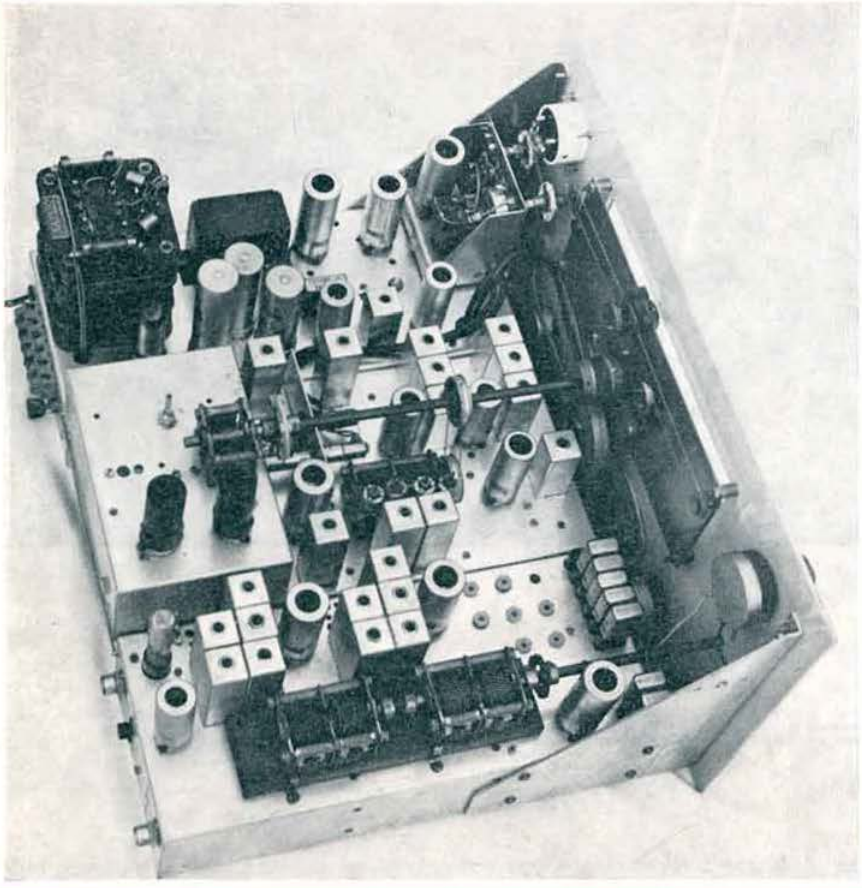
NOVEMBER 1973

RADIO COMMUNICATION



THE G2DAF MARK 2 RECEIVER

by

G. R. B. Thornley

Part 1—
Design considerations—
commences on page 744

RSGB Diamond Jubilee Year

1913 – 1973

Journal of the Radio Society of Great Britain

NOVEMBER 1973

RADIO COMMUNICATION

Volume 49 No 11 Price 40p

CONTENTS

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ABC
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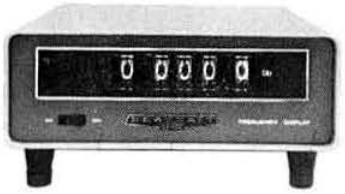

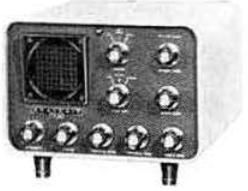

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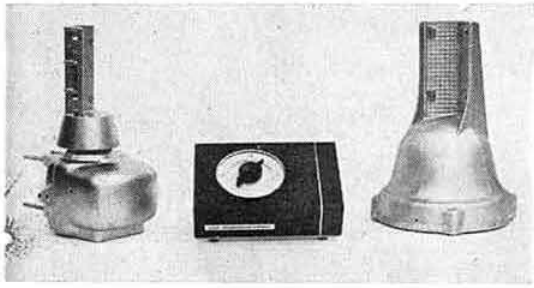
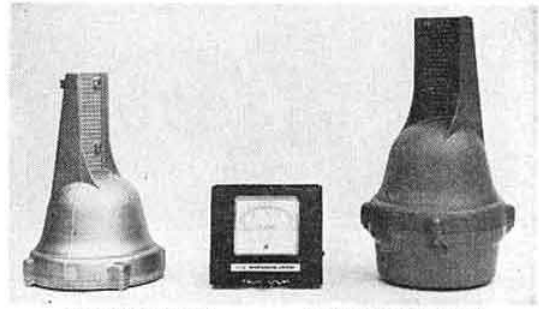


AR20 (£22.00) **AR22 (£27.50)**

HY-GAIN 400 (£126.50)



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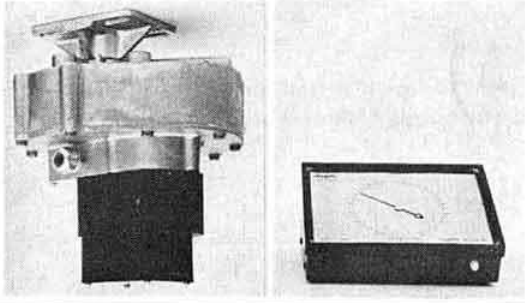

We stock the best range of rotators, CDE and HY-GAIN and spares. Our stocks are good so you'll get fast delivery plus the after-sales service which counts.

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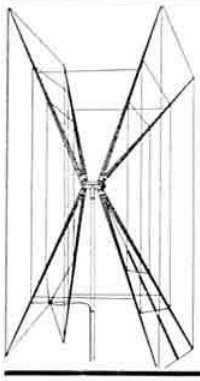
CABLE	4-way, 12p. 8-way 24p. per metre. Carriage free with rotator.



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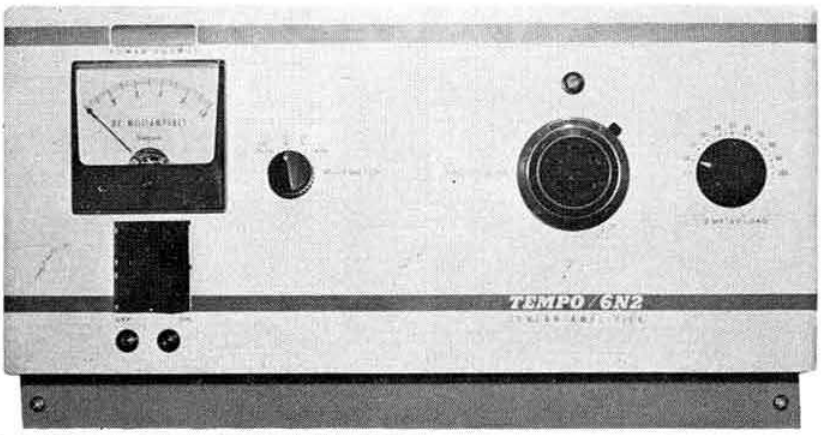

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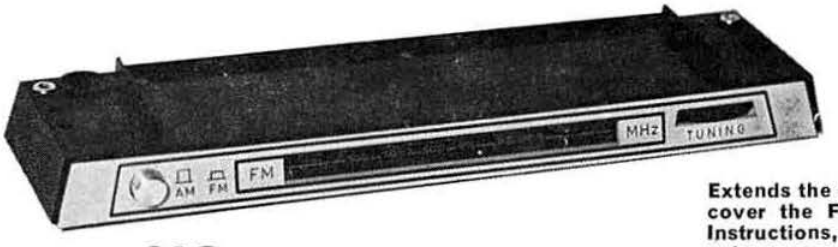

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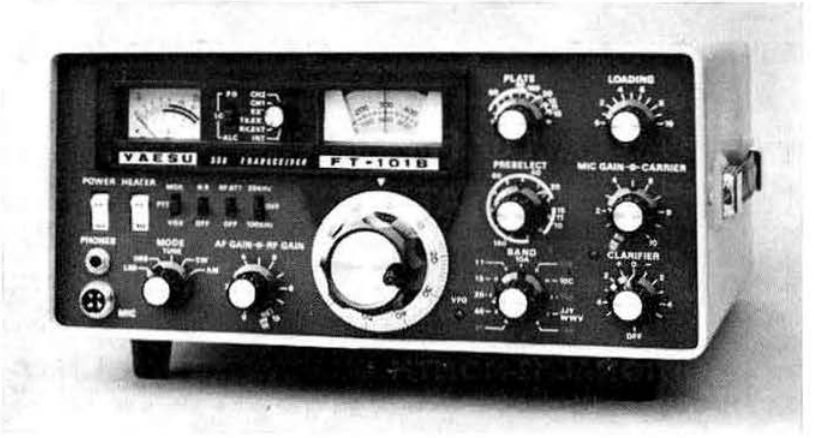

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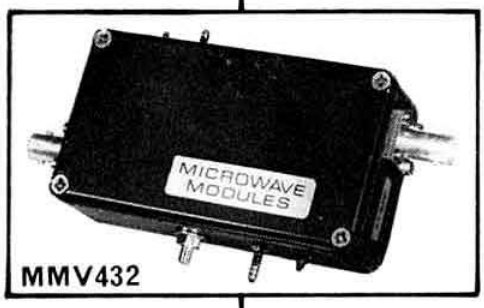
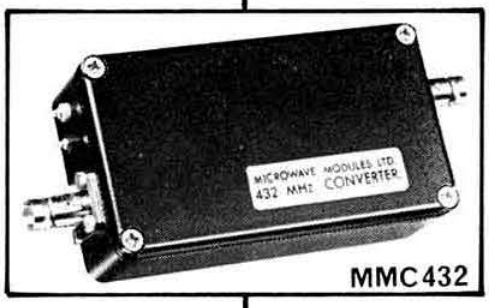


MMV432



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RADIO SOCIETY OF GREAT BRITAIN

35 DOUGHTY STREET, LONDON WC1N 2AE

FOUNDED 1913
INCORPORATED 1926

MEMBER SOCIETY
INTERNATIONAL AMATEUR RADIO UNION

PATRON: HRH THE PRINCE PHILIP, DUKE OF EDINBURGH, KG

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QTC AMATEUR RADIO NEWS

RSGB President for 1974

At its meeting on 8 October 1973, the RSGB Council elected Mr G. R. Jessop, CEng, MIERE, G6JP, this year's Executive Vice-President, to be President of the Society for 1974.

Value Added Tax

On learning of the recent VAT tribunal decision in the case of Automobile Association subscriptions, whereby a reduction of VAT on that part of the subscription which covers the cost of zero-rated publications was allowed, representations were made to HM Customs & Excise regarding treatment of RSGB subscriptions on a similar basis. The following reply was received:

"The recent VAT tribunal decision in the case of subscriptions to the Automobile Association applies, directly, only to that organization. The Commissioners of Customs and Excise are still considering the implications of this decision. However, if you would care to inform me as to precisely what facilities and advantages your members gain by virtue of their subscriptions and what method of apportionment you propose, I will submit your case, without prejudice, to the commissioners."

This matter will be pursued by the Society, although it should be borne in mind that the decision in respect of the AA is still subject to any possible appeal.

Temporary sites in the Bailiwick of Guernsey

Although the amateur licence authorizes the establishment and use of a station at temporary premises or a temporary location in the UK for a period not exceeding four consecutive weeks, without previous notification to the MPT or local telephone manager, it does not absolve the licensee from obtaining any necessary consent from the owner of the site before doing so.

The Seneschal of Sark has objected most strongly to amateurs setting up temporary stations on the island without his permission and the MPT has been asked to make arrangements forthwith so that he has prior knowledge of such activities.

From now on it will be necessary for an amateur who proposes to operate /A or /P *on any of the islands in the Bailiwick of Guernsey* to notify the States Telecommunications Board of his intentions at least 48 hours before the station is established at the temporary site. The official of the board to be contacted is: The Development Controller, Development Division, States Telecommunications Board, PO Box No 3, St Peter Port, Guernsey. Tel: Guernsey (0481) 24211.

Station log

There has been some doubt whether it is necessary for the licensee of a station to sign or initial every entry in the log book. The MPT has now confirmed that "there is no need for the licensee to sign or initial his own entries, although we have no objection if he prefers to do so as an added safeguard. A visiting operator must sign the log book with his full name in accordance with Clause 6(2) of the licence."

RSGB LECTURE

Aerial facts and fallacies

by L. Moxon, BSc, ACGI, CEng, MIEE, G6XN

Thursday 8 November 1973

Institution of Electrical Engineers
Savoy Place, London WC2

The basic performance of one aerial relative to another is more or less predictable but the results in practice often seem to defy the laws of physics. The speaker will show how this can often be explained in terms of environment and unsuspected losses from various causes.

A cordial invitation is extended to all RSGB members and friends to attend this lecture on a subject concerning all interested in radio communication.

Buffet tea 6pm **Lecture 6.30pm**

QSL Bureau

Holders of callsigns G4AAA to G4AZZ should note that their sub-manager is now Mr C. Johnson, 118 Harvest Road, Smethwick, Warley, Worcs B67 6NG.

Members are reminded of the change in postal rates and the necessity of sending additional stamps to their sub-manager for inadequately-stamped envelopes already held.

It is a great help to the QSL Bureau if cards sent in are sorted in alphabetical order of country, and numerically for W and VE stations, and in order of sub-manager for UK calls.

Holders of callsigns G3UAA to G3VZZ should note that their sub-manager is now Mr M. Newton, G3UKW, 2 Marlowe Court, Garforth, Leeds LS25 1PR. The G3RAA to G3RZZ series will continue to be handled by Mr D. Dell, G3PQF.

Radio Amateurs' Examination

It was the intention of the Society's Education Committee to arrange a weekend course for RAE instructors. However, the proposed course has attracted only a very small response and consequently it will not be feasible for the event to take place. The committee has, therefore, decided to answer queries and offer help to RAE instructors on an individual basis. Any RAE instructor who would like the assistance of the Education Committee is invited to write to the chairman, D. M. Pratt, G3KEP, 30 Lyndale Road, Bingley, Yorkshire BD16 3HE.

The Conway Masteranger

We are advised by Pambry Electronics Ltd that the cost of the Conway Masteranger, described on p608 of the September issue, is £82.50 plus VAT and not £105.60 as stated.

Pambry Electronics Ltd have recently moved to new premises and their address is now 45 High Street, Burnham, Bucks.

Can you help?

HB9AJU (also G3OOH), resident in Geneva, seeks assistance with the delivery of a beam and rotating equipment now in Essex. Normal transport costs exceed the value of the equipment. Is there a member with transport connections who could assist for a reasonable fee? Please contact G2BVN, QTHR.

Just published

RSGB Amateur Radio Call Book

1974 Edition

Completely reset and produced by a new system, this edition contains all additions and amendments notified by the MPT up to August 1973.

Also contains band plans, list of Affiliated Societies, table of Great Circle bearings from London, amateur radio prefixes in country order, and other useful information.

144 pages **75p (inc p & p)**

The new "Call Book"

The 1974 edition of the *RSGB Amateur Radio Call Book* has now been published and members are asked to notify the editor as soon as possible of any errors or omissions.

Recent changes need not be advised as these will be incorporated in the next edition from the weekly callsign record and correction lists issued by the MPT. It is, of course, essential that all such changes are notified to the MPT without delay.

ITU

The plenipotentiary conference of the International Telecommunication Union held at Torremolinos, Spain, has recently concluded. During the conference Monsieur M. Mili and Mr R. E. Butler were re-elected as Secretary-General and Deputy Secretary-General respectively for a further term of five years. Both M Mili and Mr Butler have supported the activities of the amateur service during their tenure of office at Geneva and we look forward to their co-operation during a period that could be decisive for amateur radio.

New slant on an old saying—"Diamonds are an amateur's best friend"

Extract from the annual report of the Anglo American Corporation of South Africa Ltd:

"Two new research-based products were successfully introduced in 1972 . . . the other is a product known as a spherical diamond heat-sink, which exploits the fact that diamond is the most efficient conductor of heat and has a useful place in specialized applications in the electronics and telecommunication industries."

If your solid-state final overheats, all you need is your wife's diamonds and a couple of good excuses! (With acknowledgement to *Radio ZS* July 1973.)

RSGB 1974 DIARY

Now available from RSGB HQ is a slim pocket 1974 planner diary showing a week to an opening and other useful information.

With blue or maroon plastic cover carrying the RSGB symbol in gold.

8in × 3½in **45p (inc p & p)**

Celebrating the Diamond Jubilee of the RSGB

SOUTH-EAST COUNTIES HF CONVENTION

Sunday 18 November 1973

Airport Hotel, Crawley

Programme

11am: Convention opens; exhibitors include Amateur Radio Bulk Buying Group, Burns Electronics, Lowe Electronics, and Western Electronics. Also in attendance will be members of the RSGB Interference Committee who will offer advice on rfi problems, an RSGB bookstall, and display stands mounted by local amateur radio clubs.
12 noon: Bar opens; snacks available over the counter.
2.30pm: An address by the President of the RSGB, Dr J. A. Saxton.
2.45pm: A brief history of the RSGB, by G6NZ.
3.30pm: Tea (included in the price of the ticket).
4pm: Optimizing dx performance, by G6XN.
4.30pm: The international beacon project, by G3DME.
5pm: Bar re-opens.
7pm: Convention closes.

How to get there: The Airport Hotel is situated by the Tushmore roundabout at the northern end of the Crawley bypass (A23), about three miles south of Gatwick Airport.

Talk-in station: G3WSC will be operational on 80m, 4m and 2m.

Tickets: In advance—50p each from Steve Emlyn-Jones, G4BKG, 36A London Road, Southborough, Tunbridge Wells, Kent. SAE, please. Cheques etc should be made out to the SEC HF Convention.

At the door—60p each.

Advance booking is recommended, as the accommodation is limited.

Book now

RAE courses

Subject to the number of students enrolling, it is proposed to hold an RAE course at the North Oxford Technical College at 7.30pm on Mondays. Anyone interested should contact Mr M. Bolton, 142 Oxford Road, Banbury, Oxon; tel Banbury 52221.

An RAE course is currently being run at the Durham Technical College from 1830 to 2000 (theory) and 2000 to 2130 (morse) on Fridays. Course tutor is Mr F. L. Firth, G8JD, from whom details may be obtained on Durham 2021.

Bradford Radio Society—change of title

The Bradford Radio Society has changed its title to Bradford Radio & Electronics Society, callsign G3NN. The secretary is now Mr R. Harker, 65 Whitby Road, Bradford BD8 9JN.

This information came to hand after the 1974 *RSGB Amateur Radio Call Book* had gone to press, and the entry under Affiliated Societies should therefore be amended. The entry under G3NN should also be amended to read: Bradford Radio & Electronics Society, c/o 18 Wrose Road, Wrose, Shipley, Yorks BD18 1AA.

The G2DAF Mark 2 receiver

A high-performance double conversion design covering six amateur bands

by G. R. B. THORNLEY, G2DAF*

Part 1

RADIO communication has always encouraged the competitive spirit; to work that rare dx station, to own a coveted trophy, or to do better in a contest than the other man at the club, has always been part and parcel of amateur radio, but there is an old saying, "If you can't hear them, you can't work them!" That is still as true as it ever was!

There are many amateurs with sufficient constructional experience to build successfully a modern communications receiver and who will actually do so, provided that they have some initial guidance in regard to design considerations and are then given the full constructional details of the type of receiver that has been under consideration.

All *Radio Communication* readers with some interest in receiver operation appreciate fully that design practice has changed considerably over the past decade. The increasing congestion on the crowded amateur bands and the greater ingress of high power telex and broadcast transmissions has highlighted the limitations of the often used—two rf, converter, 455kHz i.f.—circuit arrangement.

There have been many references in the past to the limitations in receiver performance, [1], [2], [3], and it is now known that sensitivity and signal-to-noise ratio are not the most important parameters. Of even greater importance is the ability of the receiver to resolve weak signals of a few microvolts in the presence of much larger interfering signals. These interfering transmissions may be completely outside the passband of the selective i.f. filter, but if they are within the passband of the relatively unselective front-end circuits they will be amplified by the receiver front-end gain to a level that will overload the converter and allow the strong signal to modulate the weak signal.

Many amateurs who complain about the congestion in the popular 80, 40 and 20m bands just do not realize that many signals they are hearing are not in the amateur bands at all. While the 15 and 10m dx bands are relatively free from commercial interference, the same adverse conditions can apply. A local amateur operating in the same band can radiate a field strength sufficient to cause receiver front-end blocking, and some of the more powerful dx stations using high-gain directional aerial systems (or 2m stations converted to a tunable i.f. of 10m) can cause severe cross-modulation to a wanted weak signal as much as 25 or 50kHz away.

The author is at present developing a fully-transistorized high-performance amateur-band communications receiver, but notwithstanding the many claims that have been made for the dynamic performance of fet and mosfet devices, he is satisfied that even now the thermonic valve still gives superior results in regard to the following desirable receiver characteristics: (1) high front-end dynamic range; (2) greater immunity to strong blocking signals, and (3) superior agc performance. The semiconductor receiver may have advantages from the point of view of light weight, portability or battery operation, but if the receiver is being built for main station use and a mains supply is available there should be no valid reason for not constructing a valve design. Additionally, a large number of RSGB members are still "more at home" with thermonic valves and those 1,000 or so amateurs who constructed the G2DAF Mark 1 Receiver [1] may be interested in worthwhile modifications to Mark 2 standards in order to obtain improved performance.

5 Janice Drive, Fulwood, Preston, Lancs PR2 4YE

DESIGN CONSIDERATIONS

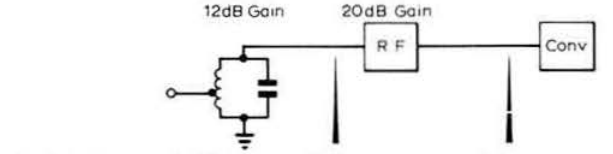
The front-end requirements for a modern communications receiver may be summarized as follows:

(1) As little gain as possible before the first converter: (*a*) this means no rf amplification; (*b*) however, an rf stage is a convenient and efficient method of coupling two signal frequency tuned circuits and if the rf stage is controlled by the agc line it becomes an automatic large-signal attenuator. To reconcile (*a*) and (*b*) the rf stage operates at unity gain.

(2) A reduction in converter noise in order to maintain the required signal-to-noise ratio with the lower level of wanted signal at the converter grid.

(3) Push-pull operation in order to obtain the greatest possible dynamic range and conversion gain.

If correctly designed and accurately matched, the aerial input coil will give a voltage step-up of approximately 10 to 12dB. There should also be no difficulty in getting 20dB gain from the rf stage. The block diagram of Fig 1 shows the front-end and the gain and signal-to-noise relationships of the original G2DAF Mark 1 receiver. It will be noted that 30dB of gain is used in front of the first converter (Fig 2). This was necessary in order to overcome the effect of converter noise and obtain the required signal-to-noise ratio.



Aerial noise	0·125μV	0·5μV	5·0μV
Valve RF noise	0·25μV	0·25μV	2·5μV
Valve conv noise	—	—	2·5μV
Signal	0·5μV	2·0μV	20·0μV

Noise total .... $\sqrt[2]{5{\cdot}0^2 + 2{\cdot}5^2 + 2{\cdot}5^2}$ = 6·1μV approx

Signal + noise / Noise ratio = 12dB approx

Fig 1. Receiver front-end signal-to-noise relationships for bandwidth of 2·5kHz

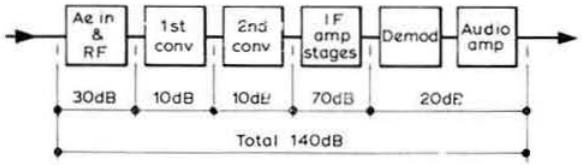


Fig 2. Gain distribution from aerial input to output stage of the Mark 1 receiver

From inspection of the diagram it will be clear that a reduction in converter noise would allow a significant reduction in front-end gain while still retaining the same signal-to-noise ratio. Using an rf triode converter with a 10dB noise improvement and re-distributing the front-end gain to obtain approximately the same signal-to-noise ratio, the results would be as shown in Fig 3. It will be seen that the signal output to the first converter valve is now 20dB lower than it was in the Mark 1 receiver. This means that for approximately the same signal-plus-noise to noise ratio the front-end dynamic range has been increased by 20dB—a worthwhile improvement!

A well-recognized method of achieving even greater dynamic range is to use a fully-balanced system. Push-pull operation will further improve significantly the conversion gain, and will have the further advantage of an inherent balance against the heterodyning oscillator injection and a reduction in oscillator white noise [4]. These same considerations apply to the second converter and, in regard to signal handling capability, to the rf stage as well.

Required specification

It is rather important before considering any aspect of communications receiver design to decide clearly what is wanted and what the final requirements are to be. If the answer is the maximum possible performance the targets will be as follows:

(1) A high degree of bandspread, constant on all bands, and a slow tuning rate.

(2) High stability and dial setting accuracy. This includes freedom from slow drift and freedom from frequency shift due to agc action.

(3) Signal-to-noise ratio. 10dB for less than 0·5μV aerial input on all bands.

(4) Selectivity. 2·5kHz wide at 6dB down; not more than 5kHz wide 60dB down.

(5) Second channel rejection not less than 80dB down.

(6) I.F. breakthrough rejection not less than 80dB down.

(7) Spurious responses. Self-generated spurious responses below threshold noise level on all bands.

(8) Automatic gain control. Two-speed agc system suitable for a.m., cw or ssb reception. Audio rise less than 6dB for 60dB change in signal input.

(9) Noise limiter. Effective a.m. noise limiter, fully adjustable.

(10) Stability. Under conditions of constant ambient temperature and constant mains voltage—after 30min warm up; drift not to exceed 100kHz/h.

(11) Dynamic range. Front-end dynamic range not less than 100dB.

(12) Q-multiplier heterodyne rejection filter.

(13) Calibration oscillator. Built-in 100kHz oscillator.

(14) Sideband switching. Low or high sideband plus a.m. 6kHz bandwidth.

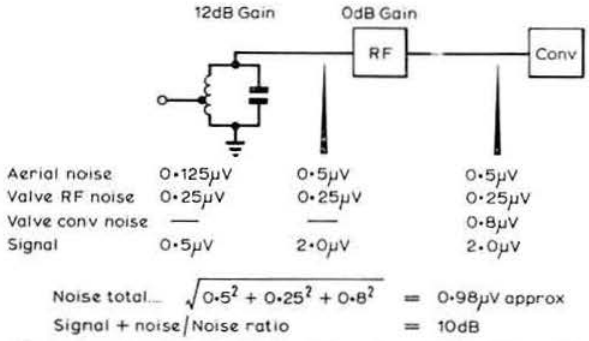


Fig 3. Receiver front-end signal-to-noise relationships with low-noise converter and unity gain rf stage. (Bandwidth 2·5kHz)

(15) Professional appearance, with convenient layout of controls.

Stability

The double superhet principle has worthwhile advantages for the home constructor. If the first oscillator is made crystal controlled and tuning is confined to the first i.f., the vfo can be on a relatively low frequency where the stability is higher and bandchange switching is not required. This has the additional advantage of making the bandspread, the dial calibration and the tuning rate constant on all bands. For the amateur constructor the simplification of using a tunable first i.f. instead of front-end coils, which would require tedious adjustment to get the required bandspread and accurate oscillator tracking on each of the required bands, is very great.

The first i.f. should be high enough in frequency effectively to reduce image interference, but must not be so high as to transfer this problem to the second conversion chain.

Second intermediate frequency

I.F. transformers on non-standard frequencies are difficult and exacting to wind. The choice is therefore practically confined to standard frequencies normally available. In addition, mechanical filters for ssb reception on a nominal frequency of 455kHz are relatively inexpensive and are capable of giving a passband with a shape factor (ratio of bandwidth at the 6dB and 60dB points) of two or better, and without degradation of filter response due to side lobes.

The choice then for the second i.f. is a frequency of 455kHz with a 6dB passband of approximately 2·5kHz for sideband reception using a mechanical filter, with switching to a 6kHz passband for a.m. reception, using top-coupled standard i.f. transformers.

First intermediate frequency tuning

The tunable i.f. section is the most important part of the receiver, and the positioning of the frequency band over which it will tune will affect the final receiver performance in regard to the following important factors: [1]

(1) Freedom from self-generated spurious responses or birdies.

(2) Second channel rejection.

(3) I.F. breakthrough rejection.

A tunable i.f. of 5 to 5·5MHz has been chosen as offering a very acceptable compromise between the conflicting

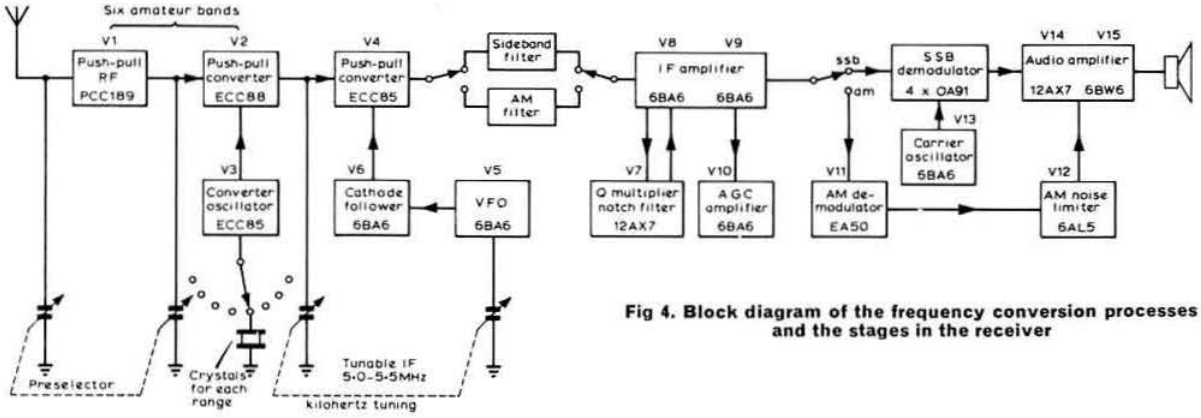


Fig 4. Block diagram of the frequency conversion processes and the stages in the receiver

requirements of second channel and i.f. breakthrough rejection, and at the same time excellent immunity against self-generated spurious responses.

Signal frequency tuning

It must be clearly understood that for every setting of the tunable i.f. section the receiver will accept at roughly equal strength *three* separate and distinct signals; the intermediate frequency itself, the heterodyning frequency less the tunable i.f., and the heterodyning frequency plus the tunable i.f.

To take an example, a receiver with a tunable i.f. of 5 to 5·5MHz would require a 9MHz heterodyning frequency for the 80m band. If the i.f. were tuned to 5·3MHz the receiver would accept the wanted 9MHz less 5·3MHz (difference frequency) input on 3·7MHz, the 9MHz plus 5·3MHz (sum frequency or second channel) at 14·3MHz and additionally the tunable i.f. of 5·3MHz. It can, therefore, be seen that signal inputs on 3·7MHz, 5·3MHz and 14·3MHz would all be converted to the final 455kHz i.f. and fed through the following receiver stages.

There is only one part of the whole receiver where this can be prevented from happening. That is the front-end circuits between the aerial input and the first converter grid. In order to give sufficient discrimination, two signal frequency circuits will be necessary; the first as the aerial input coil, and the second as the converter input coil. Two tuned circuits are convenient in practice and can be tuned by a small two-section capacitor brought out to a panel control and used in much the same way as the normal aerial trimmer. It is, however, important to realize that the required attenuation of the unwanted inputs is directly dependent on the "goodness factor" of these two tuned circuits. There must be high Q with low-loss coil formers and adjusted to remain in step across the range. Additionally, if the required signal-to-noise ratio is to be obtained, the aerial input impedance must also be correctly matched to the coil on each of the amateur bands required.

Demodulation and the carrier insertion oscillator

It may appear rather surprising to discuss detection and carrier insertion oscillators together. However, the demodulation of a cw or ssb signal, or an a.m. signal received in the same way, requires the received sideband to be first combined with a local carrier. The cio is therefore an essential part of the demodulation process.

Sideband demodulation in a receiver is simply the reverse of modulation in a transmitter. A type of balanced modulator using four diodes in a ring circuit is known to give excellent results and low distortion. This method will give comparable performance in a receiver. This type of demodulator is a true heterodyne detector and as there is no output when the cio is switched off, it cannot be used for normal a.m. reception and a second envelope detector for a.m. use has to be provided. The required switching can be ganged to the cio switch so that the change-over from ssb to a.m. conditions is automatic.

Correct audio balance and natural speech quality can only be obtained when the local carrier is re-inserted in the correct frequency relationship with the sideband. With a narrow passband of 2·5kHz and steep filter response, the correct positioning of the carrier is critical and there are practical advantages in having crystal control.

Noise limiter

With the possible exception of the multi-stage wideband noise amplifier operating a gate circuit [7], in the author's experience noise limiters are of little value for ssb reception. This is due to the high Q elements of the steep-sided sideband filter increasing the duration of the noise pulse. A 1μs pulse may be several milliseconds long after passing through a mechanical or crystal filter. Fortunately ssb reception does not appear to be affected by man-made interference to anything like the extent of a.m. reception.

When receiving a.m. signals, a simple diode noise limiter following the detector can be very effective and is worth incorporating into the receiver design.

Final design

The block diagram of a communications receiver capable of meeting all the performance requirements that have been previously discussed is shown in Fig 4.

This receiver uses a total of 17 valves including the 100kHz calibration oscillator, and an OA2 stabilizer. The 200V ht supply is derived from silicon rectifiers.

Tuning range is 500kHz in up to eight switched bands, plus msf on 5MHz.

Self-generated white-noise is at an exceptionally low level and the ability of the receiver to resolve weak signals on crowded amateur bands is outstandingly good.

To be continued

Oscar 7 and its capabilities†

by J. KASSER, G3ZCZ/W3 and J. A. KING, W3GEY*

THIS article briefly describes the Oscar 7 radio amateur satellite, its modes of operation, its orbit and tracking information, and also specifies the type of ground equipment needed to work through or receive signals from the spacecraft, which is scheduled for launching in April 1974.

The spacecraft

Oscar 7 is the second in the AMSAT-OSCAR-B series of long-life amateur spacecraft. It is built in an octahedral (8-sided solid) configuration, allowing sufficient surface area for enough solar cells to provide a positive power budget system. This means that, unlike Oscar 6, this spacecraft should not have to be commanded into recharge modes periodically.

Physically, the experiments and individual modules are built in a "plug-in module" type of construction. This allows the same spacecraft configuration to contain a number of different experiments and modules. The main difference between this spacecraft and Oscar 6 is that Oscar 7 contains two repeaters and two auxiliary beacons, and both morse code and teletype telemetry encoders.

The Oscar 7 2 to 10m repeater has an output power of 2W p.e.p. This will make signals received on the ground somewhat stronger than those coming from Oscar 6. The second repeater is the AMSAT-Deutschland repeater which relays signals from 432MHz to 145·9MHz with an internal beacon on 145·98MHz. The unit was designed and built by Dr Karl Meinzer, DJ4ZC, and Werner Haas, DJ5KQ. The two beacons consist of a Canadian-built 435·1MHz beacon similar to the one on Oscar 6, and a second auxiliary beacon at 2,304MHz developed by members of the San Bernardino Microwave Society.

Ground control of the spacecraft is achieved by means of command receivers in each repeater, redundant command decoders and an experiment control logic sub-system.

Downlinked telemetry and stored message data are generated by the morse code telemetry encoder, or the Codestore unit, these two systems being identical to those on Oscar 6, and a new teletype telemetry encoder designed and built by Dr Peter Hammer, VK3ZPI, and Edwin Schoell, VK3BDS.

The Codestore morse code telemetry and teletype telemetry signals can be routed to any of the four beacons in the spacecraft‡. The four beacons include two in the repeaters and two auxiliary transmitters, in a similar manner to Oscar 6. It is thus possible, for example, to receive morse code telemetry on the 29·45MHz beacon and teletype telemetry on the 435·1MHz beacon at the same time (on two receivers).

The primary power source of the spacecraft consists of eight solar cell arrays supplying 2·2A at 6·4V when illuminated by the sun. A battery charge regulator converts the raw solar cell array output to a +14V supply bus. This supply line charges the battery and supplies the spacecraft loads if the solar cell current is not sufficient to run the spacecraft (for example when the satellite is on the dark side of the earth). During these periods the Nicad battery supplies the extra power. Two other redundant switching regulators supply the remaining voltages needed by the spacecraft modules.

Modes of operation

Oscar 7 has four automatic modes of operation defined as follows:

Mode A	AMSAT 2 to 10m repeater.
Mode B	AMSAT Deutschland 432 to 146MHz repeater in high-power mode.
Mode C	AMSAT Deutschland 432 to 146MHz repeater in low-power mode.
Mode D	Recharge mode.

Each of these modes of operation may be overridden by ground command. In Mode D either the 435·1MHz or the 2,304MHz beacon can be operational upon ground command, while none of the repeaters will be operating. It is also possible to have the 435·1MHz auxiliary beacon operational by ground command while the spacecraft is operating in Mode A. The 2,304MHz beacon can be operated in any of the modes.

The spacecraft will normally alternate between Modes A and B. An internal timer in the spacecraft generates a pulse every 24h which causes the satellite to switch between these two modes. The 24h timer will be set by ground command so that the mode change can be kept at approximately the same time each day. Thus, each repeater will be operational on alternate days.

The spacecraft contains automatic power supply monitoring circuitry, so that if the battery charge drops 60 per cent below the full-charge value, the spacecraft will automatically switch to Mode C and reset the timer so as to stay in that mode for 24h. In Mode C, the AMSAT Deutschland repeater output power is reduced to 2·5W p.e.p., and the battery drain should be reduced sufficiently to permit the battery to be recharged by the solar cell arrays.

The switch to Mode C takes place under low battery charge conditions when the spacecraft is operating in either Mode A or Mode B. If the battery charge recovers, the spacecraft will switch to Mode B at the next 24h pulse, and then continue normal operation. If the battery power does not recover, but deteriorates even further so that the battery charge drops 70 per cent below the full-charge value, the

* c/o AMSAT, PO Box 27, Washington, DC 20044, USA.

† Presented at the ARRL Technical Symposium, Reston, Virginia, 14 September 1973.

‡ There is one exception; the 2,304MHz beacon cannot be keyed with Codestore or teletype telemetry.

spacecraft will automatically switch to Mode D and reset the 24h timer. Both repeaters will then be switched off, but the 435·1 or 2,304MHz beacons can be switched on by ground command to allow telemetry to be received.

Modes C and D are actually expected to serve as backup operating modes for use if the spacecraft available power reserves are low. Normally, operation in these modes will not be required.

Each of the modes can be changed by ground command so as to turn any repeater or beacon on or off as required. This is done so that any failure of the automatic control circuits can be overcome by ground command.

Initial launch operation

The spacecraft contains an initial condition reset circuit so that the aerials will deploy after separation from the launch vehicle and the spacecraft will power up in Mode D with the 435·1MHz beacon on. No repeaters will be operational for at least the first day, and it is expected that the repeaters will not be turned on until the spacecraft has stabilized electrically and thermally, as indicated from telemetry data.

Orbit and tracking data

The orbit of Oscar 7 is expected to be very similar to that of Oscar 6, and to be sun-synchronous with an almost identical period and inclination. Thus, the same tracking procedures used for Oscar 6 will be suitable for use with Oscar 7.

The spacecraft is expected to be placed into orbit so that it is half an orbit ahead of or behind Oscar 6, which at present comes over daily at a time about 5min earlier every 48h. If all goes well, Oscar 7 is to be launched so that it will come over about 2½min earlier than Oscar 6 did the day before and, similarly, Oscar 6 will come over about 2½min earlier than Oscar 7 did on the previous day. It is thus possible to expect that instead of three usable spacecraft passes about 2h apart each evening, there will be five or six passes (assuming Oscar 6 is in operation) about 60min apart.

The reference orbit data for Oscar 7 will also be published in the same format as the Oscar 6 data has been up to now, so as to enable each individual to plot his own orbital information.

Ground equipment needed to operate each repeater or beacon

AMSAT 2 to 10m repeater

The 2 to 10m repeater operates in a linear mode similar to the unit on Oscar 6, and ssb and cw are the preferred operating modes. The repeater receives signals between 145·85 and 145·95MHz and re-radiates them between 29·4 and 29·5MHz. There is also a telemetry beacon on 29·50MHz.

Note that these frequencies are different from those employed with Oscar 6, and reflect comments received on the operational experience obtained with that satellite. The repeater has an output power of 2W p.e.p., so received ground signals should be stronger. The same equipment used to work through Oscar 6 will be suitable for working through this repeater, namely a sensitive receiver, and preamplifier if possible, as well as a suitable 10m aerial. Since the spacecraft will again be using a linearly polarized 10m aerial, the ground station aerial should preferably be circularly polarized. Linearly polarized 10m receiving aerials can also be used, but at the sacrifice of some fading.

The transmitting equipment should be capable of putting out no more than 80–100W of effective radiated power from the aerial. It is operationally preferable to use a transmitter with an output power of the order of 80–100W and a simple ground plane or turnstile aerial than to use a lower powered transmitter and more directional aerial. Communicating through Oscar in a low orbit is a challenge for the single operator—besides tuning the transmitter and receiver, it is necessary to keep both aerials tracking the spacecraft—and then work someone in between. It is advantageous to minimize the duties to be performed during each pass, so as to be able to concentrate on the important business of making contacts through the satellite, and this can be partly achieved by using the low-gain aerials and the 80–100W indicated.

AMSAT Deutschland 432 to 145·9MHz repeater

The AMSAT Deutschland repeater is also a linear device and, again, cw and ssb (or controlled-carrier a.m.) are the preferred operating modes. The repeater has an input frequency passband between 432·125MHz and 432·175MHz, and an output frequency passband between 145·975MHz and 145·925MHz. The output passband is inverted; that is, upper-sideband signals transmitted to the spacecraft would be received on lower sideband.

The relationship between input and output frequencies is such that a received signal on 432·125MHz would be relayed on 145·975MHz, and a received signal on 432·175MHz would be relayed on 145·925MHz, ie tune up the band at 432MHz and down the band at 145MHz. This repeater also has a telemetry beacon on 145·980MHz.

Any receiver with a good 2m converter should be able to receive signals from this repeater, even with a simple aerial. Since the spacecraft aerials associated with this repeater are circularly polarized, linearly-polarized aerials will be suitable for ground use. If linearly polarized, the receiving aerial for this repeater can be the same one used to work through the 2 to 10m repeater.

On the transmitting side, the recommended effective radiated power output is of the order of 300–400W. Thus, a 30W transmitter will require an aerial with a gain of the order of 10–12dB, but it would be preferable to build a 300W amplifier and use an omnidirectional aerial to reduce directional accuracy requirements.

Though the spacecraft will have circularly-polarized aerials for this repeater, linear aerials at ground stations will also be suitable, but it is important not to forget that circularly-polarized ground station aerials can be expected to provide as much as 3dB more signal, and this might be the difference between making or missing a contact. All circularly-polarized aerials used with this repeater should be right-hand circularly-polarized (rhcp) in the northern hemisphere and left-hand circularly-polarized (lhcp) in the southern hemisphere.

The easiest way of generating rf for the 432MHz uplink is probably to convert a surplus 450MHz fm transmitter strip for cw operation on 432MHz. Other techniques are to triple 144MHz signals to 432MHz, or double 220MHz to 440MHz, and use a different crystal to transmit on 432MHz. The best method is to build a transverter from, say, 50MHz to 432MHz. This would allow both ssb and cw operation with full vfo control.

435·1MHz auxiliary beacon

The Canadian 435·1MHz beacon will usually be operating when the spacecraft is in Modes A or D. It will not operate while the spacecraft is in Modes B or C because of interference effects with the 432MHz uplink of the AMSAT Deutschland repeater.

Extremely good signal levels were copied from the Oscar 6 435·1MHz beacon during the early months that it was operating. For receiving the signals, a receiver with any good converter and aerial will be suitable. Again, a circularly-polarized aerial would be preferable.†† The converter should be fitted with a new crystal to cover 435·1MHz instead of the more conventional 432MHz.

Doppler shifts of the order of ±10kHz can be expected on the signals, so be prepared to keep retuning during the pass.

2,304MHz S-band beacon

The 2,304MHz beacon, built by members of the San Bernardino Microwave Society in California, will transmit a "HI" in morse code followed by 30s of continuous carrier for tracking purposes. The beacon contains an internal 30min timer to ensure positive control which will shut down the beacon 30min after it is commanded on. The 2,304MHz beacon can also be keyed with morse code telemetry on ground command.

Link calculations have been done for the spacecraft-to-ground communications link to determine the sort of equipment needed. Considering a typical ground station using a 4ft dish and a converter with a 6dB noise figure, the link calculations are as follows:

Spacecraft output power (100mW)		+ 20dBm
Path loss to ground for 2,000 miles		—170dB
Thus, signal level at aerial	=	—150dBm
Gain of 4ft dish		+ 27dB
Polarization and line losses		— 6dB
Thus, signal power at converter input	=	—129dBm
Noise power in a 500Hz bandwidth, 6dB noise figure receiver		—141dBm
Thus, received signal-to-noise ratio	=	+ 12dB

This was calculated for a 4ft dish and a receiver with a bandwidth of 500Hz. The Doppler shift for an overhead pass at this frequency has been calculated to be ±55kHz. The 3dB beamwidth of the 4ft dish is only 7·5°. Anybody trying to track the S-band beacon is going to have a lot of fun.

Copying telemetry

Oscar 7 contains two separate telemetry encoders: a morse code unit identical to that on Oscar 6 and an 850Hz shift teletype encoder designed and built in Australia.

Morse code telemetry

The morse code telemetry format is identical to that of Oscar 6. The format is arranged in six lines of four words. The first digit of each three-figure "word" is the line identifier. Each telemetry frame is separated from the next by the "HI" identifier. The code speed, like that of Oscar 6, is commandable between 10 and 20 words/min.

†† In this case, lhcp should be used in the northen hemisphere and rhcp in the southern hemisphere.

Teletype telemetry

Sixty channels of data are monitored and encoded by the WIA-Project Australis teletype telemetry encoder. The data format is 10 words/line in six lines of data. Each data word contains five digits. The first two digits indicate the channel number and the last three represent the encoded sensor data digits. Between each data frame are two lines of digital data which provide information on the spacecraft clock and command register status.

The encoder has two operating modes. There is a stepping mode in which each channel is sampled in turn, and a single-channel "dwell" mode in which one channel is sampled continuously. Each line of data is followed by a carriage return, line feed and figures signal, so as to keep the printer in upper case.

The teletype data is transmitted from the spacecraft in Baudot code using 850Hz shift. Signals will be frequency-shift keyed on 435·1MHz and audio-frequency shift keyed on 145·98 and 29·5MHz. It may be necessary to be able to revise the mark and space tones in the ground station terminal unit to receive the afsk telemetry.

Doppler on the 435·1MHz beacon will be of the order of ±10kHz for a pass directly overhead. Tests were conducted from WA3EWJ transmitting fsk rtty through the 2 to 10m repeater in Oscar 6 during January 1973 and it was found that the 5kHz Doppler shift encountered there did not cause any appreciable errors. It was just necessary to keep retuning the receiver every few minutes. Thus, the tuning rate will just have to be increased to cope with the extra Doppler shift.

