert Dixon, 1618 1/2 Central Avenue, Augusta, Ga. |
| **W4LYY/KS6** | via W4 QSL Bureau. |
| **LA1EE/P** | via W2GHK. |
| **LX2UW** | via W2GHK. |
| **DJ6QT/LX** | via W2GHK. |
| **PX1YR** | via W2GHK. |
| **VK2ADY/VK0** | via W4ECI, 3101 Fourth Avenue South, Birmingham, Alabama, 35233. |
| **VP2KQ** | Sheila Stratfull, Audit Dept., St Kitts, Leeward Is., West Indies. |
| **VP2LS** | via K6HZP, 7602 Rhine Drive, Huntington Beach, Calif. |
| **VQ9EF** | Box 191, Victoria, Mahé, Seychelles. |
| **VS5JC** | via 9V1 Bureau. |
| **ex-VU2GG** | G. R. Gauntlett, 36 Muston Road, Filey, Yorks. |
| **3A0DX** | via K6CYG—see CT3AR. |

**QSL MANAGER**
**W2GHK** PO Box 7388, Newark, NJ, USA 07107.

* * *

**RSGB QSL Bureau, G2MI, Bromley, Kent.**

## QRP News

Those who feel that QRO transmitters and the ultimate in beams are needed to enter the DX game should take note of the really outstanding performance of GW3AHN. In a letter to your scribe Tom says that he has worked 320 of the 323 countries currently listed in the DXCC list using 25 watts input. In addition 19 of the " deleted " countries were also raised the same way. WAZ Phone Certificate No. 25 (the second of this type to be issued to a UK station) was obtained as a result of using 25 watts of a.m. on 21 and 28 Mc/s. To date 303 countries have been contacted on 21 Mc/s. All this has been achieved with a Viceroy (Mark 1) which has been modified, and an " X 20 " beam at 35 ft. for 20m, with a rotary dipole at 25 ft. for 15m. Tom does confess to using the full output of the transmitter occasionally to raise a brand new one, but once having logged it he has another QSO using low power!

Using 10 watts input G3URX has raised W1, 2, 3, 8, and 9 and VE2 and 3. He also raised the US Aircraft Carrier *Randolph* of space flight fame, when it was off the Norwegian coast.

## Band Reports

Only one report has been received about the state of 3·5 Mc/s, but it would seem that on this band, as well as on 7 Mc/s there is still DX to be worked by those who can fight their way through the static and the non-amateur signals. During the middle of July the h.f. bands suffered quite a severe disturbance, and for several days there was little of interest to be heard. Unfortunately this spell coincided with the Heard Island DXpedition and made matters very difficult for those Europeans who were interested in having a contact with that place. 21 Mc/s appears to have been very good at times. Your scribe has received very interesting reports on the band from Shetland and it would seem that the near " midnight sun " conditions prevailing there at this time of year are very favourable to 21 Mc/s. Elsewhere in the UK this band has been opening to VK twice daily—around 22.00 on the long path, and in the early mornings via the short

path. VK2NN was reported to have tried aerial experiments during a long path QSO—he has a rhombic, a three-element Yagi, and a quad. His signals were S7, S5, and S4 respectively. There is still sporadic DX on 28 Mc/s for the patient ones, but there are still too many wide open spaces!

In spite of the usual summer counter attractions the following were kind enough to send in reports, for which the which the writer is much indebted and grateful: G2LB, G2BOZ, GW3AHN, GW3AX, G3HCT, G3HDA, G3JFL, G3KSH, G3MBL, G3NMH, G3SEP, G3SML, GM3SVK, G3TMA, G3URX, G3VJG, G3WZ, G4MJ, G8JM, G8VG, BRS20317, BRS25605, BRS26222, A4038, A4182, A4431, A4568, A4886, A4955, A5135, and A5141.

**3·5 Mc/s C.W.:** PY2BGL (01.28), WA2JAM (01.47).

**7 Mc/s C.W.:** CM2QN (01.30), HI8XAL (23.07), HK4EX (04.56), KV4CI (21.59), LU6DJX (23.40), PJ2MI (23.01), PY7AKQ (02.25), VP6BW (23.00), VQ9TC (18.36), YV4NS (00.13), ZD7IP (22.10), 9Y4LT (23.00).

**7 Mc/s S.S.B.:** CN2BS (21.44), CN8AW (20.30), ET3AC (20.30), HB0SJ (19.00), LA1EE/P (21.00), LX1BW (21.50), OH0NI (21.30), PY4ND (21.36), PY7LAK (22.45), UD6BR (21.00), UW9AF (21.00), VKs 3APW, KBM, VJ (21.00), VP6KL (21.00), YV5BCJ (21.00), ZB2AJ (22.55), ZSs 1JA, 1KJ, 4PU, 5GU (20.30), 9H1A (21.00), 9M2OV (22.00).

**14 Mc/s C.W.:** BV1US (18.45), CR9AH (17.05), CT3AR (19.16), FH8GF (15.50), FM7WQ (22.07), HK0AI (23.17), TA2BBK (01.00), TN8AF (15.49), UA1KED (14.15), VK2ADY/VK0 (Heard Is. 06.06, 21.53), VP2AZ (22.37), VP8HJ (19.15), " ZA1BB " (17.35), 5V8AB (19.20), 6O6BW (11.50), 7X0PQ (21.15).

**14 Mc/s S.S.B.:** BV1USA (20.21), CP5EQ (22.30), CR5SP (21.20), CX9CO (21.13), EA9EO (19.35), FH8GF (15.55), FL8AC (19.00), FO8AB (08.45), FO8AG (07.25), FP8CV (12.16), FR7GF/FR7G (Glorieuse Is. 07.20), FY7s YJ, YL (22.43), HB0XCO/M (09.14), HH9DL (22.35), HH9GR (22.00), HL9TU (08.04), HP1JC (23.54), HR9EB (23.18), HS1S (18.43), HS1AK/2 (16.30), HV3SJ (18.35), I0RB (08.05), KB6CZ (07.00, 12.10), KJ6CF (06.43), K4LYY/KS6 (07.00), W7VEI/KS6 (07.12), KW6EJ (06.05), KX6BQ (16.58), LA1EE/P (Bear Is. Svalbard, 08.20), G3BHT/LX/M (16.30), M1B (08.03), OA7Z (22.40), PX1YR (18.30), ST2BSS (20.48), TI6CAL (05.40), TU2BD (17.05), VK2ADY/VK0 (06.23), VP2SQ (22.45), VP3HAG (22.24), VQ9s BC (19.24), EF (16.12), RH (19.40), VR6TC (06.00, most mornings around 14,170 kc/s), VS6DS (15.44), XW8BJ (19.55), YA1FV (16.53), YK1AA (16.30), ZD7RH (20.04), ZD9BE (16.35), 3A0DX (16.40), 4S7LM (16.50), 6O6DB (18.17), 8J1AF (Japanese Base in Antarctica, 18.15), 9K2AM (19.36), 9M6NQ (08.15), 9N1BG (15.30), 9X5CE (running 20 watts, 21.45).

**21 Mc/s C.W.:** CE2BC (20.40), CP2BH (20.35), CR6FA (17.17), FG7XT (20.50), FP8CK (19.08), HK5YC (22.31), JA1OUB (22.39), SU1DL (08.33), TL8SW (15.55), VE8YU (23.20), VK2EO (22.00), VP2AZ (19.59), VP2KJ (17.35), VP2LS (20.42), VP5AR (20.16), VP6AK (20.27), VR2DK (08.40), VR6TC (21.05), ZD5M (15.20), ZD8TD (18.30), ZD8WZ (13.32), ZL3IS (22.15), ZL4JP (22.30), 5R8CQ (07.35), 7G1A (09.07), 9J7AA/P (Zambian Field Day Station 11.54).

**21 Mc/s A.M.:** EA6AU (20.34), CR5CA (Sao Tome, 09.35), CR6GL (19.35), CR7's CI, FM, MS (19.45), MP4BBA (16.25), ST2SA (12.28), TN8BK (17.48), TT8AB (17.51), W6KXZ (15.00), " ZA1AB " (20.43), ZP2AC (21.17), 5X5JK (18.49), 9G1FL (19.00), 9U5KU (19.30).

**21 Mc/s S.S.B.:** CE3BC (23.30), G3SJ/CT3 (20.26), CP8AB (21.10), EL2A (18.20), FG7XT (20.58), FL8MC (16.00), GC5ACI/WB6QEP (Guernsey 20.10), GC5ACH/W6KG (Sark 11.50), HK0AI (23.30), HM1BO (14.40), HP3MC (22.20), HZ1AT (26.30), JAs (07.20 to 13.15 s.p. 22.35 l.p.), KB6CZ, W1YIS/KG6 (22.03), KG6AAY (10.38), KH6BB (07.45), KX6DR (10.33), MP4TBO (16.40 to 19.45), OA6BZ (22.20), PE2EVO (Special Netherlands station 11.35), PJ2ME (21.10), TA1DB (10.00), TL8SW (17.00), VK2NN (s.p. 06.55-08.10, l.p. 22.10-22.57), VK2QK (04.50), VP2AZ (20.45), VP2LS (17.20), VP3YG (21.30), VQ9EF (16.07), VR2EK (07.35), VR6TC (22.15), VS6FO (12.52), VU2JA (15.00), W6s (18.40), XE3MF (23.40), XW8BJ (10.05), YS2RM (22.40), ZD7RH (19.25), ZD8RB (21.45), ZD8TV (19.15), ZP5DH (21.25), ZS8L (15.40), 5R8CQ (15.30), 6O1GB (12.50), 9M2DQ (09.47), 9V1NL (14.08).

**28 Mc/s C.W.:** CR7IZ (13.40), HG1SD (Hungarian V.H.F. station. 14.00), ZD7IP (13.35), ZD7RH (16.00), ZE3JO (12.58), 4X4MR (14.31), 7Q7RM (16.05), 7X0AH (10.47), 9J2MM (17.45), 9Q5LJ (16.00), 9Q5WR (18.50), 9V1LP (10.18).

**28 Mc/s S.S.B.:** CR6EI (17.50), CR7IZ (17.23), EL2AK (18.20), MP4TBO (18.50), PYs (18.25 to 19.05), TI2IO (19.53), TL8SW (17.01), VS9AJC (14.38), YV5AGM (17.55), YV5APN (19.15), ZD7RH (14.20 to 18.05), 5N2AAF (16.10), 5Z4AA (17.55), 7X2AH (15.20), 9J2VX (15.00), 9L1SL (19.08), 9Y4VS (18.49).

## 1966 Countries Table

| | 1·8 Mc/s | 3·5 Mc/s | 7 Mc/s | 14 Mc/s | 21 Mc/s | 28 Mc/s | Total |
|---|---|---|---|---|---|---|---|
| G3IGW | 19 | 43 | 46 | 58 | 55 | 1 | 222 |
| GM3KLA | 3 | 38 | 41 | 30 | 66 | 15 | 193 |
| G3IAR | 6 | 32 | 38 | 57 | 52 | 16 | 201 |
| G3UML | 3 | 29 | 26 | 145 | 69 | 55 | 327 |
| G8VG | 5 | 22 | 28 | 78 | 62 | 38 | 233 |
| G3KSH | 8 | 17 | 34 | 45 | 33 | 11 | 148 |
| G3LHJ | 4 | 20 | 19 | 63 | 22 | 4 | 132 |
| G3PQF | — | 24 | 45 | 18 | 5 | 15 | 107 |
| G3JVJ | 15 | 9 | 16 | 6 | 2 | — | 48 |
| 5N2AAF | 9 | 14 | 23 | 137 | 68 | 29 | 280 |
| 9V1LP | 6 | 12 | 20 | 27 | 23 | 14 | 102 |
| G3MWZ | 7 | 10 | 1 | 20 | 6 | — | 52 |
| GM3SVK | 5 | 4 | 37 | 24 | 92 | 3 | 155 |
| G3WZ | 2 | 4 | 27 | 26 | 2 | — | 61 |
| G8JM | 5 | — | 14 | 199 | 108 | 16 | 342 |
| G3NMH | — | — | — | 177 | 93 | 48 | 318 |
| A4489 | 21 | 59 | 76 | 157 | 25 | 1 | 339 |
| A3942 | 12 | 36 | 59 | 94 | 45 | 1 | 247 |
| BRS25605 | 9 | 38 | 44 | 101 | 65 | 21 | 278 |
| BRS26222 | 5 | 39 | 22 | 201 | 91 | 51 | 409 |
| A4048 | 7 | 37 | 36 | 117 | 60 | 16 | 273 |
| A4609 | 16 | 17 | 35 | 105 | 103 | 26 | 302 |
| A3699 | 7 | 24 | 27 | 76 | 63 | 16 | 213 |
| A4431 | 4 | 25 | 37 | 77 | 88 | 26 | 257 |
| A4552 | 2 | 25 | 12 | 127 | 84 | 30 | 280 |
| A4955 | 8 | 19 | 33 | 50 | 52 | 7 | 169 |
| A4370 | 4 | 22 | 5 | 139 | 27 | 1 | 198 |
| A4182 | 4 | 19 | 13 | 117 | 35 | 20 | 208 |
| A4568 | 2 | 17 | 13 | 184 | 116 | 34 | 366 |
| G8API | 2 | 16 | 40 | 141 | 110 | 47 | 356 |
| A4038 | 5 | 10 | 19 | 203 | 105 | 69 | 411 |
| A4311 | — | 15 | 13 | 115 | 37 | 23 | 203 |

This month's table is given in order of 1·8 plus 3·5 Mc/s scores.

## DX Briefs

At the time of writing **LA1EE/P** had just moved from Bear Island, and had begun operations from Spitzbergen. It is believed that for DXCC purposes Bear Island is counted with Spitzbergen.

Iris and Lloyd Colvin are now on the air from the island of Sark, using the call-sign **G5ACH/W6KG**. They are believed to be contemplating a move to Gibraltar when they leave the Channel Islands.

There is a new station on from Portugese Guinea. His call-sign is **CR3KD**, and he has been noted on 21 Mc/s c.w. and a.m. He was formerly CT1KD.

Special prefixes seem to be popular in Italy at the present

# IARU Region 1 Opatija Conference

By JOHN CLARRICOATS, OBE, G6CL*

IN Part 1 of this article (July 1966) it was reported that three Committees were set up at the first Plenary meeting of the IARU Region 1 Division Conference held at the Hotel Kvarner, Opatija, Yugoslavia, from 23 May to 27 May, 1966. Highlights of the Conference were mentioned briefly. In this article the main recommendations of the three Committees and the decisions reached at the final Plenary meeting are dealt with.

## *ADMINISTRATIVE AND OPERATIONAL COMMITTEE*

This Committee met under the experienced chairmanship of Lt Col Per-Anders Kinnman, SM5ZD, with Mr Roy Stevens, G2BVN (President of RSGB) acting as Secretary. The Committee was faced with an agenda running to 30 major items based on about 100 proposals submitted by Subscribing Member Societies, many of which were supported by papers sent in advance of the Conference.

### Defence of the Amateur Bands

The question of action necessary for the defence of the amateur bands and preparations for the next ITU World or Regional Frequency Conference was introduced by VERON, UBA and RSGB. The Committee agreed it was essential to have available suitable publicity material which would serve to introduce Amateur Radio to national authorities and delegates at ITU Conferences. The Conference endorsed that view and requested the Executive Committee to prepare a booklet setting out the policies of the Amateur Radio movement and reasons for its continuance and expansion. The booklet is to be prepared initially in English and member societies are to be invited to send in contributions and suggestions.

It was agreed that in the event of a representative of IARU Region 1 Division being refused observer status at an ITU Conference the Executive Committee shall have the power to provide an amount of money from Region 1 funds (Fund 3) sufficient to enable the representative to become a member of his National delegation. National societies are to examine their membership records to ascertain if they have any members who by reason of their professional background may be suitable persons to represent Amateur Radio at ITU Conferences. Proposals made by member societies for alterations to existing amateur allocations are to be passed on to the Executive Committee for consideration before being sent to national telecommunication authorities.

### New and Developing Countries

The Committee considered how best member societies and individual amateurs can assist those living in new and developing countries to establish national Amateur Radio societies. USKA reported on the production of a booklet suitable for introducing people to Amateur Radio. Consideration was also given to a paper on the subject submitted by SRJ and to an article published in the May 1966 issue of the Nigerian Amateur Radio Society's Journal. It was agreed that suitable publicity material should be made available and that Europeans resident in new and developing countries in Africa should try to encourage the growth of Amateur Radio in those countries, with particular emphasis on schools, colleges and technical institutions. Students from new and developing countries, when temporarily resident abroad, should be contacted and introduced to Amateur Radio.

The Conference noted the views of the Committee and requested the Executive Committee to take all possible steps to introduce Amateur Radio into the new and developing countries and to keep in mind the proposals made by SRJ when preparing a programme.

### Intruders in Amateur Bands

ARI, OeVSV, SSA and UBA submitted views on the subject of intruders and USKA tabled a document which listed intruders in exclusive amateur bands which had been identified by the Swiss PTT. During the subsequent discussion the delegates of RSF of the USSR stated their intention to make every effort to persuade their authority to shift the Soviet Union intruders noted in the Swiss document. They were also endeavouring to obtain deletion of the Geneva Radio Regulations, Footnote 218 regarding the operation of Fixed stations in the band 14,250-14,350 kc/s. The Committee recommended that Member Societies of countries listed by USKA as operating commercial stations within exclusive amateur bands should take up the matter with their respective Administrations and report the results to the Executive Committee not later than 31 December, 1966. Member societies will also communicate lists of intruders to other national societies in Region 1 in the manner shown in the document (O.C.27-3) produced by USKA.

The Committee agreed that it would be desirable for all Member Societies to maintain efficient Intruder Watches and to report offending stations to their licensing authority. RSGB agreed to circulate copies of their Intruder Watch documents to other Member Societies where so requested.

### Band Plan

SRAL introduced an amendment to the European Band Plan which, after discussion, was adopted. The new Band Plan is set out below:

| Frequency Band | Types of Emission |
|---|---|
| 3·5 — 3·6 Mc/s | C.w. only |
| 3·6 — 3·8 Mc/s | C.w. and phone |
| 7·0 — 7·04 Mc/s | C.w. only |
| 7·04 — 7·1Mc/s | C.w. and phone |
| 14·0 — 14·1 Mc/s | C.w. only |
| 14·1 — 14·35 Mc/s | C.w. and phone |
| 21·0 — 21·15 Mc/s | C.w. only |
| 21·15 — 21·45 Mc/s | C.w. and phone |
| 28·0 — 28·2 Mc/s | C.w. only |
| 28·2 — 29·7 Mc/s | C.w. and phone |

The Conference accepted a recommendation of the Committee that the new Band Plan be adopted with a footnote to the effect that Radio Teleprinter operation is recommended to take place around 14,090 kc/s. (SSA reserved its position in respect of the recommendation relating to the use of telephony between 7040 and 7050 kc/s. REF reserved its position in respect of the recommendation relating to the use of c.w. throughout all bands. DARC reserved its position in respect of the recommendation relating to the operation of RTTY around 14,090 kc/s). The voting on the Band Plan recommendation was: In favour 12; Against 3; Abstention 1; Not Voting 1. Total 17.

### Licence Survey

RSGB reported on an Amateur Licence Survey booklet prepared by Mr L. E. Newnham, G6NZ, and distributed

* Conference Secretary and Secretary IARU Region 1 Division; Honorary Member, RSGB.

prior to the Conference to the delegates. The Survey gave basic details of amateur licences in force in various countries in Region 1. The Committee recorded its thanks to RSGB for the work which had been carried out and decided that the need for a unified licence (which had prompted the preparation of the Survey, following a discussion at the Malmoe Conference in 1963) had disappeared with the spread of reciprocal licensing. Arising from a discussion on this matter the Committee recommended acceptance of an offer made by IARU Headquarters to collect data on licensing conditions in the country of each member society in the Union and to publish the information. The Conference accepted the recommendation, DARC abstaining.

**Calling and Emergency Frequencies**

ARI, OeVSV and USKA submitted documents relating to these matters. The Committee decided (i) that the publication of calling frequencies may be desirable (possibly in *Region 1 Bulletin*) but Regional adoption is not desirable, (ii) that unified International emergency frequencies are not necessary.

**IARU Region 1 Bulletin**

The Conference Secretary submitted a report dealing with the production of the *Region 1 Bulletin*. He mentioned the difficulty of obtaining information from some Member Societies and stated that the cost of producing 250 copies of a 32 page issue was approximately £85 including materials and postages. A vote of thanks to the Editor (G6CL) proposed by SRAL was endorsed by the Committee.

After discussion the Committee recommended that production of the *Region 1 Bulletin* shall be continued and that all Member Societies shall be instructed to appoint *Bulletin* Liaison Officers. The Committee also recommended that the possibility of supplying the *Bulletin* on a subscription basis be investigated and that the Executive Committee be asked to ascertain the best and most economical method of producing the *Bulletin* on this basis. The Conference accepted the recommendations.

**Part-time General Manager**

The Chairman of the Executive Committee submitted a paper prepared by himself and the Vice-Chairman. The paper stressed the need for the continuance of the work of Region 1 at a high level to ensure the existence of Amateur Radio in its present form. IRTS, SRAL, SSA, UBA and USKA supported the view that a part-time General Manager was necessary but all delegations felt that the financial implications needed careful consideration.

Discussion showed that the feeling of the Committee was that the proposal (already recommended by the Credentials and Finance Committee) for an increased levy from 50 to 75 Swiss Centimes (10d. to 1s. 3d.) per member should include finance necessary for a part-time General Manager. After discussion the Committee decided (with six abstentions) to inform the Conference that the appointment of a General Manager is regarded as essential to the future work of Region 1 and requested the Committee to give effect to the proposal as soon as the financial obligations have been approved by subscribing member societies.

When the foregoing recommendation was considered by the Conference, ARI, DARC, PZK and RSF expressed themselves as being in favour of the proposal to appoint a paid part-time General Manager but considered it would lead to financial difficulties at the present time. After discussion the Conference resolved (i) to record that the appointment of a General Manager is very desirable for the future of IARU Region 1 Division, (ii) to request the Executive Committee to study in detail the conditions and implications of a possible appointment and to submit appropriate proposals for approval by subscribing member societies not later than 30 June, 1968.


**A first day cover issued to commemorate the Region 1 Conference**

**Scientific Observations**

RSGB introduced a Conference document which set out the results of scientific observation work. It was suggested that the paper was worthy of reproduction in journals of member societies. A vote of thanks to RSGB was proposed by VERON and endorsed by the Committee. DARC were also thanked for their co-operation in the scientific projects.

**Region 1 Operating Certificate**

RSGB introduced a Conference document outlining proposals for an IARU Region 1 Operating Certificate designed to focus interest in IARU affairs. SRAL considered the award would have good public relations value while other delegations suggested modifications of the qualifications. After examining a proposed design the feeling of the Conference was that the cost was not justified at the present time. RSGB accordingly withdrew the proposal.

**QSL Cards**

SSA, UBA and USKA drew attention to the financial difficulties facing their societies as the result of a decision made by the CEPT Conference in Vienna during 1964 to abolish the commercial paper rate as from 1 January, 1966. The effect of this decision is that many European postal authorities now insist that bulk postings of QSL cards shall be at parcel post or letter rate.

RSGB tabled correspondence from the United Kingdom Post Office and also an extract from the 1964 Vienna Convention. During the discussion ARI, DARC, PZK, REF, RSF, SRJ and VERON reported similar difficulties to those referred to by SSA, UBA and USKA.

The Committee decided to recommend that each subscribing member society should ensure that their postal authority (i) asks the International Bureaux of the Universal Postal Union for an interpretation of Article 128 of the Vienna 1964 Convention insofar as QSL cards are concerned, (ii) supports a favourable interpretation of Article 128 when the matter is raised at the 1967 meeting of the Executive Committee of the UPU.

**Fox Hunting Championships**

A Working Group consisting of representatives from CRCC, DARC, OeVSV, PZK, RSF, SRJ and SSA was set up by the Conference to draft revised rules for Fox Hunting Championships and to submit them to the next Conference. An offer by the Central Radio Club of Czechoslovakia to organize the 1967 European Championships was accepted.

**Contests**

The Committee decided that (i) as contests are good ways of defending amateur bands, societies should encourage members to participate in existing events, (ii) in view of

clash of dates the co-ordination of contests should be put into effect by member societies.

The Conference recommended:

(i) that the following be the maximum periods for each type of contest: World Wide—48 hours; Continental —36 hours; National—24 hours; "closed shop" (such as BERU)—no time limit;
(ii) that National and "closed shop" contests be restricted to certain segments of each band;
(iii) that societies consider whether it is desirable for them to continue to organize the multi-band type of contest;
(iv) that all IARU Region 1 Field Days be held at the same time and corresponding weekends in each year;
(v) that societies restrict the number of certificates issued or sponsored by their organization—such certificates to be called "official certificates."

RSGB were requested to co-ordinate (iv) above by formulating common rules and fixing a suitable date.

It was the wish of the Committee that the BERU Contest shall be open to anyone in the world. It was also considered desirable that the ARRL DX Contest shall be limited to one weekend for each type of operation (c.w. and telephony).

**International Sports Code**

Copies of a proposed International Sports Code prepared by RSF were sent to delegates shortly before the opening of the Conference. The Committee recorded appreciation of the work carried out by RSF in preparing the document and recommended societies to examine the proposals immediately and send their comments to the Executive Committee not later than 31 December, 1966. The Executive Committee will formulate a Code in accordance with the comments received and recommend societies to bring it into provisional use before the next Region 1 Conference.

**IARU Region 1 Amateur Radio Records**

Recognizing the value of Region 1 Amateur Radio records, particularly in connection with the International Sports Code, the Conference requested the Executive Committee to investigate the procedure necessary to give effect to proposals made in a document submitted by RSF.

**IARU Region 1 Championships**

The Committee accepted an offer made by RSF to submit to the next Conference proposed rules for IARU Region 1 Championships.

**Mobile Rallies**

RSGB submitted a Conference document dealing with the organization of mobile rallies within the United Kingdom and an offer of assistance made by the Society was noted.

**Call-Signs**

The Committee noted some difficulties with call-signs and considered it desirable for information to be collected and published showing different ways of allocating call-signs for reciprocal licences.

**Other Matters**

The Committee also dealt with a variety of other matters including the relationship between IARU and IARC (Geneva); a suggestion that simple equipment be introduced at the IARC station 4U1ITU; collaboration with the Red Cross and Civil Defence services; the timing of news bulletins and a proposal that the election of members to serve on the Executive Committee be by the vote of leaders of delegations representing subscribing member societies and that the ballot be in secret.

**Technical Matters**

Member Societies are (i) to study the matter of stringent regulations in Amateur Radio regulations and to oppose the adoption of severe tolerances, (ii) to investigate the matter of unwanted detection in electronic entertainment equipment and to see the co-operation of equipment manufacturers in obtaining protection against unwanted detection of radio signals in such equipment.

**Radio Teleprinting**

The Committee recommended that 45·45 and 50 bauds be provisionally adopted as standard speeds for RTTY.

### *V.H.F. COMMITTEE*

The Committee met under the chairmanship of Mr C. van Dijk, PA0QC, with Mr F. G. Lambeth, G2AIW, acting as Secretary, and representatives present from 14 Member Societies.

**EUOSCAR Projects**

The Conference accepted a recommendation of the Committee that Region 1 Division shall sponsor the construction of a European *OSCAR* and contribute 500 Swiss Francs towards the cost. (It is anticipated that this *OSCAR*—now under construction by DJ4ZC—will be launched during 1966.) The Conference also agreed that the sum of 2000 Sw. Fr. shall be made available annually for the next three years (1967-1969) by Region 1 Division to realize the construction of at least one Region 1 satellite per annum. Individual societies and interested persons are also to be invited to contribute to the cost of the projects (DL3NE on behalf of the Executive Committee will co-ordinate the work of the Region 1 *OSCAR* Group in Germany).

