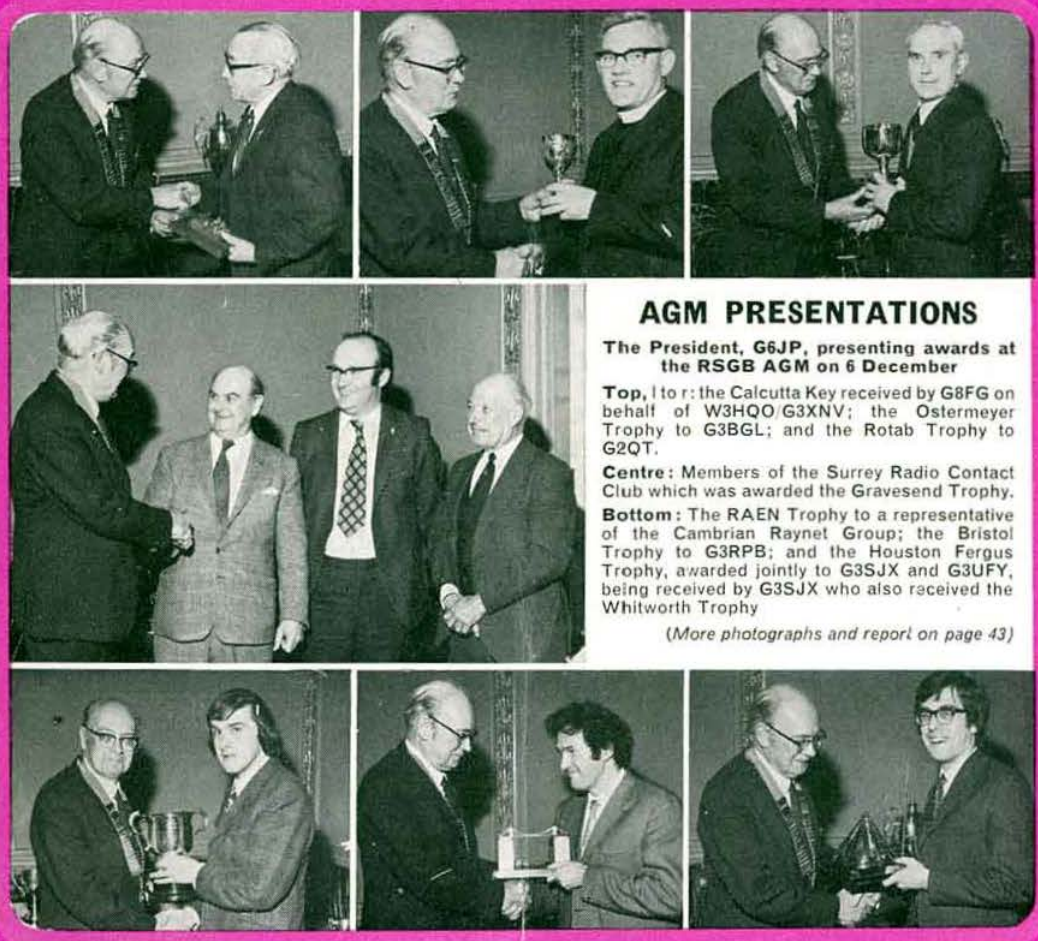
radio communication

January 1975



AGM PRESENTATIONS

The President, G6JP, presenting awards at the RSGB AGM on 6 December

Top, l to r: the Calcutta Key received by G8FG on behalf of W3HQO/G3XNV; the Ostermeyer Trophy to G3BGL; and the Rotab Trophy to G2QT.

Centre: Members of the Surrey Radio Contact Club which was awarded the Gravesend Trophy.

Bottom: The RAEN Trophy to a representative of the Cambrian Raynet Group; the Bristol Trophy to G3RPB; and the Houston Fergus Trophy, awarded jointly to G3SJX and G3UFY, being received by G3SJX who also received the Whitworth Trophy

(More photographs and report on page 43)

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radio communication

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CONTENTS

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ABC
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

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Advertising, other than Members' Ads, should be sent to the above address marked for the attention of Mr C. C. Lindsay. Tel 01-837 8688 (or 01-686 5839, advertising only).

GENERAL CHAT

Well, which way will amateur radio go in 1975. There seems to be no shortage of new licencees so we could have even more crowded band conditions than ever. This means that each amateur must "keep his house in order" with respect to his signal, since it is just bad manners to splatter your signal across the next door QSO. Inevitably more attention will be paid to producing lower and lower intermodulation products in the transmitter and a closer watch must be kept on signal width. The use of better filters (ie. 8 pole rather than the common 6 pole) in the transmitter will almost become a necessity and overdriven TV line output PA tubes will have to be under run before they become acceptable.

Our servicing load is as heavy as ever and previous customers will be aware of course that our connections with Yaesu as regards service are as strong as ever; it was we, after all, who established the Yaesu servicing reputation in this country and we shall always continue to maintain any equipment sold by us.

LOWE ELECTRONICS

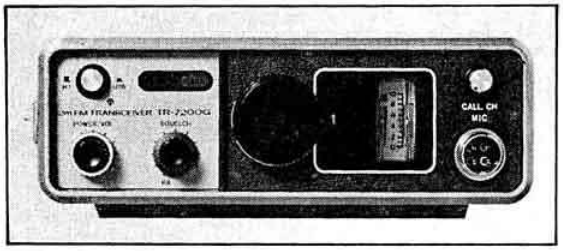
TRIO FOR VHF

TS700 Specification

FREQUENCY RANGE	*144–146MHz*
MODES	*usb, lsb, cw, am, fm*
VFO COVERAGE	*144–145 and 145–146 MHz*
CRYSTAL OUTPUT	*22 Channel capability*
POWER OUTPUT	*10W minimum*
ANTENNA IMPEDANCE	*50 ohms*
CARRIER SUPPRESSION	*50dB*
SIDEBAND SUPPRESSION	*Greater than 40dB*
SPURIOUS RADIATION	*Better than — 60dB down in all modes*
DEVIATION	*± 10KHz or ± 3KHz*
REPEATER TONE	*750–Hz Tuning Fork Oscillator*
IF	*10·7MHz for ssb, am, cw, single Conversion* *10·7MHz and 455KHz for fm, double Conversion*
SENSITIVITY	*0·5V for 10dB S + N/N*
IMAGE REJECTION	*Greater than 60dB*
IF REJECTION	*Greater than 60dB*
IF SHAPE FACTOR	*Better than 2·1 all modes*
AF OUTPUT	*Greater than 2W into 8 ohms*
STABILITY	*Better than 200Hz in any 30 min. period after warm-up*
REPEATER SHIFT	*Standard 600KHz transmit downshift provided*
CALIBRATOR	*Built-in 1MHz Calibration points*
DIAL READOUT	*To better than 1KHz all modes*
R.I.T.	*4KHz shift of receiver with respect to transmit frequency*
NOISE BLANKER	*Advanced circuitry noise blanker for noise free mobile or fixed operation*
ALC INPUT	*Socket provided for ALC input from linear*
AUX RELAY	*Socket provided for switching external linear*

POWER REQUIREMENTS	*120/240V 50/60Hz ac; 12–16V dc negative earth*
CONSUMPTION	*Receive 45 watts ac; 800 ma dc* *Transmit 95 watts ac; 4A dc*
DIMENSIONS (mm)	*278 wide × 124 high × 320 deep*
WEIGHT	*11kg 24·2 lb*

Price £300 (VAT excl)



TR7200G 2m Mobile Transceiver

22 Switch selected transmitting and receiving frequencies in the 2m FM band between 144MHz and 146MHz, five of which are factory-equipped with TX and RX crystals. Illuminated channel indication.

Channels Fitted 145·50 Simplex, 145·525 Simplex, 145·55 Simplex, 145·15/75 Duplex, 145·175/775 Duplex

Price £125 (VAT excl)

TR2200G

The world's most popular 2 metre handy transceiver now comes complete with tuning fork controlled repeater access tone and facilities for 12 channels. With the advent of repeater operation in this country, it is now possible to work long distances with low power equipment and the sudden popularity of portable 2 metre equipment testifies to this fact. The TRIO TR2200G is a high performance transceiver with features not found in other rigs. Supplied with 3 channels fitted:

145·50 Simplex
145·55 Simplex
145·175/775 Duplex

Most other I.A.R.U. channels available.

Price £80 (VAT excl)

REMEMBER! IC210 STILL AVAILABLE AT £200 (VAT EXC.)
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73 from BILL G3UBO/VE8DP, ALAN G3MME, JOHN G3PCY/5N2AAC, IAN G3ZYC

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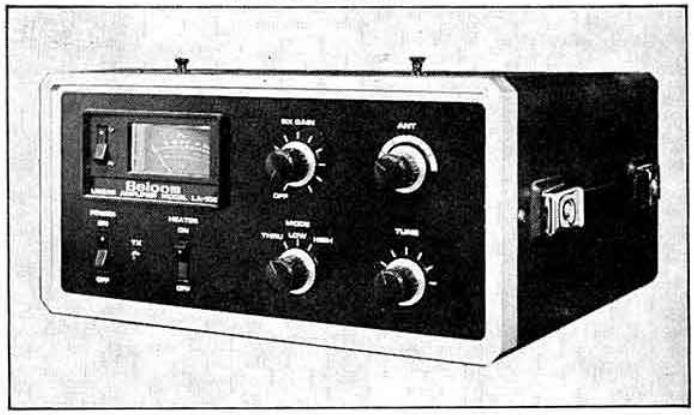
BELCOM LA106 2m linear amplifier

A reasonably priced, compact, high performance linear for 2m SSB/FM CW operation. 10W of drive for more than 200W input gives your signal the extra kick to get it out of the noise. Built-in receive preamplifier with adjustable rf gain and using helical filters for extra selectivity and reduced intermod. from out of band signals. Built-in regulated 13v 2·5A power supply for Liner 2 or any similar drive unit.

Frequency range:	144-146MHz
Modes:	SSB, FM, CW
Input power:	200W p.e.p.
Drive power:	10W
Receiver preamplifier adjustable gain up to 10dB	
Accessory supply:	13v 2·5A regulated
Power supply:	240v 50Hz
Dimensions (mms)	315 × 148 × 280
Weight:	12kgs
Price:	**£165 plus v.a.t.**

MADE SPECIALLY BY NIHON DENGYO FOR THEIR LINER 2



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SSB 144MHz MOBILE TRANSCEIVER

Liner 2

The brilliantly conceived and designed Liner 2 has revolutionized 2m sideband and is responsible for the enormous increase in activity. It combines the advantages of switched channels with direct frequency readout (e.g. Channel 20 is 145·20MHz) with the ability to tune between channels with the VXO. In addition the provision of R.I.T. which enables the rx to be tuned a kHz or two either side of the Tx frequency is a useful feature. The VXO gives, as one would expect, crystal stability which, coupled with an extremely effective noise blanker makes mobile operation a delight without detracting from its use (with an A.C. psu) as a base station.

Most important is the surprisingly low level of spurious emissions which sets a new standard. This low level is achieved by very careful design and alignment and owners are most strongly urged not to attempt alignment without a laboratory spectrum analyser.

For the first time, here is a completely solid state, fully tuneable 2m SSB rig with an electronically protected PA at a reasonable price which truly performs with the utmost reliability.

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DAVE
G8ELP

PAUL
G3VJF

UK IMPORTERS OF INOUE EQUIPMENT

IC-210 FANTASTIC PRICE REDUCTION

After discussion with Inoue we are, for the time being, able to offer you this excellent FM transceiver at the bargain price of **£200** + VAT. We still consider that this is the best FM base station for 2 metres available in the country. It is fully VFO over the whole band and has a built in repeater facility which drops the transmit frequency by 600kHz and introduces a tone-burst. Receiver sensitivity is excellent (0·4 uV for 20dB quieting) and netting is easy and accurate using the built in centre zero meter. Because it is designed solely for FM it does not employ some of the compromises used in multi-mode rigs and has a filter designed for the mode. The signal is extremely clean—If you are an FM man this is the rig for you!

NEWS FROM INOUE. A version of the IC-210 but with multi-mode facilities is shortly to be introduced. We have no further details yet but if it is as well designed and built as the IC-210 it should be a cracker! It will be called the IC-201. If you would like to be put on our mailing list ready for when details arrive please let us know.

NEWS FOR OUR NORTHERN CUSTOMERS. We are pleased to introduce MR. PETER AVILL G3TPX of 7 Moorland Crescent, Mapplewell, BARNSLEY as our SOUTH YORKSHIRE AGENT. Peter has a representative range of our stock and will be pleased to demonstrate and sell it evenings or weekends at his excellent QTH which is the proposed site for the Barnsley repeater GB3NA. Feel free to phone him for an appointment on DARTON 2517 (STD Code 022 678). Peter is very close to the motorway and can thus be reached quickly from Leeds, Sheffield, Bradford and East Lancashire.

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PRICE LIST — January 1975

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Extra channels for above	£3.50
IC-225 80 channel mobile transceiver	£195.00
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2m Low noise preamp with 2 isolated outputs	£9.00
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SOMMERKAMP EQUIPMENT—*Prices on application*

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40w Linear Amplifier, Transistorised FM or SSB (suitable for Liner 2, TS700, IC-210, IC-22, etc.)	£40.00
Above with built in Rx. Pre-amp	£44.00

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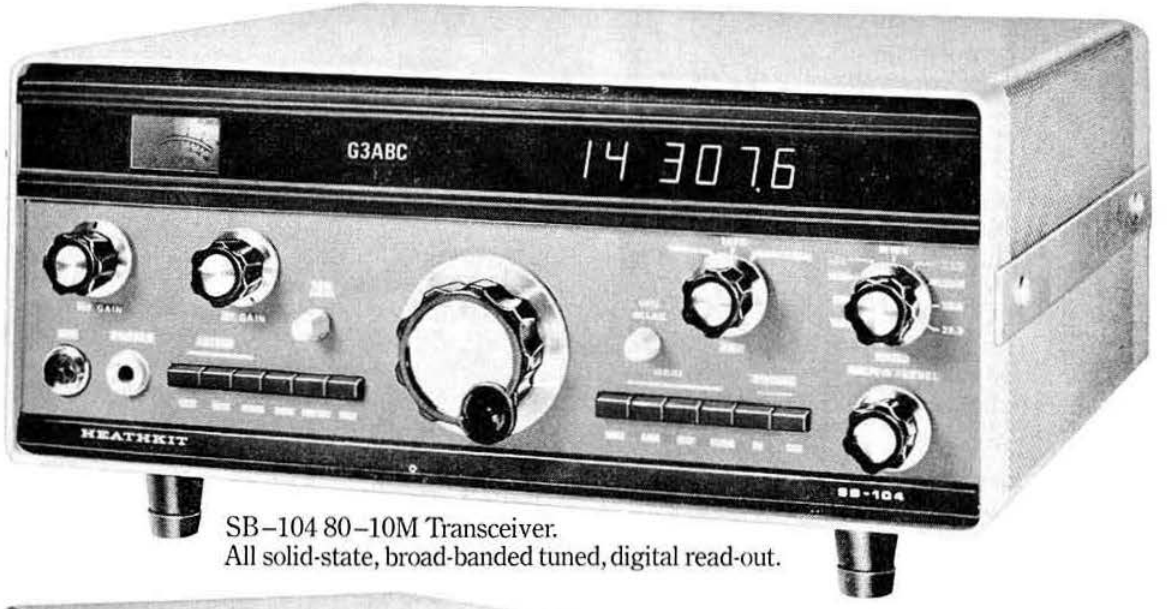

SB–104 80–10M Transceiver.
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Easy assembly. Eleven of the PC boards simply plug-in and seven of them can be extended out of the chassis whilst operational.

SB–104

And alignment is quick and easy, needing only a dummy load and VVM.

Yet, being the most sophisticated transceiver available, the SB–104 will naturally take you quite a few evenings to put together. But we can promise that assembly is beautifully straightforward. Just what you'd expect from Heathkit. And you can operate it directly from a 12 VDC supply or, for fixed station use, connected to our new HP–1144 power supply.

SB–230

SB–230 1 kW Linear

High performance. The SB–230 provides 1200 watts PEP SSB, 1000 watts CW input from less than 100 watts drive. And a large heat sink eliminates the need for a fan.

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Easy assembly with the help of the Heathkit manual. The SB–230 should go together in only 15 or 20 hours with no alignment necessary.

SB–604 Station Speaker

Large enough to house the AC power supply with a 5″×7″ speaker, response tailored for SSB.

SB–604

The inside information.

SB-614

SB-614 Station Monitor
The SB-614 monitors transmitted SSB, CW and AM signals up to 1kW from 80-6 metres. The highly visible CRT gives a sharp, clean, stable trace.

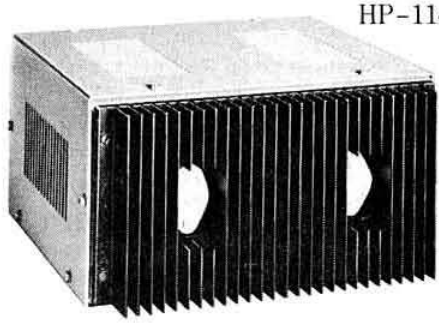
SB-634

SB-634 Station Console
The SB-634 provides four very useful station functions: 24 hour digital clock, ten minute ID timer, RF wattmeter, SWR bridge and phone patch, where permitted.

SB-644

SB-644 Remote VFO
Provides split transmit/receive facility without a separate transmitter and receiver—and with no in-band frequency limitations. The SB-644 also features pushbutton control of all receive, transmit and transceive modes on both the SB-104 and remote VFO.

HP-1144.



HP-1144 Power Supply
The HP-1144 fixed station power supply provides you with the 13.8 VDC required by the SB-104. And the entire unit can be mounted inside the SB-604 speaker cabinet.

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FT401B FL2000B FV401 FTV650

The FT401B (An FT401 with AM, but without the CW filter) and its accessories are shown above, and provide an uncompromising approach to the home station. The FT401B itself runs 560 watts P.I.P. but when throttled back to drive the FL2000B and coupled with the FV401 external V.F.O. provides the base station with ultimate DX appeal.
The unit nestling on the end is the FTV650, a 6m transverter which we can provide electrically modified for 70MHz, 100W P.I.P., 50W CW, 40W FM/AM £80.00.

NEW FROM S.M.C. — THE FT620

(The VHF man's perfect exciter!)

A compact unit featuring full 1kHz resolution VFO coverage across 50–54MHz in 8 ranges, SSB (selectable) AM or CW (build your own FM modulator) 4 crystal controlled channels in each band segment, receiver offset clarifier, noise blanker, built in AC and 12V DC power supplies, mic supplied, optional AM filter and crystal calibrator **£175.00.**
The exceedingly low level of spurious emissions and the 50MHz output makes this unit highly suitable for use as a drive source transverting to 4, 2 or 70cms and/or parametrically up converting to 70 or 23.
For use on 70cms we are pleased to announce the Microwave Modules transverter is now available for us with a 50MHz I.F. **£62.00.**

ALL IN STOCK EX-TOTTON

FT2F Auto
A unique concept in 2 metres FM transceivers. The "Auto Scan" circuit monitors every ½second each of the 8 channels and automatically locks upon receipt of a signal. Individual lockout buttons enable you to eliminate any undesired or occupied channels. A priority circuit may be activated to check your local net or RAEN frequency every two seconds. To transmit on a channel being received a momentary pressing of the P.T.T. locks the transmitter to the receiver. Manual operation is available, duplex operation with or control tone burst, built in mains and 12V power supplies and microphone.

Sigmasizer 200R
200 channel synthesized FM transceiver offering complete simplex and duplex coverage of two metres in 10kHz increments. A 600kHz transmitter offset oscillator gives complete flexibility when coupled with the built in tone burst. A priority channel may be preset for instant selection of net or RAEN channels. Automatic final protection, 10W of R.F. and a generous 2 watts of audio for mobile use with a battery drain of only 2·2A on transmit. The unit may be run as a base station with the FP2AC regulated power supply and battery charger.

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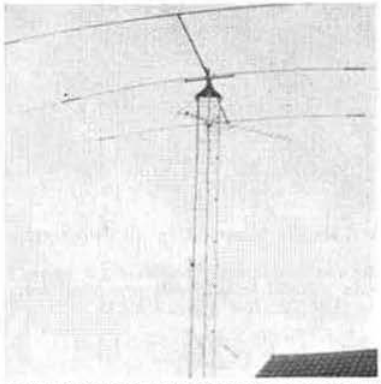
(Shown) 30' HAM TOWER



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The tilting facility allows ease of maintenance and changes of antennas. The relatively low weight for this type mast allows ease of installation. Buy from the company with over 15 years of experience in this field. Prices from **£172.25.**

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The mast for VHF and UHF antennas. The short section 1·5m series fits in the car. The 2m series on the car and the 3m series for permanent installation 6 to 21 metres. Rigging wire and fittings extra. Prices from **£11.50** for 6m to **£38.80** for 21m.

Telescopic galvanised masts 10' section length. Prices carriage paid with VAT.

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30'	**£15.00** + VAT	**£29.00** + VAT
40'	**£20.00** + VAT	**£39.00** + VAT
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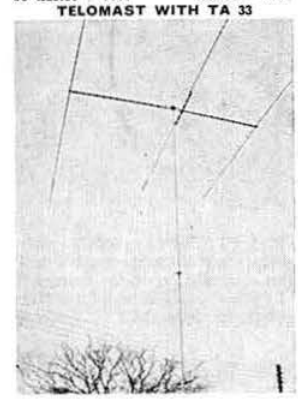
TELOMAST WITH TA 33



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Magnetic mount saves hole in car, fits the above, **£7.50** + VAT. New boot mount, **£5.10** + VAT.

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Masting 10-20m 3 ele .. **£60.00**
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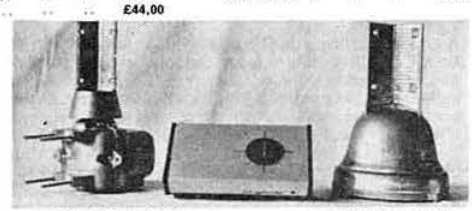

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Membership rates: UK—£5.50, VAT included (Unlicensed members under 18 years of age—£2). Overseas—£5 (USA $12). Members are asked to notify changes of address without delay.

A message from the President

I am deeply conscious of the great honour which has been conferred upon me in being President of the Society for the year 1975, and especially so since I am the first holder of a Welsh callsign to hold this office. I would like to take this opportunity to thank all the people who have given me assistance and encouragement during the years in which I have had the privilege of acting as the representative for Wales.

I feel that I should be doing less than my duty if I did not acknowledge the debt we all owe to those selfless people who give so much of their time and energy to the essential tasks of manning the various committees of the Society, operating the scheme of representation and the QSL service, and carrying out the many duties without which the Society could not function.

To them and to all members and staff of the Society I extend sincere wishes for a happy and prosperous New Year.

C. H. Parsons, GW8NP

QTC AMATEUR RADIO NEWS

RSGB lecture meeting

More than 120 members and guests attended the Society's lecture meeting on Monday 25 November in the main lecture theatre at the Institution of Electrical Engineers. Mr R. J. Harry of the Directorate of Radio Technology of the Home Office, currently based at the radio interference laboratory at Stanmore, opened the proceedings with a description of the standards by which interference is assessed and the measuring equipment in current use. His talk was illustrated by slides and examples of the equipment were on display.

Mr Harry was followed by Andrew Holloway, G3VUQ, and Ian Jackson, G3OHX, members of the Society's Interference Committee, who dealt with the problems of emc and the radio amateur. Their message was essentially, "Face up to the facts on interference, report it and help to provoke action by manufacturers to improve the standards of domestic equipment such as television receivers and audio amplifiers".

The lectures were followed by a question period and one of the points mentioned by Mr Harry was that adoption of common standards within the EEC might, in due course, provide the amateur service with some protection against sources of electrical interference and lead to an improvement in engineering standards.

The meeting was chaired by the RSGB President, Mr G. R. Jessop, G6JP; and Geoff Stone, G3FZL, proposed a vote of thanks to the speakers.

New prefix

The ITU announces the allocation of the following new callsign series: C6A-C6Z, Bahamas (Commonwealth of the).

RSGB

Readers of the *Financial Times* may have noticed in the issue of 10 December a reference to a report on radio listenership in the London area. This report is being issued by Research Surveys of Great Britain Limited whose title is frequently abbreviated to RSGB. These initials are used in the *Financial Times* article although it is stated that the report is by a market research company.

The use of these initials and the misunderstanding that would arise was mentioned in *Radio Communication* in March 1973.

Facts and figures

The Home Office advises that the following numbers of amateur licences were in force at 30 September 1974:

Class A	15,221	Class B/M	1,504
Class B	4,949	Television	267
Class A/M	3,345		

The Callsign Record received from the Home Office, dated 30 November, gives the latest callsigns issued in the G4 and G8 series as G4DOJ and G8JQU respectively.

At the end of November RSGB membership totalled 17,245 made up of 14,447 UK corporate, 1,049 UK associate members and 1,749 overseas members.

Thames Valley links twin towns

On 30 November 1974 G3TVS, the club call for the Thames Valley Amateur Radio Transmitters Society, linked the twin towns of Walton-on-Thames and Rueil-Malmaison, near Paris. The occasion was to mark a cultural exhibition taking place in the French town and the transmission of appropriate greetings between the two societies. Thames Valley members are largely from the Elmbridge area which now incorporates the town of Walton.

Working under poor conditions on 40m ssb, G3TVS linked with F6KFA, the Rueil-Malmaison society, and members of both clubs monitored and recorded the contact.

COUNCIL ELECTION RESULTS

The results of the ballot to fill the two vacancies on Council from 1 January 1975 were as follows:

Ordinary member

M. Hearsey, G8ATK	386 votes
P. F. Jobson, G3HLF	214 votes
G. B. Packer, G3UUS	241 votes
D. M. Pratt, G3KEP	429 votes

Zonal member—Zone E

D. H. Adams, GW3VBP	58 votes
D. M. Thomas, GW3RWX	104 votes

Total voting papers received....2,688. Spoiled votes....34

Votes cast in favour of Mr G. M. C. Stone, G3FZL, but not accepted due to Mr Stone's nomination being invalid, totalled 1,369. One of Mr Stone's nominators was not a member of the Society at the time of nomination as required by the Articles of Association, but unfortunately the discrepancy was not discovered until after the ballot papers had been distributed.

The Society's solicitors were consulted and they were of the opinion that Mr Stone's name should not have appeared on the ballot paper and therefore votes cast for him should not be counted. The rest of the ballot paper should, however, be considered as valid.

Messrs **D. M. Pratt** and **D. M. Thomas** were accordingly elected to serve on Council for the three years 1975-7.

Leading members of the French society were expected to visit Thames Valley on the weekend of 14-15 December, with a view to developing the idea of "twinning" the two societies.

Vintage Wireless Museum

The Vintage Wireless Museum of the Wireless Preservation Society has been transferred from Lincolnshire to the Isle of Wight. Anyone who would like to see the many interesting items in this historic collection is asked to contact the hon secretary and curator, Mr Douglas Byrne, G3KPO, at the Alverstone Manor Hotel, Shanklin (Tel Shanklin 2586).

RNARS morse proficiency transmission

Commencing 7 January, the morse proficiency transmission by G3BZU on 3·520MHz on the first Tuesday of each month will be augmented. In addition to the speeds of 20, 25, 30, 35 and 40 words per minute, a section at 15 words per minute will be included.

Details of these and RSGB slow morse practice transmissions were last published in the November 1974 issue.

Proposed club on HMS Belfast

In connection with this item which appeared on page 843 of the December issue, we are advised by RNARS that the meeting to discuss this project on 11 January will be open to members of the RNARS only. Other details are as published.

First-day covers

Official first-day cover envelopes commemorating the launch of Oscar 7 are now available from AMSAT, PO Box 27, Washington DC, 20044, for $1 (or 5 IRCs each). Enclose a large self-addressed envelope and an additional irc in lieu of stamps. The first-day covers were postmarked at the launch site, Lompoc, California, on the day of the launch, and make an excellent collector's item.

Proposed repeater

The idea of a vhf or uhf repeater to serve an area centred on Chelmsford has been proposed, and an invitation is extended to all interested parties to attend a meeting to discuss the feasibility of the idea.

The meeting will be held in the lecture room of Chelmsford Public Library on Friday 10 January at 7.30pm. It is hoped that representatives from all clubs in the area bounded by Harlow, Brentwood, Southend and Colchester will attend.

"Radar precision and resolution"

This recently published book was written by G. J. A. Bird, G3KOV. As the book contains a treatment of Hilbert transforms and complex analytic signals it may be useful to amateurs interested in the mathematics of ssb.

G3KOV is QRT at the moment, working on a second book dealing with the applications of Laplace transforms and Z transforms.

HMS Belfast

The Royal Naval Amateur Radio Society will be activating special station GB3RN on board *HMS Belfast*, moored in the Pool of London, over the Easter period (28 March to 7 April). Activity will be on all hf bands and on vhf.

Members of the RNARS who would be willing to offer their services as operators are asked to contact the activity organizer: G3HZL, 153 Worple Rd, Isleworth, Middx. Tel 01-892 3239 during weekends and evenings.

Talking books

The first appeal of the British Talking Book Service for the Blind was made in the *RSGB Bulletin* some 20 years ago, when it had a membership of 2,900. Today there are just over 40,500 readers.

One of the problems of the service is that certain areas have more helpers than blind people and vice-versa. Problem areas at present are: N & W Yorks; Northumberland, except the south-east, N Lancs; W Notts; Herts; N & E Kent; Caernarvon; Merioneth; Pembroke; N of Carmarthen, and N & E of Aberdeenshire; and two town areas—Barnsley and the east side of Glasgow.

Anyone who would like more information about the service, or would be prepared to help in the problem areas, is asked to write to: D. Finlay-Maxwell, MIEE, FTI (hon recruiting organizer), J. Gladstone & Co Ltd, Wellington Mills, Huddersfield, Yorks.

Headquarters notice

To assist the staff in dealing with members' correspondence efficiently, please address enquiries to the appropriate department, marking the envelope accordingly, ie "The Editor" (all matters concerning the content of *Radio Communication* or other RSGB publications), "Accounts", "Publications", "Subscriptions", "Technical".

When more than one matter is being raised, please write each enquiry on separate sheets. Multi-subject letters are difficult to process and cause delay in reply.

Your co-operation will be appreciated.

EQUIPMENT REVIEW

The Solid State Modules Europa

by K. A. M. FISHER, AMIPRE, G3WSN*

THE Europa transverter is a compact hybrid unit designed for use with the Yaesu/Sommerkamp series transceivers to provide vhf coverage of ssb/cw/a.m. from the hf unit. It is available in two forms covering either the 2m or 4m band. Both models are housed in neat cabinets of extremely modest size—9in by 4¾in by 4½in, and are finished in black with silver front panels.

The 2m Europa was loaned for review by Solid State Modules, 63 Woodhead Road, Solid, Lockwood, Huddersfield, HD4 6ER, and the current price of either version is £88 complete, or £74 less valves.

An additional 12·6V ac transformer for use with the FT401 or FL400 etc can be supplied at £3.24 or at £6.37 in a case matching the Europa.

General description

The transverter can be considered as two units, a converter and a transmitter, housed in a single case. An oscillator provides a signal at 116MHz which is used in both the transmit and receive mixers in order to retain the transceive function.

The 28MHz signal from the hf equipment (at low level) is mixed with the 116MHz in a QQV03-10 balanced mixer. This is followed by a further QQV03-10 acting as a buffer/driver for the QQV06-40A power amplifier.

The meter can be selected to indicate the pa cathode current or the rf output. The front panel controls consist of mixer tune, buffer/driver tune, pa tune, pa loading, meter switch, and heater ON/OFF. The bias and hence pa standing Ia is adjustable by means of a pre-set control to the rear of the unit. The receiver uses dual gate MOSFETS in both the rf and mixer stages. The input is diode protected.

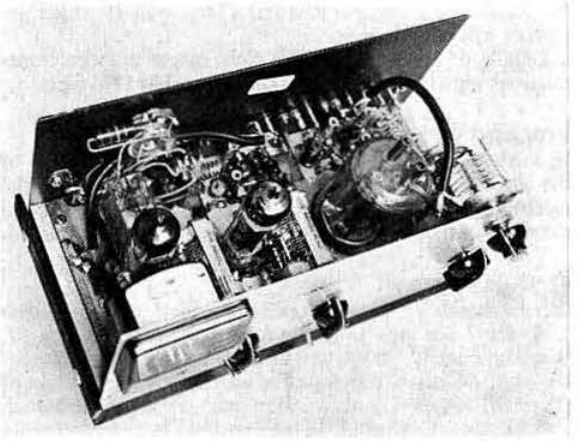
Power for the unit is obtained from the transceiver using the lead supplied, and with the addition of an aerial changeover relay and suitable aerial the station is complete. While being designed for use with the Yaesu/Sommerkamp series of transceivers, the Europa could be used in conjunction with any other hf equipment, transceive or separates, having 28-30MHz coverage, (this range is required for the full 144-146MHz coverage) with relatively few circuit adjustments. Instructions for using the Europa with other well-known equipment are available from SSM. The low level hf ssb input, vhf ssb output, vhf receiver input and hf converter output are all brought out to the rear panel on separate Belling-Lee domestic tv sockets which assists with the utilization of a variety of equipment with the Europa. Various switching functions also available on a multi-way socket.

Tests

For all performance tests the Europa was used in conjunction with a Yaesu FT101B hf transceiver.

The transmitter

In these days of high band occupancy within the allotted amateur bands and the increased use of all the vhf/uhf



Top view of the Europa

* 88 Longmead Avenue, Great Baddow, Chelmsford, Essex.

