RADio COMmunication

DECEMBER 1987

FOUR PAGE CHRISTMAS PULL-OUT

Journal of the Radio Society of Great Britain

RSGB

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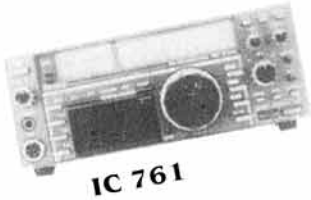

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Amcomm of London

VISA

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The Editor
Radio Communication
Lambda House
Cranborne Road
Potters Bar
Herts EN6 3JE

Correspondence concerning the distribution of the journal, and all other Society matters should be addressed to:

RSGB Headquarters,
Lambda House,
Cranborne Road,
Potters Bar,
Herts EN6 3JE

Fax 0707 45105

Business hours: 1000 to 1600

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Tel 0707 59312 for a recording of the latest amateur radio news

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RSGB Data Box 0707 52242
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FRONT COVER

CHRISTMAS IN TRAFALGAR SQUARE, LONDON

Photo: "Britain on View" (BTA/ETB)

ABC
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CONTENTS

Technical articles on subjects of amateur interest are always welcome and should be sent to: The Editor, *Radio Communication*, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

All articles received are reviewed for technical merit by the RSGB Technical & Publications Committee, or an acknowledged expert on the subject, before acceptance. Payment at high competitive rates will be made for all articles published.

A contribution will only be considered for publication on the understanding that the person submitting it is the original author and owner of the whole copyright, and that on acceptance for publication such copyright will become the property of the RSGB in consideration of the above-mentioned payment by the RSGB to the contributor.

The editor will be pleased to send intending authors a manuscript preparation guide and to give any other advice and assistance requested.

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two great handhelds from KENWOOD.

Without a doubt the two new 2 metre FM hand-helds from KENWOOD now represent the best value for money in amateur radio equipment today.

For the amateur who wants a simple high quality transceiver from a reputable manufacturer at a rock bottom price but still wants high output power for shack use, the TH205E is the answer. And for the operator who is prepared to pay a little more to gain additional features, the TH215E is the obvious choice. As well as the new rigs for 2 metres, KENWOOD have produced 70 centimetre versions, these are the TH405E and TH415E.

	TH205E	TH215E
Frequency range	144 to 146 MHz for both receivers	
Power output	Depending on operating voltage up to 5 watts (with standard PB2 battery pack 2.5 watts)	
Operating voltage	Battery terminal 6.3 to 15 volts DC Top panel jack 7.2 to 16 volts DC	
Memory channels	3 with quick recall	10 with quick recall
Frequency stepping	5 kHz	5, 10, 15, 20 or 25 kHz
Battery saver	Built-in battery saver extends operating life	
Scan	Simple band scan	Band, memory and programmable scan
Size	67(2.64) W × 173(6.81) H × 37(1.46) D mm (in.)	
Weight	520 g (1.15 lb) with PB2 and aerial	

£215 **£252**

Prices include NiCad, charger & VAT

TM221E & TM421E

2 metre and 70 centimetre FM mobiles

45watts 35watts

The new KENWOOD TM221E and TM421E two metre and seventy centimetre FM mobile transceivers have been specifically designed to condense maximum performance and operating convenience into a compact package. Output power is 45 watts on two metres (TM221E) and 35 watts on 70 centimetres (TM421E). Receiver sensitivity matches the output power of the set and measures an amazing 0.141μV for 12dB SINAD (across 144-146). The figures are those given by Chris Lorek in his recent TM221E review published in the July edition of HAM RADIO TODAY.

Much discussion has taken place recently regarding 12.5 and 25 kHz spaced frequency channels on the two metre band. With the new mobiles channel spacing is not a problem. KENWOOD with their usual attention to detail have made the frequency step user selectable. The steps available are 5, 10, 12.5, 15, 20 and 25 kHz. Once programmed either microphone up/down button or the transceivers front panel knob can be used to step the transceiver across the band. Of course should it be necessary the selected step can easily be changed.

A new orange backlit liquid crystal display gives the transceiver an amazingly clear frequency readout that can be read in the brightest of sunlight.

The transceiver has all essential operating aids. There are 14 memory channels, each of which holds frequency, whether simplex or repeater operation is required and whether or not the tone burst is on or off. Scanning can either be memory with the ability to lock out unwanted channels or band with the scan limits set by the operator. The usual priority channel facility is also included to make sure that no call is missed. As well as showing the operating frequency the display also indicates which of the facilities are being used.

TM221E...£317.30 inc VAT (carr. £7.00)
TM421E...£372.08 inc VAT (carr. £7.00)

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Telephone 0629 580800 (4 lines)

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TS940S . . . £1995.00 inc vat, carriage £7.00.

TS930S ... **Much has been said** and written about the TS930S and it now has a place high in the affection of radio amateurs. Modes of operation are USB, LSB, CW, AM and FSK. Providing full coverage of the amateur bands from 160 to 10 metres and including a general coverage receiver tuning from 150 kHz to 30 MHz, the TRIO TS930S is the ideal rig for today's crowded bands.
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TS440S ... **A step forward** in compact HF equipment, the TS440S covers the amateur bands from 160 to 10 metres and is also a general coverage receiver tuning from 100 kHz to 30 MHz. It has keyboard frequency entry, full and semi break-in on CW, one hundred memories and provision for fitting an internal ATU. Modes of operation are USB, LSB, AM, FM and AFSK.
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TS430S ... **A compact HF transceiver** suit... operation, yet having all... radio communi... bands from 160 to 10 metres and ... MHz. Modes of operati...
TS430S . . . £97...

TS430S – PRICE REDUCED TO £748
SAVE £226

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CD600. . .RTTY, CW, ASCII, TOR, AMTOR decoder, output for UHF television, monitor and printer, can also be used as morse tutor. . .**£215.14 inc vat,** carriage £7.00.
CD670. . .A higher specification RTTY, CW, ASCII, TOR, AMTOR decoder complete with liquid crystal dot matrix display, variable RTTY shift, normal/reverse mode switch, outputs for TV, monitor and printer and can also be used as morse tutor. . .**£327.77 inc vat,** carriage £7.00.
CD660. . .Similar to the CD670 but without the built-in display. . .**£264.97 inc vat,** carriage £7.00.

A Christmas Message

There were shepherds abiding in the field, keeping watch over the flocks by night. And lo, the angel of the Lord came upon them, and the glory of the Lord shone about them, and they were sore afraid.

And the angel said unto them, "fear now, for behold I bring you good tidings of great joy, which shall be to all people. For unto you is born this day, in the City of David, a Saviour which is Christ the Lord".

And suddenly there was with the angel a multitude of the heavenly host, praising God, and saying:

"Glory to God, glory to God in the highest, and peace on earth, goodwill towards men."

LUKE 2 V 6 to 14

A peaceful Christmas to our friends

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1300HC frequency counter.

Small enough to fit into a shirt pocket, the 1300HC frequency counter brings easy and accurate frequency measurement well within everyones reach.
The 1300HC uses a full 8 digit display, and measures to 1300 MHz, thus being ideal for amateur as well as all mobile radio bands including cellular.
The unit contains its own rechargeable NiCd battery pack which is charged from an external supply. The frequency counter can also be powered from any 9 to 12 volt dc supply, which charges the batteries as well.
The 1300HC has excellent sensitivity, and when used with the optional telescopic whip, easily measures transmitter frequencies of mobile or handheld transceivers, even low powered "bug" devices. When used in conjunction with a simple "dip oscillator", the 1300HC makes checking tuned circuit or aerial resonance an easy task.
The high performance of the 1300HC frequency counter makes it an indispensable tool for every amateur, engineer or technician. Its small size makes it suitable for either shack or "on the move" use.

Specification

Range	1-300 MHz
Resolution	100Hz at 2.5 sec. gate 1 kHz at 250 mS. gate
Display	8 digit 0.3" LED MHz decimal point Leading zero blanking
Gate times	Fast. 250 mS Slow. 2.5 S
Sensitivity (typical)	1-10 Mhz. . .10-150 mV rms 10-1000 Mhz. . .3-50 mV rms 1-1.3 GHz. . .10-150 mV rms
Accuracy (typical)	+ ! – 1ppm, + / – 1 count LSD
Aging	0.1 ppm/month (typical)
Gate indication	Red LED during sampling
Input connector	B.N.C.
Input power	9-12 Vdc at 150 mA
Power connector	Concentric. Centre positive.
Case	Brushed anodised aluminium
Size	3.9H × 3.5W × 1D (inches)
Weight	255 g
Power supply	Internal NiCd pack. (supplied), or external dc source (option)

1300HC ...Handheld frequency counter **£135.00 inc vat,** carr. £2.00

Options

PS12.....AC mains power supply **£8.50 inc vat,** carr. £2.00
BNC6.....Telescopic whip **£7.46 inc vat,** carr. £0.50
CC12.....Padded carrying case **£9.90 in vat,** carr. £1.00

packet radio from KANTRONICS

KPC2 . . . This KANTRONICS designed AX25 version 2 TNC features a built-in VHF and HF modem, full duplex operation and multiple connect facilities. The serial RS232 port, combined with the enhanced generic command structure allows operation with any computer.

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KPC4 . . . A KPC4 is your gateway into pocket flexibility. Having two packet ports, digipeating on each port and gateway between ports, the KPC4 lets you bridge two frequencies on one band or operate cross band. The KPC4 also includes the PERSONAL PACKET MAILBOX feature.

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U66V remote head, 140/525 MHz, max 300 W, N type connectors. . .**£55.27 inc vat,** carriage £1.50.

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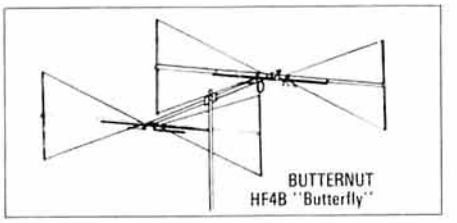
MFJ841	2M In Line 5W BNC Conn. Switchable SWR/PWR	42.02



HRS

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ICOM

THE NEW F

IC-761, HF TRANSCEIVER with General coverage receiver.

The new ICOM IC-761 H.F. Transceiver has many features making it probably the best top of the line Amateur transceiver available today. This all mode transceiver features an internal tuning unit and A.C. power supply. The A.T.U. boasts a 3 second band selection and tune up with a VSWR matching of less than 1.3:1. For the serious operator the 100kHz-30MHz general coverage receiver and 105dB dynamic range make it ideal for DX chasing. Frequency selection is by the main VFO or via the front panel direct access keypad. And for when reception is difficult, pass band tuning, I.F. shift, notch filter, noise blanker, pre-amp and attenuator should enable you to copy even those weak DX stations whether amateur or broadcast. The C.W. operator will appreciate the electronic keyer, 500Hz filter and full break in (40wpm) other filter options are available. The IC-CR64 high stability crystal is standard as is the CI-V communications interface for computer control. Twin VFO's and split mode for cross band contacts,the IC-761 features program scanning, memory scan and mode select scan and the 32 memories can store frequency and mode. The transceivers operating system is held permanently in ROM and is not dependant upon the lithium battery. The cell is used for memory back up only. A new style meter gives P.O., A.L.C., IC, VC, COMP and SWR readings.

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FACE OF HF.

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Features:

- All mode.
- 100kHz-30MHz General Coverage Receiver.
- 100 watts.
- 12v Operation.
- 105dB Dynamic Range.
- 32 Memories.
- Electronic Keyer.
- Full Break In (40wpm).
- 500 Hz CW Filter.
- HM36 Microphone.

IC-735.

- Small Compact Size.
- 100kHz-30MHz General Coverage Receiver.
- 100 watts.
- 105dB Dynamic Range.
- FM Standard.
- 12v Operation
- Large LCD Readout.
- 12 Memories.
- CI-V Communications Interface
- HM12 Microphone.

STOP PRESS. **Later in 1988 Icom are launching a terrific new HF transceiver, similar in size to the IC-735 but simpler to operate. This new HF rig is also realistically priced and aimed at a large section of Ham operators. The introduction of this new HF transceiver emphasises Icom's positive approach to market requirements.**

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ICOM

VHF/UHF FM Handportables

If you want a handheld with exceptional features quality built to last and a wide variety of interchangeable accessories, take a look at the ICOn range of FM transceivers, all ICOM handportables come with a nicad battery pack, AC wall charger, flexible antenna and wrist strap.

Micro 2E/4E

These new micro-sized 2 metre and 70 centimere handportables give the performance and reliability you come to expect from ICOM. Measuring only 148 x 50 x 30 the Micro fits in your pocket as easily as a cassette tape. The Micro 2E/4E feature san up/down tuning system for quick frequency adjustments. 10 programmable memories, a top panel LCD readout, up to 2.5 watts of output (optional).

IC-2E 2 metre Thumbwheel Handportable

This popular handheld from ICOm is still available.
For those amateurs who require a straightforward and effective FM transceiver the IC-2E takes some beating. Frequency selection is by means of thumbwheel switches (with 5Khz up switch) simplex or duplex facility. Power output is 1.5 watts or low 150 milliwatts (2.5 watts possible with BP5A battery pack).

IC-02E/04E 2 metre and 70cm Keypad Handportable

These direct entry CUP controlled handhelds utilise a 16 button keypad allowing easy access to frequencies, memories and scan functions. Ten memories store frequency and offset, these handhelds have an LCD readout and power outputs is 2.5 watts or low 0.5 watt. 5 watts is possible with the IC-BP7 battery pack or external 3.8v DC.

IC-12E 23cm Handportable

Similar in design and style to the 02E/04E this 1296Mhz handheld utilises ICOM's experience in GHZ technology, gained by the excellent IC-1271E base station. Power output is 1 watt from the standard BP3 nicad pack, external 13.8v DC powering is available to the top panel jack. With the growing number of repeaters on 23cm. The IC-12E makes it an ideal band for rag chew contacts.

ALSO AVAILABLE FOR ICOM HANDPORTABLES ARE A LARGE RANGE OF OPTIONAL EXTRAS INCLUDING A VARIETY OF RECHARGEABLE NICAD POWER PACKS, DRY CELL BATTERY PACKS, DESK CHARGERS, HEADSET AND BOOM MIC, LEATHERETTE CASES AND MOBILE MOUNTING BRACKETS.

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Dept RC, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 363859. 24 Hour.

Count on us!

IC-28E, 2m FM Mini-mobile.

This 2 metre band transceiver is just 140mm (W) x 50mm (H) x 133mm (D) and will fit nearly anywhere in your vehicle or shack. Power output is 25 watts or 5 watts low power and is supplied complete with an internal loudspeaker.

The large front panel LCD readout is designed for wide angle viewing with an automatic dimmer circuit to control the back lighting of the display for day or night operation.

The front layouts is very simple, all the controls are easy to select making mobile operation safe. The IC-28E contains 21 memory channels with duplex and memory skip functions. All memories and frequencies can be scanned by using the HM-15 microphone provided. Also available is the IC-28H with the same features but with a 45 watt output power.

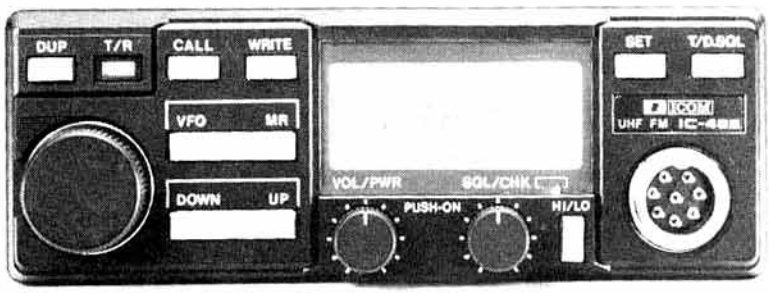
Options include IC-PS45 13.8v 8A power supply, SP8 and SP10 external speakers, HS15 flexible mobile microphone and PTT switchbox.

IC-3200E, Dual-band transceiver.

If you are a newly licensed or just undecided about which band to first operate, then the ICOM IC-3200E is just the answer. This is a dual-band (144-146/430-440MHz) FM transceiver ideally suited for the mobile operator. The IC-3200E has a built in duplexer and can operate on the antenna for both VHF and UFH, and with 25 watts of output power on both bands (the low power can be adjusted from 1 to 10 watts) you can never be far from a contact whether simplex or 2m/70cm repeater.

The IC-3200E employs a function key for low priority operations to simplify the front panel and a new LCD display which is easy to read in bright sunlight, 10 memory channels will show operating frequencies simplex or duplex, and four scanning systems memory, band, program and priorty scan.

IC-48E, 70cm FM Mini-mobile.



This 70cm band transceiver is so small that it will fit almost anywhere in your vehicle or shack. Power output is 25 watts or 5 watts low, the IC-48E is supplied complete with an internal loud-speaker. The large front panel LCD readout is designed for wide-angle viewing with an automatic dimmer circuit to control the back lighting of the display for day or night operating. The front panel of the IC-48E is straightforward to make mobile operation safe and easy. The IC-48E contains 21 memory channels with duplex and memory skip functions. All memories and frequencies can be scanned by using the HM15 hand mic provided.

IC-48E options include the PS45 13.8V. 8 amp power supply, SP8 and SP10 external loudspeakers. HS15/SB mobile flexible microphone and PTT switchbox.

Why not try 70 cms as a serious alternative to the 2 metre band, you might be amazed at what can be achieved. For more information contact us or your local ICOM dealer.

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TS430S	160M-10M Transceiver	748.00	(10.00)
TS440S	NEW Amateur band transceiver General coverage RX	1138.81	(7.00)
PS50	Heavy Duty PSU for TS440S	222.49	(5.00)
AT440	Auto ATU for TS440S	144.82	(3.00)
TS940S	9 Band TX General Cov RX	1995.00	(7.00)
AT940	Auto ATU for TS940S	244.88	(4.00)
TS930S	9 Band TX General Cov RX	1695.00	(7.00)
TS830S	160-10m Transceiver 9 Bands	1098.00	(7.00)
AT230	All Band ATU Power Meter	208.87	(5.00)
SP230	External Speaker Unit	66.49	(5.00)
PS430	Matching Power Supply	173.78	(5.00)
SP430	Matching Speaker	40.81	(3.00)
MB430	Mobile Mounting Bracket	15.80	(2.50)
FM430	FM Board for TS430	48.05	(1.50)
LF30A	HF Low Pass Filter 1kW	32.26	(2.50)
YK88A	6kHz AM filter for TS430S 440S	49.37	(1.00)
YK88C	500Hz CW filter for TS430 440 830 530	46.08	(1.00)
YK88CN	270Hz CW filter for TS430 440 830 530	54.64	(1.00)
YK88SN	1.8Hz SSB filter for TS430 440 830 530	46.74	(1.00)
MC50	Dual Impedance Desk Microphone	46.08	(2.50)
MC35S	First Microphone 50K ohm IMP	21.72	(1.50)
MC85	Deluxe Desk Mic with Audio Compensator	99.00	(3.00)
MC43S	Up Down Hand Mic 8 Pin 500 Ohm	22.22	(1.50)
MC60A	Desk Mic with built-in Pre-amp	88.22	(3.00)
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TR751E	2M Multimode (mobile)	599.00	(5.00)
MU1	DCL option for TR751E	30.95	(1.00)
TS711E	2M Base Stations	940.00	(7.00)
HS5	Deluxe Headphones	37.54	(2.50)
SP40	Mobile External Speaker	21.06	(2.00)

NEW

TH205E	2M Handheld Transceiver	215.26	(4.00)
TH215E	2M Handheld with Keypad Entry	252.13	(4.00)
PB1	Nicad Pack 12v 800mAh	57.27	(2.00)
PB2	Nicad Pack 8.4v 500mAh	34.22	(2.00)
PB3	Nicad Pack 7.2v 800mAh	38.82	(2.00)
PB4	Nicad Pack 7.2v 1600mAh	63.19	(2.00)
BT5	Dry Battery Case	11.86	(1.50)
BC7	Rapid Charger	97.42	(3.00)
SC12	Case for (PB2 3)	13.82	(1.50)
SC13	Case for (PB1 4)	14.49	(1.50)
PG2V	DC Power Cable for TH205E 215E	3.96	(1.50)
SMC30	Speaker Mic for TH21E 41E 2600 3600E	28.31	(2.00)
HMC1	Headset Unit with VOX for TH21E 41E 2600 3600E	32.91	(2.00)
RA2	Rubber Flexible Antenna for TR2400 2500 2600E	9.87	(1.50)
RA3	Telescopic Whip Antenna for TR2400 2500 2600E	13.17	(1.50)
TM221E	2M FM Mobile Transceiver 45W	317.30	(5.00)
TM421E	70cms FM Mobile Transceiver 35W	352.84	(5.00)
TH405E	70cms Handheld Transceiver	273.00	(4.00)
TH415E	70cms Handheld with Keypad Entry	298.85	(4.00)
TR851E	70cms All Mode Transceiver	699.00	(5.00)
TW4100E	VHF UHF FM Mobile Transceiver	699.00	(5.00)

Yaesu

PA3	Car Adaptor Charger	21.85	(2.00)
MH1B8	Hand 600 8pin mic	21.00	(1.50)
MD1B8	Desk 600 8pin mic	79.00	(3.00)
MF1A3B	Boom mobile mic	25.00	(2.00)
MH12A2B	Speaker Microphone	27.00	(2.00)
YH77	Lightweight phones	19.99	(2.00)
YH55	Padded phones	19.99	(2.00)
YH1	L weight Mobile H set-Boom mic	19.99	(1.50)
YH2	L weight Mobile H set-Boom mic	19.99	(1.50)
SB1	PTT Switch Box 208 708	22.00	(1.50)
SB2	PTT Switch Box 290 790	22.00	(1.50)
SB10	PTT Switch Box 270 2700	22.00	(1.50)

NEW

FT757GX2	NEW HF general coverage transceiver	969.00	(5.00)
FT221RH	2M FM mobile transceiver	309.00	(5.00)
FT767GX	HF Gen. Coverage trans. with optional VHF/UHF/6M modules	1550.00	(—)
FEX 767-2	2m module for FT767	169.00	(3.00)
FEX 767-7(B)	70cms module for FT767	215.00	(3.00)
FEX 767-6	6m module for FT767	169.00	(3.00)
FL7000	Solid State linear with built in auto ATU	1600.00	(—)
FT727R	Dual Band handheld transceiver 144-146MHz 430-440MHz up to 5W on each band	425.00	(3.00)
FT290RMK II	2M multimode portable mobile base	429.00	(3.00)
FT23R	2M mini handheld with LCD display 5W	£249.00	(2.00)
FT73R	70cms mini handheld with LCD display 5W	£269.00	(2.00)
FT690RMK II	6M multimode portable/mobile/base transceiver	£399.00	(5.00)

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£249.00 INC VAT, P&P £3.00

Receivers

		P&P
Trio R2000 HF general coverage receiver	595.00	(7.00)
Trio VC10 VHF converter for R2000 118-174MHz	161.94	(3.00)
Trio R5000 NEW HF general coverage receiver	875.00	(7.00)
Trio VC20 VHF converter for R5000 108-174MHz	167.21	(3.00)
Yaesu FRG8800 HF general coverage receiver	639.00	(7.00)
Yaesu FRV8800 VHF converter for FRG8800 118-175MHz	100.00	(3.00)
Icom R71E HF general coverage receiver	825.00	(7.00)
Icom RC11 remote control unit for ICR71E	62.00	(2.00)
AR2002 VHF/UHF scanner 25-550MHz and 800-1300MHz	487.00	(5.00)
Icom R7000 VHF/UHF scanner, all modes 25-2000MHz	957.00	(7.00)
Icom RC12 remote control unit for R7000	62.00	(2.00)
Yaesu FRG9600 VHF/UHF scanner 60-950MHz	509.00	(5.00)
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IC761 all mode general coverage transceiver. 32 mems. 100W. including internal ATU and PSU	2459.00	(10.00)
IC751A SSB, CW, FM, AM, RTTY general coverage trans.	1465.00	(10.00)
IC735 HF general coverage transceiver	949.00	(10.00)
IC505 50MHz SSB, CW, FM (optional), portable, 3/10W	459.00	(5.00)
IC Micro 2. 2M FM mini handportable, 10 mems. LCD. 1W	239.00	(5.00)
ICO2E FM handportable. Keypad entry. 3W	269.00	(5.00)
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IC290D 2M multimode mobile. Scanning. 5 mems. 25W	542.00	(5.00)
IC275E 2M multimode base station. Inc. PSU. 25W	1039.00	(10.00)
IC Micro 4. 70cms FM mini handportable. 10 mems. LCD. 1.5W	279.00	(5.00)
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IC490E 70cms Multimode mobile. Scanning. 5 mems. 10W	617.00	(5.00)
IC3200E 2M/70cms FM mobile. Scanning. 10 mems. 25W	556.00	(5.00)
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ICUX59 50MHz band unit. 10W	239.00	(5.00)
ICUX29 144MHz band unit. 25W	229.00	(5.00)
ICUX29H 144MHz band unit. 45W	249.00	(5.00)
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ICUX129 1296MHz band unit. 10W	P.O.A.	

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DAIWA MR750E	Heavy Duty rotator. Can have up to 4 motors	254.10	(4.00)
KR400	Medium duty	139.95	(3.50)
KR500	6 core Elevation	149.95	(3.50)
KR400RC	5 core Medium Duty	169.95	(3.50)
KR600RC	6 core Heavy Duty	219.00	(3.50)
KC038	Lower mast clamps	17.45	(2.00)
KSD65	Rotary Bearing	26.00	(2.50)
AR1002	Lightweight VHF Rotator	52.95	(3.50)

Switches

Sigma	2 way SO239	20.20	(1.75)
Sigma	2 way 'n' Skts	22.95	(1.75)
Welz CH20A	2 way SO239	30.75	(1.75)
Welz CH20N	2 way 'n' Skts	54.00	(1.75)
Drae	3 way SO239	£17.00	(1.75)
Drae	3 way 'n' Skts	£22.00	(1.75)

CW/RTTY/Equipment

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BY1	Squeeze Key. Black base	67.42	(2.00)
BY2	Squeeze Key. Chrome base	76.95	(2.00)
HI-MOUND MORSE KEYS			
HK708	Straight Key	21.50	(2.50)
HK702	Deluxe version of above on Marble Base	42.50	(3.00)
HK706	Straight key	23.00	(2.50)
HK707	Straight key	22.25	(2.50)
MK704	Squeeze paddle	20.00	(2.50)
MK705	Squeeze paddle on Marble Base	32.20	(3.00)

CW/RTTY/Equipment (cont.)

NEW

RTTY-EQUIPMENT			P&P
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Fax Option	For existing PK-232. (Includes new manual)	49.95	(2.50)
PK-87	1200 Baud Amateur Packet Radio TNC	169.50	(4.00)
PK-90	Commercial Packet Radio TNC	465.25	(4.00)
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PK232/C64/128	Cartridge, overlays, cable, handbook	69.00	(1.50)
PK232	BBC B & Master, E-PROM, overlay, cable, handbook	35.00	(1.50)
PK232	IBM-PC and Compatibles. Disk, handbook	39.00	(2.50)
PK87/C64/128	Cartridge, overlays, cable, handbook	69.00	(1.50)
PK87	BBC-B & Master, E-PROM, overlay, cable, handbook	35.00	(1.50)
DEDICATED RADIO FACSIMILE EQUIPMENT			
FAX-1	Radio Facsimile Weather Map demodulator with double screened printer cable. Includes mounting bracket and NEW RTTY receive facility.	329.95	(4.00)
CD660	Data Receiver for CW RTTY TOR AMTOR ASCII	264.97	(5.00)
CD670	As above but with built in LCD display	327.77	(5.00)
KEYERS & ACCESSORIES			
Star Master Key	Electronic Keyer	54.70	(3.00)
NEW Star	Masterkey electronic. CMOS memory keyer	95.00	(3.00)
TRX3	Morse Oscillator	13.65	(1.50)
Datong	D70 Morse Tutor	56.50	(2.50)

Accessories

SEM Tranzmatch ATU	1.8MHz to 30MHz balanced and unbalanced feeder. 1kW rating	110.00	(4.00)
Welz AC200 ATU	3.5MHz to 30MHz. 200W	159.95	(5.00)
Mizuho KX3	SWL ATU	67.30	(4.00)
MICS			
Adonis AM503G	Base mic + speech processor	69.00	(3.00)
Adonis AM303G	Base mic. Up/down scanning	53.00	(3.00)
HSMX2	Mobile mic with up/down scanning	38.80	(3.00)
SWR/POWER METERS			
SP10X VSWR meter	1.8-150MHz. 200W	39.95	(2.50)
SP122 VSWR meter	1.6-60MHz. 2Kw	79.95	(3.00)
SP220 VSWR meter	1.8-200MHz. 200W	67.95	(3.00)
SP225 VSWR meter	1.8-200MHz. 200W	99.95	(3.00)
SP420 VSWR meter	140-525MHz. 200W	59.95	(3.00)
SP425 VSWR meter	140-525MHz. 150W	119.95	(3.00)
SP620 VSWR meter	1.8-525MHz. 200W	109.95	(3.00)
Kenwood SW100A	VSWR meter. 1.8-150MHz	49.50	(2.50)
Kenwood SW100B	VSWR meter. 140-450MHz	49.50	(2.50)
Kenwood SW200A	VSWR meter/PEP meter. 1.8-150MHz	107.95	(3.00)
Kenwood SW200B	VSWR/PEP meter. 140-450MHz	107.95	(3.00)
Kenwood SW2000	VSWR/PEP meter. 1.8-54MHz. 2kW	117.17	(3.00)
Kenwood SWC1	Optional coupler for SW200/2000 1.8-150MHz	29.62	(2.00)
Kenwood SWC2	Optional coupler for SW200/2000. 140-450MHz	29.62	(2.00)
Kenwood SWC3	2kW HF coupler for SW2000	34.89	(2.00)
Kenwood SWC4	23cms coupler for SW200A/B and SW2000	46.08	(2.00)
Daiwa CN410M	3.5-150MHz cross needle VSWR meter	61.72	(2.50)
Daiwa CN460M	140-450MHz cross needle VSWR meter	65.40	(2.50)
Daiwa NS660P	1.8-150MHz SWR/PEP/RMS meter. Optional couplers available	115.00	(3.00)
Daiwa U66VN	Optional coupler head for NS660P. 140-525MHz	55.27	(2.50)
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70N2DX	High Gain 2M 70cms mobile	37.75	(3.00)
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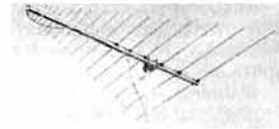

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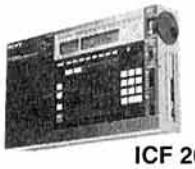

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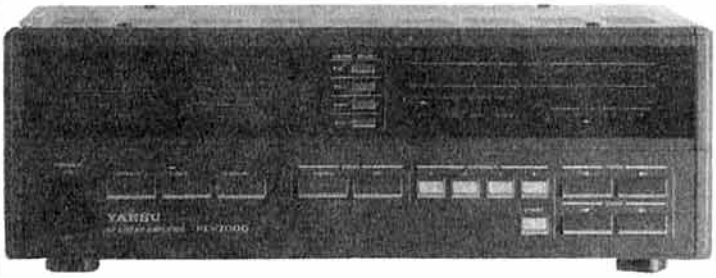

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SMC 78F

GCD

SMC258

GCD

SMC-HS MOBILE ANTENNAS		£	P&P
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SMCT144h	Telescopic 2M ¼ wave BNC	13.50	0.85
SMC6P2T/BNC	Telescopic 2M BNC fitting ¼λ	7.94	0.85
SMC2H/PL	Helical 2M PL259 fitting	6.33	0.85
SMC2H/BNC	Helical 2M BNC fitting	7.94	0.85
SMCHS430S	70cm ½ wave BNC 2.5dB	9.75	0.65
SMC2QW	2M ¼ wave 0dB 1.6'	3.15	1.85
SMC2NE	2M ¼ wave 3.0dB	13.95	2.00
SMC2VF	2M ¼ wave fold 3.0dB 3.5'	16.13	2.00
SMC78F	2M ¼ wave fold 4.5dB 5.7'	23.95	2.50
SMC78B	2M ¼ wave ball 4.5dB 5.6'	23.95	2.59
SMC78SF	2M ¼ wave short 4.7'	22.95	2.50
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SMCGCCA	Gutter clip 4 mtrs cable	14.25	2.00
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LPM144-10-180	2m 180W out 10W in	355.00
LPM144-25-180	2m 180W out 25W in	305.00
LPM432-1-50	70cms 50W out 1W in	255.00
LPM432-3-50	70cms 50W out 3W in	255.00
LPM432-10-50	70cms 50W out 10W in	215.00
LPM432-3-100	70cms 100W out 3W in	395.00
LPM432-10-100	70cms 100W out 10W in	395.00
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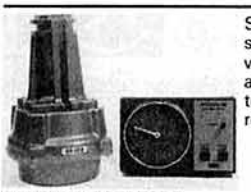

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Membership application forms available from RSGB HQ

On behalf of all the Society's staff, may I wish you a Happy Christmas and a Prosperous New Year.

WHY IS '88 SO SPECIAL?

Next year is a very special one for amateur radio in the UK. The 75 years of the Society, with its members, being at the forefront of innovation must instil a sense of pride in everyone. Radio amateurs pioneered shortwaves, have helped the country in times of war and have continued to develop radio communication techniques which have later found their way into professional systems. Amateur radio has achieved all that it has set out to do: technical challenge, international friendship, technology transfer and for most of us it has been downright good fun.

But what of the next 75 years? Looking back with nostalgia will not ensure our place in the radio spectrum. Many hard-won battles are in the past, many have yet to be fought. Attitudes are always changing and amateur radio will continue to have its good times and its bad times. What is certain is that we must always be looking to the future and stretching our goals. Today, and in the next decade at least, amateur radio must show that it can contribute to society at large. Not only by the efficient handling of emergency situations and public service, but more. The strength of amateur radio today is that in an increasingly complex technical world it can offer a bridge between high technology and the layman. It can offer a user-friendly approach to learning and understanding about science, engineering and electronics. If properly cultivated, amateur radio could be as powerful a tool in schools as the table-top computer.

The UK needs more scientists, more engineers and more people in electronics. Amateur radio could very easily provide an important learning option for young people. It could provide that extra incentive, that extra dimension for learning which educationalists always strive for. This is amateur radio's greatest strength at the present time, all we have to do is tap that strength!

Next year, 1988, is special because it must be utilised as a launching pad for the future. We have a special opportunity for achievement, we have a special President to guide our hand, and now is the right time for amateur radio to make more impact on Government and society at large. Every single member has a role to play, please play it.

David Evans, G3OUF

A SEASONAL MESSAGE FROM THE SOCIETY'S PRESIDENT

As I come to the end of my second term of office, I look back on a year which has been mainly devoted to planning for the future. As the message "From the Secretary's Office" in last month's "Rad Com" clearly shows, this is no time for complacency or negative thinking. Throughout the year, we have concentrated our efforts in reorganising the Society's resources to meet the challenges which face amateur radio as we go into the 'nineties.

We are living today in a more competitive world where influence is all important. We need to make more impact on Government. We have already taken initial steps in this direction. Nevertheless, we must accept that defence of our privileges will continue to be both necessary and costly. EMC, antenna planning and frequency allocation are good examples of areas demanding more and more effort from the Society. Yet despite this, the subscription remains barely adequate to fund the many services that the Society continues to provide. It is vital for the future wellbeing of our hobby that the Society has a sound financial footing. Budget control and an increased income are the key to this, and I am confident that the positive measures we have now taken will improve our finances and promote future growth.

I firmly believe that if the Society is to flourish, it must have strong roots. One of the first tasks this year was to strengthen our field operations. The RSGB Liaison Scheme, due to start in January 1988, will expand our lines of communication and enable us to work more directly with local clubs and organisations. I must say that their initial response to the new scheme is an encouraging sign for the future. A major task that we must tackle together is how to attract more young people into our hobby. The Society intends to play its part in creating an interest and generally raising the level of awareness of amateur radio, but the final reponsibility in encouraging the growth of amateur radio at local level must inevitably fall largely on individuals within local clubs and organisations. If we cannot persuade you to invest some of your time to the future of amateur radio then it will surely die.

Our plans to promote growth are ambitious, although financial constraint means that we must rely more heavily on the contributions of volunteers to carry these out. We have sought out those who are experts in their particular field and those who can exert influence on our behalf and have been greatly encouraged by their positive reactions. This policy of using the services of specialists, whose work will not allow them to make a full commitment to the Society, but who can, and will, offer their services for a specific task for which they are qualified, is proving very successful and one which we shall continue to use to good effect in future.

We have of course, continued to make our views known in conferences on matters concerning the radio spectrum both here and abroad, and we have further cemented good relations with other national societies. On the home front we were successful in gaining increased facilities at 50MHz for all UK radio amateurs, and are continuing to progress a major review of our licence conditions with the DTI.

Another subject to which we have given much thought is the planning of the Society's 75th Anniversary celebrations, an event which is creating a great deal of interest from many of our friends abroad. I believe we have organised an interesting programme of events for 1988 which will not only look back on our achievements in the past, but of more importance, will present a good image of an interesting and worthwhile hobby, with a future which continues to be relevant to the UK electronics industry. To emphasise this it is our intention to launch a campaign to promote youth into electronics through amateur radio.

Finally, may I take this opportunity to thank my colleagues and the staff for their support and enthusiasm during this difficult but highly rewarding year. May I extend to you, the members, my good wishes for the festive season and the year ahead.

A very Merry Christmas and a Happy New Year to you all.

Joan Heathershaw, G4CHH

Members' Mailbag

The views expressed in published correspondence are not necessarily those of the RSGB, and readers are urged to verify independently any factual statements on which they may wish to rely as it cannot be guaranteed that such statements are correct.

YAESU FT767GX REVIEW

Sir – We were very saddened to see the RSGB publish such a biased statement as was made by G3RZP, the chairman of the Technical & Publications Committee of the Society ("Members Mailbag", October) and as such it was our interpretation that this was the RSGB's official position in the matter. However, we understand that this is not the case and that the Society wishes to be impartial. The comment made by Mr Chadwick related to the 144MHz performance only, even though, by implication, his comments have been related to the general performance of the transceiver. We agree that the original 144MHz modules generated more noise than was acceptable and that as a consequence, Yaesu have issued a modification involving only one resistor, which improved the situation dramatically. Furthermore Yaesu intend to have an upgrade modification available by February 1988 for existing modules.

Various comments have been made regarding the phase noise present on the main vco, and while we do not consider this to be excessive by modern standards, we understand that Mr Withers, of Ray Withers, of Ray Withers Communications, has developed a modification that reduces this noise by a further 20dB, which moves this transceiver into the high-performance bracket without compromising the competitive price.

It is interesting to compare reviews of the same equipment and note the vastly differing findings, even though in some cases we know the equipment has not been touched between reviews. Added to this, the conclusions drawn at the end of the reviews are personal opinions which may not be shared by others. However, we feel it is preferable to have such comment, as to omit it removes any feel for the equipment, which is so often the case with American reviews.

We do not consider the contest code of practise to be relevant to the specification of a radio intended for amateur radio usage, as a figure of –90dBc for inband spurious outputs tends to be idealistic and, judging by recent equipment reviews, is rarely achieved. We feel that Mr Chadwick would be better employed persuading portable station entrants to pay serious consideration to out-of-band spurious emission, as these could cause havoc with other radio users and as a consequence bring amateur radio into disrepute.

The Directors
SMC Ltd

WHAT OF THE FUTURE? — ANOTHER VIEW

Sir — In his letter in September's issue, G3JDK perhaps overlooks the phrase "for the self-training". Some people are not electronic geniuses and have other hobbies than amateur radio; I am one such person; my own construction of bits for the sback being mere test equipment such as swr bridge, imb bridge, wave meters etc.

I am a black-box operator and enjoy the hobby but I well remember when I first went on the air on 144MHz hearing one of the "real amateurs" telling every "contact", and everyone 200kHz either side, that he was running a "homebrew" linear. He was not next door, he was miles away, and no amount of hot air from my end would convince him, my being still wet behind the ears so to speak. A few words from another station of long standing soon did the trick.

To get back to the point of "for the self-training", I feel sure the G0s he refers to could refer to

paperwork, books and formulas collected before and after the RAE and come up with the right answers. Not being technically minded, I can only guess that the potted components be "culled" from whereever, were of a nature to be "potted", critical in construction and spacing etc, so we G0s would have no chance.

In conclusion, stop bleating about the standards of education of less mortals, and offer to help and enlighten them, and I am sure we can then all enjoy the hobby and learn a great deal from each other.

The future is in your and others' hands, so hand it down a little at a time and you will not overtax us G0s.

K Fellows, G0GXL

SPECIAL EVENT STATIONS

Sir — I greatly deplore the proliferation of so called "special event stations", and wonder whether others feel the same way. Eight years ago it was an exciting moment to hear a special event callsign on the air, and we derived a great deal of plesure from hearing/working the station. Ideally, prefixes such as GB should be used only to indicate amateur radio activities such as expeditions and others which do genuinely reflect the original purspoe of the GB callsign.

Those who wish to run a station to celebrate the birth of kittens or obtaining a new dustbin, can still do so whenever they wish, using their own callsigns. Sponsored fund-raising, while being very worthwihle, has nothing to do with the objectives of our hobby, and can easily be done with more suitable, repetitive activities. Nowadays the fact is that "special" is not an appropriate description, people seem to be using GB callsigns for the most inane reasons.

I wonder just how many other fellow amateurs feel the same way, and I beg the Society committee responsible to seriously consider my comments.

Gerard Craig, G4IUT

DXPEDITION FUND

Sir — In the "News Bulletin" September, under the title "HF Dxpedition Fund", it was reported that the RSGB HF Committee had decided to launch a new fund to support hf dxpeditions.

While I do not disagree with dxpeditions as such, I do feel however, that support of such ventures should not be a priority of RSGB. In my opinion it would be more appropriate and certainly more helpful to use any available funds to support and encourage the growth of amateur radio in the developing world, and particularly in Africa.

Martin Broadway, G4GF1

WOT — NO COMPLIMENTS?

Sir — I recently had the pleasure of a visit by a fairly well-known amateur friend from the USA. He was looking forward to some European if operation which was unfortunately marred by negativity from a few individuals.

Due to a good location and many hours of experimentation (including some invaluable advice from G6XN) I can radiate a respectable signal from my QTH. Running legal power on 3·5MHz to several antennas, including a large rhombic hung high over a valley, these fortuitous circumstances can produce good local and dx results for both received and transmitted signals. As a consequence I am used to the silly accusations levelled by those who still fail to understnad that even 10kW is only 20dB over 100W, or that the antenna is what counts!

However, my visitor was quite surprised at the occasional attempts at malicious interference, and the odd thinly-veiled accusations that the signal produced. As he said: 'Back home a good signal is cause for a compliment. What's the matter with these guys?"

Is this symptomatic of the same fringe mentality that jam repeaters, or are there some who still resent success? I could not explain it to my visitors.

Nevertheless my thanks to the majority of those many amateurs who did contribute to make his operating here so enjoyable.

M MacGregor, G4EZG

HELPING THE DISABLED

Sir — As a disabled person may I be permitted to send my very sincere thanks to several people who have helped me to obtain my Class A licence.

To the chief examiner, Mr Neville Lanson, for all his help; to Tony, G4AXO, and Peter, G3TZL, for their extreme kindess and assistance; to my wife Nicky for constant support in difficult times, and to many other friends for all their help.

Last, but by no means least, to all the members of "The Middle Watch Nutters Net", thank you all for so many happy hours.

G S Goodwin, G01HA

DISILLUSIONED CLASS A

If Mr Goldsmith thinks he has problems("Members Mailbag" May) he should try and operate for fun from dx locations. Quite often it is **not** fun.