A better idea is to use a special i.f. with a 25kHz bandwidth and a phase-lock loop teletype terminal unit using one of the phase-lock integrated circuits now available at low cost.

Summary

This article has briefly described Oscar 7, its projected orbit and the type of equipment needed to operate with it. A summary table of the frequencies of interest is presented below.

Beacons

29·50MHz	Mode A	Associated with the 2 to 10m repeater.
145·98MHz	Modes B and C	Associated with the 432 to 146MHz repeater.
435·10MHz	Modes A and D	Teletype, morse code or codestore keying.
2,304MHz	Mode A,B,C and D	CW tracking beacon and morse code telemetry.

Repeaters

Mode A	145·85MHz to 145·95MHz input. 29·40MHz to 29·50MHz output (non-inverting passband).
Modes B and C	432·125MHz to 432·175MHz input. 145·975MHz to 145·925MHz output (inverted passband).

It is hoped that those reading this article will want to try their hand in participating with Oscar 7, certainly the most advanced satellite yet developed for the amateur service.

Toneburst generator using ICs

by G. B. PACKER, GW3UUS*

THIS circuit was developed by the author in collaboration with members of the Milwaukee Repeater Club as a means of accessing the WB9ADX system in south-east Wisconsin.

The need arose for a stable 0·5s toneburst that was insensitive to temperature effects, holding within 10 or 15Hz of the nominal frequency over a temperature range of −30 to +30°C, and protected against the effects of normal car voltage variations. A switching circuit seemed preferable to a conventional LC or RC oscillator design, as a digital arrangement has no characteristic as such to vary with temperature.

Although the prototype was required to produce a tone on 1,750Hz, a table of component values will be given to allow any frequency in the range 1,700–2,500Hz to be produced. (The present GB3PI repeater requires a tone of 1,700Hz).

IC and printed circuit

A number of quad 2-input NOR gates were available, namely the RCA CD4001 series, so these were utilized in the circuit of Fig 1. The RCA Cosmos series logic has a very low power consumption and so lends itself to incorporation in hand-held equipment of this nature.

The printed circuit board of Fig 2 is a straightforward design and should ensure repeatability of results.

Frequencies

With the components specified it should be posssible to achieve a tone within 20Hz of the design frequency at switch-on. Corrections to the tone frequency can be made by altering slightly (within the range 900kΩ to 1·1MΩ) the value of R1, and once the design frequency has been obtained the table of tone frequency against R2 will hold good. In practice, 1MΩ resistors generally have a spread over the range of interest, so this setting of the final tone frequency can be achieved by trying various samples of R1.

1,750Hz is the IARU suggested common access tone for European systems, but Table 1 is included in case systems using a common rf channel are eventually forced to discriminate by using different frequencies for geographical reasons.

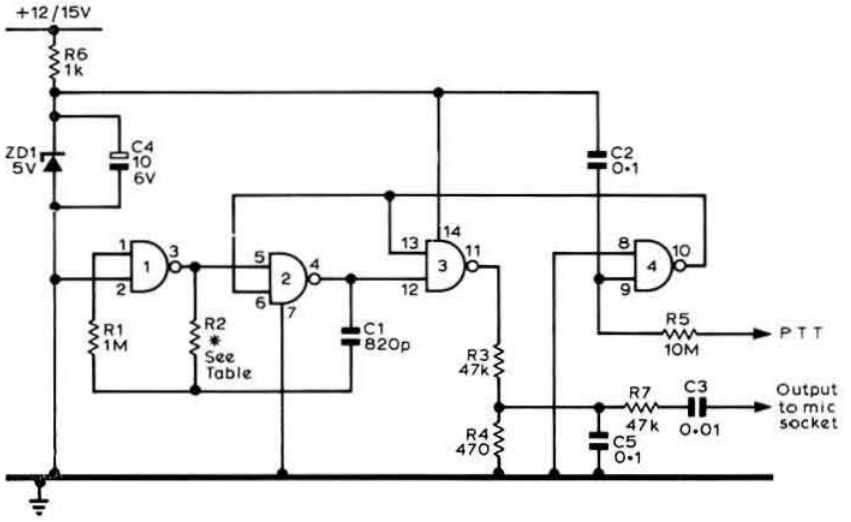


Fig 1. Complete circuit diagram of the toneburst generator

Waveform

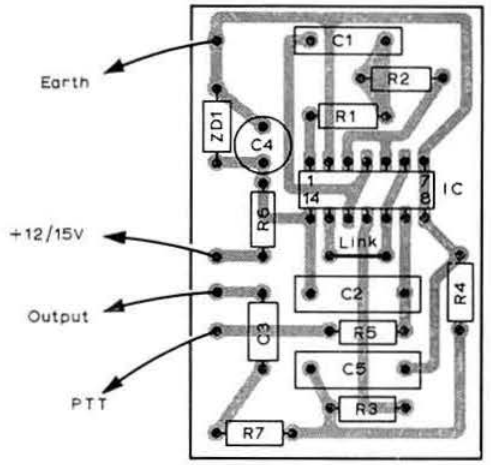
One objection likely to be raised at this point is the fact that any "switching" toneburst generator will produce a substantially square wave, or at least a waveform with short rise and fall times. So, assuming an access frequency of 1,750Hz, the second harmonic lies at 3,500Hz, which is safely towards the hf end of a properly tailored speech pass band. If, in fact, a proper square wave is generated, this second harmonic should be of negligible proportions, just leaving the third harmonic as the only one of any significance, and any station that lets this 5,250Hz through is asking for trouble from other quarters in any case!

*3 Robertson Way, Newport, Mon NPT 6QP

Keying and toneburst

In the average transceiver, grounding of the ptt contact switches the set from receive to transmit (whether electronic or relay switching). In the receive mode, C2 is completely discharged through R5, and the transceiver to the supply rail, thus allowing a logic 1 to be entered into gate 4. A 1 input to a NOR gate gives a 0 output irrespective of the state of the other inputs, thus allowing the first two gates to oscillate continuously through the RC network composed of R1, R2 and C1.

Grounding the ptt contact charges C2 via R5 until the potential drops from a 1 to a 0. When both inputs of the 2-input NOR gate are at 0, the output is a 1, so permanently blocking the output switching stage gate 3. This action gives



Printed circuit board viewed from copper track side – the components are mounted on the reverse side of board

Fig 2. Printed circuit board layout

the 0·5s delay, and its period may be lengthened or shortened by altering the values of C2 or R5.

If an alternative form of transmitter keying is used, then either a small relay (Fig 3) or the equivalent logic circuitry may be used.

Uses

Besides the obvious use of repeater accessing, Raynet groups or local nets may like to consider the use of a non-standard yet very stable toneburst for opening members' receivers, irrespective of whether the signal is being repeated or not.

This would be advantageous where one does not wish to listen to general ragchewing on an agreed frequency, but would be available in the event of a callout. Such an audio squelch system obviates the need for another rf channel for this purpose, the operator switching the tone squelch in and out of circuit depending on his availability.

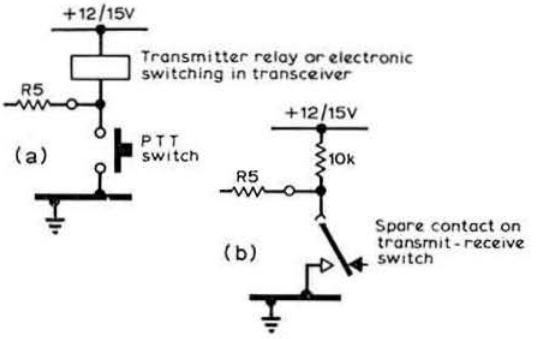


Fig 3. Connection of the toneburst generator to the transceiver

Table 1

TONE FREQUENCIES PRODUCED BY VARIOUS VALUES OF R2

f tone (Hz)	R2 (kΩ)	f tone (Hz)	R2 (kΩ)
1,700	310	2,150	237
1,750	300	2.200	231
1,800	288	2,250	226
1,850	279	2,300	220
1,900	271	2,350	215
1,950	264	2,400	210
2,000	257	2,450	206
2,050	250	2,500	201
2,100	243		

80m twilight operation

The following information from the Radio and Space Research Station has been received by Mr A. D. Tregale, G3LMT, who comments on the fact that when working the top end of 80m it is noticeable that the best reports between G stations and dx stations are reserved for G stations south of a line from London to Cardiff; many northern stations seem to think it is due to earth conductivity.

Frequencies in the 4MHz band are particularly sensitive to ionospheric absorption so that anomalies in their propagation are mainly associated with anomalies in this phenomenon. In particular, both normal and abnormal absorption increases rather rapidly as the auroral zone is approached, a movement of a path by 50 miles perpendicular to the zone can make an enormous difference in the number of hours per year a twilight path is open in this frequency band. The great circle from London to New York and Washington skirts the auroral zone and very small north shifts have large effects. Thus there is a rapid deterioration in transatlantic propagation westward as the latitude of a UK station increases. Similar phenomena occur for north-north-east propagation due to the section of the auroral zone over Scandinavia, and the section between these limits is usually rather difficult.

The sectors affected by this phenomenon, and which will therefore show a rapid change with position in the UK, include the east coast of North America, Southern California, and, on the other edge, Japan, New Zealand and most of the Southern Pacific. The subjective effects are increased because there is a considerable concentration of stations in the fringe zones, so that small movements greatly change the number of possible contacts, and because of the shape of the twilight zone in which conditions at both ends are likely to be more favourable.

It would be interesting to know whether this band is more open for amateurs in sunspot minimum years than at sunspot maximum. Almost all long-range operation in this frequency band is by F-layer reflection but in sunspot minimum it is possible to get relatively low-loss E reflections further into the day sector. This is a question of signal to noise ratio, if the power is too small no effect will be seen; if adequate, probably a large effect.

Technical notes on the Braun SE600 dig 2m transceiver

by T. BITTAN, G3JVQ

ALTHOUGH its price in the £600 bracket will put this equipment beyond the reach of most UK amateurs, the entry of the UK into the Common Market presents an opportunity to take a look at one piece of equipment currently available from West Germany.

The Braun SE600 dig 2m transceiver is manufactured by Karl Braun of Nuremburg and has virtually everything for the vhf amateur who can afford it, offering all operating modes; usb, lsb, fm, and cw. The transceiver can be switched for tuning as a transceiver (transmitter and receiver tuned to the same frequency) or for independent tuning of transmitter and receiver. One outstanding feature of the transceiver is that the mode of operation can be selected independently for the transmitter and the receiver so that it is possible, for instance, to transmit usb and to receive fm.

As its name suggests, the SE600 dig possesses a digital frequency readout with a resolution of 1kHz at 144MHz (a slightly cheaper version with two analogue frequency scales instead of digital readout is also available). The interpolation tuning provided allows the frequency to be determined with an accuracy of approximately 100Hz. When transmitting on a different frequency to that tuned on the receiver the digital readout will jump from one to the other on actuating the ptt button or vox.

The SE600 virtually possesses a separate crystal filter for each mode, which results in first-class sensitivity and selectivity figures. Specially developed 10·7MHz KVG filters are used throughout. In the a.m. mode, true plate and screen grid modulation is used and not the carrier injection method often employed in such cases. The transceiver is equipped with a speech processor with an emphasis of 6dB per octave, which can be switched off for local QSOs if preferred.

With the exception of the pa, the SE600 is fully silicon-transistorized and can be operated from power sources of 220-240V ac and 12V dc. The driver and the pa, as well as the complete receiver module, are completely enclosed in separate silver-plated brass compartments.

Lowe Electronics have the sole sale rights for the UK.

TEST MEASUREMENTS

		Specification	Measured
Frequency range		144–146MHz	—
IF		10·7MHz	—
Bandwidth	cw/ssb	2·4kHz	KVG crystal filters
	a.m.	6·0kHz	KVG crystal filters
	fm	15·0kHz	KVG crystal filters
Noise figure		2·5dB	2·4dB
Sensitivity for 10dB S/N	ssb	approx 0·11μV	0·10μV
	a.m.	approx 0·17μV	0·16μV
	fm	approx 0·26μV	0·25μV
Cross mod rejection		greater than 90mV	95mV
Point of overload		greater than 250mV	280mV
AGC-range		120dB	126dB
Transmitter			
RF output	a.m.	12W unmod.	12·5W
	fm	12W	13·2W
	cw	12W	14·0W
	ssb	40W p.e.p.	52·5W
Frequency dev adjustable		2–10kHz	—
SSB carrier supp		55dB (± 3dB)	56dB
SSB unwanted sb supp		greater than 60dB	62dB
Harmonic attenuation		greater than 70dB	76dB
Spurious signal rej.		greater than 80dB	86dB

Frequency drift measured on SE600 dig Serial No 0294:

0–15 min. warm-up period	10 hours + 35Hz
75 min. −480Hz	14 hours + 922Hz
200 min. − 1,020Hz	20 hours + 1,767Hz
6 hours −1,465Hz	

Power consumption at 220V:

Receive	25·3W	AM transmit 100% mod	77·0W
FM transmit	52·8W	SSB transmit 100% mod	79·2W

TECHNICAL ARTICLES

The editor is always pleased to receive technical articles for consideration with a view to publication in *Radio Communication*.

No article which is technically sound is likely to be rejected, be it simple for the beginner or highly technical for the advanced amateur. The copyright of all articles will be paid for on publication.

The editor will be happy to give advice on the preparation of articles and will send a copy of the *RSGB Style Guide for Authors* on request.

MICROWAVES—1,000MHz and up

by DAIN EVANS, G3RPE*

The round-hole cross coupler

When a directional coupler with a coupling coefficient greater than 20dB is required, a convenient design is the round-hole cross coupler shown in Fig 1. Coupling is via three circular holes drilled at corners of a square of side equal to $\lambda_g/4$, where λ_g is the wavelength in the waveguide in use. The degree of coupling varies with the ratio of the diameter (D_1) of the larger holes to that of the larger internal width (a) of the waveguide as summarized in the figure. This data was derived from that given in the *Microwave Engineer's Handbook 1972*. The smaller hole has a diameter equal to $2/3 D_1$.

For waveguide No 16, a is 0·9in and λ_g is 1·550in at 10,050MHz or 1·474in at 10,350MHz. A 25dB coupler for the lower frequency for example would therefore require two holes 0·311in in diameter and one 0·208in, spaced by 0·194in from the centre lines of the waveguide.

The holes may be drilled directly in the wall of one of the waveguides, preferably the input arm, the corresponding broad face wall of the second being removed. Alternatively, the holes can be drilled in a separate piece of brass in the way described in an earlier article (*Radio Communication* September 1971 p609). If the thickness of the brass plate is made slightly less than the wall thickness of the waveguide, then the assembly becomes self-aligning. The earlier article also describes another form of coupler with which the coupling may be as high as 9dB.

It may be possible to achieve a higher coupling than the 20dB indicated by enlarging the holes, but this has not yet been tried.

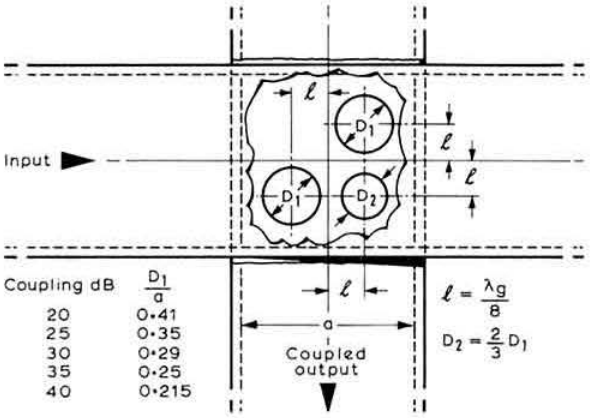


Fig 1. The dimensions of a round-hole cross directional coupler

Power/current relationship in Schottky diodes

The approximate relationship between the rf input power to a Schottky diode and the dc output is shown in Fig 2. The corresponding curve for point contact diodes is given in the September 1973 issue (p618). Note that each curve corresponds to a particular *total* series resistance. The resistance of a meter used, which is typically 100Ω for 1mA fsd, 1,000Ω for 100μA fsd and so on, may form a significant part of the total and must be allowed for.

Microwave interest

G8AGN (Sheffield) writes that he has been active on 9cm since 1968 but suffers from a lack of local interest. He would like to contact other 9cm enthusiasts in his area—with his home QTH at 950ft asl this area should be quite extensive. His present transmitter uses a 726 klystron giving 100mW output to a dipole in a corner reflector. The receiver also uses a 726 klystron but in a "polaplexer" configuration, the circular waveguide for which is a baked-bean can. Crystal-controlled equipment for the band is his next step. He also reports some activity locally on 3cm, but gives no names.

G8CGN (Cowes) is now active on 3cm from the Isle of Wight using a 15mW Gunn oscillator as the transmitter. He is experimenting with cavity designs for an Impatt oscillator with which he expects to develop 500mW of rf.

Others interested in building 3cm equipment are GW8HNE (Llanelli), Cliff Barber (Stevenage), G8GNK (Lowestoft) and G8HLT (Croydon). GM8BKE (Glasgow) also reports others interested in 3cm in that region, but no callsigns are given.

On the minus side, G3ZGO (Acton) has departed to Vancouver on what is expected to be a permanent holiday. His activity on 3cm will be sorely missed and there is really only one word to say—moonbounce?

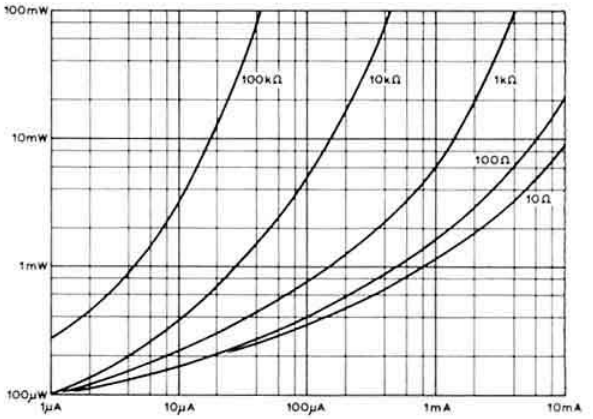


Fig 2. The approximate relationship between rf power input and dc output for a typical Schottky barrier mixer diode

*4 Upper Sales, Chaulden, Hemel Hempstead, Herts.

TECHNICAL TOPICS

by PAT HAWKER, G3VA

DURING the 15½ years of putting together *Technical Topics* I have invariably tried to give full acknowledgement of the source of all material. This is not always as simple as it sounds: circuits and ideas circulate pretty freely among amateurs the world over, often on the way picking up minor or major modifications. Then again, readers who have tried out an idea and found it useful and practical often pass along details without mentioning the source from which they obtained it—not from any intent to claim credit but because they feel that many readers may not be aware of a good idea.

For example, in the September *TT* we included information on the use of 10·7MHz ceramic resonators as nbfm filters. Several readers, to whom I am most grateful, promptly brought to my notice the fact that this idea, including an identical circuit diagram and response curve, appeared in the July 1972 issue of *Electronic Engineering* (indeed I find that I had noted this at the time as a possible *TT* item but it had slipped my memory).

This was based on work by G. Sinigaglia and G. Tomassetti of the Instituto di Fisica dell'Universita in Bologna, Italy: G. Sinigaglia is I4BBE and G. Tomassetti is I4BER (by coincidence his design for a single-device vhf converter appeared in the same issue). So we are glad to acknowledge, if belatedly, the source of these narrowband filters made from wideband ceramic filters.

Origins of the huff and puff vfo

Very different considerations apply where an idea has been developed independently or where new circuit techniques implement a basic principle. But even here it is often interesting to look into the history of a new system. Harry Burton, ZL2APC, who is an assistant commissioner in the New Zealand patent office, comments informatively on the crystal-stabilized vfo (*TT* July and October) which is clearly attracting a good deal of interest. He points out that the basic technique is closely akin to the system outlined in British Patent No 1,210,803 (New Zealand Patent No 151,781). This patent, for which the application was filed by the Plessey Company in March 1967, describes "Improvements in or relating to oscillators" naming A. J. Tiffin and E. Jaeger as the inventors.

It outlines "a frequency stabilization arrangement for an oscillator comprising detection means responsive to the oscillator frequency for successive predetermined periods during each of which a number of cycles of said oscillator are such that at the end of each period the detection means remains in one or other of two conditions in accordance with the number of cycles generated during that period, which in association with frequency control means provides compensation for the oscillator frequency if during a number of successive periods one or other condition of the detector predominates, the compensation being in a sense determined in accordance with the predominant condition, whereby the oscillator frequency is substantially stabilized". Which is a fairly legalistic way of explaining the principle of the huff and puff vfo.

Harry Burton did in fact briefly try the system from the patent description but was not altogether favourably impressed; he is now building a synthesizer along the lines suggested in *QST* (September 1972).

The patent specification includes an outline of the timing periods needed to achieve an oscillator stabilization of the order of 10Hz and this stability can be achieved fairly readily using the integrated-circuit implementation along the lines proposed by PA0KSB.

More views on huff and puff VFOs

This seems to be time to turn to a report from John Compton, BRS33886, of Southampton who, like Joe Cropper, G3BY, (*TT* October) has tried out the system for what seems a very practical application—improving the stability of an existing receiver.

He makes the point that inherently the system ("brilliantly simple") is "a lazy man's answer to a problem which, as G3PDM has shown (*TT* December 1969 and *ART3* and *4*), can be solved by more conventional means." In other words, if you are starting out to build a good vfo you can achieve good stability without stabilization if you take the type of precautions outlined by G3PDM, or alternatively think in terms of a *good* frequency synthesizer. But on the other hand, as BRS33886 states, "to someone who wishes to improve an already-built or commercial receiver or transmitter without major internal changes the idea is certainly promising."

And this was the basis of his own experiments: using as the test bed his FR400 receiver with a vfo which normally drifts some 1,900Hz from cold and tends to be still drifting at a rate of 280Hz per quarter-hour after one hour's warm up, no matter how the thermal compensation adjustments provided on the receiver are adjusted. After adding stabilization the total drift from switch-on was less than 60Hz and was at no time faster than about 1Hz/min; and this drift could possibly be attributed to the temperature coefficient of the timing crystal which is not in an oven.

BRS33886, like G3BY, emphasizes that the original simplified block diagram, reproduced in *TT* from *Reflecties* (*Electron*) is a little misleading but the amendments needed in practice are fairly obvious; similarly he believes that something went wrong in the presentation of the "timing periods" since these appear to be calculated on a decimal basis rather than divide-by-sixteen: a gate-open time of 1s gives 16Hz increments; 0·4s 40Hz, and so on.

"It is quite unnecessary," he writes, "although sometimes convenient when using clock pulses derived from other equipment, to use a long gate-closed period. Several microseconds only are needed to store the counter output, zero the counter and open the gate—so that the device can be active for a larger proportion of the time, so improving resolution. For convenience, I have used a gate-closed time of 1/128th of the clock period, derived from seven of the inputs of a 7430 8-input nand gate fed from the last two divide-by-sixteen ICs in the clock pulse generator, giving a clock period of about 0·5s, found to be about optimum.

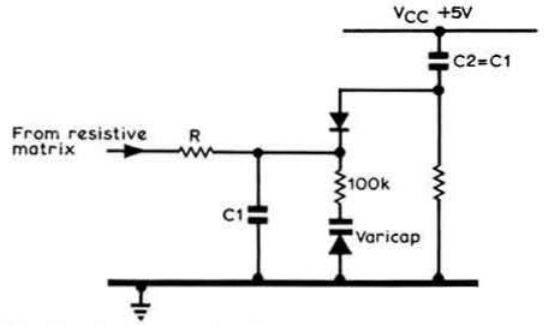


Fig 1. BRS33886's suggestions for roughly stabilizing voltage across the frequency compensating varicap to reduce the time needed for the huff and puff stabilizer to take effect after switch on

I used a 7493 counter (cheaper than 74141 but asynchronous) set to divide the vfo frequency by eight. A simple fet/pnp-bipolar/7413 amplifier/shaper was used to match the 5MHz vfo output to the ttl levels, giving an increment of about 16Hz, which seems closer than really necessary; 32Hz or even 64Hz would do very well."

He tried a proportional output voltage by using a resistive matrix (1kΩ, 2·2kΩ and 4·7kΩ from the ÷ 8, ÷ 4 and ÷ 2 outputs of the counter) using a 7475 quad-latch in place of the 7474. While this works, he doubts if the refinement is really helpful, although perhaps worthwhile if the basic oscillator showed fast or erratic drift.

A difficulty is that of reset accuracy after switching the equipment off for a time; some network is needed to ensure an approximately correct voltage across C1 when switching on. Fig 1 works well, but the voltage across C varies considerably after a switch-off/switch-on sequence, resulting in a frequency shift of up to 2kHz (in this particular example). This is perhaps of little practical importance for most amateur applications; no obvious solution has been discovered.

If most of the range of output voltage is to be used for frequency compensation (from almost zero to about 4V), a two-varicap circuit is needed to eliminate conduction of the varicap at low control voltages which can result in a flattening or even reversal of the voltage/frequency characteristic. Fig 2 shows a two-varicap arrangement.

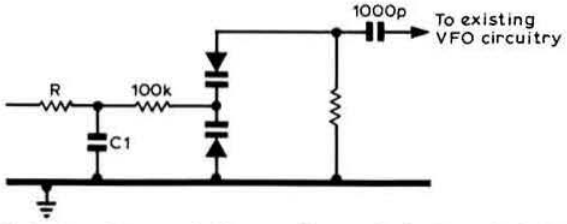


Fig 2. Use of two variable capacitance diodes to make fuller use of the full range of control voltage

Some care has been found to be needed in determining the best point in the existing circuitry to connect the compensating element. There is no point in connecting the circuitry directly across the vfo inductor if this results in, say, 100kHz shift for 0 to 4V variation when possibly only 2 or 3kHz drift is expected. Series and/or parallel padding and trimming capacitors may be needed to get the right degree of compensation, or a less sensitive point may be found in the existing circuitry, as is possible in the FR400.

Values and ratio of R and C1 appear to fairly non-critical. BRS33886 found 220kΩ and 2,000μF suitable. He suggests that a simple technique is to use an available capacitor and then try increasing values of R until a value is reached which has no overshoot. BRS33886 does not feel that a special low-leakage electrolytic is really necessary for C1 provided that the leakage is reasonably constant. He found that low-cost electrolytics all worked quite well. Although a tantalum type might let the circuit settle down rather quicker, he finds it takes only about 45s with lower cost capacitors.

On the assumption that the function of the first PA0KSB 74121 was to ensure that no switching took place before the gate was closed, BRS33882 replaced this with a 100Ω, 1,000pF integrator, inverted the sign of the input pulse and used the B input to the second 74121; this works quite well and it is possible that the other 74121 circuits could be replaced using a couple of spare gates, but this has not been tried.

A side effect of working on the system has been the large number of spurii; these are not prominent at hf but of considerable potential nuisance value at vhf, and enclosing the added circuitry in a die-cast box remote from the receiver, and with its own battery power supply, did little to improve the situation. The spurii arise mainly from harmonics of the 5MHz vfo and the various clock frequencies (these can, of course, also be a problem in almost any form of digital frequency synthesizer). It has not proved possible to eliminate them at vhf; this could prove a major problem for vhf applications.

BRS33882 emphasises that despite his comments and reservations he nevertheless feels the idea is ingenious and practicable—with the possibility that a single add-on unit could be used with a number of separate receivers and various vfo frequencies at an extra cost of possibly a plug and a couple of diodes per vfo. Using the stabilizer on his FR400 receiver has made operation much easier, especially for weak and fading signals, and he says, "It's great being able to switch on two minutes rather than two hours before a specially wanted transmission—if only transmitter frequencies were equally stable!"

Finally before leaving this subject (which seems well worth the space since it concerns a matter affecting almost everyone), a quick comment from Dave Martin, G3RUZ. This refers to G3BY's point about using external resistors with the 74121 devices. He says this device has an internal 2kΩ resistor which may be used in cases like this (where the length of the output pulse is not critical) by simply connecting together pins 9 and 14 of the ic.

Checking and setting nbfm deviation

Barry Priestley, G3JGO, points out that it is possible to prove mathematically that if an fm transmitter is modulated with a pure audio tone of 1·247kHz, then at exactly 3kHz deviation all the output power is converted into sidebands and the carrier disappears. This condition can be detected with a receiver having a narrow cw filter. Further, even if this filter does not completely reject the sidebands, the carrier null will be fairly well defined by the increase in level of the 2·5kHz beat between the sidebands as the carrier is reduced. Other carrier nulls exist at about 7, 10·7 and 14kHz

deviation but can be avoided by increasing the af level only slowly.

He adds that the clipper level of an fm transmitter could be reduced until the carrier null can just be reached, so limiting maximum deviation to 3kHz.

A suitable simple af oscillator providing a pure tone can be found in *Wireless World* June 1972, p275, modified as in Fig 3. This needs to be carefully trimmed to exactly 1,247Hz, using a counter or a piano (D is 1,245Hz).

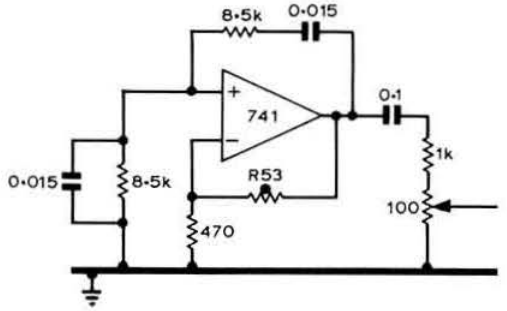


Fig 3. Low distortion 1·247kHz af generator used to provide a simple method of setting up fm deviation. Output about 3V peak-to-peak with 4 to 15V supply. Second harmonic about −74dB, third harmonic −71dB. Value of the two resistors shown as 8·5kΩ needs to be adjusted to trim to exact frequency (eg use 10kΩ resistors with 56kΩ in parallel). Mathematical justification: 1·247 = 3000/2·405; J_0 (2·405) = 0

NBFM adaptor for a.m. transmitters

A convenient, compact and self-contained adaptor which enables almost any 144MHz a.m. transmitter to operate on nbfm is described by Austin Davitt, K1MHD, in *QST* (July 1973). This uses a varactor diode in conjunction with the 8MHz crystal and forms an alternative (though not necessarily an improvement) to the various phase-modulators described in *TT* in recent years. There are no circuit gimmicks unless the use of op-amp integrated circuits in the audio section is so regarded. But it is felt that there must still be many a.m. operators who would like to use nbfm from time to time without making any modifications to the present gear.

Fig 4 shows the essential details. It is stated that the deviation when multiplied 16 times can be to a maximum of 10kHz (this does *not* mean that it should be operated with this deviation!). Two small 9V batteries provide power for the type 741 op-amps.

The crystal frequency can be trimmed by C4 for correct netting; C5 and C6 also affect the frequency of operation. C5 and CR1 determine the amount of deviation, audio quality, and centre frequency—since there is interaction between these components a change in one value may require changes elsewhere. Since the bias on CR1 affects the junction capacitance, adjustment of transmitter frequency should be done with the adaptor turned on. If necessary an audio gain control may be connected between C2 and R2. One end of the pot is grounded, the other end to C2 and the wiper arm to R2; a suitable value would be 5kΩ.

There still seems to be a good deal of misunderstanding prevalent about the communications efficiency of nbfm. It should be appreciated that with fm there is a trade-off between deviation and communications efficiency: wide deviation (for example, as in broadcast fm) gives better results than a.m. but, except in rare circumstances, would be regarded as a pretty antisocial gobbling up of bandwidth, particularly on a crowded band such as 144MHz. True nbfm with a deviation of about ±3kHz is rather less effective than a.m. of comparable power but may provide other benefits. To obtain maximum communications efficiency with any form of fm it is necessary to use a true fm discriminator in the receiver and not to rely on slope detection.

Noise reduction on cw

From time to time we have referred to the various techniques which can be used to process cw signals in the audio stages of a receiver to clean them up and reduce the effects of noise, both spiky impulse noise and general background hiss and hum, etc. Amplitude limiting—usually back-to-back diodes—is pretty effective in getting rid of spikes of noise: the lesser-known threshold gating cuts out the fuzz of signals below the level of the wanted signal.

A number of articles on various forms of threshold gating combined with amplitude limiting and filtering have been written recently by John J. Duda, W2ELV, (*Ham Radio* January 1972, May 1972 and September 1973). Fig 5 shows a threshold-gate and energy-gate limiter circuit with post-gate filtering, using the emitter-base junction of germanium transistors (eg 2N414) to provide suitable diodes. Another version of this approach turns up in the Swedish *QTC* journal (No 2, 1973) by Goran Nilsson, SM7AYB, including

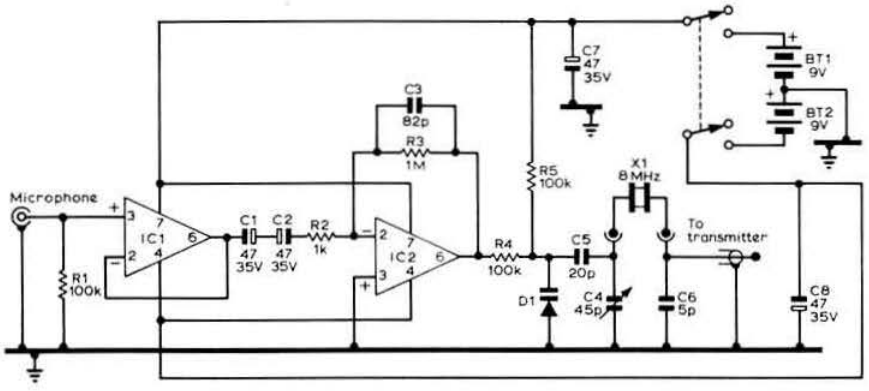


Fig 4. NBFM adaptor suitable for use with 144MHz a.m. transmitters. C4 7-45pF; D1 varactor diode (Motorola MV1632 or equivalent); U1 and U2 μA741 operational amplifier. Note that the polarity of C8 has been drawn the wrong way round

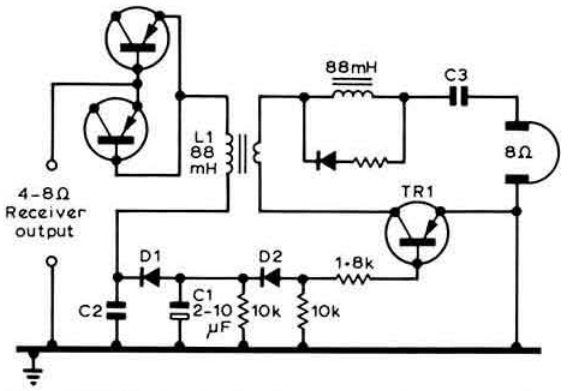


Fig 5. W2ELV's threshold-gate circuit with both amplitude and average energy thresholds. C1 is the energy integrating capacitor and 2 to 10μF usually provides satisfactory results. D1 provides threshold keying of TR1 which acts as a switch in the headphone circuit. Link on L1 is 32 turns No 28 enamel wire

facilities to switch it in or out of circuit: Fig 6. More complex systems, including, for example, the use in cascade of several threshold gate limiters with energy-gating amplitude limiters, can be built.

It is interesting to note that with a two-stage arrangement, W2BLV claims that almost complete immunity can be achieved from the sideband energy of most phone and broadcast signals. This means, for example, that he can tune through the broadcast section of the 7MHz band and reduce these signals to a series of carriers each occupying only about 200Hz of spectrum, and thus presumably leaving plenty of gaps in which cw operation is feasible. This opens up a number of possibilities though we are certainly *not* suggesting that it eliminates the need to adhere to hf band-planning!

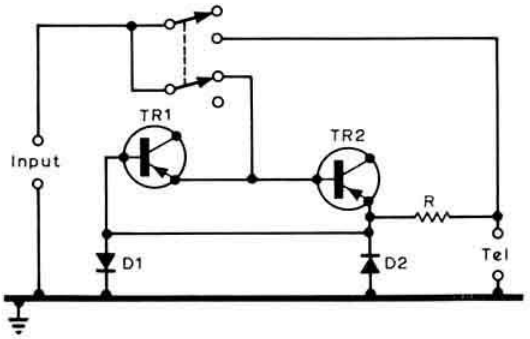
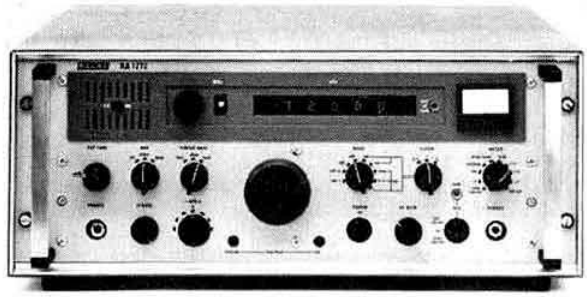


Fig 6. Threshold gate limiter with diode amplitude clipping limiter used by SM7AYB

Racalex

There was a good deal to see and hear on the subject of hf receiver design and frequency stability at the recent Racalex exhibition in London, including the latest models in the RA1770–72 series of receivers, and such lectures as "Operational aspects of hf receiver design" by R. F. E. Winn and "HF transmitters and receivers for close proximity working" by G. J. Lomer.

This particular range of receivers—though in a price bracket that puts them beyond the reach of most amateurs—is notable on a number of counts. For instance, it uses frequency synthesizer techniques with 10Hz increments, yet knob-tuned to provide the feel of a vfo when searching for signals, and with an ingenious electronically switched "fast" or "slow" tuning rate. Furthermore these receivers place great emphasis on the achievement of good dynamic selectivity: that is to say, "real life" selectivity with hundreds of strong signals applied to the input rather than the "easier" static selectivity that is plotted when applying one test signal. As we have stressed many, many times in *TT*, good dynamic selectivity with semiconductors is only possible by paying great attention to reducing the susceptibility of the front-end of a receiver to intermodulation, cross-modulation, blocking and the affects of reciprocal mixing. All this calls for wide linear dynamic range up to the final selectivity shaping filter and the absence of excessive noise sidebands in the output of the local oscillator(s).



The Racal RA1772 high-grade general purpose communications receiver (15kHz to 30MHz) with free-tuning synthesizer for search purposes. A feature of the design is the high dynamic selectivity achieved by the use of a highly linear front-end which allows wide-band filters in the rf and mixer stages

For commercial reasons, Racal have been most careful over the past year or so not to disclose the precise circuit arrangements that they are using to achieve a "90dB" dynamic range (ie the limiting factor of intermodulation products being at least −90dB). The only admission I could obtain was that they use wideband double-balanced mixers with a wide-band rf stage—but whether they use Schottky hot-carrier diodes or power FETs in their mixer and possibly a power fet in the rf stage remains open to conjecture. My guess would be diodes plus power fet but I could be wrong.

Whatever the circuit techniques, the outcome is impressive and a definite step forward in general-purpose receivers compared with those of even a few years ago. And one is glad to see that with frequency synthesizers in almost all receivers and transmitters, even military man-pack units, Racal places considerable emphasis on the importance of achieving low-noise sidebands in such sources. With weak wanted signals, reciprocal mixing now dominates the receiver performance and cross-modulation and blocking are less important, to quote the paper by G. J. Lomer.

A device we noted with some interest was a magnetic tape unit which allows pre-recorded morse messages to be sent and received at 10 times normal rate. Such techniques were used by the Germans for U-boats and some undercover

radio circuits in the second world war, and have been mentioned in some of the post-war spy trials, but this was the first time that we have seen such devices marketed as standard equipment: very attractive for meteor-scatter!

The all-semiconductor approach to transmitters, with assemblies of modules to provide high-power linear output stages, was shown in 1kW, 500W and 100W ratings. The wide temperature range which can now be obtained was vividly demonstrated by shutting up one of the 1kW transmitters in a telephone callbox and letting it stew!

Other items include an automatic modulation meter that measures both a.m. depth and fm peak deviation; a relatively low-cost digital frequency meter to 560MHz; miniature active vertical receiving aerials for 10kHz to 100MHz providing 75Ω resistive matching and with overall height of 95cm or 150cm; and some useful transportable and fixed hf aerials, including rotatable log-periodics.

For those of us who have always been fascinated by the vagaries as well as the solid achievements of hf radio, both amateur and professional, it remains encouraging to find a firm that has continued advanced development in this field despite all the prognostications of a few years back that in an era of space satellites and ocean telephone cables the day of hf was almost done: a sentiment for which we have never had much sympathy!

More on the coaxial folded dipole

In the August *TT*, details were included of a double-coaxial folded dipole based on an article in *CQ* (May 1973) by John Schultz, W2EEY. By one of those coincidences of publishing, the July issue of *Break-In* carried an entirely independent write-up of this relatively little known aerial ("A broadband 80m antenna," by F. Jennings, ZL1BET). This gives some background information on the aerial: it was developed in the USA at the Massachussetts Institute of Technology during the second world war for radar applications. Later it was used by the Mosley Antenna Company for the driven element of a series of amateur beams. ZL1BET, who has been using one for over 10 years, says it gives good results, especially for portable and field day work, as it can be used over the band 3·5 to 3·9MHz without difficulty. He suggests that it is advisable to avoid making the coaxial feed an exact electrical multiple of a quarter-wavelength.

Capacitively tuned dipoles

The usual approach to making an aerial effective over a wide band of frequencies is to adopt one of the various "broadband" approaches, as in the coaxial folded dipole. But would it be possible to develop a narrow-band dipole that could be electrically tuned over a wide-band of frequencies? Apparently so, to judge by some experimental work carried out at uhf at University College, London, and reported by D. Lamensdorf in *Electronics Letters*, Vol 9, No 13, 23 September 1973, pp445–6. This makes use of a configuration akin to a folded dipole but with the two sections capacitively coupled by means of capacitors. If these capacitors are fixed the dipole is resonant at one specific frequency; to make the system variably tuned, the capacitors are in the form of variable capacitance diodes. It is not intended here to attempt to reproduce the full design data given in the report. This makes it clear that there are limitations but shows that an experimental aerial operates successfully over the range 573 to 1,270MHz. In effect, the reactive component at the feed point is tuned out, leaving only the resistive component; while the feed impedance varies to some extent with frequency it can be used over a wide band with a coaxial feeder and tuned for minimum swr.

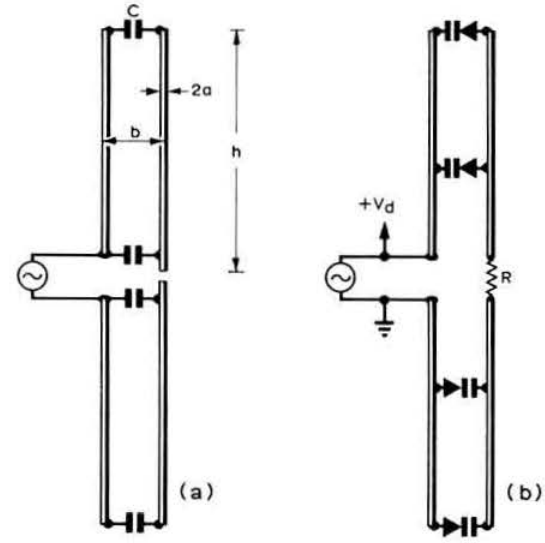


Fig 7. Capacitor tuned dipoles. (a) For single frequency (dimensions of experimental uhf model: a, 0·0794cm; b, 0·95cm; h, 7·5cm). (b) Variable capacitance diode tuned dipole covering wide band of frequencies (a, 0·0794cm; b, 0·95cm; h, 7·5cm)

Quads and loops and feeders

In *TT* (May 1973) we illustrated some of K8ANV's techniques for building and erecting 14MHz delta-loop beams. These showed a mechanically sound system when built with mechanical expertise, but one suspects that the amateur who owns a less perfect one is unlikely to sleep soundly during gales. This is because of the high torque which results from the high centre of gravity when the delta is mounted directly on to the boom. For those prepared to lose a little of the height advantage of the K8ANV form of mounting, Norman Fleming, W8PJ, (*QST* July 1973, pp24–27) suggests lowering the elements so that a significant part of the loop is below the boom. W8PJ says that supporting the elements by means of a wooden strut about 7ft up from the bottom takes a good deal of pressure off the boom, provides a better overall mechanical balance and keeps the elements from swinging wildly in a gale. Since the strength of the structure depends on the mechanical details, we suggest that the original article should be consulted, but Fig 8 gives some idea of the arrangement.

In his introductory notes to the 14MHz Zygi beam (*Radio Communication* July 1973), G3PTN mentions the use of a rotary half-wave loop. This has prompted Eric Early to comment on the use of 14MHz quads on 7MHz (a subject which was also explored in the articles by G6XN to which we referred in the February *TT*). He notes that this can be done quite easily by using tuned feeders, although it is not a particularly efficient radiator on 7MHz since it forms, in effect, a Reinartz quarter-wave loop; radiating upwards or downwards depending on whether the loop is open or closed

at the top. When open at the top the quad becomes what W6SAI calls the X-quad but in effect is a rediscovery of the old Chiriex-Mesny square of the 'twenties, which was also used with a reflector and made into arrays.

Eric Early mentions that at his suggestion F3EG has been using tuned lines to feed his quad for about five years and finds this an improvement; he himself has been using tuned lines on a 4-element 14MHz Yagi for over 15 years and on no account would ever go back to coaxial!

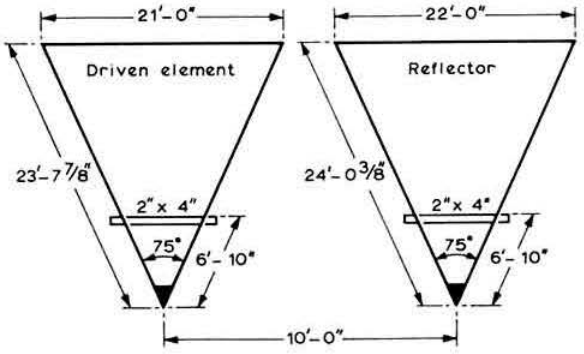


Fig 8. Dimensions of the W8PJ modified 14MHz delta-loop beam showing the use of the wooden spreaders which are then mounted on the main boom, with further struts from the apex of the loops to the boom near its central support, etc

Fallacies of swr

Mention of tuned feeders with their extremely high swr reminds me that C. B. Raithby, G8GI, recently drew my attention to the article "Importance of standing-wave ratios" by Earl Whyman, W2HB, in *Ham Radio* July 1973, which attempts to clear up some of the myths and misunderstandings about swr that persist among many amateurs. G8GI puts his own interpretation on this article in four pithy comments:

(1) Radiated power does *not* increase with reducing swr;
(2) Reflected power does *not* represent lost power;
(3) Reflected power is *not* dissipated in the power amplifier;
(4) *All* power goes to the aerial, regardless of any swr.

While perhaps some slight qualifications need to be added to these statements, they are a good deal less misleading than some of the ones so often bandied around, and which have made a fetish of unity swr.