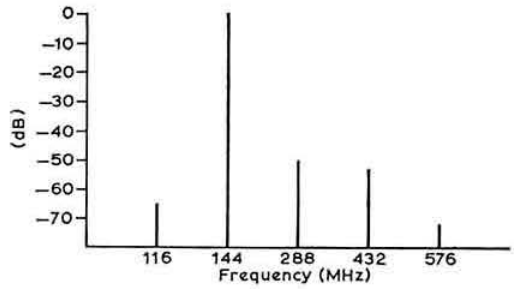


Fig 1. RF output of Europa—cw

frequencies, an extremely important factor to be considered in the design and operation of any transmitting system is the output purity. Under the ideal situation only the wanted signal is present at the output. Practically though, harmonics and spurious signals due to mixer products are always present but the amplitudes are dependent on the circuits used and frequencies employed. With careful choice of circuits, frequencies and levels, and good screening, the unwanted signals can be held down to acceptable levels. The output spectrum of the Europa running with a cw output of 60W in 50Ω is shown in Fig 1.

The dc input to the pa and the resulting rf output were noted as follows:

DC input	RF output
123W	50W
95W	30W
65W	13W

The carrier suppression at 145MHz was −40dB on a 1kHz tone output.

The receiver

For any serious comparison of receiver performance, certain parameters have to be known. Unfortunately at the time of this review it was not possible to measure the input impedance of the converter in the Europa. Assuming an input impedance of 50Ω, the sensitivity for 10dB s/n at 144·15MHz was 0·5μV (30 per cent modulation).

Local oscillator

The 116MHz oscillator was measured after 1·5 hours and was 116·0096MHz. There is no means of adjustment of this frequency—a point not likely to cause concern to the average user. In many cases the error could be corrected by adjustment to the calibration of the hf unit.

Drift

The unit was found to be rather susceptible to the effects of heat, largely from the pa valve which would be difficult to improve due to the size of the unit. This was particularly noticeable on lengthy periods of transmission. It was generally acceptable on the shorter dx type overs, showing only a slow drift as the general operating temperature within the case increased.

Spurious responses

No unusual signs were noted. The receiver was stable and no birdies were found. Following a complaint that the Europa transmitter was generally unstable, checks were made to investigate this claim.

With the unit fed into a 50Ω load, and bias set for 35mA, under no-speech conditions all controls were adjusted and deliberately de-tuned in an attempt to produce instability. None was noted under any setting of the various controls. Similarly under cw conditions no spurious signals occurred when the pa was detuned and only the expected loss in output power ensued. Anyone suffering from suspected instability would be wise to change the pa and/or drive valves since both the QQV03-10 and QQV06-40A are internally neutralized. Alternatively a poor vswr due to an aerial or feeder fault could affect the performance of the pa stage.

Intermodulation

This check was made using two signal generators fed through matching pads. The generators were spaced 20kHz apart. The generator outputs were increased together until a signal, equivalent to that produced from a signal of 1μV pd, was observed 20kHz below the lower generator. (This level was previously determined using one signal generator). The generator levels when this occurred were +75dB rel 1μV. The signal levels at the receiver were therefore +69dB rel 1μV due to the loss in the matching pad used to combine the two generators. Again it has to be assumed that the input impedance was 50Ω. However, this was a very satisfactory result.

Blocking

For this test again the two signal generators were used. Spacing was set to 10kHz and one generator adjusted to give a s/n ratio of 10dB. The level of the other signal generator was then increased until the wanted s/n ratio was degraded by 3dB. At this point the unwanted signal was +65dB rel 1μV; a good result.

Conclusions

The unit was subjected to an on-the-air test following the various performance checks, and even when using an indoor dipole several contacts were obtained.

The transceive function doubtless aided this, although in these days of high ssb activity, even with simple systems good contacts become common-place. The only factor causing comment seemed to be the drift on long overs caused by the heat and physical layout.

A circuit diagram was supplied although this was not quite up to the expected standard in print or accuracy. There were several small errors. The input diode protection was omitted from the diagram. General construction was good with well-wound coils used throughout. The fixing of the unit lid would probably give rise to problems after several fittings due to the use of coarse-threaded self-tapping screws.

This unit was considered very satisfactory and should find use in both new and well-established stations. In view of its size it could be easily accommodated in the domestic environment, an important factor these days, and to the newcomer or adventurous hf enthusiast it is an easy method of vhf operation of the kind most likely to provide considerable enjoyment. It is also an ideal system for use with Oscar 6 and Oscar 7, apart from normal tropo work, and should also perform from the FT101B when operated from 12V supply, rendering portable operating a simple task. □

Simple Q measurement

by R. C. MARSHALL, MA, CEng, MIEE, G3SBA*

PART of the challenge of amateur radio is to achieve at little expense, eg homebrew rigs are built out of junk boxes and fed into weird structures of wire and garden canes, but test equipment is a problem, partly because it never seems worth building. This article describes how to measure the Q, or goodness factor, of a tuned circuit with some components in a tobacco tin and a communications receiver.

The principle, borrowed from the "aerial noise bridge", is to energize the tuned circuit with noise giving equal signal strength over a wide frequency band and then observe the frequency response using a receiver. It is, of course, necessary that the receiver bandwidth be appreciably narrower than the circuit under test, but this is true of any communications receiver. The S-meter is simply used to find the −6dB points of the circuit, and its selectivity factor Q calculated. It is possible to measure circuits *in situ*, and to observe the behaviour of coupled pairs or simple filters. The noise generator is shown in Fig 1. It uses reverse break-down of the base-emitter junction of TR1 to generate noise, which is then amplified by the remaining three transistors and delivered at low impedance.

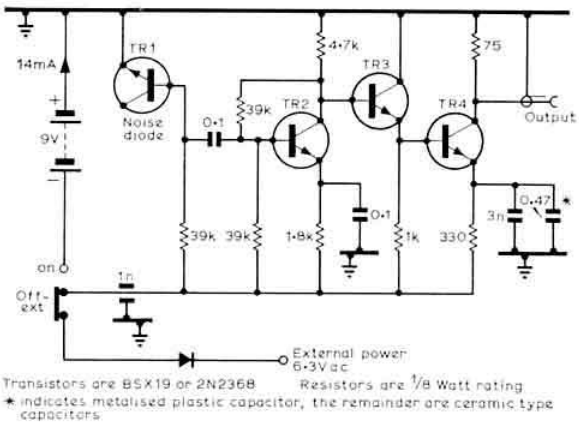


Fig 1. Noise generator

Several transistors should be tried for TR1 and the most noisy one used. Note that because the zener voltage is usually about 6 or 7V, the zener current and hence the noise output is very sensitive to battery voltage. A good battery is therefore necessary for stable output. Leads should be kept short to avoid resonances and the components can be mounted, complete with a PP3 battery, in a 2oz tobacco tin.

The on/off switch is arranged to provide the alternatives of external 12V dc supply via an "idiot diode", or 6·3V ac

*30 Ox Lane, Harpenden, Herts.

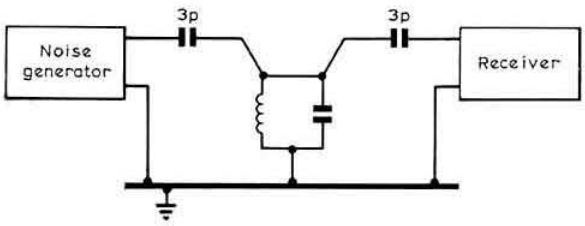


Fig 2. Test connections

operation. This latter modulates the noise output, making it easily distinguishable from other noise sources so that by using an attenuator, receiver sensitivities can be compared by seeing how small a signal gives an audible buzz.

Fig 2 shows one test set-up for Q measurement, though in many cases it is better to use an inductive coupling for either generator or receiver. If the loaded or in-circuit Q is to be determined, then it is often possible to use the in-circuit couplings. The −6dB point will be one or two S points below maximum (there seem to be two rival standards; if in doubt make a 6dB attenuator and use it with the noise

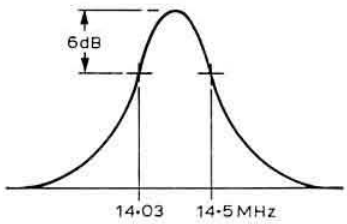


Fig 3. Typical response curve

generator to check). Then, assuming sufficiently narrow receiver bandwidth, the formula to use is

$$Q = 170 \div \text{(percentage bandwidth at } -6\text{dB)}$$

so that, for example, if the peak response is at 14·27MHz and the −6dB points are 14·03MHz and 14·50MHz as in Fig 3 then

$$Q = \frac{170 \times 14{\cdot}27}{100 \times 0{\cdot}47} = 51{\cdot}5$$

The author has been surprised by the Q values of coils that he wound, and he now pays much more attention to wire size, turn spacing, and the ratio of length to diameter—these factors are explained clearly in *Radio Designers Handbook* by F. Langford-Smith.

New catalogue

The sixth and latest edition of the catalogue from Arrow Electronics is now available. In its 45 pages there is a listing of the extensive range of components and other items available from this company. Among the new listings is the Mullard LP range of modules, and the complete Newmarket range is also available. The catalogue is obtainable from Arrow Electronics Ltd, 7 Coptfold Road, Brentwood, Essex, CM14 4BN.

THE OSCAR FILE

Oscar 7 launch

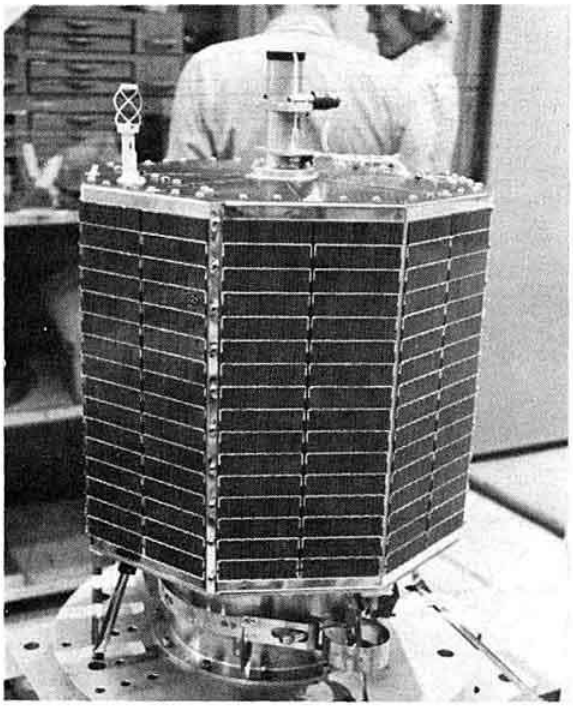
After delays due to faults in the launch vehicle, Oscar 7 was lifted off from the Western Test Range in California at 1711 on 15 November. The AMSAT net on 14,280kHz carried the launch proceedings to Europe and fortunately propagation conditions were above average on that evening. Carried on the launch vehicle with Oscar 7 were the NOAA4 weather satellite and the Spanish Intastat, and within a minute of the separation of Oscar 7 the telemetry on 435·1MHz was being heard in the UK. The first reported reception in Europe was at 1828·46 and the first report of reception from North America came from K7BBO at 1846·37gmt. A radio teleprinter link between K3IVO and PA0AA was in operation and on Orbit 4 data was relayed on 144MHz into the Washington area.

At the time of writing, the spacecraft systems appear to be functioning in accordance with expectations although some difficulty has been experienced in obtaining access to the 144/29MHz repeater. Excellent results are reported using the 432/144MHz repeater and W6ZVV has been worked from Europe. Telemetry on all three beacons using cw and rtty has been copied at good signal strengths.

Orbital data

During December and early January Oscar 7 will appear at a time roughly midway between the orbits of Oscar 6. The orbital period is 114·96min and the longitude increment for each revolution is 28·74°W. The angle of inclination is 101·7413°. When it has been observed that the orbit characteristics are completely stable it will be possible to issue long-term predictions as has been done with Oscar 6. In the meantime users should monitor the GB2RS news bulletins and the Oscar net on 3,780kHz on Sundays at 1015 for late news.

GB2SM in action during the successful launch of Oscar 7. Operated by Geoff Voller, G3JUL; Richard Limebear, G3RWL; and Kevin Lamb, G4BUW, it was integrated with the UK reporting team. During the first orbit telemetry signals were received by G3WPO and passed to GB2SM on 80m. *(A Science Museum photograph)*



Oscar 7 during vibration tests. The 2,304MHz quadrifilar aerial furnished by RCA can be seen at the top

Oscar 6

Launched in October 1972 the spacecraft continues in orbit and is extensively used by stations throughout the world. The existing schedule for European users is as yet unaltered and should be strictly adhered to if the life of the satellite is to be extended. Unfortunately many European stations are heard working through Oscar 6 at times other than the scheduled periods which are during south to north (local evening ascending node) passes on Mondays, Thursdays and Saturdays and north to south (local morning) passes on Sundays.

Information concerning the two Oscar satellites can be obtained from the quarterly AMSAT newsletter and from *Oscar News*. Information on joining AMSAT last appeared in the December issue of *Radio Communication* and an sae to Tony Bailey, G3WPO, 5 Erin Way, Burgess Hill, Sussex, will bring details of *Oscar News*.

Congratulations

Oscar 7 was the result of work extending over a four-year period with active participation from the USA, Germany and Australia. To the prime movers—Perry Klein, K3JTE, and AMSAT—and to all others concerned, a hearty thank you. □

MICROWAVES

by DAIN EVANS, G3RPE*

A long quad-Yagi for 1,296MHz

The development of Yagi aerials for 1,296MHz, such as the design given below and the G8AZM design given in this column in August 1971 and March 1974, represents a significant advance in practice. The most common aerial in current use consists of a focal-plane dish typically 4ft in diameter with a dipole/splashplate feed. This form of aerial is not only difficult to mount because of its weight and windage, but is also a not particularly efficient radiator. For a parabolic reflector to behave correctly, its diameter should preferably be at least 10λ, which is about 8ft at this frequency. Short focal-length dishes are in any case difficult to illuminate effectively.

A single aerial to the design shown in Figs 1 and 2 has a nominal gain of 22dB, which is equivalent to a well-illuminated 4ft dish. Four such aerials mounted together using a combiner such as described in December will be equivalent in gain to a dish 8ft in diameter, which represents a reasonable size of aerial for this band. A novel feature of the design is the use of quad elements rather than rod elements. These produce extra gain and, because of their lower Q, a greater bandwidth.

The construction of the aerial is quite straightforward, but the dimensions given must be closely adhered to: after all, a 0·1in error represents about one per cent of a wavelength, or 13MHz. In drilling the boom, for example, measurements of the position of the elements should be made from a single point by adding the appropriate lengths: if the individual gaps are marked out, then errors may accumulate to an excessive degree. Elements other than the radiator are made from flat aluminium strip, the two holes in which are drilled before bending with a spacing equal to the circumference specified in the figure.

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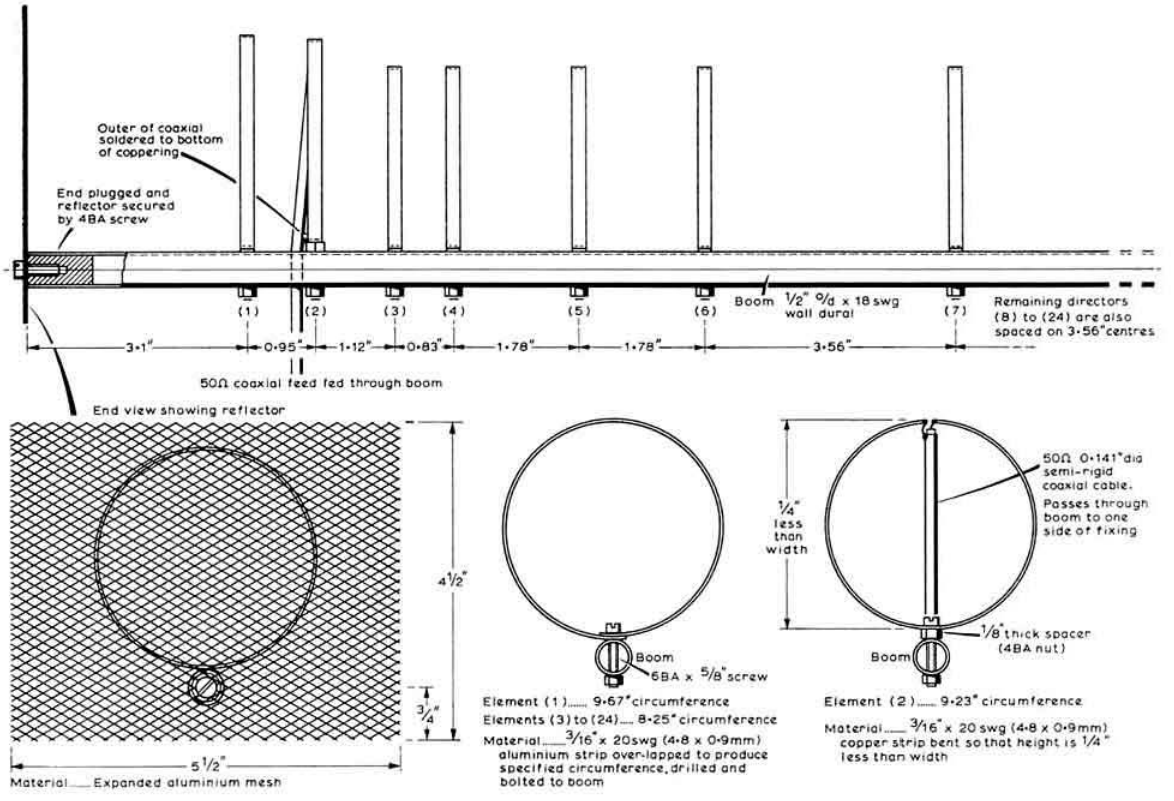

Fig 1. Construction details for a 1,296MHz quad-Yagi aerial

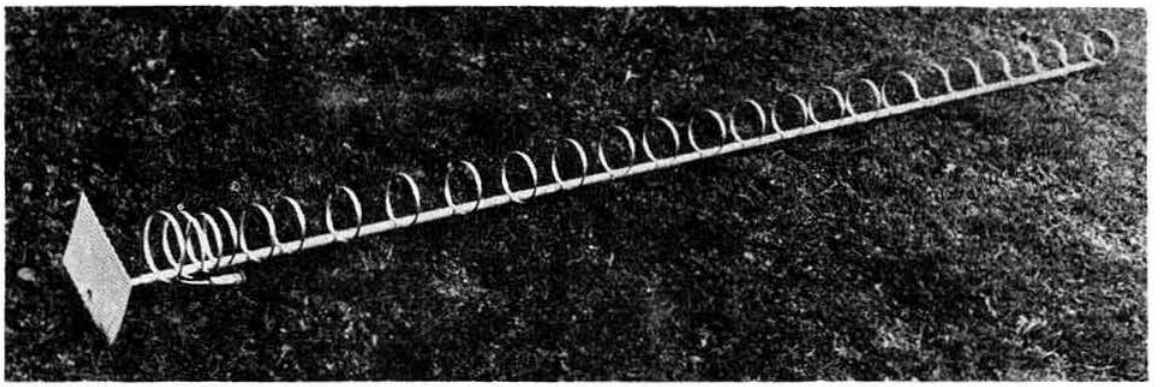

Fig 2. The completed quad-Yagi aerial

The radiator is made from copper strip which is bent into a flattened circle so that the width is ¼in greater than the height. Note that it is mounted on a spacer so that it has the same centre as the other elements. The 50Ω coaxial feeder has a copper outer and ptfe dielectric. The balun is formed by soldering the outer to the part of the radiator nearest the boom. It is important that the feeder passes through the boom: if taken to one side the gain may be significantly reduced. The copper radiator, and all screws and soldered joints, should be protected with polyurethane varnish after assembly, followed by a coat of paint on all surfaces.

Versions for 432MHz and 2,304MHz have been produced by accurately scaling *all* the dimensions given, and these aerials also perform well. The 1,296MHz version is available commercially from Hanwell Ltd, High Peak, Telegraph Lane, Four Marks, Alton, Hants.

Modifying Mullard trimmers to split-stator construction

by I. F. WHITE, G3SEK*

SPLIT-STATOR tuning capacitors are difficult to find in the physical and electrical sizes needed for the 432MHz band. This note describes a way of splitting the stator of a Mullard trimmer without breaking the ceramic or mangling the stator halves beyond hope of symmetrical reassembly. Fig 1 shows how the modification is carried out.

1. Cut off tag on stator and smooth off with a fine file.
2. Hold the trimmer horizontally in a vice. Grip the base nut, *not* the body.
3. Carefully file away the brass sleeve across A-A (Fig 1b). Keep the file horizontal. Do not file right through: stop when some ceramic begins to show through.
4. Turn over the trimmer and file across B-B. Make sure the file cuts are diametrically opposite. File right through the brass sleeve, which will slide off.
5. Part the two half-stators and clean off the sharp edges by rubbing on an oilstone. Grind the two halves to the same size.
6. Before reassembly solder on wire or (better) copper foil leads.
7. Reassemble using Cyanolit adhesive or Araldite. Make certain the two half-stators are the same distance up the ceramic tube.

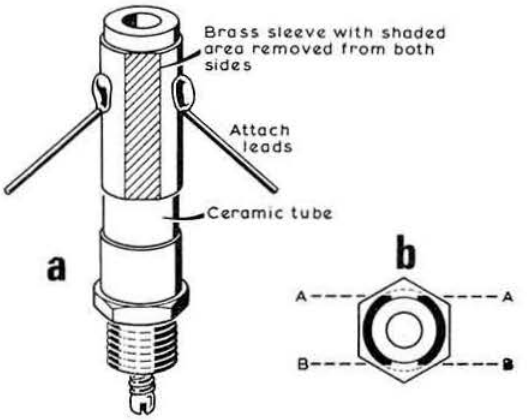

Fig 1. The modified trimmer

Cyanolit adhesive is available from Home Radio (Components) Ltd; it sets in seconds and very little is required.

Starting from an 18pF Mullard trimmer, the finished product has about the correct capacitance to tune QQVO2-6 grid and anode lines to 432MHz. In some layouts it may be necessary to reduce the capacitance by shortening the stators after step 5. The electrical balance to ground is very good if the stator halves are matched and reassembled with care.

The performance of these split-stator trimmers fully repays the effort of making them. And they remove one more excuse for not getting going on uhf!

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TECHNICAL TOPICS

by PAT HAWKER, G3VA

NEVILLE SHUTE, novelist and one of the designers of the airship R100 (the one that did not crash), once suggested that good engineering is to do for £1 what any damn fool could do for £10—or something very like that. At one time the radio amateur was extremely proud of his ability to get excellent results from equipment that cost him a fraction of what professional communicators would spend to do roughly the same job. And of course even today an amateur invests in factory equipment significantly less than what the professional would pay. But this is not quite what Neville Shute meant. For what the modern amateur often buys is simply relaxed performance characteristics and that is nobody's idea of "good engineering" though possibly good value for money.

What does seem to be gradually disappearing is the old urge to make something that works as well as the most costly professional equipment but at much lower cost; for instance by using circuits that are either novel or perhaps take more fiddling with or more operational skill. And that is a great pity since it meant that at one time the experimenter and the amateur led the field with *their* techniques and ideas, with *their* circuits being gradually snaffled by the pros, rather than the other way round.

For instance, the October *TT* included a novel third-method ssb generator developed by A. de Muijnkc along the lines of a unit described (but without a working circuit diagram) by A. J. Turner, G3UFP, in *Wireless World*. Readily available ic devices, no problems of low-tolerance, odd-value phasing-network components and, above all, no expensive ssb filter. Yet has there been a rush to build this generator? If there has then everyone has been keeping pretty quiet about it! But, as our first item indicates, at least Joe Cropper, G3BY, could not resist trying something new.

Low-cost digital ssb generator

Por now G3BY writes: "It is presently operational on 1·8MHz with the near addition of 3·5MHz and receiving good reports. Surely this should begin the end of rigs using expensive and almost unobtainable ssb filters. My filter rig is now obsolete anyway."

Well that, with the enthusiasm of the true experimenter, is perhaps putting it a bit strong. But there can be little doubt that this type of ssb generator, provided one does not want to generate directly at too high a frequency, clearly has a lot to offer—not least, low cost.

But let us see what G3BY has to say on any problems:

"First tested my 7473s and found that maximum frequency of operation was about 11MHz with nil at 12MHz; this agrees with G3UFP's figure of around 10MHz rather than the 20MHz suggested by A. de Muijnkc, but perhaps they make them better in Holland! This indicated some matching of the oscillator to the ttl device (who invented the ponderous terms 'interfacings' and 'fan out' when they mean loading?). G3UFP has noted that higher speed ICs could be used but it is clear that the standard 7473 should work well for 1·8MHz and provide a signal suitable for mixing to other bands.

"The use of TBA120s as balanced modulators is a stroke of genius. I thought this must be a mistake until I looked up the circuit in *Radio Communication* for September 1972. (The device is a consumer ic intended to provide a high-gain limiting i.f. amplifier followed by a balanced coincidence fm detector and making liberal use of long-tail pairs dc-connected—*G3VA*). They are already well balanced and the balancing pots are so non-critical that it suggests that the balance will hold well. A bonus point is that the audio and radio frequency carriers go through the limiter sections and any remaining ripple is removed. A stabilized supply is necessary as I found that varying the supply voltage from 5V to 5·1V shifted the null points on the balancing pots to near the limit of adjustment. The audio filter is almost crude but no inverted sideband is audible on the wanted sideband (there being no unwanted sideband as such with the third method).

"The necessity for a high input frequency, due to the divide-by-four accompaniment of digital phase shift, is a bit worrying at first, but in practice it comes down to top band handling and stability; covering 2MHz on the vfo gives 500kHz tuning, and drift is divided by four. An intriguing thought is that when the 'huff and puff' vfo control is installed the hold points will be spaced about 10Hz and hunting less than 3Hz!

"Note that in the circuit diagram (Fig 3, page 689 of the October 1974 issue) I feel there should be 4·7μF capacitors at pin 7 of each of the vfo TBA120s (as in the af units) otherwise the presets marked RV bias the input to cut-off and results will not be! Personally I found the presets unnecessary, in which case the diagram is correct as given. The whole unit draws about 80mA.

"In my case the output drives an EF50/EF55 amplifier to 15W average input direct from the balanced modulators; more output would be available if these devices were run on 9V but I prefer to leave it as it is. An amplifier/mixer for other bands would introduce less balancing difficulties than increasing the output.

"The limiter section of fm ICs such as the TBA120 would in fact seem a useful addition to oscillators generally, giving a more constant output and ripple reduction.

"All of which reminds me of the quote 'If you think there is still a place for valves, I've got news for you. Transistors are nearly out!' "

Certainly, Joe, the integrated circuits now available are very attractive but so are some of the discrete semiconductors, and, as we indicate later, so are valves. The real point is that the constructor has available a marvellous flexibility in the enormous range of active devices he is offered. Far better off in fact than for passive components of the types often needed for amateur equipment. That's life.

Electronic bias switching for linears

In *QST* (May 1974) J. A. Bryant, W4UX, comments on the advantages of electronic bias switching of rf amplifiers and shows how this can be done. Basically the idea of this

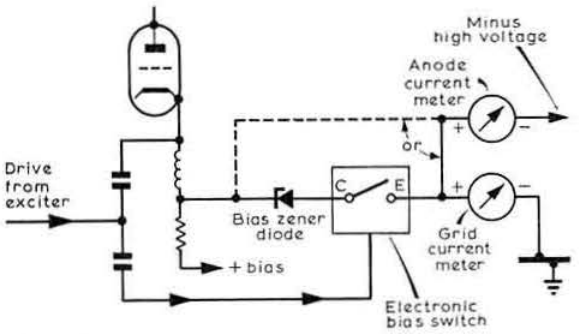


Fig 1. Basic arrangement of electronic bias switching as applied to a SB220 grounded-grid linear power amplifier

switching is to eliminate the quiescent or standing current of a linear amplifier so that there is true zero anode current in the absence of rf drive so that the amplifier appears to be working in Class B or Class C. Although in theory any Class B amplifier is biased to cut-off, in practice many linear amplifiers are in effect Class AB and dissipate quite large amounts of dc power when idling, resulting in the consumption of unnecessary power, reduction of valve life, generation of heat that may affect components and, of particular importance, the generation of wideband shot noise which, with some forms of t-r or other aerial switching can result in high received noise levels (for instance making cw break-in operation impossible).

W4UX provided a detailed account of how to apply full cut-off bias to an amplifier during those intervals when there is no drive; in his case the amplifier was a Heath SB220 linear and his system was adapted from the built-in electronic bias switching of the Alpha 77 linear. Richard Thurlow, G3WW, confirms that the W4UX arrangement does all that is claimed for it. While there are possibly not that many SB220 linears around there is very little reason why the same basic arrangement should not be applied to almost any grounded-grid power amplifier, and the same idea, if not the same circuit, could probably be applied to most amplifiers.

Fig 1 shows the basic principle, with an electronic switch that is closed whenever drive is applied, virtually short-circuiting the 120V bias supply, leaving the amplifier biased from the zener diode. The actual switching is effected by the collector-emitter junction of TR2: Fig 2. When rf drive is present from the exciter, a small portion is fed through C1 and R1 to the rectifier diodes, filtered by C2, and the resulting positive voltage is applied to the base of TR1, driving TR2 into saturation and virtually short-circuiting the additional bias. W4UX includes an arrangement which protects the transistors in the event of TR2 not switching on when drive is applied; this is a "crowbar" technique which places a short-circuit across C-E when a chosen voltage is reached, using a zener diode in conjunction with the 2N1596 silicon-controlled rectifier (thyristor). It should be appreciated that under normal operating conditions neither the scr nor the zener diode takes any part in the switching, but take the ebs out of circuit if the voltage across C-E rises above 75V. A degree of heat-sinking should be used on the scr. In fitting or adjusting the unit take full safety precautions, since lethal voltages are found in linear amplifiers. If it is intended to incorporate an ebs in the SB220 it is well worth consulting the original W4UX article since this gives a lot of additional information, but these notes should have given an idea of what electronic bias switching is all about and how it could be incorporated in a linear.

Conicals, discones and inverted ground-planes

Quite a long time ago we included in *TT* (and subsequently *ART*) details of a couple of broad-band biconical aerials, including the pretty massive units developed for the Royal Navy at ASWE. A related form of broadband vertical is the discone of which, at the time, we wrote: "Details of hf discones have been given in a number of amateur publications but have never proved very popular, one of the many problems being the "top hat" disc and the dimensions which in practice limit their use to 14MHz and above". One of the standard sources on amateur discones was the 14th (and possibly other) editions of *The Radio Handbook*; the aerial was first described by Kandoian (*Proc IRE*, February 1946).

So it was with some interest that recently we received two letters about this family of aerials. One, from David Ellenberg, WA2KWP, drew attention to the article by W5WEU in *CQ* (January 1966). In fact this design of conical monopole was reproduced in *TT* (May 1966) and in all recent editions of *ART*. WA2KWP feels that this approach "represents the logical ultimate extension of the concept of top loading of the folded umbrella aerial" (*TT* July 1974).

The other letter was from Michael O'Beirne, BRS33172, and brought to attention the recent article by Mike Wintzer, DJ4GA, in *QST* (October 1974) "Dipole passé?—some experiments on discone arrangements".

This new article outlines the problems of using dipoles and ground-planes particularly for temporary locations, saying of vertical monopole aerials: "The obvious goal is to move the current maximum upwards and at the same time eliminate

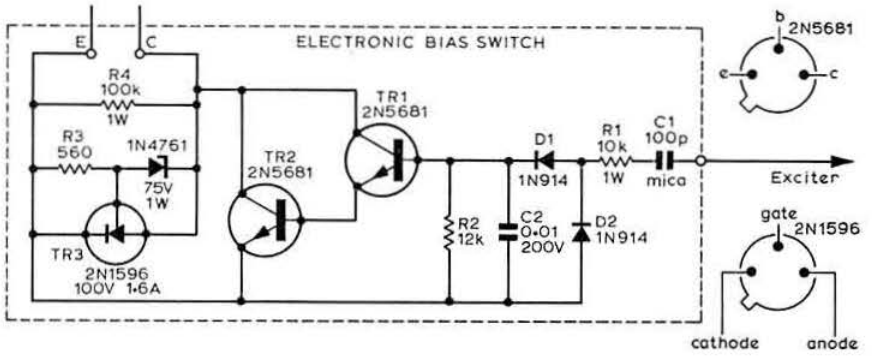


Fig 2. Circuit details of the electronic bias switch with "crowbar" protective circuit to reduce risk of destroying the basic switch formed by TR1 and TR2

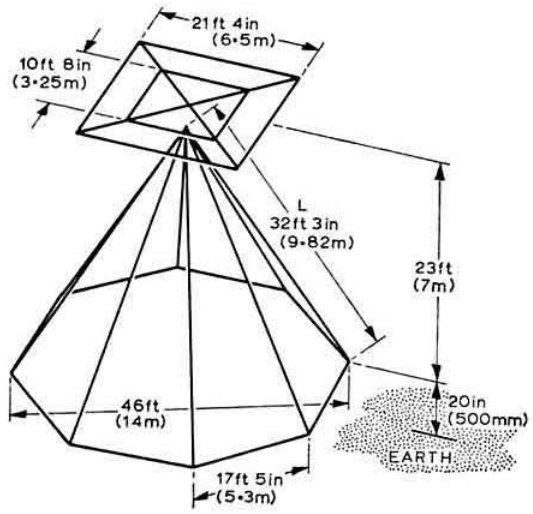


Fig 3. The simulated discone aerial investigated by DJ4GA for use between 7 and 29MHz

the necessity of a ground reference. It is also desirable to keep the magnitude of the vertical component of current high compared to any horizontal components. A first attempt in this direction would be to turn the ground plane upside down. While not very practical in most cases the principle is right!"