**Scientific Work**

The Conference accepted a recommendation that groups of amateurs shall be organized to carry out scientific observations in regard to ionospheric, tropospheric and space radio propagation. It was recommended that the results of observations shall be offered for publication in Member Society or Scientific Journals.

**Band Planning**

The Committee recommended the adoption of the following Two Metre Band Plan:

| | |
|---|---|
| 144·00-144·15 Mc/s | C.w. only with a special concession to use s.s.b. between 144·1 and 144·15 Mc/s when a satellite or other translator is active. |
| 144·15-145·85 Mc/s | Any mode of transmission. |
| 145·85-145·95 Mc/s | Satellites and stratospheric translators. |
| 145·95-146·00 Mc/s | Beacons and special services. |

For crystal controlled work above 2300 Mc/s the Committee recommended that operators should use the following harmonically related parts of the u.h.f./s.h.f. bands:

| | |
|---|---|
| Exciter | 1150-1158 Mc/s |
| X2 | 2300-2316 Mc/s |
| X3 | 3450-3474 Mc/s |
| X5 | 5750-5790 Mc/s |
| X9 | 10,350-10,422 Mc/s |

**Other Matters**

The Committee dealt with a variety of other matters including special recognition for QSO's made via a translator system, QRA locator maps, amateur space communication, constitution and terms of reference of the Region 1 V.H.F. Committee.

### *CREDENTIALS AND FINANCE COMMITTEE*

The Committee met under the chairmanship of Ir. W. J. L. Dalmijn, PA0DD, with the Conference Secretary acting as Secretary.

**Financial Matters**

The Conference accepted a recommendation that as from 1 January, 1967 no monies shall be transferred from Fund 3

(*Continued on page 542*)

# Single Sideband

By G. R. B. Thornley, G2DAF *

DURING the last two years there has been increasing interest in the use of 6HF5 valves for linear amplifier service. These valves, developed initially in the USA as line timebase output valves in colour television receivers, are now available in the UK at low cost (about 30s. or so each). Four valves in parallel with 800 volts h.t. supply will run under voice input conditions to the maximum licensed rating of 400 watts p.e.p. r.f. output.

It is not suggested that any UK member will want to run ten of these valves in parallel at 2 kW p.e.p. input (American licence conditions). Nevertheless, there are certain technical aspects of the latest Galaxy Model 2000 Linear Amplifier of sufficient general interest to merit inclusion in *Single Sideband*.

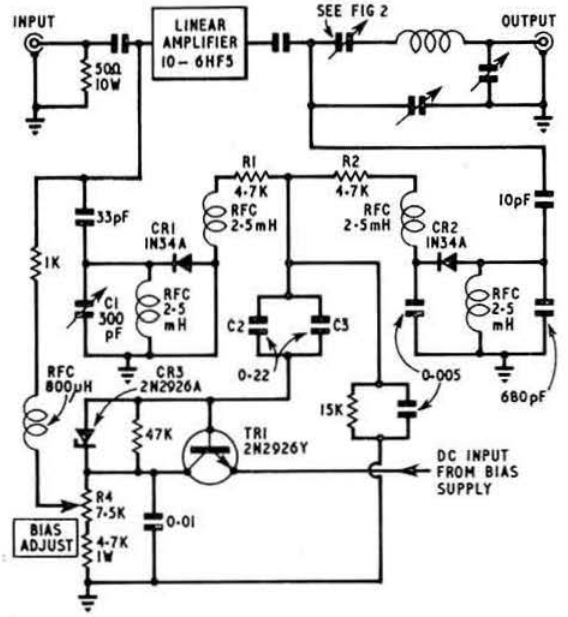



**Fig. 1. Circuit diagram of the Galaxy amplifier a.l.s. system. The input and output waveforms are sampled by CR1 and CR2 rectified. If the waveforms are not identical an error signal occurs across R3, changing the operating point of TR1, which in turn varies the bias supplied to the amplifier grid circuit. The change in bias shifts the class of operation from AB into the class A region whenever non-linearity occurs. This change in operating conditions tends to hold the intermodulation distortion level to a low value.**

## Galaxy 2000 Linear Amplifier

This linear is designed for table top operation and is housed in a very compact cabinet 10¼ in. wide, 11½ in. deep and 6 in. high with a separate power supply contained in its own cabinet, rather smaller than the r.f. assembly. Operation covers the 80, 40, 20, 15, and 10m bands and the amplifier can be driven with any s.s.b. exciter that is capable of delivering about 100 watts r.f. output. The use of 10 small television line timebase valves (6HF5s) instead of the large power type transmitting valves that are used in some other equipment has enabled the maker to provide a 1 kW output power potential in a remarkably small assembly.

* 5 Janice Drive, Fulwood, Preston, Lancs.

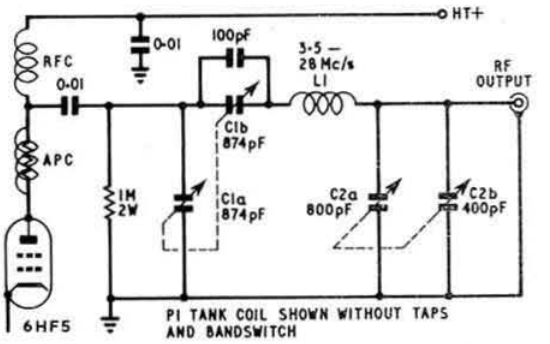



**Fig. 2. The amplifier tank circuit, showing the modified pi-network arrangement for matching the low value anode load impedance of the amplifier valves to the nominal 50 ohms aerial impedance. "Split tuning" is used at C1a and C1b to permit practicable values of inductance to be used at L1. C1a and C1b are ganged, as is the case with C2a and C2b.**

## Circuit

Television line deflector valves are of necessity designed to give a high peak output at relatively low anode voltages. In the Galaxy amplifier the 6HF5s are supplied with 800 volts d.c. for s.s.b. operation; this is reduced to 600 volts d.c. if operation is required on c.w. or RTTY. Under all conditions the amplifier operates in class AB1 with a resting (zero signal) anode current of 300 mA (30 mA per valve).

All present or prospective users of 6HF5 valves will be interested in the "automatic linearity system" network (a.l.s.) shown in the circuit of Fig. 1. This is built into the bias circuit to prevent any deterioration in the intermodulation distortion level of the amplifier. Fixed bias is supplied to the amplifier grid circuit through the a.l.s. network and the input and output r.f. envelopes of the amplifier are sampled by diodes CR1 and CR2. Each diode receives the same amplitude of signal—they are, however, connected to produce opposite polarity. If the amplifier input and output signals are such that the diode sampling networks "see" equal envelope voltages, no error signal will exist across R3 in the interconnecting resistor network R1, R2 and R3. This condition establishes a steady operating point for transistor TR1, permitting the normal class AB1 bias to be applied through TR1 to the grids of the 6HF5 valves. However, if the output signal of the amplifier is not an exact replica of the input signal, an error signal will exist across the resistor network that will shift the operating point of TR1, changing the value of bias that reaches the grids of the 6HF5 valves. Under normal operating conditions this change of bias is in the direction which moves the operating point of the valves into the class A region, thereby reducing the distortion in the amplifier. If at any instant the output signal is not the same as the input signal, the bias is reduced until the two signals are the same. The Zener diode CR3 prevents TR1 from biasing the valves too far into the class A region. It is claimed that this control system has shown its effectiveness in actual practice by permitting the amplifier to produce a clean signal under all operating conditions.

Ten valves in parallel require a very low value of anode load ($R_L$) and this in turn results in higher than average LC ratios in the pi-tank circuit. To overcome this difficulty Galaxy have adopted a system of split parallel tuning at the valve end of the tank circuit. This is shown in detail in Fig. 2 and inspection of values will show that C1a plus the valve output capacity is equal to C1b plus the fixed 100 pF; the 6HF5 anode line is therefore effectively tapped down by a ratio of 2 : 1, enabling a physically closer-to-normal value of tank circuit inductance than would be possible with a conventional pi-network. The method shown in Fig. 2 is

particularly necessary for operation on 20, 15 and 10m with a coil of practicable dimensions.

### General Features

The power supply employs solid-state rectifiers in the high and low voltage and bias sections and the supply can be activated either by the function switch on the front panel of the amplifier or by a remote control line from the exciter. Operating voltage for the cooling fan housed in the r.f. assembly is supplied from the power unit through the interconnecting cable to the amplifier.

Of further interest is the built-in TVI protection, in the form of a built-in low-pass filter which is prealigned at the factory to attenuate those frequencies that lie above 40 Mc/s. Maximum attenuation of harmonic energy is designed to occur at US Channel 2 and Channel 6; however if TVI is more significant on other channels the filter can be retuned from outside the cabinet.

A meter located on the panel of the amplifier can be switched to monitor anode voltage, anode current in the TUNE mode, and anode current while operating.

No tuning adjustments are required for the input of the amplifier because a 50 ohm non-inductive resistor is used as a broad band load in the conventional passive grid input circuit. The amplifier also contains a " switch through " feature that permits it to be used with most transceivers. This is made possible by a 6 volt a.c. relay which is mounted on the amplifier chassis and connected to switch the aerial round the amplifier for receiving. When transmitting, the relay is activated by a control line from the transceiver (most transceivers have spare relay contacts for this) and connects the aerial to the output of the linear amplifier's pi-network, at the same time switching on the amplifier power supply. Using this feature, VOX or push-to-talk operation is possible.

### Pulsed Two-tone Test Oscillator

A transistorized two-tone test oscillator was described in *Single Sideband* in the October, 1965 issue of the BULLETIN. This comparatively simple and easily built unit is invaluable for testing and loading correctly a new linear amplifier. However, it cannot be used for more than a minute or two where the operating conditions are such that the design power output of 400 watts p.e.p. results in an anode dissipation greatly in excess of the manufacturer's rating for the valves in use. Under these conditions prolonged operation (for instance, detailed inspection of the envelope pattern on the oscilloscope while making tuning and loading adjustment) could result in the anode structure becoming white hot with permanent damage to the valves.

The currently popular amplifier using four 6HF5 valves comes into this category and inspection of the figures given in Table 1, *Single Sideband*, July, 1965, BULLETIN, will show that under two-tone driving conditions to 400 watts p.e.p. output, the d.c. power input is 380 watts. As the output power is 200 watts mean, the difference between these two values (180 watts) is being dissipated at the anodes of the valves—that is 45 watts each valve, and greatly in excess of the maker's rating of 27·5 watts. This difficulty can be overcome and the amplifier can be driven, for several hours if necessary, by keying the two-tone audio input. This is simple for anyone with an electronic bug key; all that is necessary is to lock the keyer in the dot position and key the exciter while the audio tone is being fed into the microphone input socket. For those without an electronic key the circuit of a simple " pulser " is shown in Fig. 3. This unit is connected into position between the output of the transistorized two-tone oscillator and the audio input of the exciter. It is a simple method of testing an amplifier where the ordinary two-tone test would result in excessive anode dissipation in the amplifier valves.

The 6J5 (or similar valve) operates as a cathode follower with a.c. instead of d.c. on the anode. The cathode follower conducts during the positive half cycles of the anode voltage and not during the negative half cycles, resulting in a test signal that is on about half of the time. As there is a 50 c/s component in the cathode current, the output is taken off through a small 15 pF capacitor to reduce this component reaching the output. In addition to this, most sideband transmitters have poor 50 c/s response in their audio amplifiers and a further reduction in the 50 c/s component will be obtained.

The circuit shown is a simple way of pulsing a two-tone test signal through the amplifier and permitting maximum peaks with little strain on the amplifier valves. It can equally be used to pulse the output of an existing audio signal generator when this is used to drive the audio amplifier and inserted carrier is used to provide the second of the two amplifier driving frequencies through the exciter.

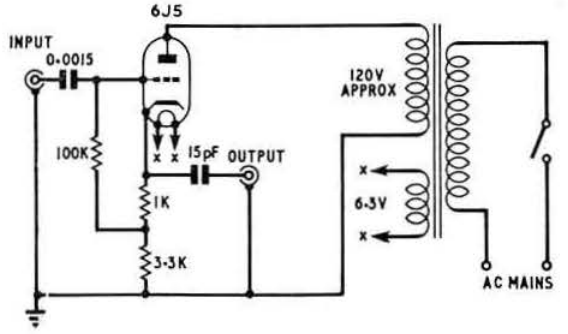



**Fig. 3. Circuit diagram of a simple " pulser " for keying the audio tone from the two-tone oscillator, or from a single audio signal generator. Any triode valve with characteristics similar to the 6J5 would be suitable.**

### Members in Devon

Mr H. F. V. Webb, BRS25172, 15 Blackmore Road, Tiverton, Devon, will be pleased to hear from other members in the area.

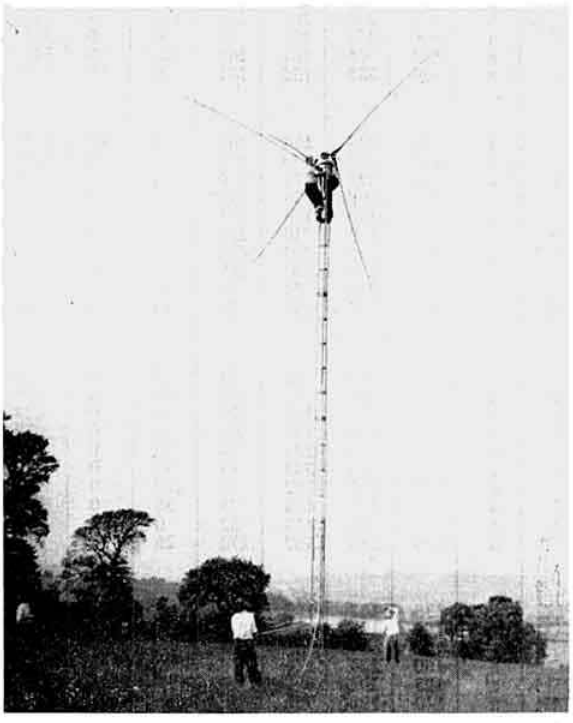
# NFD '66 REPORT AND FULL RESULTS

| | | |
|---|---|---|
| NFD Shield | Exeter Group (G3ID/P & G3JW/P) | 2430 points |
| Gravesend Trophy | Gravesend Amateur Radio Society (G3SXZ/P and G6BQ/P) | 2285 points |
| Frank Hoosen (G3YF) Memorial Trophy | Exeter Group (G3ID/P) | 945 points |
| Scottish NFD Trophy | Glasgow City Group (GM3SSB/P and GM3AXX/P) | 1165 points |
| Bristol Trophy | Maidstone YMCA (G3TRF/P) | 1250 points |
| Leading 1·8 Mc/s Station | Cardiff RCC (GW3NJW/P) | 451 points |
| Leading 3·5 Mc/s Station | Lichfield ARS (G3PLD/P) | 621 points |
| Leading 7·0 Mc/s Station | Cardiff RCC (GW3OAY/P) | 610 points |
| Leading 14·0 Mc/s Station | Exeter (G3ID/P) | 945 points |
| Leading 21·0 Mc/s Station | Exeter (G3ID/P) | 399 points |
| Leading 28·0 Mc/s Station | Edgware (G5FG/P) | 46 points |

Overseas Station contributing most points to competitors:
Cyprus Amateur Radio Society, Famagusta Group (ZC4SS/P)

THE results of this year's NFD show a considerable rearrangement of the top groups: encouraged by their 1965 success in the single station entry section, Exeter and Gravesend ran two stations this year with even better results.

Exeter are the 1966 winners of the **NFD Shield,** the Leading 14 Mc/s entrant with a tremendous score of 945 points, and the leading 21 Mc/s entrant with 399 points. In addition, they were the second highest scorer on 7 Mc/s with 554 points! This truly remarkable performance gave them a clear lead of 155 points over their nearest challengers Gravesend ARS who were second with 2285 points, narrowly beating Cardiff RCC with 2263 points. The Belfast and District Group were fourth with 2254 points. So close were the second, third and fourth places, that an extremely careful second check on all the logs involved was necessary to establish the final result. In passing, we should record that the Gravesend group have won the **Gravesend Trophy** by finishing in overall second place!



**G3TJW and G3SCU atop G3TJW's tower which was used to support the Exeter Group's "A" station 14 and 21 Mc/s quads. G3ID and G3RUX are helping to steady the quad. The Exeter group won the NFD shield and the Frank Hoosen (G3YF) Memorial Trophy.**
*(Photo by G3HTA)*

The **Bristol Trophy** for the leading single station entry was again won by the Maidstone YMCA Group (G3TRF/P), with 1250 points, an increase on their leading 1965 score.

Second place was taken by Stourbridge and District ARS (G6OI/P) with 1079 points, an almost identical score with the 1075 points which placed them third in the 1965 event. Stean moved up from fifth in 1965 to take this year's third place with 1042 points.

The winners of the **Scottish NFD Trophy** are the Glasgow City Group with a score of 1165 points from their dual station entry, leading by 172 points from the Caithness Group.

The weather, taken over the country, appears to have been almost as variable as the conditions, which ranged from "poor" (comments from some groups) to "very good" (judging by Exeter's score!).

### 1·8 Mc/s

Cardiff Group—GW3NJW/P—are the leaders on this band with a score of 451 points from 109 contacts; in second place are Pontypool Group with 430 points from 108 contacts. Chester DRS (G3TOW/P) in fifth place are the leading English group, scoring 366 points from 133 contacts. In passing, we should record that Exeter made only a nominal score on this band, long regarded by many as the "bread and butter" leading towards a winning entry.

### 3·5 Mc/s

The band leader was Lichfield ARS (G3PLD/P), who scored 621 points to give them a clear lead over Cannock Chase (G4CP/P) with 592 points. G3PLD/P was a single band station and made 258 QSO's using a homebrew transmitter, a KW77 receiver, and a dipole aerial. "Eighty" has always been a high scoring band, and this year six stations exceeded the 1965 band leader's score. The large number of continental portable stations helped to produce a high rate of scoring for the leading stations—over 70 points an hour

# Two Station Entries

| Posn. | Group | A Stn. | B Stn. | Band Group | 1·8 Mc/s | 3·5 Mc/s | 7 Mc/s | 14 Mc/s | 21 Mc/s | 28 Mc/s | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Exeter | G3ID | G3JW | b | 71 | 459 | 554 | 945 | 399 | 2 | 2430 |
| 2 | Gravesend ARS | G3SXZ | G6BQ | a | 271 | 399 | 510 | 765 | 323 | 17 | 2285 |
| 3 | Cardiff RCC | GW3NJW | GW3OAY | b | 451 | 576 | 610 | 408 | 212 | 6 | 2263 |
| 4 | Belfast & District | GI3NSM | GI3OIC | a | 338 | 454 | 315 | 810 | 337 | 0 | 2254 |
| 5 | Croydon RSGB Group | G3BFP | G6LX | a | 279 | 340 | 328 | 797 | 183 | 42 | 1969 |
| 6 | Oxford DARS | G2DU | G8PX | a | 318 | 454 | 407 | 537 | 213 | 21 | 1950 |
| 7 | Cannock Chase ARS | G3VCC | G4CP | a | 300 | 592 | 451 | 400 | 202 | 0 | 1945 |
| 8 | KW Electronics RC | G8KW | G8VG | a | 181 | 495 | 400 | 519 | 218 | 9 | 1822 |
| 9 | Guildford & DRS | G3KMO | G3TLM | a | 296 | 544 | 518 | 242 | 185 | 3 | 1788 |
| 10 | Newark SWC | G3UEB | G3TWV | f | 213 | 323 | 538 | 499 | 185 | 3 | 1761 |
| 11 | Reigate ATS | G3FM | G3REI | c | 320 | 498 | 311 | 248 | 203 | 20 | 1600 |
| 12 | Norwich | G2YU | G3IOR | a | 154 | 433 | 191 | 686 | 98 | 20 | 1582 |
| 13 | Verulam ARC | G2AIA | G3VER | e | 333 | 439 | 404 | 216 | 144 | 0 | 1536 |
| 14 | BBC (Langham) | G3AYC | G3GDT | b | 231 | 400 | 345 | 267 | 239 | 17 | 1499 |
| 15 | Lymington DARS | G2DC | G3JAF | a | 268 | 481 | 323 | 223 | 195 | 0 | 1490 |
| 16 | Radio Soc. of Harrow | G3EFX | G2TA | a | 171 | 422 | 388 | 247 | 183 | 12 | 1423 |
| 17 | Crawley ARC | G2DP | G3TIR | a | 209 | 436 | 315 | 166 | 214 | 24 | 1364 |
| 18 | Bristol RSGB | G3RQ | G6GN | f | 258 | 414 | 317 | 214 | 140 | 0 | 1343 |
| 19 | Macclesfield DRS | G3LDT | G3MKR | b | 312 | 376 | 228 | 285 | 123 | 0 | 1324 |
| 20 | Derby & DARS | G3ERD | G2DJ | a | 220 | 501 | 346 | 189 | 36 | 0 | 1292 |
| 21 | Torbay ARS | G3GDW | G3NJA | a | 284 | 322 | 303 | 216 | 157 | 0 | 1282 |
| 22 | North Notts ARS | G3RCW | G3OZN | a | 238 | 485 | 479 | 10 | 52 | 0 | 1264 |
| 23 | Chelmsford ARS | G6ZC | G4VF | a | 230 | 566 | 316 | 78 | 71 | 0 | 1261 |
| 24 | Wirral ARS | G8BM | G2AMV | h | 256 | 349 | 249 | 403 | 0 | 0 | 1257 |
| 25 | Sutton & Cheam RS | G2XP | G8DF | a | 245 | 439 | 322 | 138 | 92 | 17 | 1253 |
| 26 | Pontypool | GW3RNH | GW3CDH | a | 430 | 309 | 280 | 127 | 86 | 2 | 1234 |
| 27 | Glasgow City Group | GM3SSB | GM3AXX | b | 318 | 246 | 265 | 208 | 128 | 0 | 1165 |
| 28 | Chester & DRS | G3TOW | G3EWZ | a | 366 | 475 | 225 | 78 | 0 | 0 | 1144 |
| 29 | Liverpool & DARS | G2HKA | G8DT | a | 252 | 505 | 164 | 145 | 46 | 0 | 1112 |
| 30 | Chiltern ARC | G5WW | G3BXS | a | 306 | 388 | 185 | 131 | 80 | 15 | 1105 |
| 31 | Edgware | G3VW | G5FG | a | 142 | 224 | 284 | 263 | 142 | 46 | 1101 |
| 32 | Scarborough ARS | G3KS | G4BP | a | 162 | 387 | 270 | 154 | 105 | 0 | 1078 |
| 33 | Chorley & Leyland RSGB | G3RFT | G3GGS | a | 184 | 391 | 71 | 270 | 137 | 0 | 1053 |
| 34 | Blackpool | G8GG | G5ND | a | 194 | 207 | 29 | 390 | 209 | 0 | 1029 |
| 35 | Ilford | G3HIW | G6AH | a | 266 | 399 | 195 | 101 | 60 | 0 | 1021 |
| 36 | Ballymena | GI3PDN | GI3FFF | a | 361 | 189 | 210 | 223 | 15 | 0 | 998 |
| 37 | Caithness | GM3JUD | GM3GUJ | a | 123 | 150 | 205 | 449 | 66 | 0 | 993 |
| 38 | Stevenage & DARS | G3SAD | G3CEU | a | 331 | 233 | 207 | 169 | 8 | 0 | 948 |
| 39 | Conway Valley ARC | GW5WO | GW3YR | d | 335 | 238 | 324 | 45 | 0 | 0 | 942 |
| 40 | North Kent RS | G6HD | G3OFM | a | 283 | 367 | 208 | 24 | 26 | 0 | 908 |
| 41 | Purley & DRS | G3KTA | G3FTQ | e | 270 | 312 | 83 | 111 | 113 | 0 | 889 |
| 42 | Dundee | GM2HFV | GM4HR | a | 164 | 253 | 47 | 351 | 45 | 0 | 860 |
| 43 | West Kent ARS | G3TLB | G3TXZ | c | 42 | 325 | 362 | 99 | 0 | 0 | 828 |
| 44 | Bedford & DARC | G3ATI | G3VBA | a | 184 | 279 | 148 | 208 | 0 | 0 | 819 |
| 45 | Dorking & DRS | G3AEZ | G3CZU | a | 126 | 264 | 285 | 54 | 78 | 0 | 807 |
| 46 | Clifton ARS | G3GHN | G3OGE | e | 57 | 385 | 243 | 83 | 31 | 0 | 799 |
| 47 | Crystal Palace & DRC | G3VCP | G3IIR | a | 152 | 272 | 202 | 55 | 107 | 0 | 788 |
| 48 | Ainsdale RC | G8OG | G2CUZ | a | 132 | 276 | 198 | 75 | 38 | 0 | 719 |
| 49 | Burnham Beeches | G2XA | G3AHB | c | 128 | 394 | 148 | 32 | 0 | 0 | 702 |
| 50 | Ayrshire Group | GM5KF | GM4QK | a | 190 | 148 | 167 | 172 | 20 | 0 | 697 |
| 51 | Dunfermline RS | GM3EGW | GM3FIZ | f | 236 | 162 | 186 | 98 | 3 | 0 | 685 |
| 52 | Southampton RSGB | G3SOU | G3AMO | g | 160 | 194 | 14 | 171 | 90 | 0 | 629 |
| 53 | Stoke on Trent ARS | G3UD | G3GBU | a | 242 | 154 | 110 | 21 | 99 | 0 | 626 |
| 54 | Cray Valley RS | G3RCV | G3DNC | a | 160 | 207 | 237 | 12 | 0 | 0 | 616 |
| 55 | Aberdeen ARS | GM3BSQ | GM3DWX | a | 125 | 205 | 197 | 17 | 0 | 0 | 544 |
| 56 | Glasgow RSGB Group | GM3OFT | GM3IMR | a | 140 | 100 | 154 | 34 | 85 | 0 | 513 |
| 57 | Stroud & DG | G3SDR | G3SZS | e | 167 | 181 | 52 | 39 | 0 | 0 | 439 |
| 58 | Mid. Lanarkshire RSGB | GM3GDX | GM3TLR | a | 39 | 83 | 186 | 72 | 0 | 0 | 380 |

*Band Grouping:* " A " station
a 1·8, 7 and 21 Mc/s.
b 1·8, 14 and 21 Mc/s.
c 1·8, 3·5 and 21 Mc/s.
d 1·8, 3·5 and 14 Mc/s.
e 1·8, 3·5 and 28 Mc/s.
f 1·8, 7 and 28 Mc/s.
g 1·8, 3·5 and 7 Mc/s.
h 1·8, 14 and 28 Mc/s.