D-layer whispering gallery

Frequent reference has been made in *TT* to various forms of "chordal-hop" propagation in which the signals are bounced along an ionized layer without returning to earth at intermediate points. This type of propagation is now often called "supermode" and sometimes "whispering gallery". This latter name is derived from the whispering gallery in St Paul's Cathedral where it is said that low-level speech can be made to propagate round the interior of the dome. We suspect that recent correspondence in *QST* about "tunnel propagation" (where two stations at long distance suddenly find themselves in virtually exclusive contact with one another at great strength, almost as though they had a private speaking tube between them) is yet another manifestation of this type of propagation (as in fact we have long suggested in *TT* and *ART*).

For amateurs, this chordal-hop type of propagation is normally considered to use the F-layer, although some papers have appeared on the possibility of using the rather lower E-layer, and the Radio and Space Research Station has carried out some investigations on vhf propagation by double-hop reflection in the troposphere.

Clearly most of these (except the tropo chordal-hop) have the entry and exit signals crossing the D-layer about 20 to 30 miles up. This is where the greatest variation in attenuation takes place and is thus largely responsible for the difference between "good" and "bad" conditions (assuming that the F-layer permits contact). One of the advantages of chordal-hop over multi-hop propagation is that it reduces the number of times the signals cross the D-layer. And one of the reasons why vlf signals (such as GBR, Rugby, on 16kHz) can be received consistently worldwide is because they propagate along the "waveguide" formed between earth and D-layer and are thus not subject to the varying attenuation of D-layer crossings.

So clearly it would open up some very interesting possibilities in low-power operation if we could use the D-layer as the reflecting layer for hf or mf propagation, since we do not have amateur bands at vlf and in case it is very difficult to build vlf transmitting aerials in the back garden. One would end up with a communications system virtually unaffected by solar storms or natural or man-made radio blackouts.

Normally any signals above vlf go through the D-layer, so at first sight a two-way mf communications systems using the D-layer would seem to be out of the question.

But it can be done—and possibly at frequencies up to 2MHz. This is indicated in reports of a series of tests carried out by the US Air Force and General Electric over a 1,000-mile path between California and New Mexico. This used peak powers of 50W, average power of 3W and with path losses some 40dB less than with conventional propagation at the two test frequencies of 220kHz and 440kHz. Now there are plans to try the system over distances of about 2,000 miles before deciding if this could really form the basis of an ultra-reliable emergency communications system.

So what about 1·8MHz? Well we must admit that from an amateur viewpoint the system as tested has one overwhelming drawback: the signals were launched into and collected out of the D-layer whispering gallery mode by means of balloons at a height of 23 miles (about 120,000ft), and not many of us have skyhooks of that calibre! It is reported that another suitable height at which to achieve the necessary focusing effect (caustic region) is 57,000ft but that is still a lot higher than my 30ft maximum!

Nevertheless it seems to me that the system is still interesting to amateurs. It provides another example of the benefits of whispering gallery mode, and provides some useful clues on launching signals into and out of the mode; it also shows that this mode supports propagation at frequencies very much higher than the traditional muf of the layer. What one needs is more information on caustic regions for the different layers, and so on; the ideal would be to know the exact conditions under which whispering gallery modes can be achieved with the various layers.

SWL NEWS

by BOB TREACHER, BRS32525*

The month's news . . .

Since this column last appeared, the ARRL has agreed that East Germany and West Germany should each count as separate DXCC countries. Therefore, from 18 September this year "Germany" is a deleted country and credit is now given for the Federal Republic of Germany (West Germany) including West Berlin, and the German Democratic Republic (East Germany) including East Berlin. East Germans are now using the DT prefix as well as the usual DM. This special prefix is being used to commemorate the 20th year of amateur radio in the GDR and can be used until 31 December.

A reminder that UK postage stamps are not valid in the Isle of Man which now issues its own, and alternative arrangements should be made when QSL cards are requested direct.

. . . and mail

David Whitaker, BRS25429, comments that he is doubtful if he will get his five-band DXCC for the fourth year running. Although 10m was open to Africa when he wrote, he needs another 42 countries on that band for his "ton". On 40m Dave heard KS6DH for a new one. QSLs received recently include Kure Is for an all-time new one plus FY7AL on 40m. Dave's 80m heard score now stands at 188, his latest addition being ZD7FT. Also mentioned in an interesting letter was the idea of holding several "set listening periods" (slp). This is a form of activity period on a particular band, say 10m, to determine the conditions on the band. The listeners can only play their part if the licensed members are in agreement, so I would be very interested to hear from those who would like to take part in such an activity both at home and abroad. If there is sufficient interest a test could take place early next year.

David Johnson, A7511, was pleased with his contribution to the Cray Valley Radio Society's SWL Contest and thoroughly enjoyed his stint of logging. Conditions for the contest were apparently reasonable, with some interesting dx stations audible on 15 and 20m. David remarked that he had recently started on log book No 11 since January 1970, which indicates how active David has been in the last few years.

Neville Metcalfe, BRS33629, wrote enquiring about awards available to SWLs. I suggest that those members interested in the fascinating side hobby of award collecting obtain a copy of the new *Amateur Radio Awards* from RSGB headquarters, price £1.40 (inc postage and packing). It has been compiled by Chas Emary, G5GH, RSGB's HF Awards Manager. The book gives information on all the major awards—and the less important ones—from national radio societies and is very good value. Neville did mention the "Mercury Award" specifically—an award issued by the Royal Naval ARS. This is obtainable from G3HZL, QTHR, at a cost of 15p.

A disgruntled Peter Giles writes from Dumbarton because he has received a very small return in reply to about 1,500 QSL cards sent out this year. QSLing can be a very slow business when the QSL Bureau is used, and on average it can take at least nine months to get a card in return. This is mainly because the outgoing card goes first to the RSGB bureau, from where it is sent with many others to the QSL bureau in the country of destination; from there it is sent to the addressee, where it may rest for a considerable time. This process is then repeated in reverse until it reaches the RSGB QSL Bureau and is sent on to G3YOU—the swl sub-manager. If the card is dealt with promptly on the way, in nine months you may receive a card in return. In many instances, however, the addressee will not acknowledge the card for a few months, and in fact the writer is still receiving cards via the bureau for reports sent out in early 1971.

When QSLing direct, the correct number of IRCs must be sent to enable a card to be returned. Using air mail, three are required for cards sent to the USA or Canada; one is usually sufficient for Europe; two or three are usually required for South America and Africa; while for cards sent to the Pacific area and Asia as many as four IRCs are needed to have an air mail reply. Unless the report is of real use to the transmitting amateur, it is highly unlikely that he will use his own resources to mail a card direct if insufficient IRCs are supplied. The writer hopes he has not painted too gloomy a picture, but unfortunately this is the way the cookie crumbles.

"Looking forward to the expedition to Farquhar," is Chris Henderson's main comment—your scribe's comment, too, as well as that of many other top dxers. It will probably be the

1973 COUNTRIES TABLE

	10	15	20	40	80	160	Total	Mode
BRS33558	107	91	220	108	101	7	734	ssb
A7460	78	163	208	78	107	8	642	ssb/cw
BRS25429	58	136	185	102	120	9	610	ssb
BRS25901	75	121	196	79	89	5	565	ssb
BRS33823	65	142	162	80	98	9	556	ssb
BRS33211	47	104	161	71	120	1	504	ssb
BRS6604	51	114	145	103	63	15	491	cw
BRS33364	47	122	170	60	84	6	489	ssb
A8458	68	113	119	40	36	3	452	ssb
A7784	44	83	120	58	60	5	370	ssb
A8094	43	80	111	33	53	6	326	
A7511	1	67	124	40	73	4	309	ssb
A8037	41	58	115	20	39	2	275	sstv/ssb
BRS33629	—	—	206	42	22	1	271	ssb
BRS32286	14	64	87	21	80	—	266	
A8320	—	58	118	33	45	1	255	ssb
A8482	15	52	70	22	80	3	242	ssb
A8374	16	82	81	7	10	2	197	ssb
A8179	12	45	89	13	22	2	184	ssb
A8313	—	7	71	15	51	17	161	ssb/cw
A8374	10	55	59	—	8	2	134	ssb
A7139	5	30	28	25	41	5	134	ssb
A7951	9	17	61	12	29	3	131	ssb
A8431	—	11	57	34	32	1	124	ssb
A8065	17	21	25	18	35	3	119	
A7700	8	26	42	18	20	1	115	ssb
BRS33210	1	20	33	8	38	6	106	ssb

* 392 Rochester Way, Eltham, London SE9 6LH.

first new one for many since the expedition to Spratly Is earlier in the year. Chris, although being very active with his HAB activities, has logged 3B6CF, KM6DF and KC6SK for new countries, taking his heard score above the 270 mark.

Irwin Brown, BRS33211, has been involved with special station GB3MKB and has also helped out at GI3FFF on VHF Field Day. Irwin is studying for the May RAE but, in between his studies, has been listening a great deal on 2m, logging GC, F, PA0 and DL on extended tropo. He suggests a table for vhf similar to that run for the hf bands already. This seems a worthwhile idea and may promote more interest in the vhf bands. As an experiment only, a table showing countries and counties on each of the vhf bands, 70cm, 4m and 2m only, will be run starting from 1 January 1974.

"Tam" Large, A8374, relates eavesdropping on a QSO involving KC4USP. Apparently October is the iceberg season in Antarctica and he can gaze out of his shack window and watch the icebergs floating by. This sounds very much like a QTH free of all types of QRM and QRN!

BRS33558 still heads the countries table. Latest additions to a formidable total include CR8, KM6, KS6, KX6 VR4, XV5, 3D2 and 5W1. Your scribe is 99 per cent certain that XZ1TA was a misreading of HZ1TA, as there is at present no amateur radio operation from XZ-land. He mentions that K6UA is to erect a rotatable 80m quad for the coming 80m dx season. Readers may be interested to know that this station already has the following aerial system—a 10-element collinear beam for 10m at 80ft, a 10-element 15m collinear beam at 70ft for 15m; a 15m 10-element stacked beam at 100ft, a 20m 10-element stacked beam at 100ft, a 100ft 5-element Yagi for 20m, a 5-element beam at 100ft for 40m; a two element beam, two extended double zepps and one rhombic—465ft legs—for 80m and phased 135ft verticals for 160m. It would certainly be interesting to hear of anyone with a more elaborate aerial array.

John Fitzgerald, BRS33823, passed his May RAE but is concentrating on his morse in an attempt to take out a G4 call. John mentions obtaining cards from UK1ZFI (Franz Josef Land), UI8 and UA9 but is still missing a confirmation from European Russia (UA).

S-E Counties HF Convention

It would be very pleasant to see a number of the country's top hf listeners at the convention, details of which appear under "QTC", to discuss generally the hf bands, conditions, and in particular to compare dx notes. Hope to see a good turnout there.

News, comment, photographs and updatings for the countries table for inclusion in the January 1974 *SWL News* should reach the writer before 24 November.

Special event station on HMS Belfast

A special event station (GB3RN) was operated continuously from 3 to 8 September on board *HMS Belfast*, moored in the Pool of London, by members of the Royal Navy Amateur Radio Society, as part of the RSGB Diamond Jubilee Year celebrations.

Special QSL cards were sent to confirm 1,250 contacts on all bands and over 100 swl reports. There was an RSGB bookstall on board and the station was visited by over 1,000 members of the public.

Operators and others at the station on *HMS Belfast*. Standing (l to r): G3HZL, G3PZP, G3LCS, xyl of G3WAO, W4CXH/G5AWU and xyl, G3WAO and G3KOJ. Seated (l to r) G3IZD; Wally Walker, BRS32378, (secretary of RNARS); and G3AGL. *Photo: P. Fletcher*

FOUR METRES AND DOWN

by JACK HUM, G5UM*

What kind of people do they think we are?

It was not without good reason that the VHF Committee when it was hammering out the code of practice for the use of the 2m band worded Item 10 to read: "Remember others are listening: *your* example will influence them".

Who is "them"?

It is the short wave listening man waiting to become a transmitting man, assimilating for better or for worse the operating procedures he hears on 2m.

It is the man in the ministry, whose official duties require him to note how we go about our collective business over the air.

It is the man in the street, owner of a receiver capable of catching amateur signals, certainly the a.m. signals from redundant vehicle radios and probably fm too, if he has a general coverage set that resolves the mode.

A fourth "them" is the fully fledged transmitting licence holder, also very much to be numbered among the "others listening" and very much to be impressed (or depressed) by what he overhears. Let us for the present exclude him from the discussion and dwell upon the other three.

First, the BRS- or A-man: how well he has done his homework becomes evident when he appears on the 2m air with the brand new ticket, for *your* example will assuredly have influenced *him*.

Next, the man in the ministry: what opinion *he* forms from hearing amateurs in action will in turn influence his policy-making chieftains to whom he reports, and we may be sure that *our* example will influence *them*. It is a tribute to the British amateur radio movement that it is given wide latitude by the licensing authority to self-regulate its actions, formulate its bandplans and generally be trusted to behave in a responsible way—a trust not widely abused so far as one's observations of the metre wave scene are concerned.

Finally, and probably most important of all, what of the man in the street, the great British public: what kind of people do they think we are? Unmindful of the movement's high technicality and concentrated sense of purpose, they have an uncomfortable habit of looking upon it as ". . . a lot of boys playing about at radio" ("boys" can be 16 or 60). To them we are "hams", a ham-handed lot, the great guffaw. Their media influence them in this belief (try to dissuade a newspaper editor to whom you have given a story about amateur radio from using "ham" and he will reply that it is the word his readers understand).

Some amateurs' own actions reinforce this image of us, eg fatuous net titles, stilted speech forms ("the handle", saying "our" when "my" is meant) and much else that would never be said in face to face conversation or over the landline telephone.

A frightening indicator of public attitudes was provided by the recent case in which a lunatic using the marine distress frequency called out rescue ships and aircraft to a fictitious wreck. "It was all found to be a hoax by a local radio ham" reported the national press. If that is the sort of people they think we are, then individually and collectively we have much to do to disabuse them of this belief, indeed, to cause *our* example to influence *them*.

The foregoing is no more than a personal expression of opinion. Others may think it to be overstated, or understated—or simply that ". . . all's right with the world". But never let any of us forget the importance of Item 10 of the 2m code of practice and the serious implications that lie behind its wording.

The "how" of operating

Flowing from the foregoing are the several comments readers have made following last month's piece about the fatuities to be heard on 2m. Even allowing for the fact that every specialist hobby develops its specialist language, opinion has it that there should be more naturalness in over-the-air exchanges (see three paragraphs above).

Two favourite fatuities of Chris Towns, GM8BKE, are "K somebody please" and "carefully tuning". Why not, he asks, finish a call with tuning intentions, calling modes copyable (not all mobiles can copy ssb), and add beam heading and location? The latter, as we said last time, is exceptionally important in the case of newer callsigns which have just missed the 1974 *Callbook*.

And on the subject of modes, G2CUZ is another who laments the ". . . awful segregation of modes on 2m" and endorses the G3LGK suggestion for more A1 to A3J contacts. But, he adds, ". . . even if the cw men approached the sacred sideband sector would the inhabitants recognize it?" Like many others, Norman Horrocks would like to see sideband spreading over the whole of 2m within the geographical zones ("Perhaps many of the transverter fans are incapable of dealing with the problems of shifting frequency").

Joe Ludlow, GW3ZTH, however, has different views from G2CUZ. He believes it to be a good thing to use cw actually in the sideband sector, and finds that nobody objects. He does not share the G3LGK thoughts about a separate cw-to-ssb channel. Nor does he complain, as some do, about having to repeak an A3J transmitter from 145·41 to 144·01. Even with 11 tuned circuits at 144MHz between mixer and the aerial change-over relay, the operation takes him a bare 30s. Birmingham's G8COG *welcomes* cross-mode contacts, finds that ssb men readily resolve his phase-mod on both 2m and 70cm.

The super-dx clip

The past summer's anomalous propagation produced plenty of non-British contacts via GB3PI (eg Norway to Germany), and in reverse many UK stations heard coming up in odd places in the top megahertz of 2m were in fact doing so via German repeaters. As far north as Forfar,

*Houghton-on-the-Hill, Leicester LE7 9JJ

GM8BZX notes that the Cuxhaven *relais* often pops out of the noise: "It is amazing the number of bursts that come through when the band is quiet," he says. He keeps an fm receiver tuned to its frequency: it is helped by a double-8 Yagi system vertically polarized.

In more sub-tropical regions the "anaprop" intensifies. Last July a huge transpacific duct had Californian 2m men triggering repeaters in Hawaii, 2,400 miles away. No matter that the first to do so was K6DYD of San Diego with a cool kilowatt linear and an 80-el beam: it was not long before the 10W mobiles were doing the same. The duct was evidently quite pronounced: an Hawaii repeater 7,500ft up gave excellent results from the USA, but another at 10,000ft heard nothing. The fantastic across-water conditions prompted attempts at direct contact on 2m, and there was a limited number on cw. More sensationally, KH6BZF and W6FZJ made the believed-first California-to-Hawaii contact on 432MHz.

Farther across the Pacific the Australians are limbering up for more e-m-e experiments. From VK2ALU, Lyle Patison, PO Box 1108, Wollongong, NSW 2500, comes a request for schedules on 432MHz via the e-m-e path. He especially wishes to explore rtty potential over this path.

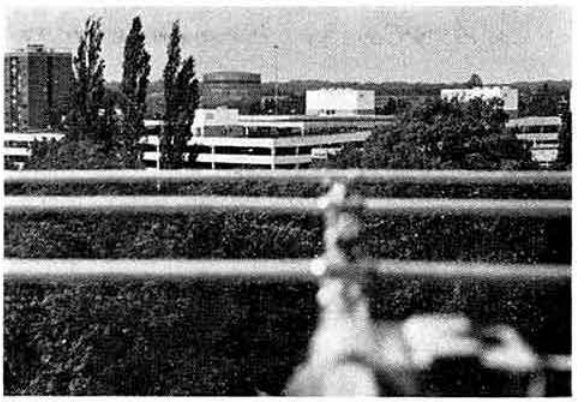
Other celestial bodies can be used for metre-wave QSOs, as our piece last month about ms suggested. Now comes a request from SP2DX for meteor scatter schedules with British stations. During all major meteor showers he appears on 144·1MHz with 750W keyable at 40 words/min and a four-wavelength 13-el Yagi. The QTH of Wes Wysocki is PO Box 2, 80-952 Gdansk 6.

Next month's Kohoutek Comet might be a target for an exalted form of meteor scatter propagation—or it might be too remote to provide any sort of detectable return. At any rate, the thought is passed on to the ms and e-m-e specialists for what it is worth. The astronomers promise earthlings a spectacular show with this new heavenly body only lately predicted by a Czech and likely to be brighter than the brightest star for much of December. They even say that at certain points of its track the tail will be so attracted by the gravitation of the sun that it will be ahead of the comet and not behind it.

Whether or not the ms experts have a go at Kohoutek, they have enjoyed consistent successes with our permanent satellite, the moon. The prearranged schedule on 23cm between PA0SSB and W2FNA for 29-30 September produced a 579 signal from Holland across the Atlantic. Hearing the QSO, WA2HVA commented that the PA0SSB signal via e-m-e was stronger than the talk link on 20m. Power output at the parabola feedpoints both at the PA and USA ends was 500W-plus.

Back in the UK, Peter Blair, near Chelmsford, has continued his 432MHz tests with the far west, a minimal signal being heard from W6FZJ and a rather better one from VE7BBG, both via the 15ft dish at G3LTF.

Last month's comments about speeds of morse sending required for ms work have prompted a note from GW3ZTH of Bridgend. As a committed ms operator, Joe Ludlow has found 30 words/min to be adequate, and even this speed does not need to be used for very long if pre-recorded tapes are kept handy with which to send the other man's report. These may be fed through a keyer unit (home built in the 'ZTH case) to take most of the repetitive chores out of ms super-dx chasing. Further to reduce these chores, could the long time scale of ms QSO be reduced by use of auto-sending



"Have you ever wondered what sort of view your 2m beam has?" thought G3INU. Reg Appleby lives in a block of flats in Stevenage, and the take-off from his beam, as this picture shows, is restricted both by the distant hills to the south and by the fact that the aerial must perforce be clamped to the balcony handrail. But that gasholder on the line of shoot acts as a reflector for signals coming from the north, and probably from other directions as well. The result is that G3INU does much better on 2m cw than anybody would imagine to be possible, looking at his site

allied to common transmitter/receiver aerials? muses G2CIL.

And how super can the dx be via meteors? Johnny Stace at Scunthorpe had a report from UK5EAD that the G3CCH keyings were heard in southern Russia during the Perseids, three good bursts and several pings—and that is a QRB of about 1,500-plus miles.

Aurora contacts are perhaps the next best thing after ms, though unlikely to yield comparable path distances. The auroras of 19-23 September produced 2m QSOs for SM7-FJE in southern Sweden with far north SM, LA and OH, and even a rare Russian in QRA locator MT, which is off the map, literally, for most of us in the UK.

"Because it's there . . ."

Further to moonbounce and meteor scatter, it must be the ". . . because it's there" challenge that persuades men to devote so much technical expertise and sheer patience to mastering them. Similar mental processes spur on the low power enthusiasts, whose increasing number was remarked here last time.

Just what can be done on QRP was borne in on G3XBM of Cambridge, who, new to 70cm, decided to ". . . have a QRP go" at the October IARU contest; best contact was with G3NHE at 168km (did *you* remember to use kilometres in your entry and not the usual concentric circles?). At the Sheffield end the G3XBM/P signal was RS55. With what *petite puissance*? Just 400mW and a 4-el Yagi. This from one of the rare hillocks in the flatlands of Cambridgeshire, used by Roger Lapthorn for many previous sorties on 2m to earn him three countries and 20 counties on 145MHz with never more than 1W input.

Diary-date 9 Dec for Dunstable Downs test

New metre-wave beacons or repeaters (or whatever) are never conjured into existence simply because a local group or club thinks they would be nice things to have. And some do!

Master the technical problems, earmark a prime site, guarantee 99·9 per cent serviceability, arrange immediate switch-off at any time, and of course make sure that the service you propose is wanted anyway, then your project will be a case and not a colander.

Knowing these things, the Dunstable Downs Radio Club in their characteristically methodical manner are laying on an exercise in connection with a 23cm beacon project they are promoting. On Sunday 9 December from 1000 to 1300gmt they will conduct a field strength trial to determine the signal levels received by amateurs at their home locations. The radiated frequency will be a nominal 1,297·975 MHz, and, of course, by the terms of the licence they will be able to answer in the band on which they send. If distant operators prefer to call on 70cm or on 2m, G4ARD/P will reply on 432·64 or via GB3PI.

Listener reports will be welcomed by G3VZV, 2 Orchard Close, Toddington, Dunstable, Beds, who adds: "We wish to gauge the level of interest and activity on 23cm in various directions from Dunstable Downs, and it will help if as many as possible come on and give us reports."

A pile of 23cm stickers

Not to be too dogmatic about it, one sometimes feels that the more "experimental" a band, the less its occupants tend to bother about QSLs. Take 23cm, an "experimental" band if ever there was one: surely somewhere there is someone who has worked *three* countries and collected 20 counties besides the solitary G3MCS, the only possessor of a 1,296 MHz FMD Award. Those who worked France on 23cm during this year's several lifts may also have GW somewhere in the bag, along with the 20 British counties needed for a claim to be put in. Participants in VHF NFD over the last few years must assuredly have mustered the contacts if not the cards, and be in line for a /P claim.

Meanwhile in the bottom of the VHF Certificates Manager's steel cabinet, a packet of stickers lettered with "Twenty three centimetre award (Transmitting)" is waiting to get out. He could start using them up if more QSLs for 23cm contacts began to go into circulation.

Not so difficult as the 23cm award is the 70MHz Senior, but it is tough enough: the one which went to Dave Griffiths, G3RDQ, last month was only No 13, and well deserved for much patient work on the band and the regular signal from Stokenchurch in the Chilterns every contest-time. In 1974–5 he will be translated to Ross & Cromarty and the Butt of Lewis, in the course of his work; an effective cw/ssb rig for 4m is planned, to keep GM3RDQ/P in touch with points south.

Two more "four metre frequentlies" whose claims were approved at the October meeting of the VHF Committee are G3YSK of Winchester and G3WKH of Cheltenham: to them, certificates Nos 100 and 101 respectively. This means that 70MHz Transmitting Awards have outstripped those for 432MHz, each having run neck and neck for some years. Just three claims for a 432MHz parchment will restore the balance.

In the 144MHz Transmitting bracket the number of claimants who say "All contacts were made on sideband" or "All on fm" are now so frequent as not to excite comment any more (much less frequent is "All on cw", so the best of luck to one noted keyman who is attempting the 144 Senior wholly on A1).

The latest 144MHz list reads: No 344 to G4BBB of Malvern, a double application from Geoff Edwards, bringing him 432MHz No 98 with a second set of cards for "the next band up"; No 345 to G3FPK; No 346 G8FEP; 347 G8GNE of March; 348 GW8FQF/P, which brought Morris Wickham his third FMD parchment in a month (the other two were reported last time); 349 to G8GMR of Luton (see under "Skedspot"); 350 to G3ZOD; 351 G8HAC of Northampton, the first G8H-man to get it, and with plenty of operating experience behind him . . . one-time RAF r/t op, in Germany during the Berlin airlift ". . . but only returned to the radio hobby about 18 months ago". Lucky John Males secured the five-plus-30 cards in six months. To G8FRA No 352; G8GAU/P 353; G8GMU 354; and a difficult No 355 for G3XDY, activities restricted mainly to vacations from Manchester University and from a home QTH at Cleethorpes only 10ft asl. Leicester's G8GVA got his five-plus-30 back within a year, with a 25 per cent return and praise for stations in Bucks, who QSLd him 100 per cent, when HE, MX and SY failed to reply at all: now he has Certificate No 356.

Four figure frequency

It would help to get our 23cm FMD stickers moving on to certificates, as mentioned above, if more of the 1,296MHz fraternity knew when the rest were likely to be workable. Please give *FMD* your 23cm sked-times and general operating periods. For a start here are a couple:

From his 700ft site near Stoke on Trent, G3EHM transmits on 70cm every evening at 2000gmt onwards, and will change at once to 23cm upon request. He has 120W input and a 4ft dish 50ft up. Just north of Swindon, G6XM using an MV1808 Motorola varactor tripler and a scaled down 46-el multibeam reached as far as G4BYV in Norfolk, G3LTF in Essex and G4ALN in eastern London, at path distances of 120, 90 and 80 miles, all set up initially on 432MHz.

At Cannock, G8BMP looks for 23cm contacts most nights, transferring from 432MHz whenever asked.

Mark cards clearly

As the recipient of cards from exotic dx stations all over the world which one has never worked (Memo: must ask Vic Desmond, G5VM, if he has received any mysterious 2m cards lately), one can sympathize with the dilemma of G8GMU of Coventry. Cards intended for him have been going to G8GMV, and 'GMV's to 'GMU. This properly sabotages attempts to collect cards for the FMD Award.

This problem came to light when G8GMU worked G8GMV on 2m. Other members who have anomalous letters in their callsigns suffer similarly. Moral: print callsigns clearly when despatching cards through the bureau. To make doubly sure, print them twice.

Tops on 3cm

"The weather was so bad even the ducks were walking". On Snowdon on 13 September not only were the ducks (if any) walking, but the mountain railway was not running: gale force winds and cloudbase on the summit gave visibility of 15yd.

None of this deterred seven Surrey members from attempting to raise the 3cm distance record that afternoon; at 212·5km north in GM a party of six waited at 2,300ft

The Snowdon end of the GW-to-GM record-making contact on 3cm. At the left G8HCO (Margaret) operates the 2m talk-link (a Trio 2200 into a ¼ whip). Centre: G8BPN. Right: G8FTB with parabola

on the Cairnsmore of Fleet. Success quickly came when a cheap plastic compass gave them an accurate fix on Snowdon; using GM8AZU/P they worked GW8CKT/P with a 32in dish fed by 100mW from a Mullard CXY19 Gunn device. At the Snowdon end the wild weather precluded the use of the dish shown in the accompanying picture, and a 10dB horn was used instead.

And so the distance record was established, 'AZU and 'CKT beating their own previous best thanks to superbly-designed all-solid-state gear that took a bit of a hammering before it got to the top (in both senses of the phrase) and to the dedication of the lucky 13 at both ends.

Contest news

The fourth annual 2m contest of the Dunstable Downs club uses RSGB rules and log sheets, gives maximum points to inter-member contacts, and properly stirred up activity last month. It still has three sessions to go, *viz* 1, 10 and 18 November, so look for the DDC men between 2030 and 2130 each of those nights.

The first of the 70MHz Cumulatives at the sensible out-of-tv-times of 1000–1200 hours hit such abysmally normal conditions on 30 September that most people were restricted to three-pointers—but lots of cw helped to effect weak and watery but complete exchanges where none would otherwise have been possible. Increased A3J, now evident on 4m, also helped things along. New G4C-- licensees who may have transferred from Class B specifically "to have a go on four" are reminded that four more two-hour sessions lie ahead, that the *best three* sessions can be selected for entry, and that there is a certificate awaiting the highest scorer in each RSGB region. The same goes for the 432MHz "grand band" Cumulatives. Rules: p633 September. List of RSGB regions: p272 April.

Ainsdale Radio Club's annual contest—well, strictly speaking, the RSGB Region 1 VHF Contest, a region in which large numbers of members are members of Ainsdale—was put back to 5 August to avoid national contests. This hit the holiday season but still brought a good turnout and good QRBs (GD3FLH/P worked the best dx at 417km). Overall winners were the GW3AHD/P team in the portable section and G3BRS/A in the fixed section. Both used the three bands available, "4–2–70". Best log from outside Region 1 came from GW8ACG/P.

Skedspot

Every Thursday night from 1900 to 2100 G8GQY/P radiates on 145·93MHz from a Cumbrian fell with a 40W transmitter. Cumberland-chasers will like to know that David Crompton activates that county on the last Thursday in the month.

Bedford is a highly "radioactive" county: there may still be members in remote counties who have yet to work it on 2m. To them skeds are offered by G8GMR, Colin Baker, 18 Collingtree, Luton, at any convenient time. He has two stacked 14-els at 76ft agl on a site 530ft asl and can offer a.m. or ssb.

Here and there

Reports of contacts made via the Mirabel 2 balloon-borne translator, 432·2 up to 145·8, should go to M. André Jungbluth, F6APU, at 3 Rue des Tulipes, 67380, Lingolsheim. And *Four Metres and Down* would like news of any outstanding successes. Listener reports also welcomed.

Our Malaysian friends have regained the use of 2m but are desperately short of equipment and technical information. Says G3LWM: "In particular, they urgently need data and circuits on the BCC 400E-25 transmitter and 100E-25A receiver. Incidentally, in 9M2 they have no lifts at all on 2m due to the permanent 98 per cent humidity!" Any info direct to G3LWM, QTHR.

Just back from RAF Cyprus, Dave Sugden, one time G8BHL and ZC4DS, has got himself a shiny new callsign, G4CGS, and a ditto SE600 to go with it.

Two more ARRL Satellite 1000 Awards for Britain. To G8CEX (see *FMD* last month) goes No 132, and to G8GP No 133, dated 30 August and 4 September respectively.

What they say

"Amateur radio is a hobby, and some of the 'topical' arguments that go on in *FMD* are a waste of good space, eg the mode war. Surely the answer is: Use whatever mode suits you. All my contacts have been on fm but I am building for ssb and have gear for a.m. (none for cw!)"—G8FRA.

"I wish someone would think up something to increase the 4m activity at all times, not just during cumulatives. We have a heck of a good band going to waste and a 2m one full of loutish behaviour at times"—G2CUZ (*One answer: regular schedules at well publicized times. Activity breeds activity*—JH)

25 YEARS BACK

"... it has been said that the Amateur Radio market in Great Britain is worth at least £250,000 a year. Even that figure is probably an underestimate, bearing in mind that there are now nearly 7,000 fully licensed transmitting amateurs and at least 20,000 keenly interested short-wave listeners."

RSGB Bulletin November 1948.

THE MONTH ON THE AIR

by JOHN ALLAWAY, G3FKM*

COMPLAINTS continue to arrive concerning amateurs who do not observe band plans and continue to use telephony in exclusive cw bands. For the benefit of the few readers who do not know which these are they are shown below:

3,500— 3,600kHz	21,000—21,150kHz
7,000— 7,040kHz	28,000—28,200kHz
14,000—14,100kHz	

The Region 1 band plan applies to all countries whose societies are members of IARU Region 1 and is fully supported by RSGB. There seems no excuse for the violation of these sections of the bands by phone stations when it is realized that they represent less than a fifth of the total spectrum allocation available, and there is a growing feeling that if the comparatively few black sheep do not stop making nuisances of themselves compulsory band-planning will have to be asked for.

Sincere apologies to 9M2TR, VQ9MC and G3WUW for errors which unfortunately appeared in captions to photographs in two recent *MOTAs*. On page 625 of the September issue 9M2TR should have appeared as HRH Tunku Abdul Rahman of Muar, and in October (p706) the picture showed Bob Carragher, VQ9MC, and not Allan Papworth.

News from overseas

Richard Limebear, G3RWL, formerly 8P6DR, promises to QSL to anyone who still needs his 8P6DR card if they will send an sae to the address in *QTH Corner* or alternatively via G2MI marked "via G3RWL". The same applies to those needing VP2AGA cards. Richard made just under 15,000 contacts from the West Indies.

G3VUI left the UK at the end of October on his way to join the British Antarctic Survey as radio operator at the Argentine Is base for a period of two years. He should be on the air early in 1974 and has an FT101 which he expects will suffer some interference from the base ionosonde which transmits every 15min with a 1kW output! QSLs will be sent out by G4AFJ—further details will be published when Mike's VP8 callsign is known.

G4CGS, who has just returned from Cyprus, has provided an account of the activity and progress of the beacon station ZC4CY. The equipment was originally supplied by RSGB on behalf of the IARU and consisted of a modified Heathkit DX40 which was activated by an electromechanical keyer. It was sited on the premises of the Limassol ARC where it was looked after by ZC4TE and G4CGS (who was then ZC4DS). Power output was 12W into a TA33Jr beam. This continued from early May to mid-August, when 5B4WR and 5B4WP took charge and it was decided that the equipment should be moved to a new site some 20 miles east of Limassol to facilitate maintenance. At the new site the aerial is expected to be a $\frac{5}{8}\lambda$ vertical and the callsign will be changed to 5B4CY. An electronic keyer came into use in late May and transmissions are now as follows: QRG 28,120kHz, switching to 28,200kHz for 5min at 15 and 45min past each hour. Callsign four times every 72s by fsk of carrier, with carrier cut for last 2s of each cycle to enable residual noise on band to be monitored.

Ian Cable, formerly MP4BBW, has left Bahrain and was expecting to be in the Philippine Is by 1 October (see *QTH Corner*).

VS6DM left Hong Kong in October, having been there since April 1972. He has returned to the UK where he is now G4BLV. David invites anyone still needing his QSL to send an sae and IRCs to the address in *QTH Corner*, or via the bureau. Another overseas Briton who is coming home is VP2AZA who leaves Antigua at the end of November. In future, QSL cards for this call or 8P6EK should be sent to his UK call, G4AMD, via the bureau.

Amateur radio stations in Afghanistan were closed down on 18 August and all equipment sequestered by the authorities. Until the restoration of licences it is asked that all QSL cards and other communications for the Camel Drivers Radio Club be sent via their awards manager whose address is: DK5AR, Wolfgang Renner, 34 Goettingen, Friedensstr 25, Germany.

Eric Lomax, 5N2ABG, arrived back in the UK on 6 November. He has all his logs with him and will QSL from his address as given in *QTH Corner*. Unfortunately Eric has to take the RAE to get a G licence, so he will be inactive for a time. He wishes to express his good wishes to the many friends he made over the air from Nigeria. 5N2AAN will also be closing down in December and returning to England, this will leave only 5N2AAE, 5N2AAJ, 5N2AAV and 5N2ESH still active and there is little immediate prospect of any new licences being issued. NARS activities will go into "cold storage" for a while, but communications may be sent to Postbox 2873, Lagos, where they will be dealt with by 5N2AAJ.

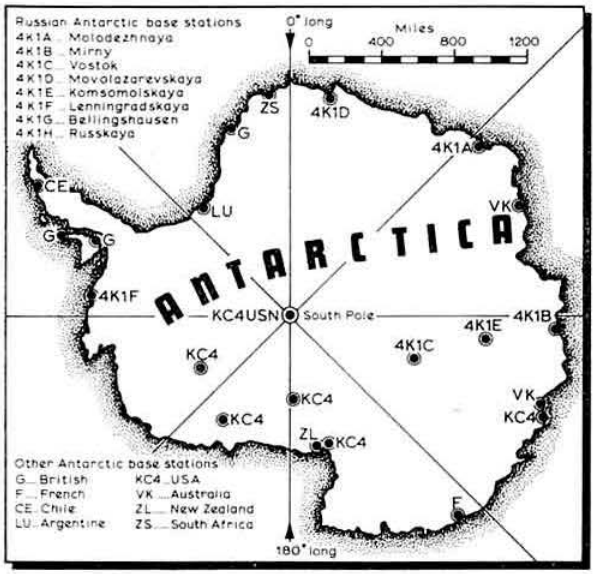
Fred Sawyer, G3SLN (ex-5Z4KO), has left for a three year trip to Zambia. He will be staying, together with his wife and son, in Nairobi for a few days to look up old friends, and hopes to be on the air soon with a 9J2 call.

Jim, G3ZVV/9V1QH, will be in the Maldive Is for nine months and will use the callsign VS9MJ. Maurice, VS5MC, may have a beam by now and makes special efforts to contact Europe on Thursdays and Saturdays around 14,035 and 14,275kHz until 1900. On other days he closes down at 1600. VS5LH now has a good signal as he is using the beam left by 9M8WUW.

JH6HYD left Japan on 27 August on a solo transpacific journey by small sailing boat. He was hoping to reach the west USA coast and then sail down to South America and complete a round-the-world trip in 300 days. On board he has a Yaesu FT75 and a 21MHz vertical aerial, and he may be active on 21,400 or 21,410kHz.

A new station has appeared from Haiti—HH2OEA—who is alleged to be a Chilean who is on official business for the Organisation of American States.

*10 Knightlow Road, Birmingham B17 5QB



This map shows the location of the USSR bases in Antarctica which all have their own callsigns. The same system applies to the USA bases, and G3RFG, who kindly supplied the map, suggests that the UK authorities could also adopt it for British bases

Australian stations have been using the AX prefix again—this time to celebrate the visit of HM The Queen. OK5OR was a special station set up in the exhibition in Bratislava which commemorated the 50th anniversary of broadcasting in that city. WP2MAP emanated from the Miss America Pageant (in Atlantic City), and WT0NEB from the Nebraska State Fair. OR4VN is a Belgian Red Cross station in Niamey, Niger.

During the first two weeks of November, G3TXF expects to be on the air from Anguilla. Operation will be mainly on cw and the callsign will probably be VP2EN. Nigel will also be on as G3TXF/KP4 for a week and QSLs for both calls should be sent to his home QTH.

Although 3A2CP's callsign has been pirated it seems that this has now ceased, and contacts since 1 September should have been with the genuine station. In a letter to G3JZV, W2OEH says that he is not QSL manager for C31CQ and he has no information about such a station.

Top Band news

Transatlantic and **Transpacific** tests will once again be held during the forthcoming winter. The 41st Annual Transatlantic Tests will be held on 18 November, 23 December, 13 January and 10 February between 0500 and 0730. Frequencies to be used are 1,800–1,807kHz (W/VE) and 1,825–1,830kHz, the "dx window" (all eastern hemisphere stations). Procedure will consist of alternate 2½min periods of calling "CQ DX Test" and listening. W/VEs will lead off the first 5min period and alternate 5min periods therefrom, others call in the second half of the first 5min etc. These periods should be closely adhered to unless contact is established. The Transpacific Tests will be held on 17 November, 22 December, 12 January and 9 February from 1330 to 1600 with procedures as above. ZLs use 1,875kHz, VKs 1,800–1,805kHz, JAs 1,907·5–1,912·5kHz, and others 1,800–1,805kHz. Please send reports on all these tests to W1BB (36 Pleasant St, Winthrop, Mass, 02152, USA) and to G3FKM.

The **All Austria Contest** will take place from 1900 17 November to 0700 18 November. This is cw only and exchanges consist of RST and serial QSO number from 001. Each contact counts one point and the multiplier is one for each OE prefix and two for each "Bundesland" worked. Send logs before 15 December to OE8SH, Obirstrasse 26, A-9020 Klagenfurt, Austria. Listeners may enter and should note that they may only log contacts of one station three times consecutively and not again until a further five loggings have been made. OE stations use 1,823–1,838kHz, 1,854 – 1,873kHz and 1,879 – 1,900kHz.

DX news

To celebrate the 25th anniversary of VERONA (the Netherlands Antilles Radio Society) December 1973 has been declared a special PJ activity month, VERONA members will be permitted to use the PJ1 prefix (viz PJ1CX = PJ2CX) and special QSLs will be issued.

9V1SEA will be the special callsign used from the SEANET Convention being held at the Marco Polo Hotel in Singapore from 8 to 10 November. SEANET meets at 1200 daily on or near 14,320kHz, often with 4S7PB in control.

BRS34417, W. G. (Bill) Rapley, broadcasting engineer with the Gilbert & Ellice Is broadcasting service, is hoping to come on the air as a VR1 in the near future.

Contrary to some rumours, QSL cards issued by DL7FT for contacts made by him when he was operating with the SV1DB/A expedition are valid for DXCC purposes. Frank has kindly supplied a photocopy of a letter from ARRL which makes this very clear. A letter has been received from G5BCX, Al Fance, who also operated the transmitter and he offers to QSL for his contacts which were made as follows: 22 April 1344—1403, 23 April 0910—1005 and 2100—2205, 24 April 1431—1535, and 25 April 0706—0800. His address is "Birchdene", The Lagger, Chalfont-St-Giles, Bucks.

Dxpeditions

W9JVF advises that with the assistance of ZB2BL he will be on the air, most likely as ZB2CR, from 18 to 24 November. He will be in Gibraltar on assignment from the *Saturday Evening Post* to write an article on amateur radio and Gibraltar. Most operation is expected to take place on 14MHz ssb just above 14,200kHz.

SM7AFV and several others hope to be in the Maldive Is for one or two weeks commencing about 27 November. Their 8Q6 call is not known, but they will operate on all bands and will be on for 24 hours a day.

KH6HIF, who was one of the ZK1TA group who failed to get to Tongareva, has been rumoured to be casting his attention to FW8, ZM7 and KP6, but nothing definite is known yet.

The group which activated Spratly Is as 1S1A last February may return next spring after the monsoon season. There is also a possibility of some activity from Malpelo Is (HK0) early in 1974, and in the same area TI8PE is said to be considering a visit to Cocos Is (TI9) around the same time.

A party led by VQ9BP was due to leave Mahé on 17 October en route for Farquhar Is where they hoped to come on the air on the 21st. They were due to close down on the 28th, but in the event of a delay may still be active. Callsigns were to be VQ9B/F, VQ9BP/F, VQ9M/F and VQ9R/F, and QSLs go to VQ9BP (see *QTH Corner*).

The Amateur Television Association

This was founded in 1967 and publishes a three-monthly mainly technical magazine in English entitled *ATA International*. Regular items include sstv, amateur uhf tv, facsimile and weather satellite reception. The subscription is $5, payable to: M. De Meyers, ON4NU, Hullekensstraat 7, 9831 Deurle, Belgium. Specimen copies are available.

S-E Counties HF Convention

This event is being held to celebrate the Diamond Jubilee of the RSGB and will take place on 18 November at the Airport Hotel, Crawley. Full details appear under the "QTC" section.

Contests

The OK DX Contest

0000 to 2400 11 November.

1·8 to 28MHz, cw and phone. No cross band/mode. Exchange RS/T and ITU zone (UK is 27). Contacts with OK count three points, with other countries one point. QSOs with one's own country count no points. A station may be contacted only once per band. Multiplier is total of ITU zones worked on each band added together and there are single-operator single- and multi-band categories as well as multi-operator multi-band. Logs should show date, time, station worked, number sent and received, points and ITU zone (first time only). They should include the category, name, callsign and address of the entrant as well as QSO points details, multipliers, and final claimed score and a signed declaration that the station was operated in accordance with the rules of the contest as well as the regulations of amateur radio in the applicant's country and that the report is "correct and true". Send logs (before 31 December) to CRC, PO Box 69, 113 27 Praha 1, Czechoslovakia.

The Spanish Contest

2000 1 December to 2000 2 December.

All bands 3·5 to 28MHz, cw only. The object is to contact as many EA stations as possible and the multiplier is the total number of EA districts worked on each band added together. Each contact counts one point, and exchanges consist of RST and serial number (from 001). Logs should show date, time, band, station worked, number sent and received, points, and if multiplier. A signed declaration that licence and contest rules have been observed should be included with the logs and sent to: URE, Concurso International CW 1973, PO Box 220, Madrid, Spain, to arrive before 2 January.

The Welsh 80m Contest

0900-1100 and 1700-1900 11 November

Exchange RST plus QSO number (starting from 001 in each section). Each contact with Wales counts three points, with other countries one. Stations may only be worked once and only on one mode. Listeners log QSOs only, and only of stations in the contest. Certificates go to leading transmitter and listener in each section. Post logs before 11 December to: K. Johnston, Cliff Walls, Marine Parade, Penarth, Glam.

QTH CORNER

A51PN	via W1JFL, 79 Plymouth Rd, N Bellingham, Mass, 02024, USA.
C31HF	via DJ9NA, L. Leberecht, Brehmstr 21, 7320 Goeppingen, Germany
CR8AM	PO Box 22, Dili, Portuguese Timor.
EI0WPO	via EI5P, 27 Sweetmount Park, Dundrum, Dublin 14, Eire.
FG0ZZ/FS7	via F2QQ, 95 Rue Barbusse, 92700 Colombes, France.
HH2OEA	J. Silva, PO Box 1304, Port au Prince, Haiti.
G3TXF/KP4	(see VP2EN).
ex-MP4BBW	I. Cable, c/o Caltex (Philippines) Inc, PO Box 783, Manila, Phillipine Is.
PQ0MI	via PT4AM, PON 07/0044, 70.000 Brasilia, DF, Brazil.
PT0MI	
PY0AO	PO Box 1408, ZC 00 Rio de Janeiro, Brazil.
PY0BRL	via PT4AM (see above).
TR8WR	R. Wegseheider, PO Box 16, Moanda, Gabon.
VP2EN	G3TXF, Holt Cottage, Kingston Hill, Surrey. KT2 7JH.
VP2GBL	W4YHB, 97 Island Drive S, Ocean Ridge, Fla. 33444, USA.
VQ9B/F, VQ9BP/F	via VQ9BP, PO Box 220, Mahe, Seychelles Is.
VQ9M/F, VQ9R/F	
VS6DM	G4BLV, 76 Woodville Drive, Pembroke Park, Southsea, Hants.
VS9MJ	via G3LQP, 56 Combe Rd, Tilehurst, Reading, Berks.
XF4YK	via XE1J, J. Levy, M Herrera 254, Box 200, Colima, Mexico.
XT2AE	via DJ9KR, Gartenstr 14, D-74 Tubingen, Germany.
ZD3U	via G3LQP (see VS9MJ).
ZF1FBI	via WA2FBI, 6 Howard Drive, Spring Valley, NY, 10977, USA.
ZF1KXJ	via WA0KXJ, 5200 Shriver Av, Des Moines, Iowa, 50312, USA.
3A2CP	via WA3HUP, 212 Clark St, Lemoyne, Pa, 17048, USA.
ex-5N2AAN	J. Manger, 19 Withcote Av, Leicester.
ex-5N2ABG	E. Lomax, 38 Regent Park Grove, Morecambe, LA4 4LB.
7Q7JD	J. Downey, PO Box 340, Lilongwe, Malawi.
ex-8P6DR	R. Limebear, 60 Willow Road, Enfield, Middlesex EN1 3NQ.
9M8JP	via WB6BGQ, 1049 Sheridan St, Vallejo, Calif, 94590, USA.
	RSGB QSL Bureau, G2MI, Bromley, Kent, BR2 7NH.