(This gives me an opportunity to do a little trumpet blowing in pointing out that the term "inverted ground plane" was used to describe a vertical-T aerial with two top radials used by G3VA and published in *TT*, July 1970. To the best of my knowledge this was the first advocacy in any amateur journal of this approach).

DJ4GA goes on to suggest that an aerial that satisfies these goals is the discone in which the top radials are in effect replaced by a disc (which may be simulated at hf by wires) and having a vertical radiator made broadband by the use of the conical principle of multiple wires gradually spreading out. He built a simulated discone using a "top cap" of wires about 6·5m square: Fig 3. However (to cut short the interesting description in the *QST* article) in his final form he eliminates the multiple wires and reduces the whole structure

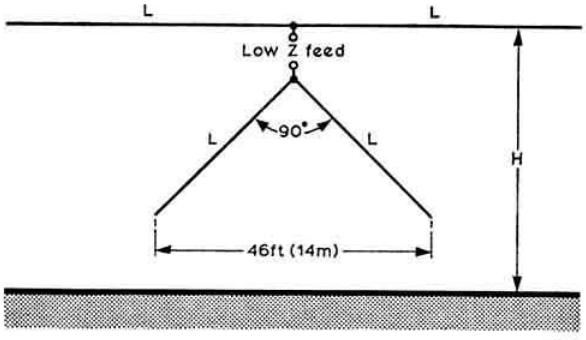


Fig 4. One version of the DJ4GA aerial as used on 7MHz. 2L is equal to 64ft 5in and all four wires are the same length L (32ft 2½in). The height H is 25ft 1in. Bandwidth for an swr of less than 2:1 was 550kHz

to two top radials (which may be in-line or at 90°) and two vertical wires: Fig 4. We are now back essentially to the G3VA vertical-T/inverted ground plane of 1970 except that the single vertical wire has been replaced by two sloping wires (and the aerial is top fed from coaxial rather than voltage-fed at the base) and this should improve bandwidth. Fig 4 shows a 7MHz version of which it is claimed that it produced significantly better results at dx and on ground-wave than a comparison dipole, but noticeably weaker signals on short skip. Altogether a very interesting aerial that can be constructed easily, though we would hesitate to call it a discone.

Low-cost mini-quad

A recent newsletter of the Association of Sheffield Amateur Radio Clubs includes details of a useful-looking quad-type 14MHz beam aerial which has the elements little more than half normal size: Fig 5. It is described by P. E. H. Day, G3PHO, who, as ZL2BDA, used one most successfully during 1966-68. It has been published in a number of journals, including most recently the Russian *Radio*.

Among the attractions are that it can quite easily be made by one person, is much less conspicuous than a full-size quad, has a performance at long-distances which is claimed to be distinctly better than verticals and dipoles and, indeed, as good as the 14MHz performance of most of the popular triband beams. On the other hand it is admitted that the

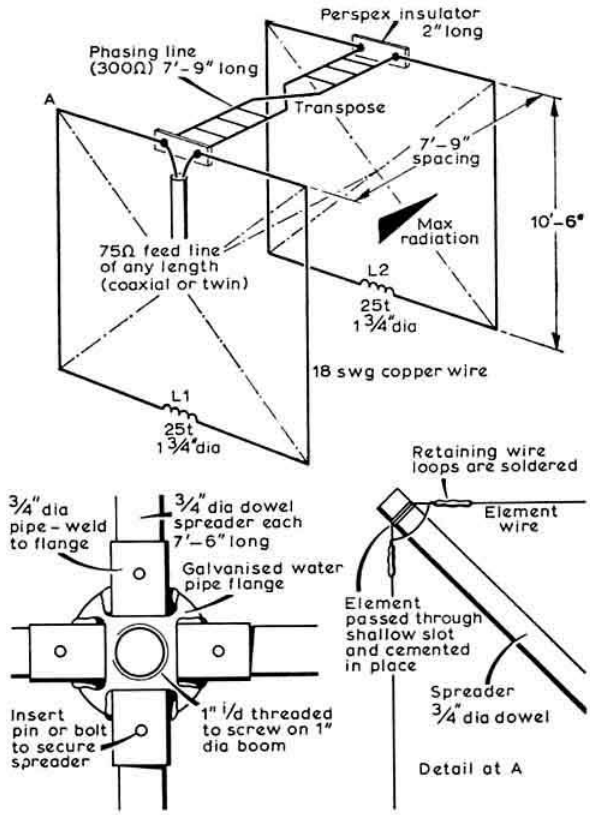


Fig 5. The mini-quad beam for 14MHz used by G3PHO/ ZL2BDA as described in the newsletter of the Association of Sheffield Amateur Radio Clubs

front-to-back ratio will be less than for a full-size quad (typically 18 to 20dB at low angles, less at higher angles). It should also be noted that as for all compromise and loaded aerials it is necessary to tune and adjust the aerial carefully for optimum performance.

The following constructional hints are taken from G3PHO's notes:

(1) Spider. Cross-arms and boom assembly should be as strong as possible and able to withstand high winds. But do not use metal arms, since metal in the field of the loops can cause undesirable effects.

(2) Loading coils can be wound on pvc tubing (from builders merchants) preferably threaded on a lathe for 12 tpi. After final adjustments spray them with Holts Dampstart to keep out moisture.

(3) Tuning with swr indicator and gdo. Connect 75Ω feedline to beam and erect aerial as high as possible consistent with easy access to the coils. Preen the coils until gdo indicates resonance at 14MHz for forward element and 14·250MHz for rear element without adding or removing turns, by using 3in lengths of ferrite rod dipped in Bostik and sliding the rods in until the correct resonances are achieved, then leave well alone until the glue sticks firmly.

Modifying the G3HBW vhf/uhf gdo

W. H. Bond, G3XGP, considers that one of the best gdo designs for vhf/uhf is the G3HBW calitron unit described in *Radio Communication* (September 1970) but that inevitably one tends to look for possible ways of improving the design to meet particular requirements. His only criticisms of the original design were what he regarded as needless insensitivity, the lack of a modulator and that construction was in the form of tag board rather than printed circuit board form. G3XGP has overcome all these points and while not claiming that the result is a better device it meets his own needs and the modifications could well be of interest to others. He writes:

"Increased sensitivity as a wavemeter is easily met by substituting a 100μA meter for the 1mA meter and putting a 1–5kΩ potentiometer across the meter as an external sensitivity adjustment.

"A suitable printed circuit board fitting right on top of the capacitor is outlined in Fig 6 and has been found to work to the maximum frequencies suggested by A. L. Mynett.

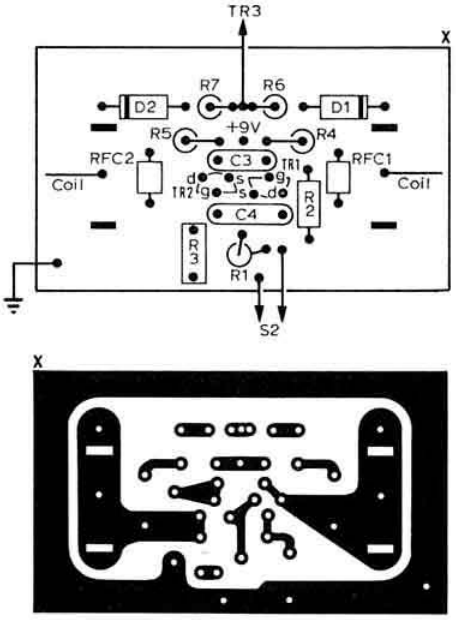


Fig 6. Printed circuit board designed by G3XGP for the G3HBW vhf/uhf grid dip oscillator

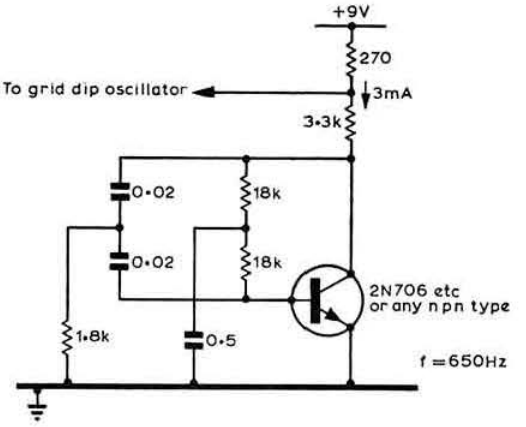


Fig 7. Twin-T audio oscillator used as modulator by G3XGP

"The provision of a modulator is easy and well worth the trouble as it allows one to recognize the signal easily when playing about with receivers and converters. The suggested circuit of Fig 7 is based on the double-T oscillator shown in the *ARRL VHF Handbook*. By the inclusion of a 270Ω resistor in a common line to both modulator and gdo about 30 per cent modulation is achieved with a useful amount of frequency modulation. While the waveform looks terrible on a 'scope it is nevertheless extremely useful in practice."

Solid-state progress

Although the thermionic valve remains a cheap, effective and in many ways very attractive means of generating or amplifying substantial rf power (and for providing good dynamic range in hf receivers) the all-solid-state amateur station of medium power is today not only feasible but is beginning to make an impact in the market place. A good illustration of this trend are the preliminary announcements in the American journals of the Heathkit SB104, a transceiver for 3·5 to 29·7MHz with 100W p.e.p. output on ssb (100W cw), six-figure digital frequency readout, broadband operation that is claimed to allow you to go from 3,500kHz cw to usb on 29·7MHz in 10s with no preselector, load or tune controls to worry about. The adverts claim the receiver is designed for minimum inter- and cross-modulation but give no indication of how this is done with broadband circuitry other than saying that active devices are kept to a minimum ahead of the highly selective crystal filter. Altogether 31 integrated circuits, 75 transistors and 171 diodes are used. With 2,800 parts it represents quite a challenge for kit builders. The only valve in sight is the 8873 triode in the associated 1kW linear. It will be interesting to see how the equipment works out in practice.

Up at the other end of the spectrum recent developments

in rf power transistors include a Motorola device (MRF306) that can give 60W output at uhf, the RCA 2023-12 with a minimum output of 12·5W and 7dB gain at 2 to 2·3GHz (but at a price of $238) and Hewlett-Packard impatt diodes providing up to 2·5W output at 10 to 14GHz.

Microwave power FETs using gallium arsenide (GaAs) are also under development. A recent article in *RCA Engineering* (June/July 1974) indicates that above 4GHz these GaAs FETs are proving superior to bipolars. A 0·8W output at 4GHz has been achieved and a two-stage amplifier for 4·5 to 6·5GHz provides 60mW output with a gain of about 16dB. Within the next one or two years bipolar Class A amplifiers with 3W output are expected to reach 4GHz with GaAs FETs approaching the 1W level at 10GHz. But these state-of-the-art devices cannot be expected to come cheaply to begin with.

Aerial miscellany

Writing from North Ryde, New South Wales, Denzil Roden, VK2BXF/G3KXF, raises some interesting points in connection with W2DU's check list on swr (*TT* June 1974) as he feels that some of these, while all true, can confuse newcomers. For instance where power is radiated from feeders it may be wasted by absorption by buildings or the ground, and such radiation can affect the directional properties of beams (but does an open wire feeder with a high swr lose power in this way to nearby objects or not?).

While he agrees that efforts to reduce swr below 2:1 on any coaxial line generally represents wasted effort from the viewpoint of increasing the radiation from the aerial, there are an increasing number of transistor output stages which have to be derated by about 3dB at this swr and should provide full power output only to an swr approaching unity.

Generally VK2BXF feels that too many amateurs (and professionals) are willing to spend much money on good transmitters and receivers while largely disregarding the inefficiency of aerials, insisting on trying and re-trying types that have been fully documented virtually since radio began, or using compromise aerials intended as a solution to space and cost limitations where these restrictions do not really apply. He writes:

"Wide-band aerials are often used where only two channels spaced less than 100kHz are used; yet such aerials require expensive heavy-duty supports and cannot easily be adjusted. In such circumstances a simple single-wire dipole would win hands down. I think that wideband aerials only have applications with the military and should be avoided where possible otherwise.

"I have come across commercial transmitters churning out 10kW via coaxial into balun-fed aerials with good swr and no indication that the aerial had collapsed and was draped across other radiators. It only goes to prove 100W erp is probably enough for a 2,000-mile path! And if one were cynical one might wonder why commercial baluns have large cooling fins!

"These are greatly over-rated for transmitting purposes and usually offer no improvement in radiation efficiency. The most they do is to cause dipoles etc to fire at right angles to the run of the wire and in practice this makes only marginal improvement. Commercial baluns often exhibit high losses at certain frequencies within the span of frequencies advertised as flat. A great awakening is taking place as users begin to look for the most efficient aerial for a particular situation."

Minimizing cross-over distortion

It has long been recognized that one of the major defects in transistorized receivers and af amplifiers is the cross-over distortion in power amplifier stages. Cross-over distortion is the particularly objectionable type of distortion that arises when the two halves of the output waveform delivered by a push-pull type of circuit do not accurately fit together at the cross-over points due to the bias conditions for the two devices not being accurately matched.

In early transistor portable receivers it was very often the increasing onset of cross-over distortion with reducing battery voltage that determined when the battery had to be discarded. More modern designs usually incorporate any one of a number of compensating arrangements that allow the unit to be used over a wider range of battery voltages and ambient temperatures.

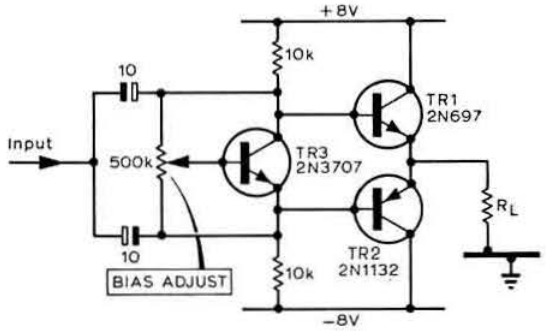


Fig 8. Cross-over distortion regulator. The bias-adjusting potentiometer permits exact setting of the stage's bias point, and the transistor voltage regulator (TR3) also automatically compensates for varying temperature

A new technique for doing this more precisely is described by Dale Hileman in *Electronics* (28 November 1974). He uses a bipolar transistor as a simple voltage regulator in conjunction with a potentiometer that sets the bias point of the stage accurately. In Fig 8, TR1 and TR2 are the usual complementary-pair power amplifier, with TR3 forming the bias regulator. The input to the stage is applied through the two coupling capacitors, and the collector-emitter voltage of TR3 is set by the potentiometer, to provide optimum base bias for TR1 and TR2. If the circuit's operating temperature varies, TR3 automatically adjusts the bias voltage to compensate TR1 and TR2.

Propagation on medium frequencies

Those who are striving after 1·8MHz long-distance this season are likely to be interested in several of the points made about mf propagation in a survey article by P. Knight in *BBC Engineering* (August 1974).

For example, it is noted that day-to-day variations of signal strengths at the same time after sunset can be about 7 to 11dB higher on about 10 per cent of nights than the median value based on 50 per cent of nights. Again, field strengths at mf decrease by about $R_d \times 10^{-5}$ decibels where R is the sunspot number and d is the path length in kilometres (ie this quantifies inversely the degree of improvement that can be expected on mf during sunspot minimum periods). It is stated that in North America there is greater variation than this; in tropical regions often less.

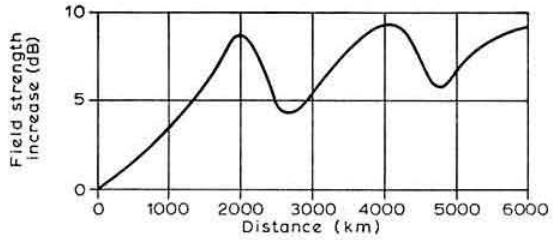


Fig 9. Showing the effect on mf of replacing land at the transmitting or receiving sites by sea (*Knight*)

The effect on field strength of living near the sea (ie obtaining the benefit of nature's best earth system) can be appreciable: about 8dB improvement over a 2,000km path, or 16dB if both transmitter and receiver are located on the coast; this decreases to about 4·5dB (9dB) at 2,700km but then steadily increases, reaching 10dB (20dB) for paths over 4,000km (Fig 9). Assuming a 5° take off it can be calculated that the benefit falls off quite rapidly more than 5km from the coast, until at about 25km one is significantly worse off than well inland (Fig 10).

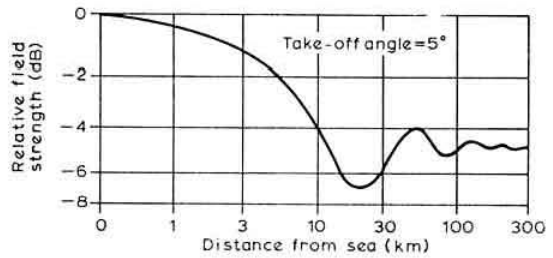


Fig 10. Variation of field strength with distance of site from sea (*Knight*)

Factors such as polarization coupling losses and ionospheric loss tend to be greater on east-west paths than on north-south paths, but these losses are much less important above than below about 1·5MHz.

Microphones and speech processing

Harry Leeming, G3LLL, is anxious to clear up one or two possible misunderstandings in the previous comments on suitable microphones for use with rf clipping (*TT* August and November 1974). In reply to the point made by G8ENN on external or built-in rising audio response, G3LLL writes:

"I am sorry if I have given the impression that it is necessary to buy a Shure 444 (or alternatively a Datong clipper) in order to obtain a rising af response. By using a suitable value of capacitor in series with the output of the microphone any microphone can be given a rising response with any clipper. But this does not automatically turn any microphone into a 'decent microphone'.

"Whatever the theoretical arguments, clipping *does* seem to amplify the defects of some kinds of microphones. In tests I have made I have come across several instances where stations just could not copy me with the original FT101 microphone but could copy Q4-5 when I used either the 444 or (a very good second best) an 85p Acos crystal insert.

"Where clarity of speech in adverse conditions is important—as opposed just to apparent loudness of the signal—I still feel that the correct choice of microphone is extremely important. This is irrespective of whether clipping is used or not, but seems to become even more important when clipping is used.

"Having been slightly disheartened by the results some stations have obtained with the G3LLL rf clipper, just because they will not take advice to change the microphone, my firm (Holdings Photo Audio Centre) has even decided for a limited period to 'throw-in' a free 444 microphone, as we hope that, by doing this, other stations will hear how good results can be, and get the message!"

G3LLL also points out that the FT101 for which his rf clipper is designed has an input impedance of 50kΩ, so that if an Acos insert is used with the Datong clipper it should be loaded with a resistor of this value to give the correct response.

I remember many years ago Reg Hammans, G2IG, pointing out at an RSGB lecture that the basic voice characteristics of different speakers had an important effect on ssb intelligibility, some voices being naturally processed to provide appreciably more talk power than others. In broadcasting it has long been recognized that a major problem is to provide programme meters with characteristics that would allow them to indicate accurately the subjective loudness of different programme sources. Many listeners still complain at what they regard as the wrong balance between speech and music without realizing that the "correct" balance depends on many, perhaps unexpected, factors.

These include age of listener (need one say that young people have a preference towards louder music in respect of speech than older people); type of music; language; people in cities tend to be less critical of balance than rural inhabitants; and ambient noise (for car radios the correct balance between music and speech can usually be re-established only by amplifying speech an extra 6dB). A good deal of interesting research on these lines has been carried out by the Finnish Broadcasting Company which proposed, at the 1972 International Broadcasting Convention, a cunning system in which additional information would be transmitted as a pilot to adjust the dynamic range of the receiver to suit the type of programme material being transmitted.

For all these reasons we suspect that G3LLL's views on the microphone playing a significant role are correct; possibly more uncertain is whether any single type would ideally fit the basic voice characteristics of different operators. It is easier to change your microphone than to change your voice!

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.

Building blocks for the novice

by SVEN WEBER, G8ACC

Diodes, diodes and diodes — and some experiments with them (Part 10)

Diodes and demodulation (1)

The purpose of a demodulator is to restore the original modulation frequency. If the carrier is present in the received signal, the modulation can be recovered by rectifying the complete signal. As was stated in Part 9, the form of an a.m. wave is that both positive and negative carrier half-cycles are impressed with the modulating voltage, and one can consider that the two halves of the modulating voltage balance each other out as far as recovering this voltage is concerned. But simple rectification to make the wave unbalanced and filtering off the carrier component is enough to restore the original. This can be done by *any* rectifier circuit mentioned in Parts 3 and 4, provided that the capacitor input filter after the diode(s) with the load in mind has a time constant much smaller than the time for one cycle of the highest modulation frequency, and much larger than the time for one cycle of the carrier frequency.

To get a minimum of distortion from the detector, the input voltage should be as high as practicable, the load should be much higher than the diode forward resistance (see Part 8) and the ratio of ac and dc loads should approach unity. Thus in Fig 70 the final load R2 should be as big in proportion to R1 as possible ($\times$ 10 at least), otherwise the

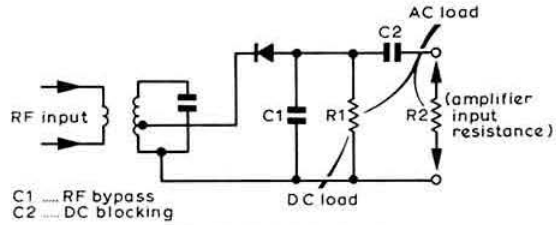


Fig 70. Simple detector

ac load (R2 in parallel with R1 through C2) would make the diode current swing more widely around its centre point when the input is modulated. If the modulation approaches 100 per cent it will clip the negative peaks and introduce distortion. To get a reasonable selectivity or Q from the tuned circuit the diode should be tapped down fairly near the earthy end (see Part 8) and doing this makes the previous requirements all the more necessary.

Sometimes the diode is slightly forward biased to reduce its voltage drop, which makes the circuit somewhat more sensitive. Occasionally the biasing is such as to bring the normal operating point on to the upper (almost square law) part of the E/I curve. There would still be rectification because the curve is not linear, but the efficiency would be considerably less. Distortion would generally be more (mostly 2nd harmonic) but the loading on the tuned circuit would be less. Again notice the difference between the standard "detector" which switches, and the biased type which operates on the non-linear part of the curve. To make this plainer, take Fig 8 and add on the load resistance (say, 10kΩ). The section of the curve where the diode swings into full conduction from a negligible value is far more compressed (Fig 71).

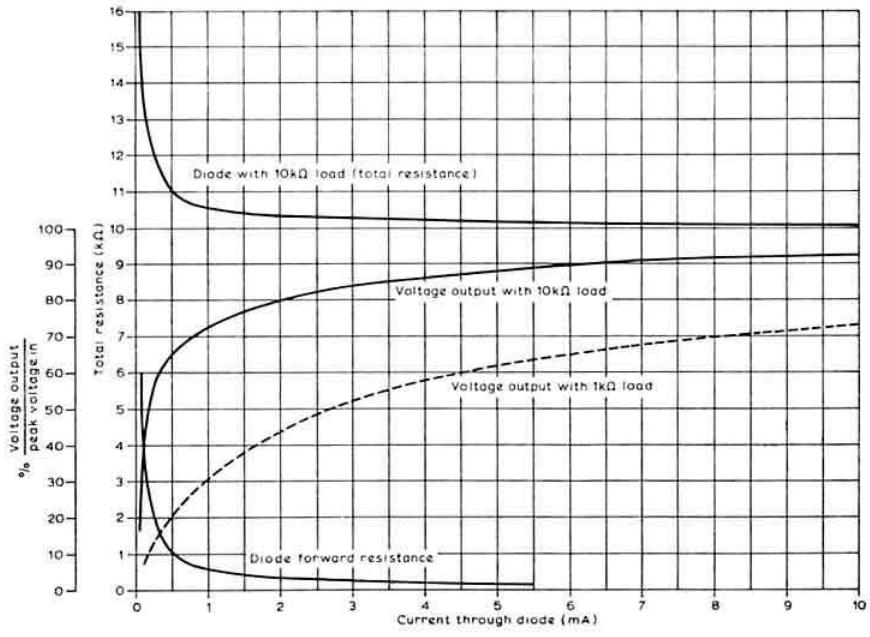


Fig 71. Diode efficiency with 10kΩ load

To illustrate these points, two circuits are given in Figs 72 and 73. In Fig 72 the diode circuit loads the tuned circuit very heavily and unless R1 were of the order of 500Ω, which would make the loading ridiculous, the distortion caused by the transistor input resistance in parallel with R2 and R3 would be quite considerable and, more likely than not, the amplifier would overload. In the second circuit,

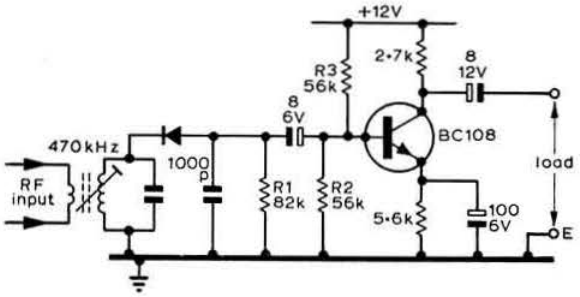


Fig 72. Badly designed detector: ac and dc loads very different

which is given in three forms (Fig 73), the diode is tapped down the tuned circuit and it is slightly forward biased. The ac loading is kept to a minimum by high values of amplifier input resistance (ie (*a*) common collector, (*b*) fet common source and (*c*) series resistance respectively).

SSB (and cw) detection. If the carrier is not present in the transmission, it has to be reinserted in the receiver and then the whole has to be detected. This can be done with an ordinary single diode detector which has a local oscillator feeding it (bfo) as well as the desired signal. But if both sidebands are present, the new carrier has to be exactly at the right frequency and phase between them. This is almost impossible to achieve except with a signal that radiates as a weak carrier and a local oscillator that is actually locked on to that original carrier. With single sideband there is no restriction of this kind and the new carrier can be anything up to 50 to 100Hz away from the original without making things unintelligible. A balanced modulator (or balanced "product detector") is the most efficient way of detecting ssb signals, and a bridge-ring more so: $f_{c+m} \bmod f_c \rightarrow f_{2c+m} + f_m$. Therefore, the circuits given in Figs 66–69 are just as suitable for receivers as transmitters.

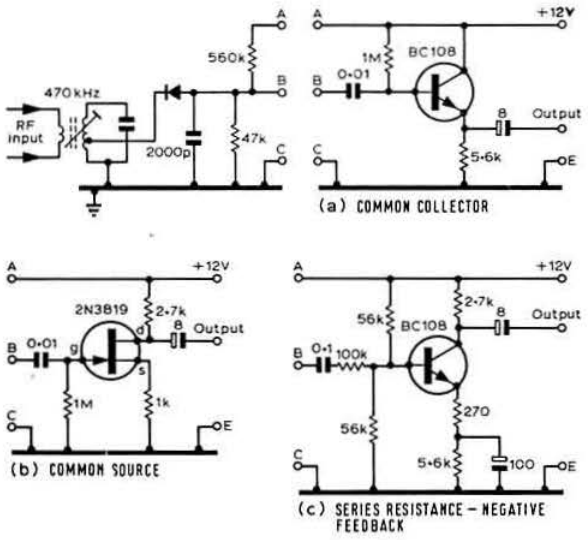


Fig 73. Three versions of load for detector: (a) common collector with BC108 transistor; (b) common source with fet; (c) series resistance and negative feedback

Fig 74. Square wave type of rectified output current from diode. Consists mainly of odd harmonics

The same applies to mixers (ie "translating" the main frequency to some other part of the rf spectrum) in both transmitters and receivers. Although simple diodes do the job well enough, the spurious outputs often give trouble and a balanced or double balanced (ring) modulator frequently give the best results: $f_{c+m} \bmod f_{Lo} \rightarrow f_{Lo+c+m} + f_{Lo-(c+m)}$. ($f_{Lo}$ is the local oscillator in a superhet receiver or mixer oscillator in a transmitter). Similarly with an a.m. transmission.

Harmonic generation and frequency multiplying. Most diode E/I characteristics follow an exponential law, and passing a large sine wave current through such a diode will generate many harmonics, even if the diode is never switched off by the input signal due to its being forward biased. If the diode is operated so that the input signal is cut off for any length of time, the output current would very largely be a type of square wave (Fig 74) and this type of wave consists of all the *odd* harmonic frequencies decreasing in a 1/n ratio. So a very simple odd harmonic generator could be made as in Fig 75.

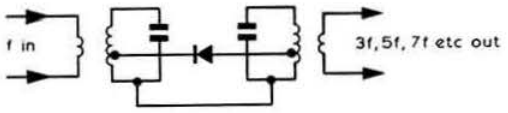


Fig 75. Odd harmonic generator

A full-wave diode circuit would give an output of twice the number of pulses per input cycle, therefore a frequency doubler (and the odd harmonic ratios of this frequency (sextupler, decupler etc)) could be made simply with this kind of circuit (similar in essence to the "push-push" doubler with valves and transistors). Of course, in all these circuits there is quite a considerable loss from input to output, but this may not be such an important factor when

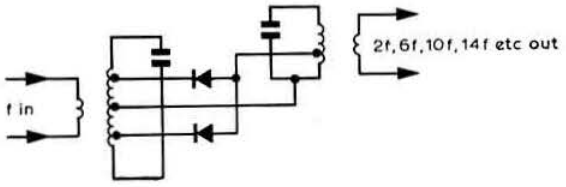


Fig 76. Full wave harmonic generator: harmonics are twice the odd harmonics

multiplying up a local oscillator in a uhf receiver. For example in Fig 76, arranged to give an output of 10 times the input frequency, there would be a loss of at least 20dB. With a variable capacitance diode or step diode there would be far less loss, but consideration of these will have to wait until later. With ordinary diodes, a ring mixer may also be used to multiply frequency by two by inserting the same carrier at both inputs with a 90° phase change.

(To be continued)

THE MONTH ON THE AIR

by JOHN ALLAWAY, G3FKM*

THE first *MOTA* of the new year seems to be the right place to remind readers of their responsibilities to their fellow amateurs in the matter of band planning. Old hands are fully familiar with the **Region 1 Band Plan,** but some newer licensees (and a very few of the older ones) may wish to be reminded of how it works. Although all band plans in this country are purely voluntary your scribe feels that they should be followed strictly so that we obtain the best use of our frequencies. They are as follows:

3,500-3,600kHz, telegraphy only.
3,600-3,800kHz, telegraphy and telephony.
7,000-7,040kHz, telegraphy only.
7,040-7,100kHz, telegraphy and telephony.
14,000-14,100kHz, telegraphy only.
14,090kHz, rtty.
14,100-14,350kHz, telegraphy and telephony.
21,000-21,150kHz, telegraphy only.
21,150-21,450kHz, telegraphy and telephony.
28,000-28,200kHz, telegraphy only.
28,200-29,700kHz, telegraphy and telephony.

On the 80m band it is *recommended* that 3,500-3,510kHz and 3,790-3,800kHz are reserved for intercontinental contacts when the band is open for dx working.

It has been noted by the Intruder Watch that a regular "net" is taking place on 14,320kHz, the participants in which appear to include a number of Arabic speaking stations, including HZ1HZ which seems to be being used by many different operators. Diplomatic traffic is being handled. There also seems to be an Iraqi diplomatic net in the cw section of 14MHz. The writer is interested in the position of BBC stations broadcasting to Region 2 on frequencies between 7,100 and 7,300kHz.

G3UML (and many more readers) would be grateful for any information on how to obtain a QSL card from AC3PT. Many direct requests accompanied by a surfeit of IRCs have failed to elicit any response.

Low power dx tests

A series of transatlantic QRP dx tests will be held on each Saturday and Sunday during February and March 1975. Times will be 1130-1230 and 1600-1700 using frequencies between 14,060 and 14,065kHz. DX stations (ie W/VEs) will call CQ DX QRP during the first five minutes, European stations will call during the second five minutes, and so on. Good USA participation has been promised. Reports of contacts and stations heard would be appreciated by G8PG, 37 Pickerill Road, Greasby, Wirral, Merseyside. For the purposes of these tests QRP is taken as 10W input or less, and it is pointed out that if conditions are reasonably good only 2W can produce good contact.

G3RJV (61 Park St, Cleethorpes, South Humberside) is in the process of organizing a club for QRP operators in the UK. A number of enquiries have already been received and G2NJ has offered to present a trophy for annual award. Intending members are invited to contact G3RJV.

News from overseas

In a letter dated 3 November 1974, Geoff Smith, G4AJJ (ex-3B8DQ), writing from San'a in the Yemen Arab Republic, pointed out that he would be on the air as 4W1GS for six weeks, and that after Christmas he would be in Oman (United Arab Emirates) for two months, and then the Seychelles Is. Activity would be mainly on 14 and 21MHz. QSL requests should be sent to the address in *QTH Corner* accompanied by three IRCs.

Brian Rous, G3RHL, is at present in New Zealand using the callsign ZL1ACX, and would like to wish all his UK friends a happy 1975. He will be returning to England in March.

In a letter much delayed by the French postal strike, John Wright, F0BJO/G3VPW/VP8KF, says that he left the Falkland Is on 13 May 1974 after six years on the air during which he made over 8,000 contacts. The summer was spent working at the Appleton Laboratory, Slough, and on 9 September he moved to his present location about three miles east of the Andorra/France frontier and 2,350m asl. Here he is using his FT101 and 18AVT/WB powered by a dc power unit and a generator. John wishes it to be known that he was not in the South Sandwich islands last March and that his callsign was pirated at that time; he would also like to apologise for the delay in supplying VP8KF QSLs which he will not be able to send out until he returns to Nottingham in June.