Many times over the last 20 years, in rarish locations, I have used the ultimate weapon to cut the QRM from over-zealous operators–the "off switch!", but I can also remember many hours of pleasant QSOs when conditions and congestion permitted.

I keep my key well oiled, rarely call CQ, and get enjoyment from operating on the hf bands without a linear and with whatever antenna I can make.

Robin N Francis G3RMU
MP4MAM, MP4BFH, VP5RF, VP5T1, ZK1AC

Sir — I was surprised by the somewhat scathing view of amateur radio technology expressed by G3ESP in his letter in your June issue. In the same paragrah in which he expresses cynicism about the apparent complexity of a Yaesu FT767GX, he refers to his older Yaesu rig with only 16-control Yaesu rig there were probably a number of people about who, having read the advertisments, were probably ready to express contempt at the lastest appliance and to ask what had happened to real amateur radio.

Whether we like it or not, communication and computer technology does move on. It best behoves use to learn how to employ such technology for our benefit rather than to expand energies in figuring out how to stop it. The thought that came to my mind when reading Mr Farrar's letter was that he was over-estimating the operational complexity of a piece of equipment and under-estimating the capacity of people to competently install and operate it.

With regard to the technology itself, I compare my original KW Viceroy and separate receiver to my current Yaesu FT-ONE. The KW was a delight to use but the FT-ONE, with all of its controls, is even more delightful. I have more communication flexibility than before, and the number of controls and functions is not a barrier to enjoying straight-forward cw communication or more complex Amtor communication or anything in between. In fact, the number of controls doesn't enter in to it. Their use becomes somewhat second nature.

One of the delights of amateur radio is that we can all choose how simple or how complex we wish our operations to be. We can, if we like, use battery-powered QRP cw equipment that requires a honing of our operating skills to establish and maintain communication in varied conditions. On the other hand we can, if we like, set up a station that incudes the most advanced integration of communication and computer technology. There really is room for all.

So, I do disagree with G3ESP's expressed view of things, but I also would like to think that he is not the Luddite he pretends to be!

Michael Yorke, NT2R/G4ASW

432MHz OPERATION

I was sorry to read the letter from Paul Rigg, G6FMP, in your July issue concerning his experiences of 432MHz operation. I have been regularly active on the band for 12 years using fm mobile, and for the past six years on ssb/cw from the home location and portable. I cannot recall ever having difficulty in raising activity on the band while mobile, assuming that there is someone living in that area and within range of the local repeater. In fact, it is my experience that operators on 432MHz (all modes) are very friendly and will be quick to help out a fellow traveller in need of directions in a strange town.

May I assure Paul that if he ventures down to Hertfordshire he will always find a welcome through the 432MHz repeaters in the country, and I'm sure that goes for many others. One thing has always puzzles me though. Why is there so much more activity on the Midlands and Northern repeaters than in the Southeast? Perhaps our friends from "north of Watford" would like to confirm this and offer some suggestions.

Peter J Marcham, G3YXZ

Sir — I refer to the letter from Paul Rigg, G6FMP, in July's "Mailbag". I operate on 432MHz with a small fm Handie in the Reading, Swindon and Cardiff areas, and have found that though the band may be "quiet" at times there has been no evidence of "cliques". The motive to move to 432MHz from 144MHz was the very same inability to access repeaters used by homebase nets. I sincerely hope that Paul Rigg's findings are not an indication of what is to come.

Anthony A Ledger, G6LBR

IN FAVOUR OF QRP

Sir—I agree with G13XZM. I get immense pleasure from building simple receivers and picking up all the chatter from amateurs all over the world. It has taken quite a while to get it right and there is always the uncertainty that some days they don't work at all, but my map is littered with pins covering the world.

My most expensive set cost £6 and would agree that "getting the bits" is the most difficult part. Analysing the 25 suppliers from G3LWM's list (July *Rad Com*) I find: 11 had a minimum order charge; 3 did not supply individuals; 2 charged the earth for catalogues; 1 supplied valves; 2 charged a lot for postage; 1 had no catalogue. This left five the adverts of one have barely changed over the years; two I have never seen advertised; one had only selected items; and Electrovalue from whom I have had excellent service in the past.

I suspect the majority of suppliers are not interested in the "loner" wanting a few bits and pieces. I appreciate the economics. Perhaps the RSGB might consider retailing components!

Peter McBeath, RS44030

Sir – I wish to put forward my two pennyworth in reference to QRP and C13XZM's letter in your July issue. I am 79 years old and do believe construction is the main basis of amateur radio, in fact valves give 100 per cent better performance than transistors. I am a member of the G-QRP Club, and have had some very good help.

At times it is difficult in this area to obtain suitable parts, and at times I need advice on some circuits, so if my address is printed I may be one of the lucky G1 QRPers, and all success to *Rad Com*. There should be more amateurs join and get the good service you give.

Bob Freeman, G1THX, 22 St Aldates Court, Grindon, Sunderland, Tyne & Wear

FURTHER CONGRATULATIONS

Sir – I note in the July issue the congratulations in regard to 50/70MHz etc but, as one who qualifies, may I add my congratulations for introducing the new membership category (p505). I joined the RSGB last year as an swl and am awaiting (without hope) the result of the RAE in May. On renewal of my membership I can, however, look forward to a reduced fee and, in the future, a further reduction on completion of five years!

When I enquired prior to joining whether there was any reduction for OAPs I did not expect that within my first year such a concession would be a reality. On behalf of myself and others in the same category: congratulations, and thank you RSGB!

D R Horne, RS90312

RSGB MORSE TESTS

Sir – Having noted various criticisms of RSGB morse testing in several publications devoted to radio, I felt obliged to write and recount my recent experience of the system.

After writing to the RSGB, I received the test centres past by return of post. I applied for and was given a suitable date, very soon thereafter, and I took the test at the Tyneside ARC Byker, on 24 June.

The examiners were courteous and made conscious efforts to settle the candidates' obvious and understandable apprehension. The test itself was conducted with scrupulous fairness and attention to detail, coupled, again, with sympathetic treatment. I was informed of the test result by first-class post, on the morning of the following Wednesday. I found your system professional and "human" from start to finish. If there is any way in the examiners concerned can receive a copy of this letter I shall be greatly obliged. Thank you very much, again.

John Dickson

A power supply and control system for tetrode amplifiers

JOHN H NELSON, GW4FRX*, AND MELVYN NOAKES, G4JZQ†

(PART 1)

IN 1981, one of the authors wrote a series of articles (1) dealing with a high-performance power supply and control system for 4CX350/250 amplifiers, part of which was itself based on a design by A J Wade, G4AJW, (2). The inevitable feedback and further experimentation led to better and simpler ways of doing the same job, and this article outlines a self-contained power supply and control system for tetrode amplifiers which is substantially complete except for the high-voltage anode supply.

Many amplifier designs using valves in the 4CX250/350 series have been published and usually present little difficulty from the rf point of view. However, vhf and uhf receiver design has improved in recent years, especially in the area of strong-signal handling, and the intermodulation performance of many 4CX-based linear amplifiers is still considerably worse than could theoretically be achieved. For a given audio bandwidth, the "width" of an ssb transmission – ie the amount of spectrum space it takes up – is chiefly a function of intermodulation products of seventh-order and higher; in this context it is interesting to note that several professional specifications for the intermodulation performance of ssb transmitters are some 40dB more demanding for seventh-order products and above than for the more commonly-measured third and fifth. It is in this area that some linear amplifiers – not merely those employing members of the 4CX family – are deficient. However, the root of the deficiencies is not generally in the design of the amplifier itself. In a correctly adjusted amplifier, a pair of 4CX250Bs operating at 500W output is easily capable of producing a performance in which all intermodulation products of seventh-order and above are better than −55dB with respect to one tone in a two-tone test; other valves in the family designed specifically for linear service (which the 4CX250B was not) will improve on this figure. However, the achievement of this order of performance depends crucially on some aspects of the amplifier's power supply.

There have been several published designs for power supply and control units for 4CX amplifiers, most of which are simpler than the present unit in conception; however, it is felt that this "de luxe" system offers a combination of excellent performance and good protection to the amplifier itself, both of which are important requirements.

Design considerations

The most frequently used valves for producing the maximum licensed power in the 144 and 430MHz bands are the 4CX250B and related devices such as the 4CX250R, 4CX250BM etc. For the production of the legal limit of power with acceptable intermodulation performance, two valves in push-pull or parallel are required. The 4CX350A and FJ are also usable but only for Class AB1 operation. Valves in this sub-family are intended for linear service and must not be driven into grid current. A few amateurs are using the slightly larger 4CX600 series or the 4CX1000 or 1500. Although there is a tendency for large triodes such as the 3CX1500A7/8877 to be used at 144MHz, these valves remain very expensive compared with the 4CX250B, and bases for them are also difficult to obtain. Also, if triodes and tetrodes of similar anode dissipation are compared at similar output power levels, the intermodulation performance of the triode will in general terms be worse than that of the tetrode. It is worth mentioning that the 4CX family tend to have exceptionally long lives when properly used; professional users have reported service lives of better than 20,000h for the 4CX250B. All in all, as current UK licensing conditions permit a maximum power of 400W (26dBW) at the antenna, "a pair of 250Bs" therefore continues to represent an excellent choice for a legal limit power amplifier.

An analysis of the factors involved in the design of the amplifier's power supply was presented in (1), but the essential requirements are for a very stable screen supply with good sink/source performance, a stable control grid supply which will sink quite large amounts of grid current and – for a reliable amplifier – some control and protection functions. Attention to detail is also required in matters such as the amount of cooling air, the heater voltage and the overriding need both to protect the valve and its base from the consequences of flashover and, as far as possible, to ensure by design that flashover does not occur. New 4CX tetrodes of good quality can currently be expected to cost not less than £40 for a 250B, and more for others in the series, and new Eimac SK600A or SK620A bases for them are likely to cost even more than valves, – a good argument for the provision of protection circuitry.

Secondary emission effects in the 4CX250 family mean that when an amplifier using them is correctly loaded in linear service, the screen grid will source current for much of the rf driving cycle. It is important for the well-being of the valve and the internal capacitor in the valve base that the screen voltage is never allowed to rise uncontrollably, either as a result of flashover or of secondary emission effects. The value of bleed resistor recommended by Eimac has been shown to be much too high for safety in this respect. Following extensive tests and measurements in the laboratory and on-air, it also seems clear that the neon stabiliser tube or Zener-chain approaches to screen supplies for the 4CX family do not permit the intermodulation performance now required for present-day conditions on 144 and 430MHz. In essence, neither technique permits proper balancing of the standing currents in a twin-valve amplifier, neither gives the order of regulation which is required for low intermodulation in view of the very high grid-screen transconductance of the valves, and both can, under some circumstances, result in the production of wideband transmitted noise. The "do-it-yourself aurora" heard on many high-power cw signals from 4CX250B amplifiers is frequently traceable to noise from the screen supply.

There are three main requirements for obtaining good intermodulation performance from the 4CX family. The first is that the amplifier must be quite heavily loaded, and this is especially true at vhf and uhf. Tuning and loading for maximum rf output will imply that the middle- and high-order intermodulation performance will be considerably worse than it needs to be, and the signal consequently wider; in a push-pull or parallel amplifier the intermodulation products may also not be symmetrically disposed about the frequency of the suppressed carrier. It is essential to meter the screen current of each valve used in a 4CX-based amplifier and to adjust the loading by reference to the single-tone screen current figure given in the data sheet for a particular valve under the chosen operating conditions. This point appears to be especially misunderstood by manufacturers of commercial amplifiers using 4CX tetrodes, who no doubt wish customers to see maximum indications on their power meters. Some of the indicated power seen when tuning and loading for "maximum smoke" in commercial 4CX-based amplifiers is likely to be in the form of intermodulation products, which serve no purpose as far as the dx is concerned but which render more of the band in the vicinity of the transmission uninhabitable by neighbouring stations. In fact, there is a case for saying that the most important meter in the power supply of a linear amplifier is that (or those, if there are two valves) associated with the screen current. Screen current is a most sensitive indicator of loading, as discussed earlier, and in a push-pull or parallel amplifier it is also a good indicator of balance of grid drive and symmetry in the anode circuit.

The second requirement is for a screen supply which has good voltage regulation over the entire range of screen current drawn *and sourced* by the valve during the rf driving cycle. It can be safely assumed that the mean value of screen current in a correctly loaded 4CX-based amplifier over one rf cycle will be negative, and that the screen current meter will indicate a negative-going current of some milliamperes at syllabic rate when the operator is transmitting ssb.

A practical screen supply must source and sink at least 30mA at the chosen screen voltage. Its ability to sink the negative screen current discussed above while maintaining good regulation – which is a much more difficult case for the designer than the requirement to source positive screen current while maintaining regulation – will have a considerable effect on intermodulation performance. To a first order of approximation, the linearity will be a direct function of the "stiffness" of the screen supply under these conditions. The 4CX350 series is particularly sensitive in this respect. In a series of tests involving a carefully adjusted 144MHz amplifier with a pair of 4CX350FJ valves, the present screen supply design was compared with a "string of zeners" supply which permitted screen voltage variations as monitored on an oscilloscope of

*Bank Cottage, Crew Green, Shrewsbury SY5 9BN.
†328 Watford Road, St Albans, Herts AL2 3DP.

about ± 3V at syllabic rate. In a two-tone test at 500W output, all intermodulation products up to thirteenth order were at least 5dB worse (and the fifth, seventh and eleventh orders were some 8dB worse) with the zener supply, and when using normal ssb the audible effect as reported by a number of competent observers (who were not told what to listen for) was of a considerably wider transmission which sounded less smooth and pleasant.

The only type of screen supply which is likely to be able to meet the required criteria – as well as some others which are described in this article – is one designed around active devices in a shunt stabiliser configuration. The G4AJW design (2) works well although theoretically the EL84 valves are overrun from the point of view of maximum anode voltage, and triode-connected 807s might be a wiser (if bulkier) solution. The earlier G4FRX/G4JZQ design (1) is good, although the present design is a considerable improvement in several respects; there is less temperature rise in various areas of the circuit, and the ripple rejection is considerably better, which implies that quite a small value of reservoir capacitance can be used after the supply rectifiers. Designs employing neon stabilisers or zener chains (3,4,5,6,7,8,9 and others) will not permit the achievement of the best intermodulation performance for a given valve or valves.

The third requirement is for a control grid supply which is capable of sinking at least 30mA per valve while maintaining a constant output voltage. The 4CX family tends, especially after a few hundred hours of use, to suffer from mild grid emission effects – the associated meter can be seen to move slightly negative at syllabic or keying rate – and if the supply cannot sink this current the working point of the valve will tend to vary a little in such a way as to cause a few decibels deterioration in intermodulation performance. A sink capability of some 30mA will easily cater for both this effect and the normal grid current sourced by the valve in Class C. A shunt stabiliser as used in (1) and (2) will serve the purpose, but the large number of published designs which simply rectify and smooth a medium-voltage supply and produce a negative grid bias voltage (3,4,5,6 and 7, among others) will not.

The circuitry presented in this article constitutes the authors' attempt to design a power supply and control system to meet the requirements for contemporary high-power amplifiers using 4CX tetrodes. The control logic and alarm circuitry is cmos-based and provides operating voltages to the amplifier in the correct sequence. Malfunctions in the grid, screen or anode supplies are brought to the attention of the user, and in each case the appropriate executive action is taken. Screen and control grid supplies are provided, together with the appropriate switching. Failure of cooling air is detected. An audible alarm sounds in the event of a fault condition, which is a useful feature in contest operation when the operator's attention is usually elsewhere, and l.e.ds associated with each failure case are illuminated. As a companion to the current design, a simple stabilised 6V dc supply for the valve heaters using a 6·3V ac input has been developed and may be the subject of a future article.

As discussed later, a pcb for this design is available from one of the authors, as are complete units. Pin numbers shown on the circuit diagram and mentioned in the text refer to those on this pcb.

Control logic and alarms

Refer to Fig 1. IC1a/b and IC2a/b form over-and under-voltage detectors for the two channels of the screen supply (it is assumed that a two-valve amplifier is in use) with their inputs at pins 75 and 76. RLC1 and RLC2 alter resistor

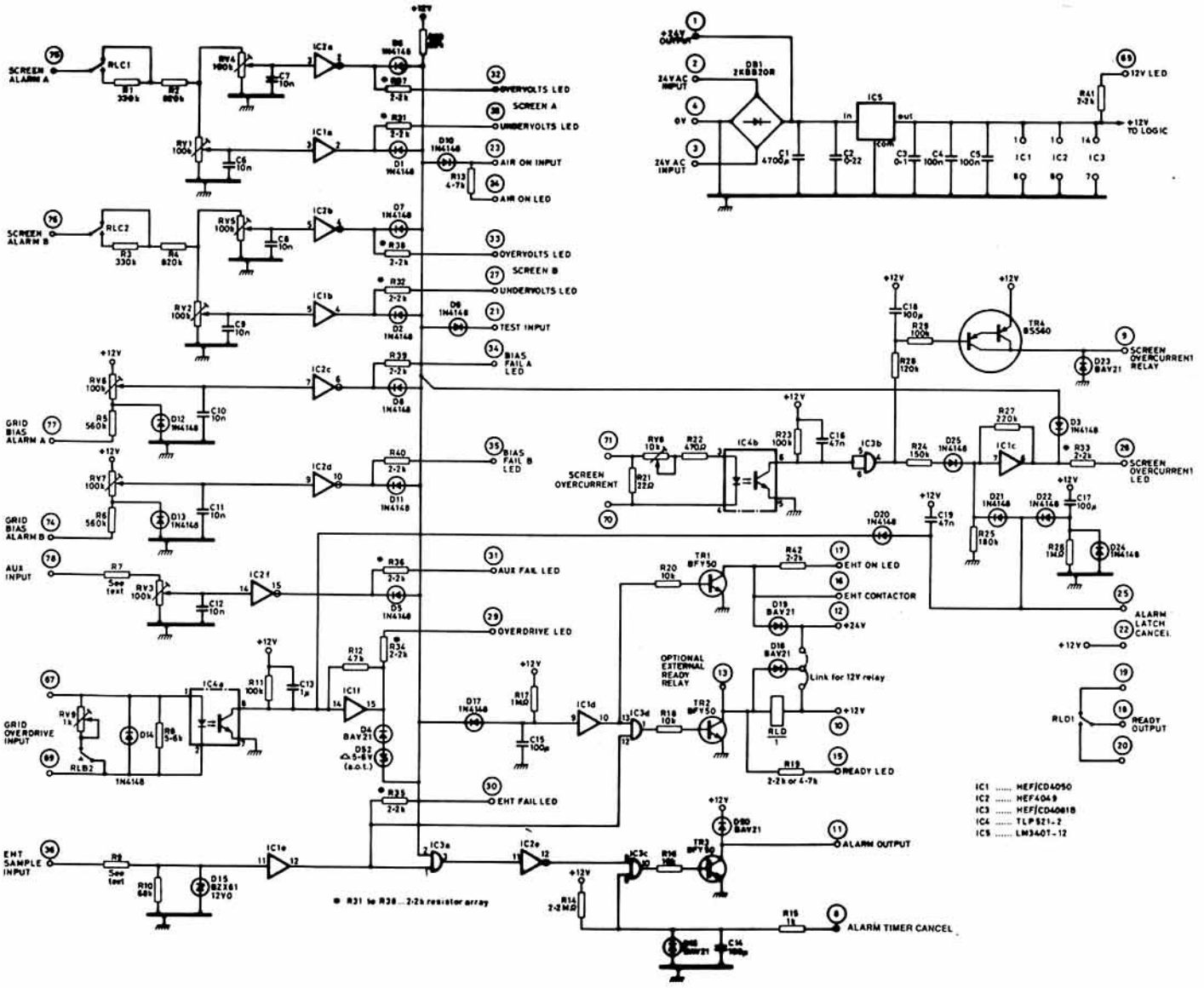


Fig 1. Control logic. Note that the label alongside pin 8 should read "ALARM TIMER CONTROL"

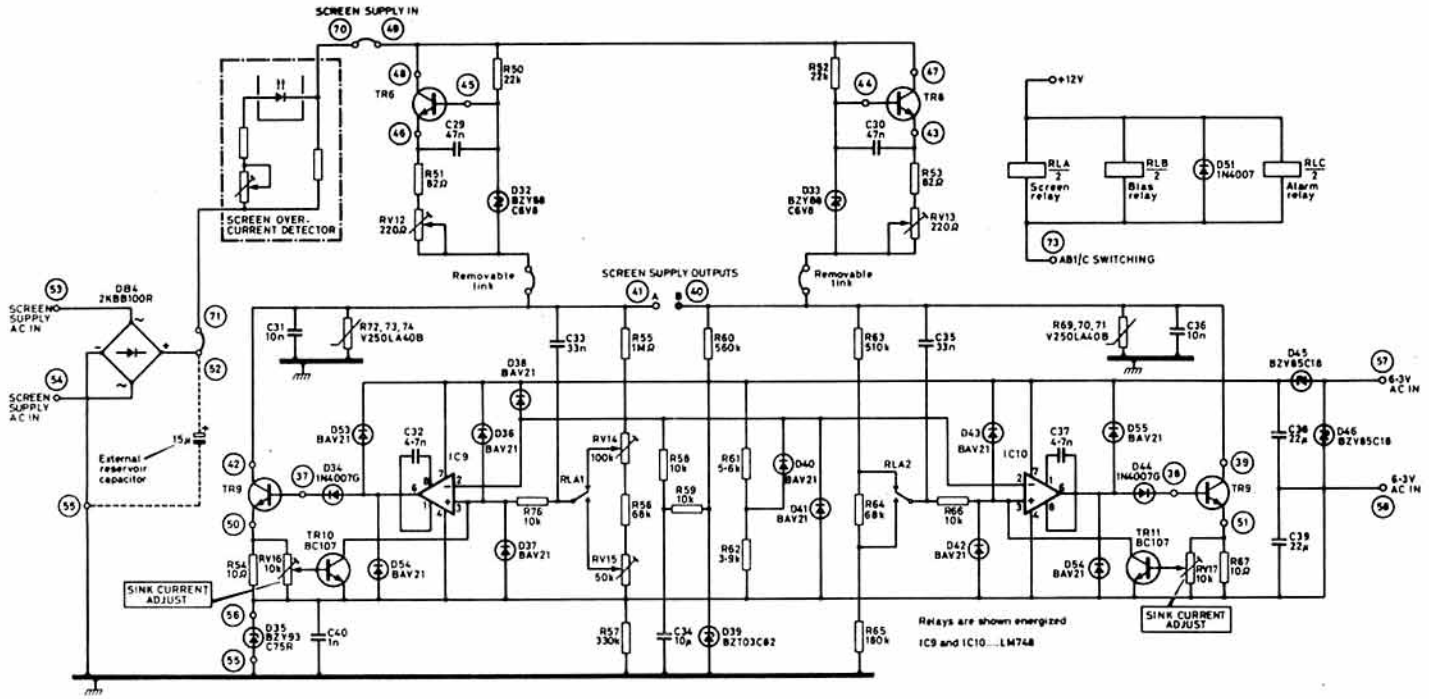


Fig 2. Screen grid supply

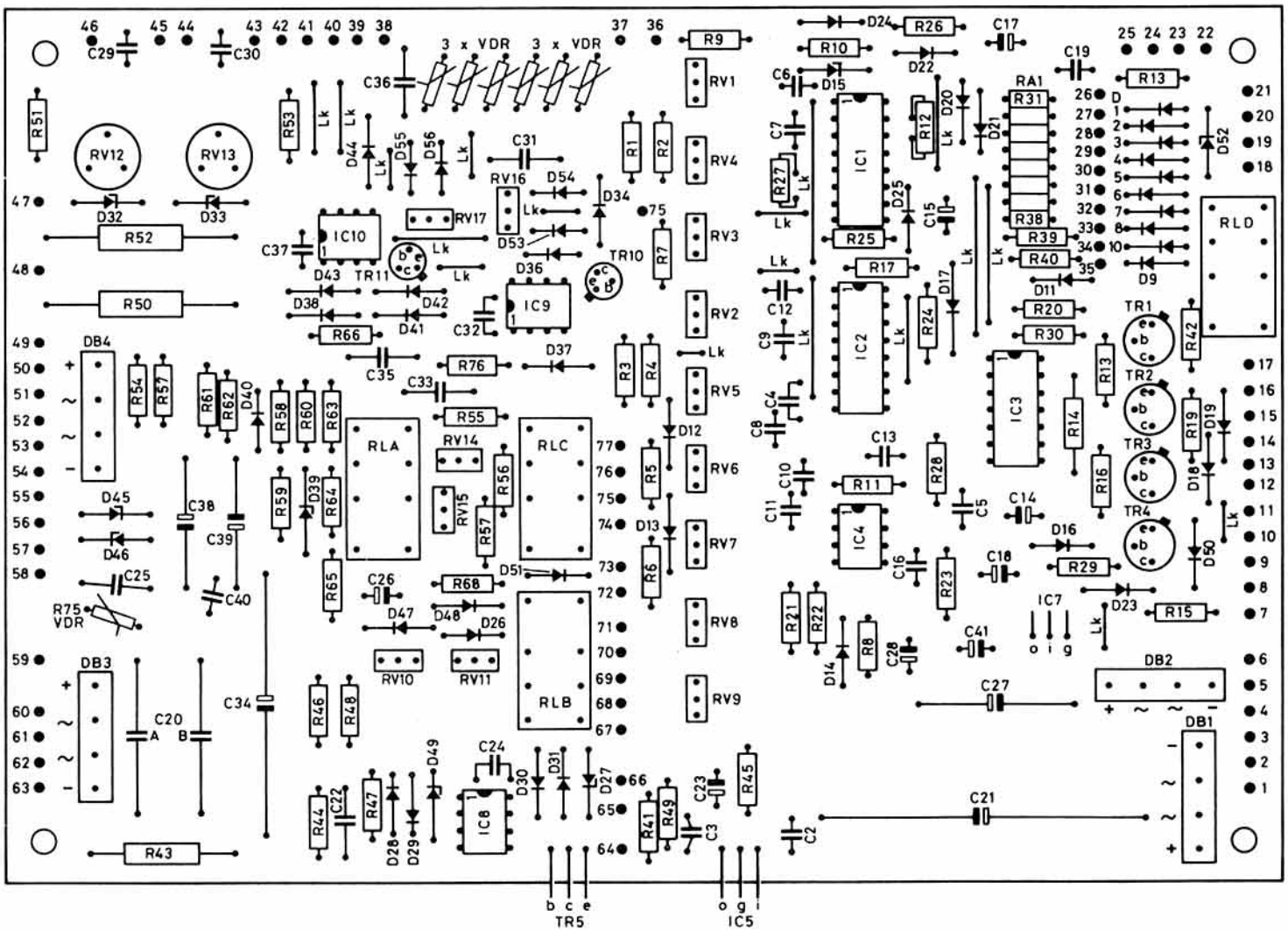


Fig 3. Component layout

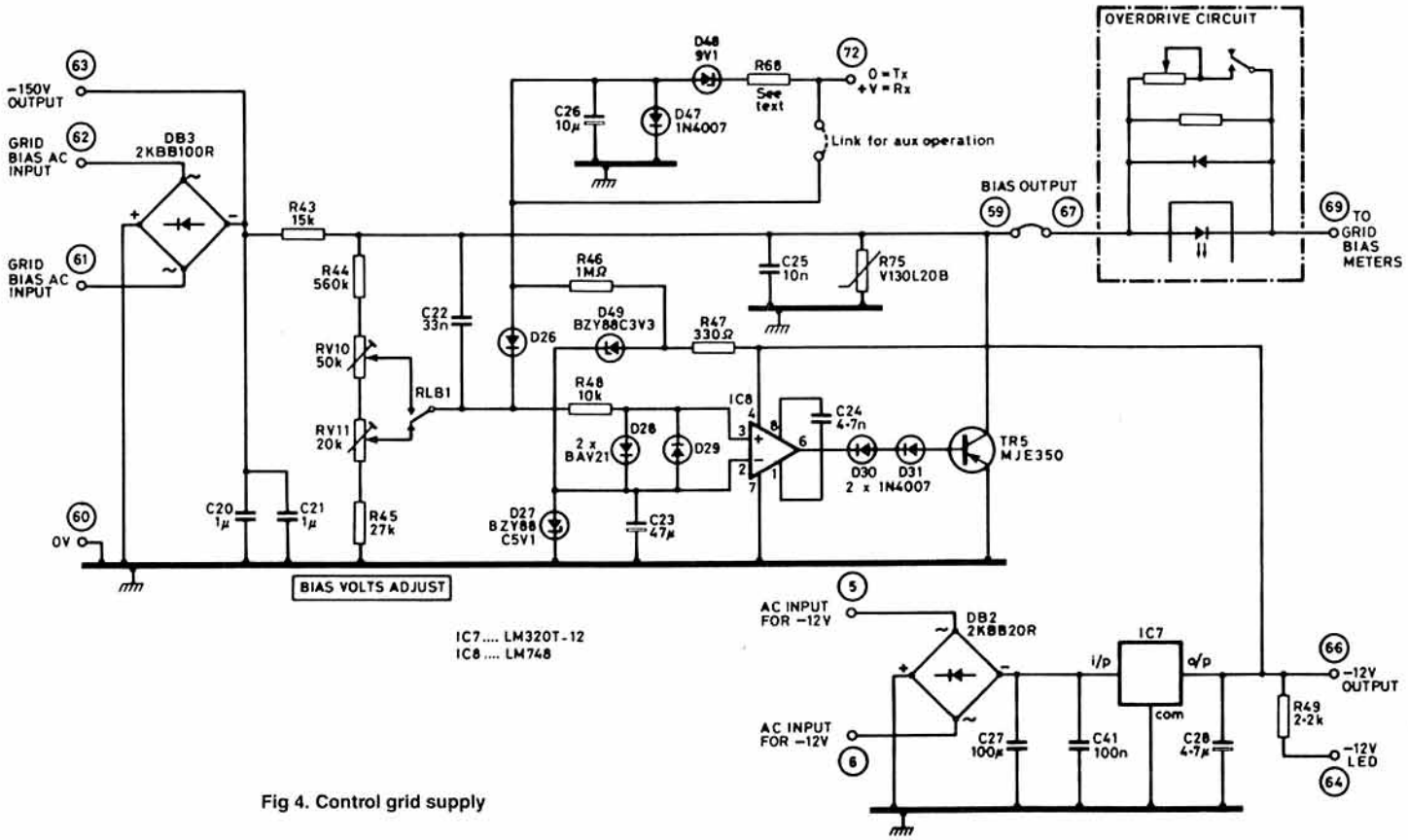


Fig 4. Control grid supply

values to cater for the different voltages produced by the screen supply in Class AB1 and Class C. IC2c and IC2d form undervoltage detectors for the two grid bias feeds, with inputs at pins 77 and 74. The intention here is to guard against loss of control grid bias, which would cause very heavy anode currents to flow and possible damage to the ehv power supply or the valves themselves. IC1f, in conjunction with half the dual optoisolator IC4a, forms an "overdrive" alarm of which the function is discussed later. IC1c is part of an overcurrent alarm for the screen supply which is also described later. Front panel l.e.ds warning the operator of a fault condition are driven by each alarm detector. It is worth mentioning at this stage that high-efficiency devices should be used for these l.e.ds since only some 5mA operating current is available. IC2f forms an "auxiliary" fault input channel with the input at pin 78. Use of this, together with the associated warning l.e.d, is optional; when the stabilised heater supply is used, the auxiliary input forms the heater undervoltage/no-voltage alarm, although any positive-going alarm voltage can be detected and alarmed. It is easily possible to "fan-in" any number of active high alarm voltages with a diode OR-gate if desired.

It will be seen that the outputs of the alarm detectors are tied to a common rail which in normal circumstances is pulled up virtually to +12V by R30. A failure condition will force this line low and reset the 1min timer formed by IC1d, R17 and C15. The output of this timer is one input of a two-input AND gate formed by IC3d. At initial switch-on C15 is discharged and the input to IC1d consequently low. After 1 min its output switches high, turning on TR1 and hence the ehv supply via an external contactor or relay driven from pin 16. A sample of the ehv is fed via pin 36 to IC1e, the output of which provides the other input to IC3d. When ehv is available, and assuming that there are no alarm conditions, the output of IC3d switches high and consequently turns on TR2. This in turn operates RLD (the "ready" relay), which can either be the small two-pole changeover type for which provision has been made on the pcb, or an external relay; links have been provided on the board to accommodate either. Since this relay will only operate when the main timer has cycled, the ehv is available and there are no alarms, it should be connected to the external circuitry in such a way that the amplifier cannot be placed in circuit unless it has operated. This implies disabling the ptt line, the antenna changeover relays, the screen changeover relay and the bias supply changeover system discussed later. There is obviously scope for implementing individual requirements in this area, and several circuit configurations are possible; the most important element involved is t/r timing of the bias supply and the chosen changeover system should make the necessary provisions. An example of a suitable t/r changeover circuit is given in Fig. 6

Another input to the common fault rail, at pin 23, is derived from the airflow switch, if one is fitted to the amplifier. If the "air on" input is taken low by operation of the airflow switch, the fault rail will be forced low, resetting the timer and disabling the ptt. An associated l.e.d is also illuminated. One further input is from the "test" switch at pin 21, the operation of which resets the timer. Other active low alarms could be fed into the circuitry at this point via diodes if required; in the current GW4FRX amplifier the antenna changeover relay supply is monitored in this way.

The common fault rail also forms one input of the two-input AND gate formed by IC3a; its other input is derived from the output of the ehv detector IC1e. Loss of ehv or an alarm condition results in the output of IC3a being taken low. This is inverted by IC2e and used as one input to a two-input AND gate IC3c. The other input of this gate is the junction of R14 and C14, which forms another timing element. At initial switch-on C14 is discharged and this input of IC3c consequently low. Since its other input will be low until the 1min timer has operated and ehv has become available, the output of the gate will be low and TR3 turned off. However, after some 2.5min pin 8 of IC3c will become high as C14 charges. If at that time there is either no ehv or an extant alarm, TR3 will turn on and pin 11 will go from almost +12V to virtually earth potential. This transistor drives an audio alarm sounder in the prototypes, although an l.e.d or large lamp could be used instead by those who dislike loud noises. The audio alarm is turned off by a front-panel push-button switch which earths pin 8. If the fault remains extant the alarm will sound again after a further 2.5mins, reminding the operator that something is still amiss.

The dual optoisolator IC4 is used for one fault detector and one "operator reminder". Taking the latter first, IC4a is used for an "overdrive" alarm. In Class AB1, virtually by definition, the flow of grid current – that is to say, current out of the control grid of the valve back into the bias supply – must *not* take place. Many cases of "splattered" transmissions are caused by operators driving the valve(s) into grid current on speech peaks in an effort to extract maximum power from the amplifier. These may not be noticed on the metering, or not thought to be important. The common feed from the bias supply (ie its output prior to splitting for separate metering and feeding of a two-valve amplifier) is taken via the diode section of IC4a (pins 67 and 69). Any flow of grid current in Class AB1 is therefore detected by IC4a and the input of IC1f – which is connected as a resettable latch – is consequently taken low. Its output takes the alarm rail low via D4 and D52, forcing a partial discharge of C15. The effect is a timer reset and ptt inhibit lasting about 5s from the time at which the latch is cancelled by the operator, together with a warning l.e.d and an audible alarm which will also stop sounding when the

(Continued on page 907)

Reduction of rf breakthrough from the BBC microcomputer

*J C Worsnop, CEng, MIEE, G4BAO**

Introduction

The BBC micro has many excellent facilities of interfacing to radio equipment in the amateur's shack. There is also a large amount of amateur radio software on the market which makes good use of the graphic capabilities of the machine. Many amateurs have bought a BBC and have been bitterly disappointed to find that the electromagnetic breakthrough produced has made it impossible to operate the station when the computer is switched on. As an example of the seriousness of the problem, a BBC owned by a neighbour three houses away put in a signal in the order of 10μV at the input to my 50MHz receiver!

This article outlines some steps that can be taken to reduce this interference to tolerable levels.

Sources of breakthrough

Any equipment using square-wave clocks will generate harmonic energy at hf and vhf due to the fast rising edges of the pulses. Combined with a switched mode power supply as used in the BBC we have a recipe for a radio operator's nightmare if steps are not taken to reduce radiation.

In the BBC the radiaton comes from three main sources:

(1) Direct radiation from the case.
(2) Radiation from the interface leads (disc drive etc).
(3) Radiation carried via the mains supply.

Suppression of breakthrough

(1) Case radiation

The plastic case of the BBC provides no screening to breakthrough, and one solution to the problem would be to build the computer into a homemade metal case. I rejected this, as the last time I attempted such "chassis bashing" was at school! A better approach which keeps the "look" of the BBC is to coat the inside of the case with a conducting material.

The references at the end of the article give the address of a firm which specialises in the spraying of plastic substrates for the reduction of breakthrough. They will plate the case with a zinc compound which will reduce the leakage by a factor of around 30dB.

The less expensive solution is to home spray the inside of the case with a shielding paint available from RS Components (Cat No 551-570). Measurements have shown that a reduction in breakthrough of 15dB is attainable with this method.

Preparation for spraying

Remove the top cover by removing the four large pozidrive screws, two at the back, two under the keyboard. Disconnect the power supply leads, and keyboard connector, noting carefully where they must be reconnected. Remove the power supply unit by removing the three screws from beneath. The mains lead will pass through the hole with the plug top connected, but you need patience!

Next remove the keyboard, and disconnect the loudspeaker lead. The BNC vdu socket must now be removed, and the centre lead de-soldered before the main pcb can be removed. Remove the main printed circuit board. Remove all the sticky paper labels from the inside of the case, and remove all traces of glue with methylated spirits. Thoroughly wash the inside of the top and bottom cases with warm soapy water and dry thoroughly. Finish by wiping with methylated spirits to remove all traces of grease.

Mask the case outside with masking tape and paper, making sure to cover all holes, and leaving the case jointing surfaces unmasked to make sure of a good connection between the two halves of the case.

Reassembly

Before the pcb is replaced put solder tags under each mounting hole and connect them to a convenient earth track on the board, but be absolutely sure that the track is an earth before connecting! A further improvement can be made by earthing the clock crystal as in Fig 1.

*20 Lode Avenue, Waterbeach, Cambridge CB5 9PX.

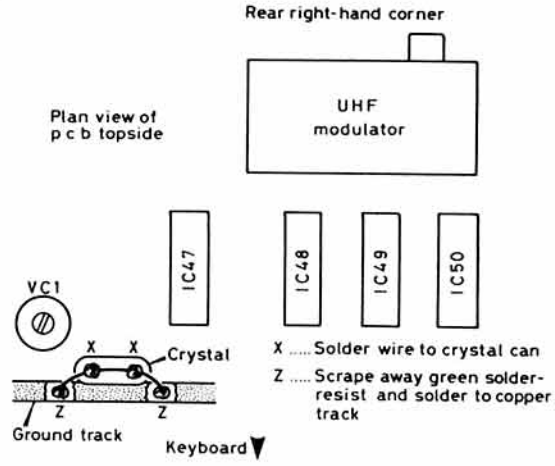


Fig 1. Grounding of clock crystal

Note of caution! Make absolutely sure that no conductors under the boards touch the case on reassembly. Measure the resistance from the + Vcc and −5V pins to the 0V pins before and after screwing the board in. The keyboard pins *will* touch unless pvc tape is stuck along the ridges in the case under it. Note that I take no responsibility for blown-up Beebs if this is not checked.

The metal plate to which the keyboard is attached should also be grounded by scraping the paint from beneath the nuts holding it down and earthing with stout wires as in Photo 1.

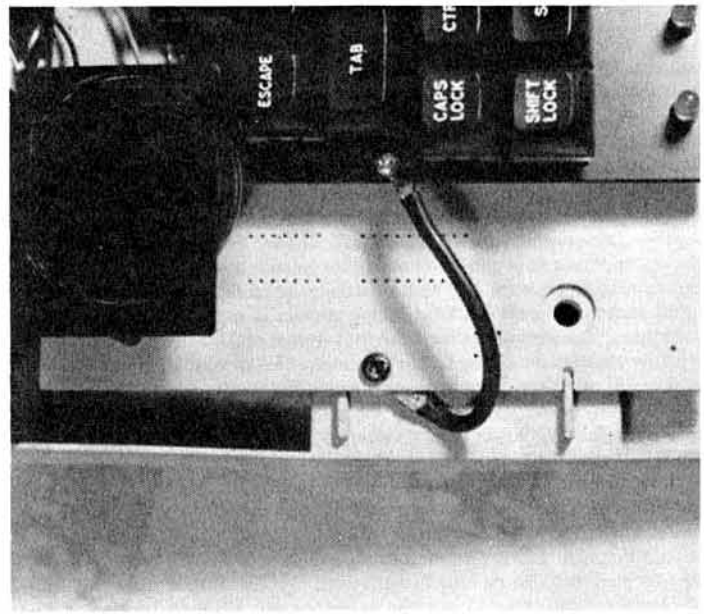


Photo 1. Keyboard grounding

(2) Lead radiation

The computer should now be "quiet" until an interface lead such as a disc drive or cassette is connected. Decoupling the digital interface leads with rf chokes and capacitors is likely to have detrimental effects on the digital signals on the lines and cause timing problems in the same way as excessive lengths, so this is not recommended. This is especially true if leads are approaching the maximum length of 600mm (1).

Screening the leads is the only sensible solution. It is relatively easy to obtain good quality screened lead for the cassette interface, and screened ribbon cable is available via RS but it is rather expensive. Such a purchase could be made by a club or similar organisation. I have a rather cheaper solution to screening ribbon cable. The leads may be wrapped in ordinary kitchen foil and Sellotape, but the foil must be securely grounded both to the case of the computer and the disc drive.

Adhesive copper tape (RS 512-272) is much easier to connect to, but once again the price may be prohibitive unless a reel is bought via a club or group.

(3) Mains breakthrough

Mains breakthrough can be reduced by soldering all crimped terminals in the power supply and fitting a miniature mains filter inside the case, screwed to the power supply compartment; see Photo 2. Photo 3 shows an alternative view, note that the power supply compartment wall is drilled for the fixing screws.

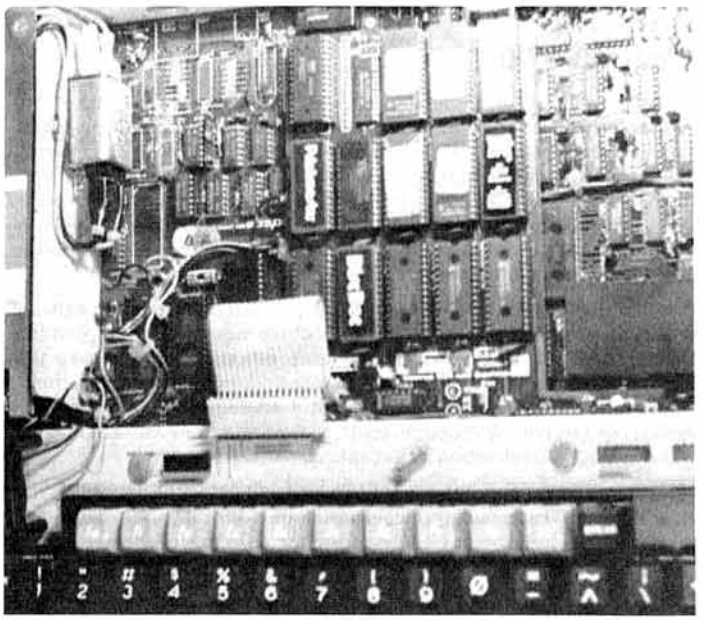


Photo 2. Interior view showing mains filter

I obtained a "surplus" mains filter of unknown origin from a rally, but there are a number of filters available via RS to the following specifications.