# Single Station Entries

| Posn. | Group | Call-sign | 1·8 Mc/s | 3·5 Mc/s | 7 Mc/s | 14 Mc/s | 21 Mc/s | 28 Mc/s | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Maidstone YMCA | G3TRF | | 192 | 480 | 578 | | | 1250 |
| 2 | Stourbridge & DARS | G6OI | | 427 | 383 | 269 | | | 1079 |
| 3 | Stean | G8NF | 269 | 428 | | 345 | | | 1042 |
| 4 | Wolverton DRC | G4CK | | 500 | 217 | 315 | | | 1032 |
| 5 | Belmont, Belfast | GI3SXG | | 260 | | 480 | 279 | | 1019 |
| 6 | East Barnet ARCC | G3FD | 287 | 406 | 212 | | | | 905 |
| 7 | Luton & DARS | G3KAA | | 395 | 343 | 123 | | | 861 |
| 8 | Gloucester | G3MA | 237 | 314 | 295 | | | | 846 |
| 9 | Caterham | G2AJS | | 313 | 252 | 262 | | | 827 |
| 10 | Leicester Rad. Soc. | G3LRS | 259 | 402 | | 139 | | | 800 |
| 11 | Manchester & DARS | G3HOX | 187 | 340 | | 266 | | | 793 |
| 12 | Cheltenham ARS | G5BK | | 385 | 283 | 115 | | | 783 |
| 13 | AERE (Harwell) ARC | G3PIA | | 229 | 239 | 307 | | | 775 |
| 14 | Basildon & DARS | G3EDM | 174 | 353 | 220 | | | | 747 |
| 15 | Midland ARS | G3MAR | 342 | 248 | 156 | | | | 746 |
| 16 | Cheltenham RSGB | G3CGD | 305 | 288 | 145 | | | | 738 |
| 17 | Bristol ARC | G4UZ | | 333 | 193 | 207 | | | 733 |
| 18 | East Worcestershire AR Group | G3RZI | 249 | 351 | 123 | | | | 723 |
| 19 | Loddon Valley ARCC | G3PGM | 334 | 385 | | | | | 719 |
| 20 | Emley Moor | G6LD | 222 | 304 | | 186 | | | 712 |
| 21 | Southgate Rad. Club | G5FA | 193 | 340 | 177 | | | | 710 |
| 22 | Swindon & DARC | G3NMH | 210 | 284 | | 212 | | | 706 |
| 23 | City of Belfast YMCA Radio Club | GI6YM | 108 | | | 307 | 254 | | 669 |
| 24 | Retford | G3KPU | 136 | 294 | 211 | | | | 641 |
| 25 | NW Durham | G3SKN | | 188 | 215 | 224 | | | 627 |
| 26 | Lichfield ARS | G3PLD | | 621 | | | | | 621 |
| 27 | Hull & DARS | G3AMW | | 323 | 205 | 72 | | | 600 |
| 28 | East Yorkshire Group | G3LZQ | | 291 | 207 | 100 | | | 598 |
| 29 | Darlington & Dis. Group | G2CKN | | 403 | | 192 | | | 595 |
| 30 | East Molesey | G5LC | 167 | 420 | | | | 7 | 594 |
| 31 | Northern Polytechnic ARS | G3HNR | 126 | 277 | | 181 | | | 584 |
| 32 | Southport Radio Soc. | G3NKL | 250 | 247 | 81 | | | | 578 |
| 33 | Hartlepools | G3AWL | 245 | | 239 | 83 | | | 567 |
| 34 | Grimsby ARS | G4XC | | 565 | | | | | 565 |
| 35 | Chingford RSGB Group | G4GA | | 392 | 141 | 31 | | | 564 |
| 36 | Plymouth Radio Club | G3PRC | | 251 | 158 | 151 | | | 560 |
| 37 | Bury St Edmunds | G3IRM | 129 | 381 | | 49 | | | 559 |
| 38 | Salisbury | G3FKF | 195 | 304 | 41 | | | | 540 |
| 39 | Loughborough ARC | G4BI | 163 | 268 | | 101 | | | 532 |
| 40 | Farthing Downs Group | G3DVQ | | 240 | 160 | 130 | | | 530 |
| 41 | Ashford ARC. | G2QT | | 185 | 301 | 29 | | | 515 |
| 42 | South Dorset RS | G3SDS | 173 | 250 | | 65 | | | 488 |
| 43 | Harlow & DARS | G6UT | 355 | | 125 | | | | 480 |
| 44 | Stockport Radio Soc. | G3NBM | 47 | 214 | | 218 | | | 479 |
| 45 | Ilminster Grammar School, Somerset | G3IGS | 169 | 251 | 43 | | | | 463 |
| 46 | Basingstoke ARC | G3TCR | | 316 | 82 | 42 | | | 440 |
| 47 | Stourbridge RSGB | G2OG | 55 | 308 | 61 | | | | 424 |
| 48 | Shefford & DARS | G2DPQ | 180 | 213 | 6 | | | | 399 |
| 49 | Henley-in-Arden & Dist. Group | G3SIA | 216 | 178 | 3 | | | | 397 |
| 50 | Loughton & DRS | G8AB | | 395 | | | | | 395 |
| 51 | Thanet | G2IC | 177 | 211 | | | | | 388 |
| 52 | Bromsgrove & DARC | G3VGG | 237 | 119 | | 27 | | | 383 |
| | Peterborough & DARS | G3DQW | 169 | 98 | | 116 | | | 383 |
| 54 | Forfar | GM3GBZ | 269 | 94 | | | | | 363 |
| 55 | Wessex ARG | G3FVU | | 341 | | | | | 341 |
| | Stratford upon Avon & DRC | G3PGU | 27 | 266 | | 48 | | | 341 |
| 57 | East Lancashire ARC | G3TD | 77 | 261 | | | | | 338 |
| 58 | Ariel Radio Group BBC Club Tel. Soc. | G3NTS | 303 | | | 17 | 16 | | 336 |
| 59 | Sheffield | G8NN | 307 | 27 | | | | | 334 |
| 60 | Southend & DRS | G5QK | 113 | 152 | 64 | | | | 329 |
| 61 | South Shields & DARC | G3DDI | — | | 230 | | 98 | | 328 |
| 62 | RAS Group, Doncaster | G3PSB | 97 | 140 | 36 | | | | 273 |
| 63 | Isle of Wight Radio Society | G3SKY | 253 | | | | | | 253 |
| 64 | Preston ARS | G3KUE | 89 | 61 | | 31 | | | 181 |
| 65 | Sunderland Technical College ARS | G3STC | 106 | 59 | | | | | 165 |
| 66 | East Ham RSGB Group | G3THY | 162 | | | | | | 162 |

at the peak. A few entrants managed to work the odd North American station.

### 7 Mc/s

Even higher scores were made this year on 7 Mc/s, in spite of heavy European QRM. The band leaders were Cardiff RCC with 610 points, closely followed by overall winners Exeter with 554 points. Newark came into third place on 7 Mc/s with an " A " station score of 538 points on this band. In addition to the tremendous amount of EU activity, the leading stations (and some others) worked all W call areas except W7, also VE1, VE2 and VE3. One or two VPs were also in evidence.

### 14 Mc/s

A new award this year, the **Frank Hoosen, G3YF, Memorial Trophy** is won by the Exeter Group, G3ID, with a record score of 945 points . They quite wisely abandoned Top Band almost completely and concentrated on 14 Mc/s, producing 301 contacts in 18 hours operating time. Over half of their contacts were with stations in North America, using home-built equipment with what is rapidly becoming the standard aerial for this band—the quad.

Following Exeter are the Belfast and District RSGB Group with 810 points and Croydon Group with 797 points. The leading 10 stations all used quads, with the exception of Gravesend who had three lazy-H aerials. Maidstone Group used a W8JK fixed beam.

Exceptional conditions on the North American path accounted for this year's high scores. The band was well open to the East Coast at the beginning of the contest, and from 20.00 onwards all USA call areas were workable with comparative ease. The leading stations maintained scoring rates of 25-35 QSOs per hour throughout the night, the best spells being between 01.00 and 03.00. The band closed to the USA around 06.00 after a good opening to the West Coast.

A sprinkling of Caribbean stations around 20.00 and the usual ZC4 portables added interest. The band opened to South East Asia for a few hours at the beginning and end of the contest. There were comparatively few signals from Africa, but the received signal reports show that this was due more to inactivity than adverse conditions. The unexpected

**Cray Valley Radio Club members manning G3RCV/P set up in the grounds of the War Memorial Hospital, Shoates Hill, London. The operator on the left is Alan Swinton, G3ANK, with Bill Jardine, G2AQB.**

*(Photo by K. G. Jones)*

appearance of VK5GQ in the early hours of the morning, and the reliable signal of ZL1AH at 08.30 provided the only opportunities of contacting the Antipodes.

European portables appeared during the day, but the going was difficult and scoring rates were low.

### 21 Mc/s

Conditions on 21 Mc/s were quite a lot better this year and four stations scored more points than the 1965 band leader. Exeter Group had a clear lead over the Belfast and District RSGB Group, who in turn were closely followed by the Gravesend ARS.

The band opened up quite well to the west and Exeter worked all W call areas except 7, as well as VE1, 2 and 3—an interesting sign of increasing solar activity. In addition, quite a number of JA stations were worked. Exeter made a total of 110 contacts for 399 points, and Belfast 97 contacts to give them second place with 337 points.

As far as aerials were concerned it is interesting to note that the leading six stations all used quads.

## Entries Disallowed

The following entries have been disallowed for the reasons stated. The scores are *claimed* figures only.

### Two Station Entries

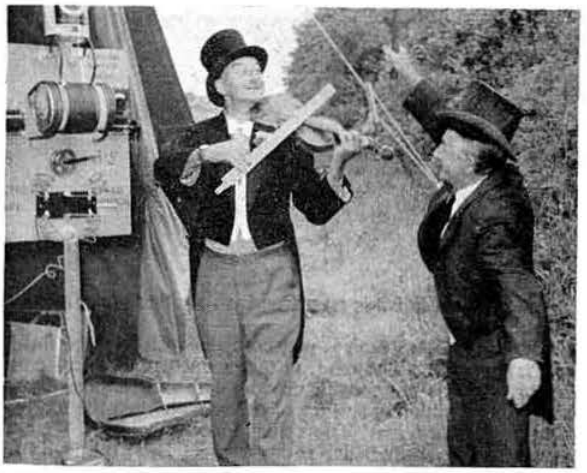
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * | South Birmingham RS .. .. .. | G3OHM | G3NM | f | 262 | 480 | 241 | 250 | 146 | 24 | 1403 |
| † | Weston-super-Mare .. .. .. | G5DV | G8FC | a | 260 | 435 | 281 | 172 | 82 | 0 | 1230 |

* Rule 20 (i) Late entry (ii) no separate logs for each band.
† Rule 19 no operators' calls on logsheets.

### Single Station Entries

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| * | EMI, Wells .. .. .. .. .. .. | G3ORA | 168 | 250 | | 536 | | | 954 |
| * | Durham City ARS .. .. .. .. .. | G3TAK | | 454 | | 145 | | 12 | 613 |
| *† | Worcester & Dist. .. .. .. .. .. | G8JC | 170 | 297 | 103 | | | | 570 |
| † | Skegness & Dist. .. .. .. .. .. | G2FT | 53 | 512 | | | | | 565 |
| * | Barnsley & Dist. .. .. .. .. .. | G5IV | | 307 | 248 | | | | 555 |
| * | Bath Spa Radio Club .. .. .. .. | G3IVL | 166 | 231 | | 164 | | | 562 |
| ‡ | Worthing ARS .. .. .. .. .. | G3IWL | | 269 | 165 | 19 | | | 453 |
| § | Bradford .. .. .. .. .. .. | G3NN | 180 | 236 | 24 | | | | 440 |
| *‖ | East Molesey " B " .. .. .. .. .. | G6GB | | | 113 | 137 | 54 | | 304 |
| * | Eccles & Dist... .. .. .. .. .. | G3GXI | | 332 | 86 | 4 | | | 422 |
| * | Northern Heights .. .. .. .. .. | G2SU | 108 | 85 | | 19 | | | 212 |

* No operators' calls on logsheets (Rule 19)
† Late entry (Rule 20)
‡ No summary sheet (Rule 20). No signature of responsible member (Rule 18)
§ No separate logs for each band (Rule 20).
‖ " A " station entry in order, accepted as " single station."



**Full dress ceremony at the Loughton and District Radio Society station G8AB/P. Albert, mine host at the Rainbow and Dove, conducts G3JBS (left) in the opening bars of *CQ NFD* before tuning up of the water cooled 10 watt aerial tuning unit on the left of the picture. Albert has been host to G8AB/P since NFD 1938.**
*(Photo by G8AB)*

### 28 Mc/s

Conditions on 28 Mc/s were not very good although the band had been open for long periods during the previous fortnight. The band leader, Edgware (G5FG/P), managed to find contacts worth 46 points, and was closely followed by the Croydon RSGB Group (G6LX/P), with 42 points. A large proportion of the contacts made by competing stations were of the ground wave type, but QSOs were had with stations in CR7, PY, ZC4, ZE, 9J7 and 9Q5. Aerials varied from dipoles to Sterba curtains and W8JK's, with the usual high number of cubical quads.

### Comments

" Suggest points system could be based, for example, on the ' adjacent county ' system " (*Caithness*).

" Thank you yet again for an FB NFD and long may it prosper, preferably without present antideluvian rules! " (*Plymouth*).

" Only general view about the rules is that use of 230V a.c. generators should be stopped to encourage use of modern transistorized gear " (*North Notts.*).

" We strongly urge that new consideration be given to raising power input to a level compatible with that used by European Field Day Stations . . . We feel that to limit beam antennas to 14 s.w.g. wire is now outdated " (*Cardiff*).

" Surely working a JA from a low power NFD station is worth more than three points? " (*Verulam*).

" Disused water borehole used for earth connection, and we claim to have the deepest earth connection used in the contest—despite this we scored less than last year! " (*Bury St. Edmunds*).

" Notable T9 transmissions from ' G ' portables, this cannot be said for many European stations " (*Exeter*).

" Suggest bonus points for non-use of p.e. generator, all transistor equipment, etc. " (*Norwich*).

### Comments by the Committee

First of all, our thanks to all stations who took part and helped to make NFD so interesting.

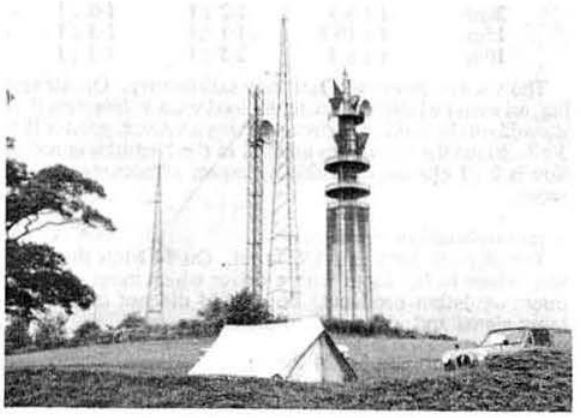
Many of you may be surprised to see the results in the August BULLETIN—just eight weeks after the contest. This has only been achieved by a mammoth effort on the part of the H.F. Contests Committee, who put in some 250 man hours to make the early publication of results possible. The majority of competitors helped in this effort by sending in excellent logs—but as will be seen from the results, a number of entries had to be disallowed for not complying with the rules. To these unlucky ones we say—*Please read the rules. Do* send in a correctly signed summary sheet. *Do* submit separate logs for each band: It is impracticable to check entries listing contacts consecutively regardless of band. *Do* put operators' call-signs against each contact in your logs. *Don't* post your entry at the last minute (or later).

With particular reference to the last point, we have been " under fire " for some while to produce the results quickly. We cannot hope to do this with some logs still arriving *three weeks* after the closing date, when these results were already in the printer's hands.

The Committee has had a number of requests for more detailed information and statistics concerning equipment, aerials, scoring rates, etc. To this end, a more detailed summary is in course of preparation.

### Check Logs

The Committee has, once again, to thank the very large number of stations who submitted check logs: EI6Y/P, EI9S, G2VV, G3EJF, G3KAY, G3RDY, G3RME, G3ULF, GB2SM, GM3TFY, HA9KYB, K9IYK, LA7H, SM2DPB, SM3CXS, SM5BDS, SM5CHH, SM7TV, SP6SO, VE2LY, W1AQE, W4HOS, W4KMS, WA3EFT, ZC4GB, ZC4LK, ZC4SS, ZC4TX, 9M2LO, and 9V1MX.



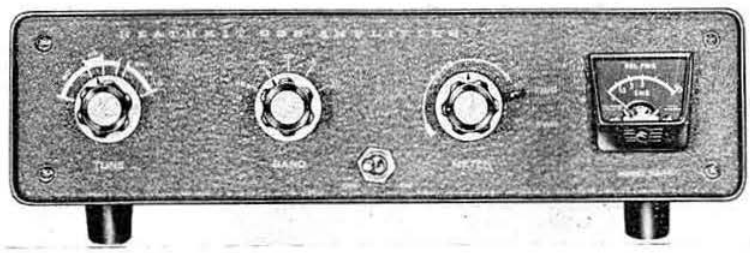
**Manchester and District Amateur Radio Society assure us that they were not cheating during Field Day! Their aerial wire runs from the tent to trees on the left. The site is Heaton Park, Manchester, adjacent to the Police and GPO transmitter sites.**
*(Photo by G3IOA)*

**G3KSH, G3RAA and G3SJE at the Edgware Group Station.**

*Equipment Review*

# THE HEATHKIT 1KW S.S.B. AMPLIFIER HA14

By B. D. A. ARMSTRONG, G3EDD *



DAYSTROM Ltd. of England, market a wide range of American Heathkit s.s.b. equipment amongst which is the HA14 1 kW amplifier. The claim that this is the " world's smallest 1 kW amplifier " is probably justified.

The HA14 and its associated power unit the HP24 are normally advertised as kits, but were supplied to the RSGB for review as assembled units. The mail order prices for the HA14 and HP24 kits are £56 5s. 0d. and £29 5s. 0d. respectively. For assembled units the prices are £68 5s. 0d. and £35 5s. 0d. respectively.

## Circuit Description

***HA14:*** Two 572B (or T160-L) triodes are used in parallel as grounded grid amplifiers. These valves are of glass construction with carbon anodes and although they look old fashioned they are in fact of recent introduction. Power from the exciter is fed through a phono plug to the directly heated cathodes in which there is a preset matching circuit for each frequency band. A pi-output circuit is used but the output capacitor is a fixed type. This makes for a simple circuit but does mean that the amplifier will not be very efficient if the load is reactive or outside the impedance range required. The output socket is the u.h.f. series SO239.

A small meter is fitted which is connected to a simple reflectometer so that relative forward and reflected power is indicated. The sensitivity control is set to full scale on forward power and the meter reads v.s.w.r. when switched to the reflected power position. There is no provision for the measurement of anode current. The operator thus has no idea of the actual power output or d.c. input unless external metering is employed.

An internal relay is fitted so that the aerial is switched straight through to the exciter when the amplifier is not keyed. Keying is accomplished by shorting the −180 volts cut-off bias to ground through the relay and a resistor. An a.l.c. output is provided.

***HP24:*** The power unit is very simple. Fourteen diodes in a full-wave doubler circuit feed six 125 $\mu$F 450 volt capacitors in series to give approximately 2500 volts no load. A single diode with a 30 $\mu$F 200 volt smoothing capacitor provides −180 volts bias.

The mains input is for 120 or 240 volts a.c. 60 c/s and the transformer is protected by an 8 amp resettable contact breaker in each leg.

## Mechanical Construction

***HA14:*** The amplifier is constructed in aluminium and has no chassis as such. All the components are mounted on the screens. Except for the input section, which includes the relay, accessibility is excellent. In spite of the lightweight construction the unit is very stiff and quite suitable for mobile use. The valves could not be easily removed as the base retaining clips fouled the bases. It is necessary to remove the single nut and bolt on the retainer to remove a valve. All voltages except the h.t. are brought in on a small 12 way Jones type chassis mounting plug.

The external finish is an attractive very fine green crackle paint.

***HP24:*** The power unit is very compact with a similar finish to the amplifier. The e.h.t. is taken out on a special connector which is not considered very safe as it is possible to touch the conducting surface of the socket when the mating plug is disconnected. The other end of the e.h.t. lead is terminated in a plug which is dangerous. The e.h.t. lead has very thick transparent insulation and as supplied by Daystrom the terminating plug was badly connected in that the lead insulation stopped short of the plug. The conductor could be seen but not touched. Although the lead was reterminated the same thing tended to happen in use. The remaining voltages are taken out on an octal socket.

## Testing the HA14

Due to limitations in the available drive units, full power testing was carried on 14 Mc/s only. The Heathkit specification could be construed as slightly misleading in that it says the power drive necessary is 100 watts. It does not say if this is actual r.f. watts or the d.c. input to the driver; in fact the former is the case. The power at the output socket on the other hand is in terms of d.c. power input. This is quite reasonable since Heathkit may have no control of the driver used, but it should be made clearer.

The maximum power output on single-tone test at 14 Mc/s was just over 600 watts.

The power gain, input v.s.w.r. and output v.s.w.r. on a 50 ohms load, as shown on the built-in meter, were measured and the following results obtained:

| Band | Power Gain | Input V.S.W.R | V.S.W.R. Indicated |
|---|---|---|---|
| 80m | 1 : 7 | 1·2 : 1 | 1·2 : 1 |
| 40m | 1 : 6·4 | 1·2 : 1 | 1·2 : 1 |
| 20m | 1 : 8·3 | 1·2 : 1 | 1·3 : 1 |
| 15m | 1 : 10·8 | 1·1 : 1 | 1·3 : 1 |
| 10m | 1 : 8·4 | 2·5 : 1 | 1·3 : 1 |

The v.s.w.r. meter was not very satisfactory. On air testing, an aerial which had an actual feed v.s.w.r. less than 2 : 1 showed on the built in meter as having a v.s.w.r. greater than 3 : 1. Since the maximum advised in the Heathkit specification is 2 : 1 one could justifiably expect an accurate built-in meter.

## Intermodulation Products

The claim is 30db at 1 kW input. On 14 Mc/s the HA14 was driven to full input with a driver which measured 30db intermodulation products. The HA14 did not degrade the input signal and was thus satisfactory.

## Comments on the HP24 P.S.U.

This power unit is extremely compact and it is remarkable that so much comes from so little. There are catches however. The heater volts at the input to the HA14 are 12·5 a.c. When driven to full output by constant modulation these heater volts fall to 12·0. The only reason why this was noticed was that the heaters are particularly bright and it was

* Member of the RSGB Technical Committee.

observed that on whistling into the driver microphone, the heaters visibly dimmed. The e.h.t. was 2·56 kV on standby, 2·35 kV in the undriven transmit condition and 1·9 kV with full tone modulation. It should be pointed out to the unwary that due to the high impedance bleed resistor on the main electrolytics the e.h.t. took 64 seconds to fall to 100 volts when the mains supply was disconnected. Another result of the low bleed current is that the d.c. voltage across the electrolytics was unbalanced. With 240 volts a.c. input the voltages varied from 370 to 460 volts d.c. across 450 volt electrolytics. This is very unsatisfactory and there appears to be little that can be done about it. If the bleed current were raised, the transformer would probably be over-run; there is no space for the two additional electrolitics that would be necessary if the bleed current was left as it is.

### Handbooks

The HA14 and HP24 have separate handbooks or assembly manuals as Heathkit prefer to term them. These are excellent and contain a wealth of information as well as precise and lucid assembly instructions. One circuit error involving the bifilar wound heater choke was found in the HA14 handbook.

## MANUFACTURER'S TECHNICAL SPECIFICATIONS

**HA14**

| | |
|---|---|
| *Bands Covered:* | 80, 40, 20, 15 and 10m. |
| *Maximum Power Input:* | S.s.b.: 1000 watts p.e.p. |
| *Driving Power Required:* | 100 watts. |
| *Duty Cycle:* | S.s.b.: 50 per cent voice modulation. |
| *Third Order Distortion:* | −30db or better at 1000 watts p.e.p. |
| *Output Impedance:* | 50–75 ohms unbalanced, s.w.r. not to exceed 2 : 1. |
| *Input Impedance:* | 52 ohms unbalanced; broadband pretuned input circuit requires no tuning. |
| *Meter Functions:* | 0–6 relative power.<br>1 : 1 to 3 : 1 s.w.r. |
| *Front Panel Controls:* | TUNE: 80, 40, 20, 15 and 10m.<br>BAND: 80, 40, 20 15 and 10m.<br>RELATIVE POWER SENSITIVITY<br>Meter switch F.W.D. and S.W.R.<br>Power switch: OFF, ON. |
| *Valve Complement:* | Two 572-B (or two T160-L) in parallel. |
| *Power Requirements:* | 2000 volts d.c. at 500 mA s.s.b. peak, −120 volts d.c. at 60 mA, and 12·6 volts d.c.* at 4 amps. |
| *Cabinet Size:* | 12 ⅞ in. wide × 3 ⅞ in. high × 10 in. deep. |
| *Net Weight:* | 7 lb. |

**HP24**

| | |
|---|---|
| *High Voltage:* | 2500 volts d.c. maximum with no load.<br>2000 volts d.c. at 300 mA.<br>1900 volts d.c. minimum at 500 mA. |
| *Effective Output Capacitance:* | 21 μF. |
| *Ripple:* | Less than 1 per cent at 500 mA. |
| *Duty Cycle:* | S.s.b.: 50 per cent at 500 mA peak; normal voice operation.<br>C.w.: 33 per cent at 500 mA; normal telegraphy operation. |
| *Bias Voltage:* | −180 volts d.c. with no load.<br>−120 volts d.c. at 60 mA. |
| *Duty Cycle:* | Continuous at 40 milliamperes. |
| *A.L.C. Threshold Voltage:* | Approximately 6 volts d.c. |
| *Filament Voltage:* | 12·6 volts a.c. at 4 amps. |
| *Power Requirements:* | 120 volts 60 c/s, a.c. at 16 amps (maximum).<br>240 volts 60 c/s, a.c. at 8 amps (maximum). |
| *Dimensions:* | 9 in. long × 4¾ in. wide × 6¾ in. high. |
| *Net Weight:* | 18¼ lb. |

Daystrom Ltd. have stated that the HP24 is suitable for use on a 50 c/s mains supply.

* Although the heater requirements are stated as d.c., the power supply in fact supplies a.c.

### On the Air

As has been mentioned previously there is no way of determining the d.c. power input to the HA14 amplifier valves. It can be driven to 1·2 kW input before limiting starts, although the specification says 1 kW. The best approach is to work backwards from the power gain figures quoted above and adjust the driver accordingly.

The driver used for air testing was the KW Vespa which conveniently had insufficient power to run the HA14 into limiting, but sufficient to drive it to the legal limit. With only two controls, bandswitch and anode tuning, the HA14 was extremely easy to tune up. The forward power position of the v.s.w.r. meter was used to indicate resonance. Listener reports indicated that the extra power was well worthwhile and that there was no difference in audio quality.

The duty cycle is of some importance in a compact unit. Heathkit say 50 per cent voice modulation on s.s.b. Just what this statement means is not clear. With the KW Vespa as a driver, the heat rise during transmit periods was reasonable. During the bench tests the heat rise was very high, which is only to be expected when well over 500 watts is dissipated in 290 cubic inches, and the unit had to be externally blower cooled for test purposes.

### TVI

The HA14 was checked on 40, 20, 15 and 10m under the same conditions as the KW Vespa reviewed in the May issue of the RSGB BULLETIN. There was no sign of parasitics under any drive condition and although TVI occurred on 20, 15 and 10m, it was due to swamp signal from the HA14. A simple high pass filter in the television feeder cleared the interference.

### Warranty

The units are warranted for three months from date of purchase. The warranty is not transferable and outside the USA is on a factory f.o.b. basis.

### Conclusions

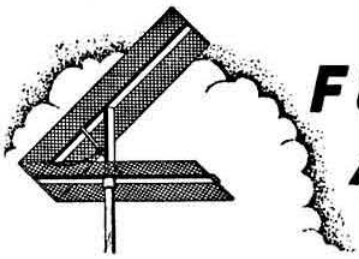
The main thing about the HA14 is that it works. It is an attractive low cost device, but in the terminology of the sports car enthusiast, is very "hairy." There is a more sophisticated alternative, however. The Heathkit SB200 is almost identical to the HA14 and HP24 combination in circuitry but has built in grid and anode current metering. It also has a better engineered reflectometer, an output loading control and a cooling fan.