Andy, G3XAR/F0MQ/VP2GAM, is now active from the Sultanate of Oman. He has an NCX5 and Hy-Gain 18AVT and is looking for UK contacts on 14MHz. His callsign is A4XFU, and QSLs (as for his other callsigns) should be sent via G3OKA. He wishes to send regards to all friends.

DX news

It is rumoured that 3Y3CC and 3Y5DQ will be on the air from Ellsworth Land (80° S, 83° W) until late in January, and that their favoured frequencies will be 14,040, 14,140 and 14,340kHz.

A list of USSR Antarctic base stations was recently published in *DX News Sheet* and identifies the location and ITU zones of stations using the prefix 4K. It is as follows: 4K1A Molodezknaya (69), 4K1B Mirny (69), 4K1C Vostock (70), 4K1D Novolazorenskaya (67), 4K1E Komsomolskaya (69), 4K1F Bellingshausen (73), 4K1G Leningradskaya (?) and 4K1H Russkaye (?). Contacts with each count as 10 points towards the RAEM Award. In the same area VK0MX has been heard from Casey (70) and he has asked for QSLs to be sent via VK5TY.

VP8OA was formerly ZD8RR and is located in Stanley, Falkland Is. He is in charge of communications with the

* 10 Knightlow Road, Birmingham B17 8QB

Jim Sayer, VP9BY, this year's President of the Radio Society of Bermuda, uses this impressive array of equipment from his home on that beautiful island

Antarctic bases and expects to be starting a six months round trip of the area in February. He has a TA33Jr beam and has been heard on 14,300 and 21,315kHz ssb.

OE5CA/YK was expected to relieve OE2EM/YK and to be active from Syria for six months on all bands but with a preference for 14,295kHz. VE3CUD/SU is newly on the air from Egypt and will be in the area for six months.

It seems that "3A2GX" who has been on the bands since June was in fact in France and not in Monaco. He had made 800 contacts in the CQ WW DX phone contest when his station was closed down by the authorities (at 1800 on 26 October). His logs were confiscated and the fact that his QSL cards were invalid for DXCC has been noted by ARRL.

ON4AXA/MM was the callsign of a raft occupied by two Belgians and one Moroccan who left CN8 on 26 October in an attempt to drift across the Atlantic. They hoped to reach Trinidad by 1 January.

ZL3OG/C, who was located on Chatham Is, was due to return to New Zealand in December. Readers who know George Studd, ZL2AFZ, (who also operated from the island in 1969) will be sorry to learn that he was involved in a motor car accident in November and may be in hospital until early in 1975.

The Society for Preservation of Ancient Monuments whose headquarters is in Seattle anticipates organizing five 15-day expeditions to Easter Is during 1975. It is hoped that some amateur radio activity may result.

DJ4RT was expecting to be on the air as FH0RX, FR7IG, and also from Kenya during the period 12 December to 10 January.

Top band news

9L1JT was planning to operate from a 2,000ft mountain peak overlooking Freetown Bay during the Christmas period and the 22 December dx test. According to *DX News Sheet*, EP2BQ contacted ST2AY on 14 November for a new 160m first, and has also heard K8KAS at 0245. ST2AY worked K1PBW during the CQ WW DX Contest and this is another band record. 4X4NJ will be active during contests using his R4C/T4XC combination. DJ6QT will be back in Madeira for the CQ 160m contest this month and will sign as DJ6QT/CT3.

A reminder of the transatlantic first timer's tests on 12 January and 9 February—full details appeared in November 1974 *MOTA*. In connection with this and all other dx activities on 160m it must be remembered that **all** interference to other band users must be avoided. **While transmitting in the "dx window" and listening at the low end of the band it is most important to check the transmitting frequency at all times.**

ST2AY transmits on 1,827·5kHz at 2310 on Thursdays, and at 0010, 0110 and 0210 on Fridays. He will listen in the 1,800-1,808kHz section of the band for replies.

A radiotelegram has been received from G3WVZ, who is radio officer on board the Norwegian tanker *Sylvania*, in which he reports reception of G3RVM, GM3OLK, OL5AQC and 9H1BX all at RST 569 between 2300 and 2400 on 9 November while anchored at Rastanura in the Arabian Gulf. He also heard G3UBR at RST 459 and some OK stations at strengths up to RST 599.

Contests

The CQ WW DX 160 Contest

2200 24 January to 1600 26 January.

CW only. Exchange RST and serial QSO number from 001. USA and Canadian stations also denote their state or province. Each contact with own country counts two points, with other countries five points, and with Canada and the USA 10 points. The multiplier is the total number of DXCC countries, USA states, and Canadian provinces contacted. Note that a contact with W or VE cannot be counted both as a country and state/province multiplier. Log sheets are available from: CQ 160 Contest, 14 Vanderventer Av, Port Washington, LI, NY, 11050, USA, in exchange for a large envelope and IRCs. Logs must be posted to this address no later than 28 February.

In the **1974 CQ WW DX 160 Contest,** British scores were as follows:

GC3SVK (single operator)	31,556	points
G4BUE ,,	10,353	,,
GM3UPK ,,	8,968	,,
G3VDW ,,	2,502	,,
G4BXN ,,	1,801	,,
GM3IGW/A (multi-operator)	38,412	,,
GW3UCB/P ,,	37,422	,,
G3XEP ,,	11,970	,,
G3KMI ,,	11,400	,,
G4BUX ,,	8,160	,,
GM3YOR ,,	7,371	,,
G3GJL ,,	4,764	,,
G3YDD/A ,,	2,943	,,
G3IRS ,,	1,414	,,

The 3·5MHz YU-DX Contest

2100 11 January to 2100 12 January.

Exchange RST and serial QSO number (from 001). Contacts between stations in same country count one point, with other countries in same continent two points, and other continents five. Contacts with YU count 10 points. The multiplier is the number of DXCC countries (including own) and different YU prefixes worked. Entries may be single or multi-operator, and certificates will be sent to the scorers in each country with second and third place certificates if justified. Include summary sheet and usual declaration, and in log show date, time, station worked, numbers sent and

A group of visitors to the AGM of the Bermuda Radio Society on 16 October 1974 at the Sherwoods Hotel, Hamilton. Standing (l to r): WA2AMU and xyl, W1NU and xyl, G3HCT's xyl, G3ZGR, G3LN's xyl, VE3RO, G4BKI, K3LGC, K1RQE's xyl, VE3TB, G3BLH's xyl, G3BLH, VE3BD's xyl, and VE3BD. Sitting: G3HCT, G3LNS, VE3CJ, K1RQE and W1BGD

received, if multiplier, and points claimed. Post before 15 March to YU-DX Club SRJ, PO Box 48, 11001 Belgrade, Yugoslavia.

The DL QRP CW Contest

1800 11 January to 1500 12 January.

Input 10W or less, 1·8 to 28MHz. Limit operation to 15 hours—the six hours rest may be taken in two periods. Exchange RST plus QSO number and power input. If crystal controlled send "x" after power indicator. Contacts with other QRP entrants in same country count four points, other countries on same continent five points, and with other continents six points. QRO stations may take part and contacts with these count one, two and three points respectively. Multipliers consist of one for each DXCC country contacted on own continent, two for others and for each JA, PY, VE, VK, W/K, ZS call area. Special points are awarded for contacts with stations using less than 3·4W and it is suggested that entrants contact G8PG, 37 Pickerill Rd, Greasby, Wirrall, Merseyside, who will also be the UK collecting point for logs.

The following results of the **1974 ARRL DX Contests** have been received from WA1PID:

Phone section

G3YBH	10,143 points	G3RCV	
GW3UCB		(Multi-op)	177,970 points
(G4BRK)	936 points	G4ALE	
G3UBR		(Multi-op)	130,050 points
(Multi-op)	881,391 points	**GW3VKL**	
		(Multi-op)	110,397 points

CW section

G3MXJ	1,062,480 points	G4BXN	1,512 points
GM3CFS	570,078 points	**G4ALE**	
GM6RV	292,320 points	(Multi-op)	538,704 points
G2QT	179,865 points	G3SXW	
G4CHM	19,985 points	(Multi-op)	457,172 points
GD4BEG	11,040 points	**GW4BUC**	
G2AJB	3,900 points	(Multi-op)	12,177 points

Congratulations to the certificate winners (listed in bold type). G3UBR was the top European multi-operator (single transmitter) entry in the phone section, and G3MXJ and GM3CFS are to be congratulated on winning the Society's Braaten and Milne Trophies respectively as leading G and leading non-G British stations in the cw section.

The 1975 French Contest

1400 25 January to 2200 26 January (cw).

1400 22 February to 2200 23 February (phone).

Contest exchange not confined to French continental stations only but includes DUF countries and HB, LX, ON, 9Q, 9U, 9X and 4U1ITU. The same station may be worked on each band for credit. Exchange RS/T and serial QSO number (from 001). Each contact counts three points and multipliers consist of French departments (95), Swiss cantons (22), Belgian provinces (10) and each DUF country, plus LX and 4U1ITU worked on each band. In celebration of the 50th anniversary of REF contacts with F8REF will be worth 50 points and a multiplier of one on each band. Send logs to F8TM, 53 rue Marceau, 91120 Palaiseau, France. QSOs made during this contest may be used for credit for the DUF, DPF, DDFM and DTA awards if application is made within two years.

The ARRL DX Contest

0001 1 February to 2400 2 February and same times 1–2 March (phone).

0001 15 February to 2400 16 February and same times 15–16 March (cw).

Single operator (1) all band, (2) high band—14, 21 and 28MHz, and (3) low band—1·8, 3·5 and 7MHz categories. Multi-operator single- or multi-transmitter all band only. Contact the 48 contiguous United States and Canadian provinces. Each QSO counts three points, incomplete ones two points. Send RS/T plus input power. Multipliers are the totals of states/provinces (57 maximum) contacted on each band added together. Entrants making 1,000 contacts will be awarded a certificate, and a handsome plaque will be awarded to continental high scorers, single operator, in the

QTH Corner

A4XFU	via G3OKA, J. Share, 219 Prenton Dell Rd, Birkenhead, Merseyside.
A9XV	c/o Gulf Aviation, PO Box 138, Bahrain.
CE0ZG	CE2AA, Radio Club Valparaiso, PO Box 3016, Valparaiso, Chile.
F0BJO	J. S. Wright, 25/26 Le Cadran Solaire, Rue Balcon Sud, 66120 Font-Romeu, France.
FK0DX	WB6LTJ, 631 1st St, Hermosa Beach, Cal, 90254, USA.
FK0GA	K6RIR, 5612 Mason Av, Woodland Hills, Cal, 91364, USA.
FK0IC	K6YFZ, 18406, Delano St, Reseda, Cal, 91335, USA
FW0DX	(see FK0DX).
FW0GA	(see FK0GA).
FW0IC	(see FK0IC).
HL9TG	WA7KYZ, G. D. Ford, RFD 2-Box 2215, Spanaway, Wa, 98387, USA.
HL9UA	WA3CNP, L. H. Welsch, 425 4th Av, Parkesburg, Pa, 19365, USA.
KG6SX	Box 62, Sterling, Va, 22170, USA.
TU2EI	F5ST, S. Theollerre, 121 Av Colonel Fabien, F-94800 Villejuif, France.
VE8RCS	CFS, Alert, NWT, MPO 310, via Belleville, Ont, Canada.
VP1FF	W0ELT, 8109 Carslbad Dr, St Louis, Mo, 63123, USA.
VP2AYL	Box 550, St Johns, Antigua.
VP2MGB	Ruby Bramble, Bethel PO, Montserrat.
OE2HKL/YK	via OE2SCL, F. Schatzberger, Schwarzenberg-Kaserne, 5071 Wals, Austria.
OE5CA/YK	via OE5REB, Dr R. Eisenwagner, Airline Met. Office, A-4063 Horsching, Austria.
ZD8MH	M. Hodges, G4DDH, 26 West Park, Minehead, Somerset.
ZK1CL	WA2YJN, 2411 E 3rd St, Brooklyn, NY, 11223, USA.
ZK1DA	WA5OCN, 5014 Loch Lomond Dr, Houston, Texas, 77035, USA.
ZM7AH	J. Wernick, W5ZF, 11504 Golden Gate, Albuquerque, NM, 87111, USA.
4W1GS	G4AJJ, K. Runcorn, 15 Cavendish Av, Harrogate, Yorks.
5W1AV	W6KNC, 5724 W. Ironwood St, Palos Verdes Peninsular, Cal, 90274, USA.
8Q6AH	via JA0CUV/1.

RSGB QSL Bureau, G2MI, Bromley, Kent, BR2 7NH

all band class. Send logs before 28 April to ARRL, 225 Main St., Newington, Conn, 06111, USA. Logs and summary sheets may be available from G3FKM.

Awards

The CESP
For confirmed contacts with the state of Sao Paulo since 1 January 1965. European applicants require 30, and a certified list plus 10 IRCs should be sent to LABRE Awards Manager, PO Box 22—01000 Sao Paulo, SP, Brazil.

The Ziemia Bydgoska Award
For confirmed contacts with stations in at least four towns in Bydgoszcz district (SP2) and earning at least 50 points. The towns are Bydgoszcz (one contact must be included), Torun, Grudziadz, Inowroclaw and Wloclawek, and each QSO counts 10 points. Contacts with other places in the district count two points. Send verified list of contacts and seven IRCs to: PZK, ZOW, PO Box 37, Bydgoszcz 1, Poland.

The W-SP0 Award
Issued by the same section of PZK as the previous certificate for confirmed contacts with three SP0 stations (dx applicants need only two). Apply to the same address with list and seven IRCS.

Band reports

The winter conditions have favoured dx working on the lf bands and, at the time of writing, west coast USA stations were being received at good signal strength on 3·5MHz around 0730, and 1·8MHz seems to have been particularly good during the weekend of the CQ WW DX Contest.

Very many thanks to the following for sending in logs from which this section has been compiled: Gs 2CIL, 2HKU, 4RZ, 5JL, 6GH, 8MY, 3GVV, 3NKQ, 3ORP and 3XWZ, BRSs 17567, 17991, 25429 and 31301, and As 7056, 8312, 8431 and 8713.

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

1·8MHz. 0000 *W1HGT, KIPBW, W1BB, WB8APH.* **0100** *OD5IQ, ST2AY, VE1CD, W2KHT, W2UEZ, 4U1ITU, 4X4NJ.* **0500** *WA8IJI, K8KAS.* **0600** *W3AU, K7HAA,* **0700** W2HCW, *W4QCW.* **2100** *PY1RO, VK6HD, 9H1BX.* **2200** *K2GNC, ST2AY, VS6DO, 4S7GV.* **2300** *KV4FZ, W2PV.*

3·5MHz. 0000 AP2KS, VP8NP, 8Q6AG. **0600** *KC4NI,* VP1FF, VP2GE, XE3EB, W6NLZ, 8R1AG. **0700** HR1AT, KS6DH, W7LGJ (Wash), YV1AD, ZL2, ZL4, 6W8DY. **1600** VS6DO, 4X4QG. **1700** EP2LT, HZ1KE, JX2HK. **1800** EL7F. **1900** JY9GR, VQ9AA, 5B4BM. **2000** OE5CA/YK. **2100** AP2KS, JY3ZH, TJ1EZ, VP9HP, YV5ANS. **2200** OA5CT, S21CW, VP2LB, VS6DO, VS6UM, ZS5LB, 9M2s DQ, FX. **2300** PJ2CW, ST2AY, WA5QYR, ZD7FT, 4S7PB, 9M2CW.

7MHz. 0000 EP2TW, FY0BHI. **0100** VU2IN. **0200** *CX4AQ.* **0700** *HV3SJ,* JA1DJL. **0800** CT3AR. **0900** *CT2AK, FY7AA, OX3DL.* **1700** A4XFE. **1900** 5X5NK. **2100** TJ1EZ. **2200** *FG7AO.* **2300** *FG7AN* (QSL via WA3EDS), *PJ9JT, 8P6AK.*

14MHz. 0800 A35AF. **0900** A7XA, CE0ZG, *KL7HSV,* KX6BU, P29GO, VE3CUD/SU, *UA0YT,* VK0DM, VKs, *VS6BL, VU2DX,* XT2AE, YB0CJ, ZLs, ZM7AH, *3D2AN.* **1000** *FK8AI,* HL9KZ, KC4AAC, XW8CO. **1100** KX6LP, ON4AXA/MM, VKs, YJ8BL, 9M2HA, 9Y4PL. **1200** OJ0MA, S21JA, VE8, ZL. **1400** YB1KW. **1500** *FR7AK,* VQ9M, 3B8DR, 4W1GM, *8Q6AH,* **1700** KH6BB, ZS2MI, 4W1ED. **1800** XU1DX. **1900** VP2s DM, MRA. **2000** VP8NP, ZLs. **2100** VP8s, ML, NY, 9X5PT.

21MHz. 0900 *DJ3DH/ET3,* JAs, PYs, ZD7FT, *ZD7PS, UA0YT, 5X5NK,* 8Q6AH. **1000** S21CW, 9M2AA. **1200** *FY7AA,* HP1XJS, HZ1KE, VK2s, VK3s, VK4s, ZD3G, *5V7WT.* **1300** VQ9HCS. **1400** *FR7AL,* 5T5GS. **1500** A2CJP, HC2HM, Ws, ZD7SD. **1800** XE2MX.

28MHz. 0800 UA3, UB5. **0900** VK6s NS, *SA,* ZEs, ZSs, 4Z4MQ. **1000** CR7s, LA, SM, ZE. **1100** EA8EI, VK6HR, ZD7HH, ZS5KI. **1200** CR6s. **1400** W1JUJ, ZSs. **1500** ZSs. **1600** PYs, W4s, W6OV, W8s, ZD7FT. **1700** LUs, W4s, WB5ANK, WA8IEK, ZSs. **1800** WB4LWD.

Many thanks to all correspondents and to the authors of the following for information obtained from their publications: **DX News Sheet** (*Geoff Watts*), the **29 DX Club Newsletter** (*George Allen*), **World Radio News,** the **DX'ers Magazine** (*W4BPD*), **Long Skip** (*Nick Sawchuk*), the **West Coast DX Bulletin** (*WA6AUD*), **DX'press** (*PA0INA/PA0TO*), and the **Ex-G Radio Club Bulletin** (*W3HQO*).

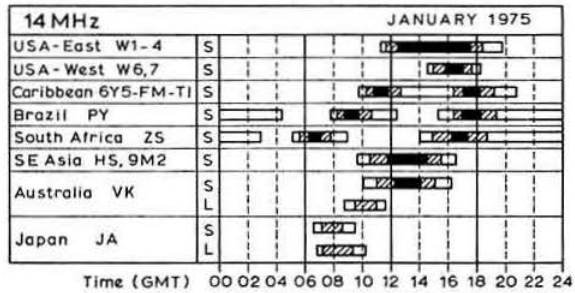
Please send all items for the **February** issue to **reach G3FKM** no later than **8 January,** and for **March** issue by **5 February.**

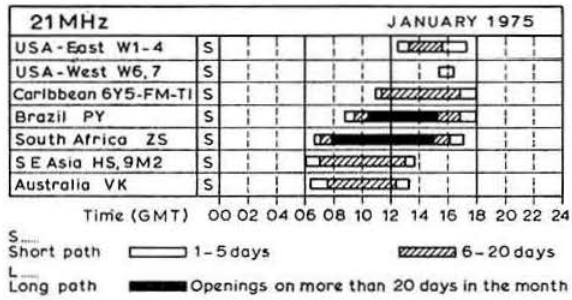
Propagation Predictions

There will be little change in propagation conditions in January compared with the previous month, but the hf bands may possibly remain open a little longer towards the end of the month. The conditions given for December will hold good on all bands.

We once again point out that the time given in Propagation Predictions is gmt. This is done to make conversion into local time easier. In addition to RSGB, these predictions are also published by the Polish amateur radio society PZK.

The provisional sunspot numbers from the Swiss Federal Observatory for November 1974 was 23·9 with solar activity reasonably evenly distributed throughout the month. It was noted that on 15 November at a solar latitude of +37° the first sunspot of the new cycle appeared. The predicted smoothed sunspot numbers for March, April and May 1975 are 24, 23 and 22 respectively.





SWL NEWS

by BOB TREACHER, BRS32525*

10m slp

The set listening period for 10m was quite a success judging from correspondence received from David Whitaker BRS25429. David has received a dozen reports from stations located in PY, W1, W4, W7, ZE, 9H1, SP, I, DL, F, HB9, as well as many from G and GM. Regrettably not many listeners sent reports to him. Those who did were A8118, A8482, BRS24643, BRS28198, BRS29909 and yours truly. Conditions during the slp were quite good and at times very good indeed. Amateur stations and listeners in the south of England seemed to fare better, propagationally speaking, than stations in the north. One listener on the south coast logged 100 stations in some 34 countries.

Reports gathered so far from Western Europe suggest that the skip started off to the Middle East and South America. During the afternoon African stations were logged in the main but there were also some strong signals audible from stations in Central and Northern European countries. Towards the end of the period the South American continent was evident again at good strengths. Three amateurs reporting from the USA mention working Central and South America and South Africa. One USA reporter mentions working FO8DR at 1721 on cw and, on the day before, FO8EG on ssb at 2236. I1ZL reports working 9V1OP and UH8HAI between 1440 and 1453, and he then heard but failed to work TN8BI at 1520. An swl located in Cornwall and F8RU mention that YB0AAG was worked at 1240, but no other dx was worked or heard in Western Europe from the Far East.

It was noticeable that some signals had strong QSB and that the European signals heard were probably by what is termed "scatter propagation".

As a propagation exercise this period proved very useful and Dave reports that in correspondence received 57 countries had been either heard or worked during the six-hour listening period. Whether this activity was due to the advance publicity given to the slp in this feature, by Geoff Watts in *DX News Sheet*, or whether it was as a result of favourable conditions we shall never know.

News from the few

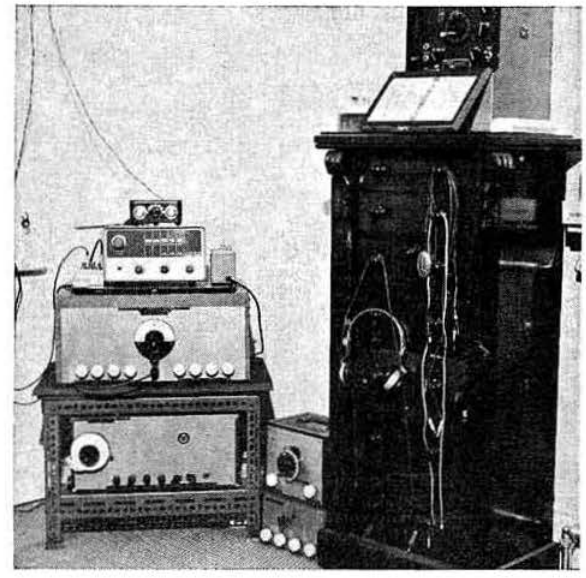
Not so much material this month. This must either be due to the early deadline or perhaps the Christmas festivities had started early in many places. Keith Kerr, our top dog in the Countries Table, writes from his new QTH in Edinburgh saying that he is looking forward to a rest from amateur radio. In October he reports being active in four listener contests: Cray Valley, VK/ZL, and the RSGB 21/28MHz and 7MHz contests. Keith also found new ones for the table in the CQ WW phone contest. He can only sit, wait and hope that Dave Whitaker will not be able to catch him. He has missed AC3PT, FR7AG/G, A51PN in recent weeks and has also been unable to catch the expeditions to ZM7, CE0 and KC4. Disappointing to say the least. Hopefully 10m conditions were good for the ARRL 10m Contest held on 14-15 December. Conditions were certainly fair when this piece was compiled, 3B8CV, KC4AAC, TJ1EZ and PZ1DR being proof of this. OE2NWL/YK found its way into a number of letters as being heard on both 15 and 20m, while XU1DX seems to have been active on 40m.

Dave Whitaker mentions hearing country No 200 on 80m in the shape of VP2DA during the CQ WW phone contest. Dave also heard five continents in two-and-a-half hours on 160m ssb—4X4, OH, W, PY and ZD3—during this same event. The 4X4 was 59 at Dave's Harrogate QTH.

Dave Sharred, A8312, feels that many listeners table entries are more than likely missing many simple countries that can be heard at anytime during any week but which are simply not logged. Dave found that he still required GC on 7MHz and OH on 10m but this was quickly remedied. He suggests to everyone that a check be made through the log and that a few surprises will be found. He also suggests that many seem to disregard 160m, but even a quick QSX may bring to light, G, GM and GW without burning that midnight oil.

A tip from your scribe during evening hours . . . tune 1,831-1,834. These are the European dx frequencies and quite

(Continued on page 42)



The main equipment at BRS31995. Two home-brew CC double conversion superhets covering 3·5-4·0 and 3·0–6·0MHz respectively. These are preceded by a Lafayette preconverter, to cover the remainder of the amateur bands, fed by a broadband Multee aerial resonating at 14 and 21MHz. The two small sets on the floor are experimental direct conversion receivers, a synchrodyne for medium wave a.m. and a homodyne for 80m ssb.

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

FOUR-TWO-SEVENTY

by MARTIN DANN, G3NHE*

AT the time of writing, with just a few weeks to go until the end of the year, there is still no sign of any improvement in either the weather or vhf/uhf conditions. However, despite the lack of tropo openings during the latter part of 1974, the year has had its moments; we have had a fair amount of sporadic-E activity (one recalls the fine contact with LZ made by G3DAO), several auroras, and that excellent lift of 20 January, when dx such as OK and OE was worked on 70cm. Finally, to liven up the windswept winter months for those who get a kick out of putting their 432 or 144MHz signals into W or VE, Oscar 7 was successfully launched in November.

Trends

There can be little doubt that after a slow start the vhf amateurs in this country are catching up with their Continental confrères in the use of ssb, especially on 2m. The efficiency of the mode still seems to amaze many new converts, who had not previously realized just how far it is possible to work on a flat band, even from a relatively poor location.

The growth of sideband on 4m and 70cm during the past year has been little short of phenomenal. As an indication, of the 54 different stations worked by G3NHE during the first five 70MHz autumn cumulatives, 40 had sideband facilities. On 70cm, over the first four of the latest cumulatives, 27 of the 42 different stations contacted used A3j. While there is an obvious tendency to work more sidebanders if one is using the mode oneself, there is happily no reluctance yet to make cross-mode contacts on 4m or 70cm, despite the rarity of such QSOs on 2m.

As a contrast to the exploiting of the natural propagational properties of vhf, the growth of repeaters, and to a lesser extent amateur satellites, offers an entirely different concept of operating. Unfortunately, a few of those to whom this type of operating does not appeal seem to be adopting a "we don't want it so they shall not have it" attitude, adding to the polarization which exists between the pro- and anti-repeater factions. With a 2m band 2MHz wide (compare with the 40m band) one would think that there would be room for all the various means of making contacts allowed by the authorities, providing the sensible discipline of the band plan is adhered to.

Contest clean-up

Following the suggestion in November's *Four-Two-Seventy* that the vhf contest adjudicators might be more severe with stations radiating sub-standard signals during contests, particularly portable events, one of the adjudicators in question makes the valid point that if no complaints are received no action can be taken. The example is cited of one group's 4m station discovering that they had been radiating an appalling signal and disqualifying themselves—yet not one complaint was received about this station on the 427 cover sheets submitted to the adjudicator. So the answer would seem to lie in our own hands, but before blowing the whistle on a bad signal let us be sure that the station responsible is told and given a chance to put things right.

All change

In the October *FMD* G4JJ expressed surprise at finding "our Continental friends dragging their feet" in the matter of moving fm repeaters from the lf end of 144MHz to the allocation agreed under the new IARU band plan. Mentioning aliases such as F0PV, ON8IO, PA0VY and DA2XU, G8CEA claims the right to feel disappointed by this remark. Richard Spencer reminds us that there are over 80 2m repeaters in Germany, all of which have to be moved, at no small cost, to the new segment.

The German amateur's reward for pioneering European repeaters, claims G8CEA, has been a good deal of inconvenience and expense. He believes that our Continental friends have done us proud and set an excellent example of how responsible amateurs can solve a difficult technical and organizational problem with the minimum fuss and inconvenience.

UHF from Northern Ireland

GI3WUO of Holywood, Co Down, reports on the beginnings of some uhf activity in the Belfast area. Lionel Waring has nightly skeds on 432·03MHz with GI8GJX in Glengormley, and although both stations are only running low power on this four-mile path across Belfast Lough, this could be the only 70cm from GI apart from club stations. GI3WUO and GI8GJX are also busy building for 23cm.

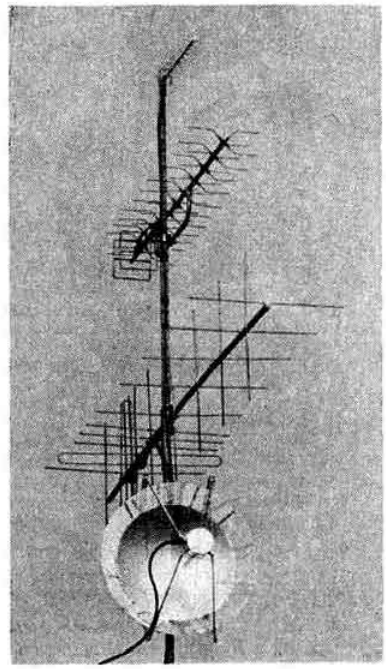
In Londonderry the North-West Amateur Radio Club station GI4DBB also has 70cm gear, and it is understood that the Ballymena Radio Club activate the band during contests.

Four metres

Some interesting statistics have been received from that 4m stalwart, G3LVP. Ken Eastty, from his location in Benfleet, Essex, worked 166 stations on 70MHz between January and mid-November 1974, 41 of them on two-way ssb. He has been impressed by the number of stations that have appeared from the Midlands, despite Channel 4 tv, but he bemoans the lack of activity from South Wales. Ken feels that the swing to uhf tv may well be helping activity to increase, because of reduced tvi problems, but he is depressed by the poor design quality of many 625-line sets, with their untuned rf stages, unscreened IFs and with the audio side wide open to breakthrough.

Jack Hum, G5UM, hopes that the continued reduction in the use of vhf tv will allow the re-kindling of the 4m Wednesday activity night which, after its introduction three years ago, foundered on the rock of tvi. G4BGZ and G5UM now invite

* 49 Windermere Court, North Anston, Sheffield S31 7GJ.



The array of Bill James, G6XM, of Highworth, Swindon, must please the eye of any vhf/uhf man, if not Bill's neighbours. From top to bottom: a scaled-down Multibeam for 23cm, a full-size Multibeam for 70cm, crossed 10-el Yagis for 2m, and a 3ft 8in dish with beer-can feed for 23cm

those interested to join them (beams on Leicestershire) any Wednesday at 2200gmt on 70·26MHz.

Elsewhere in the Midlands, G3HVI of Stoke-on-Trent has been conducting a lively get-together on 70·26MHz each Tuesday lunchtime at 1230, with stations, fixed and mobile, from a wide area taking part.

Ken Dawson, G3XSK, is a newcomer to the band and says that he has searched diligently, but has been unable to find reference to any other calling channel than 70·26MHz. This is not surprising, as the new IARU band plans do not include 4m, which, with very few exceptions, is exclusive to the British Isles. However, by sensible analogy to the other bands, 70·2MHz is being used as the ssb calling channel. Various suggestions have been made to have separate calling channels for mobile and fixed stations in order to remove some of the traffic from 70·26MHz, but activity being what it is there has been little pressure to persevere with these ideas, and thus ·26 acts as calling channel (and, too often, working channel) for all modes except ssb.

Ken also wonders when he is most likely to find activity on 4m, having only heard one station in four weeks. One time to try, if the Leicester lads have their way, is Wednesday evenings, but the main activity period is still the relatively tv-free hours of Sunday morning.

Technical tips

The response to G3HDQ's query about keying the Liner 2 leads one to the conclusion that perhaps 2m cw is not yet quite dead. Our thanks to all those who have passed ideas along; lack of space prevents us mentioning them all but here is a representative selection.

G4CDM's system requires no modifications to the Liner 2. He incorporates an af generator into a home-built ic electronic keyer, which is fed into the transmitter microphone socket. Peter Rhodes suggests that if sinusoidal af is produced, any frequency within the filter passband will do, but if, as in his case, a square wave is produced, a frequency above the mid-point of the filter should be used so that only the fundamental is passed. As well as driving the transmitter, a little af is fed to a small speaker to act as a sidetone, and Peter further suggests that voltage from the keyer could be used to power a t/r switch, suitably slugged to provide the required degree of break-in.

G4CWE uses a 700Hz twin-T network tone oscillator followed by a fet source follower. This is taken to the Liner 2 microphone socket via a pre-set potentiometer and the morse key, but Tony Humm warns that only low audio output is needed if unwanted signals are to be avoided.

Finally, G3TUX has thoughts of keying the test switch, with a possible modification to allow sidetone to be generated by using the voltage driving the power out meter, and a key controlled t/r switch.

Calling channels

G3HDQ's suggestion that there should be a cw calling channel within the range of Liner 2 operators brings comment from G4JJ, who has long been in favour of this but is worried about neglecting the bottom part of the cw segment should 144·12MHz be adopted. He suggests, therefore, that there should be two calling channels, one on 144·12MHz and one on 144·050, which is favoured on the Continent. Jack Ward says that he is also in the habit of putting out the occasional CQ call on the key around 144·2MHz at quiet times during the day, often with successful results. G4CWE is also in favour of a cw calling channel, but would prefer 144·11MHz.