(i) 238-536 2A 30dB 0·6 to 100MHz
(ii) 238-520 6A 30dB 0·4 to 50MHz
(iii) 238-407 1A 30dB 0·15 to 30MHz

(i) is probably the best one to choose for most applications, although (ii) is shown used in Photos 2 and 3 and appears to work satisfactorily.

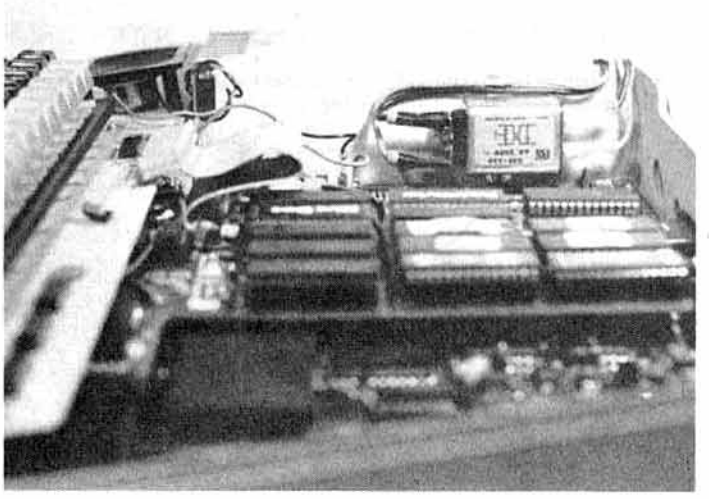


Photo 3. Mains filter

Conclusions

The measures taken in the article enable me to operate on 50 and 144MHz with the computer about 10ft below the antenna system, and James Miller, G3RUH (of AMSAT fame), reports being able to easily operate via Oscar 10 while using his "SATFOOT" program.

So many breakthrough problems can be removed if antennas are placed a long distance away from the shack, but I hope these tips will prove useful to some amateurs who do not have the luxury of a large garden and a tower. Let us hope for the introduction of sensible emi specifications for home computers in UK in the near future so that articles like this need never be written again.

John Worsnop was first licensed in 1971 at the age of 16 as G8EQR, and obtained his present callsign in 1972. He joined Pye Telecommunications Ltd (now Philips Radio Communications Systems) in 1973 as a student engineer.

In 1977 he obtained a Higher National Diploma and CEI part 2 in Electronic Engineering at the Cambridge College of Arts and Technology (CCAT). He worked on the design of rf sub-systems and telemetry for low-capacity uhf radio link equipment, before returning to CCAT as a part-time lecturer in 1980.

In 1982 he took up a full-time appointment where he now teaches telecommunications and electromagnetics up to degree level, and is currently completing a MPhil degree by research into meteor burst propagation.

His amateur radio activities have included the design and construction of the GB3WHA 70MHz beacon and the pa for the GB3PT rtty repeater. He is a past member of the RSGB Repeater Working Group. His outside interests include running, volleyball and gardening.

Acknowledgements

I am indebeted to James Miller, G3RUH, for his help and advice in the preparation of this article, and to the Engineering Department of the Cambridgeshire College of Arts and Technology for the use of their laboratory facilities.

Reference

(1) *Advanced user guide for the BBC microcomputer.*

Useful address

Deccospray Ltd, Eastmoor St, Woolwich Road, Charlton, London SE7 8NA; tel 01 858 5128. □

(Continued from page 905)

A POWER SUPPLY AND CONTROL SYSTEM FOR TETRODE AMPLIFIERS

latch is cancelled. In other words, driving the amplifier beyond the point at which grid current flows removes it temporarily from circuit. The 5s pause should be adequate to allow the operator to consider the error of his ways and make a small reduction in drive level; the precise length of time for which the amplifier is out of circuit can be increased by decreasing the zener voltage of D52. In Class C the overdrive detector's sensitivity is drastically reduced by means of RV9 and RLB2 and a preset level of permissible grid current can be set; the circuitry then functions as a simple overdrive prevention device. The latch, together with another latch in the screen overcurrent detector circuit, is reset from a front-panel push-to-make switch connecting +12V to pin 25.

IC4b and associated circuitry forms a screen overcurrent detector. The diode of the optoisolator is in series with the raw dc feed to the screen stabiliser circuitry via pins 70 and 71, and any fault in this which causes excessive current to be drawn will operate a resettable latch similar to that in the overdrive protection/prevention system and illuminate an l.e.d. Since the screen supply is essentially a shunt stabiliser, this part of the circuit cannot be used for overcurrent protection of the valves themselves, which is achieved by other means. The l.e.d illuminates immediately in the event of an overcurrent fault, but there is a delay of some 5s before the Darlington transistor TR4 turns on and operates a relay via pin 9, which removes the feed from the secondary of the screen supply transformer to the associated rectifiers and reservoir capacitor.

IC1 and IC3 can be any standard cmos 4050 and 4081 respectively, but IC2 should preferably be a Mullard/Signetics HEF4049. The reason is simply that each gate in this device is effectively three gates in series, giving a much higher effective gain and much better "snap" transitions between low and high outputs in the face of the slowly changing inputs inherent in the design. Various devices have been tried for the dual optoisolator IC4, but the common Toshiba TLP 521-2 A workswell and is recommended. TR1-3 are all medium-power npn switching transistors and the BFY50 was used in the prototypes, although the constructor's favourite devices can be used instead; the BSV64 and BSW66A-68A series are often seen for sale at rallies for a few pence and work well. Note, however, that TR1 is the ehv contactor switching transistor and that if it fails short-circuit the ehv will be switched on regardless of other conditions. Make sure that the chosen device will comfortably handle the operating current of the contactor used and is of good pedigree. TR4 is a pnp Darlington; a BSS62 was used in the prototype but others will no doubt work. The small-signal diodes used in the prototypes and shown on the circuit diagram were the BAW62 and BAV21. There is nothing exotic about these devices, which simply happended to be available at the time; the usual 1N4148 will do nicely.

To be concluded

THE G4DKG DIRECTIONAL ANTENNA FOR 3·5MHz

*G Collins, TEng, AFSERT, G4DKG**

Introduction

Having listened and operated on the 3·5MHz band with an inverted-V dipole, I had become increasingly envious of European stations giving dx stations in far-flung corners of the world 5 and 9 reports when I could not even hear the station in question. With the coming of autumn and improved long-distance propagation on the lower frequency bands, my thoughts turned to designing an antenna that would go a little way to towards helping me hear those elusive dx stations. The antenna site is 4m above sea level, on the flat coastal strip to the east of the Lincolnshire Wolds, some four miles inland from the North Sea.

Development

I have a single guyed pole 20m high, with a rope halyard for hoisting antennas aloft. A quarter-wave 3·5MHz vertical fed against a ground system was tried with mediocre success, the main stumbling block being the amount of interference received from strong stations in Europe while attempting to receive weak signals from VK/ZL on the long path. An attempt to reduce the strength of signals from the east was made using a second 3·5MHz vertical. Due to the height of the tree used to support this antenna it was top loaded, and was spaced a quarter-wave from the original antenna and fed 90° out of phase (phased verticals).

This did go a little way towards helping, but was abandoned for two reasons: **(1)** I felt that the second vetical with the top loading and an improvised radial system (I was running out of garden) was not working very efficiently. **(2)** My children enjoy playing in the garden and are too young to understand about the "no go" area Dad had claimed about the base of the new antenna in their play area. Another method of gaining some front-to-back ratio had to be found.

I had achieved a fair amount of success in the summer on 7MHz using a parasitic array, and my mind turned to using this technique. I decided to retain the vertical antenna and add some more vertical elements on the eastern side and attempt to tune them as reflectors. Tests showed that this worked well. I then went on to space the elements equally around the mast at 90° apart, and through the use of relays, made it electrically selectable for different directions.

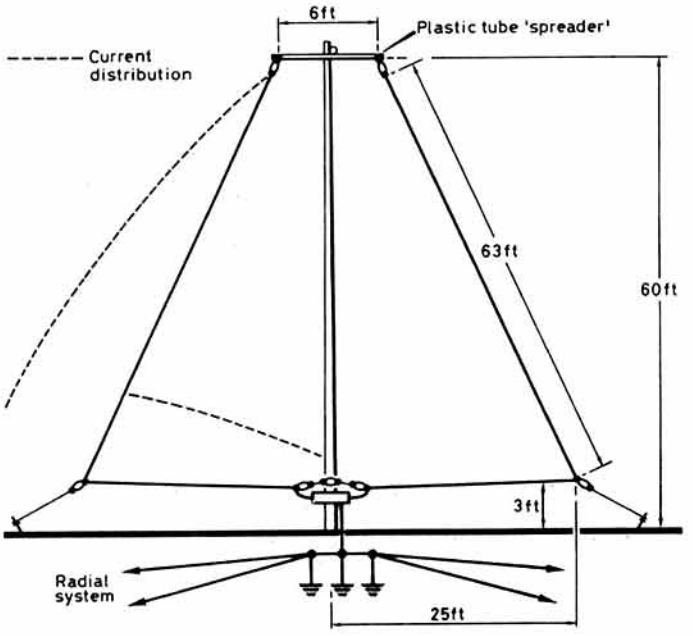


Fig 1. Side elevation of complete system showing two elements and the points at which insulators are required

The antenna is basically four vertical antenna elements supported by a central mast. The total length of one element is 88ft, and rather than use a capacitor to tune out the inductive reactance presented by an end-fed antenna of this length, it was decided to use a parallel tuned-circuit so that at all times the driven element is earthed at the antenna end of the coaxial transmission line. I have found that this helps to reduce static build-up, which can be a problem on hot humid days or during heavy snowfalls.

At first the four verticals were pulled up the mast on a common halyard without the use of the plastic spacer tubes, which meant that the tops of the elements were within a few inches of each other. However, during the development stages, the tubes were added, with a consequent increase in front-to-back ratio of approximately one S-point. I would like to try even greater spacing, but dare not risk the extra weight involved on the one halyard available on the mast. A side elevation of the antenna is shown in Fig 1.

Only one vertical out of the four is selected and fed to the atu; this is the driven element. The remaining three elements are electrically shorted together and earthed via a capacitor C1, these form the reflectors of the system.

The length of a quarter-wave radiator is given by the equation:

$$\text{Length in feet} = \frac{234}{\text{Frequency (MHz)}} = \frac{234}{3{\cdot}78} = 61{\cdot}9 \text{ ft}$$

So the current anit-node appears at the base of the long sloping section as shown in Fig. 1.

According to research by G H Brown, the optimum spacing between a reflector and driven element in a parasitic array is between 0·1 and 0·2 of a wavelength at the frequency in question (1).

In this case

$$\lambda = \frac{300}{f\,(\text{MHz})} = \frac{300}{3{\cdot}78} = 79{\cdot}6\text{m} = 258{\cdot}7\text{ft}$$

$$0{\cdot}1 \times 258{\cdot}7 = 25{\cdot}8 \text{ ft} \qquad 0{\cdot}2 \times 258{\cdot}7 = 51{\cdot}7 \text{ ft}$$

The plan view of the antenna, Fig 2, shows that the three reflectors fall very close to the above dimensions for spacing.

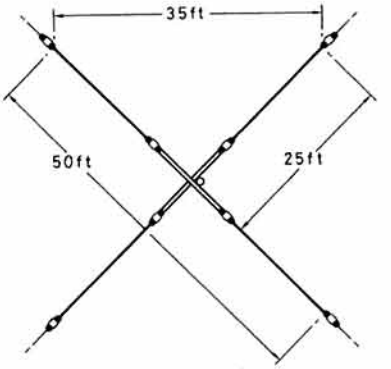


Fig 2. Plan view of antenna showing spacing between the elements at the current antinodes

Construction

The four elements are cut to equal length from stranded insulated wire. The spacers which support the four elements at the top are made from plastic electrical conduit which is extremely lightweight.

Insulators are placed at all the points marked, and the strain of the wire is taken on a rope attached to the mast prior to entering the relay box. The elements are pulled away from the mast by thin rope attached to the wires by insulators, and tied to wooden stakes hammered into the ground. It is best not to pull the elements taut with this rope but to leave a little slack, otherwise the spacer tubes at the top bend excessively.

* Grasmeade, Alford Road, Bilsby, Alford, Lincs LN13 GPY.

Switch and relays

The relays I have used are double-pole changeover (dpco) types, although only single-pole changeover required. I have given details of the relays used which are available from RS Components, the contacts are rated at 10A ac, they are not specifically for rf work but, when tried in this application, work perfectly well with no adverse effects (arcing etc).

Readers may like to try any relays that they have in the junk box which are of the same construction. The operating voltage is quoted as 24V, and I strongly recommend that any voltage greater than this is not used as damage to the cable between the shack and the mast, or the box which contains the relays, could leave people open to the risk of electric shock.

The 0V rail of the power supply feeding the relays should be connected to the station earth to provide some lightning protection.

A waterproof box fastened to the mast houses the relays and capacitor C1, which was salvaged from an old valve broadcast receiver and is a 3 x 500pF variable. The plates of this capacitor do not have to be wide spaced. Fig 3 shows the electrical drawing of the relays, the remote switch and associated antenna connections.

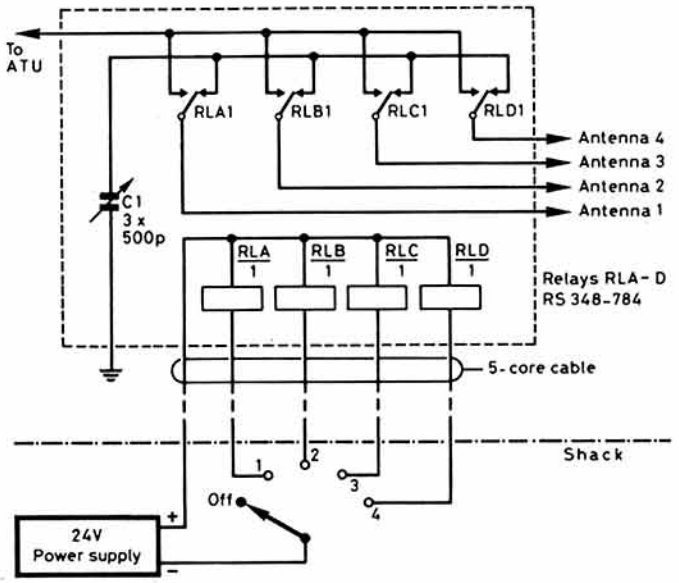


Fig 3. Diagram showing the connection of the antenna elements to the relay box along with the switch is mounted in the shack

Antenna tuning unit

As mentioned earlier, the atu is a parallel-tuned circuit and housed in a separate box on the mast, but it could easily be fitted in the box which houses the relays (depending on what size boxes are available). Capacitor C2 should be of the transmitting type, and a value of 300pF was used. The coil consists of 55 turns on a 1.75in former. Fig 4 shows the circuit diagram.

C2 should be tuned until the tuned circuit resonates at the desired frequency (3·78MHz in the author's case) with the coaxial cable tapped approximately 10 turns from the antenna end of the coil. With a small amount of power applied, C2 is then tuned and the coaxial tap adjusted to give the best swr on the 50Ω transmission line.

It is unlikely that the same position of C2 and tapping point of the line will give an ideal match for all four elements when selected in turn, but this can be remedied by lenghtening or shortening the remaining three elements to suit the atu. My antennas all give an swr of less than 1·2:1 within the frequency range of 3,710-3,800kHz.

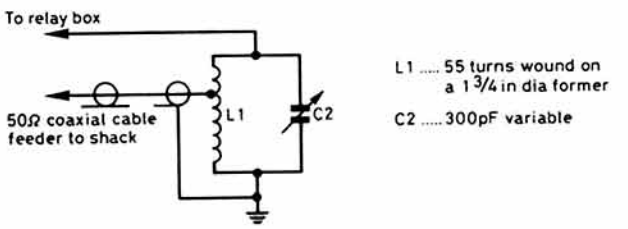


Fig 4. Circuit diagram of atu used, setting-up details are given in the text. Note the outer sheath of the rf feeder should be bonded to earth to afford some protection in the event of a lightning strike

Tuning the reflectors

It is at this point that the constructor has to decide in which part of the band he wishes to operate and take advantage of the front-to-back ratio offered by the antenna. There are two methods of tuning but both should finish up with C1 in the same position.

1. This method relies on being able to enlist the help of another amateur station within about 20-30 miles of your own QTH, and in my opinion is the best method. Select the antenna on the opposite side of the mast to the station helping, transmit on or around the frequency of interest (2-3W should be ample). The other station should tune to this signal and watch his S meter for the weakest signal at his receiver as C1 is tuned. Beacuse of the coupling between the driven element and the three reflectors, the tuning of C1 will result in the necessity to adjust C2 in the atu for the best swr once again. Once C1 has been adjusted, switch off, select the antenna towards the receiving station, and transmit to check on the front-to-back ratio obtained; this should be the same as the figure you are able to achieve on receive. Do not be tempted to beam towards the other station and tune for maximum radiation in his direction, as the correct tuning point is very hard to find; a much more defined tuning point is obtained when tuning for a null.

2. When beaming away from a transmitting station, tune C1 for a null. If the station is close (up to 30 miles away) this method works, but depending on band conditions and distances involved your S meter will probably vary more with QSB than with the tuning effect of C1. The tuning of C1 is very frequency dependent, and the front to back ratio will fall off rapidly when moving away from the frequency used to tune reflectors.

Performance

I have achieved a front-to-back ratio of between three and four S points on both transmit and receive. Unless you have a directional antenna on 3·5MHz it is hard to appreciate what a difference it makes to be able to reduce the strength of signals from mainland Europe, when working the USA or New Zealand on the long path. I am still unsure as to whether I have any gain from the array, as I have no means of making this measurement.

I have tested this antenna when in contact with various stations in other continents and they are able to see the difference in my signal strength when I beam in the opposite direction. In fact, my signal went to "barely readable" after having received a 5-8 report from New Zealand one morning.

Acknowledgements

I wish to thank the many stations I have contacted on 3·5MHz who have allowed me to test the preformance of the antenna with them, particularly my father G4SOR for his many hours of patiently watching the S meter while I tuned the reflectors, after what must seem like endless modifications to the antenna. I am at the moment trying to develop a similar antenna for the 7MHz band for use during the summer months.

Reference

(1) *ARRL Antenna Handbook* chapter 4. For more in depth reading, Brown's original paper, *Proceedings of the Institute of Radio Engineers* Vol 25, part 1, January 1937, pp 78-145. □

G4DKG is 30 years of age and became an swl at the age of 11, gaining his callsign in 1974. After seven years as a radio/electronics officer on BP ships he swallowed the anchor. He worked for South Midlands Communications for a year, and since 1983 he has been a senior electronics technician with the Anglia Water Authority.

Technical Topics

Pat Hawker, G3VA

WRITERS AND COLUMNISTS can neither expect to, nor in my opinion should they attempt to, please everybody all of the time. Some new-time readers resent being reminded of what they have missed by not being old-timers; some like, some dislike to be reminded of how classic techniques still offer scope for experimentation and development; some apparently believe that any reference to thermionic devices immediately marks one out as a non-progressive despite the fact that 99·999 per cent watch tv on thermionic cathode-ray tubes, with well over 90 per cent of viewers and listeners depending on broadcast transmitters using thermionic power amplifiers, and with space communications still largely dependent on travelling-wave-tubes and up-link klystrons. No matter; anything that happened before the 1980s is of no concern to those who do not ascribe to the view that "science without its history is like a man without a memory". Journalists and technical writers, in the view of some, should be concerned only with "oooh" and "aaah" reporting of discovery, promise, prediction and progress of new superstitions, taken in by shrewd public relations fashioned to sell technology on behalf of government departments, universities, professional societies, industry, broadcasters, health groups and publicity-seekers. I am old-fashioned enough to believe that writers and advertisers and publicists should stay at arms' length. Public relations, it has been said, is organized lying.

Near the mark was that innovative engineer/amateur, J P Costas, W2CRR when he wrote: "We may be far better off to improve what we now have rather than to seek a cure for our present problems by discarding completely the old and accepting something entirely different. This statement may draw the accusation that the writer is not of a progressive frame of mind. I would deny this by stating that progress and increased complexity are not necessarily synonymous. True progress is achieved when improvements are obtained without a significant increase in complexity."

During the 30 years of *TT*, the vast majority of space and encouragement has been given to solidstate electronics and I can think of very few major developments that have not been outlined in *TT* in advance of other UK publications on amateur radio. But current trends in professional communications technology, such as surface-mounted devices, application-specific integrated circuits, 64K memory chips, millimetric-wave GaAs integrated circuits, computer-integrated-manufacture etc are not advances that can readily be taken on board by amateur experimenters. But for some readers, mention of valves, variometers or vintage receivers or anything less than state-of-the-art seems to act like a red rag to a bull.

Mark David, G4MEM, for example, complains that he has become more and more frustrated by *TT* which he claims indicates that I would like to see everyone using HROs and No 19 sets, *(wrong!)*. He and I agree that early transistor sets may have been poor compared with the valve equipment of the 1960s. He continues "But the modern sets really do perform well, and rather than knock microprocessor technology, why not see it as an aid for operation which is what this modern technology is supposed to be? Having been professionally involved with valve, transistor and microprocessor equipment, I know which I prefer to work with. The impression given by the column to new amateurs may not be one reflecting the pioneer spirit of our hobby. Perhaps it is time for an author with a more modern outlook, reflecting amateur radio as it is now."

That's a put down and no mistake! Yet virtually by the same post there arrived (from an overseas amateur) a letter that began: "First of all I must thank and congratulate you on Technical Topics. There is always something new to me and I do find it makes Rad Com the finest radio amateur magazine of all."

Perhaps the time is coming for *TT* to be wound up, if only to make more space for all those non-technical topics that seem to obsess so many RSGB members these days! For I still believe that amateur radio should not be confused with amateur information technology, useful as the micro can be for some applications in the shack.

Using car-radio antennas on 144MHz

Back in February 1981 (*TT*, page 140), details were given showing how a 144MHz antenna could, with the aid of a simple filter, double-up as a standard am/fm broadcast antenna (Fig 1). In *TT* (September 1986, p637) and in more detail in the full-length article by David Last GW3MZY and Trevor Goddard, GW6RYH "The 'Backlite' mobile antenna for 144MHz" *(Rad Com,* February 1987, pp106-8) where it was shown that window-heater antennas developed for broadcast reception could be used for two-way radio, including 144MHz, operation.

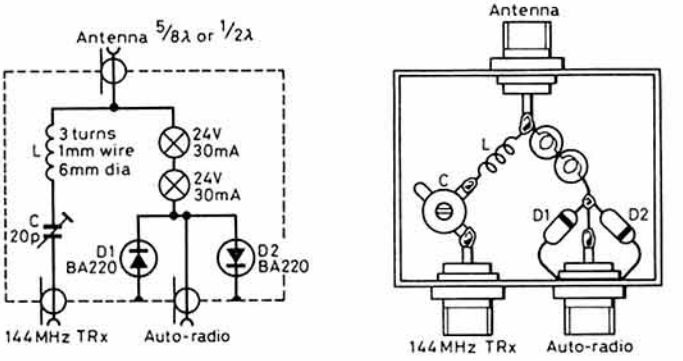


Fig 1. PA0GWF's method of feeding a broadcast car radio from his 144MHz transceiver antenna as described in *TT*, February 1981

It is an obvious advantage, even at the risk of a slight reduction in 144MHz performance, to have only a single, ordinary-looking antenna on your vehicle. No extra holes need be drilled but even more important is that there is nothing to suggest to the potential thief or vandal that there is a two-way radio waiting to be torn out. It is claimed that in the UK alone one in-car entertainment (ice) unit is stolen on average each minute of the day, often accompanied by damage to the vehicle. Various techniques to make such equipment less attractive to thieves, including sophisticated security coding, are increasingly being incorporated into the more expensive ice systems but not yet, apparently, in amateur mobile transceivers.

Dick Rollema, PA0SE, has added to the single, unobtrusive antenna approach by developing and describing a filter separating 144MHz signals from those destined for the broadcast receiver. He writes: "All designs I came across in the past were meant for use with a 144MHz antenna doubling for car-radio use. I did it the other way round. My car came with an antenna mounted on

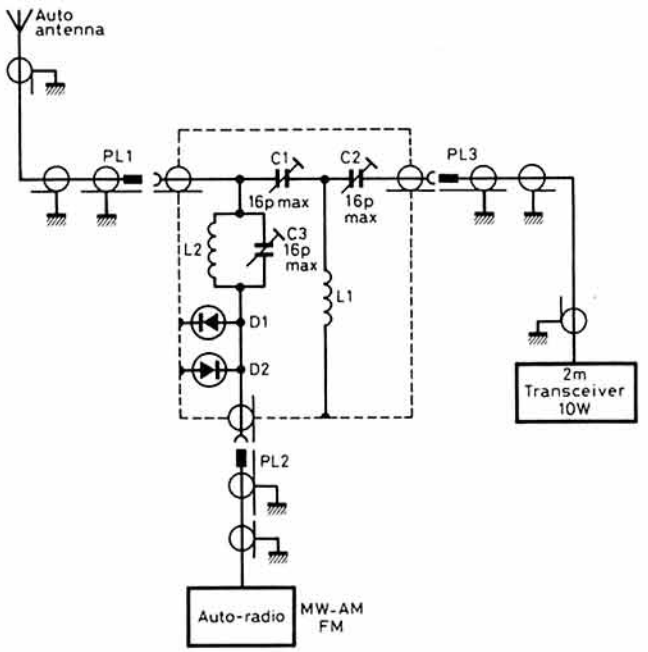


Fig 2. PA0SE's matching-filter permitting the use of a standard car-radio antenna on a 144MHz transceiver while retaining its use for broadcast reception

the front side of the roof, immediately above the windscreen. The position seemed acceptable for my 144MHz rig so I decided to give it a try. The filter unit now has the additional task of matching the car-radio antenna to the 50Ω output socket of the transceiver. I use a T-network in high-pass configuration as shown in Fig 2 (L1, C1 and C2). The broadcast receiver is protected by the parallel-tuned circuit L2, C3, resonating at 145MHz. For extra safety, diodes D1 and D2 are added. However, when properly tuned the residual rf on PL2 is of the order of 50mV or less when running 10W rf output from the transceiver, so that the diodes do not conduct. When the broadcast receiver is tuned to a reasonably strong or not-too-weak signal, broadcast reception is undisturbed when transmitting. Only on a weak broadcast station is some blocking noticeable. This can, in fact, be used for fine tuning of C3 which can be set for minimum disturbance of broadcast reception while transmitting.

"When setting up the filter, the car radio is replaced by a resistor (eg a 50Ω dummy load). C1 and C2 are tuned for minimum swr at the transceiver output and C3 for minimum rf voltage at PL2. It is useful to prune L1 in such a way that proper matching is achieved using minimum capacitance at C1 and C2 since this improves the filtering action. Similarly for L2 and C3. Not having a separate reflectometer for vhf, I used the built-in reflectometer that most if not all 144MHz transceivers include for protection of the power amplifier. I fitted a banana socket on the back panel of the radio and connected it to the output of the internal swr-bridge. With a multimeter between this socket and chassis, C1 and C2 were adjusted for minimum voltage.

"The filter has been in use for about 2½ years and no retuning whatsoever has been necessary. Theoretically the car radio antenna can be expected to perform rather worse than 5/8th-wave whip used previously but, in practice, in view of the wide fluctuations in fieldstrength in mobile operation, this is virtually unnoticeable.

"L1 and L2 are made from 1.8mm copper wire (electricians' wire with insulation stripped). L1 has two and a half turns on 10mm internal diameter. L2 has five turns, 10mm internal diameter. This data to be used as a guideline only. As noted above the coils should be so dimensioned that C1, C2 and C3 are near their minimum value. The filter is mounted in a metal box with lid that happened to be available, dimensions are 10cm wide, 5·5cm deep and 5·8cm high. The unit fits behind the car radio in its recess and is kept in position with some sponge rubber."

Constant-current charging from 12V batteries

K G Pollard with the "initialised callsign G4KGP" has an FT290 which has eight nicad cells in its battery pack. On camping holidays with his family, the only power source available for recharging the cells is the car battery. The car is little used on these occasions so that the battery is not being recharged for much of the time. In a tent it is not convenient to take out the cells of the FT290.

The nicad cells have an operating voltage of 9·6V but, when charging, a battery pack terminal voltage of about 12V is required to provide the 14-hour or one-tenth charge current. The car battery, in its quiescent state, ie not being charged, has a terminal voltage of about 12·6V. This raises the problem that it is necessary to make the car battery a constant-current source, providing the FT290 battery pack with 120mA at a terminal voltage of 12V, from a power source which varies from 12·6V to 14·5V.

G4KGP uses the simple arrangement shown in Fig 3 comprising just two transistors and two resistors. He writes: "It couldn't be much simpler. It works as follows: the BD132 transistor is turned on by the 3·5kΩ resistor. The current to the battery under charge flows through the 1Ω resistor which thus develops 120mV across it. This 120mV turns on the AC128 transistor, draining away the drive to the BD132. The circuit stabilises at a current of 120mA, so forming a constant current source. Employing a germanium transistor as the current sensing element reduces the voltage loss of this section of the circuit; a silicon device would require about 0·6V to turn it on.

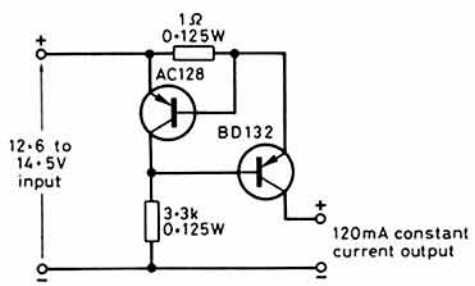


Fig 3. Simple constant-current charging system for re-charging nicad batteries from 12V car batteries

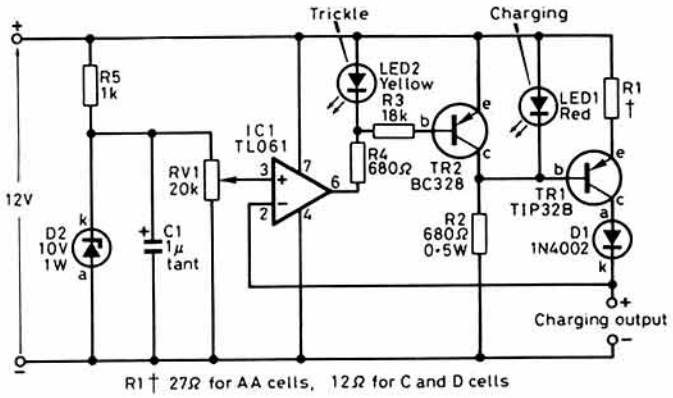


Fig 4. More elaborate nicad charger incorporating automatic float charge for use with AA cells (50mA charging rate) and larger C and D cells (120mA charging rate), as described by P Boyle in Electronics Australia

"The circuit has been arranged so that the negative terminal of the charger is at car ground potential for negative earth cars because the FT290 case is then at the same potential, so avoiding possible short-circuits. For positive earth cars the transistors could be replaced with an AC127 and a BD131. As the maximum applied voltage, when the car engine is running, is about 14·5V, the maximum power dissipation in the BD132 is only about 300mW, 14·5V-12V x 120mA, so no heat sinking is required. I soldered the case of the AC128 to the metal backing of the BD132 (do the soldering very quickly!) to provide thermal feedback. If the BD132 heats up then the AC128 turns on at a lower voltage than 120mV, so limiting the current flow. This makes the circuit thermally stable."

A rather more elaborate nicad charger incorporating automatic float charge is described by P Boyle in *Electronics Australia* (April 1987): Fig 4. This is similarly intended to operate from a 12V car or boat battery, charging up to six cells in series. When charging is complete, a trickle charge prevents the cells from self-discharging. Operation of this charger is as follows: Initially, with the 12V battery connected but no nicads connected, the yellow: "trickle" light-emitting diode (l.e.d) will light. Once the nicads are inserted, the red "charge" l.e.d lights and remains on until the nicads are charged. The red light then goes off and the yellow light comes on, TR1, R1 and LED1 form a constant current source. LED1 is lit via the current through R2 providing a 2V drop. The voltage across the base-emitter junction of TR2 is 0·6V leaving 1·4V across R1. When R1 is 27Ω, the current through TR1 is 1·4/27 = 52mA. When R1 is 12Ω the current is 116mA. These currents correspond to the 14-hour charge rate for AA cells and the larger C and D cells respectively.

IC1 is used as a voltage sensitive switch to turn off the charger. It monitors the nicad voltage set by the 10V zener D2 and trimpot RV1 which is set to the correct fully-charged potential of the cells. When this voltage is reached the output of IC1 goes low and switches on LED2. The resulting 2V across it turns on transistor TR2 via R3 and turns off LED2; this in turn reduces the voltage across R1 to 60 per cent of normal, representing the trickle charge. To adjust RV1, initally turn it fully in the direction of the zener diode cathode. Charge the nicads for 14 hours and turn RV1 back until the yellow and red l.e.ds are both just alight. With RV1 left in this position the red l.e.d. will extinguish after several minutes. Note that RV1 would need readjustment if a battery with more or less cells is to be charged.

Vertical arrival angles of dx signals

Most amateurs interested in long-distance communication by means of ionospheric propagation (ie medium frequency, hf and lower vhf) soon come to recognise that results depend to a large extent upon the vertical radiation pattern of their antennas. Power radiated outside the optimum range of arrival (departure) angles is virtually wasted power. With real earths of finite conductivity it is extremely difficult on hf to achieve vertical radiation patterns effective below about 5° above the horizon, difficult enough to radiate much power below 10°. On the other hand, high angles of elevation, associated with horizontal wires at heights above ground significantly less than a half-wavelength, can put very strong signals from F2 or F1 layer reflections into locations less than about 1,000 miles away.

This much, of course, is common knowledge. Yet few of us have any clear idea when we are working a dx station what is the vertical angle of arrival of the signals, or the appreciation that this can vary with the frequency, height of the reflective layer, mode of propagation (chordal hop/grey-line propagation etc) or appreciate that even an antenna with little low-angle radiation can still give good dx performance for limited periods of the time that the path is "open".

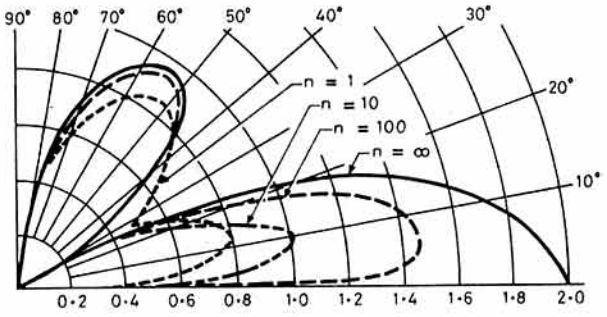


Fig 5. Vertical radiation pattern of a vertical dipole located one-half wavelength above earth of finite conductivity (n=1 represents very poor conductivity, n=infinity represents salt water). Note how at low elevation angles radiated power varies enormously with ground conductivity. (Source Collins' *HF Communications Data Book*)

In 1937, RCA mounted a successful operation designed to receive in the USA the early 405-line television signals from Alexandra Palace. As part of this work they used an interferometer technique to measure arrival angles not only of the 45MHz transatlantic signals but also (on March 4, 1937) of a number of 28MHz signals from amateur stations dotted around the USA.

The 45MHz signals were found normally to arrive at an angle of only 7·5° above the horizon. The 28MHz signals varied with distance and direction from 8·1° (2,720km, layer height 353km) to 17·2° (1,800km, layer height 360km and also, in a more southerly direction, 1,960km, layer height 402km). Typical arrival angles were around 12–14°.

In 1960-1 a more extensive set of measurements were made on frequencies around 14MHz by the Post Office (now BT) Engineering Department in the course of an investigation into the cost-effectiveness of raising their point-to-point rhombic antennas from 150ft to 300ft (a project left unfinished). More than 30,000 measurements were made at Bearley and Canewdon on signals from Poona, India; Sydney, Australia; and New York. Arrival angles were found to be largely dependent on the ratio of the operating frequency to the muf, and there was evidence that at times arrival angles were as low as 1° while at other times signals from the same location arrived at angles above about 18°, again 12±2° was typical for F2 modes. What this implies is that with a transmitting and receiving antenna effective down to very low elevation angles, signals will be received for longer periods of time, even in disturbed ionospheric conditions and at times on frequencies well above the nominal muf. On the other hand it shows that even if your antenna puts only a tiny percentage of your total power below about 15° elevation you should still be able to work dx occasionally. There was little difference in normal arrival angles from New York, Poona and the much longer path from Sydney.

A casual inspection of the vertical radiation patterns (vrp) of antennas tends to fuel the age-old debate on vertical versus horizontal polariasation. It is important to appreciate that this argument cannot be decided on the basis of "free-space" patterns or patterns with "ideal" earth. The effect of the height of a horizontal antenna above "real earth" and for vertical antennas the conductivity of the earth surrounding the antenna out to a distance of up to 100 wavelengths are the determining factors.

A valuable article "Some reflections on vertical antennas" by C J Michaels,

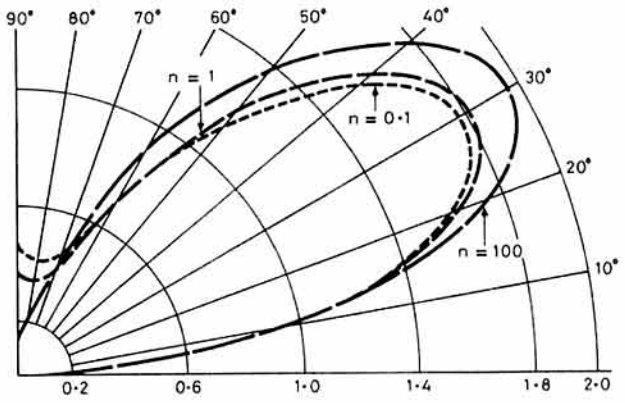


Fig 6. Vertical radiation pattern in the plane perpendicular to the axis of a horizontal dipole one-half wavelength above earth of finite conductivity. Note that earth conductivity has little effect on vrp and only slight effect on efficiency. (Source and details as for Fig 5)

Table 1. Measured vertical angles at which signals from England arrived in New Jersey

Frequency (MHz)	Angle below which signals arrived 99% of the time (Degrees)	Angle below which signals arrived 50% of the time (Degrees)	Angle above which signals arrived 90% of the time (Degrees)
7	35	22	10
14	17	11	6
21	12	7	4
28	9	5	3

W7XC in *QST*, July 1987, pp15-18 carries the highly-relevant note: "Many amateurs have observed that on a dxpedition a simple vertical antenna on an ocean beach performs beautifully, while their own vertical radiates equally poorly in all directions."

The author provides useful data to back up his explanation of why a salt-water ground-plane "earth" is very desirable with vertical polarisation, but has only a marginal effect on a horizontal antenna. He gives a useful table of vertical arrival angles (Table 1) that agrees well with the 1960 Post Office measurements but shows, also, how this tends to vary from band to band.

He also warns of the common fallacy that the use of an extensive network of buried or surface radials (up to 120 are commonly used by medium frequency broadcast stations), completely overcomes the disadvantage of a site having poor ground conductivity. He writes: "A ground radial system is often used to reduce the losses in the near field of a vertical antenna. The radial system does just that—unfortunately this has little to do with the low-angle radiation characteristics of the antenna, because the area of ground reflection (Brewster angle) lies quite a bit farther out from the antenna than any practical ground screen, earth mat, radial system (that could be installed by amateurs.)" Enormous earth mats have been installed for example in Australia, to permit the reception of signals down to below 1° elevation for signal-interception purposes. He adds: "In selecting a location for a vertical the best sites are marshy areas and those overlooking (salt) water, although radiation towards the inland side will not be as good as the over-water path. Small islands are ideal, especially ones that do not rise above the water to any great elevation.

For horizontally polarised antennas, ground conductivity has far less effect:

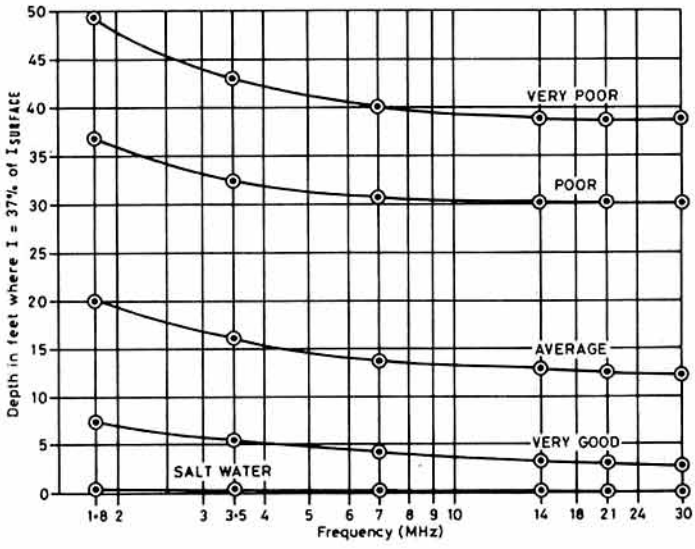


Fig 7. Depths at which the current density is 37 per cent of that at the surface for different qualities of earth over the 1·8MHz to 30MHz range (W7XC, QST, July 1987). Depth for fresh water (not shown) is 156ft almost independent of frequency below 30MHz

Table 2. For low angle radiation, the higher the better. A sloping wire or a sloping site can also provide good low angle radiation. It is often claimed that a horizontal dipole less than a half-wave above ground is not suitable for long-distance operation. While I have always argued that the higher the better, it should not be forgotten that real earth does not reflect hf signals from the surface but often from quite a few feet below the surface. W7XC provides a diagram showing the depths at which the current density of an rf signal is 37 per cent of that at the surface for different earth charcteristics over the range 1·8MHz. The rf gets surprisingly far down.

Real earth may have high or low dielectric constants and high or low conductivity. With very poor earth conductivity, such as a sandy desert (or fresh water) an antenna wire laid directly on the surface or even buried a couple of feet below the surface, will still radiate quite effectively, at least at high vertical angles.

Table 2. Gain of ½λ. Dipole as function of height and ground parameters, using lowest lobe

Height	Approx gain, db/isotropic			Direction of gain, above horizontal		
	A	B	C	A	B	C
¼	8·14	6·28	5·14	90°	90°	90°
½	8·14	7·16	6·60	30°	29°	29°
1	8·14	7·64	7·30	15°	14·5°	14·5°
2	8·14	7·90	7·72	7·5°	7°	7°
4	8·14	8·03	7·94	3·75°	3·5°	3·5°

A—perfect ground; B—moist soil; C—dry soil

One of the most effective ways of lowering the radiation angle of a horizontally polarised antenna of limited height is to use an array which sharpens the vrp in much the same way as it does the hrp. Such an array is not necessarily the usual Yagi or quad. Long-wire and rhombic antennas etc also show the same effect. A good rhombic, for example, may have maximum radiation at around 11-12° with its −6dB angles about 5° and 16°, just the range needed for consistent dx operation!

Long-wire antennas on 50MHz

In the August *TT* I wrote: "Curiously, few amateurs have shown much interest in using long-wire or rhombic antennas for vhf or uhf where they can be fitted into a surburban garden or even a loft-space..". Mike Parkin, G8NDJ is an exception and confirms that a simple long-wire antenna can put out a potent signal on 50MHz. He writes: "Having built a 50/144MHz transverting system. I was naturally keen to test it out. I did not have a 50MHz antenna so I decided to try my long-wire antenna used for listening on the hf spectrum. Rather to my surprise the antenna loaded after using a length of 75Ω coaxial cable as a matching transformer. The system worked well and I was constantly asked by the amateurs contacted for the details. It was sugested that I send along the information for possible publication.