### India's YLs

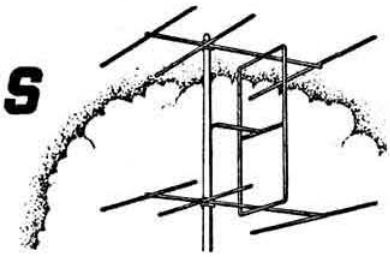
According to Louisa B. Sando, W5RZJ, YL Editor of *CQ Magazine*, there are at least half a dozen active YL amateurs in India with another half a dozen well on the way to a licence. The active group include VU2EV, LA, LD and YL, the latter being the wife of Col King, VU2AK. VU2QFZ and 2LYZ are Grade II Novice Licence holders; YU2EV and YU2LD are electronic engineers. YU2LA was recently chosen " Bangalore Ham of the Year " and received a citation for contributions to the local club and to YL activities in India.

### The Use of SI Units

A booklet dealing with the use of the metric system in the United Kingdom, entitled *The Use of SI Units*, is available from the Sales Branch, British Standards Institution, 2 Park Street, London, W.1, price 1s. post free.



# FOUR METRES AND DOWN



By JACK HUM, G5UM*

## THE BAND PLANS: 2M NOW: 70CM SOON

BY the time this feature is read the new British Isles Two Metre Band Plan will be a matter of a few days old. Evidence already exists that operators are collecting together crystals that will place them in the new 144·0 to 144·1 area for that c.w. working which is going to extend the range of the band in a manner few may have believed possible. Many of these crystals will be of " surplus " derivation to a common frequency, and the QRM level in that neighbourhood is likely to be high. Remember that a 25 pF variable trimmer across the crystal and adjustable from the front of the transmitter will permit a certain amount of frequency sliding " to get out from under."

Less evidence exists, unhappily, of an equal amount of activity in respect of v.f.o. design, apart from one professional offering that shows distinct promise. Let us not cosily imagine that we are all going to be safely rock-bound for the rest of our v.h.f. lives. Only by wholeheartedly adopting v.f.o. technique shall we achieve the flexibility we need to zero-beat with wanted stations in both the geographical zones and the c.w. one.

What is needed now is an inexpensive, readily-built design of master oscillator, preferably transistorized (might as well start off on the right foot while we are about it!), and capable of radiating a signal indistinguishable from that derived from a crystal both in terms of tonal quality and stability. It must be keyable without emitting anything less than a genuine T9 note and must not be audible in the home station receiver if full break in working is anticipated—as it should be.

Already our Belgian confreres have shown the way; the UBA has announced a competition for the best v.f.o. for v.h.f. purposes, the results to be declared in the autumn. They deserve our plaudits on this account.

Willingly, *Tech Corner* will carry the story and circuit of *your* v.h.f. signal shifter—but remember, it's got to be good!

Following the announcement of the new Two Metre Band Plan members were quick to ask: " And what about Seventy Cems? "

All u.h.f. operators will be pleased to hear that the RSGB Council has now approved proposals put to it by the V.H.F. Committee that the area 432 to 434 Mc/s shall be planned exactly as 2m, with c.w. between 432·0 and 432·1 Mc/s, sideband at 433·41 Mc/s, and the old south western Zone 1 incorporated within Zone 2, 432·1 to 432·25 Mc/s.

How many members will have the expertise to adopt single channel techniques at 70cm remains to be heard. Let us all hope the results will never sound anything less than crystal controlled.

The Council has approved the modified 70cm band plan to become effective from 1 October, 1966. This will be in time for the tropo openings which frequently occur in the Autumn.

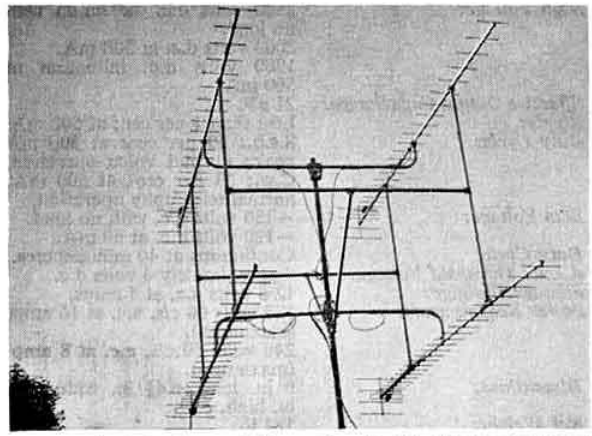
So much for band planning from the " official " end, so to speak. What of it from the user's end? Let G6SN speak for many. He says:

" Congratulations on the modified Two Metre Band Plan. This is just what is wanted to bring the band into line with modern techniques . . . it will do more to develop 2m than anything that has gone before. Sideband will come. It may result in a few pile-ups but even when conditions are wide open I don't fear anything like a 20m rat race. The behaviour on 2m even at its worst has always been exemplary. Let us hope it continues so."

## ARE OUR TECHNIQUES INADEQUATE ON "4"?

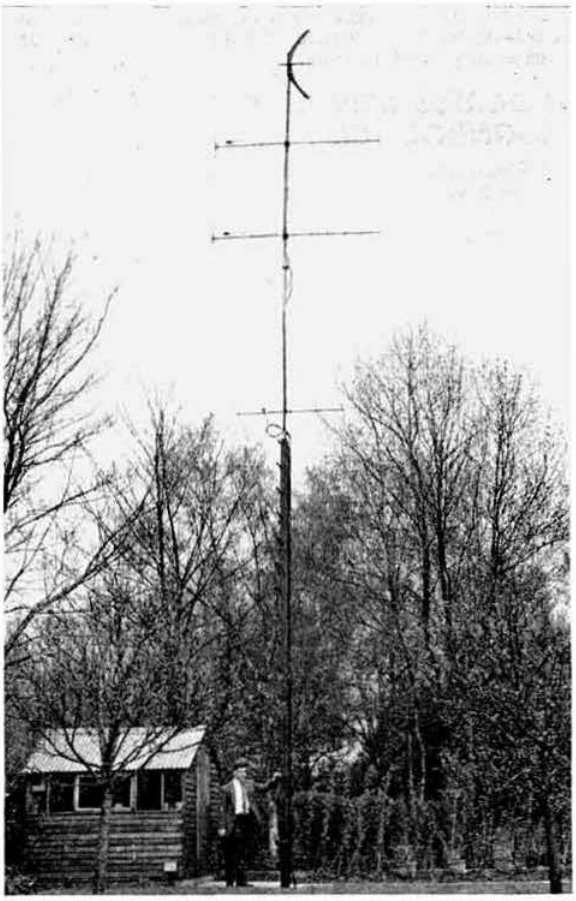
Triggered off by last month's comment about " Frustration on Four," G3FDW of Retford agrees with everything G3BA had to say about the low state of occupancy of the band at many periods when activity could well be expected to be high.

In remarking that " the situation is created by just one thing: 4m is so good a band that you can get by with just anything in the way of equipment," Mike goes on to quote



**Photographed by Harry Wilson himself, this 96-element beam at EI2W, Sandyford, Co. Dublin, accounts for much of the decibel-rating which his signal achieves " across the water ". The station is on 432 Mc/s most evenings from 1900 GMT onwards at a site 1000 ft. a.s.l., and running 20 watts to a QQE03-20.**

* Bulls Green, Knebworth, Herts. Please send reports to arrive not later than 12 August for the September issue, and 9 September for the October issue.



**Four Metres and Up! The aerial system at G8ACE, Hatfield, permits listening on 4m with a dipole and on 2m with a five-element Yagi, and transmit/receive on 70cm (14-over-14) and 23cm (semi-parabola), the four being arranged in ascending order. The mast section is rotated from a motor at ground level.**

an example of just what " Four " can do for you if you use it properly. He says:

" The other day I persuaded a Surrey station I was in contact with on 80m s.s.b. to come up on 4m. Although he was 170 miles away from me his B44 carrier was S3-5 and R5. He was disinclined to believe me until I told him when he had the carrier on and off! "

Which proves once again the point that if only users of B44 and similar modified ex-commercial equipments would fit them with keying sockets they would be surprised at their potentialities. Many of them, too, could do with a clean-up on the audio side, as has indeed been simply and cheaply achieved by a number of north London stations using transistor pre-amplifiers ahead of the audio chain.

To use existing ex-commercial receiver strips instead of installing a decent converter is, to our mind, another method for making sure you do not use " Four " to the full. No wonder G3FDW is driven to observe: " London has the biggest selection of cloth ears in the v.h.f. world."

## BEACONRY

The past month has seen several important developments on the metre-wave beacon front:

**Malta,** 9H1MB: The Malta Government has now authorized the setting up of a beacon operating on 70·1 Mc/s with the call-sign 9H1MB. The equipment will consist of a modified business-radio base station transmitter giving 15 watts output, a Government-surplus automatic keyer/tuner unit and a four-element Yagi beamed on the UK. By the time these notes appear the equipment should be undergoing its final soak test before shipment to Malta. It is hoped to have 9H1MB operational by October. Howard Cunningham, 9H1A, is responsible for the arrangements in Malta.

**Craigowl Hill, near Dundee,** GB3ANG: The transmitter was taken off the air when stability of the crystal oscillator proved unsatisfactory, and another transmitter was modified to replace it. Soon there should be a 4m service from GB3ANG. Application has been made to the GPO for authority to install a beacon at Craigowl Hill radiating on 70·695 Mc/s, usefully close to the band edge. If this permission is granted it is intended to put the GB3LER beacon in the Shetlands on 70·305 Mc/s beamed north continuously as an auroral propagation beacon.

**Strabane, N. Ireland,** GB3GI: Two aerials are used on 145·990 Mc/s, one beamed 10° east of north and the other south east; switched alternately in each direction. The call-sign is sent four times during each 1½ minute northward cycle, and six times on each 1 minute 35 second southward cycle. Reception reports from beyond 100 miles will be welcomed by the V.H.F. Committee. Already it has been heard S2/3 by Dunfermline members at a range of some 200 miles.

**Swansea,** GB3GW: This, the latest in the chain of 2m beacons, should be operational by the time this BULLETIN appears, or shortly afterwards. Watch GB2RS for news of it. As an exemplar of modern v.h.f. transmitter design it is worth describing in some detail, even though some of the devices embodied may be a little beyond the pockets of you and me at this point in time. The transmitter is completely solid state, running from a 24 volt d.c. supply. The crystal oscillator will run on 24 or 48 Mc/s, a choice dictated by stability requirements that call for a drift not exceeding 300 c/s at the radiated frequency of 144·25 Mc/s. Three amplifiers follow, driving a 1N4386 varactor capable of 32 watts output at 144 Mc/s, though in fact the output at GB3GW will be held at 5 watts.

The automatic keying system will consist of a photo-electric device with a disc containing the signal " DE GB3GW " followed by transistor amplifiers and a keying unit.

The aerial arrays, which are being supplied by J-Beam Aerials Ltd., are bi-directional and of ruggedized construction: they will need to be, for they are to be located on a building 180 ft. high right on a windswept part of the South Wales coast. The location is the University of Swansea

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

| Call-sign | Location | Nominal Frequency | Emission | Aerial Direction |
|---|---|---|---|---|
| GB3ANG | Craigowl Hill, Dundee | 145·985 Mc/s | A1 | S |
| GB3CTC | Redruth, Cornwall | 144·10 Mc/s | A1 | North-East |
| GB3GEC | Hammersmith, London | 431·5 Mc/s | F1 | |
| GB3GI | Strabane, N.I. | 145·990 Mc/s | A1 | |
| GB3LER | Lerwick | 145·995 Mc/s | A1 | S |
| GB3LER | Lerwick | 70·305 Mc/s | A1 | N/S |
| GB3LER | Lerwick | 29·005 Mc/s | A1 | N/S |
| GB3VHF | Wrotham, Kent | 144·50 Mc/s | F1 | North-West |

**RSGB V.H.F. BEACON STATION GB3VHF**

The frequency of the Society's v.h.f. beacon transmitter at Wrotham, Kent, when measured by the BBC Frequency Checking Station, was as follows (nominal frequency 144·50 Mc/s):

| Date | Time | Error |
|---|---|---|
| 15 June ... ... ... ... | ...09.35 GMT | 340 c/s low |
| 21 June ... ... ... ... | ...17.34 GMT | 330 c/s low |
| 29 June ... ... ... ... | ...09.00 GMT | 310 c/s low |

School of Engineering. Ron Barrett, GW3DFF, will be the man in charge.

**West London,** GB3GEC: Our only available 70cm beacon (431·5 Mc/s) is very welcome when it is on and the subject of a few cuss-words when it is not—which shows how valuable it is to the u.h.f. fraternity and how sorely it is missed when the exigencies of the service compel the service to be disrupted! As will be known, this beacon is operated by an industrial concern for valve life tests.

While on the subject of beacons it is worth recording that at least one of the Norwegian beacons, that at Bergen, LA4VHF, has been logged in the UK. During the " one day opening " of 29 June, Brian Armstrong, G3EDD, at Cambridge, heard it at good strength between QSOs with a couple of OZ stations; and his compatriot Gerald Jeapes, G2XV, on holiday on the Norfolk coast, logged it as well. Noting that LA4VHF is on the same latitude as the Shetlands we make its QRB of the order of 600 miles.

All the Norwegian beacons listed here in June use omni-directional aerials, reports Bill Burton, G8ANQ, who sent along the original news about them.

Incidentally, the 29 June opening seems to have been very Scandinavian-orientated. G3LTF worked SM, LA and OZ (two) that night.

## VK ON "TWO" VIA SATELLITE

To hear a VK on 2m in Britain has always seemed a flight of fancy. Soon it will be a flight of reality if the massive organizational plans now being laid by the Melbourne University Radio Club take wing, as indeed they promise to do before many months have passed.

A 35 lb. satellite will be the vehicle for a transmitter on 144·05 Mc/s to radiate telemetry information for 70 seconds followed by the keyed signal " VK " once per second for ten seconds. Simultaneously, a beacon on 29·450 Mc/s will radiate " VK " to a similar cycle every 80 seconds, with key-down in between.

Already this project, called *Australis 1*, has included two successful balloon flights of both the 2m and 10m equipments.

Eventually—perhaps by December—*Australis 1* will be launched from the Western Test Range in California, into a near circular orbit about 500 miles above the Earth. Each orbit will take about 1 hour 42 minutes, and because the satellite will travel between 70° north and 70° south latitudes, it will cover most of the populated areas of the world at least once a day. Well before the event orbital data will be publicized via transmissions on the h.f. bands.

## "ALL-OSCAR-XCLUSIVES" FROM BILL

As will have been gathered from the hint dropped here last month, the release into space of the next Orbital Satellite Carrying Amateur Radio may happen at short notice. It is well, then, to be prepared for future Oscarlations by keeping in touch with the man whose yeoman service in this area of activity deservedly won him an RSGB trophy—meaning, of course, Bill Browning, G2AOX.

If anyone can get " all-Oscar-xclusives " it is G2AOX through his almost daily h.f. band schedules with Stateside. When Bill gets hard news about Oscar developments he sends it off via his *Oscar Newsletters* to all members who have deposited stamped addressed envelopes with him. Those who haven't won't get them. This is fair enough, for the cost of mailing can quickly mount to prohibitive levels.

Those who received Oscar news from G2AOX in the past and wish to continue to have it in the future should send him a minimum of four stamped, self-addressed envelopes (9 by 4 in., please). So should all members who *haven't* had it before but now wish to do so. His address is 47 Brampton Grove, London, N.W.4.

Do not expect a regular flow of news. If there isn't any your SAEs will not be wasted—but if there is, they will come in exceedingly useful to you.

## PROGRESS REPORT ON MOONBOUNCE

Without wishing to discourage those enthusiasts who say (and we have heard them) that they would " like to go in for moonbounce " we think that the following information on the current state of the art outside the UK, passed on by G3LTF, will put the situation into its proper perspective.

Among the active EME stations abroad, says G3LTF, are: HB9RG, who has achieved partial QSOs with W1BU and WA6LET using a 20 ft. dish; W1BU, who, using a 28 ft. semi-fixed dish or an 18 ft. fully steerable, has worked K2MWA, WA6LET, KH6UK and believed-W3SDZ.

W3SDZ has a 25 ft. dish and has worked WA6LET and believed-W1BU.

KH6UK worked W1BU with an 18 ft. dish. He is now back in the US.

K2MWA with his 60 ft. dish has worked W1BU, W1HCT, and WA6LET.

And as for WA6LET, here a dish no less than 150 ft. in diameter has been in use to produce contacts with the stations listed above plus W9HGE, W2CCY, W1HIV, K2CBA and that world shattering one with G3LTF himself: *and note, all this is on 70cm.*

It is believed that OZ8EME and SM7OSC have 1 kW licences, which makes five-nation communication by EME not beyond the bounds of possibility.

Not *inapropos* the above is a paper project to put a 432 Mc/s responder beacon on the moon, according to the American *Electronic News*. A 6-ft. self inflating parabola aerial would be used. Clearly, it is going to be necessary to " watch this *space* " for further developments.

## ROCKBOUND AT 36 NORTH

Life on the Rock of Gibraltar can be a bit claustrophobic (" can," we said, not " is "), but not if you are a radio amateur with electronic tentacles at your disposal, for reaching out to see what is doing beyond.

What is fascinating about the activities of Alan Osborne, stationed on The Rock with the RAF, is the number of people in Spain and Portugal he has managed to work using his call-sign of ZB2VHF—a revelation indeed of the amount of 2m activity there is in The Peninsula. When this call-sign was obtained in March, clearance was given to use


**Coveted QSL! Given a really sensational opening (like the one to YU a year ago, remember?) it might be possible for British Isles operators to work Gibraltar on 2m or 4m, and to win themselves this rare QSL. (Story on this page.)**

6 and 4 metres as well. Apart from EA and CT no fewer than five CN8 stations have been worked on "Two."

Whether G operators would ever be able to reach that far is conjectural: only the select few have managed to work *north* Spain on "Two," and behind that is a big land mass peaking at something like 9000 ft.

But *nil desperandum:* lots of people worked YU last year and the mountains are even higher that way. So if you are interested in fixing a v.h.f. sked with "Ossie" write to him as J/T A. C. Osborne, Devil's Tower, RAF North Front, Gibraltar. It is also worth noting in the diary that ZB2VHF is on 144·091 Mc/s every Tuesday and Friday from 2000 to 2300 GMT at a site 1400 ft. a.s.l. When not in QSO he keeps the auto keyer constantly running, sending "CQ de ZB2VHF."

## TECH CORNER

Constructors who have found difficulty in persuading the low power 70cm tripler-amplifier design in *The Handbook* to perform as it should will be interested in the accompanying details (Fig. 1) from G8AAF of Beaconsfield showing modifications to the line lengths. Other components shown are as *Handbook*. The diode and meter prove useful for tuning purposes, adds G8AAF.

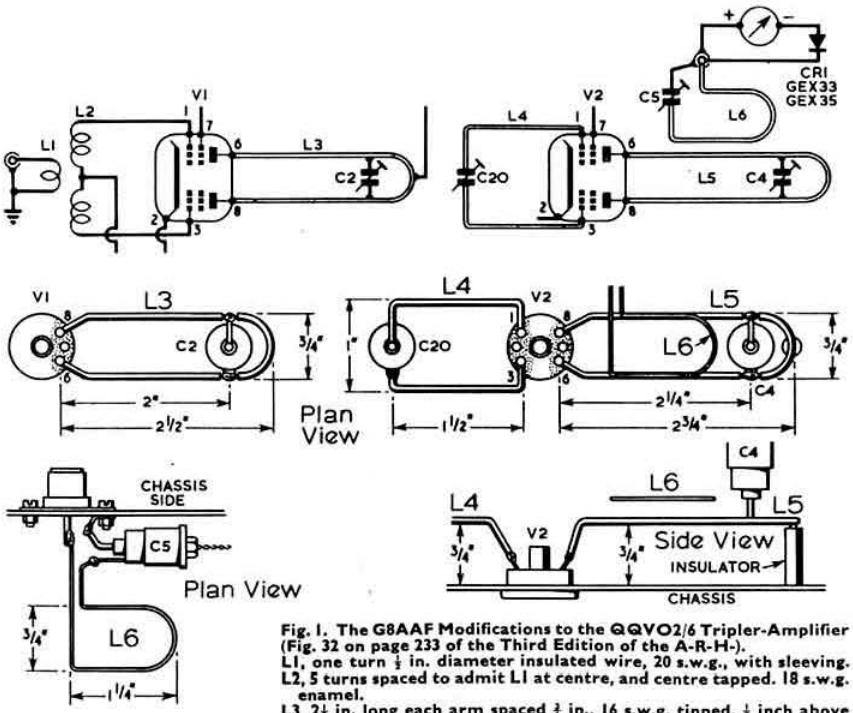
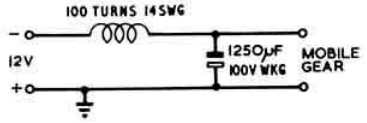


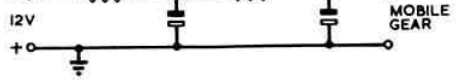

**Fig. 1. The G8AAF Modifications to the QQVO2/6 Tripler-Amplifier (Fig. 32 on page 233 of the Third Edition of the A-R-H-).**
**L1, one turn ½ in. diameter insulated wire, 20 s.w.g., with sleeving.**
**L2, 5 turns spaced to admit L1 at centre, and centre tapped. 18 s.w.g. enamel.**
**L3, 2½ in. long each arm spaced ¼ in., 16 s.w.g. tinned, ½ inch above chassis.**
**L4, 1½ in. long each arm spaced 1 in., 16 s.w.g., tinned, ¾ inch above chassis.**
**L5, 2¾ in. long each arm spaced ¼ in., 16 s.w.g., tinned, ¾ in. above chassis.**
**L6, 1¼ in. long each arm spaced ¼ in., 18 s.w.g. enamel, 1 in. above chassis.**
**Note: C20 must have a 2-8 pF body with a 3-30 pF hat.**

**From G3PTO:**

Here is a useful filter for 2m mobile operators who may still be worried by too much noise from their vehicle electrical systems:




Alternatively, a filter from a B44 may be adapted by the use of the following circuit. Both the inductors consist of 38 turns of 14 s.w.g. wire on formers ⅝ in. in diameter. Both the capacitors are 0·75 μF.




**From A4388:**

A great deal of interest was aroused by the appearance in the July issue of *Splatter*, the news-sheet of the Purley and District Radio Club, of a 4m transistor converter design by Edward Harland, A4388. The interest came from the fact that the design appeared to be so simple as to have potential as a club constructional project "to try to get more of our SWLs listening on 4," as G3FTQ, honorary secretary of the Purley Club puts it, adding: "I am sure if anyone gets into difficulties that Edward will be only too pleased to help."

The circuit (Fig. 2) and component values are reproduced herewith from *Splatter* with congratulations on a nice example of how to go about getting more people keen on v.h.f.

## CONTEST NEWS

Daybreak on 3 July gave promise of a hot spell for the Fourth 144 Mc/s (Portable) Contest and with it favourable conditions. The former phenomenon materialized but the latter did not. Almost all commentators observe that although plenty of signals were there they were of about the strength to be expected from stations specially sited for contest purposes.

As always, it was possible after sending CQ to hear about a dozen stations all doing the same, none of whom had been worked! (Usually they were collected in the fullness of time.)

The Cornish Group put G3XC/P into the field to notch 51 contacts, all of them, apart from a handful, well over the 100 mile mark. "Stations in Yorkshire and Cheshire were coming through at variable strengths from S0 to S9 most of the day," reports G3OCB.

And at the Yorkshire end G6SN/P at "a delightfully quiet spot over 1900 ft. a.s.l. in the Pennines" reached as far as South Scotland but felt that conditions were not anything to write home about. "Only 21 contacts; nevertheless, I shall enter a log even if I do come out bottom," adds "Shack" in the true contest spirit.

G3EDD at Cambridge says that GI3GXP was audible

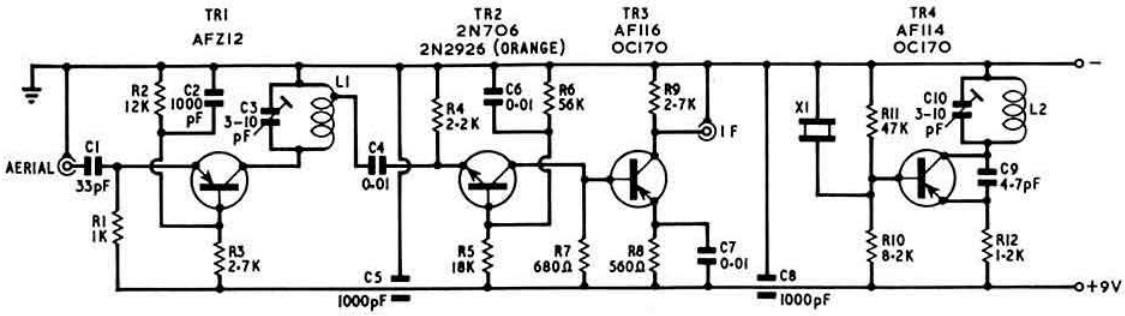



**Fig. 2. The circuit of the 4m converter developed by Edward Harland, A4388, and described in a recent edition of the Purley and District Radio Club news-sheet *Splatter*. It has distinct possibilities for communal construction by club or group memb rs wishing to get going quickly on " Four."**

**C1, 33 pF; C2, 1000 pF ceramic; C3, C10, 3-10 pF ceramic trimmers (Henry's); C4, 6, 7, 0.01 uF; C5, 8, 1000pF ceramic feedthrough (Radiospares); C9, 4·7 pF; R1, 1Kohms; R2, 12 Kohms; R3, R9, 2·7Kohms; R4, 2·2Kohms; R5, 18Kohms; R6, 56Kohms; R7, 680 ohms; R8, 560 ohms; R10, 8.2Kohms; R11, 47Kohms; R12, 1·2Kohms; L1, L2, 7 turns 20 s.w.g., ¼ in. diameter, ½ in. long, L1 tapped one turn from earthy end. TR1, AFZ12; TR2, 2N706 or 2N2926 (orange); TR3, AF115, AF116 or OC170; TR4, AF114 or OC170. The crystal should be selected according to the i.f. range required; for example, a 65 Mc/s crystal will give a tuning range on the station receiver of 5·1 to 5·7 Mc/s, representing 70·1 to 70·7 Mc/s. Enough injection occurs from the crystal oscillator into the mixer to obviate the need for coupling arrangements.**

with him, but was quickly kept occupied by more local callers. Members in the south would welcome the chance to work from portable sites some of the GI, GM and EI stations which can be detected from time to time.

On the other hand, some of the southern and east coast portable operators earned *their* corn by gathering a rich harvest of Continental stations whose signals would be too attenuated by the British Isles land mass to penetrate very far up country. For example, G3LTF/P secured no fewer than six DL and 21 PA from AL24F, if you can guess where that is! Yes, QRA Locators were in almost universal use on 3 July—yet about half of the contacts made from the /P site where the writer was helping out asked for actual location as well as QRA Locator " to help humanize the thing a bit! " as one person put it.

A contest-with-a-difference is that organized by the DARC for 1-2 October (2100-1100 GMT). Only two-way s.s.b. contacts will be valid. Scoring will be one point per kilometre on 2m, five per kilometre on 70cm, ten on 23cm and 20 points-per on 12cm. Logs, made out RSGB style and stating p.a. final used and p.e.p., to DL6HA by 15 October at Schleussnerstrasse 24, Bad Homburg 638, Germany.