GM8BRM wonders whether it would not be sensible to have an a.m. calling channel on, say, 145·40, with the normal practice of moving to another frequency after establishing contact being followed. In the *Central Scotland FM Group Newsletter No 8*, GM8FM carries the idea a little further and suggests a.m. working channels spaced at 25kHz as for fm, but one suspects that a.m. users might feel that the concept of channelizing, borrowed from commercial practice, is more applicable to fm than to other modes. While an nbfm signal should occupy no more space than an a.m. signal, assuming both are properly adjusted, the wide receiver passbands often employed for fm reception mean that the 25kHz channel separation is very necessary. A.M. can be, and usually is, taken on a narrower bandwidth i.f. Perhaps, also, there is something to be said for the advantage we have over many commercials, of having a frequency allocation within which, subject to our own disciplines, we can move freely, making full use of the space available.

Contest happenings

The 4m cumulatives continued to be reasonably well supported during November, despite indifferent conditions. The fifth session, on the 24th, found both weather and propagation to be particularly poor, although the use of ssb and cw made it possible to scrape up a little dx.

The 70cm cumulatives fared slightly better; the third session on 16 November was enlivened by conditions which were moderately above average, and activity was good. Not so the following week when many of the band's regulars seem to have tapped the glass, seen the low pressure and

spent the evening watching television. Conditions were poor, but never-the-less several 200-300km contacts were made.

Awards

An unusual claim, resulting in 144MHz Transmitting FMD Certificate No 410, was received by the vhf awards manager from G3JZG, now of Bridgnorth. The cards submitted were for contacts made from his previous location in Willenhall, Staffs; all of them being made in 1961. Of almost historical interest is the gear used. The converter was a cascode 6AK5/6J6 with 12AT7 mixer, and 6J6 crystal oscillator chain. The transmitter sounded more modern and with quite high power for those days; 120W to a QQVO6/40A modulated by a pair of 807s in AB2.

Other awards reported by G5UM are as follows:

144MHz Transmitting: G4CYB, formerly G8GVF, earns certificate No 407; No 408 to G8HVH; G4ATS (ex G8EGU) gains No 409, all worked with 10W a.m., and G8HAE, now G4DHF, gets certificate No 411.

144MHz Senior Transmitting: a double claim from G8BQX. Certificate No 67 for a fixed station claim, worked mainly on low power a.m., and for activity from G(GM)8BQX/P John Ridd receives certificate No 68.

1,296MHz Transmitting: a rare 23cm claim from Mike Waters, G3JVL, of Hayling Island, who now has award No 6. No G8 + 3 has yet won this award—we wonder who will be the first.

Ken Dawson, G3XSK, of Lowestoft, has recently mustered the necessary 25 QSL cards to enable him to claim the Dutch VHF 25 Award. Before being forwarded to Holland, this claim was sent for initial certification to the RSGB vhf awards manager, G5UM, who will be pleased to endorse any such claims from RSGB members.

The counties question

As promised last month, we hope to clear up any questions concerning FMD awards that have arisen because of the county boundary changes. From 1 January 1975 the old county list is replaced by the new one which appears elsewhere in this issue, except that for FMD award claims the Scottish counties will remain as they are until 31 December 1975. Cards submitted after 31 December 1974 for contacts before that date will still be accepted for award purposes against the old county list, which should continue to be used for all contacts made before the changeover. Claims may be made against the old *and* new lists where cards are for QSOs which have taken place both before and after the changeover date, but cards for contacts before 31 December must be for the old counties, and cards for contacts from 1 January 1975 must be for counties on the new list.

There will be instances where the same station may be claimed for two counties, providing that the station is in a new or altered county. For example, G3NHE worked at 2359gmt on 31 December 1974 would count as Yorkshire; worked again at 0001gmt on 1 January 1975 he would count as South Yorkshire, and (if he could be persuaded to part with two cards) would count as two separate counties for FMD award purposes.

If one's county status has changed, ensuring that the correct county appears on one's QSL card will save the recipient the possible disappointment of a disallowed claim. The vhf awards manager, when checking cards for FMD certificate claims, has to accept them at face value. In other words, if a QTH reads "Manchester", he cannot be sure whether the station is really in Greater Manchester, or in Lancashire. Similarly, if a location is given as "Yorkshire", he has to determine whether the card relates to West Yorkshire, South Yorkshire, North Yorkshire, or even Cleveland.

Where an alteration has to be made, a simple method is to use one of the well-known, inexpensive, children's printing sets; it takes just a few minutes to run through a few hundred cards, overstamping with the correct location.

Keyboard news

Gordon Adams, G3LEQ (Knutsford), reports on the happy state of rtty in the north-west. The vhf net is growing, with G3LEQ, G3MWI, G8DVR, G8GIW and G8ILC participating, and several others about to join. Skeds are held every week on Sundays at 3pm on 145·3MHz and at 8.30pm on 144·3MHz, and on Thursdays at 8.30pm on 144·6MHz. The net can copy 400 and 800Hz shift, but has standardized on the narrow shift of 170Hz.

G3LEQ explains that the use of 144·3MHz is to encourage the use of the mode by Liner 2 operators. He counters any suggestion that rtty is a difficult mode on which to get started. The terminal unit is likely to pose the only difficulty, and much friendly advice is readily available from the members of the North-Western RTTY VHF Net.

Four Metres and Down Certificates

The following have been issued since the last full list was published in the December 1973 issue of *Radio Communication*.

70MHz Transmitting

104 G3LVP; 105 G3ZYS/P; 106 G3ZLQ/P; 107 G3OBD/P; 108 G4BPY; 109 G4BMM; 110 G3RWM (all ssb); 111 G3NHE; 112 G3CDG/P.

70MHz Senior Transmitting

16 G3ZMD; 17 G3JYP; 18 G3RWM; 19 G3WOS; 20 G3DAH.

144MHz Transmitting

369 G4BTZ; 370 G3SDS/P; 371 GW4BXE/P; 372 GI6YM/P; 373 G3XJS; 374 G8GHZ; 375 G3TTV; 376 G8DLF; 377 G8CXK; 378 G8DYC; 379 G8ECO; 380 G6YB/P; 381 G3WPO; 382 G8HSX; 383 G3YOZ; 384 G4BYP; 385 DK4QE; 386 G4AKA/P; 387 G8EYV; 388 G4APJ/P; 389 G8GOX; 390 G8GXA; 391 GD8DMA; 392 GW3OHC/P; 393 G8EBM; 394 G4CIK; 395 G4ALB; 396 G2CDX; 396A G8GMU/P; 397 G8DML; 398 G8HPD; 399 G8HWO; 400 G8AHF; 401 G8DNF; 402 G8GXE; 403 G8ECT; 404 G8HBQ; 405 G8EQT; 406 G3ZJY; 407 G8GVF; 408 G8HVH; 409 G4ATS; 410 G3JZG; 411 G8HAE/G4DHF; 412 G3NVL.

144MHz Senior Transmitting

50 G8BCL; 51 G3WZT; 52 G3ZMD; 53 G5UM; 54 G2ATM; 55 GD2HDZ; 56 G3XBY; 57 GW3NNF; 58 G4AGE; 59 G3DAO; 60 G (GM, GW) 8AOB/P; 61 G8ATS; 62 G8FUI/G4DFE; 63 GW8FOL; 64 G3AHB; 65 G8GNE; 66 G4BPY; 67 G8BQX; 68 G (GM) 8BQX/P.

144MHz Receiving

27 BRS32755; 28 A7680; 29 A8334.

432MHz Transmitting

100 G3WSN; 101 G3JXN; 102 G3TTV; 103 G3TTV/P; 104 G8AYY; 105 G8CPX; 106 G3XJS; 107 G8CKV; 108 G8GNE; 109 G8AHF.

432MHz Senior Transmitting

18 GD2HDZ; 19 G3NHE; 20 G3EHM; 21 G8EOP; 22 G5DF; 23 G3ZMD.

432MHz Receiving

4 BRS15822.

1,296MHz Transmitting

4 G3OBD/P; 5 G3DAH; 6 G3JVL.

Supreme

6 G5DF; 7 G3DAH; 8 G3ZMD.

Microwave 3cm

11 G3KSU/P; 12 GC3WJG/P; 13 GM3DXJ/P; 14 G3OXX/P; 15 GM8BKE/P; 16 GW4BRS/P; 17 G3VPF/P.

Microwave special award 3cm

1 GM(G)(GD)3OXX/P; 2 GM3DXJ/P; 3 GM8BKE/P.

Meteor scatter

G8CUI's efforts to work DC7IT via the Taurids and Leonids resulted in partial success. Only traces of the DC were heard by Terry Lockwood of Goole, and it was not until the series of tests was over that he discovered the fault on the 2m pre-amplifier—always the way! However, DC7IT reported long bursts of readable sideband from G8CUI, peaking strength 7. Further attempts will be made during December.

Auroral research

Alan Strong, G3WXI, of the Space Physics Group at Sheffield University, would be pleased to hear from any Scottish amateur or swl who might be prepared to give assistance with a research project on radio-aurora. Anyone interested, especially in the Glasgow to Edinburgh area, should contact G3WXI, QTHR, telephone 074 15 2609, for further details.

Manners again

Far from agreeing with the bad manners label attached to those who call an expedition station who is busy setting up skeds for a more difficult band, when the caller has no gear for that band, G8BQX feels that the reverse is true. John Ridd points out that many unfavourably-located vhf amateurs rely on the well-sited expedition station to provide the rarer counties and, as a basic contact adequate for award purposes takes only 20s or so, it is hardly fair play to deny the caller this short time. The same, John says, goes for stations in the north calling, "CQ the Continent only", when the south coasters would like a chance to work the said northerners.

Miscellany

A victim of the autumn gales, Peter Cutler, G3DAO, found that the sight of his wind-lashed 8-over-8 hanging from the mast by its feeder was not a pretty one. No more immaculate cw at the bottom end of 2m from Peter until the new tower goes up—hopefully in the not-too-distant future.

Another temporary absentee from vhf is Peter Atkins of Weymouth who, exchanging his G8GSO call for G4DOL, has gone hf for the winter. He hopes to be back in the spring.

From Lowestoft, the most easterly town in the British Isles, Ken Dawson finds that few stations beam his way unless there is an opening to the Continent—and who wants to work a "G" then? So, if Suffolk is required on 2m or 4m, a letter to G3XSK, QTHR, will secure a welcome sked.

Contrary to the remarks about the healthy state of 2m activity in the December *Four-Two-Seventy*, after more than four months on the band, GM3OGJ of Clackmannanshire is disappointed by the low level of activity he has experienced. He runs a 100 per cent successful twice-weekly sked with G3GZX of Wallasey, Cheshire, and asks—"where are all the other G stations?". Perhaps, suggests GM3OGJ, all beaming at each other discussing the lack of activity from GM.

G3LQI of Lancing in Sussex has found cw activity disappointing during the two months he has been QRV on 2m. He perseveres, however, with his slow morse transmissions on 145·3, Mondays (5wpm), and Thursdays (8wpm) at 2130gmt.

Finally, news, views and comment for inclusion in the February issue direct to G3NHE as soon as possible please.

SWL NEWS

(Continued from page 38)

often a PA0 or DL can be found at good strength or ssb on these frequencies. David is a very avid 160m listener and during the two CQ Contest weekends heard the following on ssb: HB0, 9H1, 4U1 and 4X4UR, while the cw weekend produced VK6HD, VS6DO, ST2AY and OD5IQ. David said "I am quite pleased with these!" In fact, these would grace some listeners' 20m log.

It seems as though members of the Oxford & District ARC are after the scalp of Terry Vale, BRS33848, who brought up the point regarding contests last time round. Terry says he is not wholly against contests and in fact helps out in VHF NFD each year, but he does not like listener contests coinciding with transmitting contests. This point can spiral so easily that we will leave it just like that.

Interesting letters have also been received from A8431, A8606, and from John Martin, A8781, who has recently joined RSGB and has heard some very worthwhile stations during his brief time on the amateur bands.

Another who is unable to find much time for listening is Irwin Brown, BRS33211. Much of Irwin's time is spent on other radio activities and he just does not get much time to switch on the receiver. He had recently run an SWL Corner at an RSGB rally and been involved in VHF NFD and the North-West Amateur Radio Convention held at Lancaster.

A late welcome to Peter Jewitt, A8538, who wrote for the first time. A member of the Northumbria Radio Club, G4AAX, Peter runs a Collins TCS10 into a W3DZZ at 20ft but has been listening on a borrowed FT250 which he says has unfortunately had to be returned to its owner.

Down memory lane

Guss Browning, W4BPD, and his famed expeditions were raised last issue. Bernard Hughes, BRS25801, comments that he has QSL cards from the following stations heard in 1965. AC6H (Bhutan), K7LMU/TI9C (Comoran Reef), YJ8WW (New Hebrides), IS9WNV (Spratly Is); KG6IF (Marcus Is), XZ2TZ (Burma), BV1USA (Taiwan) and 7G1L (Republic de Guinee). It is very interesting to hear from members with such rare, exotic items. Hunt through that box of QSLs and see if you have anything exotic. If so write and let us know.

1974 HF Countries Table

Station	10	15	20	40	80	160	Total	Mode
A8482	113	195	224	138	152	0	822	ssb
BRS25429	90	135	202	116	113	16	692	ssb
A8606	75	159	207	88	107	4	640	ssb
A8312	61	150	177	102	106	21	617	ssb/cw
BRS25901	36	141	232	93	91	5	598	ssb
BRS33211	60	114	191	100	110	9	584	ssb
A8313	39	116	135	71	84	24	469	ssb/cw
A8431	39	73	149	53	93	12	419	ssb
A8538	4	61	157	82	110	4	418	ssb
A7317	9	86	136	45	67	6	349	ssb
BRS34658	30	76	110	52	72	8	348	ssb
A8320	0	56	122	59	70	6	313	ssb
A7460	25	73	79	78	41	14	310	cw
A8187	21	52	124	9	40	1	247	ssb
A8358	2	32	141	10	16	8	209	ssb
A8203	13	26	73	14	41	3	170	ssb
A8428	0	17	52	8	36	1	114	ssb

73 . . .

That is all for the first issue of 1975. News, comment and the final additions for the 1974 Countries Table should reach the writer by 31 January.

The 1974 AGM

Representatives of the March & D ARC receive the Surrey Trophy

THE Royal Society of Arts, just off the Strand in central London, was the venue for the 48th Annual General Meeting of the Society on 6 December 1974. In the presence of more than 200 members the President, Mr G. R. Jessop, G6JP, opened the meeting by welcoming those present and asking for the reading of part of the formal notice convening the meeting.

The minutes of the 1973 AGM were duly approved and the meeting then considered the Annual Report of the Council for the year ended 30 June 1974. While approving of "The Year in Review" published in the November issue of *Radio Communication*, G3VUQ felt that this should be the report of Council rather than the shorter formal statement required by the Companies Acts. In reply to a question by G3SJE, the Treasurer stated that about 20 members had asked for refund of their proportion of the VAT refund recently received from HM Customs and Excise.

The Report of Council having been approved the accounts were next considered. G3IIR objected to the profit on rallies being shown as a note to the accounts rather than as an item in the actual balances, and G3SWT noted the apparent drop in the rate of profit on book sales and the rise in the amount attributed to debtors. The Treasurer replied by referring to the writing down of the value of books which did not sell well, and the considerable sums owed to the Society by *Radio Communication* advertisers who were now being pressed to pay. G3UUS thought that there should be a greater reserve for legal expenses that might be incurred in defending any of the principles of amateur radio, and G2UV thought that it should be possible to effect insurance against this type of expenditure. G2YS pointed out that Society funds should only be committed when the matter in issue was of fundamental importance to amateur radio nationwide. The accounts were then approved and the meeting then considered the two special resolutions.

In introducing Item 4 of the agenda the President pointed out that the new article would give the young licence holder the option to remain an associate member until he attained the age of 18 years when he must transfer to corporate status. This resolution was approved with little discussion but the same could not be said of the next, Item 5. It was explained that the effect of this resolution would be to limit the period that a member could serve on Council to two terms of three years after which there must be a break for a minimum period of one year. Many members spoke on this proposal and there appeared to be three main lines of thought, ie it would have little effect; it would dispose of existing working members that were needed and it would help to offset apathy at election time. Eventually the motion was approved with three votes against and two abstentions.

The President then announced the names of the members to serve on Council for the year 1975. The result of the 1974 election (reported elsewhere in this issue) showed that the nomination of G3FZL was invalid and therefore the votes cast for him could not be taken into account. This statement was greeted with dismay from the members present and there were a number of demands for an explanation. It was explained that when the nominations were checked at headquarters it had been overlooked that one nominator of G3FZL was not a member at the time of signing the nomination form. It subsequently came to light that the same member had declined to sign the nomination form for another candidate, saying that he was not a member. Whatever the ethics of the matter the result was quite clear: the election was invalid in so far as G3FZL was concerned and this had been confirmed by the Society's solicitors. In reply to a question the President stated that this matter did not affect the position of the office of vhf manager and G3FZL remained eligible for nomination for this post by Council. It was agreed that additional steps were necessary to ensure that there would be no repetition of this unfortunate matter.

The remuneration of the auditors for 1975 was fixed at £450, and the President then asked for any other items of business that might be properly transacted at an annual general meeting. This caused several comments from the meeting concerning the state of the records at headquarters,

The President presents the Victor Desmond Trophy to G3ZEM (left), the NFD Shield to representatives of the Ariel Radio Group (centre), and the Braaten Trophy to G3MXJ (right)

but it was pointed out that this was not a matter for discussion at this point of the meeting.

The Council had proposed G2AOX, G4KD and G5UM as Honorary Vice-Presidents of the Society, and Phil Thorogood and Jack Hum then received their badges and the congratulations of all present. G2AOX was not able to attend and the President expressed wishes for his speedy recovery from a recent operation.

The formal portion of the meeting closed at 2000 and after a short break the presentation of trophies and awards took place.

Informal discussion

The informal discussion opened with the reading of a short supplementary report covering Society activities since 30 June 1974. The President then spoke for a few minutes outlining his thoughts on several matters affecting the Society. These included the possibility of making the formal AGM part of another event with longer opportunity for discussion, the rationalisation of the production of new books and the urgent need to enrol 2,000 new members.

Ron Ham was then invited to give a report on the preparation of the book to follow *World at their Fingertips*. Despite very considerable personal efforts and much publicity little material had been received and the main reaction was one of apathy: a further appeal for assistance was made. Ron Ham deplored the brevity of the obituary accorded to G2YL, who had carried out very valuable work on behalf of amateur radio.

The presence of W3JPT, the secretary of AMSAT, was noted by G2BVN who asked that the meeting should endorse a hearty vote of thanks to AMSAT for their work in the construction and launch of Oscars 6 and 7. This was carried with acclamation and W3JPT made a suitable reply in which he indicated that AMSAT would welcome assistance from IARU Region 1.

G8FTU referred to the item appearing under the heading of "The Future of the Society" in the November issue of *Radio Communication* and asked that the persons who had not replied should be identified.

GM8FFX, admitting his opposition to repeaters, asked about the present state of affairs regarding deliberate interference on the London repeater.

G2MI drew attention to the facilities of the news bulletins transmitted through GB2RS and made an appeal on behalf of G3UMI for additional material for the tape library. This facility is extensively used but the existing tapes are old both in age and technical content.

A representative of the North Kent Radio Society deplored the lack of time available for informal discussion and G3UUS suggested a start should be made at 1430.

The meeting was closed by the President at 2115.

This brief report of the AGM is an informal account in advance of the minutes of the meeting proper and in no way constitutes a formal record of the occasion.

G2BVN

Looking ahead

17 January 1975—RSGB Presidential Installation, Cardiff Castle.
27 April 1975—NRSA Convention, Belle Vue, Manchester
10-11 May 1975—21st VHF Convention, Winning Post, Whitton, Middlesex.

COUNCIL PROCEEDINGS

A brief report of the Council meeting held on 21 October 1974

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

Apologies for absence had been received from Messrs R. J. Baker, P. Balestrini, and A. W. Hutchinson, (*editor*).

Repeaters

Mr Stone reported on the licensing position of UK repeaters in the 2m amateur band. The licence for the Malvern Hills repeater, GB3MH, had now been received and it was expected that the repeater would be in operation in the near future. The licence for the Barkway repeater, GB3PI, had been renewed for a further year as also had the licence for the South Wales repeater, GB3BC.

He also reported that the Home Office had asked for further information on the proposed repeater at Martlesham Heath as it was felt that the service area of this repeater would overlap very considerably the service area of the Barkway repeater which was only some 50 miles away. The Home Office had expressed the view that repeaters should be separated by at least 100-150 miles, but this distance might have to be varied due to geographical considerations.

The Martlesham Heath Repeater Committee had carried out a series of tests, and it did not appear that the repeater at Barkway, nor the proposed repeater at Bacton on the coast of Norfolk, would serve mobile operators in the Martlesham Heath area. A report on the tests would be submitted to the RSGB and after consideration of this report a reply would be sent to the Home Office.

Presidential Installation

Mr Parsons explained that at the Presidential Installation in Cardiff in January 1975 it would be necessary to limit the number of members and guests who could be present at the function. Unfortunately the accommodation was limited to 150 and Mr Parsons thought that the applications for tickets would exceed this number. Council accepted that, with the exception of special guests, only members and their ladies would be invited and it could well be that a number of members would be disappointed.

Membership and affiliation

It was resolved:

(i) to approve the applications for membership, transfers and reinstatements for August and September and accordingly elect 353 new members;
(ii) to accept reduced subscriptions from 17 members;
(iii) to waive the subscriptions of 16 members on the grounds of blindness or other physical disability
(iv) to grant affiliation to the Kingston and Maldon Scout Radio Group and the Civil Aviation Authority Radio Society.

Council election

It was reported that nominations for the one vacancy for an ordinary member of Council had been received from: Messrs M. Hearsey, G8ATK; P. F. Jobson, G3HLF; G. Packer, G3UUS; D. M. Pratt, G3KEP; and G. M. C. Stone, G3FZL.

One nomination for Zone A had been received from Mr J. R. Petty, G4JW, and two nominations for Zone E had been received from Messrs D. H. Adams, GW3VBP, and D. M. Thomas, GW3RWX.

Scrutineers: Messrs W. E. Corsham, G2UV; P. A. Thorogood, G4KD, J. A. Broadbent, G3AAJ; R. H. Newland, G3VW, and E. Godfrey, G3GC.

It was agreed that in future when details of elections are published in *Radio Communication* a note should be included setting out the conditions to be fulfilled for election to Council.

Trophies

The results of the 1974 ARRL International DX Contest were now known, and Council confirmed the award of the Braaten Trophy to

the leading "G" station, Mr D. Andrews, G3MXJ; and the Milne Trophy to the leading non "G" station, Mr J. M. Robson, GM3CFS, of Orkney.

Council confirmed the award of the Founders Trophy to Mr A. Taylor, G3DME. It was agreed that the Rotab trophy should be awarded to Mr. F. H. Cooper, G2QT. A recommendation of the VHF Committee that the International VHF Trophy be awarded to Mr P. Blair, G3LTF, was accepted.

Committee minutes

Council received the minutes of the following committee meetings: Education (17/8/74), Interference (6/9/74), Mobile & Exhibition (10/9/74), Finance & Staff (12/9/74), HF Contests (19/9/74), VHF (26/9/74), VHF Contests (26/9/74), Telecommunications Liaison (3/10/74).

YOUR OPINION

The Editor
Radio Communication

Sir—I am glad that Arthur Milne has started the hare on the method of identifying ourselves when working in other call areas of the UK than our own, as I have ridden this hobby-horse verbally for many years now and have now summoned up the energy to write on the subject.

Apart from the confusion caused to Arthur and the gallant band of sub-managers, there is much confusion caused to the overseas stations that one works when trying to explain that you are merely G3VIJ on holiday in Wales or out over the Scottish border for the evening. Those who oppose the suggestion that we use our normal prefix and add the suffix call letters of the area in which we find ourselves seem to be mostly worried about the extra time wasted in contests in sending the extra letters. But this is nothing to the time wasted, often fighting QSB and QRM, by a mobile trying to get through to a W4 (who himself probably has signed himself as Mobile 3 or Portable 5) that the GW3VIJ mobile he is working is in fact G3VIJ mobile GW. I am firmly of the opinion that we should drop the /A altogether and sign G3VIJ/G even when working in our own call area. Further, why not adopt the same system for reciprocal licences as some other countries and allow them, the temporary ones anyway, to use their home calls with the appropriate UK suffix.

G. W. Perkins, G3VIJ/GM/GW!

OBITUARIES

The Society records with regret the deaths of the following radio amateurs:

Mr C. M. Benham, G4TZ
Cedric Benham, one of the old-timers of amateur radio, died on 2 December. An accomplished cw operator, he was active on the hf bands and also worked ssb, but in latter years worked rtty for much of his operating time.

Mr E. J. Laker, G6LK
Ted Laker, another of the fast-dwindling band of pioneers, died on 12 November. A member of the Guildford & D RS since the early 'thirties, he was well-known in the Surrey area. He was the first UK amateur to work ZL on 28MHz, in 1936, and was an active dx chaser, being operational on many bands until shortly before his death.

Mr P. H. Rock, G3LN
Phil Rock died at the age of 65 on 20 October. In his early years he was most active on 80m cw, but since the war he had concentrated on 2m. He was a member of the Stourbridge Radio Society.

Mr S. G. Spiegler, G3RIA
Stan Spiegler died on 19 November at the age of 43. He was very active on the hf bands, cw and phone, almost until the time he died.

Mr A. H. Watts, G3FXC
Alf Watts died on 7 November. He was formerly a member of the Wirral ARS, and latterly of the Thames Valley ARTS.

RAYNET

by S. W. LAW, G3PAZ*

MANY reports are received from groups all over the country on the subject of exercises and liaison with user services, and the Raynet Committee is pleased to note, discuss and record these. However, there are two sides to every coin, and rumour has it that there have been instances where user services and even members of the public have expressed adverse comment on our service. If such should come to light in your area, please do not assume that the committee would wish the matter swept under the mat, but send in full details in order that the position may be fully appraised and action or advice initiated.

Set piece exercise

We like to hear of these well-liaised pre-set exercises, (remember the Anglia "rail crash" that went on tv?) and West Sussex (via G3PAX) had a beauty on 24 November. A simulated road crash involving an overturned double-decker, a petrol tanker and several cars plus some 70 "casualties" was set up in the grounds of Sussex University. All services were involved and Raynet was called out by Lewes police to provide both a hospital and police HQ link from the site. Raynet mobiles were passing traffic in a very short time and the three-hour exercise was afterwards proclaimed highly successful by the police. Channels on 144·94 and 145·8MHz were in use simultaneously, the problems of adjacent base stations having been solved. Mobiles were relieved at suitable intervals as would be necessary under the stress of genuine emergency without interruption of traffic.

Around and about

The group in Glasgow appears to have had a busy 1974 to judge from their report. Extensions to equipment and expansion of the liaison with police and Red Cross have kept them busy, apart from various exercises to check on coverage and the best use of equipment and frequencies. A lengthy memo from G3OWF, controller of Kennet and Loddon, shows that this group means business. Not only are the three subsidiary areas (Basingstoke, G8CKN; Reading, G3NBU; Newbury, G8JFS) appraised, but also nine adjacent groups and two main user services plus certain other interested parties. A list of user contacts is included and comprehensive information on call-out and operating discipline with outlines of Raynet function.

The last Southport newsletter seen gave details of the snap exercise used to test call-out. During this session, in which five /M, three /P and two fixed stations participated, a minor unscheduled emergency arose when a junior op fell in the canal! The next "mystery" exercise apparently passed off well and dry, as did the two controllers' meetings held in Manchester and Blackpool. Red Cross liaison is progressing in two new counties.

The Leicester group has sorted out its channel problems and has excellent liaison with user services. Norfolk and East Suffolk have some amusing but pointed comments on how not to operate which may strike home. The proposed technical committee for this area should prove a great asset around Anglia, and we hope that the new Waveney District Council will be able to provide a suitable site for the NE Suffolk group if the original building has to go.

Listening watch

The problem of full-time listening watch has been considered by G3JGO who refers us to an article in the August 1973 issue of *73* on p36. This described an audio trip device as an adjunct to the normal squelch, apparently actuated in the original by a tone produced by a plastic whistle at the calling station. G3JGO kindly appended a basic solid-state circuit for the receiver, the whole operating as a sort of "access tone". Since the use of steady (or gliding) audio is accepted by the UK authority, this might prove a useful source for experiment.

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CONTEST NEWS

October 1974 UHF/SHF Contest results

Most contestants treated the October UHF/SHF Contest as a two-band event. Only two groups submitted logs on three frequencies; almost the whole of the remainder concentrating their efforts on 432MHz and 1,296MHz. Three groups worked 432MHz and 10GHz, but in each case it would appear that their 432MHz score was more a consequence of using this band for talkback rather than as a serious attempt to work 432MHz in its own right. Only one log was received for the 2·3GHz band.

The number of entries was similar to last year; there being 51 against 55, but with a slight shift of emphasis regarding the occupancy of the various bands. The weather unfortunately did not encourage portable activities, and the propagation conditions yielded scores which many stations considered too disappointing to be worth entering a log.

Few contestants had any serious complaints about the timing of the contest, although some expressed their doubts about the wisdom of holding a microwave contest during the first weekend of October. It must be pointed out, however, that there is a microwave event in June, and the October UHF/SHF Contest is timed to be concurrent with the IARU Region 1 UHF/SHF Contest.

The most frequently made comments concerned the choice of a talkback band for the higher frequencies, and the VHF Contests Committee is well aware of the confusion that now exists. At this moment, popular opinion is divided depending upon which end of the uhf/shf spectrum is most favoured, and it may well be that these differences constitute a strong argument for not combining "coaxial" and "waveguide" events in the future.

The awards for this year's event go to the overall winner, the March & D ARS, and to the runner up. G3WDG, both of whom operated as portable stations. G3JVL, as the leading fixed station, also receives a certificate of merit. *G2HIF*

INDIVIDUAL BAND RESULTS

432MHz Fixed Station

Posn	Callsign	Score	QSOs	Best dx	Km	Cnty	Station data
1	G3NHE	18,815	26	ON4PB/P	470	YS	15W ssb/cw 46-el
2	G3JVL	17,750	30	ON4PB/P	375	SX	100W o/p, loop quad
3	G3JXN	13,925	40	ON4PB/P	335	LD	12W o/p 46-el
4	G8EOP	10,965	19	G3DAH	320	YS	80W o/p 46-el
5	G5DF	7,070	23	G3PRM	143	BE	80W in multbm
6	G6XM	6,830	18	G3KMS	230	WE	10W o/p 46-el
7	G8FMK	6,520	25	G3NHE	170	OX	1 W o/p 46-el
8	G2RD	5,560	21	G4DGU/P	103	SY	30W in multbm
9	G3SBV	4,505	23	G3WDG/P	106	LD	10W in 8/8
10	G3COJ	3,045	6	ON4PB/P	360	BS	30W p.e.p. 14-el
11	G8BXJ	1,360	10	G8EDL/P	83	GR	6W o/p 46-el.

432MHz Portable Station

Posn	Callsign	Score	QSOs	Best dx	Km	Cnty	Station data
1	G3PMH	26,759	64	ON/4PB/P	335	HF	150W a.m./ssb 46-el
2	G8AYN	24,775	58	G8EOP	295	—	30W o/p 18 parabm
3	G3WDG	18,695	33	ON4PB/P	426	WE	10W o/p multibm
4	G4DGU	18,460	40	G3KMS	242	BE	20W ssb/cw 32-el
5	G3EDL	17,545	42	G3KMS	260	BE	15W p.e.p. 18 parabm
6	G3WSC	13,819	33	G3NHE	275	SX	15W o/p 2 × 46-el
7	G4ALE	6,105	27	G3WDG/P	110	SY	15W o/p multibm
8	G8DIC	4,860	20	G3DAH	168	HE	6W o/p nbfm 8/8
9	G3RND	1,405	5	G8EDL/P	85	HE	4W ssb Yagi
10	G3WJG	1,245	5	G8EDL/P	83	GR	3W o/p 18-el
11	GM8BKE	655	3	GM3OXX/P	81	SG	5W in 4/4 slot
12	GM3OXX	405	1	GM8BKE/P	81	EL	150mW in 2 × quad

G8ATD log disallowed, Rules 5a, 5b.

1,296MHz Fixed Station

Posn	Callsign	Score	QSOs	Best dx	Km	Cnty	Station data
1	G3JVL	46,875	19	G3KMS	332	HE	40W o/p 4 × loop quads
2	G3JXN	26,575	25	G3JVL	95	LD	5W o/p 34 parabm
3	G6XM	23,060	13	G3KMS	230	WE	20W 42in dish
4	G3NHE	20,150	7	G3DAH	266	YS	10W in 34 parabm
5	G5DF	10,825	11	G4BEL/A	96	BE	10W in 21 parabm
6	G3SBV	9,875	10	G3WDG/P	106	LD	5W in 32-el
7	G2RD	9,730	10	G4BEL/A	84	SY	30W in 36in dish
8	G8FMK	8,400	7	G4BEL/A	72	OX	400mW o/p 14-el
9	G3FYX	8,150	5	G8AYN/P	120	AN	30W in 27-el
10	G3COJ	6,225	5	G3WDG/P	74	BS	7W o/p 8-el
11	G8EOP	2,950	3	G3NHE	45	YS	40W in 34 parabm

1,296MHz Portable Station

Posn	Callsign	Score	QSOs	Best dx	Km	Cnty	Station data
1	G4BEL	56,750	31	G3JVL	151	HF	150/30W cw/ssb 48in dish
2	G3WDG	51,025	22	G3KMS	261	WE	20W p.e.p. 4 × loop quads
3	G8AYN	40,300	25	G4BEL/A	131	HE	12W o/p 72in dish
4	G4DGU	30,625	17	G3KMS	242	BE	7W o/p loop Yagi
5	G8EDL	28,175	19	G8IKO	95	BE	4W o/p 34-el
6	G4ALE	24,750	22	G3WDG/P	110	SY	5W o/p 32-el
7	G8DIC	9,250	10	G4DGU/P	88	HE	5W o/p quad loop
8	G3WJG	4,900	3	G8EDL/P	83	GR	1W 34-el
9	G3WSC	4,725	5	G3JXN	73	SX	30W o/p 34 parabm

G8ATD log disallowed, Rules 5a, 5b.