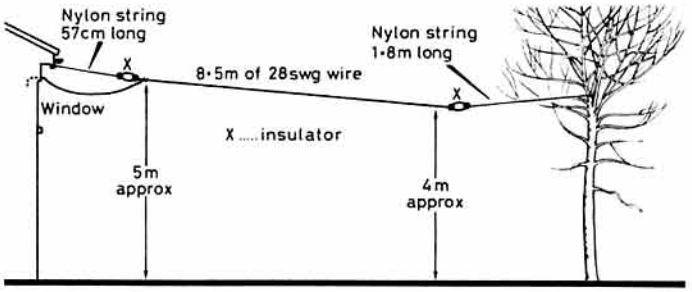


Fig 8. Basic 50MHz "long-wire" antenna used by G8NDJ

"Basically the antenna is 8·5m of 28swg copper wire suspended between the house and a tree at the bottom of the garden using insulators and nylon cord. At the house end is attached 1·8m of copper wire to act as feeder between the 75Ω matching transformer and the horizontal span of the antenna. There is 9cm of this inside the house, the rest (1.71m) attached (by soldering) to the antenna and passed through the wooden window frame.

"Initally the coaxial cable was 4m long and I chopped it back 5−10cm at a time until the swr meter reading dropped to near unity. In practice 3.9m of cable resulted in a match of 1·1:1.

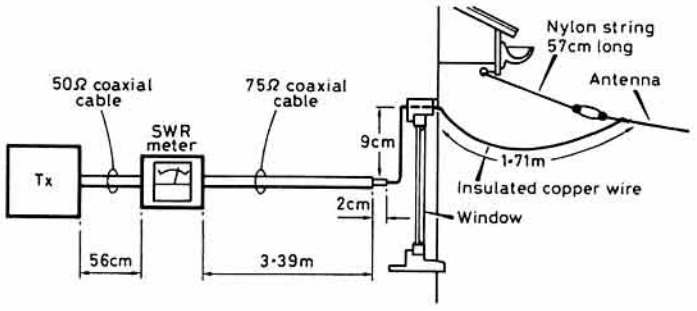


Fig 9. Details of matching arrangement used by G8NDJ

"I have been very pleased with the performance. Local contacts fall off beyond about 20 miles but it has resulted in cross-band contacts (via Sporadic-E?) with Norway, Spain, Switzerland, Italy, Germany and Portugal in a few weeks of operation. It provides a simple and cheap antenna and one that would be well suited to portable operation."

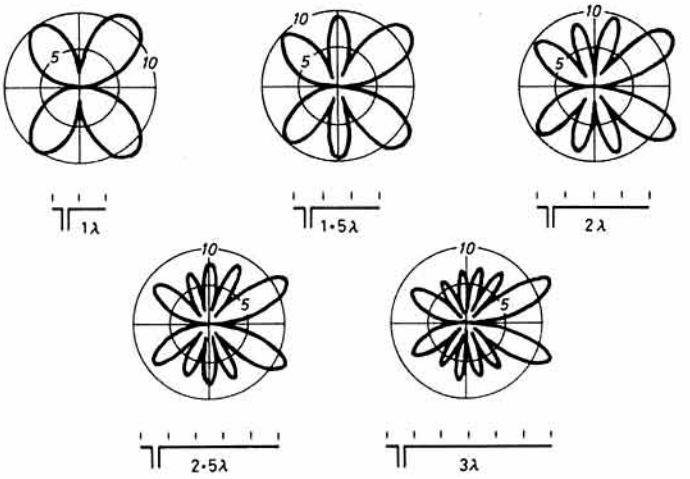


Fig 10. Horizontal radiation patterns of "long-wire" antennas fed at one-quarter wavelength from one end. Note increasing asymmetry with length of resonant long wire antennas

The ususal way of feeding a vhf long-wire with coaxial cable is simply to connect the coaxial cable to a resonant long-wire, a quarter-wave in from one-end. The possibility of using "stretched" long-wire antennas using capacitors at the appropriate intervals should not be overlooked.

Negative-line and universal keying circuits

The May *TT* included GM4DGT's keying arrangements designed to avoid electric shocks from a floating negative rail. More recently, R B Kerr, GM4FDT has sent along an alternative negative-line keying arrangement that he uses with his CQ110E transceiver: Fig 11. In this I_1 should be greater than the key down current I_2. The voltage rating (Vcbo) of TR1 must be greater than the key-up voltage. No batteries are required. Logic 1 (ie usually = 5V) represents key down. Resistor R (330Ω for the CQ110E) can be determined from I_1 = (ttl level—0.7)/R to make I_1 sightly greater than I_2 for reliable operation.

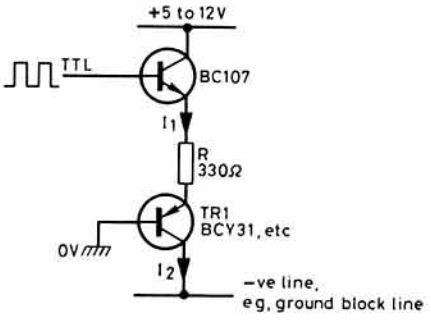


Fig 11. GM4FDT's negative-line keying arrangement

Steve Cook, G4ANA ran up against the problem that his key, a magnificent cmos version of the "Ultimatic" had a relayless output circuit which was fine for positive keying, but, on switching to negative keying as used for example for grid-block transmitters, connected the transmitter chassis to the keyer's positive rail, leaving the paddle metalwork connected to the negative rail. He writes: "Several sets of exploding nicad batteries later, I devised a "kiss" single ic arrangement (Fig 12) which not only enables me to bond all the metalwork together but has also incidentally much simplified the polarity switching and provides a 'universal' design.

"The circuit relies on the same 'same-or-different' switching characteristic of an exor gate, and clears polarity problems completely. Polarity selection is now achieved by connecting the keyer case to one or other of its power rails, leaving nothing 'floating'. IC1a inverts 'case' potential (also brought out on pin C) to provide 'anti-case' (on pin A): the input is protected against static damage by the inclusion of R3. The 'anticase' potential is used to provide the 'pullups' on the paddle inputs via R1, R2, with C1, C2 providing the usual 5ms scratch filtering. IC1b and c then compare paddle potential with that on pin B: by linking this pin A or C, the ouputs from these gates may be made active high (positive) or low as required by the main keyer pcb.

"IC1d similarly provides output polarity selection. The logic ouput of the keyer pcb (which may be of either polarity) is here compared with pin D, which is linked to A or C such that IC1d output is active high on positive keying, active

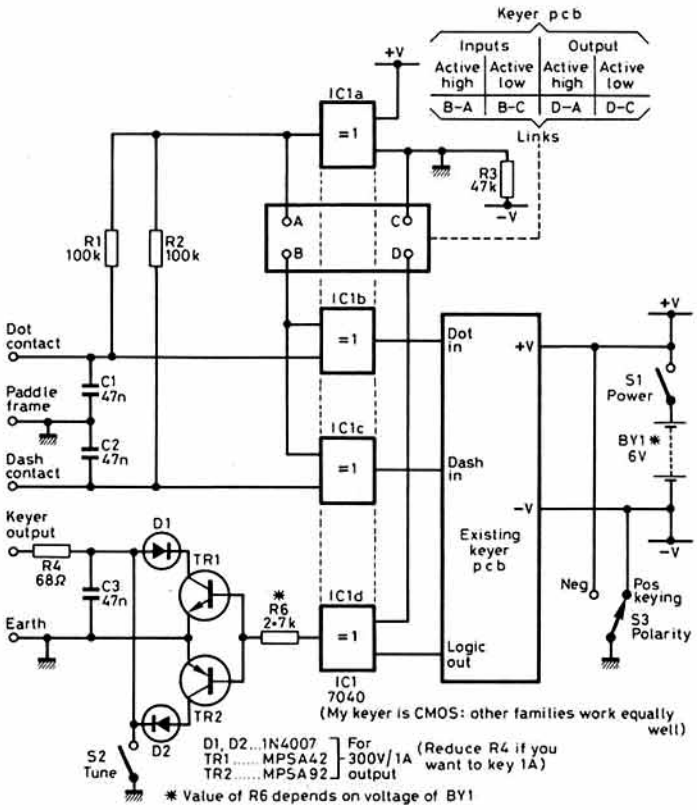


Fig 12. Dual polarity relayless keyer interface with all metal work bonded to earth (G4ANA)

low on negative. This output drives the bases of TR1, TR2, the high-voltage keying transistors, the emitters of which are connected to the case. If the case is negative and IC1d output goes high, TR1 turns on and, via D1, so does the transmitter. If the case is positive and IC1d output goes low, TR2 turns on and energises the transmitter through D2. R4 and C3 provide the usual click filter. Usefully, the b-e junctions of TR1, TR2 protect one another against excessive reverse polarity.

"Result—Nirvana! My nicads no longer explode no matter what touches what. I commend the idea to anyone with a keyer with a 'floating' paddle."

Valves in the museum or shack?

The recent revival of interest (by no means confined to *TT*) in valve technology is not apparently shared by all readers. G Orford, G4FRO complains bitterly that his heart sinks when he looks at *TT* which he considers has degenerated to tedious nostalgia, for those less than sixty, concerning vintage radio, countless valve items, and no longer providing readers with useful or relevant or "where's-the-soldering iron" items. Well, well—luckily for my morale this view does not seem to be shared by other correspondents, not all of whom are "senior citizens".

Geoff Lomas, G4SYC although admitting to belonging to this apparently "past it" category writes: "Like yourself, I am still fond of using valve equipment, despite having spent well over thirty years at the sharp end of computer and military electronics design. The hf rig is the old Heath SB101 and for general coverage the even older AR77. Both are still in fine condition and seem to work as well on cw as any modern and much more expensive gear. The AR77 has been usefully augmented with a digital read out I described in *Wireless World* in the days when there was only limited choice of integrated circuits. A valve I do not like much is the 6146B which I find subject to internal catasrophe; these have been replaced in the SB101 by 6293 valves, a development of the 6146B designed for pulse modulator service and far more robust, although almost identical electrically and physically. When I first acquired the SB101, it suffered from appalling drift. This was tracked down to a six-inch length of coaxial cable joining the vfo to the first mixer. The braid was corroded and varied in capacitance as the rig warmed up. Not one of the more obvious faults!"

Graham Maynard, a keen and experienced listener to medium-wave dx, in the course of a long report on this aspect of the hobby, in *M W News*, writes: "I was brought up in the blue spot, red spot and white world of the early germanium transistors, buying my first OC72 at the age of twelve... during the past twenty years I've tried bipolar, fet, integrated circuit devices and battery valve designs with inductive, crystal, ceramic and mechanical filters, balanced mixers, differential stages, etc, but for serious dxing I use an 'old-fashioned' valve set, a 1953 Marconi Mercury, type 1017 marine receiver. Indeed, it was the power, size, weight (and later cost) disadvantages that started the thermionic decline and not failings in attainable performance... until I can afford a modern solidstate receiver capable of *good* medium-wave performance my choice remains with secondhand professional valve gear." One of the disadvantages of much modern solidstate equipment is the use of electronic (diode) tuning in place of the much higher-Q variable tuning capacitor. It is primarily above 100MHz that the low-noise characteristics of modern solidstate devices become important.

Peter Chadwick, G3RZP warns that builders of "replica" transmitters need to ensure that they meet modern band-requirements in respect of chirp and clicks, etc. The need for a T9 and low drift however does not usually present any problem with crystal control. And of course some valve equipment of the 1950s and 60s were first-class performers (eg Collins equipment). But with 'thirties designs emc, tvi and rfi can be virulent unless adequate precautions are taken. G3RZP does not believe we can afford to indulge in the luxury of nostalgic gear with nostalgic performance! He confirms, however, that considerable use was made both in US wartime equipment and for marine emergency receivers right up to the mid-1960s of a low-voltage (12, 24, 28V) ht bus, sometimes using two pentodes (eg 2 x PL84) in parallel to provide sufficient audio output. On the use of Q-multipliers at the front-end of receivers, either valve or solidstate, he warns of oscillator radiation.

Variometers and the linear variable inductor

The recent *TT* notes on old-style mechanical variometers and the proposed linear variable inductor (lvi) outlined by A S Kislovski of Hastler Ltd in *Proc IEEE* (February 1987, see *TT* September p661) have continued to attract comment. Tim Wright G1BCR/G9BZW reports that what appears to be an identical technique has been used for a decade in the Marconi Instruments fm signal generator type 1066B as a means of controlling the sweep range. A number or readers have pointed out that, in principle, the lvi, although based on the use of two linked toroidal cores, is similar to the long established magnetic amplifiers and saturable reactors widely employed in 50 and 60Hz lighting and other control systems, using conventional E and I laminated cores.

For example, Peter Chadwick, G3RPZ, after being finally convinced that the Proc IEEE piece was not an April Fool joke warns that any core near saturation would result in horrific intermodulation when used with high-power rf signals for, say, a pa tank circuit or an atu. He also points out there is a problem with mechanical variometers. The inductance is L1+L2±2M where M is the mutual inductance. With "opposing" values of M the Q inevitably goes down, since the rf ohmic resistance is constant and thus at higher frequencies is appreciably greater than would be in the case for a conventional inductance. He adds: "This is why most marine (500kHz) transmitters only used the variometer for relatively small increments of inductance, providing tapped inductors for the wider changes in inductance". Despite this problem there is still a lot to be said for hf variometers such as those made by Lorenz etc.

Relay driver

C E Rowley, G6KVU sends along a circuit for a relay driver that he originally designed for controlling a set of bandpass-filter switching relays in a portable transmitter-receiver but which could clearly have many other applications. He writes: "A disadvantage of using low-voltage relays is that they usually have a low coil resistance and hence draw a correspondingly high operating current. For applications where a number of relays may be required to operate from a standby battery supply, it is clearly desirable to use a relay driver circuit that will maintain the holding current of a relay at as low a value as possible, without impairing its ability to energise it reliably. The arrangment of Fig 13 was designed for this purpose and for a 50-ohm 5V relay, results in a current reduction from 100mA at rated voltage, to a reliable holding current of 25mA.

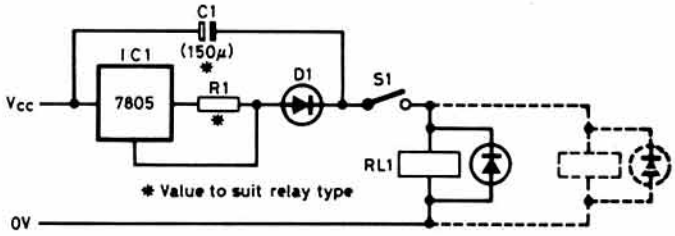


Fig 13. G6KVU's relay driver circuit can cut battery consumption during the hold-in of low-voltage relays by about a factor of four

"With S1 open, the output from D1 will be close to Vcc and C1 discharged. When S1 is closed, C1 charges through the relay coil, the resulting current pulse through RL1 energising the relay. As the capacitor charging current decays, the relay is held energised by the constant current supplied by the IC1 7805 voltage regulator ic. The value of R1 is determined by the expression 5/1R where 1R is 1·2 times the minimum holding current of the relay. Note that R1 and D1 carry the full output current and should be rated accordingly. The use of an led for D1 provides an indication that the relay is energised. Capacitor C1 should be a good quality electrolytic, suitably rated for the supply voltage. When S1 is opened, the relay de-energises and C1 rapidly discharges.

"The arrangement requires the input voltage to be as least 2V greater than the rated voltage of the relay coil. By increasing this value to twice the rated voltage of the relays, the corresponding overdrive transient, generated when S1 closes, significantly improves the pull-in time. It also permits relays of different coil voltages to be energised from a common supply (Vcc). Since it is essentially a constant-current arrangement, and an added advantage is that the relay supply is protected against a short circuit.

15W 12/240V inverter

In the past couple of years, *Electronics Australia* has published several designs for solidstate inverters transforming 12V dc into 240V ac in order to permit the operation of domestic appliances etc from 12V car batteries. One of these, for 300W output published in *EA* in September 1985, was briefly mentioned in *TT*, February 1986, page 110.

In the April 1987 issue of *Electronics Australia*, John Clarke describes a "12/240V inverter for portable compact disc players" intended for powering compact-disc players in a car but which could equally well be used for other mains-type equipments that consume 15W or less: Fig 14. The output waveform is basically a stepped square wave (duobinary) suitable for most appliances designed for mains sine-wave operation. Although only a low-power unit, the claimed line regulation is impressive: for an input voltage range of 11V dc to 15V dc, the output voltage changes only from 240V ac to 249V ac. Load regulation at 12V input is also good, changing from 242V ac at no load to 241V ac at 15W load. Efficiency at full load (15W) is 82 per cent with the current drain approximately 1·5A dc. Standby current at no load is 120mA.

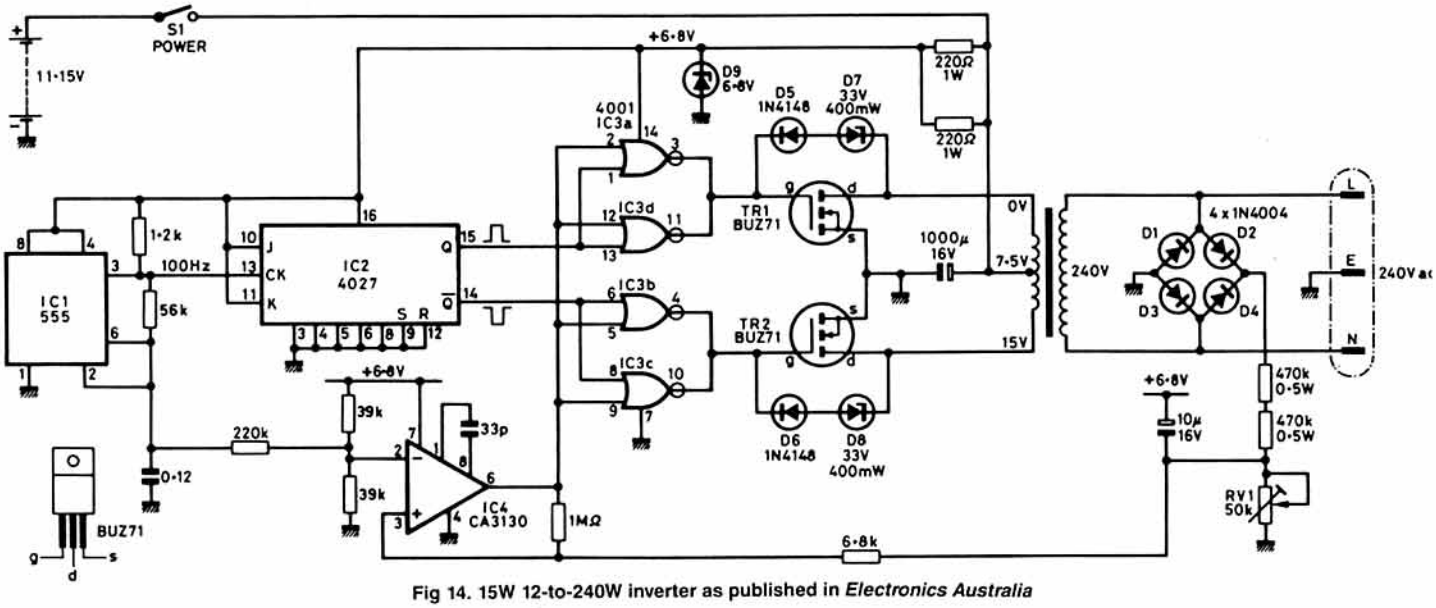


Fig 14. 15W 12-to-240W inverter as published in *Electronics Australia*

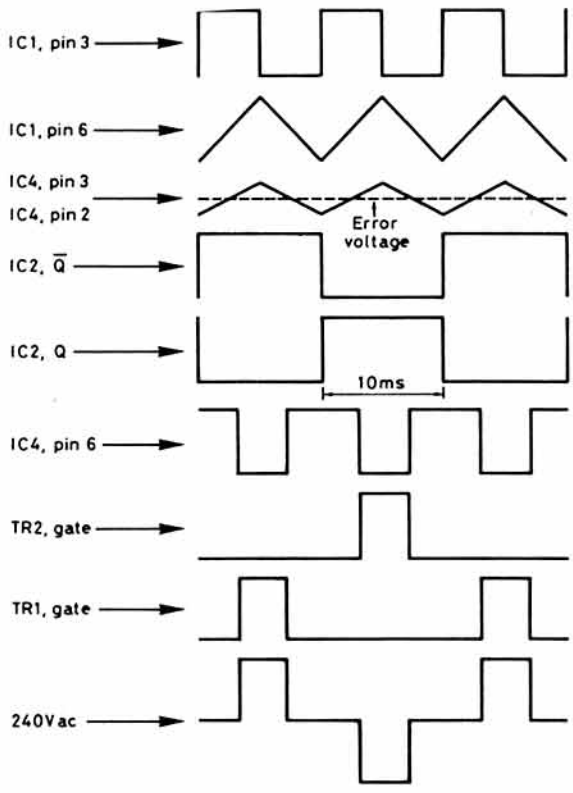


Fig 15. Waveforms at various points in the 15W inverter

The two fet switching devices (BUZ71) are heatsinked and are sipmos devices (Siemens power metal oxide semi-conductors). Several safeguards have been incorporated in order not to impair the audio quality and "to provide protection from the voltage transients common in a car electrical system" (a fact not always appreciated by mobile operators used to battery operation for handhelds etc). The negative return of the dc supply is isolated from the signal output ground to eliminate the possiblity of a current loop that can give rise to noise and distortion. The unit is based on a standard 15V centre-tapped mains transformer. Four integrated circuit devices drive push-pull switching transformers at 50Hz. The 555 in a stable mode produces a 100Hz square wave with 1:1 duty cycle. The output of IC1 goes to a 4027 J-K flipflop which in effect divides the clock input by two, with IC3 providing buffers. Waveforms at the device pins are shown in Fig 15. Output voltage is adjusted by RV1 to read 240V ac with a 12V dc input.

The EA article provides full constructional details including pcb layout etc but most of the essential detail is given in Figs 14 and 15.

A hybrid ultimate receiver

Ray Howgego, G4DTC, has been keeping the flag of experimental development flying in Caterham in a quest to develop the ultimate amateur hf communication receiver. In the course of this he has cunningly combined both traditional and novel ideas, some of which (including a novel crystal ladder filter) will have to be held over for another month.

He sets the scene as follows: "I have three factory-produced receivers, each representing different design philosophies: an FRG7, an FT200 transceiver and an Eddystone 940 general coverage receiver of the mid-1960s. **(a) The FRG7:** Yaesu seem to have been so enraptured with their implementation of a solidstate Wadley triple-mix system that other aspects of receiver performance were ignored. Seven transistors, all prone to cross-modulation, precede the filter. The attenuator reduces this problem but does not reduce the noise level. There are some unexpected spurii. In my experience this receiver is improved beyond belief by fitting an i.f gain control (eg by manually controlling the agc line)

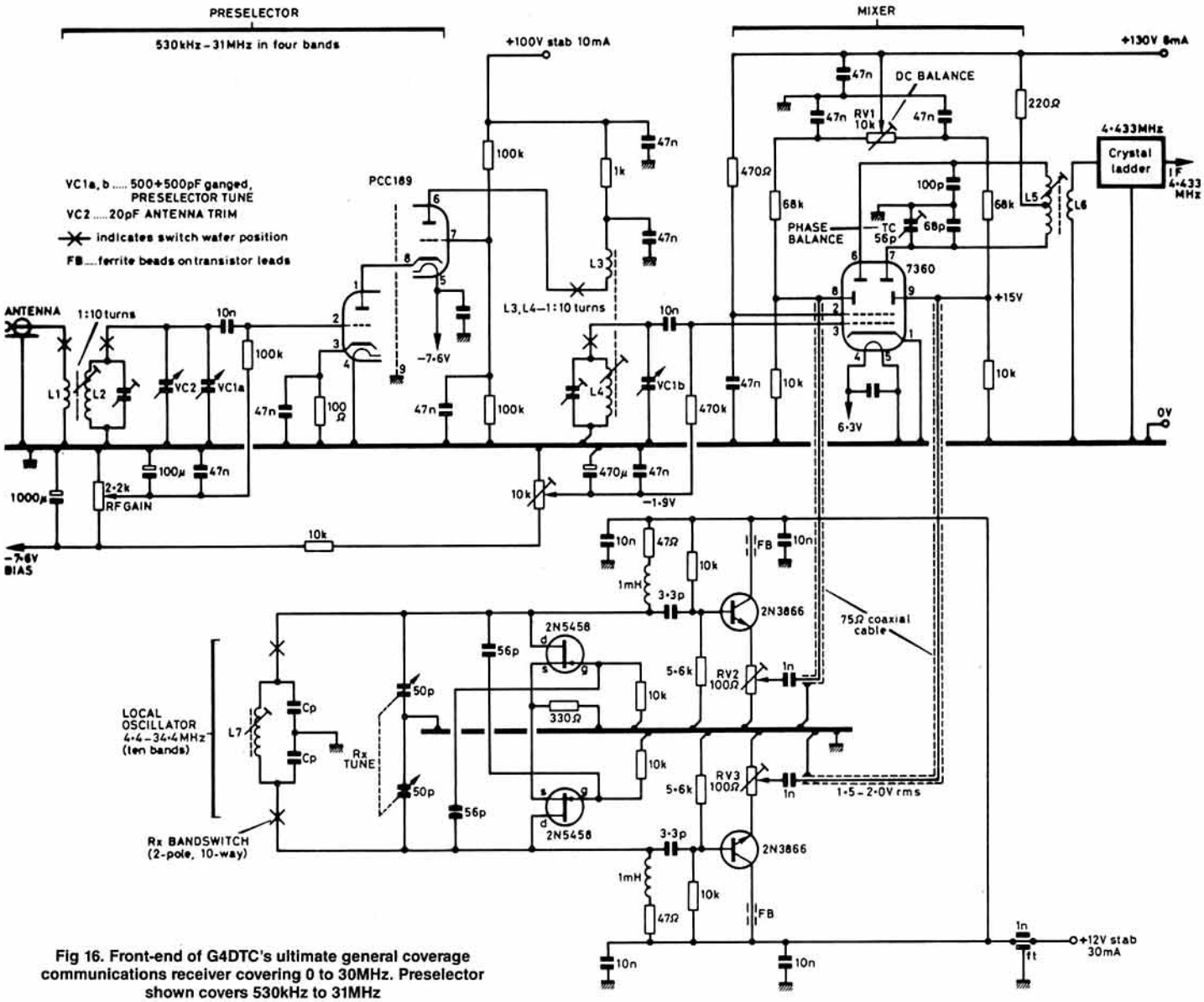


Fig 16. Front-end of G4DTC's ultimate general coverage communications receiver covering 0 to 30MHz. Preselector shown covers 530kHz to 31MHz

revealing the extreme importance of using just the right amount of gain in the i.f stages. **(b) The FT200:** The receiver section far outperforms the FRG7 but lacks sensitivity at the higher frequencies. Has just the correct gain in the i.f stages. In operation, the af gain should be held high, and volume controlled by the rf gain. **(c) Eddystone 940:** This general coverage valved receiver far outperforms the FT200 even on the amateur bands. The 940 seems to have been sadly overlooked as one of the great receivers. Whoever designed it knew what he was doing. Signals inaudible on the FRG7 stand out against a quiet background. Unfortunately it has three disadvantages: single-conversion to 450kHz (claimed image rejection at 20MHz only 40dB); the use of an easily overloaded 6BE6 for ssb detection; and combined rf/if gain control. This control unfortunately reduces the signal more rapidly than the receiver noise. The problem can be eliminated by removing the gain control line from the ECC189 cascode first rf amplifier. (This receiver has two rf amplifying stages with the front end comprising an ECC189 cascode, 6BA6 second rf amplifier, 6AJ8 mixer, 6C4 local oscillator and two 6BA6 i.f stages with a single vacuum-mounted crystal providing a 6dB bandwidth of 400Hz, and a four-gang tuning capacitor with the large Eddystone 140:1 slow motion drive and tuning scale. The five bands covered from 480kHz to 30MHz with a vernier scale – *G3VA*).

"The point I am making is that although all three receivers have similar sensitivity specifications, and all should produce a noise level below that of cosmic noise, their actual performance is noticeably different. Having heard several other recent receivers it is evident that those using the final generation of valve designs produce a much cleaner sound that those using transistors, provided the gain distribution is correct."

In publishing G4DTC's comparisons, I feel it should be underlined that the Yaesu FRG7 and FT200 models were relatively low-cost equipment built expressly for the swl and amateur-radio markets whereas the Eddystone 940 was a general-purpose professional receiver built by Eddystone in the era when the company was moving away from the amateur market (for which it was then making the amateur-bands EA12 receiver). Some of the later Eddystone receivers were made for, and marketed by, The Marconi Company which in the late 1960s took over the company completely and pulled out of the amateur market, though Eddystone have continued to produce some fine professional communications receivers. Modern solidstate professional models can cost up to over £20,000 which is not exactly a price tag likely to appeal to many newcomers. To my way of thinking, it has been a retrograde step for amateur factory designers to follow the professionals' footsteps in going for up-conversion to vhf and frequency synthesis with all the attendant problems of excessive phase-noise (jitter), reciprocal mixing and consequent reduction of near-in dynamic range. I wonder how many solidstate receivers built for the amateur market have a performance better in all respects than, say, the Collins 75A4?

But to return to G4DTC's letter: "It was decided therefore to build my ultimate receiver based on a design philosophy that embraced both valve and solidstate devices. The front-end has emerged as in Fig 16, taking into account the following considerations: The 7360 beam-deflection mixer was considered essential, nothing within an amateur budget really outperforms it. Although now quite costly (about £15) it probably still represents best performance per pound. Power supply requirements are modest. The receiver was required to tune dc to 30MHz with an i.f of 4·433MHz to permit the use of a crystal ladder filter based on low-cost PAL colour tv crystals. The use of the 7360 allows one to tune right across the i.f without a trace of a whistle. The i.f rejection is of

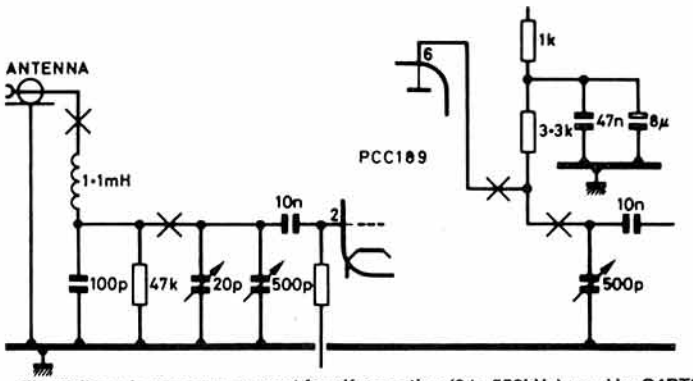


Fig 17. Preselector arrangement for vlf reception (0 to 550kHz) used by G4DTC

the order of 50-60dB while the 7360 provides about 25dB of conversion gain.

"The equivalent noise resistance of the 7360, at 1,500 ohms, is usually claimed as making it suitable for use as the first stage of an hf receiver. However this implies the use of a good antenna and for amateur applications it is useful above about 14MHz to have a stage of rf amplification. A PCC189 (more readily available than the ECC189) in a cascode circuit, with its enr only about 200 ohms, represents the ultimate in signal-to-noise performance. The gain of this stage is controlled by varying the grid bias, I find this better than the usual variable resistor in the cathode circuit since it reduces valve noise and signal in the same proportion, which cathode biasing does not. To reduce the valve to cut-off, it is run at only 100V anode potential instead of the usual 180V; this barely affects the gain. In operation, the gain of this stage is held at or below unity over most of the spectrum but can be increased to 30dB if required. The antenna trim control is essential to compensate for different antennas and ensures adjustable tracking.

Both valves have dc heater supplies through small dropper resistors from a rectified and smoothed 6.3V winding. The 7360 requires −1·9V bias supply for both valves to be absolutely free of ripple; hence the use of high-value electrolytics. For tuning below 500kHz the alternative circuit (Fig 17) is switched in with R-C coupling between the two stages. The input arrangement of the PCC189 combines a tunable circuit over 500 to 300kHz with a low-pass filter below 300kHz. This arrangement permits signals at frequencies down to a few kHz to be received at good strength.

"The deflecting electrodes of the 7360 are supplied from a balanced solidstate Kaliatron oscillator tuning 4·4 to 34MHz in ten switched bands, each 3MHz wide. In my view, synthesised oscillators, with all their problems, should be avoided like the plague. On hf who needs them? The oscillator in Fig 16, after drifitng about 4kHz in the first ten minutes then settles down to within 20Hz for an indefinite period (measured at 30MHz); after two hours I became bored with watching for a change in the final digit on the counter. The Kaliatron oscillator has proved exceptionally reliable and provides a very high output, independent of L-C ratio; output is almost as high as its supply voltage. A high degree of buffering can then be employed. It is however intolerant of any inbalance in layout or component tolerances.

"The deflecting anodes of the 7360 show a fairly high capacitance (about 10pF) and it proved necessary to supply them from a low impedance souce. This also allowed the local oscillator to be situated remotely from the mixer. Hence the 2N3866s which get quite warm. The base circuitry of these devices forms a filter with a steady roll off towards low frequencies and ensures an rms input to the 7360 of 1·5 to 2V at all frequencies. RV1 and TC are set for optimum i.f rejection. RV2 and RV3 allow equalisation of the antiphase oscillator outputs but are probably unnecessary since these outputs are within 2% of balance. Component values for the 7360 mixer were taken from previously published materials and were found to have been carefully optimised." □

Comparing simple vertical and horizontal antenna systems

D A BUNDEY, CEng, FIEE, G3JQQ

A groundplane and 66ft centre-fed multiband dipole with right-angled legs are compared by switching inputs to an FT7B transceiver. Assessed levels are recorded using the receiver S-meter, nominally calibrate at 3dB per division. One hundred and sixty nine amateur signals are compared on a random-reception basis, originating from a variety of directions and ranges, designated for convenience either easterly or westerly. Results, taken from 22 test occasions at differing times of day over a two-month, period, are presented in tabular form and some comment and conclusions offered.

Introduction

If there is one subject of amateur radio activity where theory and practice often part company it is that of antenna systems. This is especially true for hf where domestic restrictions often preclude the establishment of sensible antennas or locations, leading to the practical world of compromise and variety in results.

One question that often arises is whether to erect a vertical or horizontal system, particularly for dx working. This article looks at this question for two simple antenna systems, erected side by side but with sufficient spacing to minimise any mutual coupling (approximately 100ft apart) and attempts to explore the issue by practical assessment.

The antennas – groundplane vertical and horizontal dipole [1] [2]

The groundplane is a conventional 1 in diameter vertical (quarter-wave) with four groundplane elements with the base 8ft above the ground and fed with approximately 90ft of 52Ω coaxial cable. VSWR is less than 1·5 over the band. Aluminium tubing and copper gp are used. The dipole is 66ft centre-fed with approximately 250ft of tuned open-wire line and arranged with right-angled legs to give an omni-directional response; two half-waves on 14MHz, "Wells" configuration, Fig 1. Height above the site is 22ft on sloping ground. Tuning is by means of old-fashioned but excellent Z-match. Copper is used throughout.

The site (Fig 2)

The site is approximately one-third acre, 400ft above the city of Bath, open from west through north to east but screened by a hill to the south. Ground slope in the open directions is some 10°, giving an antenna height gain of about 1·5 compared with a horizontal location.

The assessment technique

On all occasions when signal levels are recorded, conditions of noise over-ride prevail (ie, either antenna switched to the receiver produces a discernable increase in background noise level). This ensures that the system is externally noise limited and is not debilitated by poor receiver performance, or unacceptable losses in the feeder connections.

Additionally, antennas are switched and compared against each other for noise without signals present. These comparisons are presented separately in Table 2.

Signals are assessed for each antenna without making any allowance for differing background noise. However, in nearly all cases signal levels are well above noise, making the latter an unimportant influence in determining actual levels.

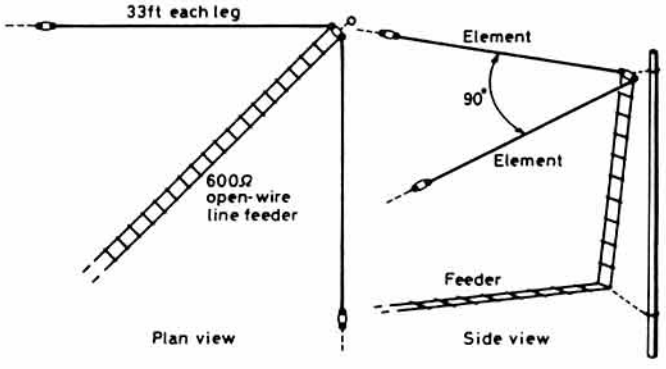


Fig 1. "Wells" antenna. Two half-waves at right angles (omni pattern)

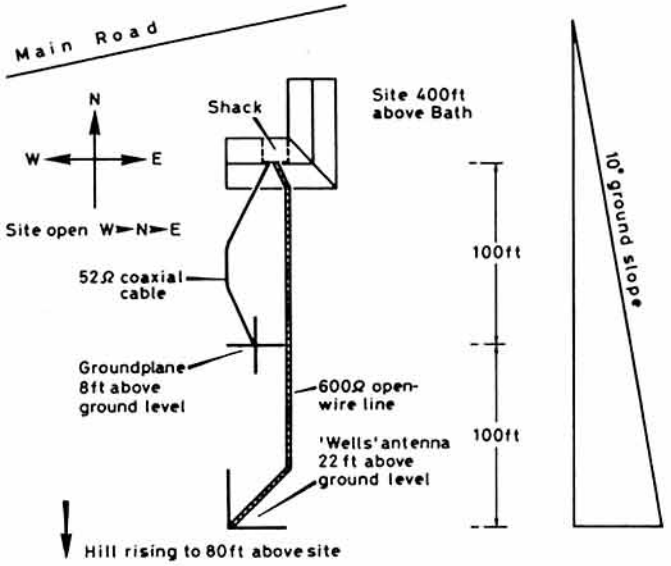


Fig 2. Site layout

Results

Table 1 shows the results, where each cross represents one assessed signal. A total of 169 signals are recorded. In attempting to tabulate the results to provide a meaningful picture, a number of points have been taken into account:

(a) Each result in an assessed average, often for a widely-varying signal, whose peaks occur at different times on each antenna. This is, of course, typical of the hf ionospheric path, [3].

(b) The effect of adjacent-channel QRM has to be considered in assigning a value of wanted-signal level on some occasions.

(c) Owing to overall signal variability there is little point in trying to discern differences much smaller than those tabulated for signal strengths or ranges.

(d) The small proportion of signals nearer the northerly or southerly regions are lumped into the easterly or westerly divisions; eg, Italy, Scandanavia etc.

Table 2 shows the comparison of background noise from the antennas on each of the 22 occasions when signals are assessed.

Table 1. Assessment results. Each cross represents one assessed signal. A total of 169 signals is recorded

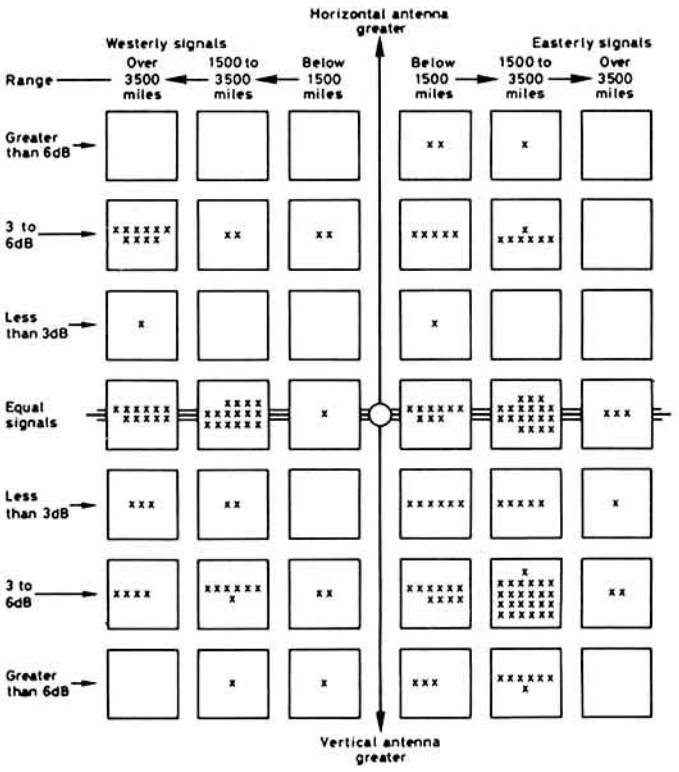


Table 2. Noise comparisons by numbers of occasions

Daily occasion	Atmospheric noise equal	Greater on dipole	Greater on vertical
Morning	3	2	2
Afternoon	1	0	2
Evening	4	1	7

Comment

Examination of Table 1 enables a number of observations to be made:

(a) Nearly half the signals are, for all practical purposes at hf, the same on either antenna; ie, less than 3dB difference.

(b) Less than 10 per cent of all signals are significantly better on any one antenna; ie, greater than 6dB difference. Most of these are easterly on the vertical.

(c) Signals from the east appear to favour vertically-polarised reception, possibly due to complex interaction with the earth's field for the E-W path, [3]. Of 106 easterly signals, 59 are greater on the vertical, 31 the same on both and only 16 greater on the dipole.

Table 2 shows that on most occasions background noise is greater from the vertical system, particularly in the afternoons and evenings. However, records show that the noise difference exceeds 3dB on the vertical for only three occasions out of 22. The effect of local man-made noise is not reflected in the table. This can be a predominant influence against a vertical on a poor site.

Conclusions

Within the limits of this exercise, bearing in mind the relatively small sample size, limited reception times of day and duration, sunspot cycle position etc, my conclusion is that for these simple antennas, little significant difference exists between horizontal or vertical polarisation for this band, unless the predominant interest is easterly. For the latter, a vertically-polarised sytem would appear to be preferable.

Concerning noise, it is concluded that the greater susceptibility of the vertical system would not negate its advantage for easterly work, because the difference in background noise between the two antennas, in general, is small; 3dB or less.

Other aspects

Notwithstanding the above, a number of other considerations have importance for the amateur where real estate precludes the erection of more than one antenna system.

EMC (TVI/BCI/AUDIO/VIDEO etc). There is much to be said for operating a balanced antenna system in order to minimise unbalance currents in local wiring and thence into neighbour's equipment, accepting that this is not the only mechanism of undesirable coupling. Centre feeding a horizontal system goes a long way towards minimising such problems.

Feeders. For vertical systems the cheaper variety of coaxial cable can introduce significant losses if long runs are contemplated, particularly after several years of weathering. Rabbits and vermin will attack cable laid along the ground. For horizontal antennas, tuned open-wire lines for any normal domestic run are virtually loss-less when properly constructed and very long lasting. A pvc cover is preferable if human contact is likely. Siting on poles and away from structures by at least half-a-metre is desirable. Domestic acceptability may be strained when such lines are run directly into the house to meet the Z-match, although spacing can be reduced to an inch or so at this point as a palliative.

System flexibility. The 66ft system is multiband as it stands and well suited to the lower frequencies where high-angle radiation is desirable for local UK/European operation. Operation of the vertical on lower frequencies is, of course, possible by the use of traps or tuning the feeder. For the latter, losses will be greater and wave launch angle possibly less than desired unless dx is the main interest on these lower bands.

Cost. Accepting that the availability of local trees is an advantage, I have always found wire antenna systems cheaper than the alternatives.

The site. There is little doubt that an elevated location, of itself, is the greatest contributor to good reception, with the possible exception of an open-sea path. In these tests, both antennas enjoyed the advantage of height. Assessments at different locations by other amateurs would be useful for comparison of findings.