## EXPEDITIONARIES

It certainly looks as though added excitement is going to be imparted to V.H.F. National Field Day next month by the presence of a number of expedition stations. Furthest south will be—once again—GB2GC on Alderney (but don't forget they are due to start operations there on 18 August); while by all accounts farthest north should be GM3RIK/P, crewed by G3RIK, G3SBI and G3JIJ, to operate from the highest QTH in Great Britain, Ben Nevis. The station will operate from the end of August right through the V.H.F./NFD period for a total of about seven days, on both 2m (with an eight-over-eight) and on 4m with a four-over-four, input 15 watts in each case.

Another interesting GM expedition calculated to put on the v.h.f. map a comparatively rare part of the UK is that planned by the Chester Radio Society to the Isle of Arran (it is in the County of Bute) from 15 to 18 September inclusive. Six operators will be available together with several receiving members, so it looks as if there will be several keying fists (and lifting arms for masts) available. There will need to be, for operation is planned on *all* bands, with 2m as an important part of the proceedings. Call-sign GM3GIZ/P. It is regretted no skeds can be arranged, says secretary G3TZO.

Almost concurrent with the above will be the G3TWV/G3TWX operations in Belgium and Holland between 16 and 20 September on a.m. and c.w., 144·7 to 145·8 Mc/s. Their ON8 and PA9 calls should be available for notice here next month.

Members who have their eyes on the Society's 70cm operating award with its requirement for 20 counties and three countries worked on that band will be grateful for the efforts of any expeditionaries who can at one and the same time put the county of Brecon and the country of Wales on the air. Each is rare enough to everyone outside the Principality (and some in it) to make the 21 August expedition there by two Birming-hams something worth watching for. Call-signs will be GW8AHE/P on A3 and GW3OVA/P on telegraphy—a wise arrangement. The frequency will be 433·26 Mc/s, the input 8 watts and operations from 1300 GMT onwards. Skeds via G8AHE.

The opportunity to add Devon to the list of 20 required 70cm counties was enjoyed by 18 operators between 18 and 25 June when G8AGU/P was at a site 1620 ft. a.s.l. in North Devon, and worked them all, from South Wales to South Devon and as far east as Ringwood in Hants. And EI2W was heard into the bargain. All this with 50 watts to a QQV0 6-40 final, which was noteworthy enough under portable conditions; but what was quite amazing was the reception of television pictures from G6SAU/T, Paignton, at 50 miles. " Quality was good, resolution being about 2 Mc/s on his test card," reports Paul, G8AGU. A test pattern from G6LYF/T, Stoke Gabriel, was just visible in the noise. The G8AGU aerial was a 14 element Yagi at 20 ft. and the receiving set-up a transistor converter into an EC10 for the A3.

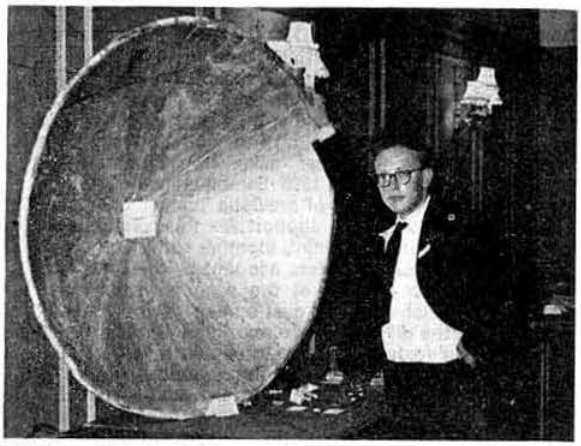
## TWO MORE ARTOBS

More news from Germany is to the effect that two more *ARTOB* balloons have taken flight, one on 3 July (did any of our /P contestants detect any evidence of it?), and the other on 19 June. Reporting that numerous DLs went through the 70cm/2m translator, DL3IY makes special reference to SM7BAE, whose 300 watts put a 599 signal into Hanover for the whole of the two hour test at a range of something like 600 km.

## SKEDS OPERATIVE

Purley Radio Club net: every Wednesday at 1930 GMT, on 70·32 Mc/s. These nets regularly attract eight to ten South London operators, and the numbers are growing.

G3FDW to G3BA either 1000 to 1100 GMT Sundays or



**G3OAD exhibited a 4ft diameter fibreglass microwave dish, suitable for use up to 35 Gc/s, at the Midlands V.H.F. Convention. He hopes to be able to put this design into production, selling for about £14.** *(Photo by R. Marley)*

at 2200 GMT Mondays, and sometimes both. Frequency: 70·16 Mc/s.

UB5KDO (QRA RJ46G) is anxious to arrange meteor scatter skeds for the Perseids, 14, 15 and 16 August. Times will be 0100 to 0300 GMT, and the frequency 144·180 Mc/s ±1 kc/s. UB5KDO will transmit during the first five minutes of each hour, listen during the next five minutes, etc. G3OQB is willing to help arrange skeds; his address is 27 Princess Drive, Bridgnorth, Shropshire.

Until 7 August, GM3TQD/P and GM3TQZ/P will be operating from some of the rare Scottish counties, staying in each area for two days. GM3TQD/P will be confined to Top Band, while GM3TQZ/P will be heard on 2m.

## POINTS OF VIEW

" It is obvious to me on openings, *OSCARS*, *ARTOBS* and the like how much the Continentals are ahead of us in the use of s.s.b. on v.h.f., although the quality of *some* of the transmissions I must admit is like the stuff I hear from Italy on 20m "—G3BA.

" I would like to make a point that the G8-plus-three operators be allowed to use all v.h.f. bands from 70 Mc/s upwards with no restriction for phone or c.w. This would help activity in all areas "—G3PTO.

" I use the amateur bands for communication, and adopt the mode appropriate to the situation. There's no point in getting involved in arguments as to which is the best. Use them all if you've got them! "—G3EDD.

" We might concentrate our 4m activity to one night during the week, say 2200-2359 clock time Monday or Friday. During the Summer I find Sunday mornings often spoilt by one contest or another "—G3FDW.

(Note—*Members are invited to give this suggestion a trial. Monday we imagine would be particularly convenient for a 4m activity period to follow the existing 2m activity night, when operators are in their shacks anyway.—J.H.*)

### ONE MORE EXPEDITION

One of the rarer Channel Islands will be the subject of considerable activity when Sark is visited by a party of amateurs from 14 to 27 August. The call-signs will be GC30HH on 70·41 Mc/s, and GC3OUF on 144·14 Mc/s. Modes are A1, A3, and RTTY using either f.s.k. or a f.s.k. Schedules can be arranged by writing to G3OUF, 80 Argyll Road, London, W13, listing the times available and frequency.

## REF ORGANISE THIS YEAR'S "V.H.F. INTERNATIONAL"

### To coincide with V.H.F./N.F.D.

The French national society REF this year has the responsibility of organizing the annual Region 1 V.H.F. Contest for the IARU. As will be seen from the rules, given in full below, the event coincides with the British V.H.F. National Field Day, and should promote an exceptionally high level of activity from UK fixed as well as portable stations.

The penalties for poor log keeping will be dire. Take a look at Rule 10!

**Rules for IARU Region 1 V.H.F. contest, organised by REF**

1. **Eligible entrants:** All licensed radio amateurs resident in Region 1. Multiple operator entries will be accepted provided only one call-sign is used. Contestants must operate within the letter and spirit of the contest and at no greater power than permitted in the ordinary licences of their country. Stations operating under special high power licences do so " hors concours " and cannot be placed in the contest proper.

2. **Contest sections:** The contest will comprise the following sections:

(1) Fixed Stations, 2m.
(2) Portable/Mobile stations, 2m.
(3) Fixed stations, 70cm.
(4) Portable/Mobile stations, 70cm.
(5) Fixed stations, 23cm.
(6) Portable/Mobile stations, 23cm.

Portable/Mobile stations must operate from the same location throughout the event.

3. **Date of contest:** The Contest will take place on 3-4 September, 1966.

4. **Duration:** The Contest will commence at 18.00 GMT on Saturday, and will end at 18.00 GMT on the Sunday.

5. **Number of contacts:** Each station to be worked once only on each band whether fixed, portable or mobile. If a station is worked again during the same contest on the same band, only one contact will count for points and should be clearly marked as duplicates, but any duplicate contacts should be logged without claim for points.

6. **Types of emission:** Contacts may be made on A1, A3, A3a, or F3.

7. **Contest Exchanges:** Code numbers exchanged during each contact shall consist of the RS or RST report followed by a serial number commencing at 001 for the first contact on each band and increasing by one for each successive contact on each band. This exchange must be immediately followed by the QRA Locator of the sending stations (example 59003 CX24J or 579023 HG46E). QTHs may be exchanged if desired.

8. **Scoring:** Points will be scored on the basis of one point per kilometre. The final claimed score must be shown at the top part of the first sheet.

9. **Entries:** Entries must be set out as shown in the example below. Two copies must be sent to the National V.H.F. Manager concerned,* postmarked not later than the second Sunday following the contest weekend. Late entries will not be accepted. The judging of the entries shall be the responsibility of the organizing Society whose decision shall be final. Submission of a log implies acceptance of the rules. Not later than the seventh Sunday following the Contest, the V.H.F. Manager or properly constituted Contest Committee will forward to REF, 60 Boulevard de Bercy, PARIS 12e, one copy of each entry, after examining the logs and certifying them to be acceptable to the best of their knowledge.

* G3FZL in the case of UK participants.

10. **Disqualification:** Entrants deliberately contravening any of these rules shall be disqualified. Minor errors may result in loss of points. Errors in call-signs and code numbers will be penalised by deducting the following percentage of claimed scores for both stations:

| | |
|---|---|
| 1 error | 25 per cent |
| 2 errors | 50 per cent |
| 3 or more | 100 per cent |

The claimed contact will be disqualified for an obviously wrongly stated QTH or a time error of more than 10 minutes.

11. **Awards:** The winner of each section will receive a certificate. The top score on 2m whether fixed or portable will be awarded the Region 1 V.H.F. trophy. The winner in the remaining categories will be awarded the PZK cup.

12. **Sample contest log sheet:** The first sheet of the log must clearly show:
Title of Contest, Date and Claimed score, Section and Call-sign.

Other required information is:
Name of entrant, home address, location of station (latitude, longitude), height above sea level in metres, transmitter input power.

Other sheets must give the list of contacts as indicated below

| Date Time | Call-sign | Serial numbers sent | Serial numbers received | Distance in km | Points claimed | |
|---|---|---|---|---|---|---|
| | | | | | | |

Contest sheets established by National Societies can be used.

13. **Declaration:** Logs must end with this declaration:
"*I declare that this station was operated strictly in accordance with the rules and spirit of the contest and I agree that the ruling of the organising society shall be final in all cases of dispute.*"

Date..... Signed.....

**INTERNATIONAL RADIO COMMUNICATIONS EXHIBITION**
**Seymour Hall, London, W1**
**26 to 29 October 1966**

In connection with the display of home constructed equipment normally held in conjunction with the Exhibition, members are asked to note that the arrangements for the 1966 Exhibition will be on a different basis to that of previous years.

For some time, the support for this display has been falling, and this point, together with shortage of space, has been taken into account by the Exhibition Committee in arriving at the requirements, which will be published in the next edition of the *Bulletin*.

Briefly, the display will be restricted to items which have been featured in constructional articles in the *RSGB Bulletin* during the period January 1965 to date. In addition, entries will be accepted from members who would be prepared, if required, to write a constructional article for publication in the *RSGB Bulletin*. In all cases, entrants must be prepared to certify that the item submitted has been constructed by themselves from readily available components.

The Exhibition Committee hopes that the display will attract entries of a high technical and constructional standard.

Accepted entries will be eligible for an award of merit.

## Mobile Column

The first paragraph of last month's mobile column referred to the use of a hand-held microphone as an offence under the Road Traffic Act. This was published in error however, for although such practice can be dangerous, it is not an offence.

# . . . . IRTS - RSGB CONVENTION . . . .

## SUNDAY 25 SEPTEMBER

Convention opens at 10.30 a.m. with an exhibition of equipment. At 2.30 p.m. *prompt* the main lecture "V.H.F. Mobile Radio" will commence.
A separate ladies' programme has been arranged.

- BALLYMASCANLAN HOTEL
- DUNDALK
- EIRE
- 10.30 a.m.

- 10.30 a.m. Exhibition of Equipment
- 2.30 p.m. Lecture—"V.H.F. Mobile Radio"—By B. Armstrong G3EDD

7.00 p.m. Dinner

*Tickets are available from:*

S. H. Foster GI3GAL
31 Belmont Park
Belfast 4

Tel. 654412

B. Fogarty EI6X
9 Wellington Street
Dunlaoire
Co. Dublin

Tel. 808379

Convention..... 30s.

Dinner only.....22s. 6d.

Convention less Dinner..... 10s.

# Jasper's Jamboree

For the past several years an unofficial, but very popular and well supported, function, generally known as " Jasper's Jamboree," has been held in Portstewart, County Derry, each May or early June. This year, however, disaster struck as Jasper Woodside, GI3KDS, had to go into hospital for an urgent operation just before the date fixed. Thanks to the efforts of Harry, GI3ONZ, Trevor, GI3TOH, Raymond, GI3PDN, and others, rearrangements were made, it being generally agreed that the function was impossible without Jasper's presence, and a very happy gathering took place in the Strand Hotel, Portstewart on Thursday, 23 June.

Some 40 amateurs were present including, for the first time, holders of GI licences from overseas countries.

After being welcomed by GI3KDS the guests enjoyed a first rate dinner, followed by informal discussions and examinations of various privately-owned items of amateur radio equipment ranging from simple test-meters through KW2000A's, Sphinx's and so-on, to KWM2's. Then Ian, GI3NUM, explained to the gathering how he powered his linear amplifier but omitted to say just how many of the power supplies he described he used up in the course of a year.

Desmond, GI3ZX, produced his traditionally provocative item, on this occasion pointing out how commercial advertising and professional constructors were influencing amateur thought, design, and construction, instead of, as it has been in the past, the other way round. Amongst other ideas he instanced the present tendency to revert from multiple conversion receivers with all their attendant drawbacks, to double and single conversion receivers, and suggested that the logical design for a modern c.w. or s.s.b. transceiver would use a " straight " circuit with the phasing system, thereby avoiding all the current evils of image-, birdie- and cross-modulation interference at one fell swoop without incurring any of the difficulties and compromises which modern design thought seems to demand. GI3ZX summed up his contribution to the evening in one word, which should be borne in mind before buying, designing or building—THINK.

The rest of the evening was devoted to social, scientific and general discussion, and, it is reliably learned, to sporting activities including football on Jasper's lawn at five o'clock on the following morning.

## Special Events Stations

The Leyland Hundred Amateur Radio Group will be operating an h.f. station at Spurrier Works, Leyland Motors, in connection with the company's 70th Anniversary. The call-sign will be **GB3LEY**, and the period of operation 18-21 August. Schedules are welcome, particularly with amateurs in the motor industry, contacts will be confirmed with a special QSL card. Further information and tickets for the open day on 20 August may be obtained from F. Whaley, Press Officer, Leyland Motors Ltd., Leyland, Lancs.

**GB3FRC** will be on 80m to 15m at an exhibition station organized by Fylingdales Radio Club in connection with the Whitby Regatta. The station will be active on 13, 14 and 15 August, located at the Spa Gates, Whitby. Further details may be obtained from W. Burton, G8ANQ, 14 Westbourne Road, Whitby, Yorks.

At the Redbourn Fair, St Albans, on 29 August, a special station with the call-sign **GB3RED** will be in operation. Activity will probably commence on the previous day, and if sufficient interest is shown, the station may not be dismantled until 30 August. Schedules may be arranged by writing to Peter Hildebrand, G3VJO, 70 Harpenden Lane, Redbourn.

## Can You Help?

● J. Allen, 33 Downham Way, Downham, Bromley, Kent, who requires information on the AM Signal Generator Type 22 Ref. No. 10SB142 Serial No. LF2177?

● C. C. Chirnside, VK3WQ, 8 Blake Street, Caulfield, Victoria, Australia, who requires information on the No. 10 Crystal Calibrator ZA332171?

● J. Webster, 3 Tylers Way, Chalford Hill, Stroud, Glos., who wishes to contact a Radio Amateur who operates Top-Band mobile from a mini, and who would be willing to assist in solving static interference problems?

● P. J. Sterry, G3CBU, " Ashley," Orchard Road, Salisbury Gardens, Basingstoke, Hampshire who requires the frequency range of the Cavity Wavemeter Type W1632, Ref No. 10T/6018?

## The Month on the Air

(continued from page 521)

time. **IR1REE** is the call-sign of the Radio and Electronic Exhibition in Rome, and **ID1IDA** was used by members of the Radio Society of Ravenna when operating from a steel tower in the Adriatic! It is reported that Dom, of HV1CN, now has his own call-sign which is **HV3SJ**. He is said to be on 14 Mc/s s.s.b. on Tuesdays and Fridays.

**FB8WW**, Crozet Island, is now very active on s.s.b., although his signals have not so far been very good in the UK. QSLs for any s.s.b. contacts should be sent via K2MGE.

Syd, **TL8SW**, will be leaving the Central African Republic almost immediately, and will appear from 9Q5 (Congo). His QSL manager is W1BPM.

Another new prefix being heard on the bands is SM0. It would seem that this is now being used by stations located in the city and county of Stockholm.

The recent very short operations by I1RB from the United Nations in Turin caused quite a stir. There is a suggestion that this area may count as a separate " country." The call used was **I0RB**. QSL to I1RB.

The **VS9HRV** trip to Kuria Maria is now scheduled for early August. Permission has now been received.

PY1CK is reported to have designs on St Peter and Paul Rocks in the near future. No further details are available.

**VK2ADY/VK0** made 2000 QSOs from Heard Island, only 50 of which were with Europe.

All correspondents are thanked for their assistance, and particular thanks and acknowledgements are due to the *West Gulf DX Bulletin* (W5IGJ), the *L.I.D.X.A. Bulletin* (WA2EFN), *DX'press* (PA0FX), *The DX'er* (W6HVN), *Florida DX Report* (W4MVB), *DX News Sheet* (Geoff Watts), *On The Air* (ON4AD), *The Ex-G Radio Club Bulletin* (W3HQO), and *KARL News*. Please send all items for the **September** issue to arrive not later than **13 August**, for the **October** issue by **5 September**, and for the **November** issue not later than **5 October**. **Please note the early deadline for the October issue.**

# Society Affairs

## A Brief Report on the 1 June, 1966 meeting of the Council

THE meeting was held on 6 June, 1966 and was attended by Messrs R. F. Stevens (President), N. Caws, J. C. Foster, L. E. Newnham, F. K. Parker, A. D. Patterson, J. F. Shepherd, G. M. C. Stone, J. W. Swinnerton, G. Twist, Louis Varney, E. W. Yeomanson (Members of the Council) and John A. Rouse (General Manager and Secretary).

*Apologies for Absence* were submitted on behalf of Messrs J. Etherington, L. N. Goldsbrough, J. C. Graham, E. G. Ingram and W. A. Roberts.

### New Member

The President welcomed Mr G. Twist, G3LWH, as the new Council Member for Zone D.

### Regional Representatives Conference

In accordance with the majority wishes of the Regional Representatives, it was agreed to hold the proposed Conference in London on 8 October, 1966. (The Conference will be held at the College of Preceptors, Bloomsbury Way, London. —EDITOR.)

### Recommendations of Committees

The Council accepted recommendations relating to p.a. power to be used during National Field Day (see page 508) (*Technical Committee*) and the purchase of 75 £1 shares in the Lambda Investment Co. Ltd. in order to give the Society a controlling interest in the company (*Finance and Staff Committee*).

### Membership and Affiliation

The Council elected 111 new members (84 Corporate and 27 Associate) and approved 15 applications for transfer from Associate to Corporate grade.

The subscriptions of two members were waived on the grounds of blindness.

The Council granted affiliation to the Douai Abbey Radio Society.

### Region 1 IARU

The Society's delegates to the Region 1 IARU Conference in Opatija, Yugoslavia, reported verbally on the Conference which was considered to have been highly successful. (A Report on the Conference was published in the July issue of the RSGB BULLETIN and is continued on page 522 of this issue.—EDITOR.)

### Amateur Radio Handbook

It was reported that an enquiry for the bulk supply of the *Amateur Radio Handbook* in sheet form had been received from a firm in India. It was agreed to investigate the proposal with a view to entering into a suitable arrangement. (Indian import regulations make it difficult to obtain bound books from other countries. Such restrictions do not affect books in sheet form for local binding.)

### Beacon Stations

It was agreed to proceed with arrangements for the setting-up of a Malta beacon station. (See page 508.—EDITOR.)

### Minutes of Committees

The Council accepted as reports the minutes of the following Committee meetings: RAEN (11.3.66), Technical (14.4.66), Exhibition (22.4.66), Education (23.4.66) and the IARU Working Group (10.5.66.)

* * *

*The meeting ended at 9.30 p.m.*

---

### Opatija Conference (Continued from page 524)

(reserved for International Conferences) to any other Fund (Fund 1 is used to meet administrative expenses and Fund 2 to meet the cost of Committee members attending Region 1 meetings). The Conference also accepted a recommendation that the Executive Committee shall review the membership composition of Region 1 societies with a view to putting forward at the next Conference proposals for what they consider to be a more equitable basis for computing contributions. During the discussion RSGB suggested that the Committee should also give consideration to the establishment of a fixed annual contribution by all Member Societies in addition to its annual quota.

### Contributions

The Conference accepted a recommendation that (i) contributions made by subscribing member societies shall, in future, be based on membership figures as at 1 January each year commencing 1 January, 1967; (ii) contributions for the period 1967-1969 shall be on the basis of 75 Swiss Centimes (1s. 3d.) per licensed member; (iii) the sum of 10,000 Swiss Francs shall be transferred to Fund 3 each year and the balance of contributions transferred to Funds 1 and 2.

### IARU Headquarters

During the concluding stages of the Conference the Head of the RSGB delegation, Mr Roy Stevens, stated that entirely false statements had appeared in at least one American journal to the effect that there is argument and dispute between IARU Member Societies on the one hand and IARU Headquarters on the other. Mr Stevens suggested that this type of misinformation could do great harm to International Amateur Radio unless it is stopped. After discussion the Conference reaffirmed its unanimous confidence in IARU Headquarters and looked forward to continuing co-operation in the future work of the IARU. The abuse of Amateur Radio by certain commercial publishers was strongly condemned. The President and Secretary of IARU thanked the Conference for the vote of confidence.

### GB2RS SCHEDULE

RSGB 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 West England |
| | 11.30 a.m. | South West Scotland |
| | 12 noon | North East Scotland |
| 145·10 Mc/s | 9.30 a.m. | Beaming north from London |
| | 10.00 a.m. | Beaming west from London |
| 145·8 Mc/s | 10.15 a.m. | Beaming south from Belfast |
| 145·30 Mc/s | 10.30 a.m. | Beaming north west from Sutton Coldfield |
| | 11.00 a.m. | Beaming south west from Sutton Coldfield |
| 145·50 Mc/s | 11.30 a.m. | Beaming north from Leeds |
| | 12 noon | Beaming east from Leeds |

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.

# CONTEST NEWS

RESULTS — REPORTS — RULES

## Third 144 Mc/s Contest (Portable) 1966

The efforts involved in taking 2m equipment to the summit of Snowdon for the Third 144 Mc/s Contest on 8 May were rewarded with success for G3KXA and G3MRZ, the operators of GW3RUF/P. From the same site they were placed second in the similar contest last year, beaten by a small margin. Unlike most contestants, they had reasonable weather until after the contest when the wind collared both tents and thick ice formed on the aerial. Their longest distance contact was with G2JF at 405 km, the next best being with GM3EGW at 362 km.

Runner up was GW3RJH/P operated by G3RJH and G3UCN from near Abergavenny, whose best contact was with G3UXF at 255 km. It must be significant that the first four stations went to Wales for the purpose of the contest.

There were 47 entrants compared with 51 last May and 37 last July. Eight check logs from listeners were received. In order of merit; BRS15744, A4048, A4743, A4242, A5032, A3942, A3768 and A5082. In addition, check logs from G8NF/P G3DTB/P, and G3LTN are acknowledged.

### Equipment

There seems to be little difficulty in running 25 watts under portable conditions and this limits the choice of transmitting valve. The 6-over-6 slot fed array is still a popular aerial, although the number of users of 10 element beams has tripled from three to nine compared with last year.

In receiver front ends 14 Nuvistors were in use, but comparatively few transistors. For a tunable i.f. the Command equipment is still quite popular, but it is remarkable that only one CR100 and not a single HRO appeared this time.

The expanded form of results table with details of equipment used was welcomed by several entrants. This is only possible when the information asked for on the cover sheet is supplied in some detail, but the analysis of the information is certainly interesting and useful as an indication of " the present state of the art."

### QRA Locator System

This was made obligatory in this contest for the first time in order to test the reactions of contestants. Comments on this subject were: " Knowing where a station is adds something to a contact " (G3NUE); " Contacts are less interesting—slight errors can mean major differences in scores " (G2WS); " There seems no point as the chance of working a number of continental stations is remote and fixed stations do not use the QRA " (G4LU); " It used to be nice to know where the station being worked was located" (G3JDM); "The QRA gives little idea of the distance being worked " (G6SC); " A large number of stations appeared to be sending incorrect QRA " (G3PXP); " QRA very good for pin-pointing but too impersonal " (G3PWJ); " Incorporate a near place name " (G3FD); " Much of the interest is removed " (G3JRL); " Quite a number cannot interpret the QRA—let's go back to miles " (G3NJF); " QRA makes for easier operating though some confusion " (G3ERD); " QRA system is very suitable " (G3PNA); " OK but a bit inaccurate " (G5PI).