2·3GHz Fixed Station

Posn	Callsign	Score	QSOs	Best dx	Km	Cnty	Station data
1	G4BYV	2,850	1	G3LQR	57	NK	0·5W o/p 48in dish

10·0GHz Portable Station

Posn	Callsign	Score	QSOs	Best dx	Km	Cnty	Station data
1	G3KSU	27,800	4	G8AZU/P	85	HE	80mW Gunn osc horn 2 × 1N23g bal mixer
2	GM3OXX	22,000	3	GM8BKE/P	81	EL	10mW Gunn osc 24in dish
3	GM8BKE, GM8HBU	18,900	3	GM3OXX/P, GM8GEC/P	81	SG	20mW Gunn osc 24in dish
4	GM3DXJ	17,000	4	GM3OXX/P, GM8GEC/P	58	WL	10mW o/p 24in dish
5	G8AZU	15,500	3	G3KSU/P	85	BE	120mW 30in dish CV2154 mixer
6	G4WDG	9,200	2	G3KSU/P	82	WE	40mW 15in dish S1M2 mixer

SWL Section

Posn	Callsign	432MHz	1,296MHz	Total score
1	BRS26431	6,280	—	6,280
2	BRS33823	2,880	—	2,880
3	A8016	2,410	—	2,410
4	BRS15822	580	750	1,330
5	BRS34348	530	—	530*

BRS26431 receives a certificate of merit, and all scores go forward for the Listener's Championship.
* Rule 5a.

OVERALL RESULTS

Posn	Group	Points	432MHz	1,296MHz	2·4GHz	10GHz
1	March & D ARS	83,509	G3PMH/A	G4BEL/A	—	—
2	G3WDG/P	78,920	G3WDG/P	G3WDG/P	—	G3WDG/P
3	G8AYN/P	65,075	G8AYN/P	G8AYN/P	—	—
4	G3JVL	64,600	G3JVL	G3JVL	—	—
5	Echelford ARS	61,220	G8EDL/P	G8EDL/P	—	G8AZU/P
6	Newbury & DARS, Berkshire Country, Gentlemen's VHF/UHF Gp	49,085	G4DGU/P	G4DGU/P	—	—
7	G3JXN	42,500	G3JXN	G3JXN	—	—
8	G3NHE	38,965	G3NHE	G3NHE	—	—
9	Addiscombe ARC	30,855	G4ALE/P	G4ALE/P	—	—
10	G6XM	29,890	G6XM	G6XM	—	—
11	Vectis VHF Gp	29,265	G3RND/P	—	—	G3KSU/P
12	GM3OXX/P	22,405	GM3OXX/P	—	—	GM3OXX/P
13	GM8BKE/P	19,555	GM8BKE/P	—	—	GM8BKE/P
14	Crawley ARC	18,544	G3WSC/P	G3WSC/P	—	—
15	G5DF	17,895	G5DF	G5DF	—	—
16	G2RD	15,290	G2RD	G2RD	—	—
17	G8FMK	14,920	G8FMK	G8FMK	—	—
18	G8DIC/P	14,110	G8DIC/P	G8DIC/P	—	—
19	G8EOP	13,915	G8EOP	G8EOP	—	—
20	G3COJ	9,270	G3COJ	G3COJ	—	—
21	G3WJG/P	6,145	G3WJG/P	G3WJG/P	—	—
22	G4BYV	2,850	—	—	G4BYV	—
23	G8BXJ	3,160	G8BXJ	—	—	—

Luton UHF/SHF Gp—Entry not valid, Rules 5a, 5b, 5c.

70MHz CW Contest rules

0900-1300gmt 19 January.

All entries and checklogs to: VHF Contests Committee, c/o G3FZL, 11 Liphook Crescent, London, SE23.

The following general rules, published in this issue of *Radio Communication*, will apply: 1, 2, 3, 4b, 5a, 6b, 7a, 8b, 9a, 10a, 11-22.

144MHz CW Contest rules

2000-0100gmt, 18-19 January.

All entries and checklogs to: VHF Contests Committee, c/o G3FZL, 11 Liphook Crescent, London, SE23.

The following general rules, published in this issue of *Radio Communication*, will apply: 1, 2, 3, 4b, 5a, 6b, 7a, 8b, 9a, 10a, 11-22.

November 1974 144MHz CW Contest results

The contest this year was, as predicted in the February 1974 issue of *Radio Communication*, held on 2m only. Disappointingly, the entry was down on last year when the contest was multi-band, falling from 25 to 22. Conditions, however, were mostly poor and this may have discouraged some possible entrants. Nevertheless activity was good and contestants enjoyed themselves.

Quotes: "I am happy to say that the use of co-channel operating is now almost universal"—G3NHE. "The lack of northern England stations was most pronounced—were they all coming back from the Leicester exhibition?—G3OZF. "Very much enjoyed the contest . . . perhaps an extra cw affair could be slipped in during the summer months"—G3YYF.

The winner will be awarded a certificate. G3RSD is thanked for his checklog. *G3FZL*

Posn	Callsign	Points	QSOs	Best dx	Km
1	GW3UCB/P	511	58	ON8IW	560
2	G3NHE	276	40	G3XDV	287
3	G8GP	226	48	F9FT	370
4	G3KMI	223	41	ON8IW	380
5	G3DAO	215	33	PA0RDY	430
6	G3OZF	201	43	F9FT	442
7	G3NSM	197	45	PA0MER	425
8	G3AKF	175	39	F9FT	450
9	G4DLB	167	33	ON4PB/P	425
10	G3WZT/P	156	35	F9FT	371
11	G3YYF	138	24	GW3UCB/P	335
12	G3TQZ	123	30	G3IUD	308
13	G3WOI/A	111	31	F9FT	
14	G5UM	105	26	G3BHW	198
15	G4ALG	88	30	PA0LSC	400
16	G3OZT	79	20	G3NHE	280
17	G5HD	63	17	G3NHE	270
18	G4DDL	58	28	GW3UCB/P	243
19	G3FPK	55	13	GW3UCB/P	280
20	G3GC	44	26	G3KMI	
21	G4BRX	42	14	G3WYV	199
22	G4BKY/A	5	1	G4CWW	

80m Field Day results

There were only 12 entries this year although 17 G portable stations were active, indicating less activity than in recent years. Conditions were generally good with a high level of activity from fixed stations enabling the leaders to make over 90 contacts.

The winning station G4ALE was operated this year by G3SJX and G3XJO from near Oakham, with an FT101, 2E26 pa, and a dipole at 60ft. In second place G3VOC was operated by G3ANK and G3VLT from Sidcup, Kent, with a home-brew transmitter, a TT11 pa, SB303 receiver, and a dipole. In third place last year's runner-up G3LHJ once again operating alone for the whole period. His gear was all home-brew and transistorized except for the 2E26 pa.

The Houston Fergus Trophy will be presented to G4ALE. Certificates will be sent to all other entrants. *G3TR*

Posn	Callsign	QSOs	Points	Posn	Callsign	QSOs	Points
1	G4ALE/P	95	630	7	GW3HGL/P	63	440
2	G3VOC/P	86	580	8	GM4ASY/P	59	420
3	G3LHJ/P	83	540	9	G3RDI/P	51	375
4	G4AUU/P	78	535	10	G6YB/P	42	315
5	G3VW/P	77	530	11	G6GH/P	33	270
6	G3JKY/P	64	460	12	G4DDX/P	37	175

An entry from G3VDF was disallowed under general rule 8(f).

Check logs were received from G4CMI, G3ZDW, G3DNF and G4BWP, and an excellent check log was received from Richard Ware, BRS32457. The HF Contests Committee thanks these members for their logs which were most useful.

432MHz SSB Contest results

Posn	Callsign	Points	QSOs	Cnty	Best dx	Km
1	GW3UCB/P	300	50	DB	ON6DH	554
2	G3NHE	107	27	YS	G3JVL	280
3	G4DGU	101	25	BE	G3KMS	238
4	G3JXN	96	30	LD	ON5FF	285
5	GD2HDZ	73	11	IM	G3NHE	230
6	G8FJG	67	19	EX	GW3UCB/P	282
7	G8EOP	57	16	YS	G3JXN	250
8	G8ABH	54	20	SY	GW3UCB/P	290
9	G3FEC/A	46	12	WE	G3NHE	195
10	G3COJ	43	11	BS	G3KMS	255
11	G8DCA	40	8	SX	ON5FF	268
12	G4BWW	39	15	LE	G3NHE	120
13	G8DEN/P	31	11	DY	GW3UCB/P	105

Conditions poor; entry very poor; comment superfluous.

G5HD

432MHz Open Contest rules

1000-1700gmt 2 February.

All entries and checklogs to: VHF Contests Committee, c/o G5HD, 100 Shirley High Street, Southampton.

The following general rules, published in this issue of *Radio Communication*, will apply: 1, 2, 3, 4b, 5a, 6a, 7a, 8b, 9a, 10a, 11-22.

First 1·8 MHz Contest 1975 rules

1. The General Rules for RSGB HF Contests, published in this issue of *Radio Communication*, will apply.

2. When. 2100gmt Saturday 8 February to 0200gmt Sunday 9 February 1975.

3. Contacts. CW (A1) only in the 1·8MHz band. The new county code letters, published in this issue of *Radio Communication*, must be sent after the report/serial number group—eg for a contact from Surrey, 579001 SRY.

4. Scoring. Six points for each of the first six contacts with stations in any one county; three points for the seventh and subsequent contacts with stations in that county; six points for each contact with a station outside the UK.

5. Logs. Column 5 should be headed "County code letters received". Entries must be addressed to: The HF Contests Committee, c/o M. Harrington, 123 Clensham Lane, Sutton, Surrey SM1 2ND.

6. Awards. The Somerset Trophy will be awarded to the winning station, and Certificates of Merit to the second- and third-place entrants. The Maitland Trophy will be awarded to the Scottish entrant with the highest aggregate number of points in this contest combined with the 2nd 1·8MHz Contest 1974.

A Certificate of Merit will be awarded to the highest placed entrant whose 18th birthday falls on or after 14 February 1974. Entrants wishing to compete for this award should state their date of birth on the cover sheet, and mark clearly at the TOP of the sheet "Under 18". Entries will only be eligible for this award where operation has taken place under the entrant's own callsign, and from the "main address" as stated on the station licence.

Contests calendar

11-12 January —AFS (Rules in November/December issues)
11-12 January —Yugoslav 3·5MHz DX
18-19 January —144MHz CW (Rules in this issue)
19 January —70MHz CW (Rules in this issue)
24-26 January —CQ WW 160m DX
25-26 January —French CW
1-2 February —ARRL DX Phone
2 February —432MHz Open (Rules in this issue)
8-9 February —1st 1·8MHz (Rules in January issue)
15-16 February—ARRL DX CW
22-23 February—French Phone
1-2 March —144MHz Open and SWL
1-2 March —ARRL DX Phone
8-9 March —BERU (Rules in December issue)
15-16 March —ARRL DX CW
5-6 April —70MHz Open and SWL
12-13 April —EEC DX
13 April —80m Low Power
27 April —1,296MHz Open
4 May —432MHz Open and SWL
31 May-1 June—144MHz Portable
7-8 June —HF NFD
22 June —Microwave
28-29 June —Summer 1·8MHz
5-6 July —RSGB VHF Open and SWL (Jubilee)
12-13 July —SSB Field Day
27 July —144MHz QRP
9 August —70MHz Portable
6-7 September—VHF NFD and SWL
14 September —80m Field Day
4-5 October —RSGB UHF Open and SWL
11-12 October —21-28MHz
18-19 October —7MHz CW
1-2 November —144MHz Open
1-2 November —7MHz Phone
8-9 November —2nd 1·8MHz
16 November —432MHz Open
7 December —144MHz Fixed

General rules for RSGB hf contests

The general rules for all RSGB hf contests are given below. For each contest throughout the year a short supplementary set of rules will be published which must be read in conjunction with the general rules. *Note that Rule 12 is new, and there are minor revisions to Rules 8(g), 10(b) and 11.*

Reprints of these general rules will be available from HQ upon request.

1. Entrants must operate in accordance with the terms of their licence.

2. Contacts with unlicensed stations will not count for points.

3. Only one contact on each band may be claimed with a specific station, whether fixed, portable, mobile or alternative address. Duplicate contacts must be logged and clearly marked as duplicates without claim for points. Cross-band contacts may not be claimed. Proof of contact may be required. Simultaneous operation on more than one band is not permitted.

4. (a) A fixed station must operate from the address shown on the licence.

(b) A portable station must operate from the same site for the duration of the contest and may not be located in a permanent building or use public mains. Power for all equipment may be derived only from a portable generator on the site, accumulators or batteries. No equipment or aerials may be installed or erected on the site prior to 24 hours before the start of the contest. This does not apply to the storage of equipment.

(c) A mobile station is a station installed in a motor vehicle, or vessel on an inland waterway, so equipped that the station may be operated in motion without alteration.

(d) An alternative address station is a station at a location not named on the licence, other than a portable or mobile station.

5. Unless otherwise stated, single-operator entries only will be accepted.

(a) A single-operator station is one manned by an individual operator who receives no assistance whatsoever in operating, log keeping or checking etc from other persons during the contest period.

(b) A multi-operator station is one which does not conform to the definition of a single-operator station given above. In those contests where multi-operator entries are allowed, such entries will only be accepted provided that:

(i) The declaration is signed by only one operator, who will be regarded as the entrant,

(ii) The callsign of the operator concerned is indicated for each contact,

(iii) The names and callsigns of all operators are listed on the cover sheet, and

(iv) For stations located in the British Isles, all operators must be fully-paid-up members of the RSGB.

6. Eligible entrants. Unless otherwise stated, only fully-paid-up members of the RSGB resident in G, GC, GD, GI, GM and GW may enter. In those contests which are open to radio amateurs elsewhere, British Isles entrants (as defined above) must be members of the RSGB. Entries from GB stations, aeronautical mobile and maritime mobile stations will not be accepted.

7. A **contact** consists of an exchange and acknowledgement of contest information. This consists of an RS report on telephony, or an RST report on telegraphy, and a three-figure serial number starting with 001 for the first contact and increasing by one for each successive contact throughout the contest, irrespective of the band or mode in use. The supplementary rules for specific contests may call for additional information to be exchanged.

8. Form of entry.

(a) Entries must be clearly written or typed on one side only of RSGB contest log sheets or international A4 size paper. Columns must be headed as shown in the example below.

(b) *Separate log sheets must be used for each band.*

(c) Logs must be kept, and entries submitted, in gmt.

(d) Each entry must include a cover sheet in the form shown below incorporating a signed declaration.

HF Contest Entry Cover Sheet (Form HFC2)

Contest ..... Date ..... Score .....

Section (if any) ..... Callsign .....

Name .....

Home address .....

Name of club or group (if applicable) .....

Address of station, or portable location (if other than home address above) .....

National Grid six-figure reference, county code letters, or other co-ordinates (see contest details) .....

Transmitter ..... Input power .....

Receiver ..... Aerial(s) .....

Declaration. I declare that this station was operated strictly in accordance with the rules and the spirit of the contest, and I agree that the decision of the Council of the RSGB shall be final in all cases of dispute. I certify that the maximum input to the final stage of the transmitter was ..... watts.

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

Failure to sign the declaration will involve disqualification of the entry.

RSGB contest log sheets and cover sheets may be obtained from HQ upon request. The request must be accompanied by a large sae.

(e) All entries become the property of the RSGB. In the event of any dispute the ruling of the Council of the RSGB shall be final.

(f) All entries must be postmarked not later than 15 days following the contest. If acknowledgement of receipt is required, British Isles entrants should include a stamped addressed postcard which will be returned to the sender. Overseas entries will not normally be acknowledged. Overseas entrants should ensure that their logs reach the adjudicators within eight weeks of the date of the contest.

(g) Unless otherwise stated, entries must be addressed to the HF Contests Committee, Radio Society of Great Britain, 35 Doughty Street, London WC1N 2AE, England, with the name of the contest marked in the top left hand corner.

9. For scoring purposes, aeronautical mobile and maritime mobile stations will count as mobile stations in the country of origin.

10. Awards

(a) Awards are made at the discretion of the Council of the RSGB and may consist of trophies, plaques or certificates. Awards are, where possible, presented at the Annual General Meeting following the contest.

(b) The standard award format for contests is as follows: Some winners and section leaders will be the holders of particular trophies, and these will also receive a special certificate or plaque. Certificates of Merit will be awarded to the entrants placed first, second and third in each section of the contest, from (i) the British Isles and (ii) overseas.

11. Disqualification. Entrants may be disqualified on any one of the following counts:

(a) Failure to complete and sign the declaration.

(b) Frequent tone reports of T8 or less.

(c) Failure to record operators' callsigns against log entries (multi-operator entries only).

(d) Failure to use separate log sheets for each band.

(e) Failure to observe the terms of the entrant's licence.

Failure to observe and comply with other rules may also entail disqualification.

12. Errors in log. Points are deducted as follows:

(a) For errors in received information, on a proportional basis (eg one-third of points claimed for one error, two-thirds for two errors, etc);

(b) For errors in callsign, both sides lose *all* points for the contact;

(c) For unmarked duplicate contacts for which points have been claimed, additional penalty points may be deducted (eg five times the claimed score for that contact).

Form HFC1 **RSGB CONTEST LOG SHEET** Band .....

Contest ..... Sheet No. ..... Callsign .....

Date and time (gmt)	Callsign of station worked	My report on his signals and serial No SENT	His report on my signals and serial No RECEIVED	(5)	(6)	(7)	Points claimed

General rules for vhf/uhf/shf contests 1975

The rules governing all RSGB vhf/uhf/shf contests to be held in 1975 will be selected from the following general rules, which will be referred to by number. Supplementary rules will be added for the more complex events such as VHF NFD.

The contents of this year's rules are very similar to last year's but they have been re-grouped in a more logical sequence, and reduced in number by four.

Please read these rules carefully.

Contest stationery. Once again the VHF Contests Committee makes its annual plea: use only up-to-date RSGB vhf/uhf contest stationery. It is designed for both your convenience and ours. If you find photocopying cheaper than SAEs, make sure you are copying the up-to-date version.

Stationery can be obtained from any contest adjudicator at the addresses given with contest rules. If you are entering a contest it is only necessary to tick the bottom of the cover sheet (Form 427) and enclose an sae. All stationery is A4 size (30 by 21cm); envelopes which will hold flat sheets will carry far more than those which require the sheets to be folded.

1 Date and time. See individual contest details.

2 All entries must be sent to the adjudicator at the address given with the rules for the contest.

3 All operators must be fully paid-up members of the RSGB.

4 Sections:

(a) There are two sections:
Section F —fixed stations;
Section P —portable and temporary stations.
If less than 10 entries are received for either section, Rule 4b will apply instead.

(b) All classes of stations with no separate sections.

(c) Fixed stations only.

(d) Portable stations only.

/A stations in which the equipment is a permanent installation are regarded as fixed stations. /A stations in which the equipment has been installed for the contest will be listed with portable stations, but may not enter portable contests run under Rule 4d.

All equipment, including aerials, for portable and temporary stations must be installed on the site during the 24 hours preceding the contest, or during the contest itself. This does not apply to storage of equipment, or to its prior installation more than 1km away from the contest operating position.

Portable stations may be required to provide proof of permission to use a site.

5 Location

(a) Entrants may not change the location of their stations during the contest.

(b) Entrants may change the location of their stations during the contest on one occasion provided that only the highest scoring contact with a given station is claimed in the event of a repeat contact. Repeat contacts must be clearly marked as such in the contest log.

6 Modes

(a) Contacts may be made on all permitted modes.

(b) Entrants may transmit only A1 (cw) or F1 (fsk) and contact only other stations transmitting these modes.

(c) Entrants may transmit A3j (ssb) only, but cross-made contacts are valid.

7 Scoring system

(a) Contacts made between the distances shown in the table will score as indicated. Contacts on borders between scoring rings score **low.**

Km	Points	Km	Points
0–50	1	250–300	11
50–100	3	300–350	13
100–150	5	350–400	15
150–200	7	400–450	17
200–250	9	and pro rata	

Note that, (i) all radial rings are 50km wide, (ii) all possible scores are **odd** numbers.

(b) Contacts will be scored at one point/kilometre.

8 Awards

(a) In each section there will be an award to the highest scoring station. An award will also be made to the runner-up in each section in which there are 10 or more entries.

(b) Awards will be made to the highest scoring station and the runner-up. If both are portable stations an award may be made to the highest scoring fixed station.

9 Cross-band contacts

(a) Cross-band contacts do not count for points.

(b) On each band to be used for scoring in the contest, half points may be claimed for a cross-band contact by transmitting to, or receiving from, a station where two-way communication cannot be established. (Points may not be claimed on the same band for a further cross-band contact with the same station with the transmitting and receiving roles reversed, see Rule 10a)

10 Repeat contacts

(a) Only one scoring contact may be made with a given station on each band covered by the contest. (ie callsigns that are fixed, /A, /P or /M or the same set of equipment used under a different callsign all count as one station.) If a station that has moved location is contacted a second time, only the higher scoring contact may be claimed. Serial numbers start at 001 and advance by one for each contact.

(b) One contact may be made with a given station (as defined in 10a) during each activity period. Only three out of seven activity periods will count towards the final score. However, all available logs should be sent to the adjudicator for the purposes of checking. To be eligible for an award, an entrant must take part in a minimum of three activity periods. Serial numbers start at 001 for each activity period and advance by one for each contact.

11 Contest exchange

The contest exchange shall consist of:

(a) Both callsigns;

(b) RS or RST report followed by serial number;

(c) Both QTH locator (the standard five-symbol location system) and QTH.

QTH must be given as a point identifiable on the Ordnance Survey 10-mile or 1:625,000 maps, or as a bearing and distance up to 25km from such a point, to the nearest kilometre.

No points will be lost if an entrant is unable to obtain a serial number or complete location information from a station not taking part in the contest. But the receiving operator must obtain enough information to be able to calculate the claimed distance score.

12 Log keeping

Entrants must keep their own log records in accordance with licence requirements.

The logs for contest entries must be made out on current RSGB vhf/uhf contest log sheets, which are tabulated as follows:

(a) Date/time (gmt);

(b) Callsign of station worked;

(c) My report on his signals and serial number sent;

(d) His report on my signals and serial number received;

(e) QTH locator received;

(f) QTH received;

(g) Points claimed.

13 An entrant must operate within the terms of his/her licence.

14 An entrant may not engage in more than one contact concurrently.

15 Stations using telephony in the recognized cw sub-bands 70·025–70·1MHz, 144·0–144·15MHz, 432·0–432·15MHz and 1,296·0–1,296·15MHz, or transmitting on beacon frequencies, are liable to disqualification. Entrants are also encouraged to observe the other provisions of the RSGB/IARU bandplans.

16 Stations that persistently overmodulate, radiate poor quality signals, or otherwise contravene the code of practice for vhf/uhf contest operation (see p 50), are liable to disqualification.

17 Special event callsigns (eg GB) may not be used.

18 Contacts made via a repeater or man-made satellite will not count for points.

19 Proof of contact may be required.

20 Entries

(a) All entries must be accompanied by an RSGB vhf/uhf contest cover sheet (Form 427). The cover sheet must be correctly made out and the declaration signed.

(b) All entries must be postmarked not more than 15 days after the end of the contest.

(c) All entries become the property of the RSGB and will not be returned.

(d) Gross errors in claimed score render the entrant liable to disqualification.

21 Failure to comply with any of the rules given for a particular contest may result in disqualification.

22. The ruling of the Council of the RSGB shall be final in all cases of dispute.

General rules for RSGB hf receiving contests

1. All entrants operating from the British Isles must be fully-paid-up members of the RSGB.
2. Single-operator entries only will be accepted.
3. To claim for points, a station may be logged once only on each band, whether fixed address, portable, mobile or alternative address.
4. A receiving station log must show in columns: date/time, callsign of station heard, report and serial number sent by station heard, callsign of station worked, band in megahertz, bonus points total points.
5. Where two or more bands are in use, separate log sheets must be submitted for each band.
6. In the column designated for "station worked", the same callsign shall not appear more than 20 times on each band throughout the contest.
7. A cover sheet shall be submitted with a contest log as under transmitting section General Rule 8(d) except that the last sentence of the declaration shall read: "I certify that I do not hold a transmitting licence."
8. The following rules from the transmitting section general rules also apply to receiving contests: 5(a), 8(e), 8(f), 8(g), 9, 10(a), 10(b), 11(a), 11(d), 12(a), 12(c).

General rules for listeners' vhf/uhf contests 1975

1. Dates and times. As for the concurrent transmitting contests.
2. Entries should be sent to the adjudicator of the transmitting contest, at the address given, and must be postmarked not more than 15 days after the end of the contest.
3. Listeners' contests are open to all non-licensed fully-paid-up members of the RSGB. Only the entrant may operate the receiving station.
4. The station must remain at the same site for the duration of the contest, although portable operation is permitted.
5. Points will be scored in the same manner as in the transmitting contest (Rule 5).
6. Logs must show in columns: (a) date/time (gmt), (b) callsign of station heard, (c) my report on his signals, (d) report and serial number sent by station heard, (e) callsign of station being worked (f) location given by station heard, (g) points claimed.
   On 144MHz the callsign in column (e) may occur only once in every 20 contacts logged. CQ and test calls do not count for points and should not be logged.

The Hanson Trophy will be awarded to the entrant with the highest aggregate score in all the swl contests between 1 March and 7 September.

Code of practice for vhf/uhf contest operation

1. Obtain permission from the landowner or agent before using the site, and check that this permission includes right of access. Portable stations should observe the Country Code.
2. Take all possible steps to ensure that a site is not going to be used by some other group or club. If it is, come to an amicable agreement *before* the event. Groups are advised to select possible alternative sites.
3. *All transmitters* generate unwanted signals; it is the level of these signals that matters. In operation from a good site, levels of spurious radiation which may be acceptable from the home station may well be found excessive by nearby stations (up to 25 miles or even further).
4. Similarly, *all receivers* are prone to have spurious responses or to generate spurious signals in the presence of one or more strong signals, even if the incoming signals are of good quality. Such spurious responses may mislead an operator into believing that the incoming signal is at fault, when in fact the fault lies in his own receiver.
5. If at all possible, critically test both receiver and transmitter for these undesirable characteristics, preferably by air test with a near neighbour before the contest. In the case of transmitters, aim to keep all in-amateur-band spurious radiations, including noise modulation, to a level of —90dB relative to the wanted signal. Similarly, every effort should be made to ensure that the receiver has an adequate dynamic range.
6. Above all, be gentlemanly at all times. Be helpful and *inform all stations* apparently radiating unwanted signals at troublesome levels—having first checked your own receiver! If asked to close down by a Government or Post Office official, do so at once without objectionable behaviour. If the site owner requests your station to close down, accede to his request without hostility.

Code letters for use in RSGB contests

The codes which have been in use for some years have been revised as a result of recent local government changes. Three letters are used to avoid confusion with the old county codes. These codes will be used from the 1st 1·8MHz Contest 1975. It is appreciated that the Scottish regional changes are not official until May 1975, but the new codes will be used in anticipation of this.

County/Region	Letters	County/Region	Letters	County/Region	Letters	County/Region	Letters
Alderney	ALD	Durham	DHM	Isles of Scilly	IOS	Salop	SLP
Antrim	ATM	Dyfed	DFD	Isle of Wight	IOW	Sark	SRK
Armagh	ARM					Shetland	SLD
Avon	AVN	Essex	ESX	Jersey	JER	Somerset	SOM
		Fermanagh	FMH	Kent	KNT	Staffordshire	SFD
Bedfordshire	BFD	Forth	FRH			Strathclyde	SCD
Berkshire	BRK			Lancashire	LNH	Suffolk	SFK
Borders	BDS	Mid Glamorgan	GNM	Leicestershire	LEC	Surrey	SRY
Buckinghamshire	BKS	South Glamorgan	GNS	Lincolnshire	LCN	East Sussex	SXE
		West Glamorgan	GNW	Greater London	LDN	West Sussex	SXW
Cambridgeshire	CBE	Gloucestershire	GLR	Londonderry	LDR		
Central	CTR	Grampian	GRN			Tayside	TYS
Cheshire	CHS	Guernsey	GUR	Greater Manchester	MCH	Tyne & Wear	TWR
Cleveland	CVE	Gwent	GWT	Merseyside	MSY	Tyrone	TYR
Clwyd	CWD	Gwynedd	GDD				
Cornwall	CNL			Norfolk	NOR	Warwickshire	WKS
Cumbria	CBA	Hampshire	HPH	Northamptonshire	NHM	Western Isles	WIL
		Hereford & Worcester	HWR	Northumberland	NLD	West Midlands	WMD
Derbyshire	DYS	Hertfordshire	HFD	Nottinghamshire	NOT	Wiltshire	WLT
Devon	DVN	Highlands	HLD	Orkney	OKE		
Dorset	DOR	Humberside	HBS	Oxfordshire	OFE	North Yorkshire	YSN
Down	DWN					South Yorkshire	YSS
Dumfries & Galloway	DGL	Isle of Man	IOM	Powys	PWS	West Yorkshire	YSW

CLUB NEWS

RSGB Affiliated Societies and Clubs, and RSGB Groups, are invited to submit items for inclusion in this section to their Regional Representatives (not direct to the editor), whose addresses appear on page 17 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: 29 January; 26 March.

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

Ainsdale (ARC)—Thursdays fortnightly, 8.15pm. 2, 16, 30 Jan., 13, 27 Feb. Ainsdale Scout Headquarters. Further details from N. Horrocks, G2CUZ, QTHR.

Blackburn (ELARC)—First Thursday in each month, 7.30pm. YMCA, Shearbank Road, Blackburn. Visitors always welcome. Sec W. E. Baxendale, G8FDG, "Juverna", Westland Ave, Darwen, Lancs.

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

Bolton (B & DARS)—3rd Wednesday in each month, 8pm. Clarence Hotel, Bradshawgate. Sec S. Macdonald, G4AQB, 8 Archer Avenue, Bolton.

Bury (B & RRS)—Second Tuesday in each month, informal meetings every other Tuesday; Morse and RAE classes are in full swing, Mosses Community Centre, Cecil Street, Bury. The junk sale was again a great evening and a large crowd of members enjoyed it. By the time this is published a new committee should have been formed and Christmas enjoyed. Happy New Year to all the clubs.

Carlisle (C & DARS)—Mondays, 7.30pm. Currock House, Lediard Avenue, Currock, Carlisle. A very full programme of lectures and demonstrations has been arranged for the coming months. Full details from G8DVD QTHR.

Cheshire (M-C ARC)—Wednesdays, 7pm. Technical Activities Centre, Winsford Verdin Comprehensive School, Grange Lane Winsford. Nets on 160m, 7pm Mondays; on 2m, 7pm Tuesdays; on 10m, 7.30pm Thursdays. On Tuesdays RAE classes and slow morse transmissions are available. Please see sec G3SIQ for details. Chairman is G3JWK.

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

Douglas IoM (D & DARS)—Sec 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, 11am Sundays on 145·66MHz. All visitors and prospective members welcome. Sec G4AEQ QTHR.

Lancaster University (UoLARS)—Wednesdays, 7pm. Furness College. RAE and morse classes. The society is active on the hf bands and 2m using G3ZBY and G8DOU. Skeds and visits welcomed; enquiries please to Colin Pegrum, Department of Physics.

Leyland Hundred ARG—2nd Monday in each month, 7.30pm. Rose & Crown, Ulnes Walton, Leyland. Net night Saturdays 2000 gmt on 145·8MHz. Details from F. Harrison, G3XII, 78 Lancaster Lane, Leyland Lancs.

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

Liverpool (NLRC)—Tuesdays 8.30pm. Informal meetings. "Nags Head", Thornton, Crosby, Liverpool 23. Visitors welcome. Sec R. B. Porter, 11 Cranmore Avenue, Crosby, Liverpool L23 0QD.

Liverpool University (UoLARS)—Full details of forthcoming arrangements may be obtained from J. M. Pagett, G8IAV, c/o The Students Union.

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

Manchester (SMRC)—Fridays, 8pm. Sale Moor Community Centre, Norris Road, Sale, Cheshire. VHF and df lads meet on Mondays, 8pm, at the club shack, "Greeba", Shady Lane, Manchester 23. Visitors are always welcome either night. On Fridays, morse lessons precede talks etc. 10 Jan. ("Some further thoughts on propagation—was Marconi right?" tape slide lecture by P. Gowen, G3IOR), 17 Jan. (Club project, progress report), 24 Jan. ("Frequency measurement and standard frequency transmissions" by M. Barnsley, G3HZM), 31 Jan. (Night on the air), 7 Feb. ("Atomic structure and semiconductor action" by M. J. Ware, G4BJT), 14 Feb. (Club activities, a slide review of club activities), 21 Feb. ("The club's G2DAF Linear Amplifier" by D. C. Holland, G3WFT), 28 Feb. (Surplus equipment sale. Non members most welcome and can bring items to sell). *G3WFT.*

Manchester University (ARS)—Full details for forthcoming arrangements may be obtained from secretary G. T. Phelan, G8EPS, c/o The University Union.