References

[1] *ARRL Antenna Book*

[2] *Transmission and Propagation* – Services Textbook of Radio series. Glazier and Lamont.

[3] *Ionospheric Radio Propagation* – NBS Monograph US Dept of Commerce. □

NEWS BULLETIN

50 70 MHz

BOTSWANA WORKED ON 50 MHz

. . . . GM4DGT - A22KZ, 8860Km

You remember that in last month's Bulletin we said that Mike, G3JVL, had heard A22KZ on 50 MHz? Well, just after we went to press (it's always the way in this game, must have a word with the Openings Secretary) it all happened in a big way.

On Saturday 17 October at 1040 GMT G6XHQ heard ZS3E in Namibia on 50.11 MHz at about 4 and 1; John said he got the impression that the Namibian station was working someone in the Mediterranean area. ZS3E's signals peaked 5 and 4 with rapid fading and were only heard for about a minute and a half.

THE BIG DAY

Thursday 22 October was the Big Day - and as Dave Butler, G4ASR, said in the VHF Newsletter, it was a day "....that six UK operators will not forget easily". G8VR's column will no doubt carry the full story in due course, but briefly the pattern of events went something like this. At 1535 G2ADR in IO93 heard A22KZ calling CQ on CW. Eric didn't have time to get his 50 MHz system running by the time A22KX had finished calling but luckily the latter then appeared on 28.885 MHz - which Eric was also monitoring. Following a successful 28 MHz contact and 28/50 MHz crossband contacts both ways, they then made two-way contact on 50 MHz at 1547. G2ADR sent a 539 report and received one of 519 from Botswana; Eric was running just 9W to a dipole!

Next to contact Botswana was G4HBA, also in IO93, at 1638. Roger was running 15W to a three-element and gave A22KZ a report of 539; he received 529. Signals were T9 with fading.

THEN THE BIG ONE

At 1650 the path extended into Scotland and Bill, GM4DGT, in IO86 worked A22KZ over what turned out to be a path of no less than 8,860 km. Bill sent a 539 report and received 519 in return; there were deep nulls and flutter fading. If the Bulletin could award a grand prize for "QSO of the Year" it'd have to be for this one - what a superb achievement and congratulations to both stations. Who'd have put money on GM-A22 on 50 MHz a year ago?

After that, G1AWP in Northumberland, G4GAI in Rochdale and finally G3CCH in IO93 also made contacts with A22KZ, all at around 1700 GMT. Interestingly enough, both G4GAI and G3CCH heard A22KZ using SSB a little later on with signals up to S5. GM4DGT heard A22KZ again at 1716 on SSB but said that he was virtually unreadable, and again at 1722 with severe flutter.

So - how about that then? We're wondering just what happens after we've gone to press this time.....seriously though, some tremendous contacts. No doubt there'll be some very special QSL cards on a few walls in the UK before too long! Propagation-wise we're still going in for TEP with some sort of E-layer happening at this end of the circuit, but no doubt the Great Brains will let us know in due course. Incidentally, mni tnx to David Butler, G4ASR, editor of the superb, magnificent and totally indispensable VHF Newsletter (free plug, published by RSGB, info on how to get yours each month from Tim at Headquarters or see last month's Bulletin) for his assistance with getting the facts of this story straight a couple of days before press time.

WHEN IN ROME - 2

Still on the subject of 50 MHz, however, there's a point we really must make about operating on that band in other countries. There have been a few instances this year when G stations (they know who they are) have operated on 50 MHz from

(cont over)

VENUE FOR THE 1988 ANNUAL MEETING OF THE SOCIETY

For many years the Annual Meeting of the Society has traditionally been held in London. However, in principle the meeting could be held anywhere in the UK, provided that Council is reasonably certain that a quorum, (ie over 50 members) would be present. Council believes that affiliated Clubs & Societies and Registered Groups might like to like to sponsor the Annual Meeting at a venue outside London. The room used for the annual meeting must be of sufficient size to cater for the likely attendance at the meeting and must also have full audio/public address facilities. In addition, facilities for checking members into the meeting and arrangements for the traditional tea/coffee break must be provided.

The 1988 Annual Meeting is scheduled for 10 December 1988. If any affiliated Club, Society or Registered Group wishes to offer or propose a suitable venue, they should write to "The Secretary" at RSGB HQ no later than the end of February 1988, giving full details of the proposed venue and facilities available. Council will discuss the offers made and if a suitable venue is available, a representative from Council will inspect the proposed location to make sure that it meets the requirements. If a suitable location outside London is offered, the 1988 meeting could well be held away from central London for the first time.

(cont from previous page)

European countries, either without obtaining permission to do so or knowing full well that such operation was illegal. We don't like having to wash our dirty linen in public and it's nothing short of tragic that the odd UK amateur could be so stupid, but let's spell it out and have done with it. Illegal operation on 50 MHz in countries where it isn't authorised is a damn good way to ensure one of two things. One is that all of us lose the band in short order, because the country concerns complains to the DTI about interference to its broadcasting service or - conceivably - to military or defence traffic and consequently the DTI has no option but to withdraw 50 MHz from the UK amateur service. The other is that in a few years' time the country concerned vetoes a 50 MHz allocation to amateurs, either in its territory or (at a World Administrative Radio Conference) within Region 1. Either way, amateur radio loses another powerful ally. Certainly the authorities in one particular European country are currently extremely upset at one case earlier this year; we've got it on the best authority that they're considering withdrawing the reciprocal licensing facility to foreign nationals altogether.

We're pretty keen on VHF and UHF DX-chasing here at Headquarters and we'd dearly love to work another dozen European countries on 50 MHz. We hope very much that the time will come when we can, and we'll go on doing everything in our power to make that time come quickly. Until then, PLEASE don't cause major problems for everyone by succumbing to the temptation to take along some 50 MHz gear next time you go somewhere exotic unless you've got it well and truly IN WRITING that you can operate on 50 MHz from that country.

PRESIDENTIAL INSTALLATION

The installation of the Society's 54th President, Sir Richard Davies, KCVO, CBE, C.Eng, FIEE, G2XM, will take place at the Town Hall/Corn Exchange, King Street, Ipswich, at 7.30pm on 30 January 1988.

Tickets, which cost £8 each, are available from Heather Norman at RSGB HQ. Please note that the number of tickets is limited and will be issued on a "first come, first served" basis.

MORSE TESTS

The following list shows the dates and locations of all the available test centres from the beginning of January to the end of March 1988, as we went to press. Because of space limitations, we cannot print a complete list of all the test centres notified to us, but these can be found on the application form itself. If you want to take a test and any of the centres shown is within striking distance, send for an application form immediately. Completed applications will be dealt with strictly on a first-come first-served basis.

Morse tests will be carried out in groups of three and will be of half an hour's duration. Details of the test, the venue and how to get there will be sent to you as soon as your application has been processed and your place confirmed.

COUNTY	TOWN OR LOCATION	DATE
Dyfed	Carmarthen	07/01/88
Tayside	Kirriemuir	09/01/88
Hereford & Worcester	Malvern	09/01/88
North Yorkshire	York	09/01/88
Isle of Wight	Binstead ARS, Ryde	09/01/88
Central	Stirling	12/01/88
Greater London	Wanstead, London E11	15/01/88
Lothian	Edinburgh & DARC	16/01/88
Essex	Colchester	16/01/88
West Midlands	Sandwell	16/01/88
Norfolk	Norwich	16/01/88
Berkshire	Reading	20/01/88
Bedfordshire	Luton	21/01/88
South Yorkshire	Sheffield	21/01/88
Powys	Montgomery	22/01/88
Dorset	Dorchester	23/01/88
Surrey	Guildford	23/01/88
Lancashire	Oldham Rally	24/01/88
Buckinghamshire	Bletchley, Milton Keynes	24/01/88
Greater London	Croydon	25/01/88
Hertfordshire	North Watford	29/01/88
Kent	Tunbridge Wells	30/01/88
Lancashire	NARSA Rally, Blackpool	31/01/88
Derbyshire	Derby & DARS	01/02/88
Guernsey	Guernsey ARS, St.Martins	04/02/88
Cambridgeshire	Haslingfield, Cambridge	05/02/88
Greater London	Eltham, London SE9	05/02/88
Staffordshire	Stafford	07/02/88
Fife	Leslie	09/02/88
Nottinghamshire	Mapperley, Nottingham	13/02/88
Northamptonshire	Tiffield, Northampton	18/02/88
Humberside	Goole	21/02/88
Greater London	Croydon	29/02/88
Dyfed	Haverfordwest	03/03/88
Tayside	Kirriemuir	05/03/88
North Yorkshire	Scarborough	05/03/88
Co.Tyrone	Dungannon	07/03/88
Lancashire	Fleetwood	12/03/88
Berkshire	Reading	16/03/88
Bedfordshire	Luton	17/03/88
South Yorkshire	Sheffield	17/03/88
Dorset	Dorchester	19/03/88
Norfolk	Norwich	19/03/88
Greater London	Croydon	28/03/88

We receive notification of new centres almost daily and the application form gives a full list of those currently taking advance bookings for Morse tests. There are now active test centres in 90% of counties in the UK. Those remaining are either in the process of having examiners appointed or have not yet found a suitable venue.

Helplines

FT102 USER GROUP:

In September's "Helplines" column, we ran an item on an FT102 User Group. As a result, Sean, GI4PCQ received over 100 enquiries from readers. Sean tells us that he has established an 80m net for FT102 users held on Tuesdays at 9pm on 3720 kHz. In addition to this, an 8-page newsletter has been sent to all those who made initial enquiries. Some copies are still available and if you'd like one, please contact Sean, GI4PCQ who's address is correct in the current Callbook.

DOUG BURGESS - WHERE ARE YOU?

After having read the item in October's "Helplines" column about the two amateurs who were reunited after 40 years, Harold McAllister, G3OEJ has written to us with a similar request for help in tracing a long-lost friend.

Harold is now 65 years young and has been trying to find Alexander James "Doug" Burgess for the past 40 years; he is making a last attempt through this column to trace him. When they were last in contact, Doug was a 'Clan Line' radio operator and amateur licensee - though Harold can't remember the callsign. Doug used to live in Urmston, Manchester but may now be living in South Africa. If you have any information on the whereabouts of Doug Burgess, or know anyone who may have served with him on the 'Clan Line', please contact:-

Harold McAllister, G3OEJ
111 George Lane
Bredbury
Stockport
Cheshire. SK6 1DH

...and "make his day".

RSGB PLANNING ADVISORY COMMITTEE:

Q) Are you a town planner, architect, surveyor, lawyer or otherwise involved in submitting or processing planning applications?

Q) Are you an RSGB member?

Q) Do you wish to help fellow members?

If you answer yes to all three questions - READ ON.

The Society's panel of planning advisors is always looking to swell its ranks with professional volunteer helpers, especially those from Scotland with knowledge of Scottish Law. If you feel that you could give some of your time and experience to helping fellow RSGB members with their planning problems, please write to the chairman of the Planning Advisory Committee:-

Mr Harold Fenton, G8GG
5 Cromer Road
St.Annes
Lytham St.Annes
FY8 3HD

WHERE AM I?

Council has recently formed a new working group - the ARDF Working Group - whose function is to advise on all aspects of amateur radio direction-finding in the UK. The specific task of the group will be to develop ARDF in the UK along IARU lines, with a view to eventual UK participation in the World Championships.

Anyone interested in taking part in this new venture should contact Mr Pearce-Bailey, G3JLE (QTHR), who is the group's chairman.

UNDER-WATER AMATEURS:

David Reid, GJ0BZF, would like to get in touch with other amateurs who are involved with the sport of sub-aqua diving with a view to setting up a net to chat about diving and exchange news and information. He's not certain whether such a net already exists, but if anyone is interested they should write to him:-

c/o Morin
"Moorside"
Maupertuis Lane
La Mare Slip
St.Clement
Jersey C.I.

STOLEN EQUIPMENT:

The following amateur radio transceivers were stolen from GI4FUM's car in the Greystone Library car park, Antrim on Sunday 25 October:-

KDK FM2033 - No. 002012
Yaesu FT790 - No. 4E100346

...any information on the above should be directed to RUC Reserve Constable Corry of the Antrim RUC on 08494-63555.

RSGB LIAISON OFFICERS

Further to the call for nominations in the September issue, 24 appointments have been made and elections are pending in 9 areas.

A list of areas for which no nominations have been received appears below.

It should be noted that clubs in some of the areas listed have advised us that they feel the area is too large for one person to carry out the job of RLO (see September RadCom for job specification). Council has agreed to the Membership & Representation Committee re-defining some of these areas to make them more manageable geographically. Unfortunately, the meeting of the M & R Committee at which the new areas were to be defined had to be postponed, due to travelling difficulties caused by recent storms in the south.

It is not appropriate therefore to call for nominations until the new areas have been agreed by the M & R Committee at their meeting scheduled for late November.

The list will be published in RadCom as soon as possible, together with a further call for nominations.

The names of RLOs appointed to date will be announced at the RSGB AGM in December and a list will appear in the January issue of RadCom.

ENGLAND

Cumbria
Derbyshire/Nottinghamshire
Dorset
Durham/Cleveland
East Sussex
Gloucester
Hertfordshire
Lancashire
Norfolk/Suffolk
North London
North Yorkshire (SW of Ouse)
Somerset
South Yorkshire
Tyne & Wear/Northumberland
West Sussex
Wiltshire

WALES

Gwent
Powys/Gwynedd/Clwyd

SCOTLAND

Dumfries/Galloway
Highlands/Western Isles
Lothian
Orkney
Strathclyde

NORTHERN IRELAND

Co Antrim/Londonderry/Tyrone

BAILIWICK OF JERSEY

Around the Groups

WAB NEWS:

A couple more "firsts" in the Worked All Britain Awards Scheme this month.

Perhaps the most encouraging of these goes to G4VOZ who receives the first 70 MHz Basic Award and the Counties Class II award. Both awards are for mixed mode on 70 MHz, which shows the difficulty of finding enough activity on the band. Will this encourage B licencees to equip themselves for 70 MHz operating? We hope so - it seems to be an ideal band for the keen WABer.

Also, Lionel Parker, G5LP/M receives the WABEMA Bronze Award for areas activated on 80 metres CW.

Now for some WAB Contest News -

Laurie, G6XLL, has recently been appointed Contest Manager and he is considering instituting a 50 MHz contest some time next year (1988). Also next year, there will be separate QRO and QRP contests on 144 MHz, as well as a separate 430 MHz contest on the same day as the 144 MHz QRP contest. The dates for these contests have not yet been fanalised but we'll publish them in this column as soon as we have them. In the meantime, if you have any correspondence relating to any of the WAB contests, they should now be addressed to:-

Laurie Segall, G6XLL
WAB Contest Manager
21 Blackstone Road
Cricklewood
London NW2 6DA

AMSAT NEWS/HAART - BALLOON ASCENT:

One evening over dinner during this year's National Convention at the NEC, three members of AMSAT-UK Committee mulled over an idea to put a transponder on board a balloon to carry out tests with a view to extending knowledge and expertise in the field of space-borne communications. In true amateur radio tradition, the original design was sketched on the back of a menu (NOT the proverbial fag packet but the nearest thing). A few months later the possibility of proceeding with this experiment went one step further when a ride was offered aboard a hot-air balloon during a high altitude record attempt. However, several criteria had to be satisfied before the experiment could go ahead. Because of weight problems, the unit was limited to 2kg maximum, special permission would have to be sought from the DTI and a special licence issued, and finally, the transponder would have to be controlled by an operator in case it had to be closed down for any reason.

The RSGB carefully examined the proposal, in order to ensure that it was consistent with normal bandplanning arrangements and that the tests would be beneficial to the stimulation of further technical expertise within the UK amateur radio community. Having done so, it contacted the DTI and made a formal proposal on behalf of the interested parties.

The weight of the transponder was no problem and the team has already built and tested one unit and has almost completed the Mk2 version. This new version will have a telemetry unit which would allow it to be controlled from the ground as the balloon 'flyer' is not a licensed amateur radio operator. All that remains is for the DTI to give permission and for the Society to arrange for the special callsign, GB5AUK, to be issued.

H.A.A.R.T. stands for High Altitude Amateur Radio Transponder. The plan is for the transponder to hitch a ride on board the balloon which will be piloted by a lady balloonist during her high altitude record attempt. She will be attempting to reach an altitude of 30,000 feet, some 8,000 feet higher than the current record. Two proving flights have already been made from a location near Nottingham and the main flight is expected to take place early in the new year, though weather conditions may be favourable before then.

More details as we get them, but keep an ear on the GB2RS news broadcasts each Sunday and the AMSAT-UK nets on Mondays and Wednesdays at 7pm and on Sundays at 10.15am on 3780 kHz, just in case the attempt is brought forward.

NEW 50 MHz BEACON AT MARL:

On 30 September, Maureen and Alan Wright, GW3LDH, presented a 50 MHz beacon to MARL-Amateur Radio League (Malta). The beacon is now operational from MARL's HQ in Valletta with the callsign 9H1SIX on a frequency of 50.085 MHz running 25 watts to a 5 element beam. The beam will be directed to different areas depending on the seasonal propagation variations and is currently pointing south. It has been heard regularly with reasonable signal strength in Botswana and southern Africa.

MARL welcomes reception reports and these should be sent to:-

9H1ES (50 MHz Beacon Report)
MARL-Amateur Radio League
PO Box 575
Valletta
Malta

DUAL-BAND OPERATORS!:

Janet Attfield, G1DAW, ex-RSGB staff member, was married to Malcolm Appleby, G3ZNU, Chairman of the RSGB's VHF Committee on Saturday 19 September at Otley, near Ipswich. Look out for possible harmonics in the Ipswich area.....

CRRL MOVES QTH:

On 1 November this year, the Canadian Radio Relay League moved its Headquarters to new and larger premises in Arva, about 4 miles north of London, Ontario on the Ontario Highway. Although the correspondence address for CRRL will remain the same:-

PO Box 7009,
Station E,
London,
Ontario N5Y 4J9
Canada

...the telephone numbers have changed to (519) 225-2188 or (519) 660-1200.

A truly international affair

TELECOM 87 Geneva, Switzerland

Whenever a golden opportunity presents itself to influence Governments and those that work in the telecommunications industry it should be seized upon. In essence that is why the International Amateur Radio Union put on an amateur radio stand at the world's largest ever exhibition of telecommunications equipment held in Geneva in October (20-27th inclusive) at TELECOM 87. Over 260,000 people attended TELECOM 87 during the eight days that it was open. Over 40 countries, including the UK, had their own national pavilion and over 800 companies exhibited at the show.

The IARU had been preparing for this major exhibition for over a year and had appointed Jaap den Herder, F6FYI/PA0YJ as overall co-ordinator. In fact, the task of co-ordination was a massive one involving 20 national societies and about 100 individuals who helped with or staffed the stand.

The RSGB's contribution was to put on a live demonstration of packet radio. This involved taking to Geneva not only a 144 MHz packet station for the stand itself, but also a second station set up as a packet radio mailbox. This mailbox was located at the headquarters station of the International Telecommunications Union using the call-sign 4U1ITU.

The Society wishes to thank both ICOM (UK) Limited for the loan of various transceivers which made the demonstration possible and Bob Smith, G8HBE, for providing his Acorn Electron mailbox software which operated flawlessly at 4U1ITU for nine days.

The live packet radio demonstration from the stand attracted much interest. There are obviously many Governments and major multi-national organisations interested in the amateur AX25 protocol. Again, work done by the amateur community finding its way into professional communication systems. In addition to the packet demonstration, the RSGB provided books and copies of Radcom, car stickers, handouts, help with video material and provided staff and administrative help for the IARU stand.

One spin-off from the packet radio demonstration was that many amateurs were exposed to the mode for the first time. Unquestionably the 4U1ITU packet mailbox aroused much interest amongst local amateurs. The interest was so high that the CERN ARC now plan to establish a mailbox to serve the Geneva area. A special thank you to EA2ADO of the ITU's IARC for his help with the 4U1ITU mailbox.

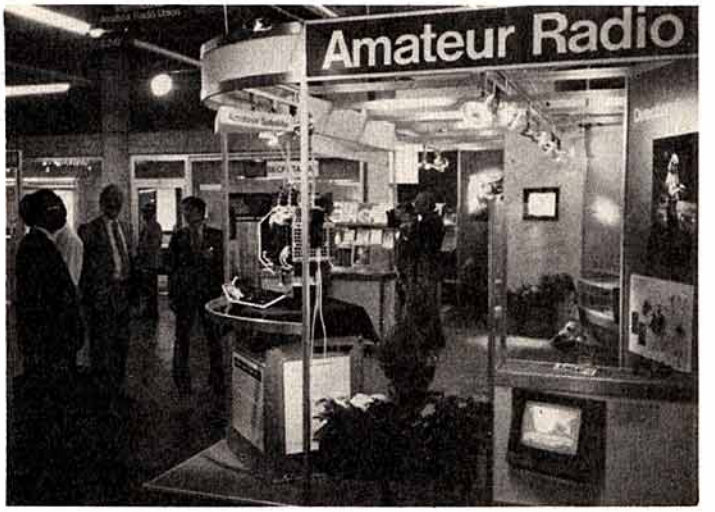
In fact, it was the CERN Amateur Radio Club team, led by Jaap den Herder, which masterminded the IARU's Telecom '87 stand. Many visitors, both amateurs and non-amateurs, expressed delight at the highly professional appearance of the stand - undoubtedly music to the ears of all the CERN ARC members who had put so much effort into the stand. A few comments from the visitors' book are reproduced over page.

National radio societies in the following countries contributed to the amateur radio stand at TELECOM 87 by supplying equipment, photographs or publications, etc:-

Canada, China, Colombia, Federal Republic of Germany, France, Great Britain, Italy, Japan, Kenya, Korea, Malaysia, Netherlands, New Zealand, Norway, Poland, Spain, Sweden, Switzerland, USA and Yugoslavia.

No report, however brief, would be complete without paying tribute to those who made the presence of amateur radio possible at the highly successful TELECOM 87 event. The CERN ARC team included: Gerard (F1ALB), Han (PA0NOS/HB9PZT), Argyris (HE9DKD), Jacques (F1QY), Yves (F6GIK), Antoine (F6FTA), Gilles (F6HYB), Edith Kaiser, Les (F5LK/G3CML), Frank (F6DBG), Oystein (LA9TJ), Regis (FC1GKF), Horst Rebmann, Paul Rebmann, Ted (F8RU), Bengt (HB9BCU/SM5ABC), Fritz (F6IMS/OE6FOG), Frode (LA2RL/HB9CHL), Kayoko Weierud and Claudia (HB9CUY). Other local assistance was provided by Renato (HE9RMH) and Jean-Pierre (HE9JPC). IARU and Society personnel present on the stand included: Naoki (N1CIX/JH1VRQ), John (G3FKM), Dick (W1RU), Phyllis Baldwin, Hans (DF5UG), David (G3OUF), Rosemary Evans, Mirko (YT7MM), Wojciech (SP5FM) and Rosella (I1RYS).

The IARU stand was busy throughout most of the 8 days that the exhibition was open.



The model of the Japanese satellite "Fuji" was a prominent feature of the IARU stand.

IARU - Influencing those who affect

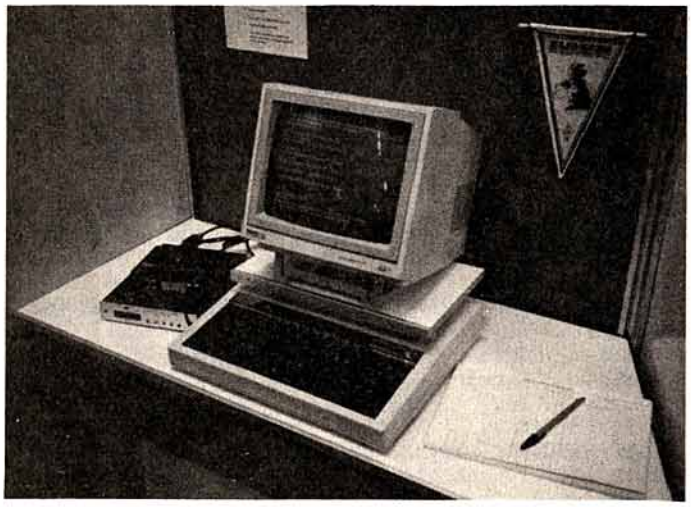
ITU HEADQUARTERS, GENEVA

"Welcome and thanks for your participation and collaboration at Telecom 87."

R. Butler - Secretary General, International Telecommunications Union.

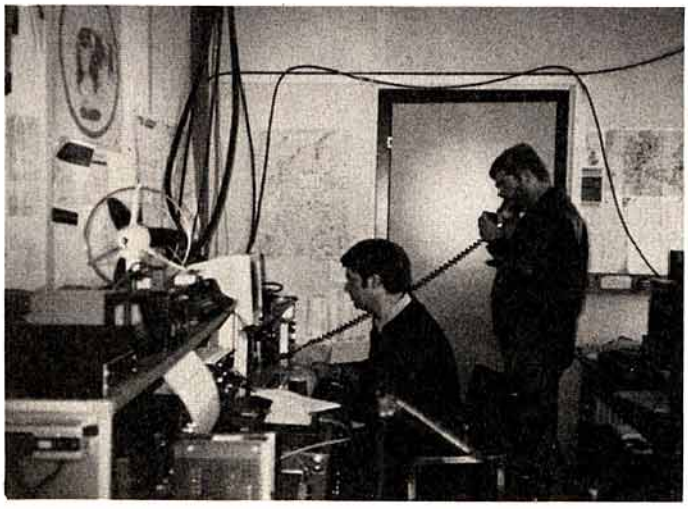
"Avec toute mon admiration pour tous les Radioams."

Jean Jipguep - Deputy Secretary General International Telecommunications Union.

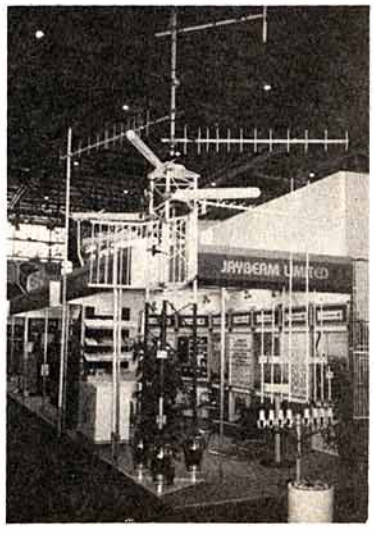


The packet radio station at Telecom '87 provided by the RSGB. The Society wishes to thank ICOM (UK) Ltd for the loan of equipment (IC28E and other equipment) which made the demonstration possible.

Distinguished visitor to the stand, Richard Butler, Secretary General of the International Telecommunications Union, being greeted by Dick Baldwin, W1RU (left), President of the International Amateur Radio Union. Also in the photograph are John Allaway, G3FKM, Region 1 Secretary and Fritz Szencso, F6IMS/OE6FOG (far right).



David Evans, G3OUF and Fritz Szencso, F6IMS/OE6FOG, setting up the packet radio mailbox at 4U1ITU.



Telecom '87 was the largest exhibition of telecommunications equipment ever held. The UK had a very large area dedicated to UK industry and it was pleasing to see Jaybeam Ltd as part of the UK stand.

the future of amateur radio

TELECOM 87 Geneva, Switzerland

"Best wishes to RSGB."

W.H. Bellchambers

W. H. Bellchambers - Chairman International Frequency Registration Board.

"Meilleurs voeux de la Tunisie."

B. Khouaja - Minister of Communications, Tunisia.

4U1ITU INTERNATIONAL AMATEUR RADIO CLUB
P.O. Box 6 CH-1211 GENÈVE 20
Switzerland

TO	DATE	TIME GMT	BAND MHz	MODE 2X	RST	OPERATOR
						73

Amateur station 4U1ITU is located at ITU headquarters in Geneva. The International Telecommunication Union is the specialized United Nations agency for telecommunications. As of 19 November 1984 it counted 160 members.

(Left to right): Dick Baldwin, W1RU, President of the IARU, Hon. John Maetia Kalivae, Minister for Posts & Communications in the Solomon Is., and John Allaway, G3FKM, IARU Region 1 Secretary.

Jaap den Herder F6FYI/PA0YJ (right), the Telecom '87 stand coordinator, looking on as one of the visitors checks out the comprehensive amateur radio database.

Vasily Bondarenko, UV3BW, demonstrating some amateur-built equipment on the USSR stand, to a group of IARU visitors.

One of the features of the stand was a comprehensive display of amateur radio publications in a variety of languages.

WHEN HELP IS NEEDED AMATE

NIAR

NEWS LETTER

AUGUST 1987

NATIONAL INSTITUTE OF AMATEUR RADIO
HYDERABAD-500 482

Institute News

Major Rail accident - HAMS again at rescue work :

There was a major Rail accident for Dakshin Express bound to Delhi on 8th of July 1987 where several people died and injured. Mr. Santanam IAS., Relief Commissioner of A. P. alerted NIAR/APARS for emergency relief communication in Mancherial. Immediate transport arrangements have been arranged and other facilities have been provided by the govt. to hams for reaching the spot. A station with Mr. Saheb VU2SUS, Mr. Shankar Rao set up on the spot. Several messages were exchanged. A base station at Secretariat was set up. Several Hams all over the country responded to the call of NIAR/APARS and got in touch with relatives and friends of the diseased and injured all over the country and got the necessary communication facilities. People were well informed about the accident and the servived could get in touch with the relatives who came to the spot immediately. Special mention of the Hams who were on radio is given. VU2NB, VU2LK, VU2YFS, VU2RM, VU2AAP. VU2RBI, VU2MY, VU2SUS, VU2MYL, VU2TP, VU2RMU, VU2HEL, VU2NRE, VU2NRL, VU2RQZ, VU2URX, VU2BL, VU2JH, VU2OFX, VU2KAN, VU2CKM, VU2RDM, VU2WC, VU2DS, VU2MRY, VU2JOS, VU2NRJ/NUD, VU2DZ, VU2UEX, VU2GVS, VU2VR.

The following are the texts of letters of appreciation given by the District Collector Adilabad and Relief Commissioner, Govt. of A. P.

S. SANTANAM, I.A.S.,
COMMISSIONER RELIEF

Hyderabad,
14-7-1987.

DO Lr. No. FC2/1405/87

Dear Sri Suri,

Kindly acknowledge my grateful thanks to you and your men for the timely assistance rendered during the recent unfortunate Mancherial Railway accident. I learnt from the district authorities of Adilabad that your people had done an excellent job in assisting the civil authorities in various operations. Your communication system has been of immense help in the disaster management and I am making special reference of this facility at the ensuing conference we are going to have with the Chief Secretary shortly. I will also take up the matter with the Central Government for developing this channel of communication.

As you may be aware natural calamities have more or less become a chronic feature in our state necessiating continuous exercise for disaster preparedness. I understand that there are some formal restrictions in the use of HAM sets by the Amateures for conveying massages. I shall be most grateful if you could kindly take up with the appropriate authorities in the Centre to secure separate frequency for this type of work which will be of immense help to the Central and State Governments in meeting emergencies. I shall appreciate, if you could kindly let us know whether you require the assistance of State Governments in moving the concerned Ministry at Centre for securing the facility.

I once again thank you for all the timely and important help you have rendered us in this hour of distress.

With kind regards,

Yours sincerely,

(Sd/- S. Santhanam)

Sri S. SURI,
Director/Hon'ble Genl. Secretary,
APARS/NIAR,
5-B, P. S. Nagar, Hyderabad-500 457.

To
Sri S. Suri, VU2MY,
Director/Hon. General Secretary,
APARS/NIAR,
5-B, P. S. Nagar, Hyderabad-500 457.

Dear Sir,

I am very much thankful to you for having
and Sk. Uddandu Saheb, VU2SUS at Mancherial
train accident to Dakshin Express near Mancheria
not only to the District Administration but also
during their crisis which was of immense help fo
accident through-out the Nation.

I really appreciate the services rendered
flood, cyclone, rail accidents etc. The services o
cers richly deserves special commendation who w
Once again, I thank you for the co-operation exte

Your two officers have been relieved on 12

Radio hams get SOS from Chile

THREE licensed radio amateurs picked up an SOS from Chile requesting urgent medical help to save the life of a baby.

Mr. Mike Piper (39), of Firglen Drive, Yateley, was with fellow-enthusiasts Mr. David Mann and Mr. Keith Willis on Saturday night when they heard the call for any London station.

The three men made contact and learned that 28-day-old Chilean baby Carmilla Garcia desperately needed a piece of medical monitoring equipment, apparently available in London.

Chilean radio amateur Mr. Alf Von Harpe told them he was calling on behalf of his friend, Mr. Hernan Garcia, Carmilla's father.

DOCTOR

The three friends decided their best move was to contact the Foreign and Home Offices, and told their Chilean contact they would call him back in an hour.

The caller had told them a doctor in Santiago, Dr. Juan Madsen, had said the monitoring equipment could be obtained from an address in Grosvenor Place, London.

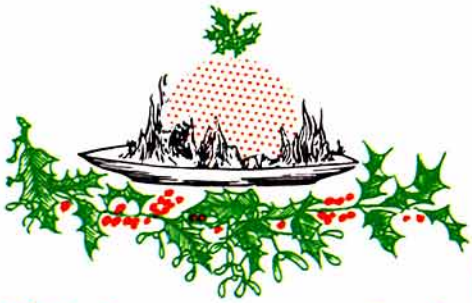
Mr. Piper, Mr. Willis of The Gallop, Yateley, and Mr. Mann, who lives on the Broadmoor Estate at Crowthorne, also tried to contact the Chilean Embassy, but got no reply.

"We had arranged to meet the guy on the air, and gave him the Chilean Embassy telephone number," said Mr. Piper, whose call sign is G0HOQ.

"There was nothing we could do at that time of night. I contacted the Home Office, but they did not really know what to do," he added.

The Chilean call was picked up while Mr. Piper, Mr. Mann — call sign G0HDN, and Mr. Willis, call sign G4XNA — were searching one part of the radio frequency spectrum

The three amateurs were in a caravan off Sandhurst Road, Yateley, on a field day — when groups run radios to try and make as many contacts around the world as possible.



4 page pull-out

Christmas Quiz

Loads and loads of Yuletide fun!!!

RADCOM ANNUAL EXTRAVAGANZA (RAE)

Yes folks - it's the Christmas edition, so it's time for another super-mega-terrific Christmas Quizword and Cross - no, er, sorry, Crossword and Quiz!

To make life easier for all concerned, this year's Crossword and Quiz can be pulled out from the centre of your Bumper Fun-packed Bulletin so that you can send the whole thing off to us without having to copy the answers out onto another piece of paper. There's even a coupon for you to fill in your name, callsign/RS number, address and telephone number.

You'll find the Crossword on another page, but on this page we present - for your edification and delight - the no-expense-spared RadCom Annual Extravaganza, otherwise known as the R.A.E.

You'll note some changes this year. Practically everyone said that last year's was too difficult since it had a written format - so this year we've gone for a multiple- choice examination - whoops, extravaganza - just to make life a bit easier. The pass mark is the same for both parts and it'll be calculated using the latest hyper-accurate mathematical techniques involving Planck's constant, the Schrodinger wave equations, Hawking's theory of the Big Bang and a newly-installed IBM Total Perspective Vortex.

So, try your luck, skill, knowledge and guesswork ability and have a go at the R.A.E. Simply circle the correct answer and send your entry off to Headquarters. As with last years' quiz, there'll be RSGB book tokens to the value of £15, £10 and £5 and we must receive your entry by HQ closing time on 20 January 1988.

1. A 2N2646 is a ...

   a) transistor
   b) thyristor
   c) UJT
   d) diode?

2. A 3CX1500A7 is a ...

   a) diode
   b) triode
   c) tetrode
   d) pentode?

3. What's another number for a 3CX1500A7?

   a) 8038
   b) 8877
   c) 8874
   d) 8904

4. An SFR25 is what sort of resistor?

   a) metal film
   b) cracked-carbon
   c) vitreous wirewound
   d) variable cermet

5. For coming top in Part 1 of this Quiz, we award you a brand-new unused 813. Would you use it for ...

   a) a local oscillator
   b) an IF amplifier
   c) voltage stabilisation
   d) an HF linear?

6. For coming bottom in Part 2, we likewise award you a dud 74HC138. Was it ...

   a) an expandable 3 out of 8 decoder
   b) a quad-state F-type buffer
   c) a dual-differential bus transceiver
   d) a triode-hexode?

7. For failing both parts, we award you a gassy EZ80. Was this ...

   a) a Schottky diode
   b) an audio tetrode
   c) a power rectifier
   d) a double diode-triode?

8. For achieving 100% in both parts, we award you an AR88LF. Is this ...

   a) a transceiver
   b) a high-level mixer
   c) a receiver
   d) a megawatt noise jammer?

9. For refusing to take the paper at all we present you with an ORP12. Is this ...

   a) a tantalum capacitor
   b) a metal oxide resistor
   c) a GaAsFET
   d) a light-dependent resistor?

10. For writing us a rude letter telling us that the new multiple-choice RAE is much easier than the written quiz you took last year, we hand you a blown fuse with "FF 1,5A" on the end cap. Is this ...

    a) antisurge
    b) semi-delay
    c) very fast
    d) non-enclosed repairable?

11. You call CQ on 144.3 MHz and someone comes back to you. You agree a frequency to QSY to and tune to it. Do you then ...

    a) ask whether the frequency is in use
    b) listen for about ten seconds and then ask whether the frequency is in use
    c) start transmitting straight away
    d) none of the above?

12. You call CQ on 144.3 MHz and receive a reply. Do you say ...

    a) "G7XXX from G9YYY, thanks for the call, let's go to 144.215, over" (having established beforehand that the frequency is clear)
    b) "G7XXX from G9YYY, thanks for the call, your report is 5 by 4, radio 5 and signal 4, in Much-Binding-in-the-Marsh. I'll spell that for you just in case you didn't copy it, M-U-C-H....in the county of Bloggsshire, West Bloggsshire and the personal this side would be Fred. Hope you copy that OK, let's put it back to you - er - sorry, didn't make a note of the callsign - er - G9YYY putting it back to G7XXX, go ahead old man, dah-de-dah"

c) All of b) plus "Oh, I suppose we'd better pick a frequency, let's try 144.295 - no, that might be busy, go to 144.305, that's usually quiet round here, over"
d) Both b) and c) plus "The locator is Italy Oscar Nine Nine Bravo Victor - that's Italy Oscar..." (da capo sine fine)

13. You hear a fully readable but extremely weak station on 144 MHz and establish contact with him. You then give him a report. Do you say ...

a) "You're readability five and strength nought"
b) "You're readability five and strength two"
c) "You're radio five and signal one"
d) "You're lighting up two bananas"

14. Does a report of "5 and 9 plus 30" mean ...

a) 300 uV across 50 ohms
b) a field strength of 10V per metre
c) absolutely nothing
d) the driven element of your antenna is glowing dull red

15. Should you rely on your S-meter when you give a signal report?

a) yes
b) only if it's an LED or LCD type
c) only if it's driven by PPM or VU meter circuitry
d) no - you use your ears instead

16. When telling someone your Christian name, do you say ...

a) "The name this way is Fred"
b) "My name is Fred"
c) "The handle this side is Fred"
d) "The personal name this way would be Fred"

17. When telling someone where you are, do you say ...

a) "We're located in Birmingham"
b) "Our QTH is Birmingham"
c) "My QTH is Birmingham"
d) "My location is Birmingham"

18. You're an averagely-sited station running 50W to an 8-element antenna and you've just had a phone call telling you that 144 MHz is wide open to Czechoslovakia. Do you ...

a) pick a clear-sounding frequency and begin a series of CQ DX calls
b) spend five or ten minutes listening around and then start calling CQ DX
c) spend five or ten minutes listening around and answer CQ calls from DX stations
d) go on the local repeater and work DX through it

19. A well-established amateur twenty miles away who's technically clued-up calls you and tells you you're twenty kHz wide. Do you ...

a) tell him he's a strong signal and also very wide
b) ask him to stand by while you try a few things like turning down the mic gain, re-loading the amplifier, turning the drive down, etc, and see whether that improves things
c) tell him to go away
d) tell him that you're running a Kencomsu FTRC-9480 which can't possibly spread and it must be his Rx

20. What are the most likely causes of wide SSB signals?

a) too much mic gain, too much drive to the amplifier, poor loading
b) insufficient IF bandwidth in the transmitter, synthesiser drift, unbalanced mixer
c) dirty antenna elements, poor earthing of power supply, fault in carrier insertion oscillator
d) not enough mic gain, lossy cable between Tx and antenna, unsatisfactory s-parameters of front-end transistor

21. Can you get 400W out of a single 4CX250B used as per its data sheet and maintain reasonable intermodulation performance?

a) yes, easily
b) no
c) yes if you have 8V on the heater
d) yes if the amplifier is properly designed

22. If your solid-state 144 MHz amplifier is stated by the manufacturer to give 100W out for 10W in, what would be a sensible level to drive it at?

a) 10W PEP
b) 10W RMS
c) 7W PEP
d) 15W PEP

23. Is the PEP output of the average 144 MHz multimode advertised to give 10W out more likely to be ...

a) 5-7W
b) 15-20W
c) 10-12W
d) 50-60W

24. You've just built a 144 MHz 400W amplifier using 4CX250Bs. What output connector will you use?

a) N-type
b) PO jack
c) BNC
d) RCA phono

25. You're just getting together the power supply for the aforementioned amplifier. What sort of anode voltage do you need?

a) about 350V
b) about 5 kV
c) about 12V
d) about 2 kV

26. You've just found a transformer which has a secondary of 2000-0-2000V. What sort of rectifier stack will you need if you plan to use it with a 4CX250B amplifier?

a) bridge
b) biphase half-wave
c) half-wave
d) star/delta

27. What order of smoothing capacitance will you need?

a) 1 uF
b) 0.1 uF
c) 30 uF
d) 3 nF

28. Assuming you have a pair of 4CX250Bs in your 144 MHz amplifier, what sort of reading should the anode current meter show when you're speaking normally and running about 400W PEP output?

a) 2-300 mA
b) 7-800 mA
c) about 1 amp
d) 50-100 mA

29. Assuming you're running 400W and that the loaded Q of the tank circuit in the same amplifier is about 12, what order of circulating current is flowing in the tank circuit?

a) 12A
b) 120 mA
c) 1.2A
d) 12 mA

30. Why should you never have more than about 2.5 kV on the anode of a 4CX250B?

a) it increases the danger of flashover
b) it causes ion bombardment of the cathode
c) it can increase secondary emission
d) all of the above

31. What is the correct CW abbreviation for the Maidenhead locator?

a) QRA
b) QFE
c) QLO
d) LOC

32. What CW abbreviation would you use during an aurora if you wanted to know the beam heading of the station you were working?

a) QBH?
b) QTF?
c) QDM?
d) QNH?