DXCC

Official Bulletin 444 from ARRL announces that with effect from 18 September the former listing of Germany is deleted. From that date there will be two new listings—the Federal Republic of Germany and the German Democratic Republic. West Berlin will count for the former and East Berlin the latter. DXCC credit applications may be made commencing 1 December.

September *QST* carried the latest DXCC Honour Roll in which were listed 18 UK stations: G5VT, G8KS and GW3AHN (320 countries): G3FKM, G3FXB, G4MJ (319); G2BOZ, GI3IVJ (318); G2BVN, G6TA (317); G3HCT, GI3JIM (315); G3DO (314); G6XL (313); G2FYT (312); and G3HDA (now VK6HD) and G3JEC (311).

Odds and ends

G3NQE, who has been inactive for a number of years previous to 4 September, believes that his callsign has been pirated on 160m.

G3ESP reports the arrival of QSLs from SP, OK and HA for contacts on cw allegedly having taken place in late 1972/early 1973. He is rarely on the air and in fact never uses cw.

Band reports

A particularly gratifying month for your scribe, who was delighted to receive more logs than of late. These included notes from several who have pointed out that 28MHz is far from dead, and G8MY and G3RFG in particular are making special studies of the band—the latter having submitted a log showing activity between 0900 and 2100.

Sunspot activity has been quite high and solar flares were observed around 8 September. The only period with no easily

visible spots (as reported by *West Coast DX Bulletin*) was from 12 to 16 September.

Very many thanks to the following for supplying the information for this section: G2s BOZ, CDT, HKU, G3DO, G3HB, G4RZ, G5JL, G6GH, G8MY, G3s AAE, GVV, KSH, LPS, NKQ, RFG, RHL, UOL, VBL, ZDF, ZUJ, ZZD, GM3DZB, GW4BLE, BRSs 17567, 25429, 31301, 34075, and As 7511, 7785, 8317, and 8446.

Stations listed in italics were using cw, the rest ssb.

1·8MHz. 0000 *W1HGT, YK1OK.*

3·5MHz. 0000 HZ1SH, KG4CB, *YK1OK.* **0200** HC2TU, 8P6AU. **0400** ZS6AWH, ZS6DW, 9Y4MH. **0500** OA4AGB, PYs. **0600** FP0SS, M1C, W5DS (Okla), WA0CPX (S Dak), XE1IIJ, ZL3, ZL4, DL2GG/6Y5. **2000** 5B4ES. **2200** EL7D, PYs, ZD7FT. **2300** EA6BZ, FP8DH.

7MHz. 0000 *PJ8NLO.* **0100** *W3JAK/MM* (nr HC8). **0200** *VP2VBU.* **0300** *FM7WU,* PJ2CW. **0400** *FG7AM.* **0500** CP1AA, *KL7UM, W6PAA, VA7WJ,* YVs, *ZF1KXJ, ZLs,* 5W1AU. **0600** *FY7YI/FG0,* HC2YL, HK0BKX, KG4AA, KS6DH, TI4LGU, *VE7ANJ, VKs,* XEs, XF4YK, ZLs. **0700** *VKs* and *ZLs.* **1900** HS4AGN, JA2EKX, ZD9GD. **2000** MP4BJS. **2100** FY7AL, JY3ZH. **2200** UK0AAB, XV5AC, *ZS3AK,* 3V8DM. **2300** *VK6GU, VP2SAH, VU2s QV, RQ, 9Y4VU.*

14MHz. 0600 CR5SP, KM6DF, 5W1AU. **0700** AX0CC, KB6CU, KH6s, KJ6BZ, KS6s CC, EM, KX6BU, ZK1DX, 5W1AA. **0800** KC4USV, KH6HDB/Kure, KJ6DI, K7SAD/KW6, VK9ZC, VK0WW (Macquarie Is), VR1AC, YJ8XX, 3D2s EK, EU, 5W1AN. **1000** *A35FX,* KH6s, KM6DZ. **1100** KH6s, YC3DX. **1200** *FC2CF,* JX4GN. **1400** XW8FQ, ZB2BL. **1500** HZ1SH, VS5LH, 9M8GP. **1600** A51PN, VK9MH (QSL to VK3RJ), VS6GA, VS9s MJ, MS, YK1OK, 9V1RN (G3PJA). **1700** OJ0AM, VK9ZC (Willis), 4S7DA, 9M8FDS. **1800** CR3KD. **1900** FP0II, HZ1TA, ZD7SD, 9G1GG. **2000** C31HF, VP2KM. **2100** *KL7MF, VKs,* VP8HZ, *ZLs,* 4W1BC. **2200** CE31F, VP8KF.

21MHz. 0900 A4FXJ (BFPO 66, London). **1000** VK9s GR, RY. **1100** CP6EB, KL7HDY, VP2SV, VP9CB, ZD7FT, ZD9GC. **1300** DU8BA, VQ9NEW, *4K1D.* **1400** XW8BP, 9M2DQ. **1500** FL8BH, KC4USP, 3V8DM. **1600** AP2ZR, EA9EJ, *FH8CY.* **1700** A6XP, TR8WR, VS5MC, W6/W7s, 3B6CF, 4W1BC, 5H3JL, 5U7AR. **1800** EA9ES, *TR8CQ,* VQ9MC, XT2AJ, 9U5CR. **1900** PJ9AVN, TJ1BG, W7HS (Utah), 5X5FS. **2000** VP8HA. **2100** CE3PY, CP8AB, PY0AA.

28MHz. 1000 VK6CT, 4Z4MJ. **1100** A4XFE, *FR7AX,* 9J2DT. **1200** 9G1AR. **1300** KP4USN. **1400** CR6s, ET3USE, VO1BT. **1500** A2CCY, JY3ZH, WB4OSX, ZSs, 5N2ABG, 5X5NK. **1600** EA9EJ, LUs, ZD7FT, 7Q7JD. **1700** CN8s, CX7BF, ELs, LUs, PYs, ZP5AR, 9H4L. **1800** EA8s, FY7AD, YVs, 8P6ES. **1900** CE3PY, KV4CI, LUs, PZs, YVs.

Very many thanks to all correspondents, and also to the authors of the following for items obtained from their publications: **NARS Newsletter** (*5N2ABG*), **Long Skip** (*Nick Sawchuk*), the **West Coast DX Bulletin** (*WA6AUD*), **DX' press** (*PA0INA/PA0TO*), **DX News Sheet** (*Geoff Watts*), the **29 DX Club Newsletter** (*George Allen*), and **World Radio News.**

Please send all items for **December** issue to reach G3FKM by **7 November,** and for **January** issue by **28 November.** Note that the latter date is early on account of Christmas and New Year holidays which fall while the issue is being printed.

Propagation Predictions

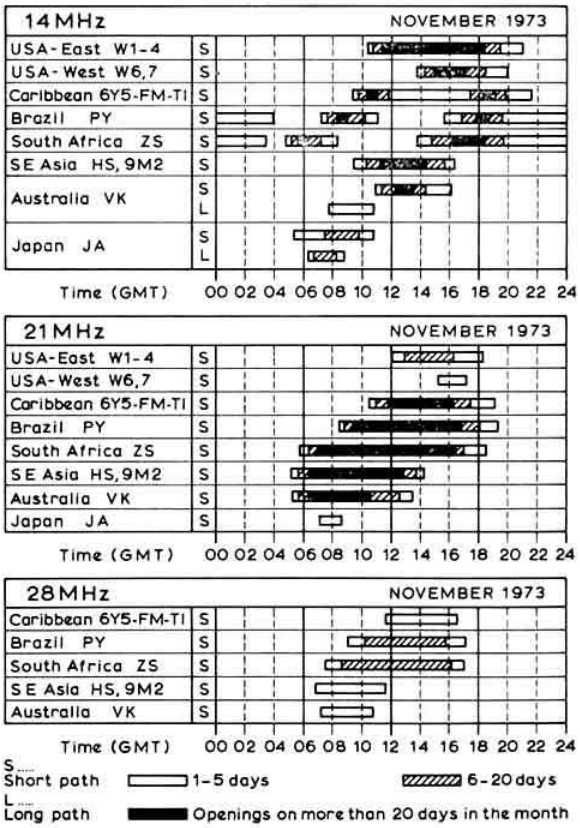
During November the highest F2 MUFs are recorded and conditions are therefore better, specially on the hf bands, than during the summer. Winter conditions on the other hand mean that 21 and 28MHz will close relatively early. There will be little opportunity for dx on these bands in the evening.

In spite of the favourable season there will be few possibilities of dx on **28MHz,** and this only on favourable days with above average MUFs, when there will be chances to reach Central and South America, Africa and South-East Asia and sometimes Australia.

Traffic with North America will be uncertain on **21MHz** and Japan will hardly be heard. DX traffic on this band will close between 1800 and 1900gmt and on **14MHz** it will close about 1930 to 2100gmt, perhaps a little later at the beginning of the month. Under exceptional conditions this band may remain open longer, especially to South America and Africa. The mid-winter conditions on this band favour dx traffic via the indirect path. Special mention is made of traffic with western North America in the afternoon, South America and East Asia before noon. There is a possibility of traffic with Hawaii via the direct path on **14MHz** on favourable days between 1630 and 1730gmt.

As **14MHz** closes so early, **7MHz** will become more important for dx traffic after 2000gmt. Decrease of atmospherics during the winter months favours dx traffic on **7** and **3·5MHz,** which should be possible when the greater part of the path lies in darkness. This condition is more important on **3·5MHz** than on **7MHz.** Local traffic will be interrupted repeatedly by the dead zone during the latter half of the night on **3·5MHz.**

The provisional sunspot number for September 1973 from the Swiss Federal Observatory was 60·8, showing an increase in solar activity compared with the previous month. During the first week of September the daily number exceeded 100 on four occasions. The predicted smoothed sunspot numbers for January, February and March 1974 are 28, 27 and 26 respectively.



NEWS FROM GM AND GW

VHF Convention and Region 13 ORM

Informality was the key feature of the Scottish VHF Convention and Region 13 ORM held at the Pollock Halls of Residence (Edinburgh University) on Saturday 22 September. By all accounts, the 180 or so who attended favoured the new venue and the new formula.

Talk-in facilities were provided by GM3BQA/A (2m) GM3HAM/A (4m) and GM4BYF (2m).

At the Zone G meeting held in the morning it was decided to award the Jock Kyle and Jack Wylie cups to GM3GUI and GM8HBE respectively. The presentations were later made by G3FZL and GM3AEL. Further presentations were made after the dinner to the Glenrothes ARC (Scottish NFD Trophy) and to GM3ZVB (for the best entry in the Constructional Competition which was judged by G3FZL).

The ORM provided an opportunity for G3FZL, G3GVV and GM3AEL to deal with a wide range of RSGB affairs.

The first purely vhf session then followed, with G3FZL outlining some band plan proposals—the RSGB proposals were supported by all but a handful of those present.

The main technical session was ably handled by GM8BJF who enlightened his audience about the use of ICs. To round off the lectures, GM8FFX and GM3VBB ran parallel sessions on the joys of portable activities and microwaves respectively.

It was an enjoyable day and, no doubt, GM3OWU and his Convention Committee will wish to repeat the performance in the future at the splendid QTH adjacent to the Commonwealth Games Pool. And why was it so successful? Simply because that indefinable quality—Amateur Spirit—which we can all recognize—was present in abundance.

Roll on the 1974 Convention!

Region 10 ORM

University College, Cardiff, was the venue for the Region 10 ORM which opened at 11am on Saturday 22 September with a trade show accommodated in the lecture room of the college. The massive display of components by J. Birkett must have encouraged those who have difficulty in obtaining items for home construction.

After lunch the business meeting was opened at 2.15pm by David Thomas, GW3RWX, the regional representative, who introduced the Executive Vice-President, George Jessop, G6JP. Council member Roy Stevens, G2BVN, then spoke on matters of Society involvement ranging from the present headquarters to the next world radio conference. After the zonal Council member, Cyril Parsons, GW8NP, had spoken on matters connected with membership and representation, the meeting was opened for questions. Interest from the 100+ members present was shown by questions concerning vhf band planning, UK country prefixes, licence conditions and tvi. The presence at the meeting of a group from the RSGB Interference Committee, comprising G3JIP, G3PAO and G3VUQ, enabled factual answers to be given.

Shortly after 5pm the botany lecture theatre of the college filled for the talk by Dud Charman, G6CJ, in the form of his unique lecture-demonstration on aerials, in which great interest was shown.

The meeting closed to enable members to attend the dinner held in a dining room of University College. This pleasant function concluded yet another ORM which, in the Region 10 tradition, was highly successful.

Great credit is due to the Region 10 organizing committee headed by GW8NP and GW3RWX, and our appreciation to the college authorities for the enjoyment of the excellent facilities.

Election of 1974 RSGB Council

Ballot forms for this election are being distributed to members of the Society with this issue of *Radio Communication*.

Personal details of the candidates

ORDINARY MEMBERS

R. J. Baker, G3USB
Member of the Society since 1964 (BRS). Licensed 1965. Member of VHF Contests Committee 1966–8. Member of Technical & Publications Committee since 1966. Member of IARU Working Group since January 1973. Member of VHF Committee since mid-1973. Former secretary of Cambridge ARC. Member of Pye Telecoms Amateur Radio Group. Mainly interested in vhf. Profession: product manager with Pye Ltd.

P. Balestrini, T Eng(CEI), MITE, MInstAM, G3BPT
Licensed 1948, ex VS1BT, served with Royal Signals, active on all bands, mainly interested in vhf. Member of the Exhibition and Mobile Committee, MPT Committee and chairman of Raynet Committee. Chairman of the British Amateur Radio Teleprinter Group. Has worked in the telecommunications field since 1950. Profession: assistant telecommunications manager for the Port of London Authority.

S. R. Boakes, G3HXN
SWL and experimenter since 1930. First licensed 1951. Member of RSGB since 1951. VHF main interest. Regular attender at mobile rallies for 15 years. Formerly design engineer and now product manager with Heath (Gloucester) Ltd.

D. Byrne, G3KPO (ex GC3KPO, G3DQW, G3PTC)
RSGB area representative. RAIBC representative. RAE tutor at Peterborough and Boston technical colleges. Founder and hon secretary of Wireless Preservation Society and curator of the Wireless Museum. Hon secretary of Peterborough Radio-Electronics Society for 12 years. Profession: assurance underwriter.

A. P. Foss, G8EAY
RSGB member since 1968. Licensed 1970. Deputy Representative for Region 7. Committee member (for five years) and chairman (for three years) of Barking Radio & Electronics Society. Active on 2m, in Raynet and contests. Profession: Post Office telecommunications engineer.

M. Hearsey, G8ATK
Member of RSGB since 1959. Licensed 1966. QSL manager CCF/ACF wireless network 1958–1968. Winner 1962 VHF Committee Cup 1970. Founder member Farnborough and District Radio Society; chairman 1967 and 1970, committee member 1968–9, president 1971. Secretary Racal ARC 1966–70. Member Racal Mobilcar Amateur Club. Active on 144MHz and 432MHz. Profession: engineer with Racal Ltd.

P. F. Jobson, G3HLF
Joined RSGB in 1949. Licensed 1951. Area representative Gravesend since 1949. Member of Interference Committee 1972–3. Member of RAF ARS and ARRL Old Timers Club. Active on hf bands, cw and ssb. Profession: television service engineer.

R. F. Stevens, G2BVN
AA licence 1937. Member of RSGB since 1940. Council member since 1962. President 1966. Now Chairman of Technical and Publications Committee, MPT Liaison Committee and IARU Working Group. Editor of several RSGB publications; member of editorial

panel of *Radio Communication*. Secretary IARU Region 1. Member UK delegation to 1971 Space Conference. Active 3·5 to 432MHz. Profession: surveyor.

ZONE F

W. F. McGonigle, GI3GXP
Interested in amateur radio since school days. Licensed 1950. Joined RSGB 1950. Member of Council since 1971. Member of Membership & Representation Committee. Founder member of Mid-Ulster RSGB Group. Member of Belfast RSGB Group and Bangor and District ARS. Active on hf and vhf. Profession: company director.

L. C. Waring, GI3WUO
Member of RSGB since 1967. Licensed 1967. Member (since 1966) and chairman (1973) of Bangor & District ARS. Active on hf bands but principally interested in 4m, 2m and 70cm and in portable equipment. Awarded PhD in 1971 for design of 3cm arrays. Profession: senior experimental officer, Queens University, Belfast.

COUNCIL PROCEEDINGS

A brief report of the Council meeting held on 3 September 1973

Present: *Dr J. A. Saxton (President, in the Chair), Messrs R. W. Fisher, W. J. Green, E. G. Ingram, G. R. Jessop, W. F. McGonigle, C. H. Parsons, J. R. Petty, W. A. Scarr, A. W. Smith, R. F. Stevens, G. M. C. Stone, F. C. Ward (members of Council), D. A Findlay (general manager), A. W. Hutchinson (editor).*

Apologies for absence had been received from Dr E. J. Allaway and Messrs B. D. A. Armstrong, J. O. Brown and R. J. Hughes.

Finance report
The Honorary Treasurer had provided a brief report on the financial results, subject to audit, for the year to 30 June 1973. The figures accompanying the report indicated that there would be a surplus in excess of £4,000 for the year. An estimate of income and expenditure for the year to 30 June 1974 had been provided and this indicated a modest surplus. Council expressed appreciation of the efforts of the Honorary Treasurer during the year.

President's ad hoc Committee
The President's ad hoc Committee had submitted a further report and made two recommendations in connection with the Society's organization which were discussed and will be further considered.

Membership and affiliation
It was resolved:

(*i*) to approve the applications for membership, transfer and reinstatements for July and accordingly elect 130 new members;
(*ii*) to accept reduced subscriptions from 31 members;
(*iii*) to waive the subscription for 1973-4 of 11 members on the grounds of blindness or other disability;
(*iv*) to grant affiliation to the Hereford Comprehensive School Amateur Radio Club, Grimsby; the John Smeaton High School Radio Club, Wetherby; and the ATV Amateur Radio Society, Birmingham.

Mr W. E. F. Corsham, G2UV
Council unanimously approved the proposal to invite Mr W. E. F. Corsham, G2UV, to be a Vice-President of the Society.

IARU Calendar June/July 1973
Proposal No 134. ARRL has submitted for consideration by IARU member societies a proposal that five- and six-band "Worked All Continents" awards be established in the interests of stimulating operation on the high-frequency bands throughout the world.

IARU headquarters asked for guidance, in the event that the proposal is adopted, on the following points:

(1) Shall all of the rules of the WAC Award apply, where appropriate, to the 5BWAC and 6BWAC?
(2) Shall there be an effective date after which contacts must be made to be eligible for the award or shall all contacts count, regardless of date?

It was agreed that RSGB would cast an "aye" vote but would comment that (a) it is felt that the WAC General Rule 4—25-mile location—should be amended to allow contacts from any call area and (b) to encourage operation, contacts after January 1974 only should be acceptable.

Proposal No 135. The Japan Amateur Radio League has submitted for consideration by IARU societies a proposal that future amateur satellites using the 144 and 430MHz bands operate within the sub-bands 144-144·1 and 435-438MHz.

IARU headquarters had advised against this proposal and Mr Stone, as VHF Manager, explained the points that had been set out in the Calendar. Council agreed to cast a "No" vote in this matter.

IARU Region 1 VHF Managers Conference
Copies of two papers for discussion in connection with the 2m band plan and the 70cm band plan had been circulated to Council for information. In addition to these papers, Mr Stone, as VHF Manager, said that he had submitted agenda items on microwave contests and means of instigating interest in the shf bands.

Mr Jessop said that he objected to the suggested 2m band plan as he did not feel that it was necessary to have simplex channels in addition to repeater channels. Mr Stone explained that the paper was dealing with modifications to the IARU 2m band plan as agreed at Scheveningen in May 1972 and not with the UK band plan. The UK band plan would be amended later.

With regard to the 70cm band plan, some additional amendments have now proved necessary. In particular it was necessary to change the beacon sub-band so that interference would not be caused to e-m-e work.

In addition, it was necessary to consider an alternative scheme for repeater frequencies so that there would be no interference with amateur television operation.

Council approved the attendance of Mr Stone at the IARU Region 1 VHF Managers Conference in Germany on 13-14 October. Mr Stevens advised Council that he would also be attending this meeting.

Founders Trophy
It was agreed unanimously that Mr R. G. Flavell, G3LTP, be awarded the Founders Trophy.

Committee minutes and recommendations
Council received the minutes of the following committee meetings: Finance and Staff (27.4.73, 5.7.73 and 17.7.73), MPT Liaison (3.5.73 and 26.7.73), Scientific Studies (21.5.73 and 30.7.73), Technical and Publications (5.6.73 and 7.8.73), Mobile and Exhibition (6.6.73, 10.7.73 and 31.7.73), VHF (27.6.73 and 15.8.73), Raynet (28.4.73), HF Contests (10.5.73), Interference (8.6.73 and 20.7.73), Education (9.6.73 and 26.7.73), VHF Contests (25.6.73), M & R (9.7.73).

MPT Liaison Committee (26.7.73)—Council noted that the meeting with the representative of the MPT had not had a satisfactory outcome.

Mobile and Exhibition (31.7.73)—It was reported that sales of publications at the Woburn Rally had amounted to approximately £430.

Technical and Publications Committee (7.8.73)—Council accepted the recommendations for the following awards:
Bevan Swift Memorial Prize: Messrs P. Thornton, GM3PKV, and the late W. H. Allen, G2UJ,
Courteney Price Trophy: Pye Telecommunications Amateur Radio Group.
Wortley-Talbot Trophy: Mr L. Moxon, G6XN.
Ostermeyer Trophy: Mr J. R. Hey, G3TDZ.

There was no recommendation for the award of the Pilot Officer Norman Keith Adams Prize.

VHF Committee (15.8.73)—Council accepted the recommendation that Mr R. J. Baker, G3USB, be co-opted to the VHF Committee.

Region 7 ORM, 6 October 1973
It was agreed that Mr Stevens would represent Council at this meeting.

Repeaters
Mr Stone reported that a request for a licence for a second UK repeater located in South Wales to cover the Bristol Channel area had been submitted to MPT.

CONTEST NEWS

RSGB Diamond Jubilee HF Contests results

The RSGB Diamond Jubilee HF Contests proved to be very popular and enjoyed good support from the membership. There were 133 acceptable entries for the telephony contest and 104 for the cw contest, while the receiving contest had 19 telephony and two cw entries.

In the telephony contest, held on 12–13 May, conditions were such that the main activity was on the 3·5MHz band, for which 131 logs were received. There were 56 logs for 7MHz, 44 for 1·8MHz, and 62 logs spread over the other three bands. An analysis of the entries for 3·5MHz showed there were more than 1,250 stations active during the contest.

The cw contest, held on 19–20 May, followed the same pattern with exactly 100 logs for the 3·5MHz, 62 for the 7MHz and 38 for the 1·8MHz bands. The three hf bands had only 24 logs between them. Activity was not so great, there being about 550 stations active on 3·5MHz during the two days.

The BOAC economy-class return ticket for the winner of the telephony contest goes to Mr G. Beasley, G3LNS, of Stratford-on-Avon; second was Mr W. R. Steverson, G3JEQ, of Leatherhead, Surrey; while Mr D. A. R. Poulter, G3WHK, of Morden, Surrey, took third place.

The winner of a similar BOAC return ticket for the cw contest was Mr R. J. Parsons, G3RBP, of Reading, Berks; second was Mr D. E. Alexander, G3KLH, also from Reading; with Mr G. Beasley, G3LNS, third.

The special award for the telephony receiving contest goes to Mr R. A. Treacher, BRS32525, of Eltham, London SE9. The runner-up was Mr J. Fitzgerald, BRS33823, of Great Missenden, Bucks; while Mr R. W. Thomas, BRS15822, of Clapton, London E5, was third.

The cw receiving contest special award goes to Mr R. W. Thomas, BRS15822, who beat Mr W. B. Taunton, BRS33442, of Gravesend, Kent, the only other entrant.

Normally, less than 10 per cent of contestants make any comments. However, this time members of the HF Contests Committee were very pleased to see that more than half the entrants had something to say. There were three critical comments, 10 constructive and 95 expressing satisfaction one way or another. There were a considerable number of requests for a similar event next year. All the comments will be duly noted by the committee and they wish to thank all those who expressed their appreciation of their work in checking the entries.

There were over 550 logs received with over 21,000 entries listed in the telephony contest and 13,000 in the cw contest. The vast majority of the logs were very good and easy to read. There were the usual few that gave a lot of trouble, mainly due to bad handwriting and also not keeping entries directly under each other. The writing was so small on one entry that a magnifier had to be used. In the telephony contest there were very many duplicate contacts for which points had been claimed, whereas in the cw contest they were almost non-existant.

Many points were deducted in the receiving contest for wrong callsigns of stations heard. It is realized that the listener cannot ask for a repeat, so perhaps the transmitting station could help by using phonetics when giving his callsign.

The HF Contests Committee is very pleased to acknowledge check-logs from GB2SM, G3HHR, G3KPJ/P, G3NAF/A and G4-BWP for the telephony contest, and from G3VFI for the cw contest.

CW CONTEST, TRANSMITTING

Posn	Callsign	Points in each band 1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Total
1	G3RBP	243	854	184	—	—	3	1,284
2	G3KLH	225	821	138	—	—	—	1,184
3	G3LNS	—	956	143	10	12	12	1,133
4	G3JEQ	207	705	161	3	3	3	1,082
5	GW3NJW	—	736	244	—	—	—	980
6	G3ABG	178	725	57	—	—	—	960
7	G3NYY	—	901	—	—	—	—	901
8	G3NOH	90	656	149	—	—	—	895
9	G3XTJ	221	528	129	—	—	—	878
10	G3KKQ	156	603	111	—	—	—	870
11	G3GOX	111	564	121	—	—	—	796
12	G3RSF	103	582	69	—	—	—	754
13	GI3GTR	—	407	288	—	—	—	695
14	G4ALG	—	666	—	—	—	—	666
15	GM3KHH	96	363	205	—	—	—	664
16	G3KDB	—	579	70	6	3	3	661
17	GW3SYL	93	481	81	—	—	—	655
18	GM3CFS	—	325	325	—	—	—	650
19	G3RZI	84	504	39	6	3	3	639
20	G3KSH	60	510	42	—	—	3	615
21	G3HGJ	48	426	120	—	—	—	594
22	G4BUO	120	432	—	—	—	3	555
23	G4BXN	87	418	39	—	—	—	544
24	G3WSL	—	541	—	—	—	—	541
25	GM3PIP	—	329	205	—	—	—	534
26	G3NEO	30	462	24	—	—	—	516
27	GW3INW	—	457	46	—	—	—	503
28	G3NKS	—	423	45	—	—	—	468
29	G3PHW	—	423	39	—	—	—	462
30	G4BWP	55	402	3	—	—	—	460
31	G3JVJ	30	367	61	—	—	—	458
32	G3GNS	—	448	—	—	—	—	448
33	G4AMH	222	132	88	—	—	—	442
34	G3MWP	—	338	99	—	—	—	437
35	G5PQ	—	406	9	—	—	—	415
36	G3YRW	102	276	31	—	—	—	409
37	G8KU	—	329	45	—	—	—	374
38	G2BCI	90	252	24	—	—	—	366
	G8HX	—	353	13	—	—	—	366
40	G3SKC	259	102	3	—	—	—	364
41	G3XSC	354	—	—	—	—	—	354
42	G6JJ	—	282	51	—	—	—	333
43	G3HZL	84	105	117	—	—	24	330
44	G3TPJ	39	223	49	—	—	—	311
45	G3UFY	99	156	51	—	—	—	306
46	G2BTO	24	237	36	—	—	—	297
	G3LCS	—	297	—	—	—	—	297
	G6GH	—	297	—	—	—	—	297
49	G3PKS	—	273	21	—	—	—	294
50	G3GXQ	—	293	—	—	—	—	293
51	G3TBK	—	271	6	—	—	—	277
52	G3HQX	48	206	22	—	—	—	276
53	G3DOT	85	180	—	—	—	—	265
54	G3IMK	—	150	111	—	—	—	261
55	G6HD	39	153	45	3	—	3	243
56	G3ZDW	—	239	—	—	—	—	239
57	GI2FHN	—	181	51	—	—	—	232
58	G2ATU	—	225	6	—	—	—	231
	G3NOM	—	231	—	—	—	—	231
60	G3BTO	144	81	—	—	—	—	225
61	G4BDQ	223	—	—	—	—	—	223
62	G3GDW	—	213	3	—	—	—	216
63	GW3MPB	—	195	18	—	—	—	213
64	G2BOZ	—	196	—	3	3	6	208
65	G3EBH	—	207	—	—	—	—	207
66	G6NK	—	193	13	—	—	—	206
67	G3ZOD	—	201	—	—	—	—	201
68	G3SVD	—	69	117	—	—	—	186
69	G3IUY	—	173	9	—	—	—	182
70	G3NPM	—	174	6	—	—	—	180
71	G2QT	—	177	—	—	—	—	177
72	G3YVR	—	159	6	—	—	—	165
73	G3KWH	—	160	3	—	—	—	163
	GM3YOR	—	120	43	—	—	—	163
75	G3ZZD	—	162	—	—	—	—	162
	G4BSS	—	162	—	—	—	—	162
77	G3VDL	—	159	—	—	—	—	159
78	G4BLR	—	153	—	—	—	—	153
	G8QZ	—	153	—	—	—	—	153
80	G3SAZ	24	117	6	—	—	—	147
	G3VQO	—	147	—	—	—	—	147
82	G3UVS	6	140	—	—	—	—	146
83	G3HCT	—	120	6	3	3	9	141
84	GM3YBQ	—	135	—	—	—	—	135
85	G3FKM	—	132	—	—	—	—	132
86	G3IQF	—	96	35	—	—	—	131
87	G3UZD	—	130	—	—	—	—	130
88	G3KPJ	—	123	—	—	—	—	123
89	G3LHN	120	—	—	—	—	—	120
	GW3JI	—	120	—	—	—	—	120
91	G5AOZ	—	113	—	—	—	—	113
92	G4AKA	60	—	51	—	—	—	111
	GM4ACM	—	111	—	—	—	—	111
94	G3MGL	—	108	—	—	—	—	108
95	G3RUG	—	107	—	—	—	—	107
96	G2YS	—	102	3	—	—	—	105
	GC3YIZ	—	105	—	—	—	—	105
98	GM3NEC	—	102	—	—	—	—	102
99	G3LXP	—	101	—	—	—	—	101
	G4AVY	—	79	22	—	—	—	101
101	G2HKU	—	94	—	—	—	—	94
102	G3WVJ	25	68	—	—	—	—	93
103	G3YCT	—	91	—	—	—	—	91
	G3ZNH	—	91	—	—	—	—	91

The following entries were not accepted: G3CWL, G3VDF, G4BKI—General Rule 8(f); G3KDP—Contest Rule 7(b).

TELEPHONY CONTEST, TRANSMITTING

Points in each band

Posn	Callsign	1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Total
1	G3LNS	—	1,764	75	57	48	36	1,980
2	G3JEQ	202	1,272	25	3	3	3	1,508
3	G3WHK	48	1,300	79	9	12	9	1,457
4	G2FNK	92	1,275	57	—	—	—	1,424
5	G4BLX	93	1,195	24	12	12	15	1,351
6	G4AMT	—	981	183	—	—	—	1,164
7	G3NIE	33	1,087	—	—	—	—	1,120
8	G4ASR	3	1,048	48	6	6	3	1,114
9	G4ALG	48	1,018	—	—	—	—	1,066
10	G4ARX	75	913	15	—	—	—	1,003
11	G3ZMD	—	917	21	—	1	15	954
12	G3JBU	—	952	—	—	—	—	952
13	GM3UWO	—	782	120	—	—	—	902
14	G4CDN	54	834	9	—	—	—	897
15	G3NOH	97	754	21	—	—	—	872
16	G3ZUE	—	828	—	—	—	33	861
17	G4ASB	37	806	—	—	—	—	843
18	G3DWQ	151	673	9	—	—	—	833
19	GC3YIZ	105	667	54	—	—	—	826
20	G3JVJ	30	784	—	—	—	3	817
21	G4ATK	150	649	—	3	3	—	805
22	G4ANS	—	786	—	—	—	—	786
23	G3XYP	—	751	13	9	6	3	782
24	G3HCT	6	614	24	30	27	39	740
25	G3UML	—	667	24	24	9	9	733
26	GM3KHH	25	526	174	—	—	—	725
27	G3SEM	—	708	6	—	—	—	714
28	G4BFV	—	705	—	—	—	—	705
29	G4BSS	—	655	9	6	6	6	682
30	G3ZOJ	—	678	—	—	—	—	678
31	GM3PIP	—	616	55	—	—	—	671
32	GW4BIQ	—	664	—	—	—	—	664
33	G4CCZ	15	621	12	—	—	—	648
34	G4ADF	—	635	18	—	—	—	643
35	GM3MQO	—	586	51	—	—	—	637
36	G3UOL	—	578	36	3	3	—	620
37	G4BWU	—	549	—	—	—	—	549
38	G3WSL	—	544	—	—	—	—	544
39	G3ZDW	—	494	24	6	6	3	533
40	G4ADM	180	310	12	9	12	9	532
41	G3LHJ	76	379	70	—	—	—	525
	G3RGA	134	381	—	—	—	—	525
43	G3UAS	—	496	6	—	—	—	502
44	GI3ZSC	—	426	75	—	—	—	501
45	G3UFY	100	348	3	—	—	42	493
46	G3ZFE	—	492	—	—	—	—	492
47	G3KWH	—	438	24	—	—	—	462
48	G3UZD	—	438	15	—	—	—	453
49	G3NKS	—	445	3	—	—	3	451
50	G3IUV	—	450	—	—	—	—	450
51	G3YPN	—	445	—	—	—	—	445
52	G3VQO	—	424	15	—	—	—	439
53	G3YFF	15	354	25	—	—	24	418
	GM3YOR	75	343	—	—	—	—	418
55	GW3SUH	—	414	—	—	—	—	414
56	G3HZL	69	309	6	—	—	27	411
57	G3ABG	—	408	0	—	—	—	408
	G3WNS	—	402	6	—	—	—	408
	G8TK	27	378	3	—	—	—	408
	GW3ZQN	—	408	—	—	—	—	408
61	G3TIW	—	401	—	—	—	—	401
62	G2AVC	9	367	21	—	—	3	400
63	G3VFI	72	318	—	—	—	—	390
64	G5BBP	—	369	6	—	—	—	375
	GW4BLE	—	354	21	—	—	—	375
66	G2BOZ	—	349	—	—	12	9	370
67	G3KRT	—	333	27	—	—	—	360
68	G3TLI	—	339	—	—	—	—	339
	G4ASX	—	330	9	—	—	—	339
70	G8KU	—	334	—	—	—	—	334
71	G4AWM	3	228	64	—	—	36	331
72	G3WMM	—	327	—	—	—	—	327
73	G3PHW	—	307	13	—	—	—	320
74	G3XSC	317	—	—	—	—	—	317
75	G3DOT	100	216	—	—	—	—	316
76	G4AET	—	315	—	—	—	—	315
77	G4APL	—	249	6	—	3	51	309
78	G3OBX	—	282	18	—	—	—	300
79	GD3YUM	—	298	—	—	—	—	298
80	G3YOL	—	291	—	—	—	—	291
81	G3LXP	19	271	—	—	—	—	290
82	G4ANU	—	289	—	—	—	—	289
83	G4BPR	—	288	—	—	—	—	288
84	G2BTO	33	249	—	—	—	—	282
85	G3KZN	—	277	—	—	—	—	277
86	G3NYY	—	267	—	—	—	—	267
	G3SAZ	27	240	—	—	—	—	267
	G3SWX	—	267	—	—	—	—	267
89	G3ZXA	27	223	12	—	—	—	262
90	G4BSC	36	210	—	—	—	—	246
91	G3ZPB	—	237	—	—	—	—	237

Points in each band

Posn	Callsign	1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Total
92	G3AFC	—	231	—	—	—	—	231
93	G3TQF	—	222	—	—	—	—	222
94	G3OHC	—	216	—	—	—	—	216
	G3XUS	21	195	—	—	—	—	216
96	G2ATU	—	213	—	—	—	—	213
97	G4BLI	—	210	—	—	—	—	210
	GM3NEC	—	210	—	—	—	—	210
99	G3VLX	—	201	—	—	—	—	201
100	G3HLF	—	192	—	—	—	—	192
101	G4BYN	—	171	—	6	4	4	185
102	G3NOM	—	180	—	—	—	—	180
103	G4AMH	55	84	12	—	10	12	173
104	G3NBJ	—	172	—	—	—	—	172
105	GW4BNJ	—	171	—	—	—	—	171
106	G3HQU	—	168	—	—	—	—	168
	G3HUT	—	168	—	—	—	—	168
108	G3WYN	—	156	—	—	—	—	156
109	G3SKC	27	127	—	—	—	—	154
110	G3RZI	3	111	9	9	9	9	150
111	G3ZJW	—	148	—	—	—	—	148
112	G3TR	—	—	—	—	—	141	141
113	G4AVY	—	127	—	—	—	—	127
114	G2QT	—	126	—	—	—	—	126
115	G3WDI	—	114	—	—	—	6	120
	G3WVF	—	120	—	—	—	—	120
117	G3ZNH	—	118	—	—	—	—	118
118	G3YRW	0	87	21	—	—	9	117
119	G3MGL	—	114	—	—	—	—	114
120	G3IQF	3	99	—	—	—	9	111
	GI3GTR	—	111	—	—	—	—	111
122	G2HKU	—	108	—	—	—	—	108
	G3BLE	—	42	66	—	—	—	108
	G3YJI	—	108	—	—	—	—	108
125	GW3TOB	—	106	—	—	—	—	106
126	G3WET	—	102	—	—	—	—	102
	G4AGE	—	102	—	—	—	—	102
	GM3IBU	27	12	63	—	—	—	102
	GM4BAE	—	102	—	—	—	—	102
130	G3FKM	—	90	3	—	—	7	100
131	G3NXC	—	99		—	—	—	99
132	G2FLG	—	90	—	—	—	—	90
133	GM4AQO	13	73	—	—	—	—	86

The following entries were not accepted: G3BOC, G3WJN, G4BKI—General Rule 8(f); G4BBA, GM5ATZ—General Rule 8(g); G3OIB, G3TBK—General Rule 11(e).

CW CONTEST, RECEIVING

Points in each band

Posn	Station	1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Total
1	BRS15822	114	657	99	—	—	—	870
2	BRS33442	—	480	48	—	—	3	531

TELEPHONY CONTEST, RECEIVING

Points in each band

Posn	Station	1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Total
1	BRS32525	90	1,286	33	—	—	—	1,409
2	BRS33823	141	1,025	45	—	—	21	1,232
3	BRS15822	60	1,053	60	—	—	—	1,173
4	BRS33923	—	1,002	—	—	—	—	1,002
5	BRS28005	—	928	—	—	—	—	928
6	BRS19682	—	859	—	—	—	—	859
7	BRS18461	—	796	—	—	—	—	796
8	A8374	18	732	—	—	—	—	750
9	A8299	—	708	—	—	—	—	708
10	BRS33794	—	698	—	—	—	—	698
11	BRS20249	21	573	3	—	—	—	597
12	A8211	33	558	—	—	—	—	591
13	BRS27880	18	507	18	—	—	—	543
14	A6098	—	507	—	—	—	—	507
15	A7511	—	461	—	—	—	—	461
16	BRS34191	45	277	15	6	—	—	343
17	A8203	—	276	15	—	—	—	291
18	BRS34303	—	185	—	—	—	—	185
19	BRS33830	33	126	—	—	—	—	159

The following entries were not accepted: A8281—General Rule 8(g); A8336; General Rule 8(g) and Contest Rule 4; A8015, General Rule 8(g) and General Rule 4.
An entry by BRS34187 was accepted as a check-log.

The following winners of the eight airport visit prizes offered by British Airways were chosen by ballot after the Diamond Jubilee Dinner which followed the Region 7 ORM on 6 October:

CW Contests R. J. Denny, G6NK; W. E. Roberts, G3GXQ; V. W. Higgs, G3WVJ, and G. C. Newby, G3EBH.

Phone Contest J. G. Jackson, G3HQU; A. E. Nicholas, G3ZUE; R. A. Fowler, G3IQF and G. K. Oleson, GM3MQO.

SUMMARY OF RESULTS

TELEPHONY CONTEST, TRANSMITTING

Band leaders and runners-up awarded certificates

Band	Posn	Callsign	Points	Posn	Callsign	Points
1·8MHz	1	G3XSC	317	2	G3JEQ	202
3·5MHz	1	G3LNS	1,764	2	G3WHK	1,300
7MHz	1	G4AMT	183	2	GM3KHH	174
14MHz	1	G3LNS	57	2	G3HCT	30
21MHz	1	G3LNS	48	2	G3HCT	27
28MHz	1	G3TR	141	2	G4APL	51

British Isles country leaders awarded certificates

Country	Callsign	Points	Country	Callsign	Points
GC	GC3YIZ*	826	GW	GW4BIQ	664
GD	GD3YUM*	298		GW3SUH	414
				GW3ZQN	408
GI	GI3ZSC	501			
	GI3GTR†	111	G	G3LNS	1,980
				G3JEQ	1,508
GM	GM3UWO	902		G3WHK	1,457
	GM3KHH	725			
	GM3PIP	671			

CW CONTEST, TRANSMITTING

Band leaders and runners-up awarded certificates

Band	Posn	Callsign	Points	Posn	Callsign	Points
1·8MHz	1	G3XSC	354	2	G3SKC	259
3·5MHz	1	G3LNS	956	2	G3NYY	901
7MHz	1	GM3CFS	325	2	GI3GTR	288
14MHz	1	G3LNS	10	2	G3KDB	6
					G3RZI	6
					G2BOZ	3
					G3HCT	3
21MHz	1	G3LNS	12	2	G3JEQ	3
					G3KDB	3
					G3RZI	3
28MHz	1	G3HZL	24	2	G3LNS	12

British Isles country leaders awarded certificates

Country	Callsign	Points	Country	Callsign	Points
GC	GC3YIZ*	105	GW	GW3NJW	980
GD	(no entries)			GW3SYL	655
				GW3INW	503
GI	GI3GTR	695			
	GI2FHN†	232	G	G3RBP	1,284
				G3KLH	1,184
GM	GM3KHH	664		G3LNS	1,133
	GM3CFS	650			
	GM3PIP	534			

TELEPHONY CONTEST, RECEIVING

Band leaders awarded certificates

Band	Station	Points	Band	Station	Points
1·8MHz	BRS33823	141	3·5MHz	BRS32525	1,286
7MHz	BRS15822	60	14MHz	BRS34191	6
21MHz	None		28MHz	BRS33823	21

Winner: BRS32525, 1,409 points—Special award
Runner-up: BRS33823, 1,232 points—Certificate
Third: BRS15822, 1,173 points—Certificate

CW CONTEST, RECEIVING

Band leaders awarded certificates

Band	Station	Points	Band	Station	Points
1·8MHz	BRS15822	114	3·5MHz	BRS15822	657
7MHz	BRS15822	99	14MHz	None	
21MHz	None		28MHz	BRS33442	3

Winner: BRS15822, 870 points—Special award
Runner-up: BRS33442, 531 points—Certificate

* Only entry † Only two entries.

BERU 1973

The BERU 1973 tabulation on page 710 of the October issue of *Radio Communication* should show the award of certificates to the following:

G3LPS Leading UK station 7MHz.
G3PVA Leading UK station 14MHz.
G8KU Leading UK station 21MHz.

An Australian amateur has kindly offered to present engraved medallions to the leading and middle-placed VK stations in BERU 1973 and these will be awarded to VK3XB and VK6RV respectively.

Discussions are taking place with the view to making similar awards to all Commonwealth areas in future BERU contests.

RSGB Diamond Jubilee VHF/UHF Contest results

Despite poor conditions, the RSGB Diamond Jubilee VHF/UHF Contest attracted a total of 85 entries from all RSGB zones, and an unusually large volume of comment from participants. The results are tabulated zone by zone, and show that the optimum band usage appeared to vary according to location. Nobody outside southern England admitted to attempting to use 1,296MHz, and reliance on 432MHz decreased considerably in the north, so that GM8FFX/P had no need to stray from 2m in order to lead the Scottish contingent.

The rules on allocation of serial numbers were somewhat ambiguous, but some entrants found that the use of a single sequence was helpful in avoiding confusion between teams of operators on different bands. In view of the overwhelmingly favourable comment on this new type of contest, the VHF Contests Committee is considering repeating it next year. Meanwhile, would-be strategists may peruse the results tables with slide-rules or pocket calculators in hand, but before planning expeditions to the areas in which the scores were lowest this year, remember that points are less easily gained from Northern Ireland or Scotland than from the Home Counties or the Welsh Marches.

Certificates will be awarded to the leading stations in each zone, and to the runners-up in Zones A, B, C and D, for which more than 10 entries were received. The listeners' section was won by Terry Cooper, BRS28005, though competition from the rising generation is increasing. An award will be made to the leading swl in each zone, and BRS28005 will retain the Hanson Trophy.

G5HD, G8ACJ, G3VIR, G3SEK.