University of Manchester (UoM—IoS&TARS)—G3CXX is active on all hf bands and G8FOT on 2m and perhaps 2cm. 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. Morse practice 7.30pm, main feature 8pm. 2, 16, 30 January; 13, 27 February.

Salford (DHRS)—Wednesdays 5pm. Dial House, Chapel Street, Salford. Members assemble in canteen and proceed to club room on roof. Sec G3WFW QTHR.

Stockport (SRS)—2nd and 4th Wednesdays in each month, 8pm, Blossoms Hotel, Buxton Road, Stockport, Sec G. R. Phillips, G3FYE, 6 Ross Avenue, Davenport, Stockport.

Thornton Cleveleys (ARS)—1st and 3rd Wednesdays in each month, 8pm, morse practice from 7.30pm. St John Ambulance Hall, Fleetwood Road North (next to Gardener's Arms), Thornton. Details from F. Hill, G3YWH, 45 Preston Old Road, Blackpool, FY3 9PR.

Warrington (W & DARS)—Tuesdays, 8pm. Thames Board Mills Social Club, Alford Hall, Manchester Road, Warrington, Sec G. H. Read, 2 Princess Avenue, Great Sankey.

Wirral (WARS)—1st and 3rd Wednesdays in each month, 7.45pm. Sports and Recreation Centre, Grange Road West, Claughton, Birkenhead. Please note new secretary is G3DLF, QTHR.

Wirral (WDXA)—Last Tuesday in each month at members' homes. Visitors are welcome. Please inform sec G3XJZ, QTHR beforehand.

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

REGION 2 **RR J. E. Agar, G8AZA**

Barnsley (B & DARC)—Fridays fortnightly, 7.30pm. King George Hotel, Peel St, Barnsley. G3LRP, QTHR.

Bradford (BRS)—10 Southbrook Terrace, Great Horton Road, Bradford 7. G3HJP, QTHR.

Goole (G & D ARS)—Fridays, 7pm. Grammar School, Goole. G8ERX, QTHR.

Halifax (Northern Heights ARS)—Fridays, Peat Pitts Inn, Ogden. G3MDW, QTHR.

Harrogate (H & KRS)—Mondays, 7.30pm. New address Christchurch FE Centre, Church Square, Harrogate. Details from G8IBB or G2CAS, QTHR.

Hull (H & DARC)—592 Hessel Road, Hull. 10 Jan. ("DX on the xtal set" by G3WWD), 17 Jan. (Club dinner), 24 Jan. (Film night by G3LUR), 31 Jan. (AGM), 7 Feb. ("Mobile transmission" by G4BHF), 14 Feb. ("The finishing touch" by G8IED) 21 Feb. ("Aerials" by G3PQY) 28 Feb. ("Mystery talk" by G3RDM). *G3PQY.*

Leeds (White Rose RS)—8 Jan. ("Coil making" by D. Foster, G3WFS). 8pm, Wednesdays. 83 Town St, Armley, Leeds 12. Also first Sunday in each month, 10am to 1.30pm. G4CUY, QTHR.

Otley (ORS)—Tuesdays. 14 Back of Court House St, Otley, Yorks. Details from H. S. Johnstone, 12 Rumple Croft, Newall Carr, Otley LS21 2RE. Tel Otley 2850.

Scarborough (SARS)—Fridays, 7.30pm. Technical College, Scalby Road, Scarborough. Club callsign G4BP. Hon sec G3VAN, PRO G8KJ.

South Shields (SS & DRC)—Fridays, 8pm. Trinity House Social Centre. Laygate, South Shields.

Sunderland (SARC)—7 Jan. ("Principles of common control working in telephone exchanges" by B. G. Robinson, TEng(CEI), MITE), 21 Jan. ("Slow scan television" by J. Melvin & J. Kirkman from MK Products), 4 Feb. (Committee meeting). Sunderland Polytec, Priestmans Buildings. Details from P. Barker, 15 Buttermere St, Grangetown, Sunderland SR2 9NJ.

York (Fulford ARS)—Tuesdays, 7.30pm. Scout HQ, 31 George St, York. G5KC, QTHR.

York (YARS)—Thursdays, 7.30pm. 61 Micklegate, York. Visitors always welcome. Hon sec K. R. Cass, G3WVO, QTHR.

REGION 3 **RR B. Kennedy, G3ZUL**

Birmingham (MARS)—Birmingham and Midland Institute, Margaret Street, *G8GOC*.

(Slade)—Alternate Fridays, 8pm. The Committee Room, Church House, Erdington. *G4BRT*.

(South)—First Wednesday in each month, club shack open every Friday, 8pm. Hampstead House, Fairfax Road, West Heath, Birmingham 31. *G8GDZ*.

Bromsgrove (BDARC)—Avoncroft Museum of Buildings, Avoncroft Art Centre, Bromsgrove. *J. Harvey, 22 Elm Grove, Bromsgrove*.

Cannock (CCARS)—Thursdays, Bridgetown Working Men's Club, Cannock. Club stations G3VCC and G8GCC will shortly be operational on most bands. *G4CFR*.

Coventry (CARS)—Fridays, 8pm. Baden Powell House, St Nicholas Street, Radford Road, Coventry. *G3TFA*.

Dudley (DARC)—Alternate Tuesdays, 7.45pm. Central Library, Dudley. Visitors welcome. *G8HHK*.

Hereford (HARS)—First and third Fridays in each month. Civil Defence HQ, Gaol St, Hereford. *G4CNY*.

Lichfield (Chad Radio)—Wednesdays fortnightly. Lichfield Fire Station, Birmingham Road, Lichfield. *G8FBL*.

Rugby (R & DAREC)—Last Tuesday in each month, 8pm. Lawrence Sherriff Arms in the town centre. *G3YQC*.

Solihull (SARS)—21 Jan. ("DX-pedition to Andorra", by Chris Eley, G8DNF). Third Tuesday in each month, 7.30pm. Manor House, High St, Solihull. *G4AEJ*.

Stourbridge (STARS)—7 Jan (Informal), 20 Jan (Annual constructor's competition), 4 Feb (Informal), 17 Feb (Lecture-subject to be announced). Third Monday in each month. Longlands School, Brook St, Stourbridge. Informal meetings at the Shrubbery Cottage, Heath Lane, Stourbridge. *G3ZVK*.

Sutton Coldfield (SCRS)—Alternate Mondays, 7.30pm. Central Youth HQ, Clifton Road, Sutton Coldfield. *G8ALO*.

Telford (T & DARS)—New venue, club now meets at Phoenix School (Metalwork Dept), Manor Road, Dawley on Wednesdays, 7.30pm, except the first Wednesday of the month when at Walker Technical College near Wellington. *G4AXZ*.

Willenhall (W & DARS)—Alternate Wednesdays. Three Crowns Stafford St, Willenhall. Morse classes at end of each meeting *G4CFR*.

Wolverhampton (WARS)—Neachells Cottage, Stockwell End, Tettenhall, Wolverhampton. *G3UBX*.

Worcester (W & DARC)—18 Jan. (Annual dinner). Old Pheasant, New St, Worcester. *G8ASO. Tel. Worcester 351565.*

May I wish all club members in Region 3 a very happy Christmas—*G3ZUL*.

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

Derby (DADARS)—119 Green Lane, Derby, 7.30pm. 8 Jan. ("The year in retrospect, films, slides etc), 15 Jan. (Ladies evening), 22 Jan. (Film show), 22 Jan. ("Integrated circuits" by Mark Edworthy, G3URU), 29 Jan. (Junior night), 5 Feb. (Surplus sale). *G2CVV*.

Derby (NHCAARG)—Nunsfield House, Boulton Lane, Alvaston, Derby, 7.30pm. 10 Jan. (Surplus sale), 17 Jan. (Night on the Air) 24 Jan. (Comparison evening), 31 Jan. (Homebrew and Commercial Equipment) 7 Feb. (Car Electrics and Interference Suppression). *G4CTZ*.

Grimsby (GARS)—Alternate Thursdays, 7.30pm. Community Centre, Duncombe Street, Grimsby. Morse classes every Thursday, 7.30pm. to 8pm. Secretary David Taylor, G8JIN.

Leicester (LRS)—6 Jan. (General discussion), 13 Jan. ("Radio Aurora" RSGB tape), 20 Jan. (AGM). Every Monday, morse practice from 7.45pm to 8.15pm. The clubroom is situated at the Gilcross Estate Cottage which is up a side lane between the cemetery and the hospital on Groby Road, Leicester. After the morse practice "tea is brewed and forced down!" and the tape or live lecture begins at 8.30pm. *G3TQF*.

Lincoln (LSWC)—Wednesdays. Lincoln Astronomical Society, Westcliffe St, off Burton Road, Lincoln.

Mansfield (MARS)—First Friday in each month, 7.45pm. The New Inn, Westgate, Mansfield.

Melton Mowbray (MMARS)—17 Jan. ("History of telegraphy" by G3FXP). 7.30pm, St John Ambulance Hall, Asford Hill, Melton Mowbray, Leics. *G3NVK*.

Nottingham (ARCON)—9 Jan. (Talk), 16 Jan. (Activity night), 23 Jan. (RSGB tape and slide lecture). 7.30pm, Woodthorpe House, Mansfield Road, Nottingham. Visitors are always welcome. *G4AFJ*.

Scunthorpe (SARC)—Wednesdays, Grange Farm Hobbies Centre, Franklyn Crescent, Scunthorpe. RAE classes are held on Thursdays. Visitors are welcome at all meetings. *G3MSB*.

Spalding (SADARS)—10 Jan. (AGM). 7.30pm, "Ship Albion", Spalding. *G6VPR*.

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

Bedford (B & DARC)—8pm. United Services Club, The Broadway, Bedford. 9 Jan. (Practical demonstration of receiver and test equipment), 16 Jan. (History talk with slides), 23 Jan. ("RF radiation and its effects" by Mr Lord of Cranfield College), 30 Jan. (Steam up with G3SME), 6 Feb. (Another homebrew 2m transverter—G4CBZ), 13 Feb. (Junk sale—G3XKB), 21 Feb. (Annual dinner), 27 Feb. (RSGB tape/slide lecture). Hon sec Steve Felts, 6 White Lodge Close, Kempston, Bedford. *G8FMG*.

Cambridge (C & DARC)—7.30pm. 10 Jan. (Film night at HQ), 17 Jan. (Informal at HQ), 24 Jan. (Visit to Cavendish Laboratories), 31 Jan. (Informal at HQ), 7 Feb. ("The mike behind the voice"—slide show at Brooklands), 14 Feb. (Informal at HQ), 21 Feb. (Junk sale), 28 Feb. (Informal). Morse practice available at all informal meetings. Hon sec J. Fellows, G3YRZ, 8 North Street, Burwell, Cambs.

Peterborough (PR & ES)—At the AGM the following were elected; chairman, G3TGO; vice-chairman, G3RED; hon sec, G8GNV; treasurer, G4BBA; vice-president, G3HXR. 7.30pm. The Scout Hut, Lincoln Road, Peterborough, third Friday in each month. 21 Feb. (Junk sale and social). All details from P. Chilcott, 258 Coneygree Road, Stanground, Peterborough.

Shefford (S & DRS)—Thursdays, 8pm. The Church Hall, Ampthill Road, Shefford. 9 Jan. (Club question night), 16 Jan. (AGM), 23 Jan. (Plastics), 30 Jan. ("Sights and sounds of the Scillies"—G3TDW). Hon sec Bob Squire, 10 Brittains Rise, Lower Stondon, Henlow, Beds. *G4DJH*.

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

Banbury (BARS)—Fridays, 7.30pm. 43 North Bar, Banbury. New members and visitors very welcome. Details from secretary G3LTN, QTHR. Tel Banbury 710623.

Cheltenham (CARS)—Wednesdays, 8pm. St Marks and Hesters Way Community Centre, Brooklyn Road, Cheltenham. *G8DVA*.

Gloucester (GARS)—G4AYM. First Thursday in each month, 8pm, Oddfellows Club, Barton Street, Gloucester. Other Thursdays, 7.30pm, Leisure Centre (Drill Hall), Painswick Road, Gloucester. *G6MA*.

Milton Keynes (MK & DRS)—8pm. Lovatt Hall, Silver Street, Newport Pagnell, Bucks. 6 Jan. (GPO lecture "Interference tracing"), 10 Feb. ("CHF aerials" by Vic Hartopp from Jaybeams) *G8HUH*.

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

Acton, Brentford & Chiswick (ABCRC)—21 Jan. (Club AGM), 18 Feb. ("Mobile transceiver FT75", by G3PZK). 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)—13 Jan. ("Tape cassette recorders" by Colin Bussey of Rank Radio International), 30 Jan (Mini lecture on radio techniques), 9 Feb. ("Microphones" by Peter Redman, G8ELX), 27 Feb. ("Radio in retrospect—a backward glance" by Leon Newnham, G6NZ). 7.30pm for 8pm. St Martin's Court, Kingston Crescent, Ashford. Visitors very welcome. Hon sec Alan Wenham, G3ZXA, QTHR. Tel Sunbury-on-Thames 86440.

Barking (BR & ES)—Mondays 7.30pm (constructional), Tuesdays 7.30pm (morse classes), Thursdays 7.30pm (Informal and constructional). Visitors very welcome. Westbury Recreation Centre, Westbury School, Ripple Road, Barking, Essex. Further details from hon sec R. E. Clark, G4DDP, QTHR.

Burnham Beeches (BBARC)—First Monday in each month Hedgerley Scout Hut, Hedgerley, near Slough, Bucks. Hon sec E. Brown, 20 Balmoral Close, Cippenham, Slough.

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. Visitors very welcome. Hon sec C. J. Hoare, G4AJA, QTHR. Tel 01-529 2282.

Cray Valley (CVRS)—16 Jan. (Natter nite), February programme to be announced. 8pm. Eltham United Reformed Church Hall, 1, Court Road, SE9. Hon sec Peter Vella, G3WYP, QTHR.

Croydon (Surrey Radio Contact Club)—Third Tuesday in each month, 8pm. "The Ship", 47 High Street, Croydon. Further details from hon sec Sid Morley, G3FWR, QTHR. Tel 01-657 3258.

Crystal Palace (CP & DRC)—18 Jan. ("Multipliers and amplifiers" by Bob Burns G3OOU, Bob Fairbairn. G8HAX). February programme to be announced. Hon sec Geoff Stone, G3FZL, QTHR. Tel 01-699 6940.

Dartford Heath (DF Club)—First and third Fridays in each month (club nights). Club hunts—details later. 8pm. Broomhill Road, Dartford. Hon sec Alan Burchmore, G4BWV, QTHR.

East London RSGB Group —19 Jan. ("Synoptic meterology", an approach to vhf propagation by G2HR), 16 Feb. ("FM and repeaters" by G8AAI), 3pm. Wanstead House, The Green, Wanstead, E11. Buses: 10, 20, 66, 101, 167. Underground: Wanstead, Central Line. Refreshments available. All SWLs, transmitting amateurs and friends welcome. Hon sec Peter Hull, G4DCP, QTHR. Tel 01-432 6122.

Edgware (E & DRS)—9 Jan. (AGM), 28 Jan. (Informal), 13 Feb. ("International amateur radio" by Roy Stevens, G2BVN), 27 Feb. (Informal). 8pm. Watling Community Association, 145 Orange Hill Road, Edgware. Hon sec Alan Masson, G3PSP, QTHR. Tel 01-950 6827.

Esher (Thames Valley ARTS)—First Wednesday in each month, 8pm. King George's Hall, Esher, (next door to fire station). Hon sec Rod Blasdell. Tel 01-432 2343.

Farnborough (Bromley RC)—Third Monday in each month. Rear of Farnborough (Kent) Village Hall (opposite "The Woodman" public house).. Details from Derek Morgan, 59, Bassetts Way, Farnborough, Kent.

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. Hon sec Dave Coltart, G3SYM, QTHR.

Harlow (DRS)—Tuesdays, 8pm. Mark Hall Barn, First Avenue, Harlow, Essex. Hon sec Vic Heard, 106, Vicarage Wood, Harlow, Essex.

Harrow (RSH)—10 Jan. (to be arranged), 17 Jan. (AGM). February programme to be announced. 8pm. Sea Cadets HQ, Woodlands Road, Harrow, Hon sec Les Light, G3KDL, QTHR. Tel 01-902 2570.

Havering (H & DRAC)—15 Jan. (AGM and presentation of cups). Natter nites on alternate Wednesdays, 8pm. British Legion House, Western Road, Romford. Hon sec K. S. Hutchinson, G4ALN, QTHR. Tel 01-597 1068.

Holloway (Grafton ARS)—Fridays, 7.30pm. Archway School Annexe, Whittington School, Highgate Hill, N19. Hon sec H. D. Ashcroft, G4CCM QTHR.

Ilford RSGB Group—Thursdays, 8pm. Mortlake Road, (Off Ilford Lane) Ilford, Essex. Hon sec Derek Sopsworth, G3YMW, QTHR.

Kingston (K & DARS)—Second Wednesday in each month, 8pm. Tolworth Scout HQ, Stirling Walk, Raeburn Avenue, Surbiton, Surrey. Acting hon sec Norman Smith, G3HFO, QTHR. Tel 01-399 9526.

London (UK FM Group)—Second Tuesday in each month, 8pm. Abbey Hotel, North Circular Road (between Western Avenue and Abbey Dale Road). PRO Kris Partridge, G8AUU, Apartment 10, 74, Woodlands, Wimbledon, SW19. Tel 01-946 7843.

Loughton (L & DRS)—Second and fourth Fridays in each month, 8pm. Loughton Hall, near Debden Station. Hon sec P. J. Lawler, G4CMD, QTHR.

New Cross (Clifton ARS)—Fridays, 8pm. 224 New Cross Road, London SE19. Details from hon sec R. A. Hinton, 48 Camilla Road, Bermondsey SE16.

Northolt (British Airways European Division ARS)—First Monday in each month. Trident Club, Western Avenue, Northolt, Middlesex. This club is open to non-BA employees by invitation. Contact David Evans, G3OUF. Tel Amersham 21573 for details.

Purley (P & DRS)—First and third Fridays in each month, 8pm. Lansdowne Road, Purley, Surrey. Hon sec N. A. Marshall, 122, Goodenough Way, Old Coulsdon, Surrey.

Reigate (RATS)—7 Jan., 4 Feb. (Natter nights), "Marquis of Granby", Hooley Lane, Redhill, 8.30pm. 14 Jan. ("HF aerials for small gardens" by G6LX), 18 Feb. (Film show). 8pm. St Mark's Hall Alma Road, Reigate. Hon sec F. H. Mundy, G3XSZ, QTHR. Tel, Reigate 43130.

St Albans (Verulum ARC)—Third Wednesday in each month, 7.30pm for 8pm. Market Hall, St. Albans. Visitors very welcome. Hon sec Hugh Young, G3YHY, QTHR. Tel Watford 25633.

Southgate (SRC)—Second Thursday in each month, 8pm. The Green, Winchmore Hill, N21. Hon sec Brian Oughton, G4AEZ, QTHR. Tel 01-336 7166.

South Kensington (Baden Powell House Scout ARG)—Third Tuesday in each month, 8pm. Baden Powell House, Queensgate, South Kensington, SW7. Hon sec Alf Watts, G3FXC, QTHR.

Sutton & Cheam (SCRS)—21 Jan. ("Experiences with repeaters and other things" by G3CDK) 18 Feb. (Talk on amateur tv). 7.30pm. "The Library", Cheam, Surrey. Hon sec Alan Keech, G4BOX, QTHR.

Welwyn (Mid-Herts ARS)—Third Monday in each month, 8pm. 20 Jan., 17 Feb. Welwyn Civic Centre, Prospect Place, Old Welwyn. Visitors very welcome. Further details from hon sec J. U. Burke, G3HEA, QTHR. Tel Stevenage 4251.

Wimbledon (W & DRS)—Second and fourth Fridays in each month, 8pm. St John Ambulance HQ, 124 Kingston Road, Wimbledon, SW19. Hon sec F. W. Hill, G3WDO, QTHR.

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

Canterbury (EKRS)—January (Junk sale), February ("Stereo fm" by G8JDT). Further information of meetings from G3XDV, QTHR.

West Kent (WKARS)—Alternate Fridays. Adult Education Centre, Tunbridge Wells. January ("Radio methods used in astronomy" by Dr Smith, G3JIX), February ("Audio night" by J. Goulden). Further details of future events from G4CCQ, QTHR. Tel Lamberhurst 393.

Worthing (W & DARC)—Second Tuesday in each month at the Adult Education Centre, Union Place, Worthing, and on other Tuesdays at Rose Wilmot Youth Centre, Littlehampton Road, Worthing. All meetings at 8pm. Further details from G6KFH/T, QTHR.

Medway (MARTS)—Fridays, 7.30pm. Aurora Hotel, Gillingham. Details of future meetings from C. R. Blackmur, G8FHN, QTHR.

Horsham (HARC)—First Wednesday in each month. Civil Defence HQ, Moons Lane, Brighton Road, Horsham. Details of meetings from G3NPF, QTHR. Tel Horsham 66290.

Mid-Sussex (MSARS)—Marle Place, Leylands Road, Burgess Hill. Details of meetings from G3RXJ, QTHR.

Eastbourne (SARS)—First Monday in each month. Victoria Hotel, Latimer Road, Eastbourne. PRO G3JFM.

Maidstone (MYMCAARS)—"Y" Sports Centre, First and third Fridays devoted to the beginners.

Crawley (CARC)—Fourth Wednesday in each month. United Reform Church Hall, Ifield, Crawley. Details from G3MGL, QTHR.

REGION 9 — RR H. W. Leonard, G4UZ

Bath (B & DRG)—Mondays, 8.30pm. Church of the Ascension, Claude Avenue, Oldfield Park, Bath. Further information from John Noden, Flat 4, 30 Paragon, Bath BA1 5LY.

Bristol RSGB—27 Jan. (AGM), 24 Feb. (Talk). 7pm. Becket Hall, St Thomas Street, Bristol 1. *G3ULJ.*

Bristol (BARC)—Tuesdays, 7.45pm. 24 Bright Street, Barton Hill, Bristol 5. *G4BZZ.*

Bristol (Shirehampton ARC)—Fridays, 7.30pm. Twyford House, Shirehampton, New members most welcome. *G4BOL.*

Bristol (University ARS)—Most Saturdays during term time, 2.30pm. Dept of Physics, Royal Fort, Tyndall Avenue, Bristol 8. Full details from G3WDG.

Cornish (CRAC)—6 Feb. ("Crime prevention—safety in the home" by Sgt Watmore, Devon & Cornwall Constabulary). 7.30pm. SWEB Clubroom, Pool, Camborne.

West Cornwall (CRAC)—Alternate Wednesdays, 7.30pm. The Guildhall, Penzance. Full details of Cornish and West Cornwall Clubs from G3NKE, QTHR, Tel Camborne 2419.

Exeter (EARS)—Second Monday in each month. 13 Jan. ("Paging systems" by G3OFY), 10 Feb. (Surplus equipment sale). 7.45pm. ATC Hut, Colleton Hill, The Quay, Exeter. Full details from Jack Bawden, 232 Exwick Road Exeter, EX4 2BA.

Newquay (N & DARS)—Alternate Wednesdays, 7.30pm. Treviglas School, Newquay. Full details from G3THT, QTHR.

North Devon (NDRC)—10 Jan. (Talk), 24 Jan. (Ragchew), 14 Feb. (AGM), these three meetings at "Crinnis", High Wall, Barnstaple. It is hoped to hold alternate meetings at Bideford at G2FKO's QTHR as from 28 February so please check with G4CG on venue. *G4CG.*

Plymouth (PRC)—First and third Tuesdays in each month, 7.30pm. Virginia House, Bretonside, Plymouth. 16 Nov (Annual dinner), 17 Dec. (Film night). Hon sec S. E. Croft, 2 Crozier Way, Mutley, Plymouth. Visitors always welcome.

Saltash (S & DARS)—First and third Fridays in each month, 7.30pm. Burraton Toc H Hall, Saltash. New chairman Nigel Huntley, G4CDU. *G4DHA.*

South Dorset (SDRS)—First Tuesday in each month, 7.30pm. Lecture Hall, South Dorset Tech College, Newstead Road Weymouth. *G3WAO.*

Taunton (T & DARS)—Fridays, 7.30pm. Jelalabad Barracks, The Mount, Taunton. Hon sec G. Swetman, "Little Copse", Monkton Heathfield, Taunton. Tel West Monkton 298.

Torbay (TARS)—Tuesdays, with special meeting on last Saturday in each month. 25 Jan. ("Tapes and slides in stereo"), 22 Feb. ("Cheshire Homes" by Peter Allen, of the Brixham Home). 7.30pm. Rear of 94 Belgrave Road, Torquay. Visitors most welcome. *G3UIQ.*
West Dorset (WDARG)—First Friday in each month, 8pm. British Legion Club Hall, Dorchester. New hon sec L. A. Barnes, G8GHU, Flat 1, 107 The Esplanade, Weymouth. *G8GHU.*
Weston-super-Mare (WsMRS)—Second Friday in each 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. 9 Jan. (Junk sale), 30 Jan. (RSGB tape lecture) 27 Feb. (RSGB tape lecture). *G3NOF.*

REGION 10 **RR D. M. Thomas, GW3RWX**
Barry (BCoFE ARS)—Thursdays, 8pm. Barry Rugby Football Club, Reservoir Road, Barry. A visit to Wales Gas Communications Centre to be arranged for the end of January. Details from sec GW3VPB.
Glamorgan VHF/UHF Group—21 Jan. ("Testing techniques" by GW3YSA and GW8HEZ). 7.30pm. NCB Social Club, Tonddu, Nr Bridgend. Details from GW3ZTH.
Port Talbot (PTARS)—Thursdays, 7.30pm. First Thursday in each month is a general meeting. BSC Sports and Social Club, Margam, Port Talbot. Details from sec GW3ACF.
Sully (S & DSWC)—Tuesdays, 7pm. Sully Bowls & Social Club, 59 South Road, Sully. Details from T. Dixon, 6 Brigham Court, Hendredenny Park, Caerphilly. *GW4CJC.*
Swansea (SARC)—Fortnightly, 14 & 28 January, 11 & 25 February. 7.30pm. The Commercial Inn, Killay, Swansea. Details from GW4BIQ.
No news received from other clubs this month. Please send details for the March issue to GW8HEZ, QTHR by 27 January.

REGION 11 **RR P. H. Hudson, GW3IEQ**
Bangor (UCoNWARS)—23 Jan. (Film evening), 6 Feb. ("High fidelity pickup cartridges" by J. W. Maunder, Shure Electronics Ltd), 20 Feb. ("Quadraphonics" by Dr K Barker, University of Sheffield). 5.10pm, Thursdays. Small lecture theatre of the School of Engineering Science. Visitors welcomed.
Rhyl (R & D ARC)—2nd Tuesday in each month. Meetings take place in the lecture room of the Ambulance Station, Coast Road, Rhyl.
Conway Valley (CVARC)—Second Thursday in each month, 7.30pm. The Quaries, Llandulas, Colwyn Bay.

REGION 13 **RR V. W. Stewart, GM3OWU**
Berwick (BARS)—Last Sunday in each month, 3pm. Tweed View Hotel. Further details from G. Shankie, GM3WIG, 8 Ettrick Terrace, Hawick, Roxburghshire.
Dunfermline (DRS)—Second Wednesday in each month, 7pm. Queen Anne High School (TV studios), Further details from D. G. L. Anderson, GM8HEY, 10 Cairneyhill Road, Crossford.
Edinburgh (LRS)—Second and fourth Thursdays in each month, 7.30pm. Adult Education Centre, Riddles Court, High Street. Hon sec GM8GEC.
Glenrothes (G & DARC)—First Sunday in each month, 7.30pm. Old Nursery Buildings, Leslie, Fife. Special meeting for project groups every Wednesday. 2 Feb. (No details), 2 March (Films). A get-together which attracted 60 visitors was held on 6 November. The speaker for the evening was GM3OLK who gave a talk on his life as VU2OLK. This was followed by a cartoon film and refreshments. Further details from GM3YOR, QTHR.

GM3YND (l) and GM4DNM at the Glenrothes open night

St Andrews (UStAARS)—Details from R. Marchant, GM3ZCQ, Dept of Physics, North Haugh, St Andrews.

REGION 14 **RR M. A. Comrie, GM3YRK**
Ardeer (ARCARS)—Thursdays, 7.30pm. Ardeer Recreation Club, Stevenston, Ayrshire.
Ayrshire (ARG)—Every second Sunday. YMCA, Howard Street, Kilmarnock. Further details from hon sec R. D. Harkness, GM3THI, 55 Woodend Road, Alloway, Ayrshire.
Falkirk & D RSGB Group—Temperance Cafe, Lint Riggs, Falkirk. Further details from J. Ramsay, GM3OQI, 78 Wheatlands Avenue, Bonnybridge, Stirlingshire.
Greenock (G & DARC)—GM3ZRC. Tuesdays and Fridays, 7.30pm. Watt Library, Union Street, Greenock. Enquiries to hon sec N. C. Henderson, GM3LYI, QTHR.
Glasgow (GURC)—George Service House, University Gardens, Glasgow. Details from hon sec, c/o Dept of Engineering.
Mid-Lanark RSGB Group—Main meetings recommence 10 January and thereafter fortnightly, with alternate Friday meetings informal. RAE classes held at 7pm every Wednesday, new enrolments for the advanced section of the course are welcome. Details from GM3KMG. Tel Hamilton 28759.
West of Scotland (ARS)—Fridays. 81 Virginia Street, Glasgow. Details from sec GM3RHR, QTHR.

REGION 15 **Deputy RR H. J. Campbell GI8FOK**
Bangor (B & DARS)—First Friday in each month, 8pm. Redcliff Hotel, Seacliff Road, Bangor. Full details regarding winter programme from hon sec N. S. Newell, GI3YMY, QTHR.
Belfast RSGB Group—Third Wednesday in each month, 8pm, 90 Belmont Road, Belfast. New members and visitors made most welcome. Interesting winter programme arranged. Further information from H. J. Campbell, GI8FOK, QTHR.
Belfast (CoB YMCARC)—Saturday afternoons, 2.30pm. New QTH Brunswick House, 7 Brunswick Street, Belfast. Hon sec GI8EWM, QTHR.
Mid-Ulster RSGB Group—First Sunday in each month, 3pm. At GI4BAC, QTHR. All welcome. Hon sec R. F. S. Sinton, GI3ONF, QTHR.
Belfast (QUoBRC)—Tuesdays 8pm. 37 Fitzwilliam Street, Belfast. Everyone welcome.

REGION 17 **RR L. Hawkyard, G5HD**
Basingstoke (BARC)—First and third Saturdays in each month. Chineham House, Popley, Basingstoke. Sec R. H. Oakley, G8FKT.
Bournemouth (Wessex ARG)—First Friday in each month and the Monday 17 days later, 8pm. 10 January ("RTTY" by G3VPC). Cricketers Arms, Windham Road. Hon sec G8BBN.
Bracknell (BARC)—Mondays, 7.30pm. Cooper's Hill Community Centre. *G3YMC.*
Fareham (F & DARC)—Wednesdays, 7.30pm. Porchester Community Centre, Room 9. Details from G8FFI, QTHR.
Farnborough (F & DRS)—Second and fourth Wednesdays in each month, 7.30pm. 8th Air Scout's Hut, Rectory Road, Farnborough. Sec G8ECO or PRO G8ATK, both QTHR.
UK FM Group (Southern)—First Wednesday in each month, 8pm. Chineham House, Popley, Basingstoke. Sec G3ZRM. Details G8HWO, QTHR.
Harwell (AERERC)—Third Tuesday in each month, 7.30pm; also informal meetings every Friday lunchtime. Social Club, AERE, Harwell. *G3NNG.*
Maidenhead (M & DARC)—Details from G3FVC. Meetings at the British Red Cross Hall, The Crescent, Maidenhead.
Portsmouth (P & DRC)—Wednesdays, 7.30pm. Portsmouth Community Centre, Malins Road, Buckland, Portsmouth. *G3NCO, QTHR.*
Jersey (JARS)—Sundays, 1030am and Fridays 8pm at Le Hocq Tower, St Clement, Jersey. Hon sec Mary McTaggart, 19 Parade Road, St Helier. Special activity station GC3DVC on 80-10m, 0900 25 January to 2000 26 January.
Reading (RARC)—Alternate Tuesdays, 8pm, "White Horse", Emmer Green. *G4BLT.*
Southampton (SUARC)—Tuesday evenings, also informal meetings every lunchtime during term in the clubroom, Old Union Building. Hon sec I. Mercer, G3ZER.
Southampton RSGB Group—Saturdays at the Lanchester Building, Southampton University, also Wednesday at the clubroom, Kent Road. Both at 7.30pm. *G4AEU.*
Swindon (SDARC)—Wednesdays, 7.30pm. Penhill Junior School, Swindon. *G3YKC, QTHR.*

MEMBERS' ADS

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

FOR SALE

Pye uhf Pocketfones 1 pair tx/rx with Deacs, £20. HRO with comp set g/c coil packs plus ac/dc PSUs, £20. AT5 160/80 a.m. tx, £12. Sentinel 2m converter 2-4MHz i.f., as new, £13. Buyer collects. G8FAS, QTHR. Tel Crewkerne 3085 after 6 pm.