33. If you were working an OH station on 144 MHz during an aurora and his signals were fairly good, what report would you send him?

a) 599
b) 559
c) 55A
d) 59A

34. If you lived in London and wanted to arrange a 144 MHz sked with a German station, what HF band might you use to do so if it was a Sunday evening in winter?

a) 21 MHz
b) 1.8 MHz
c) 28 MHz
d) 3.5 MHz

35. If you wanted to erect an antenna for 28 MHz in a hurry and decided to put up a half-wave dipole, what length might you start with before trimming?

a) 132 ft
b) 10 ft
c) 15 ft
d) 69 ft

36. What handy instrument would you use to get the above antenna to the right length?

a) oscilloscope
b) SWR bridge
c) multimeter
d) network analyser

37. When calling CQ on the 430 MHz band, is there any point in saying "....CQ, this is G7ZZZ in Italy Oscar Ninety- One Victor November square calling CQ and by"?

a) Yes - it might attract a reply from rare DX
b) Yes - it allows other stations to get their beam heading right to reply to you
c) No - it's a dead waste of time
d) No - it encourages Syledis to come up and jam you

38. You go to Andorra for your summer holiday and you've obtained a reciprocal licence. Does it permit you to operate on 50 MHz?

a) Not unless you have special permission in writing
b) Yes, because 50 MHz is available to G stations at home
c) Yes, if you have a Class A licence
d) Yes, because it's part of the normal Andorran licence

39. You work A22KZ on 50 MHz. What was the propagation mode?

a) Sporadic E
b) Tropo
c) TEP
d) TEP with assistance from sporadic E

40. You work EI on 7 MHz at lunchtime. What was the propagation mode?

a) via the E layer
b) via the D region
c) via the F2 layer
d) via chordal hop

41. Your 7 MHz dipole antenna is about 20' off the ground and runs east-west but it seems to be virtually omnidirectional. Is this basically ...

a) because it has many minor lobes

b) because its radiation resistance is low
c) because it is close to the ground in terms of wavelengths
d) because it has no radials

42. You work GBOSWR/MA. Is he ...

a) maritime mobile in distress
b) maritime mobile at anchor
c) maritime mobile in territorial waters
d) on board a military aircraft

43. Your postal address is in England (because your post town happens to be in England) but geographically speaking you are a few miles over the Welsh border. Is your prefix ...

a) G
b) GB
c) GW
d) none of these

44. What is the present ERP limit on 50 MHz?

a) 14 dBW carrier, 20 dBW PEP
b) 14 dBW carrier, 14 dBW PEP
c) 20 dBW carrier, 20 dBW PEP
d) 20 dBW carrier, 14 dBW PEP

45. What is the present ERP limit on 70 MHz?

a) 20 dBW carrier and PEP
b) 26 dBW carrier and PEP
c) 10 dBW carrier and PEP
d) None

46. What speeds does your modem have to cope with to talk to the RSGB DataBox?

a) 300/300
b) 1200/1200
c) 1200/75
d) 2400/1600

47. In RS232, to what is pin 20 normally assigned?

a) request to send
b) data set ready
c) data terminal ready
d) transmitted data

48. In packet radio, what is MAX-PAK?

    a) a 32-bit packing routine for data
    b) a method for maximising packet throughput
    c) part of a packet data repeater's protocol
    d) a Midlands-based packet group

49. Under the new designation of radio emissions introduced in January 1982, how would you express "telephony with two independent sidebands with a 2.4 kHz bandwidth"?

    a) 2K40B8E
    b) 2K4J3E
    c) A3B24K
    d) 2J3E2K40

50 - AND FINALLY. THE TIE BREAKER.

How many radio-related words can you make from the letters forming the words "Radio Society of Great Britain"? In the course of a recent train journey we found 24 - can you beat this? Just the job to keep you brain cells ticking over after the double dose of Christmas pud!!

So there it is - the RAE, and, as we said earlier, the closing date is 20 January 1988. Attempts to bribe the Bulletin staff with large bottles of whisky, brandy, used notes, massive tetrodes, etc will NOT be gratefully received unless done extremely discreetly.

PLEASE FILL IN YOUR DETAILS AND SEND THE WHOLE OF THIS 4-PAGE CENTRE SECTION TO:-

David Gough, G6EFQ,
News & Information Dept.,
RSGB Headquarters,
Lambda House,
Cranborne Road,
Potters Bar,
Herts., EN6 3JE.

Name: ooooooooooooooooooooooooooooo

Callsign: ooooooooooooooooooooooooooo

Address: ooooooooooooooooooooooooooo

ooooooooooooooooooooooooooo

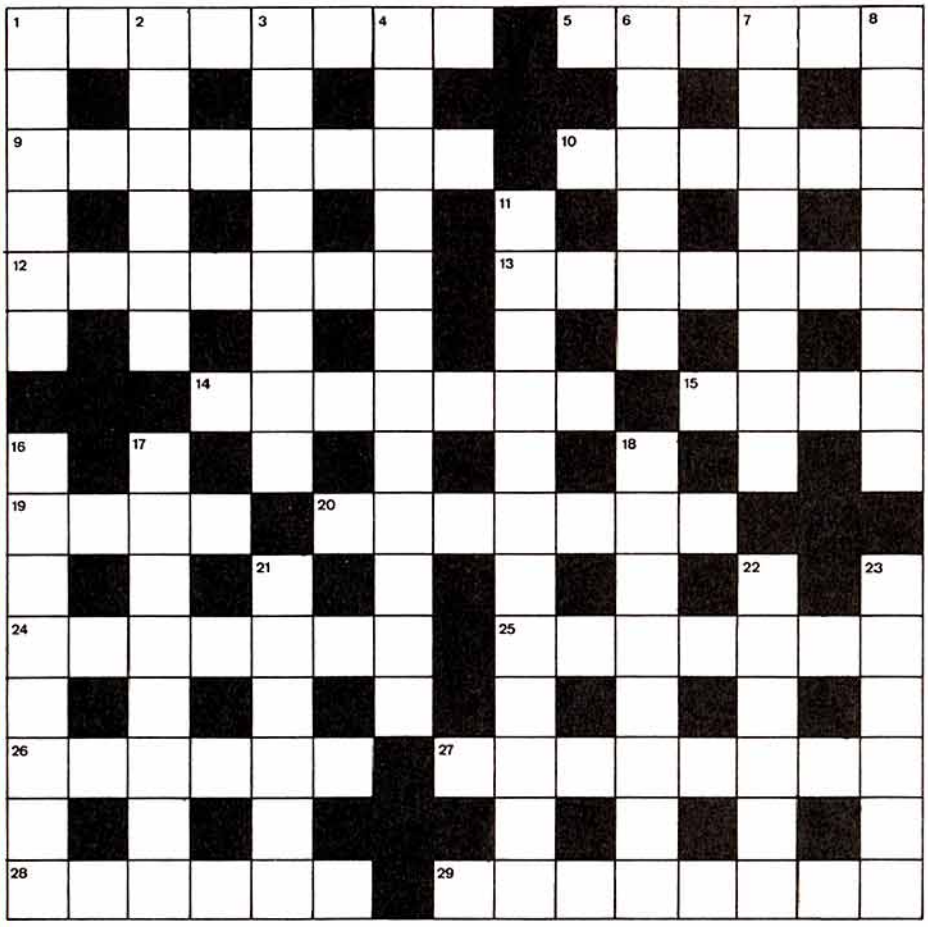
ooooooooooooooooooooooooooo

ooooooooooooooooooooooooooo

ooooooooooooooooooooooooooo

Tel (day): ooooooooooooooooooooooooo

Christmas Crossword



ACROSS:

1: A shady control (8)
5: Cut up (6)
9: These are seldom full wave (8)
10: Take a trimming tool to (6)
12: These connections are faulty (7)
13: Crystal type (7)
14: To deter (anag) (7)
15: Enter this (4)
19: Sometimes enough (4)
20: Power to conserve hand-held battery life (7)
24: Strength in sleet (7)
25: ATU for these (7)
26: He steals away to do Morse on the side (6)
27: 12 wpm is this with practice (8)
28: Views heard from Field Day locations (6)
29: Men only (8)

DOWN:

1: Not bandspread tuning (6)
2: Is this one in NATO? (6)
3: Found again by a drifter (8)
4: Symbols and codes must be for worldwide use (12)
6: Flat aerial (6)
7: Society singer. Getting together for a new set (8)
8: May be magnetic (8)
11: Resonance indicator (4,3,5)
16: Not for rag-chewers (8)
17: Lining up a picture (8)
18: Take off (8)
21: Conversion for some receivers (6)
22: Usually out of pocket (6)
23: Usually associated with stages (6)

Crossword compiled by GM3YAN.

EUR RADIO IS ALWAYS THERE

deputed Sarvasri P. Shankar Rao, S. W. L.
n 9th July morning when there was a
l. They have rendered timely co-operation
to the close relatives of the deceased
r them to get information about the rail

by your Organisation during crisis like
offered by your above mentioned two offi-
worked untiringly during day and night.
ended by your Organisation.

2-7-1987 after-noon.

Yours faithfully,
Sd/—
for COLLECTOR, ADILABAD.

GREEK AMATEURS ASSIST FIRE-FIGHTERS

There are about 25 radio amateurs on the Greek island of Rhodes, and almost all of them were involved in providing emergency communications during the ferocious forest fires which raged across the southern part of the island last August.

Dimitris, SV5ADM, secretary of the island's amateur radio club, told us that the amateurs were actively involved in the fire-fighting effort for over a week and had very little sleep until the emergency was over. The island's 144 MHz repeater has excellent coverage and was used to good effect.

NEW CLUBROOM

The Mayor of Rhodes was so impressed with and thankful for the efforts of the amateurs in the club that he's given them a pre-fabricated building to be used as a super-de-luxe shack – this will be sited on top of a hill overlooking the old town of Rhodes. The club will meet there as soon as its members have completed the building and erected the antennas.

When the club is fully established in its new QTH, they hope to have some activity periods and Dimitris will be writing to us with the details soon. Most of the amateurs on the island use 144 MHz and there are only three who are active on the HF bands because of a shortage of HF equipment. When the club shack is complete, many more will have the opportunity of working HF and they look forward to making contacts with UK amateurs.

Edmonton Examiner, Sunday, August 9, 1987

Ham operator Len Kockan and his set.

Hams provide disaster phone service

By PHILIPPA DEAN
Staff Writer

For hundreds of Edmonton amateur radio operators, the August long weekend was a gruelling test of stamina as they relayed messages and replies from concerned friends and relatives around the world to Edmontonians.

Long distance telephone lines into the city were jammed as soon as the story of the tornado hit the newscasts around the world.

The worried outsiders who couldn't get through on the clogged telephone system contacted local ham operators, who in turn called up Edmonton operators.

When a message came through, the local operator phoned whoever the message was for and relayed their answer by radio. The system was repeated at the other end.

Provincial civil servant Len Kochan, known on his ham radio as VE6 LEN, spent 50 hours monitoring eight amateur radio stations in eastern Canada which were collecting messages for Edmontonians.

He estimates he made over 300 calls while he was on duty.

"I've helped out with disasters before, but I never thought I'd see one happen in Edmonton."

Kochan, who got his first amateur radio operator's license in 1975, explains ham operators all over the world get involved whenever a disaster strikes anywhere.

Stations are usually set up in conjunction with the local Red Cross. People will call the Red Cross for help locating friends or relatives they are concerned might have been affected in a disaster. The Red Cross turns the information over to the ham operators.

"I was working during the 1985 earthquake in Mexico, for example. People in Edmonton wanted to know if their family or friends in Mexico were safe. I broadcast their messages to operators in Mexico who tried to get answers and let me know. Then I'd phone whoever sent the original message with an answer."

The system works in reverse, as well, he says. People in a disaster zone want to let others know they are well, so they have the hams transmit messages of reassurance out.

Besides disasters, ham radio operators, using their own equipment and on their own time, help out with a variety of causes.

For instance, Kochan and a number of his ham friends provided two-way communication for security and first aid at all the venues at the just ended Alberta Summer Games.

The Aftermath

RSGB comment.....

These are just some of the many reports that we hear of each year where amateur radio operators are involved in providing emergency communications or assistance in all kinds of situations. Individually, amateurs may stumble across a call for assistance on the air or may, as part of an organised group, be called out by the emergency services to provide back-up or alternative communications.

In many countries there are organised groups within the amateur fraternity who train for such emergencies and develop their skills in handling third party traffic in a calm and concise manner. Here in the UK we have RAYNET – the Radio Amateur Emergency Network – who are ready and able to provide assistance efficiently and effectively when called upon by the User Services.

RARE DRUGS

Having said that, it's worth reminding readers that if any amateur or short-wave listener receives an urgent request for rare drugs or medical assistance from overseas, they should contact the British Red Cross Society on 01-235 5454 and ask for the "International Welfare Dept". The BRCS will then contact the Red Cross in the country concerned and progress the request.

50 MHz CROSSBAND LADDER

Callsign	Countries	Best DX	Pos
G3BDQ	25	4827km	1
G2ADR	24	8500km+	2
G4IZH	19	2280km	3
GW1SSQ	19	1957km	4
G4IDE	16	1729km	5
G1KDF	15	1928km	6
G0GZI	14	*	7=
G0IMG(G1SEP)	14	*	7=
G4TLY	13	*	9
G4SJG	12	*	10
G4INL	11	1894km	11
G1SMD	11	1868km	12
G8DKF	9	1700km	13=
G1CWP	9	*	13=
G4GDY	8	*	15=
GM4ULP	8	*	15=
G8PYP	7	1866km	17
GW3WSU	6	*	18=
G6BFP	6	*	18=
G1AHM	2	*	20=
G4IDF	2	*	20=

Well, did anyone spot the deliberate mistakes in last month's 'Crossband Ladder'? Yes, quite right, we listed G1KDF and G8DKF twice - sorry about that!

The closing date for final entries in the 'Crossband Ladder' was Monday 23 November so we didn't know the winner when this Bulletin went off to the printers on 11 November (though we a pretty shrewd idea!). The final table and winner will be published in the January 1988 issue.

CALLBOOK ON DISK?:

From time to time we're asked whether the Call Book could be supplied on a disk file. In principle there's no problem, of course, but to produce a one-off set of disks or diskettes or whatever you like to call them would make it an expensive exercise and we'd have to make a fairly ferocious charge for a one-off. However - we're always keen to try and improve our service to members so we'd like to assess how interested you'd be in having a high-tech double-density floppy Call Book, so to speak. If this is potentially appealing, please drop a line to the HQ Manager at Potters Bar and tell him the type of computer system you're using and what size and storage capacity the disks for it are.

PREFIX HUNTERS TAKE NOTE:

To mark the 200th Anniversary of the US Constitution, US amateur radio clubs that have registered with ARRL will be permitted to use special "200" prefix callsigns (ie W"200"XXX) during designated one-week periods from now until the end of 1988. (CRRL News)

RSGB President, Mrs Joan Heathershaw, G4CHH, visiting the national station (ON4UB) of the Belgium Society, UBA. Her visit coincided with the National Annual Meeting of UBA, held last May.

PUNS EXPEDITION:

In 1986, the members of the Polar Universal Natural Science, (PUNS) Expedition flew to Ward Hunt Island, located just off the north coast of Canada about 450 miles south of the geographic North Pole. Because of its location, this particular spot in the arctic is often used by explorers as a starting point for journeys to the North Pole. A canvas hut was used as the base for a number of scientific programmes including flora and fauna sampling, meteorological tests, air sampling - as part of a project looking into industrial pollution in the arctic region, and a drilling programme to look at ice samples from depths up to 10 metres.

Radio propagation studies were carried out using computer predicted optimum working frequency charts provided by RACAL Communications and these tests covered areas from Europe to Antarctica. Amateur radio operation was conducted by Laurence Howell, GM4DMA/portable VE8, on all HF bands using RACAL transceivers of 100W pep with the power supplied from a 24 volt battery charged by a pair of wind turbines. The temperature in the hut was, at times, as low as -52 degrees C, but the equipment still operated without fault. However, there were other problems: the operator had to be very careful that his fingers did not freeze onto the radio equipment and the local wildlife population took a fancy to the taste of the coax cable which was coated with a special silicone coating.

One of the other projects was to attempt to travel as far north as possible without the aid of mechanical transport. Several of the members of the expedition set off from the Ward Hunt camp pulling sledges weighing in excess of 300 pounds behind them. Within 14 days they had broken the existing record.

In February next year, the four members of the group, Sir Ranulph Fiennes, Oliver Shepard, Dr. Mike Stroud and Laurence Howell, will return to the area to complete their science programme and to try to reach the North Pole - a distance of around 450 nautical miles - without support or resupply. GM4DMA/portable VE8 will be active again and some 144 MHz operation is envisaged as part of the propagation tests. Sked times and frequencies will be given as soon as we have them.

It's a long way to Tipperary - the adventures (and misadventures) of a VHF DXpedition

Dave Hardy, G8ROU

ABSOLUTE BEGINNERS

The origins and motivations behind VHF DXpeditions are shrouded in obscurity, although they have some undoubted similarities with the annual migration of lemmings. Both groups appear to have an irresistible annual urge to rush off and display strange (if not positively bizarre) behaviour which is completely beyond the ken of mere mortals! The involvement of the Derbyshire Hills Contest Group in these peculiar practices dates back to 1981, when your scribe idly suggested that it might be fun to mount an expedition. "Good idea - arrange it!" was the response, and I seem to have been suffering ever since.

In 1981, 2 and 3 we "did" Wales, and in 1984 it was the turn of Eire to suffer our attentions. Looking back on what was a highly successful DXpedition it's easy to forget the problems involved in organising amateur radio operation in another country; however, these were ably dealt with by a member of the group and, having persuaded Irish Customs to let us into the country, we located a site and set about getting on the air. This was, incidentally, when we discovered the benefits of mains electricity - with petrol at £3 per gallon we couldn't afford generators! We ended up with about 300 yards of mains cable running across the fields to a cottage at which we had negotiated to plug in....

1985 saw the group stranding itself on North Ronaldsay, one of the more isolated islands in the Orkneys with a ferry once per week. Poor tropo conditions were to some extent counterbalanced by good MS and aurora. We decided to take a break from DXpeditions in 1986, but last Christmas the old familiar urges returned and we decided that we'd go back to Eire in 1987.

THREE WHEELS ON OUR WAGON....

Once again the planning of the 1987 event fell to your scribe. Letters went off to the magazines for advance publicity and I set about recruiting victims (sorry, operators) to take part in the trip. G4VVZ and G8ROU were joined by G4XUM - who had been prevented from joining our last epic by work QRM - together with G4UYZ and

finally Dave, G4FRE, who had to be difficult and wanted to join in the GB2XO/GB4GD expedition as well. I would have loved to have seen the travel agent's face when Dave asked for a three-legged trip to the Isle of Man.... Tony, G4APA, kindly agreed to lend us a van and generator, so at this stage everything seemed to be going well.

Time passed - rather a lot of it, actually - and some members of the group began fretting somewhat at the lack of EI licences falling on their respective doormats. Enquiries via EI2CA revealed that there was a strike on in the licensing department! Fortunately, the IRTS applied a little pressure on our behalf and the problem was resolved.

The time of departure rapidly approached. Most of the equipment had been stockpiled at the QTH of G4XUM in Nantwich, which was to be our "assembly point" prior to departure. Came the day and we all converged on Nantwich for the ceremonial loading of the van; this completed, we set off for Holyhead at about 8pm - allowing, as we thought, plenty of time to catch the ferry. But fate was not on our side, and a few miles down the road disaster struck! A loud knocking noise forced an immediate stop, and the diagnosis was a wheel bearing failure. Aid, in the form of G4APA and G4XUM's father, was summoned but it was decided that nothing could be done that night. Quick adjustment of plans, 'XUM and 'YUZ were inserted into 'FRE's Metro along with a fair amount of gear and launched in the general direction of the ferry. The rest of us were "grounded" for a while.

In the morning the RAC towed the van into a garage. Inspection revealed that the entire stub axle assembly would have to be replaced, but unfortunately - it being a Saturday - not all the parts necessary to mend it could be located that day. Consequently, the van wouldn't be repaired until Monday - gloom, depression, etc.

In the meantime the rest of the party had crossed into Ireland without any further problems and were soon bumping their way across country. Irish country roads aren't exactly your six-lane motorways, and if we're being frank they're pretty dreadful; every time the Metro hit a bump there was another bump on 'YUZ's head! Battered and bruised, the party finally arrived at the house which had been rented in VN square - but of course without either their suitcases or any VHF equipment! Ultimately, of course, they discovered that it would be three days before the "van party" could join them, so to while away the time they set about improvising 3.5 and 14 MHz dipoles which could be used with 'FRE's FT901. To keep his hand in for the VHF DX to come Dave worked about 100 stations on 3.5 MHz CW, and in between times the group undertook reconnaissance missions in search of promising-looking portable sites.

BUT WE'RE STILL ROLLING ALONG.....

Monday morning saw the "van party" still stranded in England looking for parts with which to repair the van. These were duly obtained from a variety of sources and eventually - three days behind schedule - we were on our way. On arrival at Holyhead we paid a visit to Customs in order to get our equipment list certified. This is a very important move, since otherwise you might

have problems in getting the gear back into the country when you return. At this point, by the way, we must give credit to the helpful B + I staff at Holyhead, who allowed us to change our ferry bookings twice with no problems.

The sea crossing was fairly uneventful and on the Tuesday morning we rolled off the ferry and into the Red Channel at Customs. On the occasion of our last visit it had taken about two hours to negotiate this formidable obstacle, but I put on a confident face and told the Customs officer what we wanted to do and within five minutes we were setting off across Dublin whilst most of the cars were still queueing for the Green Channel! After a bumpy ride across country the group was reunited and we set about unloading the van.

As usual, I drew the short straw and had to go and ask the neighbouring farmer for permission to use his field for the 144 MHz antenna system. This was granted and we started erecting antennas; however, we almost immediately had a minor contretemps with the 144 MHz antenna system and it dawned on us that we were all extremely tired, so we unanimously decided to leave it until the following morning. However, Wednesday morning saw the thing erected without any further "prangs" and we were finally on the air!

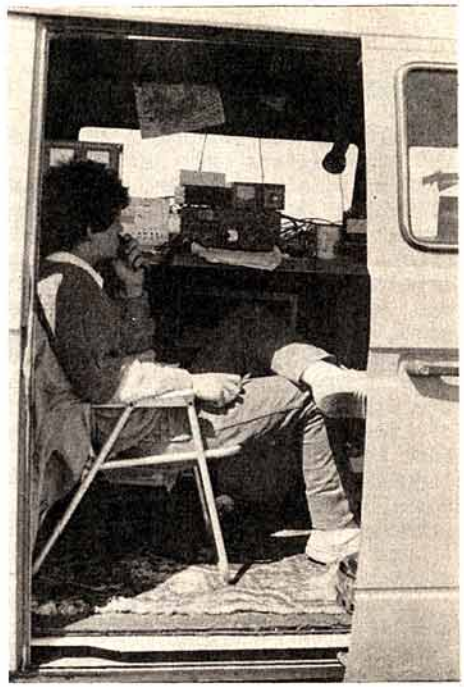
Gear for 50, 70, 430 and 1296 MHz was also erected and it was all systems go. However, we didn't work many stations on 430 and 1296 (15 and 7 respectively) before the equipment had to be dismantled to go off to GD with 'FRE on the Saturday. However, we attempted 430 MHz contacts with DK1PZ via MS and HB9CRQ via EME. Although signals were received both ways on both occasions, we didn't manage to complete either contact. 70 MHz was a struggle since we were so far west, but we did manage 14 contacts in 7 squares and 4 countries, including a crossband to 144 MHz with DK1PZ via MS. A regular 3.5 MHz sked was maintained with G4NZU so as to keep people in the UK informed of what we were up to.

The star performer was, of course, 144 MHz. On this band we made about 400 contacts on tropo under the callsign EI2VPX and gave many stations their first contact with VN square. If you called us but failed to work us, we're sorry but it is a long distance and you'll have to build a bigger station! More ERP should do the trick next time.... MS operation was very successful, with no less than 145 stations worked. The squares total from VN was ultimately 103, in 24 countries; best DX was YU at about 2300 km, and a probable first was EI to OHONC/OJO. All in all, a very successful expedition!

THE WILD ROVERS

One of the more ambitions proposals for this expedition was for a "detached" portable station which would activate UN and UO squares. After Dave abandoned us at the end of the first week for the delights of the Isle of Man, we decided that we would at least do UN but that we probably wouldn't have time to go to UO because of the fact that we were running three days late on schedule. So Ian and myself duly headed off on the Sunday morning in the general direction of UN square, and by the evening EI4VCH/P was active. The station was located on a sand dune by the Atlantic Ocean. In two days we worked about 100 stations on 144 MHz on tropo and 35 on MS, resulting in a grand total of 35 squares and 16 countries.

During the period when we were doing our thing from UN square, there was an amusing incident back at "base camp". They were well into their stride in the middle of an operating session when three members of the Garda - the Irish police - appeared and started to ask all sorts of questions. The most startling was whether they were "members of a subversive organisation"! Resisting the urge to say "yes, the Radio Society of Great Britain" the answers produced by the group were evidently satisfactory since, after a second visit, we heard no more. Apparently our antenna farm had created a certain amount of interest; certainly passers-by on the main road were wont to stare at it, obviously wondering what was going on.



We got back from UN square in good order; so much so, in fact, that we decided that we would, after all, make a quick attempt on UO on the Thursday. We blasted off in a torrential downpour and eventually arrived at The Mullet having negotiated flooded roads and all manner of other obstacles; at that point the rain stopped. We set up shop in the middle of a peat bog - which was about the only remotely viable site - and had the added interest of having to put the antennas up in the teeth of a Force 8 gale which had added to the meterological situation. Everything people say about Irish weather is true! Having got the station on the air we found, not surprisingly that tropo was fairly limited - there are, after all, some enormous mountains in the way - but we still worked the best-equipped stations. On MS we worked 41 stations in less than 24 hours before we had to beat a retreat, which added up to 17 countries.

At the end of the week the return to the UK came as an anticlimax and - much to our surprise - took place without major disasters. We all thoroughly enjoyed ourselves and no doubt we'll be off somewhere in '88 - so prepare to work us (or even better, come and join us).

HOW TO READ TECHNICAL ARTICLES:

People sometimes complain that RadCom technical articles (or any other technical articles) are difficult to read and understand. Well, thanks to the excellent Central Scotland FM Group newsletter "FM News" - which gave us the idea for the following - you'll never have that problem again. Here's a translation of the meaning of some of the more common technical phrases seen in articles.

SENTENCE	MEANING
It can be shown that....	It isn't at all clear to me, but I'm shaming you into taking it for granted
It did not operate as well as had been predicted	It burst into flames
High transient thermal impedance	I burnt my fingers on the BF981 in the preamp
After much experimentation, a solution was found	I fiddled about with it for ages and it suddenly started working
A typical sample	The only one which did more or less what I wanted, once
Transient tests were carried out	The fuses blew every time I switched on
This value is a first approximation	This value is flagrant guesswork
It should be possible to improve the method	Nothing whatsoever worked
The fundamental engineering principles are now outlined in detail	I nicked this from another article
The equation was solved numerically	I averaged eight answers that looked vaguely right
It is of interest to compare....	It isn't of the slightest interest, actually, but it'll fill more space and I'll get paid more and I can also have a go at G3...'s efforts in the other mag.
There are certain practical difficulties in realising this figure	All the transistors are simultaneously destroyed if you tweak RV3 with power on
The gain figure is sub-optimal	It has no gain and a 22dB noise figure
The efficiency has not been optimised	It's giving 4W out for 900W in and glowing red
On-air performance is extremely good	I called CQ for three hours and worked one station who gave me 4 and 2
The author wishes to thank G3... for his comments on the manuscript	G3... completely rewrote the article
The author wishes to thank G4... for his constructive comments on the project	That nuisance G4... kept calling me and complaining about the signal.
The author wishes to thank G6... for his assistance	G6... got it to work

So now you know. Simple, isn't it?

WHERE'S MY RADCOM?:

Commencing with the September 1987 issue, the printing of Radio Communication was placed in the hands of a new printer who was local to Potters Bar and also had in-house mailing facilities. Unfortunately, during the production of the October issue, the new printer decided to dispense with its in-house typesetting facilities. The consequent disruption of the production schedule resulted in the October issue being posted on 2 October and the November issue on 6 November, both being about a week after the scheduled publication dates. This has had a 'knock-on' effect and it seemed likely, at the time of going to press, that this issue would also be posted about a week late. In the meantime, we have made an urgent search for local typesetters who can undertake the work of setting the text for RadCom and, if all goes well, it is hoped that production will be back on schedule for the January issue. However, if your January issue has not appeared on your door-mat by the scheduled time, please give it a few more days before contacting HQ for a replacement. The delay may be due either to our typesetting problems or general delays in the post-Christmas post.

UK FREQUENCY ALLOCATIONS:

In conjunction with the DTI, HMSO plans to produce a coloured leaflet showing how the radio spectrum (up to 400 GHz) is allocated to all the different services. The Society hopes that this new leaflet might be made available to members. As we went to press, we were discussing this possibility with HMSO and if we can obtain copies in bulk for redistribution to members, we'll let you know in January's Bulletin.

DTI ANNUAL REPORT PUBLISHED:

The Radiocommunications Division of the DTI has just published its second Annual Report for 1986/87 - a copy flopped on our desk just as we went to press. More next month, but you can get one free on request from Waterloo Bridge House.

RSGB HON. TREASURER RETIRES:

After ten years of sterling service, Mr David Cornish, G3COR, has resigned from his position as the Society's Honorary Treasurer as a result of continuing ill-health. The Society wishes formally to place on record its thanks to David for his efforts on its behalf. The new Honorary Treasurer will be appointed at the first Council meeting of 1988.

Council Brief...

10 September 1987

Following earlier requests from the membership at previous Annual General Meetings, the Society's Council considered the selection of the venue for the Annual Meetings of the Society for 1988 and beyond. It was agreed to invite affiliated clubs, societies and registered groups to put forward suggestions for the Annual Meeting venue - a notice would be published to this effect in the December issue of the RSGB Bulletin. Council also discussed the use of audio/video equipment at this year's AGM and agreed to issue the following policy statement with the Annual Meeting Agenda - "as an experiment, the Society will make available for sale official audio tape recordings of the proceedings. The use of video equipment at the meetings will not be permitted".

Council had previously wished to change the format of the proxy voting paper so that members could vote for or against each particular motion to be discussed. This would involve a change to the Society's Articles of Association. A draft notice/agenda for an EGM to be held on 5 December was approved by Council.

Council spent some time discussing reports from its Committees for the 1986/87 financial year (a summary of these reports was published in the Society's Annual Report in the November 1987 issue of Radcom). It was agreed that in future a special President's Advisory Group would consider the detail contained in Committee reports in order to assist Council in its deliberations.

Council considered its annual awards and agreed recipients for the following trophies: Founders, Rotab, Courtney-Price, Norman Keith Adams, Ostermeyer, Wortley-Talbot and Raynet. Council also proposed two new Vice Presidents whose appointments would be discussed at the next meeting of Council.

Mr. B. O'Brien introduced the financial report. Only draft accounts for the 1986/87 financial year were available. These showed a loss which had been anticipated because of the recruitment of new senior staff and other expenditure. It was noted that the financial report for July had been made available to the F & S Committee, who would circulate it to Council for discussion at the next meeting. Mr. B. O'Brien commented that the new financial reporting methods appeared to be working well.

The Secretary reported on a number of matters including: attracting young people to amateur radio, DTI matters including the licence review, packet radio and CEPT licensing, the future of the Society's publication programme and EMC. He noted a number of staff changes at HQ; one from the despatch section, two from accounts and two new recent recruits to the MSD. Senior HQ staff felt that the Call Book/Members Handbook had had a notable effect on getting routine information to members at large. Consequently, it was now planned to print more information in the next edition of the Call Book. The Secretary also reported on a recent meeting in his office to revitalise interest in Amateur Radio Direction Finding. Council welcomed the Secretary's report on this topic and agreed to set up a new ARDF Working Group once a Chairman has been appointed. The Secretary also reported on the recent visit of Mr M. Mandrino, YT7MM, to RSGB HQ and on new antenna planning legislation being proposed by the Manx Government. The latter had been referred to the Society's representative on the Isle of Man and the Chairman of the Society's Planning Committee.

In addition, Council also discussed the following topics:

a) arrangements for the 75th Anniversary celebrations
b) awards to Committee members
c) time-consuming enquiries from members
d) the DP Act
e) future mailing shots
f) lapsed members
g) the cost of RSGB publications
h) the development of closer links between the Society and the RAIBC.

24 October 1987

Several main items of business dominated the Council meeting held on 24 October 1987. The Society had received some very positive comments concerning the new RSGB Liaison Officer Scheme, together with a few letters of criticism. One point which had been brought out was the need to reduce the size of some of the areas even further to make the job of the RLO more manageable. It was agreed that the M & R Committee (to be reformed as the Membership Liaison Committee on 1 January 1988) should look at the question of areas again, and a further call for nominations for those areas where the post of RLO had not yet been filled would be made. It was also agreed that a deputy RLO could be appointed by the RLO with the agreement of the Committee in areas such as major cities. In connection with the new RLO scheme it was agreed to ask M & R to clarify the position of registered RSGB groups.

Further discussions took place with regard to arrangements for the 75th Anniversary celebrations for 1988. Council approved in principle a schedule of events during the period 15 to 31 July inclusive. It was now hoped to activate a special event station from Windsor Castle as part of the Society's celebrations.

Under the heading of financial report, Mr. McClintock reported that the final outcome for the 1986/87 financial year showed a deficit after tax of £33,786 compared with the surplus made of £3,903 during the previous year. Council discussed in detail the financial reports for July and August 1987, which had been produced as a result of the new software recently installed at HQ. The main area of concern at present was book sales and the Secretary was urged to take a special look at this area in order that the F & S Committee could reconsider book policy in the light of the down-turn in sales. Council unanimously reaffirmed its policy that the Society provide high standard, up-to-date, reasonably priced books for the radio amateur. Council approved the 1986/87 accounts for signing and publication.

Council noted that David Cornish had recently had to go into hospital again and had expressed his wish to retire as Honorary Treasurer. It was noted that Mr. B. O'Brien, G2AMV, had recently expressed the view that he now wished to make himself available for the post of Honorary Treasurer if Council so wished. In view of Mr. B. O'Brien's imminent hospitalisation for a routine operation, it was decided to leave the appointment of a new Honorary Treasurer to the 1988 Council. In the meantime, F & S would be able to call upon the expertise of Mr. N. O'Brien, G3LP. Council noted the outstanding services of Mr. Cornish during the past 10 years and intended to recognise his work in an appropriate manner. (over)

(cont from previous page)

Attracting newcomers to amateur radio was another main theme for discussion by Council. The Secretary reported on meetings he had held with the Scout Association and that a new group had recently been formed under the Chairmanship of Don McLean, G3DNQ, to work on a recruitment video presentation. It was intended to seek financial assistance from outside sources for this project. Many professionals involved in the media had recently met at HQ and it was hoped to produce a first video on recruitment by July 1988. Council noted progress with the development of ideas for the Student Licence and the DTI's Young Amateur of the Year project.

The Secretary reported on his recent attendance at TELECOM 87, the value of the IARU stand at the event and the people that he had met who would influence amateur radio in the future. A special feature on TELECOM 87 would appear in the December Bulletin. The Secretary reported that during TELECOM 87 he had had an opportunity to visit the Mercury stand and that as a result he had asked the HQ Manager to carry out a study on the relative merits and costs associated with Mercury and BT telephone systems.

A number of awards for contests were approved by Council. In that context, a discussion followed as to how Council could best show its appreciation of volunteer Committee members who often gave up a considerable amount of their spare time to RSGB work for the benefit of amateur radio. Council approved two new Vice Presidents, Dr. D.S. Evans, G3RPE, for outstanding service to the Society, and Mr. D. Willies, G3HRK, for outstanding service to amateur radio through Raynet.

In order to further develop Amateur Radio Direction Finding in the UK, Council appointed Mr. Pearce-Boby, G3JLE, as Chairman of a new Council Working Group.

The draft agendas for the forthcoming AGM and EGM were discussed by Council. Following advice from solicitors, Council agreed to incorporate an item onto the agenda of the EGM concerning members of Council over 70 years of age.

In addition to the above, Council discussed the following business:-

a) the Data Protection Act
b) the format of Club News
c) Committee budgets
d) the forthcoming edition of the UK Call Book
e) Radcom staffing
f) the authorisation of direct debit facilities
g) life membership
h) membership composition of the EMC Committee
i) the agreement of scrutineers for the 1988 Council elections
j) the commercial interests of Committee members
k) slow morse frequencies on the 144 MHz band which was referred to the VHF Committee
1) the RAE Advisory Group.

Council accepted with thanks an offer from the Telford & DARS for a trophy for a 50 MHz contest.

WORLD SCOUT JAMBOREE

Some months ago, we mentioned that there was a strong likelihood of some amateur radio operation taking place from the World Scout Jamboree, which will be held at Cataract Park about 70km SW of Sydney Australia from 30 December 1987 to 10 January 1988. The latest news is that an amateur radio station, using the special callsign AX2SWJ, will be located in a building on site. Three 24m poles have already been erected for the antennas - though we don't know what type of antennas will be used. There's been some difficulty in finding enough scout amateur operators to man the station for the duration but this has now been resolved with the help of local non-scout operators. At least one UK scout amateur operator is known to be attending the Jamboree; Matthew Neal, G0HLW (ex-G1VIJ) who is a Pack Leader with the 2nd Olton Scout Group.

Initial plans are for the special station to be active throughout the Jamboree and if you'd like to contact AX2SWJ, try one of the following frequencies as propagation permits:-

3590 kHz
7090 kHz
14.190 MHz
21.190 MHz
28.390 MHz

...all plus or minus QRM!

RSGB STAFF APPOINTMENTS

WANTED - EDITOR:

The Society is looking for a new editor for RadCom. "Hutch", otherwise Alf Hutchinson, the indefatigable editor of the Society's magazine "Radio Communication", retires in 1988 and we shall shortly be commencing our search for someone equally talented and tireless to replace him. It goes without saying that the editor of our magazine occupies a key position in the Society's affairs and it's important that we find the right person. This is by way of being an advertisment for such an individual!

These are the qualities we're looking for:

* experience of magazine editing (essential)

* licensed amateur or swl (a positive advantage)

* literacy and fluency (indispensable)

We offer a highly attractive salary to the right person, commensurate with the importance of this position.

If you're interested and think you measure up to the requirements of this pivotal post at RSGB Headquarters, write to the Chief Executive and mark your envelope "Confidential - RadCom Editor". Enclose a comprehensive CV and tell us exactly why we should appoint you as Editor as opposed to anyone else and what you could bring to the position: we also want to see examples of your work.

We'd like to hear from you by the end of February at the latest.

NEW MSO:

We need another Membership Services Officer, and we're looking for a very special person. Basically, the position involves the processing of applications for special event stations and Morse tests but there's much more to it than that. Amongst other things you'll need to be able to type reasonably well and not be terrified by computers and suchlike, since you'll be working a lot of the time with our IBM System/38 computer. A flair for administration and a positive genius for handling queries on the telephone are also important qualities we're looking for. In MSD you're in the front-line and operating as part of a professional team - so you need to be good!

We're an equal opportunity employer and offer an attractive salary to the right person. If you're interested, give Brett Rider a ring at HQ for a preliminary discussion. Oh, we almost forgot - you'll need to have held an A or B licence for at least two years.

Events Diary

Mobile Rallies

This is a list of all rallies, exhibitions and conventions notified to HQ **(as at press date)**. Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign and telephone numbers direct to HQ and marked 'Bulletin'.

6 DECEMBER
*Verulam Christmas Rally - St Albans City Hall. Details Hilary G4JKS, tel: 0727 59318. Trade tel: Watford 52959.
13 DECEMBER
*Leeds & District ARS Christmas Rally - Pudsey Civic Centre, Dawsons Corner, Pudsey, nr Leeds. Details G4WYO, tel: 0274-685039.
24 JANUARY 1988
*Oldham Amateur Radio Rally - Queen Elizabeth Hall, Civic Centre, Oldham. All the usual attractions including a bring & buy stall. Doors open 11am, talk-in available on S22 from 9am. Free equipment minding service. Details Cathy, G4ZEP tel: 061-652 8617.
31 JANUARY
*26th NARSA Exhibition - Norbreck Castle Exhibition Centre, Blackpool. New venue, usual traders, *RSGB stand*. Details Peter G6CGF, tel: 051-630 5790.
27 FEBRUARY
*Rainham Radio Rally - Parkwood Community Centre, Deanwood Drive, Rainham, Gillingham, Kent. (5 mins from M2 junc 4). Opens 10am, many traders, bring & buy stall. Talk-in on S22, SU22 and 29.500 MHz FM by GB4RRR. Details Bob G1LKE, tel: Medway 362154.

IN BRIEF - More details later.

5 MARCH
*Blue Star Rally - High Gosforth Park (Newcastle Racecourse). Details Tyneside ARS, 13 Lothian Court, Newcastle, Tyne & Wear NE5 3TZ.
6 MARCH
*Welsh Mobile Rally - The Barry Leisure Centre, off Holton Road, Barry. Details Mike GW8CMU, tel: 0446-711426.
13 MARCH
*South Essex ARS Mobile Rally - The Paddocks Community Centre, Canvey Is, Essex. Details G0BBN, tel: 0268-755350.
20 MARCH
*8th Annual Pontefract Components Fair - Carleton Community Centre, Pontefract. Details G0AAO, tel: 0977-43101.
*Mid-Devon Rally - Pannier Market, Tiverton. Details G4TSW, Mid Devon Rally, PO Box 3, Tiverton, Devon.
27 MARCH
*White Rose Rally - University of Leeds. Details G0ECM, tel: 0532-676368.
10 APRIL
*North Cornwall Radio Rally - Launceston Town Hall. Details Maggie, RS90696 tel: Launceston 5632.
*Lough Erne ARC Rally - Killihevlin Hotel, Enniskillen. Details Billy, tel: 0365-24905.
17 APRIL
*Trafford Rally & Components Fair - Lancashire County Cricket Ground (Old Trafford), Talbot Road, Old Trafford, Manchester. Details Graham G1IJK, tel: 061-748 9804.
24 APRIL
*BATC Rally - Rugby Post House Hotel, Crick, Northants, (M1 junc 18). Details Trevor G8CJS, tel: 0532-670115.
*Swansea ARS Rally - Patti Pavilion, Swansea. Details Roger, tel: 0792-404422 evenings.
*Marske-by-the-Sea Rally - Marske Community Centre, High Street, Marske, nr Saltburn, E.Cleveland. Details Jimmy G1VLG, tel: 0642-219586.
1 MAY
*RSGB VHF CONVENTION - Sandown Park Racecourse, Esher, Surrey. Details G3FZL. Trade - Les, G5HD tel: 040 928-342.
*5th Anglo-Scottish Rally - Tait Hall, Kelso. Details Andre GM3VLB, tel: 0573-24664 (evenings).
2 MAY
*Mid Cheshire ARS Rally - Civic Hall, Winsford, Cheshire. Details David, tel: 0606-77787.
8 MAY
*Swindon & DARC Radio, Electronics & Model Engineering Fair - Science Museum, Wroughton, nr Swindon, Wilts. Details Ken G8SFM, tel: 066689-307.
*Yeovil QRP Convention - Preston Centre, Monks Dale, Yeovil. Details Dave G1HNM, tel: Yeovil 79804.
*Drayton Manor Rally - Drayton Manor Park, nr Tamworth, Staffs. Details Norman, tel: 021-422 9707.
15 MAY
*Cambridge & DARC RAlly & Car-boot Sale - Coleridge Community College, Radegund Road, Cambridge. Details Brian G4TRO, tel: 0223-353664.
29 MAY
*Plymouth RC Mobile Rally - Plymstock School, Plymstock. Details Joe G1RXR, tel: 0752-662511.
5 JUNE
*Southend Mobile Rally - Rochway Centre, Rochford, Essex. Details G8EFG, tel: 0268-755331.
*Boltonn ARC Mobile Rally - Venue to be announced. Details Kenneth G6ZJL, tel: 0204-696906.
12 JUNE
*Elvaston Castle Mobile Radio Rally - Elvaston Castle Country Park, nr Derby. Details John G4PZY, tel: 0332-767994. Trade enquiries, G4HIJ, tel: 0335-43241.
*RNARS Annual Mobile Rally - HMS Mercury, nr Petersfield, Hants. Details G4UJR tel: 0703-557469.
18 JUNE
RAFARS Golden Jubilee Radio Rally - RAF Halton Air Show, Wendover, nr Aylesbury, Bucks. Details Terry G4PSH, tel: 0296-85760.
26 JUNE
*31st Longleat Mobile Rally - Longleat House, Warminster, Wilts. Brian G4FRC, tel: Portishead 848140.
10 JULY
*Worcester & DARC Strawberry Rally - Droitwich High School. Details Steve, tel: 0905-424151.