Four stations admitted having transmitted the wrong QRA locator, which makes scoring rather difficult. Three other stations were of the (incorrect) opinion that square 80 does not

### Third 144 Mc/s Contest (Portable) 1966

| | Call-sign | Points | Contacts | Contacts Over 200 km. | Location | Receiver R.F. | Power | Aerial | Operators | Main Receiver |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GW3RUF | 21,177 | 93 | 25 | Snowdon | 6DS4 | 25 | 10 | 2 | Command |
| 2 | GW3RJH | 17,894 | 101 | 10 | Monmouth | 6CW4 | 20 | 8/8 | 2 | AR88D |
| 3 | GW3OXD | 17,010 | 93 | 4 | Radnor | 6CW4 | 25 | 6/6 | 4 | — |
| 4 | GW4LU | 16,532 | 75 | 15 | Montgomery | A2599 | 24 | 10 | 5 | — |
| 5 | G3GWB | 14,351 | 96 | 3 | Isle of Wight | — | 24 | 2 × 10 | 4 | (Transistor |
| 6 | G3RAL | 13,945 | 83 | 4 | Leicester | — | 15 | 8 | 5 | TW |
| • | G3NUE | 13,670 | 70 | 11 | Somerset | EC88 | 25 | 2 × 10 | 2 | EC10 |
| 7 | G3KMT | 13,050 | 85 | 2 | Shropshire | A2521 | 10 | 2 × 6 | 4 | S640 |
| 8 | G3KWK | 13,029 | 77 | 2 | Worcs. | EC88 | 25 | 8/8 | 2 | R1475 |
| 9 | G3MAR | 11,378 | 74 | 2 | Worcs. | 6CW4 | 20 | 8/8 | 3 | — |
| 10 | G2CZM | 11,288 | 73 | 1 | Oxford | 6CW4 | 16 | 10 | 1 | Command |
| 11 | G5HZ | 11,019 | 79 | 4 | Berks. | 6CW4 | 17 | 6/6 | 3 | BC458 |
| 12 | G3KCB | 10,884 | 73 | 3 | Cheshire | E88CC | 25 | 6/6 | 2 | BC348 |
| 13 | GW3RXK | 10,736 | 63 | 2 | Denbigh | 6CW4 | 25 | 6/6 | 2 | EC10 |
| 14 | G6SC | 10,652 | 90 | 3 | Bucks. | E88CC | 25 | 6/6 | 5 | CR100 |
| † | G3AHB | 10,566 | 70 | — | Bucks. | 6CW4 | 24 | 6/6 | 2 | HQ100 |
| 15 | G3OBD | 10,113 | 72 | 5 | Dorset | A2521 | 21 | 4 × 7 | 1 | AR88 |
| 16 | G3JZW | 9725 | 73 | 4 | Bucks. | AF180 | 12 | 6/6 | 3 | RA1 |
| 17 | G3OIW | 9270 | 76 | 3 | Cheshire | PC900 | 25 | 10 | 2 | Command |
| 18 | G3EFX | 9256 | 59 | 2 | Oxford | — | 25 | 5/5 | 2 | (Transistor) |
| † | G3FD | 8835 | 69 | — | Beds. | — | 18 | 8 | 1 | (Transistor) |
| 19 | G3JRL | 8747 | 58 | 1 | Yorks. | — | 12 | 4/4 | 2 | EC10 |
| 20 | G3ERD | 8170 | 59 | 1 | Derby | 6CW4 | 18 | 10 | 5 | — |
| 21 | G3NJF | 7476 | 46 | 4 | Lincs. | 6CW4 | 24 | 6/6 | 2 | CR300 |
| 22 | G3PMH | 7145 | 50 | 4 | Cambs. | 6DS4 | 25 | 8 | 2 | AR88 |
| † | G3PNA | 7032 | 68 | — | Surrey | E88CC | 25 | 8 | 1 | AD94 |
| 23 | G3EHM | 6766 | 54 | 1 | Staffs. | ECC88 | 20 | 4 | 3 | — |
| 24 | G3MAX | 6384 | 47 | 3 | — | 6AM4 | 15 | 4 + 4 | 1 | 960 |
| 25 | G2BLA | 6230 | 44 | 2 | Herts. | — | 10 | 5 | 4 | (Transistor) |
| 26 | G3PUO | 6119 | 45 | 2 | Lancs. | — | 10 | 8 | 4 | EC10 |
| ‡ | G3UKV | 5943 | 35 | 0 | Gloucester | GM0290 | — | 8 | 1 | R107 |
| 27 | G2WS | 5821 | 36 | 1 | Warwick. | — | 10 | 5 | 1 | EC10 |
| 28 | G3ULU | 5603 | 41 | 0 | Somerset | — | 12 | 6/6 | 2 | TW |
| 29 | G3JKO | 5272 | 52 | 1 | Sussex | — | 10 | 4 | 1 | TW |
| 30 | G8SM | 4353 | 61 | 0 | Surrey | Transistor | 10 | 5 | 2 | EC10 |
| 31 | G3NPO | 4102 | 25 | 1 | Yorks. | — | 12 | 6 | 2 | TW |
| 32 | G3SLJ | 3860 | 51 | 0 | Essex | Nuvistor | 25 | 10 | 3 | G209R |
| 33 | G3BPM | 3599 | 26 | 0 | Berks. | 6AK5 | 5 | 8/8 | 2 | — |
| 34 | G3LZR | 3291 | 48 | 0 | Essex | — | 15 | 6 | 2 | — |
| 35 | G3RCV | 3125 | 46 | 0 | Kent | — | 10 | 6/6 | 2 | — |
| 36 | G5PI | 3097 | 24 | 1 | Cornwall | E88C | 25 | 6/6 | 2 | BC454 |
| • | GM3EGW | 2727 | 22 | 4 | Dunfermline | Cascode | 25 | 8/8 | 2 | Command |
| 37 | G4JJ | 2723 | 21 | 0 | Derby | Transistor | 10 | 5 | 1 | (Transistor) |
| 38 | G3JDM | 2655 | 19 | 0 | Staffs. | 6CW4 | 15 | 5 | 1 | S640 |
| 39 | G3GOZ | 2310 | 15 | 0 | Berks. | 6CW4 | 10 | 5 | 1 | (Transistor) |
| 40 | G3HXN | 1501 | 17 | 0 | Gloucester | — | 8 | 10 | 3 | Mohican |
| 41 | G3TCG | 1199 | 20 | 0 | Essex | — | 12 | Halo | 1 | TW. |

• Late entry  † Rule 7(*a*)  ‡ not "portable"

exist, and another station, while quoting QRA on the cover sheet, has been copied by all whom he worked as sending QTH as " 1 mile North of . . . "

### General Comments

These covered the subject of two receivers, lack of c.w., and, of course, the weather. The logs of the first eight stations show only 12 c.w. contacts in a total of 696 contacts. Nine of these were made by the winners, GW3RUF/P, so that the remaining seven stations considered had only three c.w. contacts in 603! One wonders if some encouragement should be given for c.w. operation; the extended distances possible on this mode should make the contest more interesting.

" Deplorable that one contestant should work two others simultaneously; both call-signs and reports issued at the same time " (G6SC). " Asked to wait whilst another station is lined-up " (G3NUE). " If the many weak carriers had been keyed, we might have done a lot better " (G6PI). " Very little use of c.w." (G2WS). " Complete lack of c.w." (G3UKV). " Washed out by torrential rain and family in car fed-up " (G3GOZ). " Pick a bright sunny day for the next contest! " (G4LU). " Very enjoyable in spite of bad weather " (G3OIW). " The Band Plan was ignored by one or two ambitious stations " (G2WS). " Front-end transistor went O/C; apologies to those who called in vain " (G4JJ). " Took almost an hour to find that a slug in the converter had moved " (G3JRL). " Do not publish a list of QRA locators as this would constitute too handy a crib " (G3NUE).

In general, this contest was evidently much enjoyed and, as can be judged from this report, a most interesting collection of notes accompanied the log sheets sent in. These are always read by the committee even if space does not permit their publication.

## V.H.F. U.H.F. Listeners' Championship 1966

The half-yearly summary table shows the relative positions of entrants after the first six contests of the year. In spite of the multipliers possible only four logs were received for 432 Mc/s and none for the 1296 Mc/s contests. This is, however, an improvement on last year.

Keen competition has developed for first place: A4048 managed a higher score than the leader BRS15744 in the 432 Mc/s contest, but the gap between their total scores continues to widen slowly. Further down the list positions interchange quite rapidly as listeners miss contests for various reasons.

At this time of year it is appropriate to remind entrants of Rule 4. Although entries for all bands and contests will be published only the best six logs from each entrant will be totalled at the end of the year; not more than four of these six logs will be for v.h.f. bands.

| | | Previous* | 70 Mc.s April | 144 Mc/s May | 430 Mc/s May | Total | QTH |
|---|---|---|---|---|---|---|---|
| 1 | BRS15744 | 3630 | 1750 | 1460 | 3120 | 9960 | Sussex |
| 2 | A4048 | 2970 | 1650 | 1225 | 3315 | 9160 | Surrey |
| 3 | A3672† | — | — | — | 3285 | 3285 | Kent |
| 4 | A4743 | 760 | 390 | 850 | 1020 | 2960 | Lancs. |
| 5 | A4242 | 1205 | 780 | 730 | — | 2715 | London |
| 6 | A3942 | 1380 | — | 440 | — | 1820 | Sussex |
| 7 | BRS15822 | 1600 | — | — | — | 1600 | London |
| 8 | A3696 | 1535 | — | — | — | 1535 | Kent |
| 9 | A4248 | 1530 | — | — | — | 1530 | Herts. |
| 10 | A4388 | 1485 | — | — | — | 1485 | Dorset |
| 11 | A3768 | 730 | — | 405 | — | 1135 | Bucks |
| 12 | A4752 | — | 645 | — | — | 645 | Lancs. |
| 13 | A5032 | — | — | 590 | — | 590 | Herts. |
| 14 | BRS27482 | 530 | — | — | — | 530 | London |
| 15 | A4751 | 360 | — | — | — | 360 | London |
| 16 | A4694 | — | 330 | — | — | 330 | Cheshire |
| 17 | A5082 | — | — | 230 | — | 230 | Surrey |

* See June, 1966 RSGB BULLETIN, p. 411.
† Now G8AQA.

## Second 70 Mc/s Contest (Open) 1966

The major 70 Mc/s contest of the year held on 16 April produced 43 entrants, with logs from four British Isles countries, a welcome newcomer being EI9AS. Conditions throughout the contest were summed up by most entrants as being " nothing above average." However, activity, especially in the home counties, was very high for part of the contest. G3SKR found that he had three stations within 2 miles of him running 50 watts.

Once again, the overall winner was from Section B. This was the Albright and Wilson ARS station G3OXD/A operated by G3NZ, G3TGL, and G3UEY. The high score was obtained through a high points per contact average, working many stations in the London area. Second in this section is Harwell ARC, G3PIA/P, operating from the usual location in Berkshire.

Winner of Section A and the person who probably had to work hardest for his score was G3SKR, Wembley, Middlesex, who managed to work 21 stations more than anyone else. Not very far behind G3SKR is G3SUV in second place with 3460 points.

G3OXD/A will therefore receive the V.H.F. Manager's Trophy, G3SKR a miniature cup, and G3PIA/P and G3SUV will each receive a certificate of merit. These awards are subject to Council approval.

### Equipment

Very little difference from past contests was observed this year. The major change was in p.a. valves with a few 829, 832A and TT15's in use. Aerials appear to be increasing in size with six 4-over-4 Yagis and three 6-element Yagis in use, but it appears easier to increase power than to have an aerial of more than 10db gain. The only difference in the receiving equipment was that less transistorized receivers were in use.

### Comments

GW3RUF/P had trouble with equipment and encountered up to 7 ft. of snow on site. Similar trouble with the weather was experienced by G3NUE/P.

It must be mentioned once again that locations should be

| Call-sign | Pstn. (Sec. A) | Pstn. (Sec. B) | Points | Input (Watts) | Location |
|---|---|---|---|---|---|
| G3OXD/A | | 1 | 9192 | 45 | Nr. Dudley, Worcs. |
| G3PIA/P | | 2 | 8824 | 20 | Nr. Wantage, Berks. |
| GW3RUF/P | | 3 | 8078 | 40 | Nr. Abergavenny, Mon. |
| G3NUE/P | | 4 | 7425 | 25 | Nr. Porlock, Somerset |
| G3SKR | 1 | | 5681 | 47 | Wembley, Middx. |
| G3MEH | | 5 | 5453 | 50 | Coulsdon, Surrey |
| G3OIT/A | | 6 | 4944 | 30 | Billericay, Essex |
| G3EFX/A | | 7 | 4652 | 25 | Nr. Watford, Herts. |
| G3GGL/P | | 8 | 3935 | 10 | Nr. Ludlow, Shropshire |
| G3SUV | 2 | | 3460 | 20 | Nr. Colchester, Essex |
| G3TCT | 3 | | 3444 | 25 | Guildford, Surrey |
| G3PPG | | 9 | 3415 | 50 | Nr. Evesham, Worcs |
| G3NJN/P | | 10 | 3304 | 50 | Nr. Preston, Lancs. |
| G3TXB | 4 | | 3122 | 42 | London |
| G3RLE | 5 | | 3114 | 50 | Cleckheaton, Yorkshire |
| G3FDW | 6 | | 2883 | 50 | Retford, Notts. |
| G3NEO | 7 | | 2775 | 50 | Nr. Sheffield, Yorkshire |
| G3EDD | | 11 | 2692 | 40 | Nr. Cambridge |
| G3SJX/P | | 12 | 2647 | 20 | Nr. Warlingham, Surrey |
| G5FK | | 13 | 2632 | 50 | Wembley, Middx. |
| G3UYB | 8 | | 2535 | 35 | Bromley, Kent |
| G3PDT | 9 | | 2501 | 35 | Birmingham |
| G3OHH | 10 | | 2451 | 50 | Nr. Macclesfield, Cheshire |
| GM3EGW | 11 | | 2341 | 30 | Dunfermline |
| G3AEZ | 12 | | 2231 | 12 | Nr. Dorking, Surrey |
| G8PD | | 14 | 2105 | 50 | Wembley, Middx. |
| G3TWR | 13 | | 2061 | 10 | Nr. Aldershot, Hants |
| G3PMJ | 14 | | 1871 | 30 | Manchester |
| G5UM | 15 | | 1692 | 25 | Knebworth, Herts. |
| G3PUO/P | | 15 | 1659 | 12 | Nr. Accrington, Lancs. |
| G8TB/P | | 16 | 1595 | 20 | Kenley, Surrey |
| G3OCC | * | | 1573 | 24 | Chislehurst, Kent |
| G3KIQ/P | | 17 | 1528 | 10 | Nr. Leek, Staffs. |
| G3LRE/A | | * | 1441 | 12 | Chigwell, Essex |
| G3UOV | 16 | | 1353 | 7 | Crawley, Sussex |
| GW3UED | 17 | | 1224 | 12 | Nr. Mold, Flintshire |
| G3EHA/P | | 18 | 873 | 4 | Nr. Banbury, Northants. |
| EI6AS | 18 | | 836 | 25 | Nr. Dublin |
| G3HWR | 19 | | 642 | 50 | London |
| G3JMB | 20 | | 598 | 8 | Margate, Kent |
| G3KPU | 21 | | 448 | 12 | Retford, Notts. |
| G2AVC | 22 | | 350 | 25 | Hounslow, Middx. |
| G3JKY | 23 | | 173 | 6 | Beckenham, Kent |

* Late entries

given relative to a location shown on the Ordnance Survey 10 mile = 1 inch map. Locations such as 3¼m S Charing Cross and 5m S London Bridge do not ease the task of checking.

There appears to have been a lack of late Saturday/early Sunday c.w. DX working, this point being mentioned by several stations. However, the longest distance QSO was 233 miles between G3NUE/P and G3JQI (Norwich) on the Sunday morning.

The V.H.F. Contests Committee wishes to thank G3LAS, G2DHV and G2WS for check logs.

## 70 Mc/s Listeners' Contest 1966

The winner of this contest is R. A. Ham, BRS15744 closely followed by D. Poulter, A4048 who logged 118 QSO's, 25 more than BRS15744. Both of the above stations will receive certificates of merit for their work in logging stations on the air during the Second 70 Mc/s Contest (Open) 1966.

| Position | | Points |
|---|---|---|
| 1 | BRS15744 | 1750 |
| 2 | A4048 | 1650 |
| 3 | A4242 | 780 |
| 4 | A4752 | 645 |
| 5 | A4743 | 390 |
| 6 | A4694 | 333 |

### 80 Metre Field Day 1966

The rules for this year's 80m Field Day are as follows:

1. **Duration:** 10.00 GMT to 17.00 GMT on 11 September, 1966.

2. **Eligible Entrants:** All fully paid-up Corporate Members of RSGB resident in G, GC, GD, GI, GM and GW. A maximum of two operators will be allowed per station; only one call-sign may, however, be used.

3. **Contacts:** must be made on c.w. (A1) in the 3·5 Mc/s band only. Contestants should identify themselves as taking part in the contest by including the letters FD during transmission.

4. **Scoring:** Five points may be claimed for each contact with a portable or mobile station, and one point for each contact with a fixed station.

5. **Contest Exchanges:** RST reports followed by contact number starting at 001 and the location, e.g., RST559001 Bradford.

6. **Logs:** (*a*) Must be tabulated in columns headed (in this order): " Date and Time (GMT) "; " Call-sign of station contacted"; " My report on His Signals and Serial Number sent "; " His Report on my Signals and Serial Number received "; " Location of Station Contacted as Received "; " Points Claimed." Printed log forms and cover sheets are available from Headquarters on request.

(*b*) The cover sheet must be made out in accordance with RSGB Contests General Rule 4. The declaration must be signed and the location as transmitted given.

(*c*) Entries must be postmarked not later than 26 September, 1966.

7. **Equipment:** The total d.c. input to the anode circuit of the valve(s) or any other device energizing the aerial, or to any previous stage of the transmitter, shall not exceed 10 watts. The power for all parts of the station must be derived from storage batteries or accumulators.

8. The **General Rules** relating to RSGB Contests, published in the January, 1966 issue of the RSGB BULLETIN, will apply except as superseded by the rules of this contest.

9. **Awards:** At the discretion of the Council, the Houston Fergus Trophy will be awarded to the winning station 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.

## CONTESTS DIARY

| | |
|---|---|
| 13-14 August | -WAE Contest (C.W.) |
| 3-4 September | -V.H.F. NFD* (Mar. 66, p. 193) |
| 10-11 September | -WAE Contest (phone) |
| 11 September | -80 Metre Field Day (see below) |
| 17-18 September | -Scandinavian Activity Contest (C.W.) |
| 18 September | -D/F National Final |
| 24-25 September | -Scandinavian Activity Contest (Phone) |
| 15-16 October | —VU/4S7 Contest (phone) |
| 15-16 October | —RSGB 21/28 Mc/s Telephony Contest |
| 15-16 October | —Second 432 Mc/s Contest * |
| 16 October | —Second 1296 Mc/s Contest * |
| 29-30 October | —VU/4L7 Contest (C.W.) |
| 29-30 October | —RSGB 7 Mc/s DX (Phone) Contest |
| 12-13 November | —RSGB 7 Mc/s DX (C.W.) Contest |
| 19-20 November | —Second Top Band Contest |
| 4 December | —Fourth 70 Mc/s (C.W.) Contest * |

* Qualifying contests for V.H.F./U.H.F. Listeners' Championship

# CLUBROOM

*A Monthly Survey of Club and Group Activities*

***For further information on membership or the activities of a particular club, application should be made to the person whose call-sign is indicated at the end of the item. Full addresses may be obtained from the RSGB Amateur Call Book.***

**AERE (Harwell) ARC** reports that NFD went off surprisingly well despite an apparently high state of flux which existed in the arrangements just prior to the event. Apart from the weather, most of the troubles stemmed from cows which meandered through the camp during the night, becoming entwined with feeders and mast guys. One got more than it bargained for when it took a deep sniff of the exhaust from the p.e. set. One lesson learnt was that if you wash a tent down with detergent—then get it re-proofed afterwards. Attention is currently being directed to V.H.F. NFD, and all being well it should be possible to operate two stations. *G2HIF.*

**Ainsdale RC** is preparing for the Region 1 V.H.F. Contest when members will be climbing up to a higher ground level, and, all being well, using new versions of transistorized equipment. Recently VO1FB treated the club to tales of Top Band DX experiences, backing this up with tape recordings of G stations alongside the normal DX seekers. *G2CUZ.*

**Basingstoke ARC** will not be meeting during the month of August, but is looking for a full attendance at the AGM which will be held on 10 September. Preparations are well in hand for the club to participate in the first Basingstoke Arts and Crafts Exhibition which is being held on 29 and 30 September, and 1 October. At the June meeting the club enjoyed something of a symposium on DX Operating Techniques thanks to G3HS/G3NMH/K2CPR.

**Bristol RSGB Group.** At the last meeting discussions included the new 2m band plan, and this was followed by a film show of Mullard and GPO films. *G5UH.*

**Bromsgrove and District ARC** had a lecture and demonstration of hi-fi and amateur equipment at the July meeting.

**Cambridge and District ARC** has as its motto " Visitors are always welcome—they soon become members." Recently they were pleased to extend hospitality to Dr James Goding of Melbourne University (VK3ZCG), and to VE, ZL and AP calls. *G5BQ.*

**Chesham and District ARS** reports that RAE classes are held every Wednesday at 20.00, and regular club meetings on Fridays at the same time. The club held a " Field Day " on Top Band, and after sorting out r.f. feedback troubles, had a most successful day. *G3CLJ.*

**Chester and District ARS** will be operating the club station from the Isle of Arran, County of Bute, between 15 to 18 September inclusive. All bands will be worked employing s.s.b. and c.w. with particular attention to 160, 80, 2 and possible 70 cm. A special QSL card is being printed for confirmation of QSOs. County chasers should make a particular note that the club hopes to visit another rare county soon. August meetings will be on the 2nd, 9th, 16th, 23rd and 30th and cover a wide range of interesting subjects. *G3UWV.*

**A study in expressions as G4UZ demonstrates how to work DX at the recent Longleat Mobile Rally.**
*(Photo by G3HXN)*

**Civil Service RS** will be holding the last of the informal meetings on 16 August to close the 1965/66 session. The 1966/67 year starts on 6 September, for which a full programme of lectures and demonstrations has been arranged. Morse classes are being started for those who wish to aspire to becoming brass-pounders. Despite its name, the Society does not limit its membership to those engaged in the Civil Service, but welcomes enquiries from those in similar employment. *G3IIE.*

**Cornish ARC** reports that the wiring of the Caravan is about 50 per cent complete, and that two stations and lighting could be connected quite simply. The towing hitch is presenting a bit of a problem, but it is hoped to get this sorted out in the near future. If all went well the caravan should have been in use from St. Agnes Beacon on 3 July, but failing this G2BHW offered his van as a sheet anchor to the V.H.F. Group. *G3OCB.*

**Crawley ARC** will be meeting on 24 August for its Annual Junk Sale when G3FRV will, once again, use his persuasion to sell nearly everything. Plans are going ahead for participation in V.H.F. NFD, and the local RAE instructor, G3PHG, will soon be starting the yearly toil. *G3FRV.*

**Cray Valley RS** observes that this last NFD was not one of its brightest efforts. At one station everything fell into place neatly but at the other, everything fell apart. The Friday net also seems to be falling apart by all accounts. The numbers have decreased down to two or three stations at times. As is observed in *QUA*, while 4m may be a lot better than 160, the 160 net is a valuable source of publicity, and to which the club owes much of its SWL membership. Additionally the net is a rallying point, perhaps even a social event in the week, and worthy of support in the same manner as other club activities. Talking of social events, the next Annual Dinner and Dance has been planned for the 17 September and all members should make a note of this date accompanied by a resolution not to miss it. *G3DNC.*

**Crystal Palace and District RC** will be meeting on 20 August for a discussion on Aerials led by G3FZL. During an inquest on NFD some members expressed concern about the use of commercial equipment with a capability in excess of the 10 watt limit by some stations, and urged that there should be a tighter control on power consumption, say by limiting the power source to a specific battery maximum and running from such a battery, without recharge, for the whole period, so placing an accent on overall equipment efficiency. *G3FZL.*

**Derby and District ARS** will, subject to confirmation, be paying a visit to the Derbyshire Royal Infirmary on 24 August. Prior to this on 14 August, the society will be holding its ninth Mobile Rally at Rykneld School, when all members will have all hands to the pump. Don't miss out on this event for there is sure to be a job for you to do, and if you can persuade your XYL to come along and lend a hand, she will be most welcome. Help will also be needed on the Wednesday and the Saturday evenings before the Rally.

**Durham City ARS** reports that a new club net—with snappy overs—is now under way on 1·93 Mc/s starting at 10.30 BST. To cater for the enthusiastic, but often inadvertently overlooked, beginners, the accent at every other meeting will be on subjects which are of particular interest to them. It is hoped that instead of being bored, the " old hands " will actively participate in giving a helping hand. The Annual Constructional Contest was won by G3SQR with a 2m receiver.

**Ealing and District ARS** held a lively meeting on 12 July. The debate: QRO versus QRP resulted in club secretary G3SGT picking up the remains of his TT11 after being bulldozed by a pair of 527-B's! The vote taken at the end: nine for QRO and nine for QRP. Next: c.w. versus phone? *G3SGT.*

**Echelford ARS** observe that it would seem to be a good idea to arrange a day and time for a V.H.F. Round Table on either 2 or 4m, perhaps one week on one band and the following week on the

other band. It is thought that such an arrangement might encourage the building of converters by listeners and licensees and perhaps persuade Top Band addicts to sample the delights of freedom from weird noises. *G3RHF.*

**Edgware and District RS** are not holding any meetings during August as so many of their members will be away on holiday. *G3FKI.*

**Ipswich RC** continues to meet throughout the summer. Some members are now going through the waiting period after having taken the RAE, and giving thought to the impending Morse test. Meetings are on the last Wednesday in each month and are held at the Red Cross HQ, Gippeswyk Hall, Ipswich commencing at 7.30 p.m. *G3UJR.*

**Lothians RS** has now passed its AGM, and with a new team at the helm is looking forward to another year of progress. *GM3PSP.*

**Midland ARS** reports that NFD went off smoothly for them, and this was due in no small measure to the many helpers who came along and worked so hard. To them a special vote of thanks. In view of the high level of support which was given this year, there seems to be a serious suggestion going around that they may be able to run two stations next time. In the issue of MARS Newsletter under review, there is a particularly good graphical analysis correlating band/time/points per hour scored. *G3JDJ.*

**Norfolk ARC** will be holding an informal meeting on the 8 August, a Lucky Dip on the 15th, a business meeting on the 22nd, but on the 29 August, no meeting will be held. The Editorial of the issue of *Challenge* under review is one of the best written and most pertinent that we have read for a long time. *G3TLC.*

**North Kent RS** cleared its AGM early in May and is now settling down for another year of progress. *G3PUI.*

**Northern Heights ARS** will be putting on a demonstration station at the Halifax Agricultural Show on 14 August. On the 17th there will be a talk on current Transistor Design Procedure in Audio Circuits by Alan Bates, while on the 31st is the Pea and Pie Supper to which members of the Manchester RC have been invited. *G3MDW.*

**Purley and District RC** had a most successful AGM because in addition to a bumper turn-out, five new members were enrolled, and this really put sugar on the gingerbread. On 5 August the club will be meeting for a Natter Nite followed by another chin wagging session on 2 September. Colour slides taken on the island of Ibiza will be shown by G3FTQ on the 19 August. There is a move on foot to make the first Friday in each month a constructional night in addition to the usual activities, the first project probably being a group construction of a transistorized 4m converter. *G3FTQ.*

**Radio Invalid and Bedfast Club** in the July issue of *Radial* makes some well aimed comments on signal strength reporting under the heading " Five and Nine Plus Old Man " perhaps the most important of which is that there is no legal obligation to give such reports. *G3LWY.*

**Reigate ATS** took part in the recent 2m Field Day from a site near Woldingham. The main object was to check out aerials which will be used during the V.H.F. NFD in September, and from which they were happy to find that all systems are " go." The August meeting, to be held on the 25th, will be devoted to the arrangements and details for V.H.F. NFD. *G3NKS.*

**Roding Boys' Society** has been disbanded in its original form and reconstituted as the Redbridge Scientific Society.

**Saltash and District ARC** will be meeting on 12 August for a mobile Foxhunt starting outside the clubroom at 7.15 p.m. sharp, and on the 26th for a Mobilers' Mystery Evening, again starting at 7.15 p.m. sharp. The club recently had a talk by Reg Roper on TV DX, who backed up his wordage by producing pictures from Spain, France and Italy—on a television receiver naturally. *G2DFH.*

**Shefford and District RS** report that after ten years of enthusiastic and trojan service, G3IXG has given up the unenviable task of Secretary. His place has been taken by D. A. Pike.