9R59DS communications rx, £35. Furze, 68 Lyndurst Road, Barnehurst, Kent DA7 6DF. Tel Crayford 22776.

Repeater tone-burst oscillator on circuit board, 12V set 1,700 or 1,750Hz, £1.50. Predetermining decade counter 24V coil, £1. Red/green two lamp pushbutton, £1. 4-gang 10kΩ pot, £1. All post free. Mann, 45 Old School Lane, Milton, Cambridge.

Pye Pocketfones 1 pair wkg on 433·20 with batteries and unit battery charger, £35. Hartley 13A double-beam scope with leads, lid and probe, good wkg order, £15. G8GKZ, QTHR. Tel Chester 41956.

HW12 and home-brew psu, with comp cables and mic, £45 or swap. Asahi, ME-IIB power/swr metering system, £5. Robinson, 53 Barsby Drive, Loughborough, Leics.

100W 145MHz a.m. tx int psu/mod, 11 xtal posns (five xtals supplied) huge space for fm modulator etc, £45. 432MHz a.m. 20W tx, separate psu, £25. SAE list, xtals valves, transformers, semiconductors, shack clearance sale. G8BUR, QTHR. Tel Stevenage (0438) 812229.

Collins TCS6 tx with psu 1·5-12MHz, £5. Heath Q-mult, QPM1 mains, £4. Ex-govt vertical aerial in canvas bag 45ft, £4. PSU 1,000V 1A, 350V 500mA, 30V, 10V, 6·3V ac ct 10A, 125V bias. 7in by 11in by 15in, £5. G3VLT, QTHR.

Codar AT5 T28 mains psu, £35. G3TCJ, QTHR. Tel Liskeard 42073.

Trio 510 hardly used, SB610 unused since prof built now going vhf/uhf. G3BKL, QTHR. Tel Winterslow 862489.

Marconi 90W modulator 2 × 829B with diagrams, £6. Wilcox-Gay master oscillator (vfo) 1·9/20MHz, with handbook, £4.50. Both items need power supplies. Pair 240V selsyns with some gearing, £4 pair. All item buyers collect. G2ABD, QTHR. Tel Fontmell Magna (074781) 509.

Lafayette HE-40 suitable for beginner (rx), £17.50. Send sae for reply to: R. M. Mackean, 61 Anfield Road, Liverpool L4 0TQ. Buyer collects.

R216 rx plus psu 19 to 157MHz, good cond, offers. Avo characteristic valve tester, mk2, £40. ZC1 mk2, £5. G3JXZ, QTHR. Tel 01-552 2527.

KW2000A ac psu, £130. Cossor scope 1035 mk3, £20. Marconi vvm TF1100, £16. Marconi s/gen modulator TF1102, £12. 250W constant voltage transformer, £15. 150W model, £10. Other items sae. Carriage extra, prefer buyer collects. G3MBQ, QTHR.

V3 vertical 20-15-10, £7. 19in racks 21in high ideal for base stns 2 off, £4 pair. 12V mobile psu, £2. 70cm cavity wavemeter, £2. *Wanted:* 60ft wall or post Versatower, good price paid, 160m tx/rx, why? Garex 2m mk2. G4BXD, QTHR.

IC210 automatic dual toneburst, as new, £195. EC10 mk1 rx, £39. Various aerial poles, brackets etc, take px, why? Tel Leighton Buzzard 75623.

Heathkit SW-717, factory aligned and tested. Joystick vfa and Lo-Z Joymatch, offers? Xtals for Storno Viscount: GB3PI, 144·48, £4 per pair; also 144·40, 144·60 receiver, £1.50 each. 100ft ex-govt long wire, 50p. G8HSS, QTHR. Tel 01-959 7033.

Liner 2, Pye Cambridge, Creed rtty gear RQ10X, Joystick vfa, fm Pye Europa rx and more. SAE details. G8MIO, QTHR.

Eddystone EC10 mk1 rx, mains and battery psu, with handbook. Joystick aerial and Joymatch atu, £40. Stevens, 26 Lynton Rd, Midsomer Norton, Bath, Avon. Tel 076 141 2626.

SSTV monitor home built using electrostatic tube and ICs, buyer inspects, £16. 3in oscilloscope similar to OS2, £12. Philips reel-to-reel tape recorder, £5. G4AWL, 27 Old Manor Way, Cosham, Hants. Tel Cosham 79153.

AR88LF, wkg, needs attention, cond fair, with manual, £20, free delivery 60 mile radius Manchester. Home-made 2-el 15m beam steel tube for house side home-made rotator selsyn indicator with transformer, buyer dismantles and collects for preference, £15. G8UN, QTHR.

KW201 rx with xtal cal, vgc, £65. G8GHP, 6A Portobello Parade, West Kingsdown, Sevenoaks, Kent. Tel West Kingsdown 2978.

4CX250B in handbook coaxial cavity with base etc, £15. Wayne Kerr vhf admittance bridge B901, £18. Pulse induction metal detector, £40. TRW PT8743 7W out 470MHz 12V, £5. G6AFD/T, QTHR. Tel 01-959 6799.

R216 set, mint cond, continuously tunable 19-156MHz, fm a.m., ssb modes, comp with psu(ac), £60 ono. Star SR40 gen cov rx with Codar PR30X, £15. *Wanted:* 4CX1000 with base and chimney. G8FQO, QTHR.

Jaybeam, 2m, 8-el, £3. 70cm 14-el, £4. Used but ok home-built ssb tx, 6 band 2x6146 pa, McCoy filter, inc psu, £35. *Wanted:* circuit for Eddystone 730/1A. G3MEO, 6 Anvil Ave, Litlington, Nr Royston, Herts. Tel 852465.

Xtals 8·11041, 8·0250, £1 each. 43·660 48·1687 48·2875, £1.50 each. 2m tuned lines and 640A with base, £6. G8AEU 2m conv mk1 28-30, £6. G8AEU 2m QRP board, £1.50. Halo, £1. Williams, 54 Granville Drive, Kingswinford, Staffs. Tel Kingswinford 2532 evenings.

Large mains 40W 2m xtal a.m. tx, £30. Murphy 821 tx/rx, tx on 2m, rx wkg unmod, needs attn, £10. Prefer buyers collect. Xtals, fit FT243 hldr, 8·075, 12·1555, 12·1444, 80p each. Plucknett, 432 York Rd, Stevenage, Herts SG1 4EN.

Pye Vanguard control box, 30ft telescopic mast, Heathkit VF1U 160-10m vfo, pair TY3-250 triodes and bases. *Wanted:* QQVO6-40A circuit of AR88D for one week, postage refunded. GW8JOJ. 12 Black Barn Lane, Usk, Gwent.

DX100U fb cw, £30. BC358X no coils, £5. 1155 needs attention, £2 plus another 1155 for spares free. Pye base station cabinet, £1. All items buyer collects. G4BLI, QTHR. Tel 051 226 8376.

Eddystone EB36, mint, £40. VLF rx ex-Navy 15-600kHz, £10. Roller coaster atu 100W 1-14MHz mobile/static/incorporates turns counter and aerial current meter, £15. G3OFK, QTHR. Tel Eversley 733674 after office hours.

70cm tx Pye U450L comp with xtal a.m. modulator mic rack cabinet, £22. Microwave Modules 70cm converter 28-30MHz nearly new, £15. G8BCA, QTHR. Tel Mildenhall (Suffolk) 714051.

Trio TS510 plus psu, exc cond, £150 ono. Belcom Liner 2 power supply, mint, £10. TA31 rotary dipole, unused, £9. Prefer buyer inspect and collect. Hubbarb, 60 Mill Road. Billericay. Tel 3935.

Seven-segment light emitting diode displays left hand decimal common anode, £1 each. Driver SN7447 and other ICs for sale, sae for list. G8GOS, QTHR.

Drake 2C rx ideal for the serious listener, offers invited. SSM PA3 2m pre-amp, cost £5.95, ordered in error. *Wanted:* Westminster base station plus 2 mobiles or similar 12·5kHz gear a.m. or fm hi band. G4DCQ/G8DCQ, QTHR.

Eddystone EC10 mk2, mint cond, mains power pack, £65. Heathkit HM15. Reflected power meter, new, £7.50. G3HQH. Tel New Mills 44087 after 8pm.

KW2000A with ac psu, mint, £120 ono. G3GJX, QTHR. Tel Guildford 60163.

Yaesu FR50B rx as new, £55 ono. Hudson base station, perfect, £45. Pye base tx, £30. Telford TC7 mk2, new, £40. CR100, £15. 1155 rx, £15. G8HNY, QTHR. Tel Formby 78432.

GEC hf station rx BRT436 tx BRT427, £20. LG50, £15. Minimitter MK44, £5. HY psu 1,150V 500mA 300V 250mA, £10. Collins Dynamotor psu 12V in 400 dc 225 dc output, £10. RCA ET4336 spares. G3MJK, The Butts, Bratton, Wilts. Tel 038-083 246.

Cambridge for 2m tunable rx, fair, £12.50, buyer collects. Xtals 66·8, 77·08, 70·66, 82·66, 84·25, 26·65, 12·25, 68·44, 12·7MHz, 75p each. Ex-equip 2N3866, 50p. Misc bits and pieces. *Wanted:* XF9A/B xtals 66·00 132·00MHz. G8ACQ, QTHR. Tel Rushden 4986.

UHF Londex coaxial relays 24V dc wkg, N-type connectors, 70cm loss 0·3dB typical, usable 23cm, loss 1·5dB, several at £2.50 inc p & p. Valves 813 pair, new, £5 inc p & p. Pair 640s new, £3 inc p & p. G3UKS, QTHR.

KW2000B fb cond with ac psu and positive earth 12V psu, KW E-zee Match, £180 ono. G3ADB, QTHR. Tel Camborne 4264 before 4.30.

Pentax SP500 fitted 55mm F2 super Takumar, e/r case. 135mm 3.5 SMC Takumar in cases, accessories, all mint, £240 or exchange for mint Yaesu, KW, etc hf tx/rx separates. GW3GWA, QTHR. Tel Ruabon 3891 days.

Yaesu FRSDX400 160-2m, mint cond, in orig carton, £160. Prefer buyer collects. GM8HEY, QTHR. Tel Dunfermline 25534.

Aircraft tx with 2 × 4X150, comp with blower etc. good for linear, new cond. G3GIQ, 271 Popes Lane, London W5. Tel 01-567 6389.

Wearite tapedeck model 1A modified for 1in/3in ps, non-standard heads, £5. Buyer collects. Kraft, 17 Bennetts Lane, Hawarden, Deeside, Wales.

AR88D vgc with manual, Joymatch 3 and spares, bereavement causes sale, £50. Buyer collects. Mrs Painter, 16 Trevor Drive, Bromham, Bedford. Tel Oakley 2323.

Heathkit HR-10-B with HRA-10-1 crystal calibrator, exc cond, £45 ono. Pair No 88 sets, with manual, £9. Tompsett, 46 Manor Wood Road, Purley, Surrey. Tel 01-660 5634.

Yaesu-FT-101, exc, very little use, with all cables plugs packing and handbook, £195. G3UML, QTHR. Tel 01-550 0882.

2x3cm microwave dishes 24in dia 4¼in focal length, £10 each. 3cm mixer waveguide with klystron and mixer diode, £12. S640 Eddystone rx, £18. 2m FM10D on 2 with a.m. detector, £20. GM8CNK, QTHR. Tel Troon 313433.

Liner 2 with pre-amp, £125. TW 10W a.m. txs for 70MHz and 144MHz, £5 each. KW2000, £90. BC221, £10. Eddystone EC10 rx Mk1, £30. G3BOC, QTHR. Tel Nesscliffe 392.

QTH Cheltenham, Gloucestershire: 3-bedroom semi-detached (non-estate), garage, oil-fired central heating with 11 radiators, extra shower room-toilet, secluded garden with triangle section mast holding Mustang Mk2 beam and 2m array, 65ft poplar in garden with 80m inv-V dipole, £14,000. Tel Cheltenham 28959 evenings.

Eddystone 358X rx, psu, coils and box, also Trio rx 9R59 and No 19 set tx/rx, all in wkg order. Humphriss, 14 Fosseway Crescent, Tredington, Nr Shipston-on-Stour, Warwickshire CV36.

Heathkit HW101 with ac psu, gd cond, £135. CW filter SBA-301-2, £12. Medco lpf FL50B (50Ω S0239), £3. G3ROG, QTHR. Tel Franksbridge 305.

GEC BRT400E communications rx, 150kHz to 30MHz (continuous), comp with handbook and spkr, £70 ono. G3UXH, QTHR.

Spacemark sstv monitor, £105. Decca colour CV25 tv, £85. MM70cm converter and tripler both in box with relay, £30. 50Ω dummy load, £4.50. Group C TV46 Multibeam, £4. G4CXL. Tel Weybridge 47385.

Hy-Gain 3-el hf beam 75Ω coaxial, 5 over 5 2m beam 50Ω coaxial, 55ft lattice twr, shaft, base mounted motor plus rectifier and control unit, 6 guys 3 ground stakes, £120. G4CJY, QTHR. Tel 0494-444417.

2½in mc meters, bargain, 4 for £1. 20 min preset pots, incl rectilinears, 50p. Ex-equip, long leads: 50 unmarked 2N706, £1. 32 ND120 (similar BSX21) nixie drivers, £1. 150 logic diodes, 50p. Orchard, 12 Kelvin Close, W. Ewell, Surrey.

IC21 vfo, £25. Europa transverter, £50. Microwave coaxial FHJ2 50Ω, 140 ft approx., but will cut if necessary, offers per foot. G4DAW 479 Wellingborough Road, Northampton 37944.

Trio TS510 tx/rx and psu, mint cond, perf wkg order, £140. Pair 6146B. Will deliver 50 miles. GW3MOP, QTHR. Tel 0792 22322.

Top band tx, can double to 80m, 10W a.m. with speech clipping, comprehensive manual included, reduced price £19. Trials welcome. *Wanted:* GDO covering 470kHz to 150MHz, will pay around £8. G8ITH, 16 Lee Close, Charlbury, Oxon. Tel 8143 after seven.

FL2100, one spare 572B, £150. EA12, £130. IC20 fitted nine channels, ¼-wave G-whip, £95. 12V dc PSUs, sae details. G5RP, QTHR. Tel East Hendred 384.

30W Cossor base 4m tx, new cond, with xtal, £15. 2m, £16.50. 10W 2m tx similar TW, xtal, psu, mic, nuvistor converter, £10. All components 400W TT21 linear, £24.50. Tavasu mobile aerial 160/80m coils, £6.50. Handbook swr bridges, £1.50. G2HCY, QTHR. Tel 01-954 2960.

Giving up 2m. Europa transverter, complete with valves, relay and wiring for FT101, £65. 10-element beam, £6.50. Bantex ¼ mobile whip, £3. All very little used. KW107 supermatch, £45. Offers considered. *Wanted:* HW7 or similar cw QRP rig for 80-10m. G4BUE, QTHR. Tel (home) 0273 31786 or (business) 09073 64441.

FT2F perf cond with 8 sets of xtals including 2 repeaters with FP2 ac power supply and Burns 2-tone unit, £100. G3OGB. Tel 01-550 1697.

Storno Viscount control units and multi conn, £7. Mics with pre/amp, £3. Various Viscount spares, sae. GC3HKV, QTHR. Tel 47278.

Excellent HRO-5T, spkr/psu, manual, five coilpacks, £28. Instrument cabinet, 13in by 9in by 7in, £2. *Wanted:* any information, circuits, spares, personal recollections of use, etc of wartime suitcase "spy sets". All letters answered. G8IYK, 140 Wolversley Court, Woodside, Telford, Salop.

Drake R-4C, 500Hz filter, nb, 160m, as new, £265. Yaesu FR400SDX, £145. DA-1 keyer, £10. Drake W-4 wattmeter, £20. Pair unused Eimac 3-500z with sockets, chimneys and other components for linear, offers. Hughes, 94 Penygroes Road, Blaenau, Ammanford, Dyfed, SA18 3BZ.

KW77 rx 160-10m with matching spkr and manual, bargain at £55 ono. G3RWA, 3 Bankside Close, Biggin Hill, Kent, TN16 3RP. Tel Biggin Hill 75422.

Spacemark sstv monitor, £90. 2m fm tx, £20. 2m 6/40 linear, built-in psu, £30. Bug key, £3. All ono. Prefer buyer collects. G4AOK, QTHR.

Pye Cambridge radiotelephone PTC118 Reporter series, contains interesting t and r xtals, £25 ono. Morris, 4 Ashmead Green, Cam, Bursley, Glos, GL11 5EW.

Valves—large quantity various types tx and rx, majority new boxed, eg 35T, TZ40, 813, 250TH, 805, 810, 211, 807, 6L6, 866A, U19, 5U4G, S130 6·3V octal, 2·5V ux, 4V Cossor. SAE list, bulk buyer preferred. G8FC, QTHR.

Heathkit 10/18U oscilloscope 4·5MHz bandwidth perf cond, £35 ono. Kokusai filters MF455-15K 3·5kHz with FT241/A u/lsb xtals, £7.50. MF-455-10CK 2·4kHz with B7G lsb xtal, £7.50. G4AGJ, QTHR.

Pye AM25B Vanguard modded am/fm on 145 with xtals and all control gear, £18 plus carriage. New Cambridge rf board 2m tunable, unused, £3. 2m xtals HC18U 9·6333 12·0625 48·2875 48·5625 48·5875 48·6, £1.50 each. G8DJM, QTHR. Tel Lye (038482)4388.

Trio 9R59DS, brand new, plus Class D wavemeter and phones, £42. Buyer collect. East, 57 Ashleigh Road, Horsham, Sussex. Tel 60236 evenings, or office hours Crawley 0293 34122.

KW2000A plus ac psu with spare tx/rx case and two unused 6146s, £150. G3ZVU, QTHR. Tel Oxted 4277 after 7.30 and at weekends.

Heathkit HW17A with dc psu and manuals, new tuner fitted and then aligned and checked by Heathkit, £55 ovno. Tel Chesterfield 77859 and ask for Mr R. Young, or write to 25 Ashgate Road, Chesterfield, Derbyshire.

Heathkit HW17 2m tx/rx with spare valves, £50 ono. G8BXJ, QTHR. Tel Bristol 695839.

PSU 250V 60mA 6·3V 2-3A, £1. 250V 100mA 6·3V 5A, £2. 80V 200mA stabilized, £1. Ex-computer "Advance" 48V 4A, 24V 5A, £10 each. Teletype LMU3 7-hole reperf, offers. Pye 455kHz 25kHz channel filters, 50p each. G3MNV, QTHR. Tel 021353 3012.

Eddystone 770R, exc cond, realigned by mfr, £100 ono, buyer collects. TW nuvistor converter/ps, 28MHz i.f., £5. Valve 70MHz converter/ps 28MHz i.f., £5. Two walkie-talkies 28·750MHz xtals, £8. Carriage extra. G2BVN, QTHR.

KW2000B with ac psu, £180. KW105 atu, £25. Hunts res/cap bridge, £6. Taylor sig gen 100kHz-45MHz, £7. Pye Vanguard AM25B with control box cables etc, tx conv for 2m rx alignments reqd, £25. G3ZVD, QTHR. Tel 070984 3619.

Liner 2 with psu and preamp, £130 ono. Storno Viscounts hi band comp, £15. CCS1 conduction cooled 4CX250B, new, £5 each or exchange valve for heat sink flange. G8BCL, QTHR. Tel 0422-21885.

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Microwave Modules 144MHz a.m. tx and tunable rx with matching spkr/control unit to form comp 12V station module 7 × 8 × 5in, xtals 145·0, 144·25, mic, perf cond, will deliver 50 miles Bristol, £60. G3SJI, QTHR. Tel Bristol 623321.

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Eddystone EC10 II gen cov rx, unmarked, little used, orig packing, with ac/batt psu exc for car/caravan holiday use, £70. 73 Weardale Ave, Forest Hall, Newcastle upon Tyne 12.

Please collect AR88LF, cabinet, manual, £22 ono. Redifon GR286 mk3 international unit, immac cond, xtals, Ledex motors, manual, £45. GR286 mk1 less valves, xtals, £14. Carriage paid 200 miles. G3JMJ, QTHR. Tel 073-271 3467.

Comp station tx/rx NCX5 (mk2) digital readout NCX-A psu SB200 linear, £250. Heavy duty G4ZU 3-el. 10/15/20 beam with matching Panda atu, £19. TE15 transistor gdo, new cond, £12. Unstable JXK 2m converter 28-30 i.f. Offers. GM3CRY, QTHR. Tel Strathkinness 219.

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KW77 rx, one owner, vgc, nearest £50. G3RUG, QTHR. Tel 01-439 7183.

Electroniques coilpack valve. Hamband coils HSO 1·6, HSO 8·5. 3 i.f. transformers 85kHz, £10. Pair GPO telephones, £2. 390V 200m/A inverter, £4. Toggles: 4P2W, 40p. SP bias off, 15p. New: 6U4GT 5R4GY 807, 50p. 829B, £1.25. Carr extra. G3XII, QTHR. Tel Leyland 22121.

Sommerkamp FT277 with matching vfo, £250. Electroniques type transistor coil pack, £20. G3RKK communication rx 85% comp but less panel and dial, £25. Reason for sale, gone digital. G5YY, QTHR. Tel 0533 897659 (evenings).

Yamaha cassette tape recorder type TB700 with Dolby noise reduction system electronic motor control etc, mint cond with chrome tapes and handbooks, £75 ono. G4CGV, QTHR. Tel Littlehampton 6161 ext 55, daytime.

4MHz 2m 16W a.m. tx and modulator, xtals 145·800, 145·440, 145·944, set spare valves and mic, good cond, £20 ono. Can deliver reasonable distance otherwise carriage extra. GM8FJM, QTHR.

Taylor 60 sig gen, £4.50. 160m tx no pp, £5. RF27, £2. GEC miniscope, £6. HRO mains and battery pack, £22.50. Cossor 1049 mk2 scope, £15. 10W 2m tx, £15. G3MBL, QTHR.

KW204 tx, £150. B40C revalved as D model very good on ssb, with trimming tool, handbook, £60. CT82 noise meter, £10. SSM mf converter, £10. Buyer collect. G3DPR, QTHR. Phone Hawkhurst 2063.

Microwave Modules MMV432 tripler with bnc connectors, £10. All the bits for a high power linear with 4CX1000A and base and large mains transformer, £60. G3ZSS, QTHR. Tel Coventry 456782.

Liner 2 ssb 2m tx/rx with preamp fitted, recently realigned and checked professionally in fb wkg order, 144·10, 144·32, £120, carr free. G3URE, QTHR. Tel Wideopen 5311 day, 3044 evenings.

KW2000 dc power pack comp with connectors and cable, £14. Unica UNR30 rx 4 bands 550kHz 30MHz spkr bfo 240V ac, as new, £10 ono. G2HAR, QTHR. Tel Hemel Hempstead 2817.

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Liner 2 2m ssb tx/rx low band 144·1MHz to 144·35MHz, built-in rx pre-amp, 4 months old, comp with all fittings, £100. G8JLH, 27 Meadow Rise Road, Norwich, Norfolk NR2 3QR. Tel Norwich 55723.

Strumech galv tower sections, offers. Buyer collect. G4CCT, QTHR. Tel 01-349 1442.

Racal xtal filters 1·4MHz BA22786 lsb BA22287 usb swop for spares or sub-units for RA117 rx. BAY96, £2.50. CXY11, £1. BAV46, 75p pp inc. *Wanted:* AN/URM25D signal generator. G3RNV, QTHR.

4CX250B (new) comp with air system base and chimney, £12. Tel Bude (0288) 3701.

Eddystone EC-10 in exc cond, £35. Set of six xtals near 465kHz suitable ssb filter, £5, DL6SW converter board, £1. Halson mobile whip with 160m and 80m coils, offers. G3XJS, QTHR. Tel 04947 2344.

Pye Cambridge tunable over 2m, many extras, vgc, £25. R209 rx, £15. Eddystone 358X rx with 2 coils, £10. No 62 set tx/rx, £10. KW Vanguard tx, £20. Buyer collect. G8CVU, QTHR. Tel Ashford Kent 25939.

HW100 as new with push to talk mic, £80. Prof blt lin amp 600W p.e.p. with separate power supply 2,000V at 500mA, £70. Details on req, pref buyer insp and coll. G3RUN, QTHR.

Pye 2m base station tx with EL34 modulator plus fm modulator, £20. GB 16mm sound projector model L516 comp with spkr and all cables, £50. Or will exchange both for hf linear. Delivery arranged. G3XEP, QTHR. Tel Leeds 684801.

Electronic keyer EK9X, perf, £8. FL2000B Yaesu Musen linear amp, perf, little used, bargain, £135. G4CVZ, QTHR.

CR100 with handbook, Q-mult, S-meter, stabilized ht, side tone and mute facilities, £15. Buyer collects. G3WVC, QTHR. Tel Bere Regis 534.

FR50B good cond, £45. UR1 coaxial ideal Nov helical aerial 40ft roll, £5, or 10p foot cut. Cambridge rf board 68-88MHz, Cambridge 10·7MHz board, both £1. Can be seen. Del by arrangement. G8HNN, QTHR. Tel Worcs 51956.

Disposal gear late GM3MUQ SR150 + psu, £75. Shure 201, £2. KW 1pf, £2.50. Katsumi keying monitor, £3. Dentsi keyer, £6. 80Ω load, £1. Lafayette tube tester, £5. HM-15, £5.50. Raymart wavemeter, 75p. FS meter, 50p. GM3POK, QTHR. Tel Boness 3377.

WANTED

AR88LF in good cond. Smith, The Old Forge, Brinkley. Tel Newmarket 76230.

Joystick and Joymatch or any aerial system to improve swl. Bates, Flat D, 16 Trinity Crescent, Tooting Bec, London SW17. Tel 01-672 9167.

Trio JR500S or similar hf rx for swl. Please state price. P. Green, Whitneys Farm, Ombersley, Droitwich, Worcs WR9 OHP.

"QST" magazine for March 1947, January 1963 and December 1966. Also Vibroplex key or similar. G3ZCO, QTHR. Tel 78066.

HRO in any electrical cond, dial and drive must be ok. Also paddle for el-bug. *Selling:* comp wkg set of valves for 62 set, and circuit diagram, £1.50. G4BUO, QTHR.

HF ssb tx/rx for youngster just passed RAE, will collect London area. Also circuit for G209 rx, buy or loan to photostat. Jessop, 28 Moor Lane, Rickmansworth, Herts. Tel Rick 74646.

10C1 valve, serviceable. G4AJW, QTHR. Tel 021-706 0381 after 7pm.

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Information. Advertiser intends appealing against local authority decision to refuse permission to erect 60ft crank-up Versatower. Any information on successful applications or appeals of a similar nature would be appreciated. All letters acknowledged and postage refunded. G4BUE, QTHR. Tel (home) 0273 31786, (business) 09063 64441.

Permanent accommodation, flat etc in or near Stratford-on-Avon. G3TFM, QTHR. Tel Stratford 66140 business hours.

Complete fm shack for beginner, tx/rx aerial rotator tower etc, collect within home counties. Chapple, Bali Ha'i, Maybury Avenue, Cheshunt, Herts. Tel Waltham Cross 28144.

FIF 80m loading coil Heath HP-13 mobile power supply 3 pot core type LA2532. G3LIS, QTHR. Tel Aughton Green 423283.

HRO 5T good cond comp with manual and spares if possible. Remington, "Rosebank", Devizes Road, Box, Chippenham, Wilts SN14 9EB. Tel Box 2892.

Ladies. Gentlemen. Handbook circuit wanted. Gonset G76 tx/rx. USA valve wanted 6T6G osc or equiv. Livermore, Village Farm Cottage, Market Weston, Diss, Norfolk.

KW2000A and ac psu. Chaplin, 134 Upper Richmond Road West, London SW14 8DS. Tel 01-603 3431 ext 79, (office).

Circuit diagram and information on rx type R1132A (modified to TIL 149/1951) to buy or borrow. Circuit diagram or information on a diode noise generator type 122 S/No 5. Rolfe, 33 Hinton Close, Blandford Forum, Dorset.

FLDX400 tx with connecting cables and instruction manual, state cond and price, all letters answered. A. Henry, 27 Longworth Avenue, Coppull, Chorley, Lancs PR7 4PJ.

Tx/rx HW100, HW101, FT200, etc. State price and cond. GM4BVC, QTHR. Tel 0224 48202.

Rotator with control box and wire desperately needed also gen on Hudson FM208 tx/rx with view to converting to 2m. Steve, 9 Portland Close, Eaglescliffe, Stockton-on-Tees, Cleveland.

QQVO7-50 valve 50Ω 951 coaxial relay 12V. *For sale:* ATK transmit strip, £5. Xtals 8·075, 8·110, HC6U, 8·025, 8·075, 8·106, FT243, £1 each. Sherratt, 32 Springfield Way, Cranfield, Beds.

FR50B rx urgently, must be in good order, preferably with full 10m coverage and top band. Would consider exchange of KW2000A for FR50B plus FL50 with cash adjustment. Sell for spares BC342 rx, £4. Buyer collects. G3ZSV, QTHR. Tel 02214 62178.

Yaesu spkr cabinet to match 400 series, odd HRO coils, base and chimney for 4CX250. *For sale:* 116MHz xtal new, £4. GW3GHC, QTHR. Tel Castleton, Gwent 481.

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Hallicrafters vhf rx. G8FOD, QTHR.

Loan of handbook, EMI type 8 vidicon tv camera. G8AWM, 54 Horton Hill, Epsom. Tel 28229.

Trio/Kenwood tx type T599 or TS510 tx/rx. Faulty acceptable but must be mechanically sound. G3FXA. Tel Bude (0288) 2624.
Metal valves 6K8 6SJ7 small mains xformer with 200-0-200V 6·3V secondary 40-60mA information on switch phasing for crossed dipoles, or copy of *VHF Communication* 1973 ed 2. Thompson, 49 Widney Avenue, Birmingham B29 6QE. Tel 472 4678.
BC221. G5XY, QTHR. Tel Hayling Island 3195.
Circuits and/or manual for Murphy Rover type MR/960/D to borrow or buy. G8IWJ, 50 Rock Lane, East Birkenhead, Merseyside. Tel 051-645 6573.

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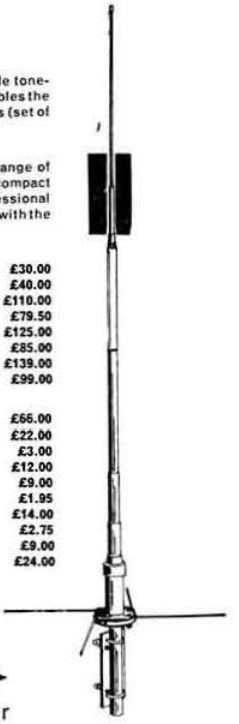

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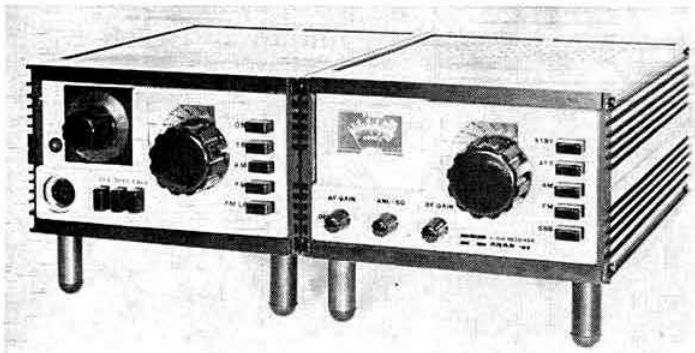

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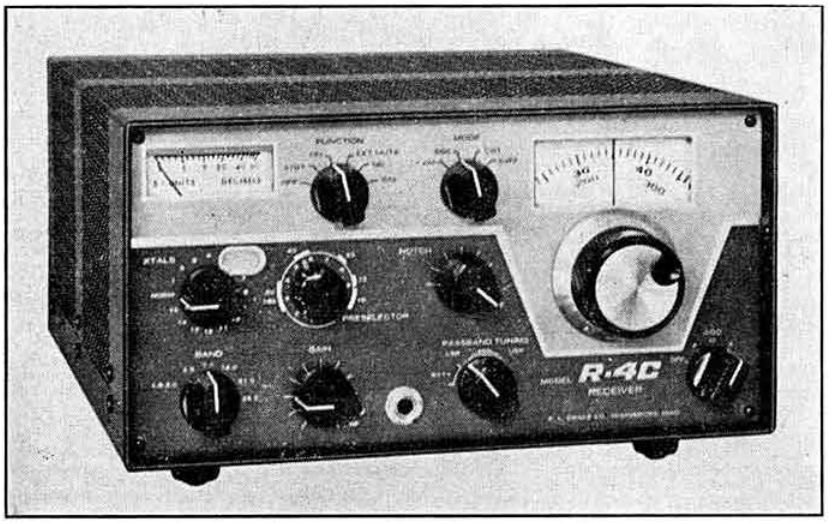

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Mixed electrolytics, large bag **£1.00.**
PC Board Withdrawel Handles, mixed cols **8 for 50p.**
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Black Plastic Knobs, ¼in. Dia., ¼in. spindle, **4 for 50p**
Ring Magnets, 7mm outside dia. **20 for 50p.**

25-Way ISEP Plugs and Sockets **40p** set (1 plug + 1 skt) Plugs and sockets sold seperately at **25p** each.
Cannon Right-angled plugs XLR LNR15 **75p.**
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Din Speaker Skts, 2-pin, **4 for 50p.**
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BNC Insulated Sockets (single hole type) **65p each.**

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radio communication

journal of the Radio Society of Great Britain

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