ZONE A—NORTH

Posn	Callsign	Points in each band 70MHz	144MHz	432MHz	1,296MHz	Total
1	G3NJN/P	628	620	135	—	1,383
2	G2SU/P	212	781	350	—	1,343
3	G8FIS/P	—	1,312	—	—	1,312
4	G3NHE	344	549	410	—	1,303
5	G4BTS/P	404	425	—	—	829
6	GD8EXI/P	—	797	—	—	797
7	G3KUE/P	120	623	—	—	743
8	GD2HDZ	148	185	185	—	518
9	G8BXF/P	—	287	—	—	287
10	G3KRG/A	—	108	—	—	108
11	G8EEM/P	—	102	—	—	102
12	G4BSC	—	52	—	—	52

ZONE B—MIDLANDS

Posn	Callsign	Points in each band 70MHz	144MHz	432MHz	1,296MHz	Total
1	G3LRS/P	396	1,037	525	—	1,958
2	G3XDY	—	780	—	—	780
3	G3XBY	—	773	—	—	773
4	G4BRT	238	503	—	—	741
5	G4CAR/P	—	672	—	—	672
6	G3ZHV	—	599	15	—	614
7	G8BMP	—	267	205	—	472
8	G3USF	—	410	—	—	410
9	G3MQV/P	—	128	105	—	233
10	G3VPR/P	14	140	—	—	154
11	G4BXL	—	81	—	—	81

ZONE C—EAST AND LONDON

Posn	Callsign	Points in each band 70MHz	144MHz	432MHz	1,296MHz	Total
1	G4ARD/P	388	960	690	742	2,780
2	G3VCP/P	450	690	570	—	1,710
3	G4AJC/P	196	921	385	3	1,505
4	G3ISO/P	392	512	510	—	1,414
5	G8GCP/P	—	764	505	—	1,269
6	G3WGC/P	—	314	485	426	1,225
7	G8CUT	—	693	395	—	1,088
8	G4ARN/P	—	1,066	—	—	1,066
9	G3WOS/P	492	173	215	122	1,002
10	G4ALN/P	162	164	425	226	977
11	G2RD	—	93	425	393	913
12	G4ASR	216	537	—	—	753
13	G4ALE/P	142	395	140	3	680
14	G3WHK	—	572	—	—	572
15	G8FAT	—	570	—	—	570
16	G2FJA/P	0	188	360	—	548
17	G4APL	—	519	—	—	519
18	G4BEG	380	—	—	—	380
19	G3LXP	140	68	125	—	333
20	G3PGN	328	—	—	—	328
21	G6HD	298	—	—	—	298
22	G3WOA/P	—	252	—	—	252

Posn	Callsign	Points in each band 70MHz	144MHz	432MHz	1,296MHz	Total
23	G3YQW	156	6	—	—	162
24	G8HAS/P	—	142	—	—	142
25	G8FCV/A	—	75	65	—	140
26	G8FUR	—	121	—	—	121
27	G2AVC	20	78	—	—	98
28	G8GXA	—	85	—	—	85
29	G8GBN	—	58	—	—	58
30	G8HBA	—	56	—	—	56
31	G8GED	—	39	—	—	39

ZONE D—SOUTH AND WEST

Posn	Callsign	Points in each band 70MHz	144MHz	432MHz	1,296MHz	Total
1	G3FEC/P	246	601	435	220	1,502
2	G3SOU/P	—	0	670	801	1,471
3	G3SDS/P	504	231	200	393	1,328
4	G3MOT	324	833	130	—	1,287
5	G4APJ/P	—	1,272	—	—	1,272
6	G8GGH/P	—	243	845	—	1,088
7	G8CIB/P	—	711	—	—	711
8	G3YXZ/P	130	161	400	—	691
9	G8FEV	—	531	115	—	646
10	G8ANZ/P	—	—	295	284	579
11	G8DCA	—	471	—	—	471
12	G8CUB/P	—	400	—	—	400
13	G3VOB/P	20	346	—	—	366
14	G8DJW/P	—	362	—	—	362
15	G5AOZ/P	—	323	—	—	323
16	G8HHI/P	—	277	—	—	277
17	G8BKR	—	249	—	—	249
18	G3RJH	—	209	—	—	209
19	GC3YIZ	—	29	—	—	29

ZONE E—WALES

Posn	Callsign	Points in each band 70MHz	144MHz	432MHz	1,296MHz	Total
1	GW3ORL/P	734	1,514	1,435	—	3,683
2	GW3ONP/P	344	1,560	1,095	—	2,999
3	GW3WAS/P	522	1,603	—	—	2,125
4	GW8FBI/P	—	1,180	390	—	1,570
5	GW8COP/P	—	848	80	—	928
6	GW8FZC/A	—	132	—	—	132

ZONE F—NORTHERN IRELAND

Posn	Callsign	Points in each band 70MHz	144MHz	432MHz	1,296MHz	Total
1	GI8AYZ/P	—	589	110	—	699
2	GI8BOA/P	—	188	—	—	188

ZONE G—SCOTLAND

Posn	Callsign	Points in each band 70MHz	144MHz	432MHz	1,296MHz	Total
1	GM8FFX/P	—	1,027	—	—	1,027
2	GM4AOR/P	82	694	—	—	776
3	GM3YOR/P	—	430	—	—	430
4	GM4BDJ/P	—	391	—	—	391

LISTENERS

Posn	Number	Zone	Points in each band 70MHz	144MHz	432MHz	Total
1	BRS28005	C	—	553	—	553
2	A7683	B	—	299	80	379
3	A7866	B	48	241	—	330
4	BRS33794	D	80	159	—	239
	BRS33823	D	100	139	—	239
6	A8324	C	62	110	—	172
7	BRS31038	E	—	91	—	91
8	A7700	A	—	84	—	84
9	A8284	B	—	42	—	42

August 144MHz QRP Contest results

As requested, this contest was inserted into the vhf contests calender, and the results and comments point to an annual QRP contest during the summer months, especially with portable and ssb transistor equipment.

The use of ssb, even at QRP, produced the points and dx with good propagation on a N-S path. There appears to have been trouble from QRP ssb stations and a lack of ssb activity due to stations preparing for the contest on the following day.

Only four portable stations used valve transmitters, and of the 14 fixed stations, eight used valve transmitters, the valves no doubt run at reduced ht on the final.

F.M.

FIXED SECTION

Posn	Callsign	Points	QSOs	Cnty	Best DX	Km
1	G8CKZ	224	36	HE	GM8DMZ/P	475
2	G4BWW	144	22	LE	G8ECK/P	320
3	G8FWB	91	19	HE	G8DML/P	385
4	G3NEO	78	20	YS	G8DMZ/P	273
	G4AJE	78	11	NR	GM3NAS/P	370
6	G4ANS	77	17	NM	F6BQH/P	295
7	G3WHK	42	20	SY	GW3ONP/P	227
8	G8FCB	35	15	NM	G4ALE/P	198
	G3XEB	35	13	HF	G8ASG	153
10	G3WXO	27	5	BS	GM8DMZ/P	380
11	G8FMK	23	13	OX	G3UPF/P	175
12	G8CCH	14	4	HE	G3XBM/P	151
13	G8DLQ	8	8	KT	—	—
14	G3JKY	1	1	KT	—	—

PORTABLE SECTION

Posn	Callsign	Points	QSOs	Cnty	Best DX	Km
1	G8DML	530	56	CD	F1CCP	567
2	G4CIZ	268	38	BE	GM8FQE/P	425
3	G4ALE	166	50	SY	G3BZP/P	414
4	G8CFZ	139	33	SX	GM8DMZ/P	525
5	G8DDW	126	24	SY	GM8DMZ/P	480
6	G4ACG	121	25	SX	GW3FEC/P	370
	G8EPA	121	41	SE	G8AUN	262
8	G3VPF	91	19	DT	F1COF/P	291
9	G3XBM	86	24	CE	GW3TTP/P	320
10	G4AOL	71	23	SX	G4AP/P	252
11	G8EZM	64	24	KT	G8AUN	160
12	G3UMF	63	15	BE	GM8EUG/P	405
13	G4ALG	62	28	OX	GW3ONP	165
14	G4BRA	60	24	OX	G4AP/P	245
15	G3GSO	57	23	DY	G3RJH	265
	G8CID	57	19	YS	—	—
17	G8FGF	52	24	OX	G4AP/P	235
18	G8CUB	45	15	YS	G5MA	295
	G3WOI	45	19	BE	G3VPF/P	157
20	G3WJG	32	14	BS	G8CFZ/P	113
21	G8DYC	30	20	LR	G3PMH/P	105
23	GC3WMR	29	3	JE	G3JXR/P	270
24	G3RQZ	27	9	SX	G3PMQ	160
25	G8ENR	26	12	LN	G8CUB/P	120
26	G8DJE	21	17	EX	G4BJO	75
27	G3TXR	11	1	GR	GC3WMP/P	270

G4BZP/P disqualified (81 points)—Rule 14(i).
Check logs acknowledged from G8GBN and BRS33823

July 1973 432MHz Portable Contest results

Of the 120 stations active during the contest period, only 18 portables found it worthwhile to send in logs. It therefore seems that this contest may revert to Open status next year.

Conditions were reported as being poor to average but this must be as much a reflection on activity as on propagation itself, since the best dx was established over a 320km path

The two leading stations made 51 contacts each but the superior location of GW3ZUL/P gave this team the winning score by some margin. Runner-up was G3PRM/P. Certificates go to both stations.

The VHF Contests Committee is disappointed with the response to this contest and would like to receive ideas from members for increasing activity on this band.

W. J. M.

Posn	Callsign	Points	QSOs	Cnty	Best dx	Km	Pwr	Aerial
1	GW3ZUL	263	51	BR	G3DAH	320	20	2 × 18pb
2	G3PRM	197	51	NR	G3WDG/P	275	130	2 × 46mb
3	GW3UBX	145	35	BR	G3NHE	195	15*	2 × 18pb
4	G3WDG	117	21	DN	G3PRM/P	275	12*	14
5	GW4ALE	109	28	MG	G3JYP/P	220	10*	46mb
	G8GCC	109	31	SE	G3WDG/P	213	4*	18pb
7	G3TTV	100	30	LR	GW8FQF/P	153	6*	18pb
8	G8AYY	91	31	SD	G2WS/P	206	25	46mb
9	G3CZU	79	39	SY	G3NHE	—	10*	9
10	GW8ADP	73	27	MH	G8AYY/P	160	2*	46mb
11	G3NEO	72	26	DY	GW3ZUL/P	180	10	18pb
12	GW8DLB	67	17	BR	G3PRM/P	178	6	18pb
13	G8ANZ	65	21	ST	G8GCC/P	146	12*	18pb
14	G8FEV	58	14	WE	G3WDG/P	180	4*	14
15	GW8ACG	57	17	MG	G3TTV/P	—	25	2 × 46mb
16	G2WS	46	16	ST	G8AYY/P	206	19	11
17	G3SHY	36	12	NM	GW3UBX/P	190	25	46mb
18	G3XBM	10	6	CE	G3TTV/P	97	150mW*	8

* Output power
Check logs are gratefully acknowledged from G8BKR and BRS33823.

BERU 1974 rules

Radio amateurs and short-wave listeners throughout the British Commonwealth are invited to take part in the 37th BERU Contest, to be held on 9-10 March 1974.

Reprints of the BERU rules, the General Rules of RSGB HF Contests and supplies of log sheets may be obtained from RSGB, 35 Doughty Street, London WC1N 2AE. UK members should enclose a large sae with their request.

Rules—Transmitting Section

1. The **General Rules** for RSGB HF Contests, as published in the January 1974 issue of *Radio Communication*, will apply.
2. **When.** From 1200gmt on Saturday 9 March 1974 to 1200gmt on Sunday 10 March 1974.
3. **Eligible entrants.** Members of the RSGB resident in the UK and radio amateurs licensed to operate within the British Commonwealth or British Mandated Territories.
4. **Contacts.** CW (A1) only, in the 3·5, 7, 14, 21 and 28MHz bands. Contacts may be made with any station using a British Commonwealth callsign, except those within the entrant's own call area. UK stations may not work each other for points. In accordance with current IARU recommendations, contestants are requested to confine their operations to within the lower 30kHz of each band.
5. **Scoring.** Each completed contact will score five points. In addition, a bonus of 20 points may be claimed for the first, second and third contacts with each Commonwealth call area (as listed in the accompanying table) on each band. All British Isles stations (G, GB, GC, GD, GI, GM and GW) count as one call area.
6. **Logs.** Separate logs are required for each band. Each band log should be separately totalled and should include at the end a check list of call areas worked on the band. Logs should be set out as shown in the General Rules for RSGB HF Contests. Separate band totals should be added together and the total claimed score entered on the cover sheet.
7. **Entries.** Entries may be single or multi-band. Single-band entries should show contacts on only one band; details of contacts made on other bands should be enclosed separately for checking purposes. Multi-band entries will not be eligible for single-band awards.,

Each entry will consist of the separate band logs together with a signed declaration. The form of declaration is shown in the General Rules for RSGB HF Contests.

Entries should be addressed to A. V. Davies, G3MGL, 41 Gainsborough Road, Tilgate, Crawley, Sussex RH10 5LD, England. Adjudication of this contest will commence on Monday 13 May 1974. Any entry received after this date may be excluded from the contest and may be ineligible for any award. Overseas stations are therefore advised to forward their logs by airmail.

8. **Awards.** To the winner, the BERU Senior Rose Bowl. To the runner-up, the BERU Junior Rose Bowl. To the leading UK station, the Col Thomas Rose Bowl.

Certificates will be awarded to the leading UK and overseas single-band entries on each band; and to the leading UK and continental leaders in the multi-band section.

Rules—Receiving Section

1. **When.** Times and dates as for transmitting section.
2. **Eligible entrants.** Members of the RSGB resident in the UK and all short-wave listeners resident in the British Commonwealth or British Mandated Territories. Only the entrant may operate his receiving station for the duration of the contest. Holders of amateur transmitting licences are not eligible to take part.
3. **Scoring.** To count for points a station outside the entrant's own call area must be heard in a contest contact. CQ or test calls will not count for points. A station may be logged only once on each band for the purpose of scoring. Where both stations in a contact are heard, they should be logged separately and points may be claimed for both entries, provided that the stations are outside the entrants own call area.

Each complete log entry will score five points. In addition, a bonus of 20 points may be claimed for the first, second and third stations heard in each Commonwealth call area on each band. All British Isles prefixes count as one call area.

4. **Logs.** A separate log is required for each band. Logs should show the following details: (i) Date/time gmt, (ii) Callsign of station heard, (iii) Report and serial number sent by station heard, (iv) Callsign of station being worked, (v) Points claimed, (vi) Bonus points claimed. Each log must be set out on one side of foolscap or A4 log sheets and must show the band to which the log sheet refers. A check list showing the call areas heard on each band mus also be included.
5. **Entries.** (a) Each entry will consist of the log sheets, check list and a signed declaration that the receiving station was operated in accordance with the rules and spirit of the contest and that the entrant does not hold an amateur transmitting licence. (b) Entries should be addressed and sent as in Rule 7, Transmitting section.
6. **Awards.** The BERU Receiving Rose Bowl to the winner. Certificates of merit to the leading entrant in each continent.

Commonwealth Call Areas

The following call areas are recognized for the purposes of scoring in the 1974 BERU Contest:

A2	Botswana	VR3	Fanning & Christmas Is.
A3	Tonga Is.		
A5	Bhutan	VR4	
AC3	Sikkim	VR6	
C2	Nauru	VS5	
		VS6	
G/GC/GD/GI/GM/GW		VS9	Gan
S2	Bangladesh	VU	India
VE1		VU	Laccadive Is.
VE2		VU	Andaman & Nicobar Is.
VE3			
VE4		YJ	
VE5		ZB2	
VE6		ZC4,5B4	
VE7		ZD3	
VE8		ZD7	
VK1		ZD8	
VK2		ZD9	
VK2	Lord Howe Is.	ZE	
VK3		ZF	
VK4		ZK1	Cook Is.
VK4	Willis Is.	ZK1	Manihiki Is.
VK5		ZK2	Nuie
VK6		ZL1	
VK7		ZL2	
VK8		ZL3	
VK9	Christmas Is.	ZL4	
VK9	Cocos Is.	ZL5	
VK9	Norfolk Is.	ZL	Auckland & Campbell Is.
VK9	Papua		
VK9	New Guinea	ZL/C	Chatham Is.
VK0	Heard Is.	ZL/K	Kermadec Is.
VK0	Macquarie Is.	ZM7	
VK0	Australian Ant.	3B6,4B7	Agalega & St. Brandon
VP1			
VO			
VP2A	Antigua, Barbuda	3B8	Mauritius
VP2D	Dominica	3B9	Rodriguez Is.
VP2E	Anguilla	3D	Fiji
VP2G	Grenada & Dep.	3D6	Swaziland
VP2K	St Kitts, Nevis	4S7	
VP2L	St Lucia	5H3	
VP2M	Montserrat	5N2	
VP2S	St Vincent & Dep.	5W	Samoa
VP2V	British Virgin Is.	5X5	
VP5	Turks & Caicos Is.	5Z4	
VP7		6Y5	
VP8	Falkland Is.	7P8	
VP8	S Georgia	7Q7	
VP8	S Orkney Is.	8P	
VP8	S Sandwich Is.	8R	
VP8	S Shetland Is.	9G1	
VP9		9H	Maltese Is.
VQ9	Chagos Is.	9J2	
VQ9	Aldabra	9L1	
VQ9	Seychelles	9M2	W Malaysia
VQ9/D	Desroches Is.	9M6/9M8	E Malaysia
VQ9/F	Farquar Is.	9V1	
VR1	British Phoenix Is.	9Y4	
VR1	Gilbert & Ellice & Ocean Is.		

This list has been compiled from the RSGB Countries List and from information supplied by the Foreign and Commonwealth Office.

August 1973 144MHz SSB Contest results

During the early part of this contest band conditions appeared to be excellent and many contestants took advantage of good paths to the east to get among the European dx. Later, conditions appeared to fade a little and only the occasional European contact was noted in the logs received.

The leading station was the Wulfrun Contest Group, operated by G8BHH and G3ONP, their equipment being in many ways typical of many other stations. They used a Liner 2 to drive a QQV06-40a which pushed 80W into a 10-element Yagi.

M. D.

Posn	Callsign	Points	Best dx	Km	QSOs	Cnty
1	GW8BHH/P	2,843	DC8ZH	914	214	RN
2	GD8FFX/P	2,540	DK4QE	922	176	IM
3	GW4ABR/P	2,329	DC6EX	720	218	MG
4	GW8ASI/P	2,113	DK1KO	945	207	RN
5	G8AGU/P	2,029	DK2FC	790	178	DN
6	GM8DMZ/P	1,839	F1ANH/P	665	148	WG
7	G8CMG/P	1,762	DJ4GM	1,000	122	DN
8	GM3WAS/P	1,678	PA0HDA	665	129	
9	G3XDY/P	1,530	F1COF	660	175	LN
10	G3PMH/P	1,362	GM3KHH/P	508	173	HN
11	G8GSX	1,324	GI3ORL/P	565	141	EX
12	G3HZL/P	1,284	DJ4GM	790	153	HE
13	G8BXC/P	1,149	F1COF/P	480	145	EX
14	G8CKZ	986	PA0JGF/M	505	114	HE
15	GD3FLH/P	985	DC9KU	793	84	IM
16	GW8FKW/P	917	DC9KU	690	111	DB
17	G3ZYC	838	DC9KU	570	115	DY
18	GD2HDZ	833	G3DAH	480	83	IM
19	G8FEV	819	GM8HEY/P	505	117	BE
20	G3NHE	802	F1COF	583	106	YS
21	G8EXL/A	795	GM3WAS/P	450	111	LD
22	G3XUS/P	782	DL8AWA	476	104	SX
23	GW3VKL/P	777	DC9KU	675	84	GN
24	G3BW	773	G3BHW	480	77	CD
25	G3XBY	758	GM4CAN/P	524	114	WK
26	G4CIZ	736	PA0GJZ/M	525	99	WE
27	GW3FEC/P	720	PA0RBK	728	78	
28	G3RHE/P	715	DC9KV	729	75	CD
29	G8BMJ/P	712	PA0POM	460	109	SD
30	G8BQX/P	670	GM3WAS/P	640	83	SX
31	GI3ORL/P	644	PA0ABB	880	52	DW
32	G3UBX/P	639	F1COF	692	77	YS
33	GW8AHI/P	625	PA0HUA	610	75	
34	G8BBP/P	614	F9ET	490	101	GR
35	GW8FBL/P	600	PA0JCW	580	61	CA
36	G4APL	592	GM3WAS/P	510	68	SY
37	G8DCA	586	GM3WAS/P	586	80	SX
38	G3WHK	568	GM8DMZ/P	471	91	SY
39	G8ERW	536	GM3WAS/P	458	86	HF
40	G8GIY/P	497	PA0JGF/M		80	
41	G8DNF	492	GD8FFX/P	470	80	SX
42	G8ETL/P	479	EI9Q	480	68	SX
43	G4AJE	441	GI3ORL/P	420	60	NR
44	G8DDW/P	435	GM3WAS/P	500	61	SY
45	G3FIJ	412	GM8DMZ/P	485	48	EX
46	G3USF	406	PA0HVA	440	68	SD
47	G4ANS	400	PA0CML	570	57	NM
	G3OZT	400	G8FIS/P	385	64	HE
49	G3BPM	383	DC9KU	485	64	
50	G8FWB	374	GD3FLH/P	410	65	HE
51	G8ELO/P	365	PA0AVA	425	71	WK
52	G4ANP	337	G8CSN/P			YS
53	G4BZD	301	G3JHM/A	304	47	YS
54	GM8HEY/P	244	G8FEV	505	36	
55	G8FRF/P	234	F6BQH/P		37	YS
56	G8FWV	211	F1CBH/A	253	49	NR
57	GM8CYX/P	168	G8FEV	495	27	AY
58	G3WKV	91	PA0AWL	270	33	EX

Check logs from G8DLF and BRS33823 acknowledged.

NFD 1974

At a recent meeting of the HF Contests Committee, it was decided that for next year's NFD the power input rule should be amended. The 13·5W maximum rated anode dissipation limit will be retained, but (except for 160m) the dc input power restriction will be removed. (An appropriately revised semiconductor rating limit will be published shortly). This change is being introduced to bring about more effective inspections—in future, the inspector will simply examine the pa valve(s) in order to determine if the station is complying with the power rule. Entrants who refuse to allow the inspector to perform this straightforward task—for whatever reason—will be disqualified. The full rules for this contest will appear in next February's *Radio Communication*.

August 1973 Fixed and Portable 70MHz Contest results

Band conditions for this contest were good for the start with "Pop" dx coming in from Eastern Europe, although the band started to fade down towards the middle of the contest and there was probably sporadic E for a short time. The adjudicator was not able to monitor the band on this occasion, but he had a very good synopsis of band conditions from GW3ONP, to whom his thanks are due. A good number of entries were received, but not as many as had been hoped for.

L.V.G.T.

FIXED SECTION

Posn	Callsign	Points	QSOs	Cnty	Best dx	Km
1	G3OHH	607	81	SD	GI3ZTL	415
2	GD2HDZ	413	37	IM	G4KF/P	495
3	G8PY	374	67	NM	G3KSU/P	?
4	G3OQT	271	45	KT	GI3VPK/P	580
5	G3NPI	225	41	BE	GI3VPK/P	487
6	G3TVW	206	38	EX	GI3VPK/P	510
7	G6HD	184	36	KT	GI3VPK/P	570
8	G3YQW	174	32	SX	G3FDW/P	418
9	G3FIJ	152	22	EX	G3FDW/P	370
10	G4CDY	127	35	SY	G3UUT/P	260
11	G4BMM	126	22	BD	GI3VPK/P	485
12	G3TDM	112	26	LD	G3FDW/P	350
13	G5HD	101	21	WE	G3FDW/P	425
14	G3RDQ	84	8	BS	GI3VPK/P	490
15	G3SVL	81	21	SY	GW3MHW	230

PORTABLE SECTION

Posn	Callsign	Points	QSOs	Cnty	Best dx	Km
1	GI3VPK	1,038	72	AM	G4KF/P	610
2	G3FDW	892	76	WD	G4KF/P	410
3	G3UUT	659	71	YS	G3KSU/P	365
4	GW3ONP	518	68	RD	GI3VPK/P	341
5	GW4BGG	493	67	?	GI3VPK/P	400+
6	G3WOS	460	64	LN	GI3VPK/P	320
7	G3ZIV	439	45	YS	G4KF/P	405
8	G4KF/P	431	61	SX	GI3VPK/P	610
9	GW4AZV	395	55	MG	G3DAH	320
10	G3YZN	380	66	SX	GI3VPK/P	580
11	G3REI	308	68	SY	GI3VPK/P	540
12	G3JEQ	306	60	SY	GI3VPK/P	535
13	G3NEO	303	47	DY	GI3VPK/P	342
14	G3RQZ	292	60	SY	GI3VPK/P	550
15	GW4ABR	291	33	RD	G4KF/P	352
16	G3PQY	256	30	YS	GI3VPK/P	450
17	G3KSU	211	31	HE	GD2HDZ	450
18	G3CDG	171	29	GR	GD2HDZ	310
19	G4ALE	158	32	SX	G3FDW/P	430
20	G5UM	123	25	RT	G3FDW/P	202

Check log from G3ZLQ is acknowledged.

1973 SSB Field Day results

Despite the poor weather, this year's event produced a most gratifying increase in participation, with 28 logs being submitted for adjudication, and a further seven portable calls appearing consistently in competitors' logs. Conditions were fairly good, with a 14MHz opening providing 200 easy QSOs with the USA for those who were on the band at the right time.

The leading station, G3SFG/P, operated by five members of the Southgate Radio Club, worked one station every 100 seconds, using an astounding array of equipment: three FT200 transceivers, two SB220 linears and an FL2000B linear, powered by two 2 kVA generators. The Northumbria Radio Club, G4AAX/P, used FL400/FR400 separates with an SB220 to make 235 less contacts, but their better bonus score secured them second place. In third place, G3BRS/P made a comfortable 668 QSOs, using an FT277 and a home-brew linear.

The definition of a "prefix" caused confusion in some circles, and 11 entrants had their claimed scores drastically adjusted. Seven logs had to be rescored completely on all bands. The table of results shows that it is no longer enough to make a large number of contacts to be sure of victory, since each new prefix is worth 10 QSOs. The standard of presentation of the logs was very high, with not one illegible entry to be found.

Certificates of merit will be awarded to G3SFG/P, G4AAX/P, G3BRS/P, and to G3WHK who was the station giving most points to competitors.

S.K.

Posn	Callsign	QSOs	Points	Posn	Callsign	QSOs	Points
1	G3SFG/P*	985	9,936	14	GM3TKV/P	315	4,869
2	G4AAX/P*	750	9,618	15	G4BDF/P	421	4,728
3	G3BRS/P*	668	8,166	16	G6YB/P	413	4,074
4	GW4NZ/P	507	6,876	17	G3KAI/P	229	4,017
5	GW5ZL/P	411	6,736	18	G3IXH/P	237	3,795
6	G3MAR/P	458	6,445	19	G3WTP/P	328	3,467
7	G3KLH/P	551	6,174	20	G3VRE/P	379	3,358
8	G3VER/P	340	5,900	21	GC3HFN/P	246	3,288
9	G4ACGP	621	5,859	22	G4BEM/P	379	3,201
10	G3PKF/P	428	5,656	23	G3XUS/P	254	2,895
11	G4ALE/P	391	5,376	24	G3WOI/P	254	1,833
12	G3ZRS/P	401	5,166	25	G3GIZ/P	262	1,806
13	G3WIM/P	412	5,004	26	G3CNX/P	156	1,248

* Certificate winner.
Check logs are gratefully acknowledged from: G3WHK, LA2HC, G2AVC/M, G4BWP, GM4BVU, A7562.
Entries disallowed: G3AYC/P,—RSGB General Rule 5b; G4BKW/P—RSGB General Rule 8f.

144MHz Fixed Contest rules

Date: 9 December 1973.
Time: 1000–1800gmt.
All entries and checklogs to: VHF Contests Committee, c/o G3VPK, "Maple Leaf", Great Braxted, Witham, Essex CM8 3EJ.
The following General Rules, published in the January 1973 issue of *Radio Communication*, will apply, 1, 2, 3, 4b, 5a, 6a, 7a, 8c, 9a, 10a, 11–24.

Dartford Heath DF Qua lifying Event results

In fine weather, rather too warm for some, 20 teams assembled at the start in Seven Mile Lane, near Mereworth, Kent. Notwithstanding tests carried out previously and again immediately before the start, neither hidden station was heard at any great strength, so under Rule 4 approximate bearings were given.

Station "A", G4BDF/P, was about 10 miles away on Sevenoaks Weald, and once away from the start no trouble was experienced with his signal and eventually 14 competitors found him tucked away in a thicket at the edge of the wood.

Station "B", G4BWV/P, unfortunately ran into transmitter trouble from the very first transmission and had to rely on cw for the whole of the event. This did not prevent him being found, again by 14 hunters, on the river bank above Yalding Lees about four miles from the start, not hidden in the true sense of the word, but rather camouflaged! The operator and his assistant posing as anglers were hidden from the towpath by a large angler's umbrella. The aerial was a normal fishing rod wound at the lower part with a loading coil, and with an earthing plate in the river was resonant at 1,880kHz.

The transmitter was on the public footpath side of the river where the camouflage was complete, but quite a few competitors approached from the other bank and two, at least, swam across, as was evident from the slips handed in after the event! Apparently quite a trade was done with boat-owners who were persuaded to ferry non-swimmers across.

The event was organized by Phil Wells on behalf of the Dartford Heath Direction Finding Club.

Posn	Competitor	Club	Time of arrival Station "A"	Station "B"
1	I. Butson	Chelmsford	1600	1442
2	B. North	Chiltern	1600½	1447
3	G. W. Anderson	Dartford Heath	1601	1427
	A. W. Butcher	Chelmsford	1601	1505
5	R. Worbey	Dartford Heath	1602	1428
6	T. Gage	Oxford	1611	1459
	R. Pearce-Boby	Oxford	1611	1437
8	B. Bristow	Oxford	1612	1437
9	G. Whenham	Coventry	1452	1613
10	M. Hawkins	Chelmsford	1622	1454
11	P. Lisle	Oxford	1428	—
12	R. Vickers	Stratford	1429	—
13	P. Tyler	Oxford	—	1450
14	D. E. Newman	Rugby	1503	—
15	P. Woollett	Dartford Heath	1507	—
	C. McEwen	Crawley	—	1507
17	W. Pechey	Chelmsford	—	1537
18	A. Fielding	Dartford Heath	—	1557

Two competitors failed to find either station.
The first and second men having already qualified, G. W. Anderson, A. Butcher and R. Worbey go into the Final.

Verulam ARC RSGB Diamond Jubilee Contest rules

Section 1—2m. 0800 to 1200gmt on Sunday 25 November 1973.
Section 2—160m. 0800 to 1200gmt on Sunday 2 December 1973.
Scoring. 1 point per contact.
5 points per contact with VARC Committee members G3OFH, G3WFM, G3YHY, G3YLG, G4AWS, G8BNR, G8DKK.
15 points per contact with the VARC club station G3VER.
Multiply the total score in each section of the contest by the number of UK counties worked in that section.
Countries outside the UK to count as additional counties.
Only one contact with a specific station in each section of the contest will count for points.
Contacts will consist of an exchange of reports, serial numbers beginning at 001 and name of county or country.
Contacts may be made using any permitted mode.
Entry is open to all licensed operators and SWLs. Portable, mobile or fixed stations may take part.
Logs to include: Date; Time; Callsign; RS or RST and serial number sent; RS or RST, serial number and county received; Points claimed. Separate logs for each section to be sent to: H. Young, G3YHY, 93 Leaford Crescent, Watford, WD2 5JQ, postmarked not later than 30 December 1973.
General. The General Rules for RSGB hf and vhf contests, as published in the January 1973 issue of *Radio Communication*, will apply.
Awards. Prizes will be awarded to the winner of each section in both the transmitting and SWL classes and all entrants will receive a commemorative certificate.

Contests calendar

10-11 November	—OK DX CW/Phone
10-11 November	—2nd 1·8MHz
10-11 November	—Ex-G
11 November	—70MHz Cumulative
11 November	—Welsh 80m
17-18 November	—All Austrian 160m
24-25 November	—CQ WW DX CW
1-2 December	—Spanish
9 December	—144 MHz Fixed
8-9 December	—TOPS
15-16 December	—ARRL 28MHz

For **70MHz Cumulative Contest** rules and **423 MHz Cumulative Contest** rules see September issue.

Mobile Rallies Calendar

19 May 1974—Northern Mobile Rally. Details later. Contact G8BZY, QTHR.
19 May 1974—Amateur Radio Mobile Society's Rally, RAF Cosford, Shropshire.

OBITUARIES

Mr V. J. Bloor, G3UD
Vernon Bloor died on 4 September at the age of 68. First licensed just after the first world war, he had been active on all the amateur bands since 1923. He was an enthusiastic supporter of the Stoke-on-Trent amateur radio society.

Mr L. R. Harper, GM5JK
Louis Harper died on 16 August at the age of 71. As well as holding an amateur licence since the 'twenties, he was professionally employed as a wireless operator, and later as an engineer with the BBC.

Mr W. Hodkinson, G8FSH
"Will" Hodkinson of Barnoldswick, Lancs, died on 27 August at the age of 56. He wa a lifelong amateur radio enthusiast, and, as swl, a former president of CHC chapter 3; since being licensed his main interest was in 2m and 70cm. He suffered from indifferent health for many years and was in the RAIBC.

Mr R. W. Lupton, G3KGR
Ray Lupton died on 8 October after a long illness. His main interest in recent years was the 2m band.

Mr J. V. Newson, G3GY
John Newson died on 15 September at the age of 69. In 1923 he was licensed as 2GF.

Mr I. Thomas, BRS27876
Idwal Thomas, of Penmaenmawr, North Wales, died on 16 September at the age of 55. Despite failing health for some time he listened regularly to the 80m rag-chews, and was well known to many amateurs in North Wales.

Mr A. C. Williams, GW5VX
Arthur Williams died on 7 October at the age of 74. A former member of the Glamorgan Constabulary, he took part in early experimental work on the use of mobile radio for police purposes, using frequencies around the 160m band. After leaving the police service, he was privately engaged in the radio business until his retirement.

Using all frequencies up to 2m, the callsign '5VX was probably best known on the 80m band. His great interest was the recruitment of new members to the hobby, and he used the Port Talbot & District ARC of which he was president, as an effective instrument to this end.

He was a member of the RSGB Council from 1 January 1958 until 31 December 1963, representing Zone E, and did much to promote the interests of the zone during his term of office. The funeral service was conducted by the Rev Monroe-Cape, GW8GPM. Nearly 50 licensed amateurs attended, and Council was represented by the zonal member, Cyril Parsons, GW8NP.

We have also been notified of the deaths of:
Mr T. W. Davies, BRS18299, who died in April after a year's hospitalization.

Dr J. R. Golding, VK3DU, who died on 3 June,

Mr D. H. Mix, W1TS, for many years Technical Editor of QST, who died on 19 September 1973,

Mr H. Richardson, VE1IE, of St John, New Brunswick, who died in September.

Looking ahead

8 November—RSGB lecture at IEE by L. Moxon, G6XN, (*see* p 743).
16 November—RSGB Dinner Club, Royal Westminster Hotel, Buckingham Palace Road, Victoria, London.
18 November—South-east Counties HF Convention, Airport Hotel Crawley, Sussex.
4 January 1974—RSGB Presidential Installation, Bonnington Hotel, Southampton Row, London WC1.

RAYNET

by S. W. LAW, G3PAZ*

Exercise Diamond
At least half the groups in the UK took an active part from the trigger signal onwards, and the way in which troubles were overcome coupled with the operation of many exercises fully merits the highest praise. Since there are many facets to a jewel, so there were many methods of tackling the basic exercise legend, that of a mass evacuation from a central area. Some groups were fortunate in having the fullest co-operation from their user services, while others had their inventiveness and imagination taxed to the full in order to attain the letter of the word in the greatest degree without the additional spur of user service liaison. We are sure that listeners who kept an ear on the activities found much to interest them and we would welcome any reports from such sources even if some critical comments are contained therein.

While there were some groups who were unable to take part due to previous long-standing commitments, there were others looking at differing facets of Diamond. Since the practice of democracy demands the free interchange of ideas, it is only fair to admit that the concept of Exercise Diamond was not acceptable to some groups. There were some fireworks, coupled with exclamations of admiration and otherwise, and in some instances of the rocket type rather than the golden rain of praise. We even had the hoary old "atom bomb" cliché from one quarter! Since the Raynet Committee was at great pains not to specify the nature of any type of "disaster" which might lead to the assumed mass evacuation for the purposes of the exercise legend, we cannot understand how this completely erroneous impression arose. It should be obvious that any one or more of a number of natural disasters could give rise to the situation envisaged for the purposes chosen to give the widest possible scope for the greatest number of members to be involved.

From the press cuttings which we have been privileged to examine it is evident that our controllers have done a very good job with the media; this also goes for the radio coverage in certain areas thanks to those who have provided interviews for the tapes of local stations in particular. Time will show how the public in general and the user services in particular respond.

In the confines of this column it is obvious that no complete report can be given on Exercise Diamond. Suffice to say that it will take G3MBQ and the committee some considerable time to complete a full analysis. Meanwhile our thanks and congratulations to all who worked so hard to make this event a worthwhile tribute to the RSGB Diamond Jubilee year.

Will you help?
We have been asked on behalf of the North Bucks group to assist in finding a new controller to replace Mr R. J. Pye, G8AAT, who has had to relinquish the position due to other commitments and has so far been unable to find a replacement. G8AAT is QTHR at Towcester and would welcome any applications or suggestions as he feels that this group should not sink into oblivion for the want of a willing leader to consolidate the work already accomplished.

* 130 Alexandra Road, Croydon, Surrey, CR0 6EW

INTERFERENCE PROBLEMS

Members accused of causing interference or who suffer interference from external sources are invited to seek the assistance of the Interference Committee in solving their problems.

Enquiries should be addressed to: The Chairman, Interference Committee, RSGB, 35 Doughty Street, London WC1N 2AE.

CLUB NEWS

RSGB Affiliated Societies are invited to submit items for inclusion in this section to their Regional Representatives (not direct to the editor), whose addresses appear on page 741 of this issue, for inclusion in the appropriate regional section.

Items of news and dates of forthcoming events should reach RRs by the following dates:

23 November for January issue

1 February for March issue

REGION 1 **RR B. O'Brien, G2AMV**

Ainsdale (ARC)—Members should contact N. Horrocks, G2CUZ, for details of meetings.

Blackburn (ELARC)—First Thursday each month, 7.30pm, Edinburgh House, Shearbank Road, Blackburn. Secretary—W. E. Baxendale, G8FDG, "Juverna", Westland Avenue, Darwen, Lancs.

Blackpool (B & DARS)—Mondays, 8pm, Pontins Holiday Camp, Squires Gate. Morse tuition 7.30pm.

Bolton (B & DARS)—Please note new address—"Clarence Hotel", Bradshawgate, Bolton. commencing 3rd Tuesday in each month, 8pm. 2m net Tuesday nights at 1900gmt—145·73MHz. Secretary—S. Macdonald, G4AQB, 8 Archer Avenue, Bolton.

Bury (B & RRS)—Every Tuesday at the Bury Community Centre, 8pm, 2nd Tuesday each month is the main lecture night; other Tuesdays being devoted to RAE classes, morse classes and informal meetings. Details from secretary—J. D. Clifford, 10 Arley Avenue, Bury.

Carlisle (C & DARS)—Mondays, 7.30pm, Currock House, Lediard Avenue, Currock. Secretary—G8GSE, 6 Carlton Gardens, Stanwix, Carlisle GA3 9NP.

Cheshire (Mid-Cheshire ARC)—Wednesdays, 7pm, Technical Activities Centre, Winsford Verdin Comprehensive School, Grange Lane, Winsford. Nets on 160m, 7pm Mondays; on 2m 7pm Tuesdays. Tuesdays RAE classes and slow morse transmissions are available. Please see secretary G3SIQ for details. Chairman is G3JWK.

Chester (C & DARS)—Tuesdays at 8pm, YMCA Chester, except 1st Tuesday in each month which is a net night on 145·08MHz and 433·15MHz. Further details from G8AYW, G6AHC/T, QTHR.

Douglas IOM (D & DARS)—Secretary GD3YUM will be pleased to hear from any member who intends to visit the island.

Eccles (E & DARC)—Tuesdays 8pm, Bridgwater School, Worsley, Manchester. Club 2m net 1100 on Sundays on 145·65MHz. All visitors and prospective members welcome. Secretary—G4AEQ, QTHR.

Lancaster University (UoLARS)—Every Wednesday at 7pm in Furness College, together with RAE and morse classes. The society is active on the hf bands and 2m using G3ZBY and G8DOU; the rtty gear is also operational on these bands. Skeds and visits welcomed, enquiries please to Colin Pegrum, Department of Physics.

Leyland Hundred (LHARG)—Second Monday each month, 7.30pm, Rose & Crown, Ulnes Walton, Leyland. Net night Saturdays 2000gmt on 145·8MHz. Details from F. Harrison, G3XII, 78 Lancaster Lane, Leyland, Lancs.

Liverpool (L & DARS)—Tuesdays, 8pm, Conservative Association Rooms, Church Road, Wavertree. Secretary—G3WCS.

Liverpool (NLRC)—Tuesdays, 8.30pm, informal meeting at the "Nags Head", Thornton, Crosby, Liverpool 23. Visitors welcome. Secretary—Alan L. Hart, G4BLI, 50 Strawberry Road, Liverpool, L11 7AD.

Liverpool University (LUARS)—Every lunch time in the radio shack in the Students Union. Formal meetings are on Monday nights at 7.30pm. Look out for GB3LID at the start of the new term and also for G3OUL in the vhf contests. We are now active on all bands up to 70cm. The annual dinner will be held at the start of next year and we would be pleased to see all past members and friends of the society, more details from the secretary. Visitors are always welcome, contact Mike Harbach, G8GMC, c/o Radio Society, Students Union, 2 Bedford Street North, Liverpool 7.

Manchester (M & DARS)—Wednesdays, 7.30pm, all meetings include morse classes. 203 Droylesden Road, Newton Heath, Manchester 10. Secretary—G3IOA.

Manchester (SMRC)—Mondays and Fridays; the Monday meetings being vhf operation at the club shack, "Greeba", Shady Lane, Manchester 23. On Fridays meetings commence at 8pm, with lectures and other activities at the Sale Moor Community Centre, Norris Road, Sale, Cheshire. A special event of the club will be the Silver Jubilee Dinner on 9 November. 2 November (Introduction to the club's new rig: FT200 transceiver), 9 November (Silver Jubilee Dinner), 16 November ("Insulation and insulators" (2 films) by B. L. Scott, G8HIW, and G. Clark, G4AHX), 23 November ("Slow scan tv" by T. Winter, G4AOK), 30 November (DX night on the air with the FT200 transceiver), 7 December (Review and discussion on club activities), 14 December ("Manufacture of plastic insulants" by W. L. Seddon, G3VIW), 21 December (Xmas party), 28 December (Club closed). Visitors are always welcome either Monday or Friday. Hon sec—G3WFT, QTHR.

Manchester University (ARS)—G3VUM is active on all bands 160–10m and also on 2m. The programme of lectures, visits, RAE and morse tuition continues as previously. Details may be obtained from the secretary, G. T. Phelan, G8EPS, at the University Union, Oxford Road, Manchester, M13 9PL, or from G3AOS, QTHR.

University of Manchester—Institute of Science & Technology (ARS)—G3CXX is active on all hf bands and G8FOT on 2m and perhaps 3cm. Items for club magazine/newsletter or letters from intending members gratefully received by G8GOS, 66 Howard Road, Kings Heath, Birmingham B14 7PQ.

Preston (PARS)—7.30pm, "Windsor Castle" (private room), St Paul's Square, Preston. Secretary—G. Earnshaw, G3ZXC. Morse practice 7.30pm, main feature 8pm. 8 and 22 November, 6 and 20 December.

Stockport (SRS)—Second and 4th Wednesday each month, 8pm, Blossoms Hotel, Buxton Road, Stockport. Secretary—G. R. Phillips, G3FYE, 6 Ross Avenue, Davenport, Stockport.

Thornton Cleveleys (ARS)—First and 3rd Wednesdays, 8pm, St John Ambulance Brigade HQ, off Fleetwood Road North (behind Police Station), Thornton, Lancs. Project group meets on Fridays 7.15–9pm at the Project Laboratory, Rossall School, Fleetwood. Work in hand includes 160 and 2m transmitters and receivers. Please note acting secretary is J. Duddington, G4BFH, The Grove, Thornton Cleveleys, Blackpool.

Warrington (W & DARS)—Every Tuesday, 8pm, Thames Board Mills Social Club. Alford Hall, Manchester Road, Warrington. Secretary—G3ZRN, QTHR.

Wirral (WARS)—First and 3rd Wednesdays each month, 7.45pm, Sports & Recreation Centre, Grange Road West, Claughton, Birkenhead. Secretary—G3WSD.

Wirral (Wirral DX Association)—Last Thursday each month at members' homes. Visitors are welcome—please inform secretary beforehand. Secretary—T. O'Neill, G4AHC, 41 Willoughby Road, Wallasey.

Merseyside members meet for lunch on the 1st Monday of every month. It is essential to book beforehand and obtain details of the venue from either G3VQT or G2AMV.

REGION 3 **RR B. Kennedy, G3ZUL G6AGT/T**

Birmingham (MARS)—20 November (Junk sale—proceeds go to club funds). Meetings at 7.45pm at The Birmingham and Midland Institute, Margaret St. *G3ZMT*.

(Slade)—Club meets on alternate Fridays at 8pm in The Committee Room, Church House, High St, Erdington, Birmingham. *G4BRT*.

(South)—7 November (AGM). Club meets on the first Wednesday of the month at 8pm at Hampstead House, Fairfax Rd, Birmingham 31. Informal meetings in the club shack every Friday. *G8GDZ*.

Bromsgrove (BDARC)—9 November ("Dxpedition to GD" by G3WJN and G3RZI), 14 December (Social evening). Club meets on the second Friday of each month at the Royal Oak, Barley Mow Lane, Catshill, Bromsgrove. *G3VGG*, 22 Elm Grove, Bromsgrove.

Coventry (CARS)—2 November (Sausage and mash supper), 9 November (Night on the air), 16 November (Natter night), 23 November (Night on the air), 30 November ("Direction finding"), 7 December (Night on the air), 21 December (Annual dinner), 14 December (Discussion night), 28 December (No meeting). Club meets at Baden Powell House, St Nicholas Street, Radford Road, Coventry, on Friday evenings at about 8pm. *G3TFA*

Dudley (DARC)—13 and 27 November, 11 December. Club meets at 8pm in the Central Library, St James's St, Dudley. *G3PWJ*.

Hereford (HARS)—First and third Fridays of the month at Civil Defence HQ, Gaol St, Hereford. *BRS30628*, 181 Kings Acre Road, Hereford. Tel Hereford 3237.

Lichfield (LARS)—5 November ("A-Z of vhf" by Tom Douglas, G3BA), 3 December ("Digital frequency measurement" by G3NSO).