**Southgate RC** will not be meeting during the " Holiday Month " of August, but on 8 September there will be a bumper junk sale and at which there promises to be some very good items. Visitors are always welcome. *G3TDM.*

**Southampton Group** will be meeting on 13 August at the Lanchester building of the Southampton University. The Clubroom, at 20 Carlton Road, is open every Wednesday and Friday evening, and visitors are always welcome. *G3HKT.*

**Surrey Radio Contact Club** has organized a Safari to be conducted by G2YL on 9 August, and to which YLs and XYLs are most cordially invited. Those with tight fists are reminded that Jack North has some receipts left to exchange for unpaid subscriptions. *G3KGA.*

**Swindon and District ARC** is meeting on the 10 and 24 August. The club is holding a Mobile Picnic at Lydiard Park on Sunday, 4 September, and to which a general invitation is extended to all amateurs in the area. Talk in stations will be operational on 160m and 4m from 12 noon, and as a further aid, approach roads will be well signposted. No amateur within travelling distance should miss this shindig, and at which special attention will be given to make YLs and XYLs welcome. *G3LLZ.*

**Thames Valley ARTS** will be meeting on the 3 August for a talk on transistor circuits by G3JKA, and on the 7 September for a talk on power supplies by G3FXC. *G5JKA.*

**Torbay ARS** recently enjoyed a most informative talk on s.s.b. given by G3ABU. In July a social evening was arranged at the club HQ to welcome GI6KT. *G3LKJ.*

**Verulam (St Albans) ARC** is more than pleased with its performance during NFD, especially as they ended up with a considerably increased score over the 1965 figure. Such is the enthusiasm that thought is already being given to 1967. A recent talk on TVI by Mr Turner of the GPO was full of interest for everybody—whether a sufferer or not—and of particular interest were the " stoppers " and " suckers " for inclusion in the TV aerial lead. Members are especially looking forward to the visit of " Dud " Charman, G6CJ, on 21 September when he will be giving his deservedly famous talk and demonstration on aerial characteristics. *G3GJC.*

**Wimbledon and District RS** recently held a " Rag-chew and Sort Out " at which candid expression of views and ideas was the main object; a sort of AGMless AGM, backed with a promise that the Chairman would leave his shotgun at home. This seems to be an idea with a lot of merit which could well be adopted by other clubs to their advantage. It should certainly help bring out current feeling. *G3EPU.*

**Wirral ARS** will be meeting on 3 August for a Junk Sale, and on the 17th for an evening D/F contest. The conclusion on NFD was that it went with a swing this year, and what helped no end was the great amount of help so freely given by the under 20's. Der Kampenfuhrer, G3VEB, vos int und tangledtvisty ven un body comensinderkampski at unt 0001 hrs vishing " Vo ist mien kippenplatz? " In the current issue of the *Newsletter* under review, there is some very useful information on the ways in which high frequency power transformers may be employed for a variety of purposes. *G3FOO.*

**York ARS** holds it meetings every Thursday at the British Legion, 61 Micklegate, commencing at 8 p.m. Visitors and prospective members are always welcome. *G3HWW.*

**Bromsgrove and District RC meet** on the second Friday of each month at the Co-op Hall, Bromsgrove, and as from 23 August, on the third Tuesday in each month at the Burcot Village Hall. *G2CLN.*

* * *

Items for inclusion in this feature are being received without an associated call-sign, and there can be no doubt that these do not have the same potential advantage to the club concerned as those where a call-sign is given. In many cases this is known to be because the Secretary does not hold a call, and where this is so, we suggest that it is in the best interests of the club concerned if the call-sign of another officer is given, and in this way contact with the club by interested persons is made easier.

Deadline for the **September** issue is **12 August** while that for the **October** issue will be **9 September.** To be absolutely sure of inclusion, it is advisable to post contributions to Headquarters at least three days prior to the dates given.

### New Club proposed for Greenock Area

Members interested in the formation of a radio club in the Greenock area are asked to contact Mr Robert Holt, GM3VCD, 38 Burns Road, Greenock.

### British Rail Amateur Radio Society

Members who work for British Rail will be interested to know that efforts are being made to form a British Rail Amateur Radio Society. Further information may be obtained from R. V. New, 29 Little Dock Lane, Honicknowle, Plymouth, or from H. A. J. Gray, BRS23279, " Eleven " Swanton Drive, East Dereham, Norfolk.

# Forthcoming Events

**Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the first of the month preceding publication. A.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. Standing instructions cannot be accepted.**

### REGION 1

**Ainsdale (ARS).**—3, 17, 31 August, 8 p.m., 77 Clifton Road, Southport.
**Allerton (Liverpool) (ASRHS).**—Thursdays, 8 p.m., 3rd Allerton Scout Group Headquarters, Church Road, Woolton, Liverpool.
**Ashton-under-Lyne (AUL&DARS).**—21, 26 August, 9 September, 8 p.m., Ashton-under-Lyne Technical College.
**Blackburn (ELARC).**—4 August (Talk by GPO Representative), 1 September (RSGB recorded lecture), 7.30 p.m., YMCA, Limbrick, Blackburn.
**Blackpool (B&FARS).**—Every Monday, 8 p.m., Pontins Holiday Camp, Squires Gate, Morse tuition from 7.30 p.m.
**Bury (B&RRS).**—9 August (Lecture and Demonstration, subject to be announced), 13 September (Film Show), 8 p.m., Old Boars Head Hotel, Crompton Street (private room).
**Chester.**—Tuesdays, 8 p.m., YMCA, except first Tuesday in each month.
**Crewe & District.**—1 August, 5 September, 8 p.m., Earl of Crewe Hotel, Nantwich Road.
**Eccles (E&DRC).**—Tuesdays, 8 p.m., Patricroft Congregational Schools, Shakespeare Crescent, Patricroft, Eccles. Every Thursday, Club Top Band net 20.30 hours.
**Liverpool (L&DARS).**—Tuesdays, 8 p.m., Conservative Association Rooms, Church Road, Wavertree.
**(ULARS).**—1, 15 and 29 August, 7.30 p.m., Students' Union, 2 Bedford Street North, Liverpool 7.
**Macclesfield.**—2, 16 and 30 August, 8 p.m., The George Hotel, Jordongate.
**Manchester (M&DARS).**—Wednesdays, 7.30 p.m., 203 Droylsden Road, Newton Heath, Manchester 10.
**(SMRC).**—Fridays, 7.45 p.m., Rackhouse Community Centre, Daine Avenue, Northenden.
**Morecambe.**—3 August, 7 September, 125 Regent Road.
**Preston.**—9 August, 13 September, 7.30 p.m., St. Paul's School, Pole Street, Preston.
**Southport (SRS).**—Wednesdays, 8 p.m., and Sundays, 4 p.m., Sea Cadets Camp, The Esplanade.
**Stockport.**—10, 24 August, 7 September, The Blossoms Hotel, Buxton Road, Stockport.
**Wirral.**—3 August (Disposal of surplus equipment) 17 August, (D/F Contest), 8 p.m., Harding House, Park Road West, Claughton, Birkenhead.

### REGION 2

**Durham City (DCARS).**—11 August (Accent on Beginners), 25 August (Ordinary Meeting), Bay Horse, Gilesgate, Durham City.
**Hull (H&DARS).**—12 August (Demonstration of Pye Commercial Equipment by G3AGX), 26 August (Transistorized Dip Meters), 8 p.m., Railway Institute, Anlaby Road, Hull.
**Northern Heights.**—3 August (Beginners Station by S. Holden, G3VEK), 13 August (Demonstration Station at Halifax Agricultural Show), 14 August (Visit to Flyingdales ARC), 17 August (" Current Transistor Design Procedure in Audio Circuits " by A. Bates), 31 August (Pea & Pie Supper) 7.45 p.m., Sportsman Inn, Ogden.

### REGION 4

**Derby (D&DARS).**—3 August (Surplus Sale), 10 August (Preparations for Mobile Rally at Rykneld School), 14 August (Ninth Annual Mobile Rally), 17 August (D/F Practice Night —Open Night for non-competitors), 24 August (Proposed Visit to Derbyshire Royal Infirmary), 31 August (Wine Making), 7.30 p.m., Room No. 4, 119 Green Lane, Derby.
**Heanor (H&DARS).**—Closed until 12 September.
**Leicester (LRS).**—Mondays, 7.30 p.m., (Slow Morse Practice), Sundays, 10.30 a.m., Old Hall Farm, Braunstone Lane, Braunstone, Leics.
**Loughborough (ARC).**—Fridays, 8 p.m., Club Room, Bleach Yard, Wards End, Loughborough.
**Magnus GS (MGSARS).**—Tuesdays, 3.50 p.m., The Junior Physics Labs, Magnus Grammar School, Newark.
**Newark (NSWC).**—Mondays, Thursdays, 7.30 p.m. The Hall, Guildhall Street, Newark, Notts.
**Nottingham (ARCN).**—Tuesdays, Thursdays, Room No. 3, Sherwood Community Centre, Woodthorpe House, Mansfield Road, Notts.
**Peterborough (P&DARS).**—Fridays, 8 p.m., Old Windmill (behind Peacock Inn), London Road, Peterborough.
**Worksop (NNARS).**—Tuesdays (RAE Class), Thursdays (Lecture Night), Club Room, 13 Gateford Road, Worksop, Notts.

### REGION 5

**Cambridge (C&DARC).**—Informal meetings on Fridays during August, 7.30 p.m., Club Headquarters, Corporation Yard, Victoria Road, Cambridge.
**Luton (L&DARS).**—Tuesdays 8 p.m., ATC Headquarters, Crescent Road, Luton, Bedfordshire.
**March (M&DARS).**—Tuesdays, 7.30 p.m., rear of Police Headquarters, March, Cambridgeshire.
**Royston (R&DARC).**—Wednesdays, 8 p.m., Manor House Social Club, Melbourn Street, Royston, Herts.
**Shefford (S&DARC).**—Thursdays, 7.45 p.m., Church Hall, High Street, Shefford, Bedfordshire. 4, 11 August (Club closed), 18 August (Open Evening), 25 August (Quiz), 1 September (" Getting re-started on Ham Bands," G3IXG, and Junk Sale).

### REGION 7

**Acton, Brentford & Chiswick (ABCRC).**—16 August, 7.30 p.m., AEU Club, 66 High Road, Chiswick.
**Ashford (Middx) Echelford ARS.**—10, 24 August, 7.30 p.m., Links Hotel, Ashford.
**Bexley Heath (NKRS).**—11 August (Club Natter Night). 7.30 p.m., 25 August (Morse Night) 8 p.m., Congregational Church Hall, Chapel Road, Bexley Heath.
**Chingford (SRC).**—Fridays (except first in Month), 8 p.m., Hill House, Simmons Lane, Chingford, E4.
**Croydon (SRCC).**—9 August, 7.30 p.m., Blacksmiths Arms, South End.
**Dorking (D&DRS).**—9 August (Informal Meeting), 8 p.m., Wheatsheaf, 23 August (Informal Meeting), 8 p.m., Barley Mow, East Horsley, Gomshall.
**Ealing (E&DARS).**—Tuesdays, 7.30 p.m., Northfields Community Centre, Northcroft Road, Ealing, London, W13.
**East Ham.**—First and third Tuesdays from September, 7.30 p.m., 12 Leigh High Road, East Ham.
**East Molesey (TVARTS).**—First Wednesday each month, Prince of Wales, Bridge Road, East Molesey.
**Edgware & Hendon (EADRS).**—8, 22 August, 8 p.m., John Keble Hall, Church Close, Deans Lane, Edgware.
**Gravesend (GRS).**—17 August, 7.30 p.m., RAFTA Club, 17 Overcliffe Road.
**Guildford (G&DRS).**—12, 26 August, 8 p.m., Guildford Model Engineering Society in Stoke Park.
**Greenford (GARS).**—Alternate Fridays, 12 August, 8 p.m., Greenford Community Centre, Oldfield Lane, Greenford.
**Harlow (DRS).**—Tuesdays, Thursdays, 7.30 p.m., Mark Hall Barn, First Avenue.
**Harrow (RSH).**—Every Friday, 8 p.m., Roxeth Manor School, Eastcote Lane.
**Havering (H&DARC).**—10, 24 August, Romford.
**Holloway (GRS).**—Mondays, Wednesdays (RAE & Morse), 7.30 p.m., (Friday Club), 7.30 p.m.
**Hounslow (HADRS).**—8, 22 August, Canteen, Mogden Main Drainage Department, Mogden Works, Isleworth.
**Ilford.**—Thursday, 8 p.m., 579 High Road, Ilford (Nr. Seven Kings Station).
**Kingston.**—4, 18 August, fortnightly 8 p.m., YMCA, Eden Street, Fridays, weekly Morse classes, 2 Sunray Avenue, Tolworth.
**Leyton & Walthamstow.**—9, 23 August, 7.30 p.m., Leyton Senior Institute, Essex Road, London, E10.
**London U.H.F. Group.**—4 August, 7.30 p.m., Bull & Mouth, Bloomsbury Way, Holborn.
**Loughton.**—Alternate Fridays, 12, 26 August, 7.30, Loughton Hall (Nr. Debden Station)
**New Cross.**—Wednesdays & Fridays, 8 p.m., 225 New Cross Road, SE14.
**Norwood & South London (CP&DRS).**—20 August (G. M. C. Stone, G3FZL on Aerials), CD Centre, Catford, London, SE6.
**Paddington (P&DARS).**—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2a Warwick Crescent, W2.
**Purley (P&DRC).**—5 August (" On 4 metres "), 19 August (G3FTQ on " Island of Ibiza slides "), 2 September (" Live on 4 "), 8 p.m., Railwaymen's Hall (Side entrance), 58 Whytecliffe Road, Purley.
**Reigate (RATS).**—18 August, 7.30 p.m., (V.H.F. NFD Night), George & Dragon, Cromwell Road, Redhill. 27 July, Hog's Back Rally.
**Romford (R&DRS).**—Tuesdays, 8.15 p.m., RAFTA House, 18 Carlton Road.
**Scout ARS.**—18 August, 7.15 p.m., Baden Powell House, Queens Gate, South Kensington, SW7.
**Science Mueum.**—16 August (Informal Meeting), 6 p.m., Science Museum, South Kensington.
**Sidcup (CVRS).**—4 August (Morse Night), 7.30 p.m., Congregational Church Hall, Court Road, Eltham. 17 September (Annual Dinner & Dance) Bulls Head Hotel.
**Slough (SDR Group).**—First Wednesday every month, 8 p.m., United Services Club, Wellington Street.
**South London Mobile Club.**—13 August (Film Show by G3DPN), 8 p.m., 27 August (Talk by G4KD, Region Seven Representative) Clapham Manor Baths, SW4.
**Southgate & District.**—7.30 p.m., Parkwood Girls' School (behind Wood Green Town Hall).
**St. Albans (Verulam ARC).**—17 August, 7.30 p.m. (T.V. Outside Broadcasts by George Eddowes, G3NOH, of BBC) 7.30 p.m., The Cavalier Hall, High Street, Cheam.
**Sutton & Cheam (SCRS).**—19 July, 8.0 p.m., The Harrow Inn, High Street, Cheam.
**Welwyn Garden City.**—11 August, Vineyard Barn.
**Wimbledon (W&DRS).**—12 August, 8 p.m., Community Centre, St. George's Road, Wimbledon, SW19.
**Wembley (GECARS).**—12 August, 7.30 p.m., visitors ring ARNold 1262, first.

### REGION 8

**Crawley (CARC).**—10 August (Informal, contact G3FRV), 24 August (Sale of surplus Equipment, conducted by G3FRV), 8 p.m., Trinity Congregational Church Hall, Ifield.
**Maidstone (MYMCAARC).**—3 August (" Radio Amateurs Examination " by G3ORP), 10 August, (" Radio Mathematics," by G3ERY), 17 August (" Class C R.F. Amplifiers " by G3LXO), 24 August (" Experiments with Transistor V.F.O's " by G3UEW), 31 August (" Centimetric Wavelengths " by G3LQV), 8 p.m., Cheshire Home, Mote House, Mote Park, Maidstone. Morse Practise, 7.30 p.m.

### REGION 9

**Bristol.**—18 August, 7.15 p.m., New Physics Theatre G44, Royal Fort, Bristol University, Woodland Road, Bristol 8.
**Burnham-on-Sea (BoSARS).**—Second Tuesday in each month, 8 p.m., Crown Hotel, Oxford Street, Burnham-on-Sea.
**Camborne (CRAC).**—First Thursday in each month, Staff Recreation Hall, SWEB Headquarters, Pool, Nr. Camborne.
**(CRAC. V.H.F. Group).**—First Thursday in each month, 7.30 p.m., The Coach and Horses, Rydar Street, Truro.

**Exeter.**—First Tuesday in each month, 7.30 p.m., George and Dragon Inn, Blackboy Road, Exeter.
**Plymouth (PRC).**—Tuesdays, 7.30 p.m., Virginia House, Bretonside, Plymouth.
**Saltash (S&DARC).**—12 August (Mobile Evening Out—" Foxhunt "), meet outside Club Room, 7.15 p.m. sharp, 26 August (Mobileers' Mystery Evening), meet Club Room, 7.15 p.m., sharp.
**South Dorset (SDRS).**—First Friday in each month 7.30 p.m., Labour Rooms, West Walks, Dorchester.
**Torquay (TARS).**—27 August (Members' Queries Across Floor) 7.30 p.m., Club H.Q., Belgrave Road, Torquay.
**Weston-super-Mare.**—First Friday in each month, 7.15 p.m., New Engineering Block, Technical College, Weston-super-Mare.
**Yeovil (YARC).**—Wednesdays, 7.30 p.m., Park Lodge, The Park, Yeovil.

**REGION 10**

**Cardiff.**—8 August, 7.30 p.m., TA Centre, Park Street, Cardiff.

**REGION 11**

**Llandudno (CVARC).**—17 August (Meeting for nominations for Regional Representative), 8 p.m., Cross Keys Hotel, Madoc Street, Llandudno.

**REGION 14**

**Auchenharvie (A&DARC).**—Wednesdays and Thursdays, 7.30 p.m., Auchenharvie Community Centre, Stevenston, Ayrshire.

**REGION 15**

**Belfast & District RSGB Group.**—Third Friday in each month, 8 p.m., Ulster Tape Recording Society Clubroom, 44 Dublin Road, Belfast.

**REGION 16**

**Basildon (BDARS).**—15 August (Visit to Chelmsford Police Communication Centre), 6 September (Social), details from G3IJB.
**Chelmsford (CARS).**—No meeting in August. 6 September (AGM and Film Show), 7.30 p.m. Marconi College, Arbour Lane, Chelmsford.
**Great Yarmouth (GYRC).**—Fridays, 7.30 p.m., the Manager's Office, the Old Power Station, Swanstons Road, Great Yarmouth.
**Ipswich (IRC).**—31 August (" Measurements," by G3NAZ), 7.30 p.m., Red Cross HQ, Gippeswyk Hall, Ipswich.
**Norwich (NARC).**—Mondays, 7.30 p.m., 15 August (Lucky Dip), Old Lakenham Hall, Mansfield Lane, Norwich.

## LOOKING AHEAD

**14 August.**—Derby Mobile Rally.
**20-21 August.**—Region 12 ORM.
**29 August.**—Peterborough Mobile Rally.
**3-4 September.**—Northern Radio Societies' Convention, Manchester.
**4 September.**—Swindon Mobile Picnic.
**11 September.**—RSGB National Mobile Rally, Woburn Abbey, Bedford.
**25 September.**—Dundalk Convention.
**2 October.**—Region 9 ORM.
**26-29 October.**—RSGB International Radio Communications Exhibition.
**9 December.**—RSGB Annual General Meeting.

### Partridge Mobile Aerial

The advertisement in the June issue of the BULLETIN for the Joystick mobile aerial manufactured by Partridge Electronics Ltd. contained an error which suggested the system had not been tested at speeds of more than 70 m.p.h.

The advertisement should have read " The System *has been* tested for safety and rigidity at speeds of over 70 m.p.h."

## MOBILE RALLIES

**14 August**.....**Derby Mobile Rally**
*Organized by the Derby and District ARC*

**29 August**.....**Peterborough Mobile Rally**
Riverside, near the swimming pool, Peterborough
(See page 334, May)
*Organized by the Peterborough and District ARS*

**4 September**.....**Swindon Mobile Picnic**
Lidiard Park, near Swindon
*Organized by the Swindon and District ARC*

**11 September**.....**RSGB National Mobile Rally**
Woburn Abbey, Bedfordshire
*Organized by the Radio Society of Great Britain*

**25 September**.....**Harlow Mobile Rally**
*Organized by the Harlow and District ARS*

# REGION 9 OFFICIAL REGIONAL MEETING

## Royal Hotel, Weymouth, Sunday, 2 October 1966

Talk-in Stations, G3TTC 1875 kc/s, G3OAP 70·38 Mc/s.

| | | | |
|---|---|---|---|
| 10.15 a.m. | Conducted tour of BBC Short Wave Station Rampisham | 3.00 p.m. | Offical Regional Meeting |
| | | 5.00 p.m. | Tea |
| 1.15 a.m. | Lunch | 6.15 p.m. | Lecture |

*Tickets are available from:-*

**W. H. Burden G3EAT,**
**102 Westhill Road,**
**Wyke Regis,**
**Weymouth.**

**Lunch, Tea and ORM** **£1 5s. 0d.**

**Tea and ORM** **10s. 0d.**

# 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.*

### G6QB

It was with shock and great dismay that I recently heard of the sudden illness and passing of Mr L. H. Thomas, MBE, G6QB. I had the privilege of knowing " Tommy " for over 25 years and he introduced me to, and encouraged me to take up Amateur Radio. On my many visits to England Tommy always gave his hospitality and advice and I know well that he encouraged many other amateurs. England will not seem the same when I next visit and I would gladly lose all my equipment just to have had the chance of a final QSO with G6QB.

JAMES C. PERSHOUSE, 9M2DQ, VS2DQ, ZC1AL etc.

Kedah, Malaysia

### DXpedition Memorial

As one who very much appears to be interested in DX and DXpeditions, I am writing you about a suggestion I have sent to Mr Herbert Hoover Jr., W6ZH, of ARRL, with a copy to John Huntoon, of *QST*. As you quite well know, Chuck, K7LMU, and his friend, Ted, ZL2AWJ, were both lost en route from Wallis Island, FW8, to Apia, Western Samoa. There can be very little argument that they really and truly gave their lives for amateur radio. It then seems reasonable to somehow permanently memorialize these men. It doesn't seem to me personally enough to give a sum of money to their widows. I have suggested to Mr. Hoover that we in ARRL carry the ball for a drive for funds to erect a beacon, lighthouse, if you prefer to call it that, in a harbour in Wallis Island, near where their last radio QTH was. As permanent as anything can be adjacent to the ocean, this then will stand as a permanent memorial to these fine people who unhappily lost their lives so we could claim another one (I personally did not even hear them).

Perhaps, we might get some backing from RSGB. I certainly hope so.

W. E. NEFF, Jr., W1AH

Cheshire, Connecticut.

### Walkie-Talkies

During a recent visit to London I noticed with some surprise the very large number of Japanese transceivers on sale to the general public in radio shops all over the West End. When I made inquiries I found that these sell extremely well: at one shop I was told that seven or eight pairs had been sold that day.

Once again we are faced with a most inconvenient anomaly in the law, which caused some difficulties eight or so years ago when the WS 19 was so widely available, namely that it is not an offence to sell transmitting equipment to those who do not possess a licence, although it is an offence for such a person to use it. Few of those who sell this kind of equipment seem to know anything about licences, and indeed, those who do have been known to say that although there is no citizens' band in the UK, there is no reason to obey the letter of the law.

Perhaps it is right that we licensed amateurs should be jealous of a privilege we have gained, and should campaign against the free sale of such equipment: the Society might give a lead by making official representations to the GPO concerning the enforcement and possibly the amendment, of the Wireless Telegraphy Act, 1949. There seem to be two courses of action open to us. In the first place, we might struggle for the sale of transmitting equipment to be made illegal, except on production of a current licence (which might itself lead to a simpler form of licence, such as the Canadian form), or alternatively we might seek the opening of a Citizens' Band in the UK, which might clear some of the intruders from the Amateur Bands, and provide a legal outlet for the walkie-talkers. It might coincidentally have the same effect as G3PL sees in the USA, of leading to a decline in the number of amateur licences issued, which would not necessarily be a catastrophe.

I imagine that these views will provoke some dissension, which is partly my intention; but I hope that it will lead to some action being taken to stop this quasi-illicit trade, which seduces innocent members of the public into unsuspected illegalities.

J. L. MARSHALL, G3RKH

Manchester.

### Morse—A Ham's Best Friend

It is a pity that G3SIL was not on the air in the '20s. He would, I am sure, be somewhat grimly reminded that his much vaunted " phone " has made little strides in ordinary amateur communications over the years. Ah yes, I do know about s.s.b. The exception is that on this medium too, the language with some has very sadly deteriorated, with the point that to talk " Radioese " with the fingers needs some skill—but with the voice—better control and deeper thinking only. Many are listening who are at times shocked and surprised at some of the language used. Some of the phone boys should remember this, as we did—even in those early days. I feel that 1920 from a phone point of view had considerable advantage over 1966 and it would do some amateurs a power of good if they had the good fortune to compare. I can, because I was there, and like most amateurs of the day used c.w. and phone as the occasion arose.

Phone is easy—one just has to talk. It is the lazy amateur's chief prerogative; he finds the learning of Morse requires concentration, and pains it is—make no mistake. It often requires hard work, which induces him to turn with relief to phone. But this has no more value to the fraternity than that of the taxi cab operator picking up fares—except as a way of saying " How do " in a simple and non-complicated way. Even the gear is bought nowadays, and I would like to have further information on where the perfecting of speech communication comes in here. Always there have been dedicated amateurs working to do this —but not with highly expensive gear in which the technical work is already done. As for killing the English language—just listen to some of the phone amateurs. There are, I know, many to whom the use of phone gives great pleasure and these are good solid members of the craft, but don't let us get blue eyed over them. they are doing just that in the majority. Morse is not, as G3SIL puts it, used by the " holier than thou, dotty dash " types. It is as much a language as any foreign language which has to be taught and learned with care. Hundreds and thousands of people get a smattering of foreign languages but it is the painstaking pupil who enjoys speaking it and can *think* in the language.

And so it is with Morse. The dabbler, who has to learn it to get by and a very poor by it is as a rule, promptly drops it on passing and it is a chore for him or her to use it again. Fair enough, I have taught and enjoyed teaching many amateurs in the past—some are now honoured names in our craft—and whereas one will get a smattering of Morse, and think he understands it, the one who really takes pains can handle a key with pride, and, above all, obtains the ability to *think* in Morse, which is essential to success. The pleasure of being able to think alike with kindred amateurs soaks into the amateur as a permancy, and is an addition to the microphone which I can assure G3SIL a Morse amateur has no difficulty in using. I wish I could say the same in reverse. I agree too with many of the points made by G3OMM.

One other point I would make is that, like fingerprints, an amateur can be read sometimes by the characteristics he adopts as experience in Morse is obtained. Few keep the correct spacing which training demands. This characteristic was useful in tracing monitored stations during the war. It is the accent of Morse.

W. E. F. CORSHAM, G2UV

Wembley, Middx.

G3SIL's letter in the June BULLETIN lacks a circumspect look on the subject of communication systems, at least, from his comments on the use of c.w.—or i.c.w. as in fact it is.

Our modern computers use a digital system in their communication network, which is, after all, only a high speed i.c.w. mode. I would suggest that if he thinks a little deeper on this subject he must come to the conclusion that there are much fewer variables to be controlled using the code form of communication than with speech. I do not infer that it is the most acceptable

form of transporting intelligence, but in my considered opinion, it is the most efficient in any given set of conditions.

Concerning G3OMM's letter, I must commend her for a very sound note on the subject of Morse tests in particular and for bringing me up to date on the spacing between words or groups.