± 15/16/17 JULY ±
± *RSGB 75th ANNIVERSARY NATIONAL CONVENTION - ±
± National Exhibition Centre, Birmingham. Details±
± RSGB HQ. Trade - Norman, G3MVV tel: 0277-225563±

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24 JULY
*McMichael 88 Rally - Haymill Centre, Burnham, nr Slough. Details Bob G0BTY.
*Anglian Mobile Rally - High Woods Sports & Leisure Centre, Severalls Lane, Colchester. Details G6HOI, tel: 0206-862403.
29-31 JULY
*AMSAT-UK Colloquium - University of Surrey, Guildford. Details G3AAJ, tel: 01-989 6741.
14 AUGUST
*RSGB MOBILE RALLY - Woburn Abbey, Bedfordshire. Details RSGB HQ. Trade - Norman, G3MVV tel: 0277-225563.
21 AUGUST
*Red Rose Rally - Bolton Sports & Leisure centre, Silverwell Street, Bolton. Details David G1IOO, tel: 0204-24104, evenings.
28 AUGUST
*Torbay ARS Rally - STC Social Club, Brixham Road, Paignton, Devon. Details G3KZJ.
4 SEPTEMBER
*21st Preston ARS Rally - University of Lancaster. Details Godfrey G3DWQ.
*Telford Radio Rally & Exhibition - Details Martyn G3UKV tel: 0952-55416.
11 SEPTEMBER
*Lincoln Hamfest '88 - Lincolnshire Showground, 4 miles N of Lincoln on A15. Details John G8VGF, tel: 0522-25760.
*Vange ARS Rally - Nicholas School, Leinster Road, Basildon. Details Alan G4OJN, tel: 0277-624386.
17 SEPTEMBER
*Scottish Amateur Radio Convention - Aberdeen. Details GM4ZUK.
*Peterborough E&RS Rally - (Provisional) Details G4PNW - QTHR.
18 SEPTEMBER
*Bristol Radio Rally - Brunel's Great Train Shed, Temple Meads Station, Bristol. Details Dave G4WUB, tel: 0272-839855.
25 SEPTEMBER
*RSGB HF CONVENTION - Belfry Hotel, nr Oxford. Details RSGB.
2 OCTOBER
*Great Lumley AR & ES Rally - Community Centre, Great Lumley, Chester-le-Street, Co.Durham.
*Wakefield Mobile Rally - Details Steve G4RCH, QTHR.
8 OCTOBER (Provisional)
*Midlands VHF Convention - Details Peter G3UBX.
9 OCTOBER
*Armagh Rally - Drumshill House Hotel, Armagh. Details GI8RNX.
28/29 OCTOBER
*Leicester Amateur Radio Show - Granby Halls, Leicester. Details Frank tel: 0533-553293 daytime.
13 NOVEMBER
*Bishop Auckland Radio Rally - Venue to be advised. Details Morris, tel: 0525-314638.

OTHER EVENTS

5 DECEMBER 1987
*RSGB ANNUAL GENERAL MEETING - IEE, Savoy Place, London WC2 starting at 2pm prompt. Nearest underground stations, Embankment or Charing Cross.
6 DECEMBER 1987
Pembrokeshire RS Bring & Buy Sale - Further Education Centre, Tower Hill, Haverfordwest. Starts at 2.30pm, trade space available, radio, electronics, anything, bargains galore! Refreshments, multi-prize raffle. All are welcome and details from Brian GW0IER, tel: 06462-2825.

GB Calls

The list below shows ALL the special event stations licensed for operation during December - **(as at press date)**
It is taken direct from the GB Calls file on the HQ computer. These callsigns are valid for use from the date given but the period of operation may vary from 1 to 28 days. There's now no need to send details direct to the editorial office.

1 DECEMBER
GB0CDE - COASTAL DEFENCE 'E': Fort Purbrook, Locator: IO 90 LU. Details G0DHZ.
GB1CDS - COASTAL DEFENCE 'S': Fort Southwick, nr Portsmouth, Grid: SU 628 069. Details G6MWY.
GB1ECC - EISTEDDFOD: Alexandra Dock, Newport, Gwent. Details GW1XYO.
GB4MPS - MOUNT PLEASANT SCHOOL: Southampton. Details G4MNP.
3 DECEMBER
GB2CDW - COASTAL DEFENCE 'W': Bridge Mary, Gosport, Hants. Details G0GIA.
4 DECEMBER
GB0CDX - COASTAL DEFENCE 'X': Golden Hill Fort, Freshwater, IOW. Details G3RJK.
GB2ASS - ASHURST SPECIAL SCHOOL: Skelmersdale, Lancs. Details G4WJR.
GB2HMS - HER MAJESTY'S SHIP: Catteridge, Birmingham. Details G0EBW.
GB6GD - GUIDE DOG: Village Hall, Colkirk, Fakenham, Norfolk. Details G4DCJ.
5 DECEMBER
GB0CDR - COASTAL DEFENCE 'R': Cowes Castle, The Royal Yacht Squadron, Cowes, IOW. Details G4ZFQ.
GB2SNP - ST NICHOLAS PATRONAL: St Nicholas Church, Warwick. Details G0GNF.
GB4GWR - GREAT WESTERN RAILWAY: Didcot Railway Centre, Oxon. Details G4PFY.
6 DECEMBER
GB2MS - MULTIPLE SCLEROSIS: Skelmersdale, Lancs. Details G4NDJ.
7 DECEMBER
GB2EC - EISTEDDFOD CASNEWYDD: Newport, Gwent. Details GW0FXC.
8 DECEMBER
GB5SM - STAMFORD MUSEUM: Broad St., Stamford, Lincs. Details G3HEE.
11 DECEMBER
GB0CDT - COASTAL DEFENCE 'T': Bridgemary, Gosport, Hants. Details G0GIA.
12 DECEMBER
GB0IBC - INVALID BLIND CLUB: Leyland, Lancs. Details G0GPI.
13 DECEMBER
GB1CDM - COASTAL DEFENCE 'M': Fort Monkton, Grid: SZ 612 978. Details G6MWY.
GB2WYR - WEST YORKSHIRE (PUDSEY) RALLY: Yarnbury RUFC, Horsforth, Leeds. Details G4WYD.
15 DECEMBER
GB2CDQ - COASTAL DEFENCE 'Q': Rowner, Gosport, Hants. Details G4LIK.
GB2CDR - COASTAL DEFENCE 'R': Rowner, Gosport, Hants. Details G4LIK.
16 DECEMBER
GB1CDJ - COASTAL DEFENCE 'J': Round Tower, Portsmouth. Grid: SZ 631 993. Details G6MWY.
GB1CDQ - COASTAL DEFENCE 'Q': Square Tower, Portsmouth, Grid: SZ 631 993. Details G6MWY.
17 DECEMBER
GB1CDE - COASTAL DEFENCE 'E': Fort Purbrook, Grid: SU 678 064. Details G1XJR.
19 DECEMBER
GB2YRS - YORK RADIO SOCIETY: Tollerton, York. Details G3TMN.
20 DECEMBER
GB2WS - WINGERWORTH SCOUTS: The Hutt, Wingerworth, Chesterfield. Details G3YBO.
24 DECEMBER
GB1CDV - COASTAL DEFENCE 'V': Fort Cumberland, Portsmouth. Details G8TNO.
27 DECEMBER
GB2IVS - INTERNATIONAL V SCOUTS: 91st Leicester Scout HQ., Leicester. Details G4SJX.
29 DECEMBER
GB1CDS - COASTAL DEFENCE 'S': Fort Southwick, nr Portsmouth, Grid: SU 628 069. Details G6MWY.

NEWS & VIEWS

HF

*John Allaway, G3FKM**

THE EDITOR has received two letters – one complaining that rules for a contest were not published early enough and the other that too much space in this column is used up with contest information! Not a landslide of complaints exactly, but an indication of one of the problems of producing a monthly magazine....

G4NXG/M has now worked 211 countries as a mobile and wonders if this is a record?

Photographs for use in *HF* are always most welcome and wherever possible will be returned to their owner if so requested. However, accidents do happen and I would like to advise anyone with an irreplaceable picture to not send it – just in case.

Computer propagation forecasting

G3JAG has written about the excellent *Miniprop* forecasting program which has been produced by Shel Shallon, W6EL. It covers 3 to 30MHz and needs only the date, the predicted sunspot number and the coordinates of the ends of the relevant path. It calculates bearings, sunrise/sunset times and grey line directions for both ends of the path. A user modifiable atlas is included, based on prefixes. John says that there are several versions – version 1.0 which is the original and requires 39k of free memory and is claimed to run on all machines under CP/M 2·2 or 3·0 but it didn't seem to work properly on any Amstrad and dropped stone dead under CP/M 3·0 (CP/M Plus). However he has created a reliable version for the Amstrad CPC 464/664/6128 under CP/M 2·2 only. The minimum requirement (for the 464) is one disc drive. Version 2·0C is the latest, enhanced, Miniprop. It is completely menu-driven and runs under CP/M 2·2 or 3·0 on the CPC 6128 as well as under 3·0 on the PCW 8256/8512. Because it needs more memory it will not run on the standard CPC 464/664.

Version 2·0M, is exactly the same as 2·0C except that it is for MSDOS machines eg PC compatibles such as the Amstrad PC1512. All versions run well in a 256K Ramdrive/silicon disc if available. *Miniprop* is a copywright work but Shel Shallon makes it available for personal, private use. He requests donations from those who find the program useful and it is available from him for US$25 – however this is not on an Amstrad compatible disc and he can only supply a limited range of disc formats. Members of the CP/M User Group can obtain it from the Library in most CP/M or MSDOS formats.

RSGB members can obtain customised Amstrad copies from G3JAG on standard SS/DD 178k data format three-inch discs and he is also able to put the files onto 5·25in floppy disc but only by prearrangement. MSDOS copies will have to be on a standard 40-track 5.25in SS/DD disc. If a system disc is sent an auto-boost RAM drive version will be supplied. If a formatted disc (preferably with an ascii text file on it for checking the format) together with callsign, exact QTH (latitude/longitude), is supplied together with £2 for expenses John will send the program. It is then up to individual users to send their donation to W6EL. Please note that these programs will not run under Basic on any machine and that they are not available as a listing. Those interested should send an sase to John Crux, 4 Sandyway, Prestwich, Manchester, M25 8PG.

Western DX Group

I recently gave publicity to the Chiltern DX Club and this time it is the turn of this group which exists in SW England and S Wales. It is not a club and has no formalstructure.Its purpose is to bring together those actively interested in pursuing hf dx by providing immediate information about dx station activity as it occurs. Information is passed on or relayed to other group members by the use of 144MHz fm on 144·525MHz. The group started in 1982 using the same frequency as the Chiltern DX Club. Today there are nearly 30 dx information contributors from Monmouth to Yeovil and across to S Devon. Some can hear all stations while others rely on relayed information. It is now becoming increasingly possible to exchange information not only with Chiltern DX Club members but also other groups elsewhere in the southern UK who are also using the same frequency.

The value and added enjoyment that the group provides can be seen in the number of newly licensed amateurs in the area who have immediately become dx enthusiasts. Some GW0 and G0 operators have already worked in excess of 260 DXCC countries and are anticipating the honour roll. Others who have been chasing dx for many years have increased their six-band scores and found enjoyment in helping the new dx operators. Anyone who seriously pursues DXCC is welcome. Listen on 144·525MHz and if you can hear dx information from the Western DX Group then join in. You will be welcome.

DX News Sheet has written: "The 2m frequency 144·525MHz fm has long been used by groups of hf operators around the UK to discuss dx matters. At the HF Convention several members of the Western DX Group suggested that publicity should be given to this activity and attempts be made to have the frequency identified in band plans as a meeting frequency for hf dx operators. DXers using 144·525MHz fm for this purpose are invited to write to *DXNS* so that activity may be assessed. The *DXNS* office is at 123 Reading Rd, Finchampstead, Wokingham, Berks, RG1 4RD)."

DX news

According to the *Long Island DX Bulletin,* TJ1DL, in **Cameroon** follows the propagation paths around 14·025, 21·025, or 28·025MHz beginning about 1500, and also occasionally uses ssb near 21·330kHz. FR5ES on **Reunion** likes 14·195kHz around 1600 and he may visit **Europa, Glorioso,** and **Tromelin Is.** From **Botswana** A22RB is regularly near 21·255kHz from 1900. YU2NA will be in **Angola** until next March and it is rumoured that he has been promised a licence.

3X0HBR in **Guinea-Bissau** has been worked in the UK on 21MHz ssb around 1900 and I have correspondence from M Sotero Sousa, who is president of the Radio Club Guineen – this might well mean that we are about to see increased activity from there soon. Morse practice tapes and two Project Goodwill kits have been sent to the club by ARRL.

QSL cards for contacts with 5U7/I2VA have now been accepted for DXCC credit, and TU4BR/5U7 has been working into Europe on 21 and 28MHz ssb and he will be visiting the USA and taking documents with him to show that he is licensed.

According to *DX News Sheet* F6AJA has confirmed that unfamiliar FT prefixes may be heard from the **French Antarctic Territories.** FB1MSR may be FT2X?, ex-FL8DD may become FT4X?, and ex-FY7BH may appear as FT5X? – all from Kerguelen. F5NB will be FT5Y? from Adelie Land, and FC1HJO and F6CZB may appear as FT3Z? and FT5Z? respectively from Amsterdam Is. FT8WA on Crozet Is is reported by *DX-NL* to be found on 3·795MHz from 0300 and to be willing to move to 1·8MHz on request.

9X5CM has recently appeared on 14MHz ssb around 1800 and is reported to be likely to remain in **Rwanda** for two years. T5GG is believed to be Italian and claiming to be in **Somalia,** and he has been reported around 14·150MHz at 0830 and later on 14·200MHz at 1930. Larry, TZ6VV, from **Mali,** is believed to like 21·271MHz from 1400 and should have a tri-band beam up by now. S92LB is regularly active between 21·300 and 21·330MHz after 1900, and 5T5RA, in **Mauretania,** is often a little higher in frequency at the same time. Lastly from Africa 5V7SA in **Togo** was often to be found near 14·160MHz at 2100 at the time of writing.

W7SW/KC4 is on a project with the US National Science Foundation and will be at McMurdo Base, **Antarctica,** until February 1988. He will be active on a number of bands. ZS7ANT is located at 70S 02W and has worked into the UK on 14·227 around 1900 and also on 28·525kHz around 1600. He will remain there until about the end of February . Sojo., VK7ZSJ, who was formerly VK0SJ, may be on the air as ZL6BA by the time this column is being read. From the USSR part of Antarctica 4K1A is running 1kW power into a rhombic antenna and has been on the low end of 14MHz around 1800.

In mid-October the situation concerning the proposed expeditions to the **Saharan Arab Democratic Republic** was unclear. According to EA2JG in *DXpress* the activity first began to be planned two years ago and all systems were go for early August. He suggests that the arrival of the German group just two weeks before this planned date caused confusion among the RASD and Algerian autorities who therefore decided to postpone everything for the time being. EA2JG, EA1QF, EA4DO, and EA2XC again met the RASD authorities on 5 September and both sides agreed to reserve judgement on what had happened. They agreed to carry on with the project and (according to EA2JG) the Lynx DX Group still holds the original and, so far only, permission to operate from RASD territory. The group regrets the inconvenience caused by this postponement.

Rumours of an expedition to **Yemen** which is being orgainsied by OE6EEG for this month appear in the *Long Island DX Bulletin*, and the same news source quotes Ron, ZL1AMO, as saying that he may join a scientific expedition to the **Auckland Is** (ZL9) in late February.

*10 Knightlow Road, Birmingham B17 8QB.

LU1ZA, who is believed to be on the **S Orkney Is,** has been active on 7MHz cw around 0300.

Peter, PA0CRA, is planning a return visit to the Caribbean and hopes to visit FY, 8R, FS, FJ, VP2M and VP2EJ, during a two week spell beginning about 15 December.

VK4ZG is reported active again from **Willis Is** following the recent staff changeover. Dave Shaw, VK3HDF, is back on **Heard Is** with this season's ANARE scientific expeditions to Antarctica and Macquarie Is He hopes to be on the air with his VK0HI call whenever time permits, until he leaves in March or April. He will have dipoles on all bands from 3·5 to 50M z, and it is believed that there will be no cw operation.

Those looking for a QSO wth the **Sovereign Base Area of Cyprus** will like to know that ZC4AP keeps a schedule with G0IHK every Sunday on 21·265MHz at 1300, after which he is available for other contacts, 9M6AE is now on from **Sabah** and has been working into the UK on 14MHz ssb between 1300 and 1500. He has a FT757 an a vertical antenna and will be particularly looking for UK stations on 14·165MHz from 1500 on weekdays. XU1SS is still to be found often with YB3CN on Mondays and Tuesdays at 1300 on 14·165MHz. Anyone making a contact and sending a QSL to any address in Thailand is asked particularly not to mention a callsign on the envelope.

G5JL has sent in a note received in response to his QSL request for a contact with ZA0RA. It came from Radio Tirana and says simply "We do not know any radioamateur with the sign ZA0RA, therefore we are sending back your QSL..."

Ken Randall, GD3RFH, well known to older dxers for his VP8HF/VP8 operation from the S Sandwich Is over 23 years ago, says that he has an Admiralty chart of the area which is available to anyone else contemplating a visit! However, he does not have any QSL cards left.

Welcome...

...to the following who became members of the Society during September: EA6FB, F6CCW, IK2BLA, VS6XMG, WA5LNB and G3WQU/4X. New listener members included J Zelisse (PA0), N Langmead, P Palamghat (VU), and L Jones (DL).

A special welcome also this time to a famous dx personality – Mary Ann Crider, WA3HUP, who is JY1's QSL manager as well as QSL manager for the W3 area and for many dx stations in addition to being an honorary member of RJARS.

Contests

The UBA SWL Competition
0000 1 January to 2400 31 December 1988
The object is to log as many different DXCC countries as possible during the year on six bands-1·8, 3·5, 7, 14, 21, and 28MHz. Each country heard counts one point on each band and each country counts as a multiplier. The final score is the total of countries heard on each band added together multiplied by the number of different countries heard. There are five categories – (1) Phone (2) CW(3) Rtty, Amtor and Ascii (4) SSTV and Fax (all single-operator) and (5) all modes club – this category must mention more than one operator. To enter the competition an interim result has to be submitted twice during the year – no later than 1 April and 1 September, and the final log has to be sent before 31 January 1989. Copies of the full rules are available from me in exchange for an sase. This contest didn't produce many British entries in 1986 which to me seems to be a pity as it is an interesting test of DX copying ability. RS88825 scored 48,471, G1VDW 15,752, and RS28198 14,630 in the Phone Section. In the cw section RS52868 scored 56,405, and RS84869 44,955.

Happy New Year Contest
0900 to 1200 1 January 1988
3,510-3,560, 7,010-7,040, and 14,010-14,060kHz cw only. Open to all licensed amateurs and listeners. Class 1 max 500W input, Class 2 max 100W input, Class 3 max 10W input, and Class 4 – listeners. Exchange RST and QSO number. AGCW members will also send membership number. Each QSO counts one point and a station may be worked once per band and only DXCC countries in Europe may be worked. The multiplier is one for each QSO with an AGCW member. Final score equals total points times multipliers. Enclose usual declaration and post logs before 31 January to Fritz Bach Jr, DK1DV, Eichendorf Str, 15, D-4787 Geseke, FR Germany. In the **QRP Winter Contest 1987** (Class A) G8PG was top score with 12,012 points, G3DNF second with 6,335 and G4BUE third with 5,811. G3KDB scored 818.

QTH CORNER

F6AJA	Jean M Duthilleul, 515 rue du petit hem, Bouvignies, 59870 Marchiennes, France.
JW5E	LA5NM, M. Bjerrang, Box 210, N-9401 Harstad, Norway.
P40M	Nao Akiyama, N1CIX, P.O. Box 855, 225 Main St, Newington, Conn, 06111, USA.
P40V	WA6AHF, Rubin Hughes, 17494 Via Alamitos, San Lorenzo, CA 94580, USA.
VK9AB	Ron Wright, ZL1AMO, 28 Chorley Av, Massey, Henderson, Auckland 8, New Zealand.
VK9YH	Hans Ten Herkel, PO Box 191, 06004 Nice Cedex, France.
VK9YV	(UK only) G3TBT, RS Hodgson, Brackendene, Hollwater Rd, Passfield, Bordon, Hants, GU35 0AE.
VK9ZG	A. Harris, VK6KZH, 4 Rae Place, Leeming, WA 6155, Australia.
VK0HI	VK3EVN, 64 Orana Drive, Watsonia, Vic 3087, Australia.
VU4GDG	Coimbatore ARC, PO Box 3733, 84 Avanashi Rd, Coimbatore 641-018, India.
ZF10PW	Cayman ARS, PO Box 1029, Grand Cayman, Cayman Is.
ZL8HV	Peter Fisher, c/o 2 Airport Drive, Hokitika, New Zealand.
1A0KM	(cw) 10JX, Tony Vernucci, Via R Lanciani 30, I-00162 Rome, Italy. (ssb) I0IJ, Tony Privitera, Via Ceresia 34, I-00199 Rome, Italy.
5T5EV	Helmut van Edig, BP 372, Nouakchott, Mauretania.
8P9HR	(CQ Contest) K4BAI, PO Box 421, Columbus, GA, 31902, USA.
9M6AE	PO Box 14277, Kota Kinabalu, Sabah, E Malaysia.

The results of the **1986 LZ DX Contest** list G3ESF with 16,884 points, G3DFV 8,820, and G6NK 4,016 in the Category A, G4ZPE with 2,367 in Category B (14MHz) and G4ODV 546 (21MHz).

In the **1987 ARRL International DX Contest (Phone),** Single-operator section UK scores were as follows:- (Multi-band) GW4BLE 580, 086, GJ3ZAY 173, 952, and G2QT 129, 921 points. On 14MHz GB6AR scored 22, 263, and G4ZXC 3, 969 points. In the Multioperator Single-transmitter category G4ANT scored 226,545 (multi-band), and G6OI 10, 179 (14MHz).

In the **CW section** rather more UK stations are listed and scores are as follows:

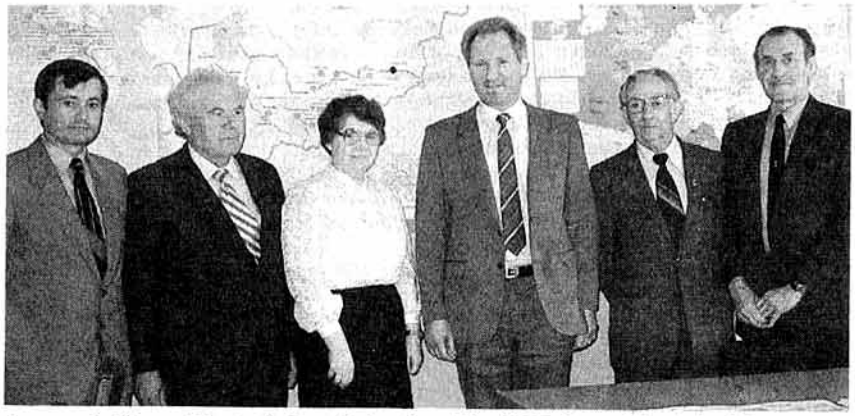
GW3YDX	(All band)	1,055,735	points	GW3JI	(All band)	63,840 points
G3FXB	(All band)	977,451	points	G6QQ	(All band)	12,168 points
G4CNY	(All band)	757,809	points	G3ILO	(All band)	11,700 points
GM3LYY	(All band)	301,290	points	G3SJX	(All band)	5,481 points
G2QT	(All band)	156,600	points	GM8SQ	(All band)	3,366 points
GM3RAO	(All band)	138,498	points	G3XWZ/A	(1·8MHz)	6,930 points
G3ESF	(All band)	74,880	points	G3TBK	(3·5MHz)	13,524 points
G3APN	(All band)	68,856	poins	GM4HQF	(14MHz)	4,092 points

In the **Multi-operator Two transmitter** section **GB4DX** was top European with 1,193,808 points.

Special congratulations to **G3FXB** who, as leading G in the cw section wins the Society's **Braaten Trophy** and to GW3YDX who as leading all-band entry from the UK (other than G) wins the **Milne Trophy.**

ARRL 160m Contest
2200 4 December to 1600 6 December
Single- and multi-operator, single-transmitter sections. Exchange RST (/MM and /AM stations send ITU zone). Multiplier is total of ARRL sections (plus VE8 and VY1 – a total of 74) and DXCC countries worked. QSOs with dx stations count five points. Note that the ARRL band-plan requires intercontinental contacts only to take place between 1,830 and 1,850kHz. Indicate multipliers first time worked and if more than 200 QSOs are made a duplicate list must be submitted. Offical log forms are available from ARRL Communications Dept, 160 Contest, 225 Main St, Newington, Conn, 06111, USA (please enclose large sase and two ircs). Entries must be posted to this address before 6 January 1988.

YL/OM Midwinter Contest
0700-1900 9 January (CW)
0700-1900 10 January (SSB)
3·5 to 28MHz following IARU Region 1 band plans. Copies of rules from G3FKM (sase please).



A group of officers of the Radio Sport Federation of the USSR. L to r: A Savetsky; A Pazoomov, UW3EE; Vern Sverolova (who runs Box 88); Vasily Bondarenko, UV3BW; Nick Kazanski, UA3AF; and interpreter.

In the results of the **1987 PACC Contest** published in the October column **G4ZIB's** callsign was printed as G4IZB. This was due to an error in the VERON listing and apologies are made to G4ZIB.

Awards

The GB Award
Available to licensed amateurs and listeners for confirmed QSOs/Reports with UK special event stations using GB calls. Basic requirement is 100 QSOs/reports, and stickers are issued at each additional 50 stage. Send log extracts certified by two other amateurs plus £1.50, US$3, or eight ircs to: 91st Leicestershire Scouts, c/o M J Harriman, G4SJX, PO Box 49, Leicester.

The YL-Year 88 Award
Class 1 - for having QSOs with eight yl operators each month for 11 months. The same station may be worked again each month. Class 2 is for working II yl operators each month for eight months. On 29 February 1988 each QSO counts two points and a maximum of these can be used as joker points. The award is issued by the DIG-PA (the Dutch section of the Diplome Intresen Gruppe) and applicants should send a list of contacts, signed by two other licensed amateurs, plus 10 ircs to: M Wolf-Wildeboer, Pilotenweg 14b, NL-8303 EJ Emmeloord, Netherlands. Listeners may apply but must submit the relevant QSLs from their reports.

ALL TIME BAND TABLE – CURRENT COUNTRIES No 7.
(Table Serial No 22)

Callsign	1.8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Total	
G3KMA	**124**	**236**	**298**	**317**	**315**	**300**	1,590	
G3GIQ	70	207	258	314	313	295	1,457	
G3MCS	64	211	259	314	314	294	1,456	
G3XTT	**151**	197	237	286	278	244	1,393	
G4DYO	66	184	233	309	302	283	1377	
G3UML	31	217	233	315	285	243	1,324	
G4GIR	92	198	232	282	258	245	1,307	
G2DMR	57	179	196	305	292	259	1,288	
G4BWP	93	209	227	279	237	240	1,285	
G4FAM	64	180	238	268	265	240	1,255	
G3ALI	2	213	221	302	271	231	1,240	
G3XOU	48	171	191	293	272	242	1,217	
VK9NS	80	184	226	290	243	192	1,215	
G4LJF	31	201	231	287	252	207	1,209	
G3TXF	64	162	185	261	246	206	1,124	
G3IGW	104	148	223	226	190	172	1,063	
G3NOF	4	84	82	313	310	264	1,057	
G3YMC	80	107	171	240	243	187	1,028	
GW4OFQ	52	222	196	215	189	135	1,009	
GM3YOR	75	137	186	220	200	180	998	(all cw
G4OBK	119	123	148	214	178	140	922	
GM3PPE	59	140	155	187	170	141	852	
G4JBR	62	142	124	142	156	172	798	
Average	69	176	207	269	251	222	1,194	

(Band leaders in bold type)
Next deadline – All-time with deletions – **to reach G3GIQ by 8 January 1988.**

10MHz Countries Table

	All-time	1987
G3PJT	101	71
G4YWG	64	49
G4VDX	71	37
G4OBK	57	36
G4YSN	1	1

1987 28MHz Countries Table

G4XAH – 124 (ssb)	G4NXG/M – 50
G4JBR – 122	G4DXW – 42
G3XQU – 114 (ssb)	G4RWP –39
G4VPM – 103	G0BXQ – 35
G0AGP – 88	GW4TEJ – 27
G4MUW – 85	G4IDF – 25
GD4XTT – 72	GM4CHX – 22
G0DNV – 70	G5HD – 10(QRP)
GD0ELY – 67	G4YMG – 9
G4OBK – 66	G0FYD – 2

Band reports

To begin with the latest progress report on Cycle 22 from G8KG.

"Although average solar activity declined somewhat during September and early October, both months saw some days with the daily solar value above 100sfu and the general level was high enough, coupled with the seasonal improvement in the northern hemisphere, to give much improved conditions on the higher bands. These improvements began to show from about mid-September, and by the second week in October both the 21 and 28MHz bands were opening at times to all continents though some of the openings on the higher band were only brief. Fortunately for those who took part, the 21/28MHz Phone Contest fell on one of the better days.

"During the early part of October there was a considerable amount of short-skip propagation on 28MHz (distances of up to 2,000km and less). At this stage of the cycle this must be presumed to be due to abnormal E-layer reflection. It was present at the same time as the normal F2 propagation and reached a peak on 12 October. It is interesting to note that this was just about three solar rotations after the extensive July openings on 28 and 50MHz, presumed to be the result of widespread abnormal-E reflection.

"In its September bulletin the SIDC, Brussels, has revised its prediction for the cycle peak, which is now forecast to have a smoothed sunspot number of 115-125 in the spring of 1990. This is at the lower end of the "consensus" prediction attempted in the last report. For the immediate future it seems probable that the rise in solar activity may slow down for a month or two and that the next major up-surge may occur about February and March."

HF F-layer propagation predictions for December 1987

The time is presented vertically at two-hour intervals 00(00)gmt to 22(00)gmt for each band, ie $\frac{0}{0}$ = 0000, $\frac{0}{2}$ = 0200, $\frac{0}{4}$ = 0400 etc.
The probability of signals being heard is given on a 0 (indicated by a dot) to a 9 scale; the higher the number the greater the probability with 1 meaning 10 to 19 per cent of days, and so on. Additionally, 50Hz F-layer and 1·8MHz openings are indicated by a plus (+) sign in the 28 and 3·5MHz columns respectively.

Time / / GMT	28MHz 000001111122 024680246802	24MHz 000001111122 024680246802	21MHz 000001111122 024680246802	18MHz 000001111122 024680246802	14MHz 000001111122 024680246802	10MHz 000001111122 024680246802	7MHz 000001111122 024680246802	3.5MHz 000001111122 024680246802
** EUROPE								
MOSCOW	.....431....	....2663....	....5886....	....79982...	...188886...	431576678422	986644346888	++53...24+++
MALTA	....1221....	....2543....	....68772...	....88885...	...1888882..	563665568754	998743347899	++++....4+++
GIBRALTAR	.....111....	.....332....	....16653...	....38885...	....888882..	242186667842	898764335898	++++3....25++
ICELAND	....	......22....	.....2551...	.....4873...	....188981..	.1..6777861.	674165557875	++++42224+++
** ASIA								
OSAKA	....	....	....2.....	....4.....	....73.....	...164223111	1..131125664	.....24+.
HONGKONG	....11....	....32....	....651....	....773....	...16762....	1..13445311.	2...11125675	.....25+4
BANGKOK	....351....	....573....	....7861...	...16873....	...146664...	2...14357223	3....1125787	.....25+5
SINGAPORE	....3541...	....5763...	....7886...	...168881...	...136674...	2...14357324	2....1125786	.....25+3
NEW DELHI	....432....	....664....	....7871...	...26883....	...346661...	521113355224	731....125788	5.....25++
TEHERAN	....4541...	....6763...	...18886....	...377881...	1..555675...	643322357445	8831..125788	+5.....25++
COLOMBO	....4542...	....6764...	...16887....	...257882...	...224676...	32...1357445	51....125788	3.....24++
BAHRAIN	....5331...	....7652...	...27775....	...466871...	1..5336751..	7432.1357655	873...125788	+5.....24++
CYPRUS	....5654...	....7876...	...188883...	...388896...	321776788311	886643468877	997311135898	++4.....25++
ADEN	....5443...	....6665...	...266782...	...355784...	2..422478211	8232..147877	872....24788	+4.....4++
** OCEANIA								
SUVA/S	....	....	.....31....	.....253....	.....5663...	....344561..	....421252..	.....2...
SUVA/L	....11....	....321....	....7531.2..	.1..87532421	111186666731	..136334651.	...2311132..	....
WELLINGTON/S	....	.....11....	.....341...	.....663....	....47661...	....64455...	....421251..	.....2...
WELLINGTON/L	....	....	....21...1..	....431..21.	112.75423532	..126334642.	...1311131..	....
SYDNEY/S	....232....	....4551...	....7774...	....8886....	...277673...	...14445611.	....2112551.	.....22..
SYDNEY/L	....	.....1.....	.....31....	....1531.11.	..1.56542531	54345731	....2111341.	....
PERTH	....4542...	....6764...	...17887....	...268882...	...246676...	1....14357433	1125762	.....253.
HONOLULU	....	....	....	....	.....12..	.1..1122541.	.13.411242..	..24.....
** AFRICA								
SEYCHELLES	....1243...	....3465...	...145782...	...345784...	2..212478221	821...147877	84.....24788	+.....4++
MAURITIUS	....3443...	....5665...	...166783...	...245785...	32.222478322	851...147888	73.....24789	4.....4++
NAIROBI	....5443...	....6666l...	...166684...	...2555871..	41.422268542	9632...37888	872....1478	+4.....4++
HARARE	....12441...	....34562...	....55686...	...14557821.	54.322258654	9832...25899	872.....3789	+4.....4++
CAPETOWN	.....2552...	....24774...	....456771..	1...45568321	53.222236775	9842...13699	873.....1478	+4.....5+
LAGOS	....36553...	....67775...	....776781..	11..75468421	66.252136876	99652...3799	8883....1588	5+5.....2++
ASCENSION Is	.....5434...	....27656...	....576672..	11..76556421	564.63223676	99843....1489	88851....169	+++2.....3+
DAKAR	.....6654...	....17766...	....487672..	.1..77557521	454.75225775	889452..2589	88872....279	55+4.....4+
LAS PALMAS	.....5543...	....17775...	....488881..	....7888841.	233.87667853	889575335798	989852112589	++++2....2++
** S. AMERICA								
Sth SHETLAND	.....1122...	....12344...	....456662..	.1..67766311	344.76533343	46634321.123	233321.....1	....
FALKLAND Is	.....1144...	.....2365...	....255662..	....4765531.	344.76322233	6883531...24	467531.....1	.342.....
R DE JANEIRO	.....21.1...	.....4223...	.....64442..	....2754431.	344.66322344	889363....147	88973.....15	+++5.....2
BUENOS AIRES	.....1..2...	.....2224...	....154452..	....4754431.	234.76322233	7893641...24	689731.....2	3++5.....
LIMA	......453...	......765...	......8762..	......8653..	..2..1632221	5572233...13	5887411.....1	2++5.....
BOGOTA	......453...	......665...	......8762..	......8653..	..1.12632221	5461443...14	7886411.....2	4+55.....
** N. AMERICA								
BARBADOS	......453...	......6651..	.....38762..	.....585541.	..2..6622331	6572443...36	887741....15	++55.....2
JAMAICA	......153...	......375...	......6862..	......7753..	....1164222.	43515331..23	7786411....3	4+55.....
BERMUDA	......153...	......375...	......6872..	.....17764..	.....465453.	4351443212145	8786411...16	+++5.....3
NEW YORK	.......43...	.......165...	......3872..	......6874..	.....166552.	324.24332343	87844211..25	+++5.....2
MEXICO	.......32...	.......54...	.......862..	.......863..	......27421.	224.43341..1	4784421....1	.++4.....
MONTREAL	.......32...	.......154...	......3872..	......5874..	.....167662.	223.24443343	878442111125	+++5.....3
DENVER	........1...	........3...	.......161..	.......373..	.......6641.	122.31153221	478241121..2	2++5.....
LOS ANGELES	....	........1...	........4...	........62..	.......2641.	122.22.44211	268242121...	.4+5.....
VANCOUVER	....	....	....	........11..	........54..	121.21.26421	367142123211	.4+5.....
FAIRBANKS	....	....	....	....	........11..	12..13235521	355.42124532	.244....22..

The provisional mean sunspot number for September 1987 issued by the Sunspot Index Data Centre, Brussels, was 33.5. The maximum daily sunspot number was 67 on 8 September and the minimum was 10 on 26 September. The predicted smoothed sunspot numbers for December 1987 and January, February and March 1988, are respectively: (classical method) 30, 30, 31 and 32; (SIDC adjusted values) 37, 38, 39 and 39.

From that encouraging piece to the list of stations worked or heard during the period under review, but first a special seasonal "thank you" to all those who write regularly and give me the material with which to write the column. This month these included G2HKU, G5JL, G3s AGZ, GVV, KSH, YRM, G4EHQ, GW4KGR, G4s LRS, NXG/M, OBK, UZN, VPM, XAH, GD4XTT, G0AGP and GD0ELY.

Callsigns in italics were of stations using A1A.

1·8MHz. 0100 W1CF. 2100 *UA1ZEO*. **2300** *UA9FAR*.

3·5MHz. 0500 *HD8CQ, HK, YV*. **2100** T77T, *TA2Y*. **2200** TP2CE, VK6LK, VP2MO, **2300** HH7PV, U0AG (=UA0AG), *UZ9FKC*, VO2AE, *W3MFW*.

7MHz. 0500 *HC8MA, TR8JLD, ZL1-ZL4, 7X3AT*. **0600** *VK2APK, ZL2-ZL3, ZL7TZ*, 5L2BG. **0700** *JA*. **1700** *UI8AHA*. **1800** RI10A. **2000** *VU4GDG*. **2100** *1A0KM*. **2200** *VK6HD, VP2M/NE1RM*.

10MHz. 0600 *UI9IWZ, VK2-VK4*. **0700** *VK3XB, ZL4QY*. **1300** *YB7HBF*. **1500** *RD4DR*. **2100** *VK3DQ, ZS2HB*. **2200** *KY9L*.

14MHz. 0700 A35SA, KC6HA, KD6TB/KH2, V85HG, YI1BGD. **0800** BY1SK, BY5RT, *FK8FG*, HL0M, HS0B, JA, *NL7DM*, VK, ZL. **0900** HV1CN, VE8RCS. **1000** AL7GA, BY5AA, NY6M/KH2, 4K0D. **1100** KC6JC, KH0AC. **1300** BY9GA, VK0GC. **1400** JA, VK, VU, VU4GDG. **1500** HS0B, KH2F, *SV2UF/SY*. **1600** *FT8ZA*, 1A0KM, 9M8PV. **1700** V85WS, VU4GDG, XX9JN, 9M2RI. **1800** KH6FKG, T5GG, *VE6-VE7*, W6-W7, 8Q7MT, 9M2HB. **1900** P40M, *VP2M/VE1RM*, VP8BPC. **2000** KP2AH, TZ6VV, W6. **2100** OD5QI, TL8HB, VO1KS/4U (=YK). **2200** VP8ML.

18MHz. 1400 *5B4DG*. **1800** *VE2LI*.

21MHz. 0700 9Q5DA. **0800** AP2P, BY4AY, JA, HL, OH6XY/4U, 8Q7AD. **0900** JA, VK. **1000** BV6IA, VU40TTC. **1100** DU6TW, FR5DX, HS0B, SV2UA/SY, T5GG. **1200** VP8MKS, VS6DO, XX9JN, YB. **1300** 9V1WP. **1400** FT8WA, OD5VT. **1500** YB3AK, *9M2FS*,, 9V1NQ. **1600** *PY1QVN/PY9*. **1700** TL8DC, TU1BS, VP8QP, W6. **1800** S92LB, W6-W7, YC0AA (via LP), ZD8RP. **1900** KH6DBV, W6-W7, VP8QP, 3X0HBR, 5U7/TU4BR. **2000** J87CF, VP2EZ, VP8BKK.

24MHz. 1500 *KV4AD, ZS6BMS*. **1800** AY6UO, *K6STI, PY1HPR, W1HMD*. **1900** *AA4TV, LU1DOW, OA4ZV*. **2000** *KP2J*. **2100** *KA1PE*.

28MHz. 0800 *JY5CI, ZD8RP*. **0900** *VK9AB, VU4GDG/TS*. **1000** *FR5EM, HZ1HZ*, OH0BH, VU4GDG/CE, YC0MCA. **1100** PA3AXU/SU, VK9AB, 3B1DB, 4X4OOO, 5Z4RT. **1200** A71BJ, FR4DL, FT8XD, KP2/W4UWH, W1-W4, DF9FA/P/4S7, 7P8DP, **1300** FM5WE, J87CD, W1-W2, ZD7BJ. **1400** FY7AN, HC5EA, TZ6MG, VP8PTG, W0QEV. **1500** FH8CB, VP2VA. **1600** HK0HEU, PA3AXU/SU, TZ6FIC, ZF2JV, 3D6BW, 3X0HBR. **1700** A22BW, CE6DFY, J73LC, OY9JD, ZD8MAC, ZD9BV, 4M5T, 5N9GM, 7P8DX. **1800** C53CR, J73LC, G4DZC/W2. JG1FVZ/5N27, 9L1RH. **1900** CP, CX, D44BC, FM, LU, PY, VE1-VE3, VP2EZ, W1-W5, W8, W9, 5H3RB, 6W7OG. **2100** VO1QU. **2200** C6AN1, WB4RFZ/HC7.

Thanks also to the following for items extracted: *Lynx DX Group Bulletin* (EA2JGO), the *DX Family Newsletter* JH1KRC), *DX'press* PA3CXC), *CQ Magazine* (W1WY), *DXNL* (DL3RK), *Long Island DX Bulletin* (2IYX), *DX News Sheet* (G4DYO), *The EX-G Radio Club Bulletin* (GI3OEN/W6), *DX Report* (VK9NS) and *Long Skip* (VE3IPR).