Club meets on the first Monday and third Tuesday of the month at the Swan Hotel, Bird St, Lichfield. *G3NLY*.
Rugby (RDAR & EC)—The club has informal meetings on the first Tuesday of the month at the Lawrence Sherriff Arms in the Town Centre. *G3YQC*.
Shrewsbury (SARS)—Club meets every Thursday at the Harlesscott Youth Centre, Sundorne Rd, Shrewsbury, at 7.30pm. *G3VZG*.
Solihull (SARS)—Club meets at The Manor House, High St, Solihull. *G4ABV*.
Stourbridge (STARS)—6 November (Informal), 19 November (Annual surplus sale), 4 December (Informal), 17 December ("Printed circuits and industrial control gear" by G3KLT). Meetings are held on the third Monday of the month at Longlands School. Informal meetings at the Shrubbery Cottage, Heath Lane. *G8HUQ*, 17 Mill Road, Cradley Heath, Warley, Worcs.
Stratford-on-Avon (SADRC)—2, 16 and 30 November, 14 December, at the South Warwickshire College of Further Education, Alcester Road, Stratford-on-Avon. *G8GAG*.
Sutton Coldfield (SCRS)—12 November (AGM and presentation of trophies), 26 November ("Amateur television" by Malcolm Sparrow, G8ACB, G6KQJ/T). Club meets on alternate Mondays at The Central Youth Headquarters, Clifton Rd, Sutton Coldfield, at 7.30pm. *G8ALO*.
Wolverhampton (WARS)—5 November (Film show), 12 November (Natternite), 19 November (Practical alignment of receivers), 26 November (Committee meeting), 3 December (The work of the Cosford Electronics School), 10 December (Natternite), 17 December (Club participation in contests), 24 December (No meeting), 31 December (No meeting). Morse classes continue on Friday evenings. All meetings at Neachells Cottage, Stockwell End, Tettenhall, Wolverhampton. *G3UBX*.
Worcester (W & DARC)—6, 17, November, 3, 15 December, at the Old Pheasant, New St, Worcester. 12 January (Annual dinner). *G8ASO*. Tel Worcester 29208.
Wrekin (WARS)—7 November (Films), 14 November (Fault finding competition), 21 November (Radio quiz against the Salop club), 28 November ("Computer programming" by G8FSV), 5 December (Practical session on a.m. demodulators), 12 December (Club project—"Puffmeter"), 19 December (Club social at the New Inn, Broseley). Wednesdays at Ketley Bank Youth Centre near Oakengates at 8pm. First Wednesday of the month at Walker Technical College, near Wellington. *G3UKV*.

May I take this rather early opportunity of wishing all RSGB members in Region 3 a very happy Christmas and a joyful New Year.

REGION 4 **RR T. Darn, G3FGY**

Derby (DADRS)—7 November (Surplus sale by auction), 14 November (Homemade wine evening—bring a bottle of yours), 21 November ("BBC Overseas Broadcasting" by Richard Buckby, G3VGW), 28 November (Film show), 5 December (Sale of surplus radio gear), 12 December (Constructors contest for the Founder Members' Trophy), 19 December (Christmas party in the clubroom). All meetings take place in the clubroom at 119 Green Lane, Derby, and commence at 7.30pm. Visitors are always welcome.
Lincoln (LSWC)—7 November (Activity for this evening is undecided), 14 November (Open night), 21 November (Films), 28 November (Talk), 5 December (Open night), 12 December (Films), 19 December (Christmas Social—when we are /P at a local Inn). The club meets every Wednesday at 7.30pm at the Lecture Room of the Lincoln Astronomical Society, on Westcliffe St, off Burton Rd, Lincoln. Visitors will be made most welcome. It is understood that Fred Day, G4BXL, will have resigned by now and we would like to thank him for the many hours of hard work that he has put in during his long term of office. May his successor follow Fred's example.
Melton Mowbray (MMARS)—16 November ("Veroboard and its uses" by D. Fisher, G8ELH), 21 December (RSGB Tape Lecture "Radio over the years"). It is hoped to arrange a lecture by W. Storey, G6JQ, on his recent visit to the USA, a lecture by G3PLL on "Radio Navigation", and a talk by members of the Nottingham club on their Andorra expedition. The club operates a Top Band net on Sunday mornings at 1115 on 1,960MHz. All meetings are held at the St John Ambulance Hall, Asfordby Hall, Melton, Mowbray, commencing 7.30pm.
Nottingham (ARCON)—8 November (Activity night), 15 November (Forum), 22 November (Talk by G4BUY on either "Fourth dimension integrated circuits" or "Predicting propagation over long distances"), 29 November (Film show). All meetings as usual are held at the Sherwood Community Centre, Mansfield Road, Nottingham, and start at 7.30. Recently the club has circulated all known radio amateurs within a radius of five miles of the city, as well as schools, youth clubs etc. *G4AFJ*.
Worksop (RCOW)—Meetings every Thursday at the North Notts College of Further Education, Room 6 (Entrance from Blyth Rd), commence 7.30pm. Alternate weeks there will be lectures and RAE course with cw instruction. *G3OZN*.

The Rev H. Roger Davis, G3IUZ, senior curate of St Nicholas and priest-in-charge of All Saints, Harpenden, and his bride, the former Miss Sara M. Cook, after their wedding at St Nicholas, Harpenden, on 7 July

REGION 5 **RR P. J. Simpson, G3GGK**

Bedford (B & DARC)—1 November ("Novice projects" by G3XKB), 8 November (Junk sale), 10 November ("Propagation", by Ron Ham), 15 November ("Quiz", by G3FWA), 22 November ("Suppression", by Lucas Ltd), 29 November ("A simple transmitter", by G3YUQ), 6 December ("Power supplies", by G2CLP), 13 December ("Drake TR4c", by G4BCZ), 14 December (Christmas dinner), 20 December ("Fun and games with Charlie Whisky", by G3XKB), 27 December (Candid recordings). 7.30pm at "The Dolphin", The Broadway, Bedford. Hon sec—Eric Hawkins, G8GRH, 8 Arrow Leys, Putnoe, Bedford.
Cambridge (C & DARC)—2 November ("GB3PI", by G3VEH), 7 December (Talk by G8AMG), both meetings 7.30pm, Civil Service Sports Club, Brooklands Avenue, Cambridge. Other meetings informal at club hq. Hon sec—Sam Stimson, G5BBP, 2 Burns Way, St Ives, Huntingdon.
Dunstable Downs (DDRC)—2 November (Between week), 9 November ("Compiling a TV programme" by G8AZV and Ray Stores), 16 November (Between week), 23 November (Idiot constructors contest), 30 November (Between week), 7 December RSGB AGM), 14 December (Between week), 21 December (Christmas special), 28 December (Between week). The annual club dinner will be held at the Halfway House, Luton Rd, Dunstable, on Friday 18 January 1974. Meetings at 8pm, at Chews House, 77 High Street, South Dunstable, Bedfordshire. Hon sec—C. G. Powell, G8BPK, 1 Wenwell Close, Aston Clinton, Aylesbury, Bucks.
Peterborough (PR & ES)—2 November (AGM), 23 November (To be arranged). Meetings are now held at The Scout Hut, Lincoln Rd (Occupation Rd corner), Peterborough. Mr P. Chilcott, G4BBA, is the new ASR, and details of meetings can be obtained from him at 258 Coneygree Rd, Stanground, Peterborough.
Stevenage (S & DARS)—1 and 15 November, 6 and 20 December at 8pm. Meetings in Senior Staff Canteen, Hawker Siddeley Dynamics, Gunnells Wood Rd, Stevenage. Further details from hon sec —Cliff Barber, G4BGP, 473 Canterbury Way, Stevenage, Herts.

REGION 6 **RR L. W. Lewis, G8ML**

Cheltenham (RSGB Group)—First Thursday in each month, 8pm, Royal Crescent Hotel, Clarence Street, Cheltenham. *G2FWA*.
Cheltenham (CARS)—Every Wednesday at 8pm, St Marks and Hesters Way Community Centre, Brooklyn Road, Cheltenham.

21 November (Special meeting for checking 2m transmitters; test gear will be available for digital readout and power output measurement), visitors are very welcome. Hon sec—J. H. Pickles, G8DVA, 23 Lansdown Place, Cheltenham.

Banbury (BARS)—Fridays at 43 North Bar, Banbury. Details from G3LTN, tel Banbury 710623.

Gloucester (ARS)—First Thursday in each month at the Oddfellows Club, Eastgate Street, Gloucester, at 7.45pm. Each remaining Thursday at the Leisure Centre, The Old Drill Hall, Painswick Road, Gloucester, at 7pm, Club station callsign G4AYM.

North Bucks ARS—Second Monday in every month at Wolverton Youth Club. 12 November "Spectrum analysers" by G2ANS), 10 December, (Tape and slide lecture). Newcomers are always welcome. Please note new secretary is R. H. King, G8CHK, 7 Brackley Road, Towcester, Northants.

South Bucks VHF Club—First Tuesday in every month at Bassetbury Manor, High Wycombe. 6 November ("Teleprinter terminal units" by G8DDM), 4 December ("Natter and noggin" at the Rising Sun, Little Hampden, SU864024). *G8DDM.*

REGION 7 **RR R. S. Hewes, G3TDR**

Acton, Brentford & Chiswick (ABCRC)—20 November ("Heathkit HW7" by G3OJX), 18 December (Film from VK2FU), 7.30pm, Chiswick Trades and Social Club, 66 High Road, Chiswick W4. Hon sec—W. G. Dyer, G3GEH, QTHR.

Addiscombe (AARC)—Tuesdays, 9pm, "Prince George", High Street, Thornton Heath. Hon sec—S. F. Knowles, G3UFY, QTHR.

Ashford, Middlesex (Echelford ARS)—12 November (Being arranged), 29 November ("Electronic components" by Tony Cockle, G3IEE), 10 December (Modern fm receiver techniques), 27 December (Natter nite), 7.30 for 8pm, St Martins Court, Kingston Crescent, Ashford. Hon sec—Vic Higgs, G3WVJ, QTHR.

Barking (BR & ES)—Thursdays, 8pm (Slow morse classes), Tuesdays, 7.30 to 9.30pm (Meetings and classes), Westbury Recreation Centre, Westbury School, Ripple Road, Barking. All visitors welcome. Hon sec—R. Clark, G8BXC, QTHR.

Bexley Heath (North Kent RS)—Second and fourth Tuesdays in each month, 8pm, Congregational Church Hall, Bexley Heath clocktower (entrance in Chapel Road). Hon sec—R. Wells, G4ARQ, QTHR.

Burnham Beeches (BBARC)—First and third Mondays in each month, 8pm, Hedgerley Scout Hut, Hedgerley, nr Slough, Bucks. Hon sec—Margaret McCabe, G8HCO, QTHR.

Cheshunt (CDRC)—First Friday in each month, 8pm, Methodist Church Hall, opposite Theobalds Station. Hon sec—Richard Ludwell, G3ZZQ, QTHR.

Chingford (Silverthorn RC)—Fridays, 7.30pm, Friday Hill House, Simmonds Lane, Chingford, E4. Hon sec—M. Higgins, G8BUF, QTHR.

Cray Valley (CVRS)—1 November ("Standing waves and all that" by T. Lyell Herdman, G6HD), 15 November (Natter nite), 6 December ("Expedition to Andorra" by Chris Eley, G8DNF), 20 December (Pre-Christmas meeting—venue to be announced), 3 January 1974 ("The super grid transmission system" by Dr Stevens, MIEE, Systems Planning Board, CEGB), 8pm, United Reformed Church Hall, Court Road, Eltham SE9. Hon sec—P. F. Vella, G3WVP, QTHR.

Croydon (Surrey Radio Contact Club)—Third Tuesday in each month, 8pm, "The Ship", 47 High Street, Croydon. Hon sec—Sid Morley, G3FWR, QTHR.

Crystal Palace (CP & DRC)—17 November (Jermyn Industries—solid state devices and their applications—arranged by G3OOU), 15 December (To be announced), 8pm, Emmanuel Church Hall, Barry Road, SE22. Hon sec—Geoff Stone, G3FZL, QTHR. (01-699 6940).

Dartford Heath (DF Club)—2 November(Surplus equipment sale), 16 November, 7 December (Club night), 8pm, The Scout Hut, Broomhill Road, Dartford. Hon sec—Maureen Worby, G3XVC, QTHR.

Dorking (DR & DRS)—Second and fourth Tuesdays in the month, 8pm, "Surrey Yeoman", Dorking. Hon sec—P. B. Gilbey, 6 Hawkwood Rise, Gt Bookham, Surrey.

East London RSGB Group—18 November ("Lecture on ICs" by K. Hutchinson, G3ALN), 16 December (AGM and junk sale), 3pm, Wanstead House, The Green, Wanstead, E11. Buses 66, 10, 20, 101, 167, Underground Wanstead Central Line Station. All SWLs, transmitting amateurs and friends very welcome. Hon sec—Ron Broadbent, G3AAJ, QTHR (01-989 6741).

Edgware (E & DRS)—8 November ("Expedition to Andorra" by G8DNF), 22 November (Informal), 13 December (Junk sale), 27 December (no meeting), 8pm, Watling Community Association, 145 Orange Hill Road, Edgware. Hon sec—Alan Masson, G3PSP, QTHR.

Esher (Thames Valley ARTS)—7 November ("Talk and demonstration" by Storno Radio), 5 December (Caernarvon Trophy Competition), 2 January 1974 (AGM), 8pm, King George's Hall, Esher, Surrey (next door to Fire Station). PRO—Bob Muir, G3LHN, QTHR, tel 01-979 6255 evenings.

Farnborough (Bromley RC)—Third Monday in each month, 8pm, rear of Farnborough (Kent) Village Hall (opposite "The Woodman" public house). Further details from PRO—Derek Morgan, 59 Bassetts Way, Farnborough.

Gravesend (RSGB Group)—Mondays, 7.30pm, "Windmill Tavern", Shrubbery Road, Gravesend, Kent. Area representative—P. F. Jobson, G3HLF, QTHR.

Guildford (G & DRS)—Second and fourth Fridays in each month, 8pm, Model Engineering HQ, Stoke Park, Guildford, Surrey. Further details from hon sec—Dave Coltart, G3SYM, QTHR.

Harlow (DRS)—Tuesdays, 8pm, Mark Hall Road, First Avenue, Harlow, Essex. Details from hon sec Vic Heard, 106 Vicarage Wood, Harlow.

Harrow (RSH)—Fridays, 8pm, Harrow Sea Cadets HQ, Woodlands Road, Harrow, Middlesex. Refreshments available during evening. Further details from hon sec—Les Light, G3KDC, QTHR.

Havering (H & DARC)—First and third Wednesdays in each month, 8pm, British Legion House, Western Road, Romford. Hon sec—Sam Hobday, G3SKV, QTHR.

Holloway (Grafton RS)—Fridays, 7.30pm, Archway School Annexe, Whittington School, Highgate Hill N19. Hon sec—H. D. Ashcroft, G8AYU, QTHR.

Ilford (RSGB Group)—Thursdays, 8pm, Mortlake Road, (off Ilford Lane), Ilford, Essex. Hon sec—Derek Sapsworth, G3YAW, QTHR.

Kingston (K & DARS)—14 November (AGM), 12 December (Surplus equipment sale), 8pm, The Berrylands Scout Troop, Stirling Walk, off Grand Avenue (behind Surbiton Lagoon), Berrylands, Surrey. Hon sec—Dick Babbs, G3GVU, QTHR.

Loughton (L & DRS)—9 November ("Radar" by G8AB), 23 November (Informal), 7 December (Being arranged), 21 December (informal), 8pm, Loughton Hall, nr Debden Station. Hon sec—David Bowers, 12, Theydon Park Road, Theydon Bois, Epping, Essex.

New Cross (Clifton ARS)—Fridays, 8pm, 225 New Cross Road, London SE14. Details from hon sec—R. A. Hinton, 48 Camilla Road, Bermondsey, SE16.

Northolt (BEAARS)—First Thursday in each month, 8pm, BEA Trident Club, Western Avenue, Northolt, Middlesex. (This club is open to non-BEA employees by invitation. Contact David Evans, G3OUF, tel Amersham 21573, for details).

Paddington (P & DRS)—First Thursday in each month, 8pm, Beauchamp Lodge, Warwick Crescent, W2. Further details from hon sec—Mike Powley, G8AWV, QTHR.

Purley (P & DRS)—16 November (Arthur Milne, G2MI, talking about the QSL Bureau), 21 December (Being arranged), 8pm, "Lansdowne Hall", Lansdowne Road, Purley, Surrey. Hon sec—M. H. Roach, G3TWJ, QTHR.

Reigate (RATS)—6 November, 4 December (Natter night), 8.30pm, "Marquis of Granby", Hooley Lane, Redhill, 20 November ("Cause and effect" by Ron Ham), 18 December (Constructional contest), 8pm, St Mark's Church Hall, Alma Road, Reigate. Visitors and prospective members always welcome. Hon sec—F. H. Mundy, G3XSZ, QTHR. (Reigate 43130).

Scouts (Baden Powell House ARG)—Third Tuesday in each month, 8pm, Baden Powell House, Queensgate, S Kensington, SW7. Further details from hon sec—Alf Watts, G3FXC, QTHR.

Shelbourne (Youth Centre RC)—Thursdays, RAE for beginners, an informal approach, Mondays, 8pm, Shelbourne (Upper) School, Hornsey Road, N7. Tutor and PRO—R. Cummings, G3SLF, QTHR.

Southgate (SRC)—8 November (Constructional contest for the G6QM Trophy), 6 December (AGM), 8pm, The Green, Winchmore Hill, N21. Further details from hon sec—John Bachelor, G3XMV, QTHR.

St Albans (Verulam ARC)—21 November (Talk and slide show on the Apollo moon landings), 19 December (AGM), 25 November and 2 December, 2m and 160m, Diamond Jubilee Contest respectively (0800 to 1200gmt). Further details on club activities and contest from hon sec—Hugh Young, G3YHY, QTHR.

Sutton & Cheam (SCRS)—20 November (Surplus equipment sale), 18 December (To be announced), 8pm, "The Harrow", Cheam, Surrey. Hon sec—Alan Keech, G4BOX, QTHR.

UK FM Group (London)—Second Tuesday in each month, 8pm,

The Scout Hut, Hayes Rd, Southall, Middx. Further details from PRO—Roger Wilkins, G3XFA, QTHR, tel Heathfield 2189.
Welwyn (Mid Herts ARS)—Second Thursday in each month, 8pm, Welwyn Civic Centre, Welwyn. Hon sec—Andrew Marshall, G8BUR, QTHR.
Wembley (GECARS)—Thursdays, 7pm, Sports Club, Preston Road, North Wembley. (This club is open to non-GEC employees by invitation. Tel Dain Evans, G3RPE, at 01-904 1262 during business hours, for details).
Wimbledon (W & DRS)—Second and fourth Fridays in each month, 8pm, St John Ambulance HQ, 124 Kingston Rd, Wimbledon, SW19. Further details from hon sec—F. W. Hill, G3WDO, QTHR.

REGION 8 — RR D. N. T. Williams, G3MDO

Canterbury (EKRS)—15 November (Film show and MCC report), 20 December ("Booze" at the Cricketers). Further details of future events from hon sec—D. N. T. Williams, G3MDO, QTHR.
Medway (MARTS)—Every Friday, 7.30pm at the Aurora Hotel, Gillingham, Kent. RAE lectures held on meeting nights commencing 7.30pm. Further information from hon sec—H. E. Willis, 111 Laburnum Road, Rochester.
University of Kent (UKC)—Details of club meetings from K. Beesley, G3UXE, Eliot College, University of Kent at Canterbury.
Brighton (BTCRC)—12, 26 November, 10 December, G3TCB/G4BTC will be on the air during the meetings which are held at club room B7, Brighton Tech College, Richmond Terrace, at 7.30pm.
Worthing (W & DARC)—Meetings held at the Rose Wilmot Youth Centre, Littlehampton Road, Worthing. Further details of future meetings from G8ETL, 12 Bramble Crescent, Worthing.
Maidstone (M YMCA ARS)—Meetings held at "Y" sports centre, first and third Fridays devoted primarily to the beginners.
Crawley (CARC)—Fourth Wednesday in the month, United Reform Church Hall, Ifield, Crawley. Further details of future events from G3MGL, QTHR.
Eastbourne (SARS)—First Monday in the month, Victoria Hotel, Latimer Road, Eastbourne. PRO—G3JFM.
Horsham (HARC)—Formal meetings, Guide HQ, Denne Road, Horsham. Informal meetings at "Star", Roffey. Further details of meetings from T. Wadsworth, G3NPF, 39 Church Road, Broadbridge, Heath, Sussex.
Mid-Sussex (MSARS)—Meetings held at Marle Place, Leylands Road, Burgess Hill. Further details of future meetings from G3RXJ, QTHR.
West Kent (WKARS)—Alternate Fridays, Adult Education Centre, Monson Road, Tunbridge Wells. Further details from G4BKG, 36a London Road, Southborough, Kent.
Adur Contest Group (ACG)—Group meets first Tuesday in the month at the QTH of G8FAY. Further details from A. J. Slater, G3FXB, QTHR.
Chichester (CRC)—Amateurs interested in this growing group please contact D. W. Hughes, G3TYD, 133 East Beech Road, Selsey, Sussex.

REGION 9 — RR H. W. Leonard, G4UZ

Bath (B & DRG)—Mondays, 8.30pm, The Crypt, Church of the Ascension, Oilfield Park, Bath. Full details from G8DRK, tel Bath 23465.
Bristol (City & County RSGB Group)—26 November ("Aerial farm" by Dud Charman, G6CJ), 17 December (Potted lectures), 7pm, Becket Hall, St Thomas Street, Bristol 1. *G3ULJ.*
Bristol (BARC)—Now 10 years old and still going strong. Tuesdays, 7.45pm, 24 Bright Street, Barton Hill, Bristol 5. *G3XEI.*
Bristol (Shirehampton)—Fridays, 7.30pm, Twyford House, Shirehampton, Bristol. *G5AQZ.*
Bristol (University ARS)—Most Saturdays during term time, 2.30pm, Dept of Physics, Royal Fort, Tyndall Avenue, Bristol BS8 ITL. All details from G3WDG.
Cornish (CRAC)—First Thursday in month. 8 November ("DX tv" by G3VWK, followed by sale of surplus equipment), 6 December ("Oscilloscopes" by G3XFL and G3VWK), 3 January ("PCB etching" by G8DZE), 7.30pm, SWEB Clubroom, Pool, Camborne. *G3XTF.*
West Cornwall Radio Club (CARC)—Now meets at Guild Hall, Penzance, on alternate Wednesdays, 7.30pm. Full details of Cornish and West Cornwall from G3NKE, tel Camborne 2419.
Exeter (EARS)—Second and fourth Tuesdays, 7.30pm, now at the ATC, The Quay, Exeter. All are welcome. Sec—Jack Bawden, 232 Exwick Rd, Exeter EX4 2BA.
North Devon (NDRC)—Second and fourth Wednesdays, 14 November (Talk), 28 November (Ragchew), 12 December (Talk), 26 December (No meeting). RAE class going well. 7.30pm, ("Grinnis"), HighWall, Sticklepath, Barnstaple. *G4CG.*
Plymouth (PRC)—First and third Tuesdays. 6 November (Film Show), 17 November (Annual dinner and dance). Members are busy improving the clubroom and vhf interest is still growing. 7.30pm, Virginia House, Bretonside, Plymouth. Visitors always welcome. *G3UVS.*
Saltash (S & DARS)—First and third Fridays, 7.30pm, Burraton Toc H Hall, Saltash. *G3ZHM.*
South Dorset (SDRS)—First Friday of month, 7.30pm, Alma Road section of Weymouth Technical College. *G3VPF.*
Taunton (T & DARS)—Every Friday, 7.30pm, Jelalabad Barracks, The Mount, Taunton. Sec—G. Swetman, "Little Copse", Monkton Heathfield, Taunton, tel West Monkton 298.
Torbay (TARS)—Every Tuesday with special meeting on last Saturday of month. 24 November ("RTTY" by G3UIQ), 15 December (Christmas party), 29 December (No meeting), 7.30pm, rear of 94 Belgrave Road, Torquay. Visitors always welcome. *G3UIQ.*
Weston-super-Mare (WsMRS)—Second Friday of month, 7.30pm, Room Lewis M2, Worle School, New Bristol Road, Worle. *G3PQE.*
Yeovil (YARS)—Every Thursday, 7.30pm, The Youth Centre, 31 The Park, Yeovil, 6 December (Film "The fisherman" by G4CEB). *G3NOF.*

REGION 10 — RR D. M. Thomas, GW3RWX

Blackwood (ARC)—Fridays 7pm, Oakdale Community Centre College, Oakdale, Mon. 2 November (Tape recordings of members transmissions), 9 November ("Integrated circuits" by GW3MMU), 7 December ("History of amateur radio", tape/slide lecture). *GW3KYA.*
Barry College of Further Education (ARS)—Thursdays, 7pm, at the College, Colcot Rd, Barry, Glam. *GW3VKL.*
Cardiff (RSGB Group)—Monday, 12 November, 7.30pm, Monday 10 December, Informal social evening. Both meetings at BBC Social Club, Newport Road, Cardiff.
Hoover (ARC)—Mondays, 7.30pm, Hoover Social Club, Hoover Works, Pentrebach, Merthyr, Glam. A visit was paid to the club on 29 October by members of the Hereford club. *GW3RNC.*
Glamorgan VHF/UHF Group—Third Tuesday of each month, 7.30pm, at the NCB Staff Members Club, Tondu, Nr Bridgend, Glam. 20 November ("GW6GW/P dxpedition" by GW4BLE and the boys), 18 December (Discussion on band-planning on the vhf and uhf bands). *GW3ZTH.*
Pembroke & District (RSGB Group)—Last Friday of each month 7.30pm, at the Defensible Barracks, Pembroke Dock. *GW4AKO.*
Pontypool (RSGB Group)—Tuesdays, 7pm, at the Educational Settlement, Rockhill Rd, Pontypool, Mon. *GW3JBH.*
Swansea Radio Society—First and third Tuesdays of each month at the Commercial Hotel, Killay, Swansea, Glam, at 7.30pm. A very successful df contest was recently held and it is planned to repeat this at a later date. Please note change of secretary—now GW4BIQ.
South-East Wales Raynet Group—Details from GW3ZFG, tel Cardiff 62411. Information for those interested in Raynet in the Britton Ferry area contact GW4ACF, tel Britton Ferry 812475.
Sully & District Short-wave Club—Tuesdays, 7pm, Annexe, Sully & District Bowls & Social Club, 59 Port Rd, Sully, Glam. *GW3PHH.*
Rhondda (ARS)—Meets at Rhondda Transport Employees Club & Institute, Porth, Rhondda, Glam. *GW3PHH.*
University College of Wales, Cardiff—Details of society activities from the Secretary, Students Union, Dumfries Place, Cardiff.
University College of Wales Aberystwyth Radio & Electronics Society—Details from the secretary, c/o Students Union, University College of Wales, Aberystwyth, Cards.

REGION 11 — RR P. Hudson, GW3IEQ

Rhyl & District ARC (R & DARC)—Please note new meeting place is New Ambulance Station Lecture Room, Mercia Drive (off coast road), Rhyl. 13 November ("Aerials and feeders"), 11 December ("Transmitters and receivers for vhf & uhf"), 8 January '74, (Technical film show). In addition it is hoped to visit places of interest during the winter session. All meetings begin at 7.45pm.
Conway Valley (CVARC)—Second Thursday of the month 7.30pm, at "The Quarries", Llandulas, visitors always welcome. 8 November ("SSB operating" by GW3ELM), 13 December (Junk sale & raffle), 10 January 74, (Guest speaker: Dr David Last, GW3MZY). The club station GW6TM is active on Tuesday evenings from 7.30. Weekly morse classes can be arranged if there are sufficient students.

REGION 12 **RR A. J. Oliphant, GM3SFH**

Aberdeen (AARS)—Fridays, 7.30pm, 91 Crown Street, Aberdeen. Details from GM3FRI, QTHR.
Dundee (Kingsway Technical College ARC)—Wednesdays, 7pm, (Morse practice 6.30pm), Kingsway Technical College, Old Glamis Road, Dundee. Visitors always welcome. J. Kelly, GM4AQM, QTHR, Dundee 730265.
Lerwick (LRS)—Tuesdays at 7pm, clubrooms, Abbsbrae House, Lerwick. GM4BBL, Lerwick 1238,
Lhanbryde (MFARS)—Wednesdays, 7.45pm. Details from GM3UKG, QTHR. Clochan 225.
Inverness (IRS)—Fortnightly on Fridays at 7.30pm. Details from Mr L. Bell, 114 Glenurquhart Road, Inverness.
Queen's Own Cameron Highlanders Memorial Youth Club Radio Section—Tuesdays, 7.30pm, Planefield Road, Inverness. Section caters for all young people from 13 years interested in learning and obtaining practice in the elements of radio technique. Bill Begg, 68 Tomnahurich Street, Inverness.
Thurso (CARS)—Second Tuesday in each month. Details from GM4BKO, QTHR, Thurso 3704. Visitors always welcome.

REGION 14 **RR M. A. Comrie, GM3YRK**

Ayrshire (AARG)—Meets at YMCA, Howard St, Kilmarnock. Further details from hon sec—R. D. Harkness, GM3THI, 55 Woodend Rd, Alloway.
Ardeer (ARCARS)—Thursdays at 7.30pm, Ardeer Recreation Club, Stevenston, Ayrshire.
Falkirk & District (RSGB)—9 November (Recorded lecture), 14 December (Films on computer subjects). Further details from J. Ramsay, 78 Wheatlands Avenue, Bonnybridge, Stirlingshire.
Greenock & District (ARC)—GM3ZRC, Tuesday and Friday, at 7.30pm, Watt Library, Union Street, Greenock. Enquiries to hon sec—N. C. Henderson, GM3LYI, QTHR.
Glasgow University Radio Club (GURC)—George Service House, University Gardens, Glasgow. Details from hon sec—c/o Dept of Eng.
Mid Lanark (ARC)—9 November (Bring and buy sale), 23 November (Stereo radio and quadraphonic sound—demonstration by GM3UCI), 7 December (AGM), 21 December ("Oklahoma—amateur radio experiences in the States" by GM3BVU). Further details from hon sec—D. H. Plumridge, GM3KMG, 7 Waterside Gardens, Hamilton, Lanarkshire, ML3 7PY.
West of Scotland Amateur Radio Society (WoSARS)—GM4AGG, each Wednesday and Friday at 8pm in the club rooms at 71 Virginia Street, Glasgow. Meetings conducted by the chairman, T. Hughes, GM3EDZ. Further details from the hon sec—M. Parks, GM8HBU, 6 Stamperland Hill, Clarkston, Glasgow.

REGION 15 **RR J. Thompson, GI3ILV**

Bangor (B & DARS)—2 November (Surplus equipment sale) at the Borough Gymnasium, Hamilton Road, Bangor, 30 November ("An aspect of amateur radio") at the Redcliff Hotel, Seacliff Road, Bangor, 6 December (Annual dinner/dance) at the New Imperial Hotel, Donaghadee. All meetings begin at 8pm. At the AGM held on 7 September Bill Langtry, GI4AAM, was elected secretary for the new season. A course for the RAE is currently in progress at the Bangor Technical College, run by Cyril Billington, GI3WSS.

BANGOR & DISTRICT ARS

Annual Dinner — Dance

Thursday 6 December
New Imperial Hotel
Donaghadee, Co Down

Commences 7.30pm Dress Informal

Tickets £2.50 each from GI3KDR, QTHR
Tel Holywood 3983

REGION 17 **RR L. Hawkyard, G5HD**

Farnborough (F & DRS)—Now meets on the 2nd and 4th Wednesdays of each month at the 8th Farnborough Air Scouts hut, Rectory Road Recreation Ground, Farnborough, Hants. Sec—J. Maidment, G8FWE, QTHR. Tel Camberley 22887.
Maidenhead (M & DARC)—First Thursday and third Tuesday at the British Red Cross Hall, The Crescent, Maidenhead, 7.30pm.
UK FM Group (Southern)—First Wednesday of each month, 8pm, Chineham House, Popley, Basingstoke. Sec—J. Akam, G8BIH.
Southampton RSGB Group—Second Saturday of each month at the Lanchester Building, Southampton University. Club night Wednesday at the clubroom, Kent Road. *G5HD*. Tel 773378.
Harwell (AEREARC)—Meetings on the third Tuesday of each month, also informal gatherings and junk sales every Friday lunch time. Social Club, AERE, Harwell, Berks. *G3NNG*.

Members of the RSGB Membership and Representation Committee meeting at RSGB headquarters on 3 September. Left to right: Messrs W. J. Green, F. C. Ward, C. H. Parsons, W. F. McGonigle, G. R. Jessop, J. R. Petty, A. W. Smith, R. W. Fisher, W. A. Scarr, and E. G. Ingram *Photo: P. Fletcher*

RSGB SLOW MORSE PRACTICE TRANSMISSIONS

These slow morse practice transmissions are sponsored by the RSGB. Alterations and additions to this list should be sent to the honorary organizer, Mr M. A. C. MacBrayne, G3KGU, 25 Purlieu Way, Theydon Bois, Essex.

Clock time	Callsign	MHz	Town
Sundays			
0900	G3KEP	1·910	Bingley, Yorks
0930	G3YZZ	3·590	Maidenhead, Berks
0930	G3HZL	1·930	Isleworth, Middlesex
0945	G3YRO	1.860	Fareham, Hants
1000	G2FXA	437·000 to north	Stockton-on-Tees
1015	G3CGD	1·875	Cheltenham
1030	G2FXA	437·000 to south	Stockton-on-Tees
1030	G3NPB	1·875	St Ives, Cornwall
1030	G3LR	1·810	Accrington, Lancs
1030	G3ZNW	144·520 to east	West Molesey, Surrey
1100	G2FXA	1·900	Stockton-on-Tees
1100	GW3UMB	1·880	Colwyn Bay
1115	G3ZNW	144·520 to north	West Molesey
1200	G3HVI	144·100 omni-directional	Stoke-on-Trent
1330	G3FWW	1·880	Burnham-on-Sea, Soms
1330	G3XDV	1·190	Canterbury, Kent
1400	G3XWQ	1·975	Canterbury Kent
1400	G3XGJ	1·830	Huddersfield, Yorks
1730 †	G3VTY	1·915	Leeds, Yorks
	G3YEE		Bradford, Yorks
	G3ZKH		Bradford, Yorks
1930	G3YFO	144·19 to south	Burnham, Bucks
Mondays			
1800 †	G3YEE	145·510	Bradford, Yorks
	G3ZKH		Bradford, Yorks
1800	G3SWR	1·980	Birmingham
1830	G3NCZ	145·800	Blackburn, Lancs
1830	G3VBI	1·910 omni-directional	Goole, Yorks.
1830	G3RXH	1·910	Skipton, Yorks
1845	G4AIV	1·860	Kettering, Northants.
1900	G3WGU	1·880	Bispham, Lancs
1900	GC2FMV	3·600	Jersey, CI
1900	G3YJA	1·920	Coventry, Warks
1900	G3YEI	1·850	Fleetwood, Lancs
1930	G3RAF	1·910 / 3·590 / 144·050	Locking, Somerset
2000	G3XWZ	1·910	Mansfield, Notts
2000	G3KAN	1·990	Northampton
2000	G3IBJ	1·910	Southampton, Hants
2000	G3BLP	144·645	Dunstable, Beds
2015	G3HZL	1·845	Isleworth, Middlesex
2030	G3JHM	70·050	Worthing, Sussex
2130	G3LQI	1·980	Lancing, Sussex
2200	GM4AJH	144·900 to north-west	Aberdeen
†Alternately			
Tuesdays			
1100	G3EBU	1·952	South Woodham, Essex
1800	G3XDV	1·910	Canterbury, Kent
1830	G4BNA	3·590	Swindon, Wilts
1900 †	G3UFO	1·980	Wirral, Cheshire
	G3XAM		
1900	G3XWQ	1·975	Canterbury, Kent
1930	G3SWP	1·850	Doncaster, Yorks
1930	G3WGU	433·500 to south-east	Bispham, Lancs
1930	G3RAF	1·910 / 3·590 / 144·050	Locking, Somerset
2000	G3ZFE	144·896 omni-directional	Hailsham, Sussex
2000	G3TUW	145·200 to south-east	Banbury, Oxon
2000	G3UPA	1·850	Meriden, Warks
2000 †	G3TIK	1·980	Stevenage, Herts
	G3KSS		
	G3OVT		
2000	G3FWW	1·880	Burnham-on-Sea, Soms
2000	G3WGD	1·860	Leicester
2000	GM3PIP	3·590	Mintlaw, Aberdeen
2030	G3ROE	1·915	Harlow, Essex
2030	G3RB	1·975	Whitley Bay, Nth'land
2045	GM2CRY	3·590	St Andrews, Fife
2200	GM4AJH	144·900 to north-west	Aberdeen
†Alternately			

Clock time	Callsign	MHz	Town
Wednesdays			
1830	G3FXA	1·900	Stockton-on-Tees
1900	G3YPZ	28·700	Harlow, Essex
1930	G3WGU	433·500 to south-east	Bispham, Lancs
1930	G3YFO	144·19 to north	Burnham, Bucks
2000 †	G3AJX	1·925	Winchester, Hants
	G3TWP		
	G3YSK		
1930	G3RAF	1·910 / 3·590 / 144·050	Locking, Somerset
2000	G8QU	1·970	London, N22
2000	G3JHM	70·050	Worthing, Sussex
2000 †	G3VCV	145·020 to north-west	Wyton, Hunts. Haddenham, Cambs
	G4BEL		
2015	G3WVJ	1·845	Staines, Middlesex
2030	G3KGU	1·915	Theydon Bois Essex
2100	G3HVI	144·100 omni-directional	Stoke-on-Trent
†Alternately			
Thursdays			
1800	G3SWR	1·980	Birmingham
1830	G4BNA	3·590	Swindon, Wilts
1830	GW3VBP	3·590	Barry, Glam
1830	GW3UMB	1·880	Colwyn Bay
1830	G3NC	1·968	Swindon, Wilts
1845	G4AIV	1·860	Kettering, Northants.
1900 †	G3ZBO		Preston, Lancs.
	G3WFY	1·850	Thornton Cleveleys
	G3YEI		Fleetwood, Lancs
1900	G3WGU	1·880	Bispham, Lancs
1915	G3ZNW	144·520 to north	West Molesey, Surrey
1930	G3RAF	1·910 / 3.590 / 144·050	Locking, Somerset
2030 †	G3SJE	1·875	Harrow Middlesex
	G3GC		
2030	G3YMJ	1·915	Harlow, Essex
2100	GW3XNI	1·930	Crosskeys, Mon
2130	G3LQI	1·980	Lancing, Sussex
2200	GM4AJH	144·900 to north-west	Aberdeen
†Alternately			
Fridays			
1800	G3XDV	1·910	Canterbury, Kent
1830	G3NCZ	145·800 omni-directional	Blackburn, Lancs
1900	G3IQF	1·980	Marlow, Bucks
1900	G3NPB	1·875	St Ives, Cornwall
1930	G3PQF	144·360 to north-east	Farnborough, Hants
1930	G3RAF	1·910 / 3·590 / 144·050	Locking, Somerset
2000	G3EEL	1·980	Peterborough
2000	G3WGD	1·860	Leicester
2015	G3SAZ	1·845	Ashford, Middlesex
2030	G3JHM	70·050	Worthing, Sussex
Saturdays			
0930	G2FNK	1·930	Staines, Middlesex
1000	G3PLE	1·820	Stourbridge, Worcs
1100 †	G3ZOQ	28·350	Leyland, Lancs
	G3ZRE		
1300	G2FXA	1·900	Stockton-on-Tees
1400	GC2FMV	3·600	Jersey, CI
1730	G3TNF	1·980	Gateshead
2000	G3KPO	1·980	Peterborough
†Alternately			

G3BZU morse proficiency transmissions at 20, 25, 30, 35 and 40wpm are made at 1900 gmt on the first Tuesday of each month on a frequency of 3·520MHz. For 100 per cent copy at 20wpm a certificate is awarded, and endorsement stickers are available for 100 per cent copy at the higher speeds. A charge of 10p or two IRCs is made for the basic certificate, and 2½p or one IRC for each endorsement sticker claimed. All claims should be sent to—The QRQ Manager, RNARS, HMS *Mercury*, Leydene, Petersfield, Hants.

MEMBERS' ADS

These low-cost flat-rate advertisements are accepted as a service to members of RSGB. They must be submitted on the Members' Ads order form printed on the last page of each issue of *Radio Communication*, or on a postcard similarly laid out. Each **must** be accompanied by a **recent** *Radio Communication* wrapper addressed to the advertiser, as proof of membership, and a remittance by postal order or cheque for 25p (stamps not accepted). They will not be acknowledged. Those not clearly worded or punctuated will be returned. No other correspondence concerning this service can be entered into.

The closing date for each issue is the 4th of the preceding month but no guarantee of inclusion in a specific issue can be given. Valid advertisements not published in the issue following receipt will be held over until the next issue.

Trade or business advertisements, even from members, will not be accepted for Members' Ads but should be submitted as classified or display advertisements in the usual way. The RSGB reserves the right to refuse advertisements, and accepts no responsibility for errors or omissions or for the quality of goods offered for sale.

Members are advised to enclose a stamped addressed envelope when replying to advertisements.

See the current order form on the last page for further details.

Post to : MEMBER'S ADS, "RADIO COMMUNICATION", 35 DOUGHTY STREET, LONDON WC1N 2AE

FOR SALE

Four transformers, potted, 0-42-46-50V at 5A, 24V at 0·5A, £1.50 each, buyer collect. G8AYM, QTHR. Tel 01-572 0921.

Microwave modules transmitter, 2m 5W a.m., with three crystals, £30; 2m 40W transmitter £25; 4m phasing harness £1. Colin Baker, Collingtree, Luton, Beds, LU2 8HN. Tel Luton 35806.

Trio JR310 rx, mint cal, built-in spkr, £50; rx, suit swl, 1·9-8MHz, compact unit, £5; 2m convtr and 8-el yagi, both £6; psu/audio amp unit £2.50. G3VFG, QTHR. Tel Leeds 757692.

Pye Vanguard AM25B complete with control box etc, on 145, new 3/20A and exciter valves, £25 + 75p p&p. Pye AM10D Cambridge dash mount 6-channel, on 2m, £28 + 75p p&p. GM8CTQ, QTHR. Tel 041-942 7802.

Late AM10B 2m, complete, mic, speaker control box mount, cables handbook, £20; exchange two 10·7MHz 8-pole xtal filters, 6kHz, 12kHz for two 9MHz ssb filters. G3OBP, QTHR. Tel Longfield 2645.

100A 3-phase Leece Neville car alternator with phase reversal and single-phase 240V transformers £25 ono; 40W Pye Ranger, complete and working on 4m, £20; small 12V petrol generator £10. G3TGF, QTHR. Tel Orpington 26802.

Radiogram, large, modern, cabinet in teak with matching Wharfedale corner speaker unit, £20; Phillips EL3302 cassette recorder with mains pu £10; Mullard valve test cards 15p each or exchange, sae list. G2BHY, QTHR. Tel Orpington 26802.

GR286 marine radiotelephone, tx on 2m, good condition, ccts, £10; CX203 general coverage rx, brand new, boxed, £23. *Wanted* RA1, must be good working order, offers, all carriage arranged. G8HAY, 39 off Hough Lane, Wombwell, Barnsley, Yorks.

Bantam fm 2m, new, ni-cads, as new, handbook etc, offers; BAY96, new, £2.50. *Wanted* XF9A/B filter, xtals (65 and 65·5MHz) and any gen on Cossor CC302 Hi-band mobile. G3RNV QTHR.

Eddystone 940, mint, £100; UR1A fet rx, mint, £19; 12AVQ trap aerial, used few times, £12.50, deliver 30 miles. *Wanted* Eddystone 730/4, excellent condition, would consider part exchange. G3FK QTHR. Tel Breamore 436.

DX100U tx, 160-10m, good condition, £35; JR500SE rx, new condition, matching speaker, £35. *Wanted* several TCC hi-pass filters type C263, good amateur band rx with cw filter. G3JFC QTHR. Tel Crayford 22489.

GR64, PR30X, QPM-1 Q-mult, £27, possibly separate. *Wanted* HA600/800 or Mohican, 2N5995, 43·9MHz HC/6U xtal. G4AFI QTHR.

Pye Vanguard, working on 2m, with crystal and all control gear, £15 plus carriage Yorkshire. G8EUH QTHR. Tel Elland 3062.

Pye base tx/rx, tx on 2m, £20; Pye base tx/rx on 2m, rx tunable, £45 buyer collect; new 2m lines (Mark Equipment), disc tuning anode, connectors, ceramic insulators, £4.50, sae enquiries. G8FUI QTHR.

Eddystone 888, immaculate, performs to maker's spec, £50, no offers, buyer collect or arrange; 9A Powerstat variable transformer, 19in panel, ac meter, fuses, £6 plus carriage. G2BAT QTHR. Tel 072-275 409.

DX100U, vgc, handbook, £35; Marconi CR100/2 rx, good condition, £5. G3WZR, c/o Rathbone Hall, N. Mossley Hill Road, Liverpool L18 8BH.

CR100/8 rx, all plugs, handbook, unused, in sealed packing when released by services, £20; Command receivers, 3-6MHz, £4, 1·5-3MHz £7; Avo 40 with case £12, prefer buyer collects, deliver Lincs/Yorks. W. H. Fletcher, Holmdale, 55 High Street, Martin, Lincoln. Tel Martin 255 (weekends) or Beverley 881255 ext 215 (office).

Taylor 65A sig gen £12; Nombrex sig gen No 31 £7. *Wanted* Heathkit VF1U and 80m xtals. G6AB QTHR. Tel Holland on Sea 3356.

Heath Twoer £17; SSM 2m pre-amp £4; G3LGK converter, 4·7-6·7 i.f. £5; stabilizing units, 12V in, 6, 7·5 or 9V out, £1.80; FT101 fan £8; Codar Q-mult £4; Trio SP5D speaker £3. P. Smith, 49 Hucknall Avenue, Ashgate, Chesterfield, Derbyshire S40 4BZ.

Trio 9R59D rx, bfo, anl etc, good condition, £30 ono, consider exchange for Heathkit Mohican or similar. *Wanted* valves for Murphy B40C, ECH22, EF52, EL22, EZ22 and EF51. C. T. Clarkson, 148 High Street, Hook, near Goole, Yorks DN14 5PL.

SSB tx, 160-15m, 120W p.e.p., built-in psu, h/b, works fb, £25; Minimitter mk2 rx, matching speaker, d conv, £20; transformer, 300/400-0-400/300V 250mA out, 250V ac in, £2. G3VFG QTHR. Tel Leeds 757692.