Like Mrs Shaw, I teach Morse at the local Technical College. Over the past two years I have been perturbed by the reports from my students of the poor standard of Morse and test apparatus at the circuit centres where the GPO hold the tests. I have written to the Radio Services Department and so have my students. A statement has been made that steps are being taken to provide transistor oscillator gear which may be an improvement, but reference to the uneven and irregular Morse sent by the examiner was refuted. The statement that these examiners held a First Class PMG certificate was brandished in my eyes. Indeed, holier than thou—I wonder. I hold a Special PMG certificate myself, taken many years ago. Degrees and qualifications are subjective appendages—they don't make you a good teacher or discerning enough to know " real good Morse." Over many years I have tried to take a long objective look—and listen. I concluded that the real crux was fluent regular phrasing, at whatever speed the Morse was being sent. This is the basis of my teaching. This is not being served at the circuit centres, at least not in the Midlands.

I am, therefore, obliged to G3OMM for raising the subject and stating it so well.

K. B. B. CUNNINGHAM, G3PBW

Stafford.

Why anyone should doubt that c.w. is the most efficient *amateur* mode mystifies me.

No one can dispute that c.w. will outperform all other modes on pure distance covered: it uses less power, simpler equipment, less bandwidth, and has its own radio equivalent to Esperanto.

That less words per minute can be passed than by voice transmission is another point in its favour. This very fact discourages the c.w. man from indulging in long overs that say nothing—neither does he repeat whole sentences, or need to resort to using phonetics.

Unfortunately, c.w. requires skill, especially in contests, where voice modes call for brute force, and this frightens off many amateurs. It is also true that the make-up of certain people prevents them from ever mastering c.w., and many more give up the mode before they reach the breakthrough speed which opens the gate to real appreciation.

Just as sound broadcasting calls for higher mental concentration and imagination on the part of the listener than vision does of the viewer, so c.w. calls for yet a further mental projection, and users of this mode cultivate what is almost a sixth sense. With the USA and USSR spending large sums in the exploration of telepathy, it would appear that c.w. is very much *the* modern method of communication.

JOHN J. YEEND, G3CGD

Cheltenham, Glos.

So c.w. is primitive? The last time I listened on 14 Mc/s it sounded as though it was the only form of communication known to mankind.

Yours prehistorically,

F. ALLAN HERRIDGE, G3IDG

Basingstoke, Hants. (*Life Member*)

### . . . The Last Word

I should be very much obliged if you would grant me facilities to reply to the gentlemen who, in the correspondence columns of the July issue, were so highly critical of my letter which appeared in the June issue.

It is immediately noticeable that these three critical letters were all written by the holders of two-letter call-signs, and it is therefore only natural that they should spring to the defence of Great-Grandfather's mode ! These gentlemen would doubtless be equally vociferous in lauding the merits of a Coach-and-Four as against the motor car!

G8IJ's assumption regarding my c.w. ability was not entirely unexpected, and in reply I would merely refer him to the last editorial paragraph on page 412 of the June issue, i.e. Grafton Top Band Contests Results. Need I say more?

As for G2TA's " letter," surely this is carrying the " Rubber Stamp " technique just a little bit too far!

The object of my original letter was to throw the spotlight on to the ever-present artificial " class barrier " which exists within amateur circles, with the " Upper Class " c.w. types always lording it over the " Lower Class " 'phone operators. The Amateur Radio fraternity is claimed to transcend all barriers of class, colour, creed and nationality. How can we possibly continue to support such a barrier within our own ranks?

I am glad that your headline gave me the opportunity to bring this matter into the open, and trust that this correspondence may be instrumental in " bridging the gap " before it gets too wide.

TED RUDOLPH, G3SIL

Stanmore, Middlesex.

*This correspondence is now closed.*—EDITOR.

### RSGB News Bulletin

Most issues discussed in these correspondence columns have two or more sides of more or less equal merit. The individual amateur takes the side of those whose preferences coincide with his. Sometimes, however, a letter appears promoting views with virtually no merit at all. We feel that K. Whitton's letter attacking the News Bulletin and the Society generally is such a letter.

Perhaps Mr Whitton fails to appreciate that the essence of Amateur Radio operation in Europe is *voluntary* restriction. We repeat, *voluntary* restriction. The majority of amateurs observe voluntary band plans, and are aware of the necessity of this on heavily occupied bands. This is not for the benefit of a chosen few but for the convenience of the large majority of operators.

Part of the voluntary restriction is the leaving open of certain frequencies for certain uses. One such frequency is 3600 kc/s which is left open for the RSGB to provide a News Service for all amateurs, whether members of the Society or not. It *is* clearly understood that 3600 kc/s is not reserved for RSGB news announcements, and that any station may use this frequency under first comer's right. We wonder, however, how many more people try to listen to GB2RS on a Sunday morning than want to listen to those whose action Mr Whitton appears to support.

We agree with Mr Whitton that the BULLETIN continues to contain the same dreary repetitions of the same old faces and call-signs. This, we feel, is because it is mainly these same old faces and same old call-signs who put in the time and trouble to supply the BULLETIN with articles, information, opinions and photographs. This same accusation, of course, could also be aimed at other magazines. Were it not for a few dedicated, extremely hard working contributors, such publications could not exist. Perhaps Mr Whitton should get a knowledgeable friend to help him read the BULLETIN, and to point out the items of interest and to explain the difficult bits.

We sincerely hope that we are mistaken in taking seriously a tongue-in-cheek letter designed to produce furious reaction. We hope so, because if Mr Whitton is serious in his remarks and comments, and if the attitudes reflected in his letter are representative of any section of the Amateur Radio movement, however small, then being known as licensed radio amateurs will no longer be a source of pride to us, but a source of shame.

J. P. BILLINGHAM, G8AAC G. B. NEALE, G8NN
R. M. STRICKLAND, G8KB A. STRONG, G8AGQ
J. R. PETTY, G4JW

Yorkshire.

### FCC Form 660A

I have successfully obtained my permit to operate a transmitting station in the USA, and feel that one or two hints might be helpful to others.

(i) Application is made on Form 610.A. obtainable at the US Embassy.

(ii) When a photostat of the applicant's station licence is requested only the front page is required.

(iii) The permit (FCC Form 660A) measures 13 x 20 cm, lists the period of validity and is forwarded to the applicant from the FCC, Washington DC. 20554, to any address which the applicant wishes to designate.

(iv) While two months is asked for processing the permit, it took only six weeks to receive mine.

(v) All communications with the FCC should be by Air Mail.

In four days I have worked over 70 stations, and all the US amateurs are very co-operative, many of them even having extended invitations to visit them.

My father has a ranch in the Mimbres Valley from where I am operating. I find it hard working into Europe, my one and only English contact being with G5AAV/K5ZKM; it was only a short QSO but quite a coincidence. Apart from operating at the ranch I also operate from W5LAJ, Dean Battishill, in Silver City. I hope that if any UK stations hear me, they will give me a call.

Simon Wheaton-Smith, G3ROW.

Sherman, New Mexico.

## 3 and 4 September 1966

Talk-in stations from 10am, on 160m, 4m and 2m. Main Stations on from 80m to 10m.

# Northern Radio Societies Association

# 1966 Convention

**Opening by M. J. Richards, Chief Constable of Manchester**

### Saturday 3 September

11 a.m. Exhibition in Lancaster Exhibition Hall. Commercial, Amateur and Public Service Represented.

2 p.m. Official Opening, followed by lectures and quiz.

Model aircraft flying display and boat display will take place in morning.

### Sunday 4 September

11 a.m. Exhibition as Saturday including finals of quiz.

8 p.m. Dinner.

A Junk Sale will also take place over the weekend.

*RSGB Council will be represented by the Executive Vice-President, A. D. Patterson, GI3KYP, and RSGB Headquarters Staff by T. R. Preece, G3TRP*

*Details from*

**F. Barlow, 2 Lingdale Avenue, Cheadle Hulme, Cheshire**

# RSGB Publications

28 LITTLE RUSSELL STREET, LONDON, W.C.1

| | Post Paid |
|---|---|
| **RSGB PUBLICATIONS** | |
| Amateur Radio Handbook | 36/6 |
| Radio Data Reference Book | 14/– |
| Technical Topics for the Radio Amateur | 10/8 |
| Amateur Radio Call Book | 6/6 |
| S.S.B. Equipment | 3/– |
| Communications Receivers (Second Edition) | 3/– |
| The Morse Code for Radio Amateurs (Third Edition) | 2/– |
| Log Book (RSGB) | 7/– |
| **ARRL PUBLICATIONS** | |
| Radio Amateur's Handbook 1966 Edition | 42/6 |
| Buckram Bound | 50/– |
| Antenna Book, 10th Edition. | 18/6 |
| A Course in Radio Fundamentals | 10/– |
| Hints and Kinks, Volume 6 or 7. | 10/– |
| Mobile Manual for Radio Amateurs | 23/6 |
| Radio Amateur's V.H.F. Manual | 18/6 |
| Single Sideband for the Amateur (Fourth Edition) | 23/6 |
| Understanding Amateur Radio | 18/6 |
| USA Licence Manual | 5/– |
| **CQ PUBLICATIONS** | |
| Antenna Roundup | 23/6 |
| Antenna Roundup Vol. 2. | 30/– |
| *CQ* Anthology, 1952–59 | 23/6 |
| *CQ* Anthology, 1945–52 | 16/– |
| *CQ* Mobile Handbook | 23/– |
| *CQ* New Sideband Handbook | 24/– |
| RTTY Handbook | 30/– |
| Shop and Shack Shortcuts | 29/6 |
| **73 MAGAZINE PUBLICATIONS** | |
| Care and Feeding of a Ham Club | 8/– |
| Index to Surplus | 12/– |
| Parametric Amplifiers | 15/– |
| Simplified Maths for the Hamshack | 4/6 |
| Test Equipment Handbook | 4/6 |
| V.H.F. Antenna Handbook | 15/– |
| **EDITORS AND ENGINEERS PUBLICATIONS** | |
| Radio Handbook (16th Edition) | 78/– |
| Transistor Radio Handbook | 42/– |
| **RADIO PUBLICATIONS INC.** | |
| Better Short-wave Reception | 22/6 |
| Cubical Quad Antennas | 22/– |
| S-9 Signals | 8/6 |
| **AMERICAN MAGAZINE SUBSCRIPTIONS** | |
| *CQ* (*Cowan*) Monthly (p.a.) | 44/– |
| †*QST* (*ARRL*) Monthly (p.a.) | 43/6 |
| Institutions, groups, etc. (p.a.) | 50/– |
| †*73 Magazine* Monthly (p.a.) | 30/– |
| † *Sample Copy 2/6* | |
| **MISCELLANEOUS PUBLICATIONS** | |
| Foundations of Wireless (*Iliffe*) | 22/3 |

| | Post Paid |
|---|---|
| Ham's Interpreter (5th Edition) | 8/6 |
| How to Listen to the World | 20/– |
| Log Book, 150 pages, opens flat (*Martins*) | 21/9 |
| Manual of Transistor Circuits (*Mullard*) | 13/6 |
| Radio Amateur Operator's Handbook (*Data*) | 5/6 |
| Semaphore to Satellite (I.T.U.) | 70/– |
| Short Wave Radio and the Ionosphere (*Iliffe*) | 12/– |
| Short Wave Receivers for the Beginner (*Data*) | 6/6 |
| Transistor Radios, Circuitry and Servicing (*Mullard*) | 5/9 |
| Understanding Television (*Data*) | 40/– |
| Wireless Radio-TV Handbook (1966) | 29/– |
| **MORSE COURSES** | |
| G3HSC Rhythm Method of Morse Tuition | |
| Complete Course with three 3 speed L.P. records + books | 84/– |
| Beginner's Course with two 3 speed L.P. records + books | 60/6 |
| Beginner's L.P. (0–15 w.p.m.) + book | 50/– |
| Advanced L.P. (9–42 w.p.m.) + book | 50/– |
| Three speed simulated GPO test. 7 in. d.s. E.P. record | 11/6 |
| RSGB Morse Instruction Tape (900 ft.) | 35/– |
| RSGB Morse Practice Tape (450 ft.) (both at 3¾ i.p.s., up to 14 w.p.m.) | 20/– |
| **SHACK AIDS** | |
| Easibinders, round backed, gold blocked, for RSGB Bulletin | 16/6 |
| Easibinder Year Stickers (1965 or 1966) | 1/6 |
| Admiralty Great Circle Map (In Postal Tube) | 8/– |
| QRA Locator, Western Europe | 5/6 |
| RSGB Countries List | 1/– |
| Panel Signs, transfers (*Data*) | |
| Set 3: White Wording | 4/9 |
| Set 4: Black Wording | 4/9 |
| Set 5: Dials (Clear Background) | 4/9 |
| Set 6: Dials (Black Background) | 4/9 |
| Decalet Panel Lettering Transfers (Black or White) | 1/– |
| Blick Dry Print Lettering (Letters and Numerals, Black) | 2/6 |
| **RSGB MEMBERS ONLY** | |
| Car Badge (De Luxe with call-sign)* (*Postage on overseas orders 5/6 extra*) | 25/– |
| Car Badge (RSGB Emblem with call-sign)* | 18/– |
| Car Badge (RSGB or RAEN Emblem) | 9/– |
| RSGB Terylene Tie (Maroon or Dark Blue) | 16/– |
| RSGB Blazer Badge (Black or Dark Navy Blue) | 7/6 |
| Stereo Block (RSGB or RAEN Emblem) | 10/– |
| Area Representatives Badge (ARs only) | 10/– |
| Members Headed Qto. Paper (100 sheets) | 10/6 |
| Call-sign Lapel Badge (with RSGB or RAEN Emblem, pin or stud fitting)* | 7/6 |
| Call-sign Lapel Bar* | 6/– |
| Tie Clips (with RSGB Emblem) | 5/– |
| RSGB Lapel Badge (½ in. size) stud or pin fitting | 2/– |
| Plastic Window Sticker (RSGB or RAEN Emblem) | 1/3 |

**Delivery 6–8 weeks*

*(Stamps and Book Tokens cannot be accepted)*

## PRIVATE ADVERTISEMENT ORDER FORM

Please send advertisement to SAWELL & SONS LTD., 4 LUDGATE CIRCUS, LONDON, E.C.4

| | | | |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**3d. per word (minimum 5/-), Box Nos. 1/6 (including forwarding replies)**

Please insert above advertisement in RSGB BULLETIN

NAME .....
(in BLOCK CAPITALS)
Address .....
.....
.....
Date ..... Signed.....

# CLASSIFIED ADVERTISEMENTS

**ADVERTISEMENT RATES. Members' Private Advertisements 3d. per word, minimum charge 5s. Trade Advertisements 9d. per word, minimum charge 12s. All capitals 1s. per word, minimum charge 18s. Write clearly. No responsibility accepted for errors. Use of Box number 1s. 6d. extra. Send copy to Sawell & Sons Ltd., 4 Ludgate Circus, London, E.C.4. Remittances should be made payable to Sawell and Sons Ltd.**

## SITUATIONS VACANT

### CITY OF LIVERPOOL EDUCATION COMMITTEE

**LIVERPOOL REGIONAL COLLEGE OF TECHNOLOGY**
**BYROM STREET, LIVERPOOL 3.**
**DEPARTMENT OF ELECTRICAL AND CONTROL ENGINEERING**

APPLICATIONS ARE INVITED FOR THE FOLLOWING POSTS:

1. **CHIEF LABORATORY TECHNICIAN.**
2. **SENIOR LABORATORY TECHNICIANS (3 POSTS).**
3. **LABORATORY TECHNICIAN.**

SALARIES (UNDER REVIEW):

| | |
|---|---|
| CHIEF TECHNICIAN .. .. .. | £930—£1,050. |
| SENIOR TECHNICIAN .. .. | £860—£960. |
| TECHNICIAN .. .. .. .. | £780—£890. |

Additional allowances for certain qualifications will be paid and a commencing salary above the minimum can be given in respect of previous appropriate experience.

Application Forms and further details (returnable to the Principal as soon as possible) from THE DIRECTOR OF EDUCATION, 14 Sir Thomas Street, Liverpool 1.

THOMAS ALKER
TOWN CLERK

**LICENSED HAM** or Enthusiast OM/YL for components organising and sales: any age. Birmingham District. Box No. Z7290, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

### TELECOMMUNICATIONS SUPERINTENDENT

Required by NIGERIAN RAILWAY CORPORATION on contract for two tours each of 18 months in first instance. Salary £2,475 gross a year. Gratuity at rate of 20 per cent of total salary drawn. Quarters provided at moderate rental. Free passages. Liberal leave.

Candidates must be experienced telecommunications engineers possessing a recognised University Degree/Diploma, or be A.M.I.E.E. or A.M.I.E.R.E. Railway (telecommunications) experience is desirable but not essential. Candidates will be required to advise the Corporation on problems arising during the installation of a complex H.F. Radio communications system. Possibility of secondment will be considered for successful applicant. Apply to CROWN AGENTS, M. Dept., 4 Millbank, London S.W.1, for application form and further particulars, stating name, age, brief details of qualifications and experience, and quoting reference M2R/62781/RC.

**YOUNG, ENTHUSIASTIC, TROUBLESHOOTERS** wanted immediately by "EAGLE." Good prospects. Write or 'phone Rex Toby, G2CDN, 32a Coptic Street, W.C.1. MUS 9606.

**ELECTRONICS TECHNICAL ASSISTANT** required for servicing and development of diverse electronic and electrical equipment in laboratory and on site in the field of specialist civil engineering. Salary according to training and experience. Applications to Rock Mechanics Ltd., 65 Old Church Street, London, S.W.3.

## MISCELLANEOUS

**QSL CARDS.** G.P.O. approved log books, cheapest, best, prompt delivery. Samples.—Atkinson Bros., Printers, Looe, Cornwall.

**RADIO ASTRONOMY.** Radio Sky, journal of the Society for Amateur Radio Astronomers, first edition just published. Price 6s. 6d. Society details, The Secretary, 9 Sutherland Road, London, W.13.

**HOLIDAY ACCOMMODATION.**—Modern Bungalow. Quantock Hills. Bed, Breakfast, Evening Meal. Terms from G3OSH, 4 St. Michael's Close, Nether Stowey, Somerset.

## FOR SALE

**65W TX,** 80 Thru 10, plate and screen modulated, built in p.s.u., good condition, £30, buyer collects. G3UXV, 2A Goldings Road, Loughton, Essex.

**THREE AUY10 TRANSISTORS,** new unused, £1 each. Suitable for top band rigs. Box Z7291, c/o RSGB BULLETIN, 4 Ludgate Circus, London, EC4.

**KW2000.** 12v. psu Shure mic 3 months use £170. Buyer collects.—Squires, 53 Penllwyngwyn Road, Bryn, Llangennech, Carms.

**SELLING UP.** Creed 7B Teleprinter (not sprocket feed), £15. Teletype 14 Auto-Tx, £5. Creed 7TR Reperf, £3. Codar Preselector PR30, £3 10s. Heathkit Q-Multi. QPM-16, £7. Unused, Hartley double beam oscilloscope type 13A, £15. Sae for further details.—B. Robertson, 9 Holbeck Lane, Cheshunt, Herts.

**HEATHKIT TA-1S** Stereo Tape Unit, professionally built, condition and appearance new. Wiring and instruction manual complete. £15 carriage paid U.K.—L. G. Davey, G3BZD, 1, Valley Road, Saltash, Cornwall.

**H.O.—10E MONITOR SCOPE,** as new, £28. Prop-Pitch Motor bought as new and unused, with indicator; best offer secures.—G3NMH, Wootton Bassett 792.

**MANUFACTURERS SURPLUS** unmarked semiconductors. Stud mounting silicon Rectifiers 5/- dozen, 5 to 10 amp. S.C.R.S., 10/- per dozen. Miniature wire ended Zener and Silicon Diodes mixed, 6/6d. per hundred. Germanium diodes 5/- per 100. Transistors similar to 2N706, 18/- per dozen. Germanium Stud Mounting Rectifiers, 12/6 per 100.—J. H. Birkett, 25 The Strait, Lincoln. Phone 20767.

**23 CMS?** Pair ceramic 2C39's £2 10s. each. AR88D, good condition, buyer collects, £30. Prop. pitch motor. Offers? May, 7 Parkwood Road, Hastings, Sussex.

**PHILIPS EL3300 TAPE RECORDER,** £18. AR88LF with manual, £35. Decca Intercontinental 1125, plus Brown headphones, £25. Heathkit OS-1 scope, £15.—Box No. Z7289, c/o RSGB BULLETIN, 4 Ludgate Circus, London E.C.4.

**QSL CARDS.** Attractive two colour designs, 25/- per 100. S.A.E. samples.—G3OYI, Cotswold Banks, Honley, Huddersfield.

**HALLICRAFTERS** SX28, £25. 1154 Power Pack (2 units) £5. Labgear plug in wide band couplers, set of 5, 30/-. Transmitter, rack design. 150 watts plus, Power Packs, Modulator, etc., requires attention, £25. Large quantity useful surplus and other items. Buyer collects.—G2FU, 85 London Road, Kearnsey, Dover. Phone Kearsney 2014.

## FOR SALE (contd.)

**GM8RV,** retired, would like to convert gear into cash. Transmitter: aluminium panels on channel iron. 12 chassis for amplifiers and power packs, 21 valves, 15 meters, well fused with relay switching, four valve mains V.F.O. Receiver NC81X with tuned Q5ER (making double superhet) BC221T with mains h.t. and l.t. power packs. Both metered, charts and spare valves. Single valve monitor. Crystal mike. Spare mike same type but crystal broken. Mains GDO with coils. Mains AVO RC test bridge. One odd power pack. Many spare valves, condensors, resistances, meters, crystals and modulation transformer. Everything working but needs cleaning. £100 o.n.o. Purchaser will have to collect or arrange transport. Vinicombe, 6 O'Connell Street, Hawick, Roxburghshire.

**COMPLETE STATION** CR100 RX, LG 300 TX, ex-WD. Modulator and p.s.u. 100 per cent mod, £50 or nearest offer. Carriage free GI only. **WANTED** H.F. Command RX. Semple, GI3OYG1, Shandon Park, Ballymoney, Co. Antrim, N. Ireland.



**GEC BRT-400,** £65. Green LA-600, £55 (11 months old) G. & D. 2M1000, £65. (This has been brought up to present Green '66 specification by ourselves. Professionally rebuilt "Renaut" HRO's, 38 guineas. Write for details: Green, E.C.E. Ltd., 79-91 Braemar Road, London, N.15. Tel: STAmford Hill 1387.

**U.H.F. TRANSISTORS** and Valves, 2N1742; 2N1743; 2N502, 10/-. TD1-100 A., £2. 4X150A., £3. All new.—Box Z7292, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

**940 EDDYSTONE RX,** 18 months old, with KW. Amateur Band Converter, Browns Headphones etc., property of late B.R.S. George Marsden. Offers please to Mrs Marsden, 150 Middleton Park Road, Leeds 10, Yorks., or G3PTN-QTHR. Tel. No. Leeds 72800.

**EDDYSTONE 888A** with mounting blocks. As new, £75. HRO MS with five-general coverage coils and HRO Power supply. Original condition, £18 10s. Superb AR88LF with "S" meter, in silver-grey hammertone finish, £40, Hallicrafters SX-43, 550 kc/s to 108 Mc/s AM/FM in seven-ranges, £50. G3MOE, QTHR.

**28 MC/S CRYSTAL** Controlled Walkie Talkies. Up to half mile range. £10 10s. pair. Limited supplies. Teleradio Electronics, 325/7 Fore Street, London, N.9.

**METALWORK.**—All types of cabinets, chassis, racks, etc., to your own specifications.—Philpott's Metalworks Ltd. (G4BI), Chapman Street, Loughborough.

**MARCONI 52 Rx,** good cond., 12v and professional mains psu's, manual, £10. 19 Mk III, rough but goes, £1. Little used Westminster record player, £5. Redifon-Steelman transistor tape recorder, high grade, 2 speed machine, leather case, £10. Carriage extra. Wanted: P/B car radio (requiring attention?), good 19 Mk II with 12 v. P.U.—A. J. Richards, Castell Forwyn, Abermule, Mont. Abermule 255.

## FOR SALE (contd.)

**CR100.** S Meter, good order, with handbook. £23. 6-6 2m. J. Beam, £4. 2m. Converter (VQ4EV), £4 10s.—H. R. Skelhorn, School House, Lowerhouse, Bollington, Macclesfield, Cheshire.

**4X150A** with Base, Chimney and Clips, £5. Box No. Z7294, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

**COLLIN'S TCS-12** Receiver with PSU and Speaker, £10. Labgear 160m. convertor, £4 5s. Both in mint condition. CR66 RX, £15 and PR30 preselector, £4 5s. in good condition. Also 160m. TX with 2 PSUs, £7. All items in perfect working order. Will deliver 30 miles, otherwise buyer collects (Staffs.). Box Z7296, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

**STEPHENS-JAMES LTD.** Stockist for KW Electronics. Codar. Joystick. Eagle, Lafayette, National, Eddystone equipment supplied. AR88d £42 10s. Eddystone 840c £48. KW Vanguard £35. Creed 7B Teleprinter and psu £15. Pand Cub £30. Webster band spanner mobile whip, coils 160, 20, 15, £10. KW Viceroy Mk 2 £80. Latest Mk 2 G3FIF mobile whips. Fibre glass. £7 7s. MK3 Stainless steel construction, £9 19s. 6d. H.P. terms arranged. Part exchanges. Post and carriage extra most items. S.A.E. Enquiries please. RSGB Publications. Maps. Log Books. 70, Priory Road, Anfield, Liverpool 4 (ANField 3141).

**MOSELY TR3 BEAM,** alloy mast with wall brackets, CDR rotator. Home made, all band 120 watt AM transmitter. Modified HRO receiver with band spread coils for all bands, all necessary power supplies. Best offer over £80 for the lot. —P. Sorab, 5 Dacre Avenue, Caversham Park Village, Reading, or National 8051 during business hours.

## WANTED

**LAFAYETTE** Preamp and Convertor with handbook. Faulty no object. State price and condition. Berden, 20 Mill Hill Avenue, Pontefract, Yorkshire.

**H.F. BAND TX.** A.M. or S.S.B. G3UOS, P. M. Clay, Physics Dept., University, Sheffield 10.

**RSGB ANNUAL, 1928;** Guide, 2nd (1934) edition; Lapel badge, incorporating "T & R." BULLETINS," with covers: July-December 1931, January, February, June-September, December 1932. July 1933, January 1944. G3IDG, 96 George Street, Basingstoke, Hampshire.

**AUTO KEYER** required for 144 Mc/s beacon in Malaysia. Offers to G2BVN at RSGB HQ.

**NCX 5,** Swan 350, 2000A, or other TX/RX covering 15m, with P.S.U., also Tri band beam, Rotator and Indicator. Fair price paid.—Box No. Z7293, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

**HEATHKIT MOHICAN RECEIVER WANTED.** Must be good condition internal and external. Please state whether factory or kit model. Sensible price please!—V. Lear, G3TKN, 49 Cliff Road, Wallasey, Cheshire.

**WANTED.**—All types of communications receivers, test equipment, tape recorders, amplifiers, etc. Prompt cash payment.—Details to R. T. & I. Electronics Ltd., Ashville Old Hall, Ashville Road, London, E.11 (LEYton 4986).

## SITUATIONS WANTED

**AMATEUR,** married, three children, at present employed marine electronics Far East, seeks employment Southern England preferably country districts. Consider anything to avoid break up of family. Available January 1967.—Box No. Z7295, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

# INDEX TO ADVERTISERS

Printed in Great Britain for the RADIO SOCIETY OF GREAT BRITAIN, New Ruskin House, Little Russell Street, London, W.C.1
by The Garden City Press Limited, Letchworth, Hertfordshire