Marconi wave analyser TF455D/1 £10; transductor transformers, 18V/18A, 30V/4A, 42V/10A, 50p ea; four output 15/30V psu £5; Geloso 4/102 less dial £1; 8kHz-30kHz rx £2, all plus carriage. G3UFW QTHR. Tel Devizes 2515.

R1132 rx with mains psu, in working order, £5 ono; Codar PR40 preselector, as new, £5. R. Hammond, 30 Harvard Road, Lewisham, London SE13 6SF.

J Beam 2m aerial, 8-over-8, £3.50; antique German hf/vhf radio rx. *Wanted* Oxley Tempatrimmer 6·5pF. G8CXG QTHR. Tel Haslemere 51394.

Labgear uhf tv masthead amplifier and psu, new condition, £5. G4BEZ QTHR. Tel Cheltenham 57595.

Exchange Liner 2 with ac psu in new condition for hf band ssb tx/rx, complete and working, details to G3CGQ QTHR. Tel 0582 25519.

UNR-30 rx, excellent condition, with headphones, £11.50 ono; PR-40, mint condition, never used, £8, or both for £18, both items in original boxes. Mr K. Corbett, 59 Stansfield Road, Benfleet, Essex SS7 4NA.

Linear HT-41 £70; receivers—SB301 £85, SX101 £60, Super Pro £25, HRO with 10 coils £25; BC221-AH, charts, £17.50; 1,200W 230/115V transformer, 4D32s, new, £9, request list sundries, all good, carriage extra. GD3TIU QTHR. Tel Marown 442.

KW Vanguard tx, 160-10m, £15. *Wanted* KW or similar Z-match. GW3WSU QTHR.

BC1000 (31 Set) with headset, rusty, £5; HROMX and 9 general coverage coils, £20; Tiger 60, 160-10m 60W a.m./cw, £22; CR100, R1392, needs attention, £5 ea, all buyer collect. G3YFE QTHR. Tel Worcester 29592.

Crystals, 5MHz HC/6U, 75p, 8·950MHz HC/18U, 75p, send 3p sae with remittance and order. Richard Bowell, 16 Margarite Way, Wickford, Essex.

Cossor 1071K-DB oscilloscope £8; Marconi TF373D CLR bridge, ex-WD, £6; Lasky transistor checker, mint, £5; Class D wavemeter modified for 6·3V ac supply, £3, all with details; Cossor 343 ganging oscillator, 0·7-20MHz, £5. H. O. Bradshaw, 63 Bunbury Road, Northfield, Birmingham B31 2DS. Tel 021-475 1107.

Heath Apache TX1 tx £45; SB10 ssb unit £20; Hallicrafters SX101A £70; AR88, no case, £30; Pye Vanguard low band with 70·26MHz xtals £15, all in vgc. GM3TRI QTHR. Tel Perth 26941.

Eddystone 680X £55; BC221 with ac psu £16; Eddystone 888A £50; Advance dip/Z signal generator 2-5, 10-18, 30-190MHz, plus cal, £20. G3GNR QTHR. Tel 08-444 5938.

KW201 rx in fine condition, £90, buyer collect. J. Nettleton, 129 Stainbeck Lane, Leeds 7. Tel Leeds 681753.

AM10D, dash-mounting Cambridge, tuned up on 145MHz but less xtals, £20, prefer buyer collect. G8CBE QTHR.

KW Vanguard 80-10 tx, excellent condition, £25 ono; Hy-Gain 18V, little used, £10 or both for £30, willing to exchange both for good 2m base station, Pye tx/rx etc. G8HHF, 13 Haling Grove, St Augustine's Avenue, South Croydon, Surrey. Tel 01-688 8045.

KW2000, modified h/built ps unit, fitted 6146B, spare 6146B, £50; Radio-tv servicing books 1965/69 £7.50 (cost £15); xtal control unit, 34 xtals, 13·54 to 19·8MHz, OK for 2m transverter, £4. G3JFL QTHR. Tel 021-360 4632.

1155 set psu, vgc, £12; 19 set, suitable for spares, £2; 12in Goodmans speaker £4; 12in Tannoy dual cone and cross-over, offers; Tripletone "hi-fi" amplifier £6.50; Grundig TK120 recorder, vgc, with extras, £15. S. Downey, 19 Wellington Avenue, Chingford E4. Tel 01-529 0558.

FTdx401 with hand-held mic £200; Sommerkamp FRdx500 with extra filters, 2m, and fm detector, £90; CR100, good condition, £15. G3WUW QTHR. Tel Swavesey 30339.

AVO 7, faulty, £7.50; MC1305P decoders £1.85ea; TAA920 40p ea; AD161-162 40p pr; 2N3055 25p ea; BC301-303 15p ea; BC141 17p ea; BC107 5p ea; BD176-177 60p pr; TAA550 30p ea; G3WZT QTHR. Tel 0403 710565.

Fidelity RAD16, lw/mw mb/sw, £10; Wien Flight 4 mw/vhf, 88-174MHz, £10; pair 27MHz walkie-talkies £6; Pye Hi-band rx and psu, unmodded, £8; Ranger rx strips for spares 50p ea, all ono/vgc. Lockwood, 29 Coppice Avenue, Norwich. Tel 48685.

HW32A, mic, M/psu, E-zee match, handbook, £50. G8ELM, c/o E. R. Jewell, 25 Central Avenue, River View Park, Althorne, Essex. Tel Maldon (Essex) 741126.

Trio 9R59DE, intermittent fault in product detector, otherwise good condition, £20. Buyer collects or pays carriage. M. Reekie, 34 Polmont Road, Laurieston, Falkirk, Stirlingshire. Tel Falkirk 23860.

YAESU FR50B with calib, mint condition, handbook, guarantee, £62 ono, would consider exchange for 680X, also Vitavox 12in spkr in cabinet £15 ono. J. Krailing, 21 Bailey Close, Frimley, Surrey. Tel Camberley 24348, after 6 pm.

SP600JX, matching speaker, in metal cabinet, handbook, fitted product detector, this general coverage receiver is in new condition, £100 ono. S. O. Hesketh, 4 Hill Farm Road, Chesham, Bucks. Tel Chesham 5557.

"QST" 1950-1972 all matching bound/binders, 22 vols, £38 the set ono, carriage extra, vgc, in green covers, plus copies to Aug 1973. Taylor, 8 Haythrop Drive, Middlesbrough.

Mono amp, T5L, EL84 output, £5; Mono amp, 6V6 output, £2; mono amp, EL84 output, £2; 15V trans, 1½ by 1in 25p ea; Grundig tape, TK20, £12; Stellophone tape, ST451, £8; vhf radiogram, Fidelity, £7. D. A. Griggs, 5 Collingwood Avenue, London N10. Tel 01-883 3474.

CR100 £5 ono, in gwo but waveband switch needs attention, buyer collects. Tel 0425 615332.

Brand new crystals for 2m, 8·0266, 44·5933 (for 144·48 fm), 8·055, 44·7666 (for 145·0 mobile), 8·100, 45·0333 (for 145·8 Raynet), all HC/6U also 100kHz HC/13U, cost over £12, will accept £9 ono. GM4AZC QTHR. Tel Troon 311245.

HRO coils, 14MHz b/s, £2.50; 14-30 gc, 3·5-7·3 gc, £1.50 ea; HRO5 metal valves, new, 15p ea; CR100 gearbox dial assy, new, £2, plus postage. G3ESB QTHR. Tel Derby 671536.

Two 7Bs, 24V, £20 and £5; CFS-TU £10; control box Mk IV £3; auto tx £4; keyboard perf £4; various bits; paper rolls, packs, tape, fsk generator; 0-1kHz shift £15, buyer arranges collection. GW3FSP QTHR. Tel 398.

Yaesu FT200 tx/rx and FP200 psu, mint, with microphone, £168; Heath SB101 with SB600 and psu, as new, £165; Bug key £2.75; B2 receiver, marked case, no psu, £2.50. G3WY QTHR. Tel Evesham 45497.

Swan 500C tx/rx with ac psu, exc cond, little used, prefer buyer insp and collect, £175. Sae with all enquiries please. G3SWP, QTHR.

IoW 3 band 2-el cubical quad £20. G8DXN, QTHR. Tel Shipley 53556.

Codar AT5 tx with mains psu £15. G3XTQ, QTHR.

Advance TYDI signal generator, 8 to 320MHz, output meter, needs some attention, £3.50; 6in dia roller coaster £1; Taylor rectangular meters, 100μA 6 by 5in £2.50; 100-0-100μA, 5 by 4½in £2, sealed, as new, carriage extra. J. H. Lepper, 128 Sheephouse Hill, Fauldhouse, West Lothian EH47 9EL. Tel Fauldhouse 433 (evenings).

Heathkit RF1U, mint, £12; RCA scope, 115V, £18; RCA sine/square af sig gen, 115V, £15; two new 813s £4; two new 6KD6s £3, buyer collects or postage extra. J. Yates, 70 Collingwood Road, Hunstanton, Norfolk.

Codar AT5, T28, 12V psu, mains psu, control box, coaxial connections, h/b 160m loading coil £35. G3TCJ, QTHR. Tel Liskeard 42073.

BC221-Q, charts, psu, £15; Nelson Jones fm tuner £5; Portus-Hayward decoder £3; New Texas ICs 7490 45p, 7400 10p, 7475 45p, 7474 30p, 74121 35p, 74141 75p, sockets 5p; new Mullard nixies, ZM1175, 80p ea. G3UJE, "The Gables", 66 Portsmouth Road, Camberley 5Y. Tel Camberley 65654.

Pye Ranger 144MHz £6; 25W modulator £10; 3·5MHz vfo (stabilized) £5; 40W phone/cw tx, 7/3·5MHz £5; mains transformers 500-0-500 (2) £1 ea; Woden DT1 driver £1. Sae details. G3BVB, QTHR. Tel Shaftesbury 2427.

B24 miniature tri-band 2-el beam aerial, few months old, will fit in loft space (turning circle only 13ft), £25, buyer coll. G3WDI, 80 Broomfield Avenue, Palmers Green, N13. Tel 01-886 0983.

Waveform generator type 51 £10; Cathode ray unit type 2 £6; 45MHz i.f. amp £2; 30MHz i.f. amp £2; vhf rf amp (miniature) £1; vhf oscillator (miniature) £1; 20MHz i.f. amp (miniature) £1; af a.m. (miniature) £1; Foster-Seeley discriminator (miniature) £1 carriage extra. Sae enquiries. Hayward, "Sunnyfields", Lighthouse Road, St Margaret's Bay, Near Dover, Kent.

Calibrator type 1 with 250V ac power unit, fully screened, useful for conversion as transmitter or receiver, or test instrument, £2.50 carriage extra. Sae enquiries. Hayward, "Sunnyfields", Lighthouse Road, St Margaret's Bay, Near Dover, Kent.

Eddystone EA12, mint, £130, take mint EC10 Mk 2 part exchange; Codar AT5, Codar ac psu Mk2, mint, £25. G4BXY, 372 Gosbrook Road, Caversham, Reading.

TC7, 28-30 i.f. brand new with bandsearch module one, scratch on lid, £38.50; Cannon 518 cine camera with 80mm converter plus Chinon 300 dual projector, as new (Cost new £235) accept £140 ono. M. Shipton, 48 Clockhouse Lane, Romford. Tel Romford 67000.

Collins R392 rx £120; Cossor hb fm base tx, 6/40A pa £15; Pye FM25B hb mobile £15; Pye FM10D hb mobile £18; TS323 vhf freq meter less charts £9. G8AJB, QTHR. Tel 051-624 4115.

Trio 9R59DS, mint condition, used less than three hours, £45. Taylor, 4 Dewsbury Drive, Penn, Wolverhampton. Tel 30309.

Heath HG10B vfo, fine on 2m, spare valves, £15 ono; Heath HM11U vswr bridge, fb, £7; QQVO7-50 (2 off) £5; Venner timeswitch, 30A, 2 on/2 off/day £4; assorted valves, new, B7A/B9A, £3 for 25; 8·000, 8·111 (FT243) xtals, £2 both. A. G. T. Bowhay, 20 Park Road, Bracknell. Tel 22169.

KW Viceroy Mk IIIA ssb tx, 180W p.e.p., 10-80m, good condition, handbook, £65 ono; Trio JR500SE a.m./cw/ssb rx, good condition plus handbook, £45 ono. G4CCJ, 3 Ennerdale House, Woodberry Down, London N4 2RP. Tel 01-800 5798.

Ex-army 62 set, complete with phones, £10; ex-army 88 set with battery and circuit diag, offers, buyer collects or carriage extra. R. Webster. Tel 031-336 4546.

Heath IO12U 5in scope, new condition, £25; Marconi TF643B uhf wavemeter £10; BC221M £10; Europa 2m transverter with valves £45. G3LBG, QTHR. Tel 0702-521561.

Yaesu FR400SDX £115; FL400 £110; FL2000B £105; SP400 £7; Osker power meter £14; KW Eze £9; Mic £8; TH3 beam £25; Tower, 3-section, £40; if purchased complete £400, complete station available for trial. G. Lusty, The Martins, Chipping Campden, Glos. Tel Evesham 840439.

Airmec wave analyser, type 248 with manual, coverage 5-300MHz, offers. G8AJZ, QTHR. Tel 0274 880452.

Inoue IC700 rx, excellent condition, home brew matching speaker, first £50 offer; top band a.m./cw tx, built-in psu, 250V, well-built, £10. M. Cooper, 12 Black Barn Lane, Usk, Monmouthshire.

Trio JR500SE rx, very good condition, £45. GW8GVK, 52 Church Road, Baglan, Port Talbot, Glam SA12 8SU. Tel Briton Ferry 813419.

Tavasu mobile whips, complete mint set, £8; Webster Bandspanner £4; Mark HW-3 triband heliwhip £6; General Radio 606-B sig gen, superb, £8; RCA TE-149 wavemeter, similar BC-221, perfect, £5. G3UML, QTHR. Tel 01-550 0882 (Ilford).

AT5 tx, T28 rx, 12MS, 12RC, mobile rig, £28; Heath RA-1 xtal calibrator, speaker, manual, revalved, £27; PR30 preselector £5, the two for £30, deliver reasonable distance. G4BWJ, 31 Elm Drive, Hove, Sussex BN3 7JS.

KW Vespa Mk II and ac psu, as new. G3FVD, QTHR. Tel Bodmin 2487.

AM10D, very clean, 145MHz, mobile mount, £28; Teletype 15 pageprinter, 240V 45/50 baud, £10; Teletype auto-tx, new, unused, 50 baud, 110V, £10, UNR-1 rx, 550-30MHz, £8; 2m 5/8 G-whip, unused, £4; 2m 4-el beam £3; Crystals 8·1, 8·05MHz, £1 ea. J. Craig, 47 Ashley Avenue, Belfast 9.

ETM-2 with c/o relay £13; Vibroplex paddle, brand new, £12; Autronic quality paddle, brand new, £11. P. D. Coull, "Domel", Eltham, CT4 6UE, Kent. Tel Eltham 244.

Army 36 sender, complete with modulator and psu, needs slight attention, £10; also sundry transformers, buyer collects. G3KMW, QTHR. Tel 021-422 6911.

FTdx560 complete with handbook and extra xtals, delivered by Securicor for £120. GD3KHE, QTHR. Tel 0624 6636.

HW100, mint condition, £100; homebuilt power supply for HW100, £10, will sell separately; Heath RA-1 with crystal calibrator and switched product detector, £25. G3HTA, QTHR. Tel Exeter 76656.

Heathkit HW-17, £35; AT&E vhf reflectometer, calibrated 20/200W, £10; AT&E vhf 150W load, £5; STC R502 absorption wavemeter, 100kHz-48MHz, £10; CT53 vhf signal generator, with calibration chart and circuit, £12. S. L. Rhodes, 8 St Andrews Road, Reading, Berks. Tel Reading 471802.

CR100 rx (B28), £13; E88CC 2m converter, built-in psu, £5; set of four FT241 filter crystals plus carrier crystal and Denco ifts, £2.50 or offers. G3MUT, QTHR. Tel 061-485 1217.

Transistor tx (G8AEV), 12V dc, 2W a.m., with crystal for 144·41-MHz and aerial relay in diecast box, plus mic and dummy load, £10. *Wanted* : 898 dial. GW8DUP, QTHR. Tel Swansea 72632.

Double conversion homebrew rx in HRO case, crystal filter, 7 bandspread coils, psu, £25 ono; Heathkit HW32A, recent manufacturers overhaul, 2 spare pa valves, £50, buyer collects. P. Bidwood, 48 Cherryburn Gardens, Fenhem, Newcastle on Tyne NE4 9NQ. Tel 0632 33351.

Pye Westminster W15AM on 145MHz, solid state, 6W output, mobile tx/rx, £60 ono, any test; Collins TCS12 tx, needs attention, £5, buyers collect or can deliver 30 mile radius London. Tel 01-858 1448 after 7pm.

KW2000A with ac psu, recently serviced by KW, vgc, will deliver, £150 ono. A. J. Mepham. Tel Bunyan (Bedfordshire) 2517.

Creed 6S/6M paper tape reader, model 75 teleprinter with perforator Creed desk with power supplies, good working order, £12 ono. G3JIB, QTHR. Tel 061-681 5117.

New 813 bases, 50p; FX1593 toroids, 12p, p & p included. G3WQQ, 11 Helena Road, Brighton SX.

AM25B Vanguard, single-channel, on 2m, with service manual, controls on front panel, needs only crystals and speaker, good used condition, £14, carriage paid, any offer considered. S. C. Cusworth, 10 Juniper Grove, Watford, Herts. Tel Watford 35587.

Eddystone EC10, new 1969, £30; Eddystone 898 dial, new, £3; 60ft armoured pvc cable, 600/1,000V, £3. N. A. Smith, 7 The Byeways, Surbiton, Surrey. Tel 399 9526.

DX100U, 160–10m, tx, £30; SB10U, factory aligned, ssb adaptor for 80-10m, £20, both excellent condition, manuals. G3YJV, QTHR. Tel Bourne End (Bucks) 21606.

Trio JR310, mint condition, with SP-5D speaker, original packing, £55, carriage extra. G8BTX, QTHR. Tel 0502 3606.

Drake 2C, Q-multiplier, general coverage crystals, 12 months old, perfect condition, must be sold, offers invited, could deliver 100 miles. Craven, "Grassmoor", Radford Road, Alvechurch, Birmingham B48. Tel 021-445 1347.

BC454, 3-6MHz, Command rx, enclose sae with offers please. R. Kell, 38 North Lane, Seahouses, Northumberland.

Collins mech filters type F455-A-3 with both crystals, £12; F455-Y21, £12. G4BCQ, QTHR. Tel Worksop 770340 after 7pm.

SWL station: CR70A, PR30, Joymatch, atu, speaker, all housed in smart modern cabinet, plus Joystick vfa, all in perfect working order and as new, bargain, £40 ono, (changing to 2m). D. S. Marshall, "Shelwyn", Nut Orchard Twyning, Glos. Tel Tewkesbury 294082.

J Beam 10-el 2m beam, latest type, balun, vgc, £6, prefer buyer collect. Will despatch, carriage extra. G8BCA, QTHR. Tel Mildenhall (Suffolk) 714051.

Solartron CD1014 twin-beam 5MHz oscilloscope, modern, compact, miniature valves, £35; Marconi signal generator TF144G £12 ono; wavemeter W1191A, £1.50; Microcell type 400 miniature battery oscilloscope, as new, £25. C. A. Cooper, 45 Nightingale Crescent, Bracknell, Berks. Tel Bracknell 4168.

Hy-Gain TH3jnr beam, brand new, £42; Top Band Command rx, mint, unused, £4; 2m tx, power pack type 1540, needs slight attention, £3, prefer buyer collects all items. G3IR, QTHR. Tel Poynton 2087.

Pye Pocketphone type PF1/N, uhf fm, with pc layout and circuit diagrams, £30 pair or two pairs £55, offers considered. Mike Dimmock, 23Whaddon Way, Bletchley, Bucks.

9R59DE rx, as new condition, with handbook, in original packing case, few hours' use only, £35; KW swr meter, mint, £6.50; Marconi valve voltmeter TF887A, with rf probe £15. G3MSL, QTHR. Tel Fleet 21446.

Radiotelephones, converted to 2m; ex G3BA Murphyphone crystal tx, tunable rx; AM10D Cambridge four tx crystals, one rx crystal. G8BBA, c/o Flat 8, Stanton House, Sycamore Road, Edge Hill, Burton-on-Trent, Staffs.

QTH, new bungalow, three bedrooms, large lounge, full oil-fired central heating, large garage, huge garden ideal aerial farm, Hamtower, TA33, AR22, 80m vee installed, ideal QTH, GW3VVC, QTHR.

AR88LF, S-meter, good, £25; 1131 modulator, 200W, £5, buyer collects. G5DW, tel Somerton 72732.

KW Vanguard mk 2, 80-10m, good condition, £27; HRO rx, l/s bandspread coils, £9. *Wanted* AT5 tx with PSUs. GM3WIJ, QTHR. Tel Aberdeen 37019.

Drake R-4B, only six months old, in perfect condition, £180 ono. P. D. Coull, "Domel", Elham, Kent CT4 6UE. Tel Elham 244.

Trio TS510, mint, under 50hrs use, £145; Electroniques HB166T coilpack £8.50; QP166 £6.75 or swap for GC166; complete set coils, IFTs, new QCC crystals for G2DAF rx mk 2, used but ok, offers. G3BKV, QTHR. Tel Weymouth 5729 beore 6pm.

Lafayette HA600A rx, 240V ac/12V dc, excellent condition, £35; pair KT88s, brand new, £1; Advance E2 signal generator, 100kHz-100MHz, working but modulator needs attention, £5. *Wanted* pair 813s and bases, also pair 5B-254Ms. K. Basterfield, 51 Ruskin Crescent, Crownhill, Plymouth, Devon PL5 3DB.

KW2000A with ac psu, complete set spare valves and crystals for 21·2-21·4MHz, recently re-aligned and in good condition, £150. G3TWE, QTHR. Tel Gt Yarmouth 64497.

Mosley TA33jnr "E", £25; Hy-Gain 18AVT/WB (as new), £33. G3KYF, QTHR. Tel Wigston 6473.

Valves: 6C4, 12AT7, 12AV7, E180F, ECC84, ECL80, 25p each, many others; regulators, S130, VR150, VR105, 25p; *Bulletins* 1960-65, *SWM* 1961-67, 80p each year, offers postage please. G2ASL, QTHR. Tel 021-475 1831.

Heathkit SB301 rx, extra a.m. filter, ex silent key, £65 ono. *Wanted* pre-war McMichael suitcase battery portable. G3XYX, QTHR. Tel 0734 785348.

Voigt corner horn loudspeaker with energizing power pack, offers. GW3SB, QTHR.

Pye Cambridge AM10D dash mounting with brackets and mic, tunable fet front end on 2m, crystal tx, £22. G4BZA (ex G8BZA), QTHR. Tel Long Buckby 757.

Crystal, 67MHz, for 2m, 10-12 i.f., £1; many others, sae list; 4X150A base £3; tv monitor, 9in, new, needs finishing, all transistor, £14.50. 138 Dollis Hill Lane, London NW2. Tel 01-580 4468 ext 4092.

Trio JR60 rx, 160-2m, £22 or part exchange for B40D. J. R. Dowdall, 56 Goetre-Bellaf, Dunvant, Swansea. Tel 0792 22287.

"J" Beam 2/16 2rpm rotator, 12-core cable, first £15 collect. J. M. Heath, 235 Thorne Road, Wheatley Hills, Doncaster DN2 5AR.

Marconi standard sig gen TF867A in first-class lab condition, £100. Kelvin Wheatstone bridge reads down to 1$\mu\Omega$, light spot mirror reflecting Galvo, perfect lab condition, £30 both snips. G2BQZ, QTHR. Tel Tadcaster 2253.

Heath HW12, £30, no psu. G3VTS, QTHR. Tel Bredon 568.

Eddystone EC10 Mk2, mint, £65. Codar AT5 + ac psu, also mint, £25. T28 rx, £10, WS 18set, £15. *Wanted* for cash or in exchange for above, powerful linear, also 9R59DE-S. All letters answered. P. Jenkins, 30 Gainsborough Road, N Finchley, London N12 8AG.

Bargains for quick sale: New Sentinel 2m/medium wave converter £14; stabilized ps 11·5-16·5V 0·4A, £2.50; AM10B Cambridge (tx on 2m), £14; 2m mobile tx, G8ATK rf board, QQV03/10 final, transistorized modulator and inverter, £14. Carriage extra. G8ENI, QTHR. Tel Cheslyn Hay 415374.

HW32A 20m tx/rx recent factory alignment two spare output valves xtal cal, £37. Carriage paid. G3MYY, QTHR. Tel Blackmore 821341.

Trio TS-510 good cond, £135; Pye AM10B 12·5kHz, 6-chan with all cables etc, less xtals, 2m, as new, £30; FM25B tx only, £8; two 4m valve receivers, £3 pair. G8FUG, QTHR.

KW Victor tx 80-10m 120W a.m./cw int psu, fair condition, £20 ono BC342 rx 160-20m + conv 15-10m, handbk, speaker, S-mtr, £15, buyer coll. G3ONR, QTHR. Tel Waltham Cross 38698.

TA33jnr, £18. 1·75MHz 8-pole xtal filter with usb osc xtal £10, (new). Pye base tx 2m 6-40pa £18. Pye Vanguard AM25T modified rx tunable, £16. 24-hour digital clocks, £8. G3VFP, QTHR. Tel 061-980-2667.

KW202 rx, as new condition, £120, (buying tx/rx). D. Craig, 2 Blakehall Rd, Carshalton, Surrey. Tel 01-387-2255 (daytime).

FT200 plus ac psu immaculate condition will deliver 40–50 miles, owner needs cash, £140 ono. Also Eumig cine projector 8mm, £15 ono. Every letter answered. G4ADF, QTHR.

Complete ssb station. KW Viceroy tx, KW77 rx, Astatic D104 mic, Dow-key c/o relay, handbooks etc. Excellent condition. Accept £115 to clear. (Can be seen and checked near Maidenhead). G6GF, QTHR. Tel Littlewick Green 2729.

FT101 with 160m, £190. IC21 fm rx ext vfo, £150. Liner 2, £100

FP2AC psu with recharge batteries, £25. HM15 swr meter, £5. KW lpf chan 1, £4. TE200 sig gen, £14. G3TLV, QTHR. Tel Middlewich 2449.

TR2002s, lo-band reporters, TA12, APS13, Osram music magnets, Hallicrafters S27CA, TR2002 on 2, £8. BC221, £14. Reporter test-set and handbook, £2. Lo-band base receiver, £4. Carriage extra. Clearing valves, xtals, meters. GW3EJR, QTHR.

Liner 2—purchased late June, fitted dual gate mosfet pre-amp, in perfect cond and unmarked case, complete with all accessories, offered at £100. Price includes free delivery and insurance. No callers please. GW8FJK, QTHR.

4m 10W fm rf base stations, brand new, £19. Used mobiles from £9. 50W fm base stations for 2 or 4m use, £25. As seen, buyers collect. Tx/rx, psu, i.f. modules also available. G8AKA, QTHR. Tel Reading 332582.

Bargains for quick sale: Telford Communications TC7 Mk2 rx with 2m G8AEV converter, perfect, £35. Heathkit HW30, 2m tx/rx with xtal and handbook, 250V, £14; (Meters, xtals, relays etc—sae) all carriage extra. G8ENI, QTHR. Tel Cheslyn Hay 415374.

EMI TR50 studio tape recorder 7½in–15in, good order, £75. *Wanted*: colour tv, faulty one considered. Unwin, 91 High Street, Long Buckby, Warks. Tel 032-731373.

TS515/PS515, perfect, £200. DX100U, £30. Pye base tx on 2m, £25. 1mA meters 4½in round, 65p each. 100μA 4½in by 4½in, 90p each. 2m a.m. and cw tx complete with ps, £12.50. Carriage extra. G5YV, QTHR. Tel Morley 7412.

Vertical aerial 18AVT/WB 10–80m, excellent cond, £27 including carriage. Write or telephone (evenings). P. Reed, G4BVH, 73 Dudley Road, Brighton, Sussex. Tel 504634 (0273).

AR88 good cond, £25. KW Vanguard 160–10, fair, £20. Pair, £40. Buyer to collect. GW4OH, QTHR. Tel Llandudno 77142.

TW 2m Communicator, mains psu, 12 xtals, mic, S-meter, £50. KW ac psu would suit KW/Heathkit tx/rx or 2m transverter, fitted with extra 6·3V heater transformer, £30. Buyer to arrange carriage. G3WHK, QTHR. Tel 01-337 0117.

CR150/6 receiver 1·8–32MHz, £25. EC10 Mk 1, £30. HC/6U crystal oven, miniature, 12/24V, £1.50. 2kHz B7G crystal, 50p. HW101 handbook, 50p. 1970 *ARRL Handbook*, £1. Tel 01-648 5895.

50ft self-supporting tower, £35 ono. Also 7ft 9in high by 19in wide rack complete with modified CR100 and 1132 vhf rxs and 19 tx/rx, £12 ono, or would split. Willing to pay part carriage. G3LYW, QTHR.

Free 8-el 2m beam to purchaser of large 3-bedroomed town house 1 mile W of centre of Cheltenham. Good 2m site. Tel 0242 23834 or write G8FNT, QTHR.

WANTED

SSB tx/rx, anything considered, Yaesu, Trio, Swan, Heath etc. Worvill, 40 The Leys, Chipping Norton, Oxon. Tel 2724.

Handbook and details for Desk Fax facsimile receiver type T200 TC200 Creed. G3RND, QTHR. Tel 098-382 5398.

Heathkit HW32A 20m ssb. *For sale* Fantavox HE50 comm rx, 530kHz-30MHz, £8 ono; Garex 2m converter, modified BF115 mixer xtal, available 28-30 i.f., £7·50 ono. G3VSJ, QTHR. Tel Waltham Cross 36512.

PSU for Pye marine tx, with leads, circuit, welcome. C. Verrinder, Woolland, Blandford, Dorset.

Circuits/manual for Murphy mobile low band 12V dynamotor tx/rx model RF810/50 and power unit PU808T, also vfo/pa type T4188. G3JEI, QTHR. Tel West Hagley 3157.

Chrome handles, 7½in c-to-c, two for Eddystone produced panel and cabinet. K. R. Davis, Haut du Pre, Fern Valley, St Helier, Jersey, Channel Islands.

Contactor switchgear electronics; tx-2A10, rx-2AR, borrow to copy or buy, circuits components list, aligning instructions, handbook, expenses paid. G4BCJ, QTHR Tel 01-478 5303.

Pye 2m base tx/rx, prefer multi-channel type, a.m. or fm, in working condition with handbook. R. Perzyna, 26 Cranbrook Road, London SE8 4EH.

Electroniques coil pack for Heathkit RG1 rx, your price paid, no seized-up slugs please. J. M. Heath, 235 Thorne Road, Doncaster DN2 5AR. Tel 66311.

Transformer, 3-4kV at approx 500mA, with choke if poss, HA14 Heath linear also Yaesu FL50B tx. Jenkins, 30 Gainsborough Road, North Finchley, London N12.

Eddystone plug-in external S-meter. Details to G3UCK, 2 Dyehouse, Wilsden Hill, Wilsden, Bradford, Yorks.

Pre-war portable accoustic gramophone, complete. G3HCO, QTHR.

Ex-WD modern radio sets and equipment wanted for army cadet force use: A13, A14, A40, A41, B47, C13, C12, C42 etc, no unofficial mods, can collect, details and prices please. Capt M. J. Buckley, 62 Ballards Way, S. Croydon, Surrey CR2 7JN. Tel 01-657 4778.

LF xtal, 120kHz or 138kHz, reasonable price. G8CGK, QTHR.

Loan or buy copy of US publication for BC342, BC312 rx TM-11-850; instruction book for T114G Marconi sig gen. G3EBG, QTHR. Tel Romford 45041.

Pair walkie-talkies, any frequency, must be good condition. G3JBU, QTHR. Tel Northampton 43020.

3-gang variable capacitor, ex RF27 unit, also National "velvet vernier" slow-motion assembly, ex TU5B unit, or Eddystone 598 slow-motion assembly. Price, Colehill House, Winchester Road, Bishops Waltham, Southampton. Tel Bishops Waltham 2577.

Solartron oscilloscope type AD557 service manual for purchase or copying. UKC? G3ZLM, QTHR. Tel Brimscombe 3441.

Circuit of MR202D power panel ser No 202D/991 mini rack, also SX28, vgc, Hallicrafters, send details please. MacGregor, 166 Ellenborough Road, Sidcup, Kent. Tel 874 6464 ext. 678.

Friction feed carriage for 7B teleprinter, state price and condition; 7B handbook, adjustments. GM3KHH, QTHR. Tel Clochan 247.

ARRL Handbook 1964-1968; CQ Sideband Handbook, state price. G3IKA, QTHR. Tel Romsey 513511.

Car radio and car recorder, no stereo. Hans Remeeus, Postbox 190, IJmuiden 1620, Netherlands. Tel 02550 10537.

To complete my "working model of the mind", require junk like EL1148 valves, old type filament rheostats, Igranic coils, 0·0005 variables etc, in usable condition, cheap for OAP. G8DVZ, QTHR. Tel Beckett 6635.

Heath HW30 2m tx/rx, preferably with mic, crystal, psu and handbook, any reasonable condition and price accepted, all letters answered. N. P. Rew, Surrey Court, University of Surrey, Guildford.

Mini-beam for 10–15–20, suitable for 15ft garden; Bauer paddle or G3FCW keyer; rx with bfo. *For sale* or exchange Heathkit RF-1U signal generator, offers, cash adjustment either way. G3WXT, QTHR.

Koyo 1770, requiring attention ok. F. G. R. Cook, Old Lodge, Seven Hills Road, Cobham, Surrey. Tel 3117.

Mullard rf/i.f. module LP1156. *For sale* G3HSC morse tuition course (two LPs, ep and books) £2.25. Mitchell, 9 Oakthorpe Road, Palmers Green, London N13 5HY.

5UP7 long-persistence tube. Colin Sykes, 15 Hereford Street, Oldham, Lancs OL9 7SA. Tel 061-633 2306.

Nephew of silent key G3CWI, Frank Rawson of Leicester, active late 'forties, would like to have one of his QSL cards. Please send to R. Newstead, Mead Lodge, Buxton, Norwich NOR 6IY.

Tx/rx with psu, for 80–10m, in exchange for Rolleicord VB camera. G3ZTR. Tel Bridlington 4337.

TA33jr Mosley beam, must be in good condition. G3XFM, QTHR. Tel 798409 after 6pm.

AM10D, Pye Bantam or any similar high band portable unit, your price considered; aerial rotator, QQV06/40 and/or QQV03/20; 70cm converter, 28-30MHz i.f.; manual or circuit diagram for Digital Measurements dvm type DM2003, buy or copy. G8GHZ, QTHR. Tel Northampton 61794.

HW12A with or without psu (not highly priced!). Will consider part-built kit or vandalized specimen. Please contact R. A. Beament, at /A QTH: "Little Croft", Lower Metherell, Callington, Cornwall.

CRT Type 900E or equiv and connection details, for vhf monitor scope. G. M. Pheasant, G4BPY, 43 Station Rd, Great Wyrley, Walsall, Staffs WS6 6LH.

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Small petrol electric generator 240V ac. Crystals between 27MHz and 27·111MHz and between 34MHz and 34·111MHz. GM3JFG, QTHR.

9MHz crystal filter + usb xtal for ssb, also any circuit details of dc-dc converter from 12 to 28V (transistor) for 2m ssb pa, and details of 12V linear approx 10–20W p.e.p. in, for photocopying. Expenses met. GM3ZVB, QTHR. Tel 031-443 3381.

Special Notice

Due to circumstances beyond our control the deadline for the January issue of the magazine has been brought forward several days. This means that in order to qualify for the **January issue,** Members' Ads must be received at RSGB headquarters on or before **Monday 26 November.**

B. BAMBER ELECTRONICS

20 WELLINGTON STREET, LITTLEPORT, CAMBS. Telephone: Ely 860185 or 860363

Pye M.F. Transmitter, runs 2 × 5B254Ms in final, VFO in 340-540kHz, 2 × 5B254Ms in modulator. MCW/CW, units complete, but no PSUs. Brand new with circuits **£20.00.** Carriage **£1.50.**

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Pye Vanguard AM25B, sets only, no control gear. High or Low band, 25kHz channel spacing, with 2nd conv. xtal and circuits, **£8.00.** Carriage **75p.**

Pye Cambridge FM Boot mount, sim. to FM10MC, High band only, sets only, no control gear, **£20.00.** Carriage **50p.**

2M Receive Xtals, HC6U, suitable for Cambridge, Vanguard, Westminster, etc. 51·7MHz for 144·4. 51·70833 MHz for 144·425. 51·71667MHz for 144·45. **£1.00** each.

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Pye Lynx Vidicon scan and focus assemblies, new **£5.50**

Pye Lynx Manuals £1.50.

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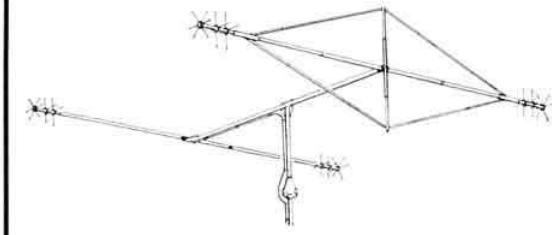

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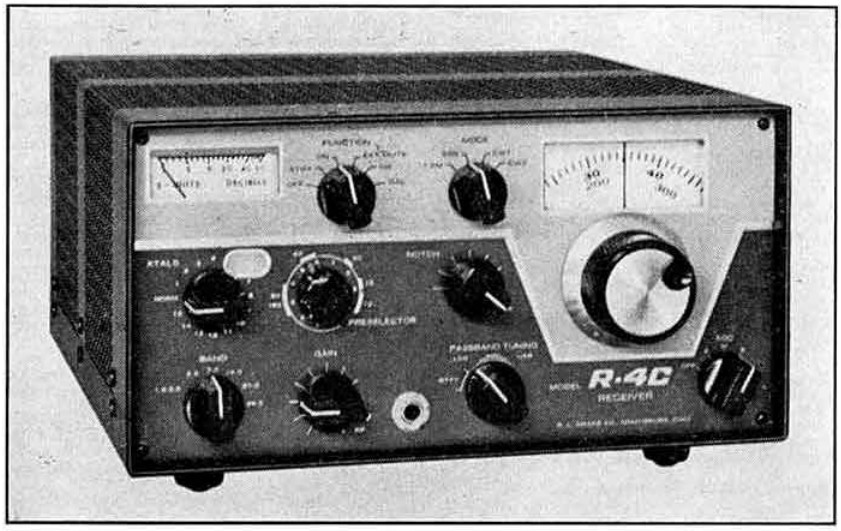

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Order surplus components from G8AAE—cheques etc payable to D. G. Phillips.

COMPONENTS FOR RADCOM DESIGNS

Our kits do not generally include the easy to get components such as resistors, capacitors and some of the transistors. They do include tinned and drilled fibreglass printed circuit boards. See last month's advert (page 678) for prices of individual items.
For G3TDZ 2m Tx/Rx. Kit for Rx, £7.35, kit for Tx (now includes 10pF trimmer) £2.70.
For G2DAF ssb Tx. Variable capacitors and drive drum still available.
For G3XGP Mini D.F.M. In addition to the standard i.c.s we can also supply guaranteed 30MHz versions; DM7490, £1.10; 74HOO, 40p, clock board to take a 1MHz Xtal oscillator (full modification details included); and a smart metal cabinet (not included in kits), £5.00. Kit price for original design is £24. Add 50p for 1MHz clock version and also 50p for 30MHz i.c.s if required. Also available (but not included in kits): OA200, 9p; 2N706, 12p; ZTX300, 15p; ZTX500, 15p.

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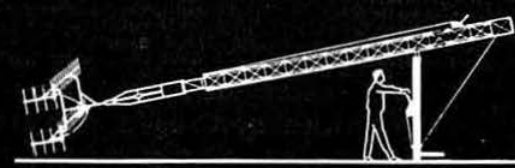

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Semiconductors:	27 transistors, 6 FETs, 1 IC, 44 diodes
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Weight:	3Kg

* Note that this coverage may be altered to any 240kHz within the band simply by altering the fourth oscillator crystal X12. As an optional extra we stock the crystal and perspex dial to enable coverage of 144·10 to 144·34MHz to conform with the I.A.R.U. Regional recommendation planned for 1975.

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Report and Accounts

for the year ended

30 June 1973

Radio Society of Great Britain

35 DOUGHTY STREET, LONDON WC1N 2AE

6 November 1973

NOTICE IS HEREBY GIVEN that the FORTY-SEVENTH ANNUAL GENERAL MEETING of the Society will take place at the Royal Society of Arts, John Adam Street, Adelphi, London WC2, at 6.30pm on Friday 7 December 1973, for the transaction of the undermentioned business:

1. To receive and, if approved, confirm the Minutes of the Forty-Sixth Annual General Meeting as published in the August 1973 issue of *Radio Communication*.

2. To receive and, if approved, adopt the Annual Report of the Council for the year ended 30 June 1973.

3. To receive and, if approved, adopt the Audited Accounts of the Society for the year ended 30 June 1973.

4. To announce the names of members to serve on the Council for the year 1974.

5. To announce the names of members who have recently accepted invitations to become Honorary Members or Vice-Presidents.

6. To report that the auditors, Messrs Edward Moore and Sons, have expressed willingness to continue in office, and to fix their remuneration for 1974.

7. To transact any other business which may be properly transacted at an Annual General Meeting.

A member entitled to attend and vote at the above meeting may appoint a proxy to attend. A proxy need not be a member of the Society.

By order of the Council
D. A. FINDLAY
Secretary

Notes (*a*) Forms for the appointment of proxies may be obtained from the Secretary upon request.
(*b*) The instrument appointing a proxy shall be deposited at the office of the Society not less than 48 hours before the time appointed for holding the meeting.

Radio Society of Great Britain

35 DOUGHTY STREET, LONDON WCIN 2AE

Patron: HRH THE PRINCE PHILIP, DUKE OF EDINBURGH, KG

President J. A. Saxton, CBE, DSc, PhD, CEng, FIEE, FInstP*
Immediate Past President R. J. Hughes, TD, DLC, G3GVV
Executive Vice-President G. R. Jessop, CEng, MIERE, G6JP
Honorary Treasurer J. O. Brown, LLB, FCA, G3DVV

MEMBERS OF COUNCIL

E. J. Allaway, MB, ChB, MRCS, LRCP, G3FKM
B. D. A. Armstrong, G3EDD
R. W. Fisher, G3PWJ†
W. J. Green, G3FBA
E. G. Ingram, GM6IZ
W. F. McGonigle, GI3GXP
L. E. Newnham, BSc, G6NZ
C. H. Parsons, GW8NP
J. R. Petty, G4JW
W. A. Scarr, MA, FBIS, G2WS
A. W. Smith, GM3AEL
R. F. Stevens, G2BVN
G. M. C. Stone, CEng, MIEE, MIERE, G3FZL
F. C. Ward, G2CVV

* Appointed in August 1972, took office on 1 January 1973.
† Appointed in January 1973.

Mr J. Bazley, G3HCT, resigned on 28 November 1972.
Mr E. W. Yeomanson, G3IIR, retired on 31 December 1972.

General Manager and Secretary: D. A. Findlay, FCA, G3BZG

Auditors: Edward Moore & Sons, Chartered Accountants

Bankers: Barclays Bank Ltd.

REPORT OF COUNCIL TO THE MEMBERS OF THE SOCIETY

THE Balance Sheet as at 30 June 1973 and notes thereon, and the Revenue Account for the year ended on that date as set out in the following pages, are submitted for the approval of the members.

The accounts again show a surplus and, although a small surplus had been expected, the final result was a pleasant surprise. Income from the sale of books has again increased and we are glad to report that following a change in policy, in that the Society now handles *Radio Communication* advertising itself, income from this source has increased by 40 per cent. On the expenses side, the overall figure for the year has turned out to be less than budgeted and some credit has to be given to the Government's pay and prices freeze. On the debit side the introduction of Value Added Tax is to the disadvantage of the Society and its members.

Unfortunately the Government freeze on prices has not covered the cost of printing and paper, and this is a problem of considerable concern. It is our largest single outgoing and the cost rose by approximately 12 per cent last year, and although we allowed for a similar rise this year when increasing subscriptions, there have since been applications to the Prices and Incomes Board for further increases. This not only affects the cost of *Radio Communication*, but also the cost of our books. Once again the Society's surplus is almost entirely due to the sale of books, and Council is very appreciative of the many hours of voluntary work put into this.

The only other item of expenditure requiring comment is the cost of printing and stationery, which is particularly large this year because of the stencils which had to be purchased for our new membership recording machine.

The budget for the current year shows that a small surplus is anticipated, but a lot depends on the country's economic trends, which show little sign of stability. There is the continuing pressure of increased costs: printing has already been mentioned and there are the usual other items, but one particular item which stands out is the cost of the general rates levied on 35 Doughty Street. This was £1,266 in the rating year 1972-3 and will be £2,194 in the rating year 1973-4.

As mentioned in last year's report, the subsidiary company, Lambda Investment Co Ltd, holds the title to the freehold of 35 Doughty Street. The ownership of this property is a hedge against inflation and the Directors of the company are of the opinion that the sale price would be about £100,000.

Finally a special word of thanks is due to headquarters' staff for all the excellent results achieved last year.

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)
AND ITS SUBSIDIARY COMPANY

CONSOLIDATED INCOME AND EXPENDITURE ACCOUNT
for the year ended 30 June 1973

1972			1973	
£	£		£	£
		INCOME		
59,301		Subscription income		64,111
16,311		Profit on sales of publications		17,481
316		Quoted investment income (Gross)		316
75,928		**Total income**		81,908
		EXPENDITURE		
	2,149	Headquarters rates, lighting, heating and cleaning	2,550	
	21,049	Staff remuneration	21,378	
	200	Pension	200	
	5,187	Telephone, postage, printing & stationery	6,380	
	342	Insurance	310	
	330	Repairs and maintenance	367	
	120	Hire of equipment	120	
	564	Depreciation of equipment (No depreciation has been provided on the freehold property)	1,446	
	843	Bank charges	566	
	141	Bank interest	—	
	325	Audit fees	325	
	—	Legal and professional fees	442	
	413	Sundry expenses	671	
	—	Provision for doubtful debts	350	
	1,141	Debenture interest of Lambda Investment Company Limited (Gross)	1,141	
32,804			36,246	
33,245		*Radio Communication*—distributed free to members—cost including staff remuneration and after deducting advertising revenue	35,895	
	690	Membership certificates, Awards, Trophies, etc	312	
	1,637	QSL Bureau, Beacons and Intruder Watch	1,832	
	546	Contributions to IARU Region 1	636	
2,873			2,780	
	825	General meetings	261	
	2,136	Council and committee expenses (after deducting surplus on rallies)	1,895	
2,961			2,156	
71,883		**Total expenditure**		77,077
£4,045		**SURPLUS FOR THE YEAR (all of which arises in the Society)**		£4,831

J. A. SAXTON, *President*

RADIO SOCIETY OF GREAT BRITAIN

(COMPANY LIMITED BY GUARANTEE)
AND ITS SUBSIDIARY COMPANY

BALANCE SHEETS 30 JUNE 1973

1972 The Society & Subsidiary £	1972 The Society £		Notes	1973 The Society £	1973 The Society & Subsidiary £
		FIXED ASSETS			
41,675	—	Freehold property at cost	(1) (2)	—	41,675
2,085	—	Sinking Fund Policy, premiums paid, (Surrender value £2,423)		—	2,502
2,141	*2,141*	Furniture and equipment, at cost less depreciation	(3)	4,060	4,060
—	*25,202*	Investment in and loan to subsidiary	(4)	25,412	—
9,055	*9,055*	Quoted investments at cost less amount written off (Market value £8,114—1972 £8,060)	(5)	9,055	9,055
54,956	*36,398*			38,527	57,292
		NET CURRENT ASSETS			
15,841	*15,841*	Stocks at lower of cost and net realisable value		18,565	18,565
5,961	*5,961*	Debtors, and payments in advance		9,482	9,482
2,361	*2,086*	Bank balances & cash in hand		3,109	3,119
24,163	*23,888*			31,156	31,166
12,324	*11,856*	**Less** Creditors & accrued charges		16,523	16,933
11,839	*12,032*			14,633	14,233
£66,795	*£48,430*	**NET ASSETS**		£53,160	£71,525
		Financed by:			
8,696	*8,634*	**ACCUMULATED FUND** Balance at 1 July 1972		12,460	12,522
4,045	*4,045*	Surplus for the year ended 30 June 1973, as shown in the Income & Expenditure Account		4,831	4,831
(219)	*(219)*	Less amount written off investments		—	—
12,522	*12,460*			17,291	17,353
(722)	—	Less preliminary expenses of the subsidiary		—	(722)
				17,291	16,631
11,800	*12,460*				
35,970	*35,970*	**SUBSCRIPTIONS IN ADVANCE**		35,869	35,869
19,025	—	6% **DEBENTURE STOCK** of Subsidiary (Redeemable at par on or before 30 June 1997: Secured on the assets of that Company)		—	19,025
£66,795	*£48,430*			£53,160	£71,525

(The notes on pages six and seven form part of these Accounts)

J. O. BROWN, *Treasurer*

NOTES ON THE ACCOUNTS

1. Accounting policies:
   (a) Subscriptions—cash received in respect of subscriptions for the year is apportioned on a time basis.
   (b) Depreciation—no depreciation has been provided on the freehold property. Furniture and equipment has been depreciated as is considered appropriate by the management.

2. The Council is of the opinion that the present market value of the Society's freehold property (which is held in the subsidiary company) is in the region of £100,000.

3. Furniture and equipment:

Cost 1 July 1972	£6,777
Additions during year	3,334
Cost 30 June 1973	10,111
Accumulated depreciation	6,051
Book value as shown in Balance Sheet	£4,060

4. The share capital of the subsidiary, Lambda Investment Company Limited, is £100 in shares of £1 each and all the shares are held by the Society or its nominees. The debenture stock has been subscribed for or purchased by individual holders in their own right.

5. **Investments**

		Cost less amount written off
		£
£5,000	3% Savings Bonds 1965/75	5,000
£4,145	British Transport 4% Guaranteed Stock 1972/77	4,055
		£9,055

Both investments are charged to Barclays Bank Ltd as security in case the Society requires overdraft facilities.

6. The sales of publications during the year amounted to £41,409 (1972—£37,980) and advertising revenue amounted to £11,550 (£6,148).

7. At 30 June 1973 there were no commitments for capital expenditure.

8. The Society administers the following prize and memorial funds:

	£	£
(a) **The Pilot Officer Norman Keith Adams Prize Fund**		
At 30 June 1973 the fund amounted to		165
Accumulated income at 30 June 1972 was	21	
Income for the year to 30 June 1973 was	12	33
		£198
Less: Cost of prize awarded		10
		£188
Which was invested in: 7% British Savings Bonds		165
Cash at bank		23
		£188
(b) **The J. Fraser Shepherd Prize Fund**		
At 30 June 1973 the fund amounted to		300
Accumulated income at 30 June 1972 was	14	
Income for the year to 30 June 1973 was	23	
	37	
Less: Cost of prize awarded	20	17
		£317
Which was invested in: £506.62 3½% War Loan		200
6% Debenture Stock Lambda Investment Company Limited ..		100
Cash in the general funds of the Society		17
		£317

(c) The fund of **The Bevan Swift Memorial** amounted to £31 at 30 June 1973, and is represented by £31 held in the general funds of the Society. £4 was paid out as a prize during the year.

(d) The subscribed fund of **The J. Clarricoats Memorial** amounted to £44, held in a separate bank account and there was no distribution during the year.

(e) The fund of **The Thomas Memorial** amounted to £15, held in the general funds of the Society; there was no expenditure during the year.

9. During the year the Society received the following major donations:

Mrs G. Walker	£30.
Mr. R. Campbell per F. Charman	£25.
Mrs A. Allen	£100

Expenditure on the headquarters station totalling £109 has been met out of the latter two donations.

REPORT OF THE AUDITORS TO THE MEMBERS OF THE RADIO SOCIETY OF GREAT BRITAIN

In our opinion the Accounts set out on pages 4 to 7 give a true and fair view of the state of the Society's affairs at 30 June 1973 and of the Surplus for the year ended on that date and comply with the Companies Acts 1948 and 1967.

4 Chiswell Street, London EC1Y 4XB,
31 October 1973

EDWARD MOORE & SONS
Chartered Accountants

LAMBDA INVESTMENT COMPANY LIMITED

The directors have pleasure in submitting their report for the year ended 30 June 1973. The company is a wholly-owned subsidiary of the Radio Society of Great Britain (a company incorporated in England) and was formed to acquire the freehold property, 35 Doughty Street, London, WC1, which is the headquarters of the Society. The directors are of the opinion that the market value of the property is in the region of £100,000.

The directors are Messrs L. E. Newnham (Chairman), R. F. Stevens, G. R. Jessop (appointed 1 January 1973) and J. O. Brown (Secretary); the first two named hold one share each as nominees of the Society and Mr Newnham holds £300 Debenture Stock. Messrs E. W. Yeomanson and A. C. Morris retired during the year. Mr L. E. Newnham acquired a further £100 of Debenture Stock during the year.

The auditors, Messrs Edward Moore & Sons, have intimated their willingness to continue in office.

By order of the Board
J. O. Brown,
Secretary

31 October 1973

BALANCE SHEET 30 June 1973
and
REVENUE ACCOUNT for the year ended on that date

1972				1973		
£	£	£		£	£	£
			ASSETS			
41,675			Freehold property at cost			41,675
2,085			Sinking Fund Policy, premiums paid (Surrender value £2,423)			2,502
241			Preliminary expenses			241
481			Debenture Issue expenses			481
275			Bank balance			10
44,757						44,909
			LIABILITIES			
	468		Sundry creditors		410	
	25,102		Loan from the Radio Society of Great Britain		25,312	
25,570						25,722
£19,187			**NET ASSETS**			£19,187
			Financed by:			
			Authorised and Issued Capital			
100			100 shares of £1 each fully paid			100
			Revenue Account			
62			Balance at 1 July 1972			62
	1,330		Rent receivable in the year to 30 June 1973		1,235	
		1,141	*Less:* Debenture interest	1,141		
		125	Bank interest	58		
		39	Sundry expenses	11		
		25	Audit fee	25		
—	*1,330*				1,235	—
19,025			6% **Debenture Stock** (redeemable at par on or before 30 June 1997—secured on the assets of the Company).			19,025
£19,187						£19,187

L. E. Newnham
J. O. Brown } *Directors*

Report of the Auditors to the Members of Lambda Investment Company Limited
In our opinion, the accounts set out above give a true and fair view of the state of the Company's affairs at 30 June 1973 and of the result for the year ended on that date and comply with the Companies Acts 1948 and 1967.

4 Chiswell Street, London EC1Y 4XB.
31 October 1973

EDWARD MOORE & SONS
Chartered Accountants

COMMITTEES OF COUNCIL, 1972-3

Diamond Jubilee

Chairman: R. J. Hughes, G3GVV.
Members: G. R. Jessop, G6JP; W. A. Scarr, G2WS.

Education

Chairman: D. M. Pratt, G3KEP.
Members: G. L. Benbow, G3HB; R. J. Hughes, G3GVV; F. N. Kendrick, G3CSG; L. E. Newnham, G6NZ; R. Wallwork, G3JNK; F. C. Ward, G2CVV.

Finance & Staff

Chairman: G. R. Jessop, G6JP.
Members: J. O. Brown, G3DVV; D. A. Findlay, G3BZG; L. E. Newnham, G6NZ; C. G. Powell, G8BPK; R. F. Stevens, G2BVN; F. C. Ward, G2CVV.

HF Contests

Chairman: J. C. Graham, G3TR.
Members: Dr E. J. Allaway, G3FKM; D. J. Andrews, G3MXJ; J. Bazley, G3HCT; R. S. Biggs, G2FLG; A. V. H. Davis, G3MGL; R. L. Glaisher, G6LX; M. Harrington, BRS20249; S. V. Knowles, G3UFY; G. T. Peck, BRS15402; R. Polley, G3PYC; D. Thom, G3NKS.

IARU Working Group

Chairman: R. F. Stevens, G2BVN
Members: D. Andrews, G3MXJ; R. J. Baker, G3USB; D. A. Findlay, G3BZG; J. C. Graham, G3TR; R. J. Hughes, G3GVV; E. G. Ingram, GM6IZ; G. M. C. Stone, G3FZL; C. Squires, G3XCS.

Interference

Chairman: J. W. Swinnerton, G2YS
Members: J. W. Hill, G3JIP; A. M. B. Holloway, G3VUQ; I. Jackson, G3OHX; P. F. Jobson, G3HLF; D. G. Pinnock, G3HVA; G. Slaughter, G3PAO; E. Swayne, G3BLE; D. M. Thomas, GW3RWX; P. W. Waters, G3OJV.

Membership & Representation

Chairman: C. H. Parsons, GW8NP
Members: R. W. Fisher, G3PWJ; W. J. Green, G3FBA; E. G. Ingram, GM6IZ; G. R. Jessop, G6JP; W. F. McGonigle, GI3GXP; J. R. Petty, G4JW; W. A. Scarr, G2WS; A. W. Smith, GM3AEL; F. C. Ward, G2CVV.

Mobile & Exhibition

Chairman: N. O. Miller, G3MVV
Members: P. Balestrini, G3BPT; S. Hitchins, G8GBN; T. I. Lundegard, G3GJW; M. A. C. MacBrayne, G3KGU; W. J. McClintock, G3VPK; G. W. Norris, G3ICI; J. R. Petty, G4JW; G. P. Shirville, G3VZV; M. G. Wallace, G8AXA; E. W. Yeomanson, G3IIR.

MPT Liaison

Chairman: R. F. Stevens, G2BVN.
Members: Dr E. J. Allaway, G3FKM; B. D. A. Armstrong, G3EDD; P. Balestrini, G3BPT; D. A. Findlay, G3BZG; R. J. Hughes, G3GVV; G. R. Jessop, G6JP; L. E. Newnham, G6NZ; F. C.Ward , G2CVV.

Raynet

Chairman: P. Balestrini, G3BPT
Members: E. R. L. Bassett, BRS16075; R. Ferguson, G4VF; Mrs J. Balestrini; Dr A. C. Gee, G2UK; S. W. Law, G3PAZ; R. A. Ledgerton, G2ABC; T. I. Lundegard, G3GJW; S. J. Scarborough, G3MBQ; E. W. Yeomanson, G3IIR.

Scientific Studies

Chairman: G. M. C. Stone, G3FZL
Members: R. G. Flavell, G3LTP; R. A. Ham, BRS15744; Prof M. Harrison, G3USF; D. Hayter, G3JHM; R. J. Hughes, G3GVV; K. S. Hutchinson, G4ALN; C. E. Newton, G2FKZ; A. J. Oliphant, GM3SFH; J. Spurling, G4AQI/3B8DG; A. Taylor, G3DME.

Technical & Publications

Chairman: R. F. Stevens, G2BVN
Members: B. D. A. Armstrong, G3EDD; R. J. Baker, G3USB; G. C. Fox, G3AEX; J. P. Hawker, G3VA; T. L. Herdman, G6HD; P. J. Horwood, G3FRB; A. W. Hutchinson; G. R. Jessop, G6JP; J. W. Mathews, G6LL; R. O. Phillips, G8CXJ; H. W. Rees, G3HWR; D. M Thomas, GW3RWX.

VHF

Chairman: G. M. C. Stone, G3FZL
Members: P. Balestrini, G3BPT; A. H. Bower, G3COJ; J. Coffey, G3PSH; B. R. Coleman, G8AZU; Dr D. S. Evans, G3RPE; D. Hayter, G3JHM; J. Hum, G5UM; A. L. Mynett, G3HBW; M. J. Sparrow G6KQJ/T; G. W. Tibbetts, G3NUE; M. Wallace, G8AXA.

VHF Contests

Chairman: C. Sharpe, G2HIF.
Members: R. G. Brade, G3VIR; M. T. Deacon, G3XHU; L. N. G. Hawkyard, G5HD; F. Mathews, G8ACJ; W. J. McClintock, G3VPK; R. G. S. Skegg, G3ZGO; G. M. C. Stone, G3FZL; L. V. G. Turner, G8CUT; I. F. White, G3SEK.

RSGB HONORARY OFFICERS

Awards Manager (hf)	C. R. Emary, G5GH
Awards Manager (vhf)	Jack Hum, G5UM
Intruder Watch Organizer	C. J. Thomas, G3PSM
QSL Bureau Manager	A. O. Milne, G2MI
Recorded Lecture Library Curator	G. Milne, G3UMI
Slow Morse Practice Transmissions Organizer	M. A. C. MacBrayne, G3KGU
Society Historian	L. E. Newnham, G6NZ
Trophies Manager	P. Carey, G3UXH
VHF Manager	G. M. C. Stone, G3FZL

THE YEAR IN REVIEW

For many years the Council has submitted a report on some of the activities of the Society during the last financial year. Prior to 1972 it was published in *Radio Communication* and brought up to date by a short verbal report at the Annual General Meeting.

In 1972 the style of the Annual Accounts was changed to include a formal Report of Council, and this year the opportunity has been taken to include with the Report and Accounts the following detailed review of the activities of the Society.

Although activities during the financial year ended 30 June 1973 are generally dealt with, in some instances a longer period is covered to add background to the review.

In addition it has been the practice to have a short verbal report at the Annual General Meeting and an informal discussion after the meeting. It is intended that this will happen again this year, although it is appreciated that not all members are able to attend this meeting and in the limited time available only a few matters may be discussed in detail.

Council

Mr R. J. Hughes, G3GVV, completed his year as President in December 1972 and Dr J. A. Saxton took office on 1 January 1973. The inauguration of Dr Saxton as President was the occasion in January 1973 of a social function at the Connaught Rooms when the Society was pleased to welcome the Minister of Posts and Telecommunications, Sir John Eden, MP.

Members will have noted with pleasure that Dr Saxton was appointed a Commander of the Order of the British Empire in HM The Queen's Birthday Honours List.

At the end of 1972 three Council members retired in rotation, having completed three or more years on Council. Two of these members, Dr E. J. Allaway, G3FKM, and Mr L. E. Newnham, G6NZ, were subsequently re-elected for 1973-5. Mr E. W. Yeomanson, G3IIR, who had served on the Council for 15 years, and who was President in 1965, did not seek re-election, and the ordinary member elected in his place was Mr F. C. Ward, G2CVV, a former President of the Society.

Mr W. A. Scarr, G2WS, retired at the end of December 1972 as member for Zone D and was re-elected unopposed. Mr W. J. Green, G3FBA, who had been co-opted to Council for 1972 as member for Zone C was also elected.

Mr J Bazley, G3HCT, had indicated his intention to resign from Council in 1973, and on his resignation Mr R. W. Fisher, G3PWJ, was co-opted to Council as member for Zone B.

Diamond Jubilee

The Presidential Inauguration was the first function held in 1973, the Diamond Jubilee Year of the Society. Since that time there have been numerous local occasions on which the Diamond Jubilee has been celebrated.

Among other functions, the Bedford and District Radio Club arranged a most interesting and successful exhibition at the County Hall, Bedford, in February. Dinners have taken place in Liverpool, Manchester and Derby, and in conjunction with ORMs at Cardiff and Whitton, Middlesex. A convention and dinner was held in Bristol in May.

In August a special activities station, using the callsign GB2GB, was operated on board the ss *Great Britain* in dry dock in Bristol. Another special activities station, callsign GB3RS, was operated from Tonbridge School, Kent, at the end of June and beginning of July and a similar project is planned for October this year.

Both contests committees organized special contests and an added attraction for the hf contests was that the winner of each section would be able to avail himself of travel facilities arranged by BOAC.

Representation

Regional Representatives were elected for a three-year term of office commencing 1 January 1972.

On his co-option to Council, Mr R. W. Fisher, G3PWJ, ceased to be Regional Representative for Region 3 and Council were pleased to accept the offer of Mr B. Kennedy, G3ZUL, to take his place.

Mr D. F. Beattie, G3OZF, moved from Region 16 during 1973, and he therefore was required to resign from his position of Regional Representative for that region.

Council places on record its appreciation of the work carried out by Regional and Area Representatives for the Society.

Council meetings

During the year to 31 December 1972, Council met eight times; four of these meetings were at Society headquarters and four were held at Gregory Hall which is close to headquarters.

By the end of 1973 Council will have met seven times.

Committees of Council

The committees of Council, chairmen and members are set out on page ix of the Report and Accounts.

The advice and assistance of the members who serve on committees is very much appreciated by Council.

Headquarters station

The headquarters station was made operational during the year and now consists of the HW101 presented by Heath (Gloucester) Ltd, at the 1971 AGM, and ancillary equipment purchased with funds generously donated by friends of the Society.

Official Regional Meetings

An ORM was held in Lancaster (Region 1) on 24 September 1972 at Lancaster University in conjunction with the North-West Amateur Radio Convention. Nearly 80 members of Region 1 attended the meeting which was under the chairmanship of Mr B. O'Brien, G2AMV. A report appeared in the November 1972 issue of *Radio Communication*.

On 1 October, 1972 a Region 14 ORM was held during the Scottish VHF Convention in Glasgow.

Special events

The 16th RSGB National Mobile Rally was held at Woburn Abbey on Sunday 6 August 1972.

There was a very good attendance, as in the previous year, despite the weather. The rally was regarded as being most successful and the Mobile and Exhibition Committee is to be congratulated on its efforts.

In October an exhibition sponsored by the Amateur Radio Retailers Association was held at the Granby Halls in Leicester. The exhibition was well attended and Society publications were on sale at a stand organized by the members of the Derby and District Radio Society.

As part of the activities to commemorate the 50th Anniversary of the British Broadcasting Corporation, the Society, in conjunction with the Institution of Electrical Engineers, arranged a meeting on 3 November 1972 at which Mr G. R. M. Garratt, G5CS, spoke on "The First Five Years of Wireless, 1896–1901". More than 200 members of the Society and IEE were present at this lecture which dealt with the period from 1896, when Marconi first arrived in England, to December 1901 when he received the first transatlantic morse transmission.

The 19th VHF Convention was held on Saturday and Sunday 7/8 April 1973 at Whitton, Middlesex. About 450 members attended the convention and more than 200 were present at the dinner at which Dr John Westhead was guest of honour. A report of the convention is in the May issue of *Radio Communication*.

Members participated in a special exercise to commemorate the 75th anniversary of Marconi's first transmission of wireless signals across water. Amateur stations were set up on Flatholm Island, on Brean Down (Weston-super-Mare) and at Lavernock on the Welsh coast. Special certificates were awarded by the Barry College of Further Education Radio Society to amateur stations which made contact with the commemorative stations.

The Barry College society also marked the occasion by providing specially designed first-day covers carrying the 7½p stamp issued to commemorate the anniversary, and arranging with the Post Office for these to be specially franked on Flatholm Island and despatched bearing a Flatholm postmark.

Education Committee

The committee consisted of seven members of whom three were corresponding members. Six meetings were held during the year ended 30 June 1973.

Owing to a disappointing response, the proposed residential weekend for RAE instructors has not been arranged, but the committee is making arrangements to give guidance and answer queries from RAE instructors on an individual basis. When the Society's RAE publications are reprinted, the contents are updated as appropriate.

The Christmas lecture at the Science Museum in January was a huge success and attracted a large audience of young people. The Society has been invited to present the lecture every other year, and preliminary arrangements have been made for the lecture in January 1975.

Following publicity in *The Times Educational Supplement* the committee has received an invitation from the Nottinghamshire Education Committee to give a lecture in Nottingham in the spring of 1974.

Finance and Staff Committee

The committee was strengthened by the addition of Mr C. G. Powell, G8BPK, during the year.

Meetings were at approximately monthly intervals and apart from routine matters of accountancy, finance, budget statements and staff problems, matters considered in depth included Value Added Tax and the discussions with Customs and Excise and the Companies Division of the Ministry of Trade and Industry on ways of alleviating the burden of this. Unfortunately all in vain. Other items given special attention related to the Society's advertising policy, the cost of publications, the cost of *Radio Communication*, the continuing problem of correct and efficient use of members' records, and possible charitable status for the Society.

The advertising policy was changed to "in-house" handling and the improvement in income as a result has been most satisfactory. The cost of production of publications is a problem and it continues to increase. Ways and means, including revised arrangements for typesetting, are being considered to try and reduce this burden as the committee feels that control of this item is the key to pegging the size of subscriptions.

The President is an ex-officio member and the committee was pleased to welcome Dr Saxton during the year.

HF Contests Committee

Fourteen contests were organized and judged by the committee, covering all hf bands 1·8 to 28MHz.

Committee meetings are held regularly to draw up rules for forthcoming contests, to consider suggestions put forward after previous contests, and to adjudicate contests that

have already taken place. The adjudication of entries is frequently carried out by members at home, occasionally single-handed, but for the major contests groups of committee members meet to deal with the entries. During the year many hours have been spent by the committee in checking contestants' logs.

Prior to major contests there is considerable organization to ensure maximum participation in the contests. In particular, NFD and BERU receive considerable pre-contest publicity and special entry forms and log sheets are provided.

In addition the committee is responsible for direction finding events, and these are co-ordinated by a committee member; the organization of each event is generally carried out by local clubs or societies affiliated to the RSGB. The committee is grateful to Mr G. T. Peck and all those who have organized and taken part in these events.

During 1972 a survey was carried out to obtain the views of contestants in respect of NFD. The survey did not indicate any great desire for major changes in the rules for this event.

IARU Working Group

The work of the group culminated in the triennial conference of the Region 1 Division of the IARU held in the Netherlands in May 1972. Considerable pre-conference work in the preparation of RSGB documents and the consideration of papers from other societies was undertaken by the group, and controversial matters were submitted to Council for consideration. Relations with other societies within Region 1 and representation at meetings in Western Europe were also dealt with by the group.

The next IARU Region 1 Division Conference will be held in Poland in 1975 and the Working Group is now becoming involved in the preparatory work for this conference.

Interference Committee

The Interference Committee met 12 times during the period of 18 months to 30 June 1973.

The majority of the committee have maintained very good attendance at meetings, and the two corresponding members have been of considerable assistance to the committee.

Problems presented to the committee have been dealt with by members according to their interests and the committee has had the benefit of a wide range of expertise.

It is thought that the increase in requests for assistance and advice has arisen from publicity given to the work of the committee rather than from any increase in the number of cases of interference.

During the period the committee has considered cases of interference brought to its notice, comprising chiefly: (a) breakthrough by 2m transmissions into uhf tv receivers; (b) pick-up on audio amplifiers in recorder and hi-fi equipment, and (c) the social problems that have become aggravated before the committee's help has been sought.

Members have given talks to local groups on interference matters, and consideration has been given to interference problems raised as professional and amateur policy in committees of organizations such as BREMA and IARU Region 1.

Articles to be submitted by members of the committee for publication in *Radio Communication* are considered by the committee before submission.

At 30 June 1973 nearly 80 cases had been considered. The majority of these had been concluded satisfactorily but there were still cases where there had been no further information from the member after the initial action by the committee and it has to be assumed that these are cleared.

Membership and Representation Committee

Membership of the committee in previous years had been restricted to the seven zonal members of Council. Towards the end of 1971 it was necessary for the committee to increase the number of members to allow for unavoidable absence and to deal with additional matters. Accordingly, three additional members were co-opted and the committee now consists of 10 members, and occasionally the Honorary Treasurer attends meetings.

Revision of the scheme of representation was considered by the committee and during the year details were agreed and made available to all concerned.

Also it had been agreed that appointment of a separate RR for the Channel Islands was desirable.

Throughout the year attention has been given to many matters affecting membership. A mailing to all non-members was planned, but the response to a sample mailing was most disappointing—under one per cent.

Mobile and Exhibition Committee

During the early months of 1972 the committee was engaged on the task of organizing the 1972 Woburn Abbey Rally. This rally, which took place on Sunday 6 August, was very successful in spite of the poor weather. Such an event involves the committee members in a very great deal of work apart from their normal committee duties and the success of this rally is an indication of the effort put into the organization.

The members of the committee were involved in the organization of stands at the Canterbury Rally in August 1972, the FM Convention, Anglian Rally, Maidstone Rally, Ipswich Rally, BARTG Convention and the Southdown Rally.

Consideration was given to the ARRA Exhibition held in Leicester in October and, although the committee was not involved in the 1972 exhibition, arrangements have been made for the RSGB to exhibit at the 1973 exhibition and the committee has been actively engaged in recent months in organizing the Society exhibit.

The vhf band plan was considered in detail, as mobile operation was involved, and the representation of mobile

interests was dealt with during discussions with the VHF Committee.

A book on vehicle interference suppression was in course of preparation.

During the period of just over a year to end of July 1973 the committee was able to achieve an average attendance of over 80 per cent.

MPT Liaison Committee

The committee maintains close contact with the MPT on all official matters relating to the amateur service.

Consideration has been given during the year to numerous matters directly referring to the terms of the amateur licence or concerning the amateur service.

Among those items that have been considered by the committee, and comments and suggestions submitted to the MPT are: the 70cm band allocations, deliberate interference to amateur stations, reciprocal licensing, repeater licences and radiation hazards.

Items which do not directly affect the amateur licence have been considered. These include operating techniques, intruder watch, increased frequency allocations above 40GHz, preparatory work for the World Radio Administrative Conference, and, in addition, the committee has considered and given advice on planning applications under the Town and Country Planning Acts.

The committee met five times during the year, and there have been meetings between members and representatives of the MPT.

Radio Amateurs Emergency Network—Raynet Committee

Although the members of Raynet were not called on to act in any emergency during the year, the groups throughout the country kept themselves in a state of readiness by means of simulated exercises.

In September 1972 five groups took part in a most successful exercise in the south-east of England. Several other successful exercises took place including those in Kent, Norfolk, Teesside, Mid-Antrim, Sutton Coldfield, South Anglia and Bromley.

New groups have been formed in North Buckinghamshire, Teesside, Nelson (Pendle Group), Cannock Chase and Mid-Warwickshire.

Liaison with all groups was maintained throughout the year and consideration was given to the extension of user services.

Scientific Studies Committee

The main effort of the committee during 1972–3 has been directed towards contributions to CCIR Study Group 5 (Tropospheric Propagation), Study Group 6 (Ionospheric Propagation) and Study Group 8 (Mobile Radio Propagation).

In addition to the studies already being carried out for Study Group 5, there will be a study of microwave propagation over mixed land/sea paths. Possible areas for this study are Isle of Wight/Brighton and London/Holland.

In the first months of 1972 considerable effort went into the papers presented to the IARU Region 1 Division Conference at Scheveningen in May 1972.

Ionospheric propagation studies are being conducted in the 20-30MHz band using a chain of beacon stations set up by member societies as part of the IARU World Amateur Beacon Project. The RSGB is responsible for beacon station GB3SX and has given considerable support to the setting up of beacons in Mauritius (3B8MS), Cyprus (ZC4CY), Canada (VE3TEN), Bermuda (VP9BA) and beacons to be established in New Zealand and Antarctica. Reception over the North Atlantic path is being studied by means of the transmissions from Radio Canada on 21·595MHz. Studies of auroral phenomena have been carried out and information provided for publication in *Radio Communication*. Reports of events of 18 June and 5 August 1972, and 1 April 1973, were all studied very fully; the latter event was one of the most intense aurora ever recorded.

Four papers for Study Group 6 had been prepared and submitted to the UK CCIR Study Group for consideration.

Technical and Publications Committee

The activities of this committee may be divided into several categories.

Production of Society publications forms a major part of the work of the committee and during the year much time was spent in organizing the preparation of material for new publications.

The *Radio Communication Handbook*, 5th edition, is in course of production and it is hoped that it will be published during 1974.

The *Test Equipment and Measurements Manual* (H. L. Gibson, G8CGA) has reached the stage where the final editorial work is being completed and publication will be early in 1974.

The *Teleprinter Handbook* (J. G. Denny, G3NTT, and D. J. Goacher, G3LLZ) has been completed and, subject to any further delays by the printers, publication is planned before the end of 1973.

The *Television Interference Manual* (B. Priestley, G3JGO) was published during the year and sales are satisfactory.

Amateur Radio Awards (C. R. Emary, G5GH) covering details of all the major certificates issued by national societies was published in time for it to be on sale at the Woburn Rally.

The fourth edition of *Amateur Radio Techniques* (Pat Hawker, G3VA) was published in July 1972 and has sold over 3,500 copies.

Work has continued throughout the year on the updating of the *RSGB Amateur Radio Call Book* and the 1974 edition will be available in October 1973.

A Guide to Amateur Radio (Pat Hawker, G3VA) was revised and the 15th edition was published during the year.

Work is in hand on an fm manual (G. R. Jessop, G6JP).

Equipment assessments have been carried out by members of the committee and the results written up for publication in *Radio Communication*. Reviews of Heathkit HW7 (March 1973), Microwave Modules 5W 145MHz transmitter (May 1973), Barlow Wadley Receiver Mk II (January 1973), Bird Ham-mate Power Meter (May 1973) and Trio TS510 Transceiver (September 1973) have all been published during the year.

Radio Communication. All articles submitted for possible publication in the journal are considered by members of the committee. The technical level of articles is maintained at a high standard and articles are reprinted in many other amateur radio journals.

The Society makes awards for technical articles published each year and the committee makes recommendations to the Council for the Norman Keith Adams Prize, Bevan Swift Memorial Prize, Courtney Price Trophy, Wortley Talbot Trophy and Ostermeyer Trophy.

Various technical matters were considered by the committee during the year including production of printed circuit boards, specification for amateur transmitters, and new types of coils.

The terms of the Diamond Jubilee Constructors' Competition were agreed and first published in *Radio Communication* in March 1973.

In addition to attending eight meetings between June 1972 and August 1973, members were engaged for many hours during the year on various aspects of committee work.

VHF Committee

In May 1972, Committee B of the IARU Region 1 Division Conference at Scheveningen considered various matters relating to vhf/uhf/shf. Several recommendations were accepted at the conference and these were referred to the committee by the VHF Manager.

The committee considered methods to make sure that the amateur service at vhf/uhf/shf is known to the Administration and for its presentation at International Conferences.

The 2m and 70cm band plans were considered at length. Special meetings were held to consider every aspect of the plans and further recommendations were submitted for consideration at a meeting of IARU Region 1 VHF Working Group held in October 1973.

In August 1972 the first licence was issued for the operation of a repeater, GB3PI, in the 2m band. The operating characteristics of the equipment were formulated as a result of recommendations at the Scheveningen conference and consideration by the committee.

Proposals for additional repeaters in other parts of the UK have been received and are under consideration by the members of the committee. Advice has also been given to prospective repeater groups.

In conjunction with the MPT Liaison Committee, submissions were made to the MPT as to future licensing of repeaters and, following this, specific cases will be forwarded as they are ready. The first of these is for a repeater in South Wales sponsored by the Bristol Channel Repeater Group.

The vhf beacons are under the control of the committee, and during the year every effort was made to ensure serviceability, by complete replacement where necessary.

Microwave techniques were encouraged by the publication each month in *Radio Communication* of details of developments in this field. As from 1 January 1973, the 21GHz amateur band was withdrawn but in its place an allocation at 24GHz would be available.

The 19th VHF Convention was held at Whitton, Middlesex in April 1973, and the arrangements for the convention were in the hands of the committee.

In order to encourage high standards of operation on the 2m bands, consideration was given to a code of practice and after very careful consideration this was announced to the members at the opening of the convention.

Other matters considered by the committee during the year included conditions applicable to certificates and awards, additional microwave allocations, beacon frequencies and the amateur satellite service.

VHF Contests Committee

The VHF Contests Committee met once a month during 1972-3 in order to administer vhf/uhf contests in accordance with their terms of reference. The majority of the committee members found it possible to attend more than 75 per cent of the meetings, and while a serious accident early in 1972 confined Mr I. F. White, G3SEK, to hospital for several months, his responsibilities as secretary were subsequently shared by Messrs W. J. McClintock, G3VPK, and C. Sharpe, G2HIF.

Eighteen national and two international (IARU Region 1) contests were organized and judged during 1972-3, the latter events running concurrently with the September and October field days. The rules and times of all sub-regional (national) contests were arranged to be compatible with similar events taking place on the Continent during the first weekends of March, May, July and November; and except for the radial scoring this compatibility was extended to the regional (international) events in September and October.

It is an unfortunate fact, however, that while the general principle of arranging RSGB contests to be on internationally agreed dates is favoured by the majority of contestants, the number of UK entries in IARU events is disappointing.

The committee, through the VHF Manager, submitted various proposals to the IARU Region 1 Conference in Scheveningen in May 1972 which were designed to further UK participation in international events, and while some of these were accepted, that for the general introduction of the RSGB radial scoring system was rejected by a large majority.

Most contestants appear to be satisfied with the rules under which vhf/uhf contests are run, and the only major change that has taken place in 1973 is the abolition of the

power limitation in VHF NFD. It is not easy to maintain a proper balance in the variety of national events without running contrary to IARU agreements, but the policy of having fixed and portable sections in multi-band contests has not been an unqualified success. There may therefore be changes in the calendar of events for 1974.

The popularity of vhf contests is increasing steadily, and the September VHF NFD now attracts more support than any other contest in the Society's calendar. The committee has continued to do everything it can to encourage 432MHz activity, but the response is slow. Interest in microwave contests, on the other hand, is growing and the June microwave event promises to become the prototype contest for similar events throughout Europe. The 70MHz contests continue to attract a moderate number of entries from the 4m enthusiasts.

The committee confidently expects that support for vhf/uhf contests will continue to increase during 1973–4 and in response to popular demand, additional events were arranged. These included a new low power event in August and a multi-band Diamond Jubilee contest in July with contestants separated according to RSGB regions. The response to both events has been very encouraging and they will appear again in future.

Representation on outside committees

The Society is represented on various outside committees and these are set out below.

Council would like to express its appreciation of the assistance given to the Society by the members who look after the interests of the amateur radio service in this way.

City and Guilds Radio Amateurs' Examination Advisory Committee: Messrs W. A. Scarr, G2WS; R. J. Hughes, G3GVV (chairman); and L. E. Newnham, G6NZ.

CCIR UK Study Groups 5 and 6	R. G. Flavell, G3LTP
CCIR UK General Purposes Committee	R. F. Stevens, G2BVN
BSI Tele 1/5 Terminology	R. S. Roberts, G6NR
BSI Tele 1/30 Terminology	R. S. Roberts, G6NR
BSI Tele 25/1 Receivers	R. F. Stevens, G2BVN
BSI Tele 25/3 Transmitters	D. A. S. Drybrough, G8HEV
BSI Tele 25/4 Aerials	R. S. Roberts, G6NR
BSI Tele 25/6 Mobile services	D. A. S. Drybrough, G8HEV
BSI Tele 25/6 Domestic hi-fi equipment	R. S. Roberts, G6NR
Frequency Advisory Committee	D. A. Findlay, G3BZG

"Radio Communication"

Radio Communication, the journal of the Society, is published each month and distributed free to all members except family members.

For the year ended 31 December 1972, volume 48 contained 856 pages.

Radio Communication enjoys the reputation of being the leading journal of its type and it maintains a high standard of production, technical content and presentation.

GB2RS news bulletin

Every Sunday morning a news bulletin consisting of items of interest to radio amateurs is broadcast by a team of voluntary news readers. The script, which is prepared by headquarters, and has to be approved by MPT prior to transmission, is distributed not only to the news readers but also to the Regional Representatives and the BBC World Radio Club. Transmissions are on 3,600kHz, or as near as possible, and in the 2m band, and the stations are located so as to give wide geographical coverage.

Certificates and awards—hf

Interest in the Society's awards and certificates continues to increase and during the year more than 800 claims were considered.

In addition to the Society awards, of which the Commonwealth DX Certificate (CDXC) is considered to be one of the major operating awards obtainable, claims are dealt with and certificates issued for IARU Region 1 Awards. Claims are also certified for Worked All Continents (WAC) awards, the certificates for which are issued by IARU headquarters.

During the year, rules for an alternative award were formulated. A new reference book—*Amateur Radio Awards*—has been published and the preparation of the information to be included in this publication and the details of the alternative award were dealt with by the Awards Manager.

Certificates and awards—vhf/uhf

During the year the Awards Manager issued 106 awards certificates in recognition of operating achievements on 70, 144, and 432MHz and 10GHz bands. In addition, 76 contest certificates were issued.

One supreme award, obtainable by holding three senior certificates or two senior certificates and one ordinary (23cm) certificate, was made during the year to Mr M. I. Sneap, G3ZYC, of Derby.

There is continuing interest in the Society's vhf awards certificates and this year's certificates were divided almost equally between Class A and Class B licence holders.

Intruder watch

The intruder watch continues to provide regular reports of intruders in the exclusive amateur bands. At the IARU Conference in Scheveningen in May 1972 it was accepted in principle that an IARU Monitoring Service should be set up and the RSGB IW organizer, C. J. Thomas, G3PSM, was appointed Region 1 Co-ordinator. Monthly reports are prepared and circulated on a world-wide basis, and complaints of harmful interference are made through the UK administration (MPT).

QSL Bureau

Although a reduction of activity on the dx bands was to be expected, the number of cards handled by the bureau still stays around an annual count of 1¾ million.

Outgoing cards are handled by the QSL Manager and despatched in bulk, if possible to other QSL bureaux. Incoming cards are in the first instance sorted into callsign categories and then sent to the sub-managers, of whom there are currently 21, who further sort and distribute to users.

There have been changes in the addresses of sub-managers during the year, but the service has been maintained at a very high level with only a very occasional slight delay. Members are advised of changes by notices in *Radio Communication* and by advance warning in the GB2RS news bulletin.

Slow morse practice transmissions

Slow morse practice transmissions are scheduled for each day of the week, and there are now more than 100 transmissions weekly. As far as possible every part of the UK is assured of some periods of practice each week. Although the honorary organizer, Mr M. A. C. MacBrayne, G3KGU, receives very few reception reports, it is known that these transmissions are much appreciated by amateurs endeavouring to increase proficiency in morse code.

Tape library

Tape/slide lectures available to clubs and societies now total 21 "sound only" tapes and 12 tapes illustrated by slides.

Demand for the tapes is high but the curator is only able to maintain an efficient service with the co-operation of club officials.

Trophies and awards

The Society has 46 trophies which are available for annual award. It is no longer possible to award some trophies due to the terms of reference and occasionally awards are not made. However, the majority of the trophies are presented by tradition at the Annual General Meeting or, if more convenient, at a local function.

The Trophies Manager is responsible for all trophies and the organization of the presentation at the AGM.

Oscar 6

One of the most interesting activities for radio amateurs during the year was communication through the satellite Oscar 6, launched on 16 October 1972. The satellite carried equipment consisting of a translator for reception of signals in the 144–146MHz band and re-transmission in the 28MHz band, and two beacon transmitters, one operating in the 432MHz band and one in the 28MHz band. In addition there is ancilliary equipment for telemetry and control purposes.

The Oscar project was organized by the Radio Amateur Satellite Corporation, Washington DC, (AMSAT). RSGB had no direct involvement with the project, but orbit data was available through the GB2RS news bulletin during the following weeks. Since then regular orbital information has been received from the Radio and Space Research Station and, by permission of the Director, details have been transmitted in the news bulletin. Information in connection with the operation of the translator has been received from AMSAT and this has also been made available to users.

VAT

Although this tax was not imposed until April 1973, very careful consideration was given to the recommendations of the Finance and Staff Committee. Unfortunately the VAT regulations are such that the whole of the amount of the subscription of UK members is liable to VAT, although nearly half of the subscription goes to provide *Radio Communication* which, as a journal, is "zero-rated". The possibility of charging separately for *Radio Communication* was considered but the administrative, legal and economic problems were such that it was considered that this was not an economic arrangement. However, the recent decision in the Automobile Association case is under consideration.

Subscriptions

For the months of April, May and June 1973, the subscription remained at its previous level, but as there was a liability to VAT the effective income of the Society was reduced. This situation could not, however, continue and it was necessary to increase the subscriptions from 1 July 1973.

VAT is now additional to the subscription for UK members. Any change in the subscription is an expensive matter as it involves asking members who pay by banker's order to alter their instructions. There are many occasions, even after instructions have been given, of incorrect or duplicate payments, and the work involved in rectifying the position adds greatly to the other expenses of the change-over.

35 Doughty Street

The rise in property prices generally has meant that numerous enquiries are received by the Society as to the disposal of the freehold property.

Experience has shown that the building is not ideal as a headquarters, both as to the location which is in the "high-salary" part of the country, and to control of an office function which is spread over four floors. However, the financial aspects are complicated at present and a sale would not produce such a surplus as at first sight appears probable. In addition, the cost of alternative property and the re-location expenses would be likely to absorb any surplus that might be available. The Finance and Staff Committee is, however, keeping this matter under regular review.

RSGB PUBLICATIONS

Technical books

Amateur Radio Awards	£1·40
Amateur Radio Techniques	£1·80
Guide to Amateur Radio (15th ed.)	90p
Morse Code for the Radio Amateur	25p
RSGB Amateur Radio Call Book 1974	75p
Radio Amateurs' Examination Manual	90p
Radio Amateurs' Examination Revision Notes	30p
Radio Communication Handbook (4th ed.)	£4·10
Radio Data Reference Book (3rd ed.)	£1
Service Valve and Semiconductor Equivalents	35p
TVI Manual	90p
VHF/UHF Manual (2nd ed.)	£1·80
World at their Fingertips (Paperback)	80p
(De-Luxe)	£2·55

Log books

RSGB Standard Log	60p
RSGB Receiving Station Log	45p
Mobile Mini-Log	25p
RSGB De-Luxe Log	£1·30

Maps and charts

Countries List	10p
Great Circle DX Map	65p
QRA Locator Map (Western Europe) (*In tube*)	50p
QRA Locator Map (Western Europe) (*on card*)	10p
RSGB Amateur Radio Prefixes (World) Map	20p
VHF/UHF band plans (*on card*)	10p

Members' sundries

RSGB Planner Diary	45p
Lapel Badge (RSGB or RAEN emblem, pin fitting)	20p
Tie (Maroon or Blue)	£1·30
Radio Communication Easi-binder	£1·25
Car window sticker (RSGB or RAEN). (Self-adhesive)	10p
Members' headed notepaper (50 sheets) quarto	40p
octavo	25p
Radio Communication. Bound Volume, 1971 or 1972	£3·00

USA PUBLICATIONS

American Radio Relay League

Antenna Book	£1·40
Course in Radio Fundamentals	£1·15
Hints and Kinks	60p
Radio Amateur's Handbook (Paperback)	£2·80
Radio Amateur's Handbook (Hardback)	£3·65
Radio Amateur's Operating Manual	85p
Single Sideband for the Radio Amateur	£1·60
Understanding Amateur Radio	£1·40
VHF Manual	£1·40

CQ (Cowan Publishing Corporation)

Amateur Radio DX Handbook	£2·05
Antenna Handbook Vol 1	£1·65
Antenna Roundup	£1·65
Mobile Handbook	£1·30
RTTY A-Z	£2·05
RTTY Handbook	£1·65
Shop and Shack Shortcuts	£1·65

Radio Publications Incorporated

Beam Antenna Handbook	£2
Better Short Wave Reception	£1·70
Cubical Quad Antennas	£1·60
Simple, Low-cost Wire Antennas	£1·75
VHF Handbook	£1·75

Radio Amateur Callbook Inc

American Callbook (USA listings)	£4·70
DX Callbook (Foreign listings)	£4·30
Prefix Map of the World	60p
World Atlas	£1·10

Magazine subscriptions

QST (including ARRL membership) (Per annum)	£3·75
CQ (Per annum)*	£2·50
73 (Per annum)*	£2·90
Ham Radio (Per annum)*	£2·85

* *Discounts available for 2- or 3-year subscriptions.*

MORSE INSTRUCTION AIDS

G3HSC Rhythm Method of Morse Tuition— Complete Course (two 3-speed LP records and one EP record plus books)	£4·95†
Beginner's Course (one 3-speed LP record and one EP record plus books)	£3·95†
Beginner's LP (0-15 wpm) plus book	£3·05
Advanced LP (9-42 wpm) plus book	£3·05
Three-speed simulated PO test 7in ds ep record	95p

† *Overseas orders: add £1.*

OTHER PUBLICATIONS

Basic Electricity	£2
Basic Theory & Application of Transistors	£1·05
Counties Map	35p
Dictionary of Electronics	55p
Foundations of Wireless	£2·05
Guide to Broadcasting Stations	85p
Ham Notebook	£1·80
How to Listen to the World	£2
Making a Transistor Radio (Ladybird)	20p
Mullard Data Book	35p
Radio Amateur Operator's Handbook	55p
Radio Valve & Transistor Data	90p
Simple Shortwave Receivers	90p
Story of Radio (Ladybird)	20p
Transistor Audio and Radio Circuits (Mullard)	£1·90
World Radio-TV Handbook	£3

TERMS: Cash with order. Stamps and book tokens cannot be accepted. Cheques and postal orders should be crossed and made payable to "Radio Society of Great Britain". When ordering please write your name and address clearly in block capitals at he top of the order. Giro A/C No 533 5256.

Prices include postage and packing.

VAT is included where applicable.

All items listed on this page are available to callers at RSGB headquarters at the above prices less postage and packing. Counter service 9.15am-5.15pm, Monday to Friday.

RSGB Publications Section, 35 Doughty Street, London WC1N 2AE

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