Closing date for receipt of material for **February** issue is **8 December.** □

HF BEACONS

Freq	Callsign	Location	Country	Lat/Long
14,100	CT3B	Funchal	Azores	3245N1655W
14,100	JA2IGY	Ise City	Japan	3427N13647E
14,100	KH6O/B	Honolulu	Hawaii	2125N15755W
14,100	LU4AA	Buenos Aires	Argentina	c36S 58W
14,100	OH2B	Espoo	Finland	6015N2503E
14,100	W6WX/B	Stanford	USA	3725N1211W
14,100	ZS6DN/B	Pretoria	S Africa	2544S2812E
14,100	4U1UN/B	New York	USA	4045N7600W
14,100	4X4TU/B	Tel Aviv KM72JC	Israel	3241N3445E
21,150		Reserved for IARU International Beacon Project (IBP)		
28,050	PY2GOB	Sao Paulo	Brazil	
28,175	**VE3TEN**	Ottawa	Canada	
28,195	IY4M	Bologna JN54QK	Italy	
28,200	**GB3SXE**	Crowboro'	England	5102NOOOBE
28,200	KF4MS	St Petersburg F1	USA	
28,201	LU8ED	(see 28280 LU8EB?)		
28,2025	**ZS5VHF**	Durban KG50JG	S Africa	2944S3050E
28,205	**DL0IGI**	Mt Predigtstuhl		4742N1253E
28,2075	**W8FKL**	Venice F1	USA	272oN8224W
28,208	WA1IOB	Marlboro Ma	USA	
28,210	**3B8MS**	Tamarind Falls	Mauitius	
28,210	K4MZ	Elizabethtown Ky	USA	
28,212	ZD9GI	Gough Is, S Atlantic		4021S0952W
28,212	EA6RCM	Palma JM19HO	Majorca	
28215	**GB3RAL**	Slough IO91RL	England	
28215	LU4XI	Cape Horn	Argentina	
28,217	WB9VMY	Oklahoma City OK	USA	
28,220	**5B4CY**	Zyyi		3445N3319E
28,222	W9UXO	Chicago Ill	USA	
28,2225	**HG2BHA**	Tapolca	Hungary	
28,2275	**EA6AU**	Palma BZ45A	Majorca	3929NO483E
28,230	**ZL2MHF**	Mt Climie	New Zealand	4109S17509E
28,232	W7JPI	Sonoita Az	USA	
28,232	KD4EC	Jupiter F1	USA	
28,235	**VP9BA**	Hamilton	Bermuda	
28,2375	**LASTEN**	Oslo	Norway	
28,240	**OA4CK**	Lima FH17MW	Peru	1203S7657W
28,240	**5Z4ERR**	Kiambu KI88MX	Kenya	
28,2425	**ZS1CTB**	Capetown	S Africa	
28,242	LU4FM	Rosario	Argentina	
28,245	**A92C**	Bahrain		
28,247	EA3JA	Barcelona	Spain	
28,248	K1BZ	Belfast Me	USA	
28,250	**Z21ANB**	Bulawayo	Zimbabwe	
28,250	**4N3ZHK**	Mt Kum JN76MC		4606N1502E
28,252	WB4JHS	Durham NC	USA	
28,255	**LU1UG**	G'ral Pico FF84DH	Argentina	
28,257	**DK0TEN**	Konstanz JN47OQ	FR Germany	4741NO91OE
28,260	**VK5WI**	Adelaide SA	Australia	
28,262	**VK2RSY**	Dural NSW (Nr Sydney)	Australia	3342S15103W
28,264	**VK6RWA**	Perth WA	Australia	
28,265	**VK**	Allocated	Australia	
28,266	**VK6RTW**	Albany WA	Australia	
28,268	**VK8VF**	Darwin NT	Australia	
28,2685	W9KFO	Eaton Ind.	USA	
28,270	**ZS6PW**	Pretoria	S Africa	
28,270	**VK4RTL**	Townsville QL	Australia	
28,272	**VK?**	Allocated	Australia	
28,275	AL7GQ	Jackson Miss	USA	
28,277	**DF0AAB**	Kiel JO54GH	FR Germany	5419N1O33E
28,280	**YV5AYV**	Caracas FK6ONI	Venezuela	1021S6653W
28,280	LU8EB	(B.A.?)	Argentina	
28,281	VE1MUF	Newfoundland	Canada	
28,284	**VP8ADE**	Adelaide Is	Antarctica	6734S68O8W
28,286	KA1YE	Rochester NY	USA	4302N7741W
28,287	W8OMV	Ashville NC	USA	
28,287	**H44SI**	Honiara	Solomon Is	
28,288	W2NZH	Moorestown NJ	USA	
28,290	VS6TEN	Mt Matilda	Hong Kong	
28,292	LU2FFV	San Jorge	Argentina	
28,295	WB8UPN	Cincinnati Ohio	USA	
28,296	W3VD	Laurel Md	USA	
28,295	WB4DJS	Ft Lauderdale	USA	
28,299	**PY2AMI**	Sao Paulo GG671G	Brazil	224S4716W
28,300	**ZS1LA**	Stillbay	South Africa	3423S2124E
28,315	ZS6DN	Irene	S Africa	
28,888	W9IRT	Hollywood	USA	3412N11828W
28,890	WD9GOE	Freeburg Ill	USA	
28,992	DL0ANN	Moritzberg FJ47a	FR Germany	

Notes: Callsigns **1** are IBP stations.
Beacons on 14,100 KHz are sponsored & supported by the Northern California DX Foundation (NCDXF).
Much of 28MHz informattion supplied by K2OLG and DL1FL.
Corrections, based on good information, would be welcomed. Please send to G3DME, QTHR, quoting source.

COMMONWEALTH CENTURY CLUB AWARD

The Commonwealth Century Club Award was introduced on 1 January 1984, and is based on effecting two-way communication since that date with amateur radio stations located in at least 100 Commonwealth call areas as defined in the current list available from the RSGB or from the awards manager.

Full details of the Commonwealth Century Club and other RSGB hf awards appear in the *RSGB Amateur Radio Callbook*, as do the general rules on applying for the various awards. However, in the unlikely event that you don't have a callbook to hand, here they are in brief.

The aim of the award is to achieve confirmed contacts (or swl reports in the case of listeners) with 100 Commonwealth Call Areas on any of the hf bands (not including the WARC bands). On submitting your claim to the RSGB awards manager (GW4BKG), together with the appropriate fee (currently £1.50), $2 or six ircs for RSGB members), you will receive an attractive certificate. A handsome plaque, bearing name, callsign, date and the number of the award is also available to those applying for membership of the Commonwealth Century Club on payment of an additional charge. In all cases, applicants should submit proof of their RSGB membership. Overseas amateurs who are not members may also claim the awards, but the charges are twice those detailed above.

The first amateur to apply for the CCC Award was Tim Timrell, G4STH, who put in his claim in May 1985. Since then only three other amateurs have claimed the award, G3AAE, G4ADD and G3NOF. However, it is known that several others are working at it, or awaiting QSL cards.

For any amateur who succeeds after the starting date of the award in working and confirming all the Commonwealth Call Areas on the list at the time of application, an engraved cup will be available.

As if all this challenge isn't enough, the RSGB has also introduced a five-band version of the Commonwealth Century Club Award. The starting date for this is 15 November 1945, so there is some scope for digging out those long-lost QSLs cards. The five-band award is available in five classes as follows:

5BCCC Supreme – 500 stations;
5BCCC Class 1 – 450 stations;
5BCCC Class 2 – 400 stations; with a minimum of 50 on each band;
5BCCC Class 3 – 300 stations, with a minimum of 40 on each band;
5BCCC Class 4 – 200 stations with, a minimum of 30 on each band;

Certificates will be issued to winners of all classes. Additionally, as in the case of the CCC Award, winners of the Class 1 award will be eligible to claim a handsome, suitably inscribed plaque, while winners of the supreme award will be eligible for an engraved cup.

Details of further RSGB hf awards will appear in future issues.

DATA COMMS

*Ian Wade, G3NRW**

IT'S CHRISTMAS TIME AGAIN, and it's two years since this column first appeared. And what changes we have seen in these two years! AX.25 packet networks now abound, with satellite data links to North America, India, Australia and New Zealand, available to anyone who can put out a few watts to a groundplane on 144MHz. Mailboxes talk to each other through the night, relaying messages up and down the country. Gateway stations automatically convert packet messages to Amtor, for onward transmission to virtually anywhere on earth on the hf bands. Packet and Amtor are becoming the standard workhorses for emergency communications.

The days of steam age rtty are now well and truly numbered, with all those rusty old 7B and 444 teleprinters being redirected to /dev/null. Hardware costs are coming down, and it's now possible to get an all-mode data comms box for around the same price as a simple rtty terminal unit.

It would take a brave man to speculate in detail on what the next year will bring, but I think the general direction is quite clear. Speeds are going up and up. Modems for 9·6 and 56kbps are undergoing beta test, and should be generally available over the next few months. High speed microwave links will form data backbones across the country, hopefully relieving 144·650MHz of the bread-and-butter mailbox traffic. Data networks will expand in size and complexity, with packages like NET/ROM and NET.EXE becoming commonplace. Maybe we will even be able to establish reliable data links with continental Europe; although we can talk to Bruce in Australia with little difficulty, we still can't get messages easily to Hanspeter in Munich!

Altogether, we are probably going through the most exciting period ever in the history of amateur radio. To be sure, the pioneers of the 'twenties and 'thirties must have been exhilarated by the hitherto undreamed of possibilities of communicating around the world (and I well remember the revolutionary development of single sideband in the 'fifties), but these experiences seem to pale in comparison with what is happening today as we hurtle towards the 'nineties.

To those of us who are concerned about the dwindling number of young newcomers to our hobby, surely the area of computers and data comms is the place to focus our attention. To those who say that keyboard communication in unnatural and not amateur radio, let's realise that it won't be very long before we can talk to each other, using our mouths once more, over digitised speech channels. The commercial and military worlds already use digital techniques extensively for voice and picture communication, and it's only a matter of time before we amateurs do the same. Just think, in a few years time we will be looking back nostalgically at steam age ssb!

The Sixth ARRL Computer Networking Conference

Last month I listed the papers which were presented at the networking conference. These papers have now been published as a 179-page document (available from ARRL at $10), and as usual are well worth reading to gain a detailed insight into current packet thinking.

On the hardware front, Terry Fox, WB4JFI and vice president of AMRAD gives some details of the new Pac-Comm PC-100 tnc board which plugs into an IBM PC. The board is half-slot size, and has an 8530 serial communications controller, which drives either an RS-232 connector or on-board modems. It can provide two different channels of packet operation, and more than one board can be chained, allowing you to build a switch to service many rf channels. The standard on-board modem is an AMD 7910 world-chip, and a TCM 3105 cmos modem is also available as an option.

Talking of modems, the conference proceedings contain details of the 56kbps modem designed and demonstrated recently by Dale Heatherington, WA4DSY. It is implemented as a low level (1mW) rf driver on 28MHz; that is, data input to the modem is converted to a modulated rf signal at 28MHz, which can then be transverted to the desired band for transmission. The modem uses a form of minimum shift keying (msk). This is similar to ordinary frequency shift keying (fsk) but with precise control of frequency shift and phase; with msk, the frequency shift is exactly a quarter of the baud rate, and the phase of the carrier shifts exactly 90° during each baud interval.

The modem has no exotic or hard-to-find parts, and is simple to set up. The tnc to which the modem is connected does not need a baud rate generator, or circuitry for rx clock recovery and NRZ-to-NRZI conversion, as these functions are included in the modem itself. The design is fast enough for real-time digitised speech (at 56kbps, the speech quality is as good as typical comms quality fm), and will probably work at 64kbps with the cheap pulse-code modulation coder/decoder chips (codecs) used in telephone networks.

7 Daubeney Close, Harlington, Dunstable, Bedfordshire LU5 6NF.

Bit error rates

Coming back down to earth, there are some interesting contributions in the proceedings on assessing the quality of modems, by measuring bit error rate (ber). Essentially, the technique involves sending a pseudo-random data stream to the modem under test, and counting the number of bits which are received incorrectly over a given period. In a paper by Hugo Lorente, LU4DXT, there is a summary of ber tests carried out on several demodulators, including amongst others the celebrated EXAR 2211 and AMD 7910 chips found in many ordinary tncs, and the JAS-1 and G3RUH psk designs for FO-12 satellite reception. Results are shown in Fig 1.

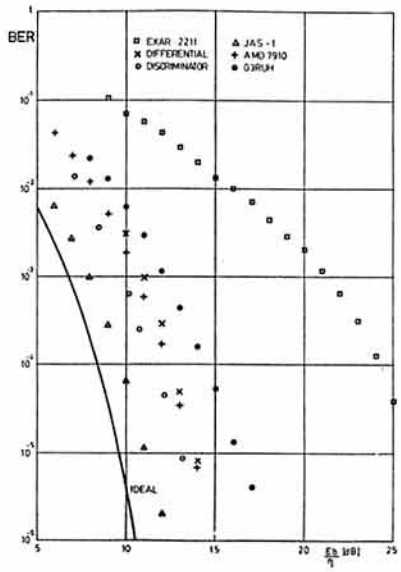


Fig 1. LU4DXT's bit error rate (ber) tests on several data demodulators. The vertical scale shows the bits received in error for signal-to-noise ratios between 5dB and 25dB. For a ber of 10-4 (ie one bit in 10000 received in error), the JAS-1 demodulator is close to the ideal, requiring a s/n of 9·7dB. At the other extreme, the EXAR 2211 used in many tncs is much poorer, needing a s/n of 24·2dB to achieve the same error rate. The AMD 7910 and G3RUH demodulators lie somewhere in between

The PS-186 packet switch

Still with the hardware, there is a most interesting paper by the San Diego Packet Radio Association (SANDPAC) in California, describing the so-called PS-186 multi-port packet switch. It supports data rates up to one million bits per second, and can be used not only as a high performance switch but also as a local packet node, mailbox system or gateway to other networks. It is based on an Intel 80186 cpu running at 8MHz, and will handle up to four independent full duplex packet channels. Data transfer is by direct memory access (dma) to up to 1Mbyte of local memory.

The hardware is implemented on a six-layer pcb measuring just 7.75 by 11.5in, the same size as two 5.25in disc drives. Operating system software for the device is well advanced, and is organised as a multi-tasking system which will allow all the standard protocols such as AX.25, KISS, SLP and TCP/IP to run under it. Altogether a remarkable beast, but most incredible of all is its power consumption of only 2·1W, and the fact that it will sell for between $200 and $300, depending on the options installed. A significant contribution indeed to the world of packet.

But wait, there's more

Packet users world wide will recognise the catch phrase "But wait, there's more", coined by Tom Clark, W3IWI. The "more" in this case is yet another very interesting conference paper by Tom, this time on digital signal processing (dsp). He highlights the almost unbelievable flexibility of dsp chips such as the TMS 320 family, which can be programmed by software to function as complex adaptive filters, companders, psk modems, pulsecode modulators, weather map decoders, 56kbps msk modems with coherent demodulation, woodpecker filters, and so on. Much practical work remains to be done in writing the software for all these things, but already he and his co-workers have successfully produced a spectrum analyser and a weak signal detection system for eme work

which run under MS-DOS. One of the biggest problems with dsp is the shortage of people able to write such software, and Tom would like to hear from anyone who can help in this fascinating area.

Next month, a further look at the conference, concentrating on the software and packet protocol issues. In the meantime, my thanks as usual go to all who have helped me in compiling this column over the past year. Have yourselves a good Christmas. □

VHF/UHF

*Ken Willis, G8VR**

AS ANOTHER YEAR slips away, it is my pleasure to wish one and all a very merry christmas, and health, prosperity and fun on the vhf/uhf bands in 1988. It was a pretty good year in radio terms with, in the end, some good tropo despite an indifferent summer. The sporadic-E was up to expectations, and there were even some good auroras in a normally fallow period for these events. The general release of 50MHz facilities, though not destined to turn everyone on, brought a new dimension to vhf operation in a part of the spectrum likely to prove of even greater fascination during the next few years as solar Cycle 22 approaches its peak.

Some early tep results

In the October issue, the possibility of transequatorial propagation was mentioned, together with plans for stations located in the most strategic places monitor 50MHz throughout October. The Mediterranean is one of the few areas in the northern hemisphere situated to take advantage of this mode, so it was very timely that Alan, GW3LDH, and his wife Maureen, GW8ZCP, were able to visit Malta at the end of September to deliver the 50MHz beacon built by G4IJE for installation on the island.

As we know from our readers there, Malta's amateurs are not represented by a single organisation, but rather by four groups which are active there, as described in *VHF/UHF* September 1986. Recognising the delicacy of the situation, Alan and Maureen adopted a diplomatic approach by arranging a party for local amateurs at which the beacon was formally handed over to representatives of all four groups. Subsequently, beacon 9H1SIX became operational on 1 October on 50·085MHz, running 10W to a horizontally-polarized Yagi antenna.

Within 24 hours, signals from the beacon were being copied in Botswana by A22KZ, surely a classic example of the value of the beacon service. Within two or three days, ZS stations were reporting reception of 9H1SIX, which, for the duration of the tep tests, was beamed towards the south, but by the time this is in print, it should be directed more towards the UK so that we can take advantage of any sporadic-E propagation which typically occurs late in the year at frequencies high enough for 50MHz operation. GW3LDH told me that during October, 9H1BT had managed more than one contact with A22KZ while on 12 October around 1730gmt, both 9H1CG and 9H1FL (the latter a newcomer to 50MHz) worked the Botswana station. Beacon keeper is Fortunato, 9H1ES. After March 1988, 9H1SIX will be beamed towards South America. On 17 October ZS3E was heard on 50MHz by G6XHQ, and on 22 October A22KZ had two-way 50MHz contacts with G2ADR, G4GAI, G4HBA and GM4DGT to create records for this band. It seems that the mode was extended tep, since some Maltese stations were worked on 50MHz from the UK at about the same time.

On 17 October at 1450, CT4KQ worked ZS3E on 50.110MHz. Not to be outdone, 9H1BT also worked the ZS, and at that date, these contacts represented the best tep dx of the season. There was the hope that during October some sporadic E propagation would extend the tep coverage to higher latitudes, and certainly on 18 October there was good 50MHz Es during which EA3CGN worked GI8YDZ crossband 28/50, while EA1MO, CT1WW and CT4KQ were all strong signals in the UK.

Way out West

Do you wonder what it would be like to live in the great American wild west, with its wide open spaces, large backyards and not much in the way of planning restrictions on antennnas? Then just look at what Russ Wicker, W4WD/7, did last summer. He set himself four major projects:

1. Build and put up new 432MHz eme array
2. Put up a new 75ft tower and move the 14/21/28MHz beam from its 25ft tower to this one.
3. Build a four element 24MHz beam. Take down the 50MHz antenna (shame on you) and put the 24MHz beam in its place.
4. Install a 3m dish for the 2GHz downlink for the new Oscar Phase 3 bird. Until Oscar goes up, put a 4 and 12GHz feed in the dish for satellite tv reception.

Russ says that 20 years ago it would all have been done in two months, but now he finds it takes twice as long to do anything. It gets worse as you go on, Russ. I put up a three element for 50MHz and changed the 144MHz antenna. Took me the whole summer.

Repeater news

Not a lot of repeater information this month, but the latest issue of *FM News* published by the Central Scotland FM Group contains its usual wealth of news and entertainment. On a more sinister note, however, the editor refers to the proposed charges by IBA for the use of their sites by repeater groups, also mentioned last month in connection with the Speyside Group. A group like the CSFMG, which relies heavily on the use of IBA sites, would need to find some £250 per annum, representing the need to recruit a further 50 members just to cover these costs. They urge users of their repeaters who are not members of the group to join up, especially if they drive an E-registered car! Seriously, though, these groups cannot survive without funds, and if the group disappears, so does the repeater. If you use a box in your locality, take a minute to work out what it saves you in phone calls each year.

GB2RS news announced the switch-on of repeater GB3GH (RB5) to 10 October. The site is at Ullenwood, four miles to the south of Gloucester, and reports of its reception would be appreciated by G6AWT, QTHR.

Wet squares expedition

One of the most imaginative expeditions ever staged gave hundreds of vhf operators some rare new squares between 8 and 10 October. Flemming Jul-Christensen, G4MJC/OZ1EVA, and Jan Ablas, G4XNL, both now resident in Eastbourne, are ex-Merchant Navy officers, so perhaps it was not surprising that they conceived and planned this sea-going expedition with continuous operation as the ship made its way through "wet" squares normally inaccessible to vhf operators. Maritime mobile operation is not new, but this was on a scale unlike anything which has been done before. They chose the 14,500-ton ferry *Dana Anglia* which regularly plies between Harwich and Esbjerg, and by arrangement with the ship's owners, a mast was fixed to the railings to carry antennas for 144 and 432MHz some 80ft asl. Operation from the ship's boardroom required feeders in excess of 150ft. Navigational information was supplied by the bridge so that they could tell with considerable accuracy when they entered and left each square en route.

One thing they could not control was the weather. When they set off on the evening of 8 October, gales were already sweeping the south coast of England. As the night progressed, sea conditions deteriorated steadily, and Flemming and Jan, assisted by G6VYH and G4MDZ, could be heard commenting "the ship is going up and down as if there is no tomorrow!". As they left port the rotator jammed, so their only beam heading on the outward journey was towards the southeast. A large funnel obstructed the antennas in the forward direction, so any radiation off the back of the beams towards OZ was minimal. All through the first night they could be heard working station after station, operating superbly, giving the impression that they were tucked up in a warm shack ashore. On arrival in Esbjerg on the Saturday, they spent only four hours ashore before setting off back towards the south. This time the funnel blockage favoured the OZs rather than the British operators. I heard them sign off in BM square around 0730gmt on Sunday 10 October, sounding as fresh as if they were just starting out.

The result of this remarkable expedition was 700-plus contacts in six countries on 144 MHz, and a further 62 in four countries on 432 MHz. Squares activated were BM, BN, CN, CO, DO and DP. Best dx on 144MHz was G3IMV (645km) and on 432MHz OZ1GMP (343km). I asked them if they would do it again, and they replied, "yes, we would". They plan to write it all up for *Rad Com*, illustrating the article with photographs, so I have tried not to steal too much of their thunder. But someone needed to congratulate them, for I suspect they are too modest to praise their own achievements. Don't forget to enclose that sae when you write for your QSL. Expeditions like these are rather costly.

Midlands VHF Convention

Peter Burden, G3UBX, who organised the Midlands VHF Convention held on 10 October, confessed to being disappointed at the low attendance this year. He feels that this must in part be due to the fact that the GB2RS script writer gave the wrong date for the event! About 150 attended, and they were treated to some excellent lectures during the afternoon session. Ian White, G3SEK, discussed the design of Yagi antennas, highlighting the virtues of the DL6WU family while pointing out that the NBS designs must now be regarded as somewhat out-moded. There are computer programs to assist would-be Yagi designers, and at least one trader at the convention was offering them on floppy disc.

*6 Lerryn Gardens, Broadstairs, Kent CT10 3BH.

Trevor Brown, G8CJS, and Barry Chambers, G8AGN, gave talks on 24cm atv and microwave amplifiers respectively, which are outside the scope of this column but will no doubt be reported by Mike Dixon in his *Microwaves* feature.

An open forum on repeater topics preceded the lectures, from which it appeared that few changes are envisaged to Midlands vhf and uhf repeaters, but there is much interest and activity surrounding data communication and packet radio via repeater networks.

The final part of the day's program was a forum to air vhf/uhf matters, during which a very wide range of topics was discussed. I will mention these in more detail next month.

There is surely a need for a regular vhf convention at a location further north than Sandown Park, so let's hope that this one will not suffer from a lack of interest. I am sure that G3UBX would appreciate any comments or suggestions which might assist in planning next year's event, so drop him a line if you have anything to say.

Contest information

Jochen Fischer, DH2NAF, reports that the 1988 "All Europe VHF/UHF/SHF Contest Calendar" is now available. It lists over 450 contests, firstly by date, and then by country, and provides all information on the rules and relevant addresses to which entries should be sent. It is written in German and English, and can be obtained by sending three IRC's to Ham Press Verlag, PO Box 1101, D-8078, Eichstatt, West Germany.

Meteor scatter

The popular Geminids shower is due this month, and the accompanying illustration shows the estimated best times for contacts along specific paths. If you are new to this mode, 10 crosses indicate a maximum probability of meteor reflections occurring in the right spot to support propagation along the relevant path. Zero or low numbers give the times when the radiant is near or below the horizon, and these migh be good times to snatch some sleep if you plan long periods of operation. The figures relate to my QTH, and so will vary slightly for other latitudes, but they are in any case only a guide, not a guarantee of meteor activity. There are always sporadic meteors which will provide reflections even when the print-out suggests a no-go situation, hence individual opinions of the precise time when the shower peaked tend to vary considerably.

Geminids MAX. 12/13 Dec. ZHR 80 RADIANT AT RA 112, DEC 33

HRS	AZ	EL	N/S	NE/SW	E/W	SE/NW
00	117	61	XXXXXXX	XXXXXXXX	XXXX	XXX
01	142	69	XXXX	XXXXXXX	XXXXX	X
02	179	72		XXXX	XXXXXX	XXXX
03	216	69	XXXX	X	XXXXX	XXXXXX
04	241	62	XXXXXXX	XX	XXXX	XXXXXXXX
05	258	53	XXXXXXXXX	XXXXX	XX	XXXXXXXX
06	271	44	XXXXXXXXXX	XXXXXXX		XXXXXX
07	282	34	XXXXXXXXX	XXXXXXXX	XX	XXXXX
08	292	25	XXXXXXX	XXXXXXX	XXX	XXX
09	302	17	XXXXX	XXXXX	XXX	X
10	312	9	XX	XXX	XX	
11	323	3	X	X	X	
12	335	-2				
13	347	-5				
14	360	-6				
15	13	-5				
16	25	-2				
17	37	3	X		X	X
18	48	9	XX		XX	XXX
19	58	17	XXXXX	X	XXX	XXXXX
20	68	25	XXXXXXX	XXX	XXX	XXXXXXX
21	78	34	XXXXXXXXX	XXXXX	XX	XXXXXXXX
22	89	44	XXXXXXXXXX	XXXXXXX		XXXXXXX
23	102	53	XXXXXXXXX	XXXXXXXX	XX	XXXXX
24	119	62	XXXXXXX	XXXXXXXX	XXX	XX

Quadrantids MAX. 3/4 Jan. ZHR 100 RADIANT AT RA 230, DEC 48

HRS	AZ	EL	N/S	NE/SW	E/W	SE/NW
00	34	10	XXXX	X	XXXXX	XXXXXX
01	43	18	XXXXX		XXXXXX	XXXXXXXX
02	52	32	XXXXXXX	X	XXXXXX	XXXXXXXXX
03	59	40	XXXXXXXX	XX	XXXXX	XXXXXXXXX
04	67	48	XXXXXXXXX	XXXX	XXXX	XXXXXXXXX
05	75	57	XXXXXXXXX	XXXXX	XX	XXXXXXXX
06	83	64	XXXXXXX	XXXXX	X	XXXXXX
07	95	74	XXXXX	XXXX		XXX
08	125	85	XX	XX	X	
09	243	24	XX	X	X	XX
10	267	74	XXXXX	XXX		XXXX
11	270	65	XXXXXXXX	XXXXXX	X	XXXXX
12	286	56	XXXXXXXXX	XXXXXXXX	XXX	XXXX
13	294	47	XXXXXXXXX	XXXXXXXXX	XXXX	XXXX
14	302	39	XXXXXXXX	XXXXXXXXX	XXXXX	XX
15	309	31	XXXXXXX	XXXXXXXXX	XXXXXX	X
16	318	24	XXXXX	XXXXXXX	XXXXXX	
17	327	18	XXX	XXXXXX	XXXXX	X
18	336	14	XX	XXXX	XXXX	XX
19	346	11	X	XXX	XXXX	XX
20	356	9		XX	XXX	XX
21	6	10		XX	XXX	XXX
22	16	11	X	XX	XXXX	XXX
23	26	15	XX	XX	XXXX	XXXXX
24	35	19	XXXX	X	XXXXX	XXXXXX

Since the Quadrantids follow hot on the heels of the Geminids, a print-out for that shower is given also. Note that the azimuth and elevation figures relate to the shower radiant, not to the direction in which you should point the antenna. Most operators simply beam towards the locator they are trying to work, though theory indicates that some specified off-set on the direct path should be employed. My experience has been that if you want to try off-setting the antenna heading, be sure the operator at the other end knows what he is doing, otherwise you can both end up widely off a heading likely to produce a contact.

From here and there

Alan, GW3LDH, QTHR, says that if you need a card from 9H1BT for a 50MHz contact, then send the QSL to him and enclose a sae since he is acting as Paul's QSL manager for this band. For other bands, send direct to 9H1BT, 94 Busketto Road, Rabat, Malta, or via the bureau.

According to Ray, G2AHU, beacon HC8SIX is being established on Galapagos Island (0·30°S 91·0°W) operating on 50·080MHz. It's a bit early in the current solar cycle to hope for any trace of its signals being heard in the UK, but after what has happened on the band this year anything seems possible!

Geoff, G3ENY, reported an increase in sunspot activity during October with some new groups appearing in the solar northern hemisphere. I visited his QTH recently to see how it was done, and was sufficiently impressed to dust off the home-brew telescope at G8VR which had lain on the shelf for years. Sure enough, the spots are easy to see, so if you bought one of those telescopes so much in vogue during the pass of comet Halley, you can do it too. Sorry to mention it again, but **do not under any circumstances** view the sun directly through any form of optical instrument or it will permanently damage your eyesight. This is particularly important if you have children around who might squint up the tube while the telescope is unattended. Use a projection method, very simple, as any suitable book from the library will illustrate.

The monthly report from Ron Livesey of the British Astromonical Association auroral group stated "September was an active month with more sunspots evident. The new cycle has begun, and aurorae are beginning to be seen in mid-latitudes." The report refers, of course, to visual observations by members of Ron's group, not to radio auroras, but all the evidence points to a welcome increase in solar activity.

Christopher Rutt, G0AMG, (Hatfield) who also holds the call C30LDF, wrote on the subject of visitors to Andorra who abuse local amateur radio regulations by using unauthorised frequencies, power levels etc. In addition, the Andorra prefix is apparently being pirated by operators outside the country, causing concern to the locals who fear that the antics of these operators will prejudice their own position. Christopher describes the Andorran offical attitude towards radio amateurs as being a rigorous one, and was told that the licences of two resident operators had been cancelled in the past year, one for operating outside the country, and the other for making false claims about the power levels permitted under the terms of the Andorra licence, this leading to an EI group making a totally abortive and expensive trip to the country. Although it affects a minority of UK amateurs, it should be said that while it may be tempting on a trip abroad to use a radio to give the folks back home a new square or country, if this involves unauthorised operation, forget it. Quite apart from the ethics of the situation, I am sure that our vhf awards manager, Jack Hum, G5UM, will take the view that any QSL card submitted which arises from unoffical operation will be unacceptable. Listen on unauthorised frequencies and work cross band using legal ones by all means, but think how you would feel if an overseas visitor set up a station in your area and used a band not available here, causing enough tvi to rouse the neighbourhood.

Roger, G4RUW (Newbury) has added to the list (October VHF/UHF) of dates on which sporadic E was present this year. Signals heard or worked at his QTH were 8 July, weak SV, 13 July EA and CN8 and on 26 July a short opening to Italy. He reckons he has developed a sixth sense for smelling out Es which seems to have paid off since he caught 12 openings between 28 May and 26 July. Roger is seeking information on the location of IS0YFG.

Arthur, GW8FKB (Anglesey) may now be active on 70MHz from XN square since he wrote to say he was building a Meon transceiver for the band. He already uses one on 50MHz, and heard the OX beacon on 16 August. Next day he copied VE1YX for about 10mins on 50.110MHz around 2155 gmt, but was unable to raise him.

Jack Hum, G5UM, reported that John Matthews, G3WZT, has claimed a 250 squares award (No 3) forthe 144 MHz band. Nos 1 and 2 are held by G3IMV and G3BW respectively. Jack says that many amateurs who he meets at club events seem unaware of the vhf/uhv awards offered by RSGB. Send Jack in sae QTHR if you need further information. □

SWL

*Bob Treacher, BRS32525**

AS CHRISTMAS AND THE NEW YEAR APPROACH, time to wish all readers a happy festive season and a happly and healthy 1988.

With the thoughts of the up and coming winter dx season on the lower frequency bands beginning to occupy our minds, I do not apologise for referring listeners again to my comments on lower frequency dxing which appeared in the magazine twelve months ago. It contained many tips on where and when to listen and will still, hopefully, be relevant to this year's dx season.

January Challenge

Once again, time to remind listeners of my LF Challenge. For the last few years, I have run a competition based on the number of countries heard on the lower frequency bands between 1-31 January. Last year saw a drop in the number of entries, but it normally inspires a good number of entries from around the globe.

The aim is to log only one station from each DXCC country on 7, 3·5 and 1·8MHz. All normal contest rules are abandoned for this event. It is meant solely as a guide to the number of countries active on the three bands, as well as providing the incentive for the listener to add to his all time country totals. Scoring for the event is simple enough, but different to recent years. Only one point can be gained for each country heard on 7 and 3·5MHz from your own continent, with two points for each dx country heard. On 1·8MHz, two points can be claimed for countries in your own continent, with five for dx countries. Stations do not have to be in QSO. Logs should include date, time, full callsign of station heard, signal report and points claimed. Please try to make your signal reports sensible. I do not expect to see 51 reports quoted on 3·5MHz as the noise level is consistently S6/7, and S1 signals would simply be lost in the noise! Any station less than 3x3 on ssb, or 339 on cw will be deleted from the log. It is debatable whether stations quoted as 2x2 are actually heard or are just figments of the imagination! Logs should be sent to me at the address at the foot of the page, postmarked no later than 26 February 1988.

The 1988 tables

Interest in the tables has continued to waver this year, even though the format was changed to try to attract a few new faces. However, to withdraw the tables would upset those who enter every year and take an interest in monitoring their progress against other listeners. The tables will therefore be retained, but in view of the lack of space they will have to appear as and when space permits.

The hf table for 1988 will revert to its original format, i.e. one table covering all six bands. Simply send me your band score and the number of dxcc countries heard by the date given at the foot of each swl column, and I will endeavour to include the table whenever I can.

The all-time and uhf/vhf tables will remain in their present format.

White Rose Contest

Time to notify listeners of the White Rose Society's efforts to provide competition on the lower frequency bands. The phone section will be held from 1200 to 1200 on 16/17 January, while a separate cw section will be held from 1200 to 1200 on 30/31 January. The full rules are different to recent years and copies can be obtained by sending an sae to G3ZGA, White Rose ARS, 146 Street Lane, Leeds, LS8 2AD. We all hope that conditions are good and the event is well supported.

Other news

Dean Allison BRS88384 had improved his antenna set up and now has a delta loop which has improved the distances he is able to reach. In particular, he had heard some good dx on 14MHz to help him towards his DXLCA certificate. He had purchased an rtty program from JEP Electronics and would like to know how to change to a different baud rate by using the calculation in the manual. If anyone can help, please write to Dean at 3 West Terrace, Stakeford, Choppington, Northumberland NE62 5UL.

Martin Parry BRS52543 admitted to having been caught by a severe bout of inactivity. His EA12 has been away for an overhaul, so he is raring to go now we are well and truly into the winter dx season.

David Whitaker BRS25429 has confirmed that he will be active on 50MHz in 1988 and he was hoping to go one better than me by putting up a beam. Because of the move to 50MHz, David is to abandon his dxing on 432MHz.

*93 Elibank Road, Eltham, London SE9 1QJ.

ALL TIME COUNTRIES TABLE

Station	dxcc	28	21	14	7	3·5	1.8	Total
BRS25429	342	280	315	338	265	248	113	1,556
BRS32525	326	268	306	321	270	268	112	1,545
BRS8841	320	256	294	317	248	233	77	1,425
BRS48909	–	216	255	276	205	189	80	1,220
BRS52543	–	196	241	259	207	191	100	1,194
BRS50134	275	178	219	245	196	185	96	1,119
BRS1066	298	198	215	276	185	135	93	1,102
ORS45992	301	217	262	286	169	136	19	1,089
ONL5810	278	163	233	266	177	168	41	1,048
BRS20249	256	139	200	206	99	102	29	775
BRS31976	248	145	117	166	84	135	64	711
Average	–	**205**	**242**	**269**	**191**	**181**	**75**	**1,163**

The next table will appear when space permits.

He has over 100 squares heard on the band but feels that for two or three tropospheric openings on the band each year his time will be better spent monitoring the Es on 50MHz, plus of course the real dx that will appear on the band as we move further into the new sunspot cycle. David had a fine time at the HF Convention and was pleased to meet ON4UN, ON5NT and LA1EE (of 3Y fame). On the dx front, he had heard the SY expedition to Mount Athos and the superb VU4 expedition to the Andamans on both 7 and 3·5MHz.

I had enjoyed a break from the office during October and had heard the VU4 trip on all five bands and added CE0Z and KH6 on 7MHz ssb. The VU4 on 28MHz was my first new country on the band since February 1983! My impressions of the hf bands were that they were begining to come nicely to life. Robert Small, BRS8841, shares that view. His letter included much dx logged on 28 and 21MHz. Good to see the dx returning to those bands. 14MHz once again proved the most rewarding with loggings from the Pacific, the Far East and Central America.

Lastly, I mentioned 24MHz last month. Spurred by the reference to ssb on the band, I took a look and in two session's logged nine countries. Best dx included FY5AU, NE5L/0A8, KA1BFC/Z56 and 9Y4JJA. These were all logged between 24,940 and 24,962kHz at around 1600–1700. Any more 24MHz news?

DXCC list

I have lost track of the number of listeners who have asked me for a copy of the DXCC list. For 50p or one irc. I can now provide a copy of the list, together with a country check list by continent with space for you to annotate the list each time a new country is heard. An ideal Christmas present!

Finale

There you have it for 1987. I would like to record my thanks to those listeners who regularly provide information for the column. I hope the number will grow in 1988. News, views, and do not forget your table score, for inclusion in the February issue should reach me no later than 8 December.

MICROWAVES

*Mike Dixon, G3PFR**

Season's greetings

As yet another year comes towards its conclusion, may I wish all readers a merry Christmas and a happy and prosperous New Year? Let us all hope that next year's weather will be a little more productive of good conditions and activity!

Wearing both a chairman's hat and a columist's hat, my special thanks must go to all those who put pen to paper on a regular (or irregular) basis and supplied the information, both operating and technical, to this column and to the *Mircrowave Newsletter!*

I must also record the Microwave Committee's thanks to Dr Dain Evans, G3RPE, who, because of prolonged (possibly permanent) absence on business, has resigned from the post of microwave manager. Dain has put many years of hard work into the microwave scene, both at home and in the international field: he has represented the Society at many top level conferences and in fields other than microwave. He is a past president and long serving member of Council, a holder of the Marconi Medal and a past prolific writer for *Rad Com.* We wish him well in his posting in Germany.

I would, at the same time, like to welcome Dr Charles Suckling, G3WDG, as the new microwave manager and wish him luck and success in his new role: a very important one at a time when the face of amateur microwaves is changing under the influence of both new technology and spectrum pressure. His job will not be easy and he will need a lot of support from all the UK microwave fraternity.

Hangover

No, not the effects of seasonal over-indulgence! I ended last month by saying that covering letters for some microwave claims submitted to G5UM had expressed persistence in pursing operating objectives.

The three 10GHz distance awards went to G0CZD/P and GW4OIH/P and GW4OIG/P. G0CZD, of the Telford group, operated from the summit of the Old Man of Coniston in the Lake District, a two and a half hour footslog carrying 100lb of gear. From experience, this is a steep and rocky path and a real grind, particulary in bad weather. 'OIG and 'OIH did a less steep two hour tramp through three feet high wet heather and horizontal driving rain onto the top of Ruabon Mountain (ngr SJ237458). Despite the apalling weather, contact was made almost immediately on 10GHz after intercepting G0CZD's first CQ call on 144MHz talkback.

G0CZD and other members of the Telford group made the 150+ mile journey especially to create activity and the other stations made an even longer journey from Northampton into North Wales. Full marks to all for persistence and determination. This month's photograph shows some of the group on their home ground, Brown Clee, a well known north midlands microwave site, the home of the 1·3GHz beacon, GB3CLE, built, run and maintained by the group.

At the other end of the microwave spectrum, G0CPU's efforts with a relatively poor 1·3GHz fixed station are also worthy of commendation. Mark used 2W, feeder with 3dB loss and a single 23 element Yagi without masthead preamp from his Essex QTH. Using this equipment he has succeeded in working 16 squares (five confirmed for his first claim) in five countries to date, but has now improved his antenna to four by 23 elements, and has plans to increase power and improve the feeder, plus a masthead preamp. This is a good example of how persistent operating can yield results and how, perhaps, the average station should evolve from modest beginnings.

24GHz and extended (winter) activity.

The Microwave Committee has for some time been trying to encourage more operation on the 24GHz band and, at the same time, extend the operating season through the winter months. A few key components for the 24GHz band are available through the components service and the techniques, at least for wideband, can be near-identical to those used by most beginners on 10GHz. We would also like to see more winter activity on almost any band!

Following a long debate in committee, it was agreed that the 24GHz Distance Award (150km+, as on 10GHz) is far too difficult to achieve in the UK unless operators are prepared to operate on high sites over line-of-sight paths in conditions of extremely low humidity. Even then it is extremely difficult! Water and water vapour are starting to play a significant part in propagation on this band, although not as much as at, say, 47GHz.In the UK, low humidity implies sub-zero temperatures – hence the difficulty in getting the magic 150km+. As far as I am aware the certificate for 150km+ has not yet been issued for 24GHz operation, although the awards manager, Jack, G5UM, will no doubt tell me otherwise!

In order to encourage beginners (particularly), it has therefore been agreed that three categories of award will be made in future: "Beginners" at 25km+, "Intermediate" at 75km+, and "Advanced" at 150km+, as now. The first category should be reasonably easy to attain with simple but efficient wideband gear under fairly normal conditions. The intermediate award will need more skill, a better path, some operating experience with well set-up equipment and favourable conditions, while the advanced award will need really good equipment, considerable experience and good conditions when using wideband techniques. Although it should be somewhat easier for narrowband stations, it will not be so easy as to devalue the award, since building working narrowband in itself is not easy! It is suggested that verified contacts (QSL) after 1/1/87 should count and it is hoped that the first awards can be made in the new year: this will give the awards manager (Jack, G5UM, QTHR) time to do the necessary!

Another innovation, starting with immediate effect as a result of suggestions from a number of operators, is to nominate the first Sunday of each month, November to March inclusive, as microwave activity days, particularly on the higher bands and particularly portable. No rules, no prizes, no trophies, but a chance to work some of the longer distances during what has traditionally been the closed season. The format could well be similar to the Summer Cumulatives, but the important thing is to go out, create activity and make contacts! Authenticated contacts on any band will, of course, be eligible for any of the distance or squares awards, subject to the usual rules, copies of which are obtainable from G5UM (QTHR). It would be appreciated if intending operators could give some advanced notice of their intentions to the editors of the *Newsletter* (G3PHO and G8AGN, both QTHR).

Midlands VHF Convention

A good cross-section of enthusiasts, from 50MHz up, was present at this event at Telford. On the microwave side, committee members G3PFR, G8AGN, G3YGF and G3WDG were present, as was the components service. No doubt a more detailed report will appear in *VHF/UHF*, especially concerning the Management Group forum, the general vhf forum and some of the lectures pertaining to vhf. Ian, G3SEK, gave his talk on long Yagis, and Trevor, G8CJS, talked on 1·3GHz atv. Barry, G8AGN, gave an interesting talk entitled "The In's and Out's of Microwave Amplifiers", concentrating on amateur computer amplifier design programs, comparing the results with professional performance analysis programs and outlining the main reasons why (unpredictability of manufacturers S-parameters in practical circuits) there have not been any definitive amateur designs, particularly for the higher bands where they are most needed! It was noted the even the now notorious SSB Electronics 10GHz transverters (which certainly work well) are full of tweekies: the need to individually optimise in this way is probably one of the reasons why pcb designs appear to have been largely neglected by UK amateurs. Few home constructors have the necessary test equipment, or even easy access to test equipment, of the calibre needed to effect such optimisation, although with a little thought and improvisation, even the simplest of test gear can yield meaningful results. This is, perhaps, one area where there is considerable scope for the traditional amateur ingenuity? The means to design and build pcbs is now open anyone with a micro, reasonably good etching techniques and some patience! Suitable substrate is available from the components service, and the middle bands up to 3·4GHz should begin to benefit from Modamps, Modcons and inexpensive GaAsfets with are appearing in the service and elsewhere: let's see some designs!

On the commercial side, there were some JVL-style loop-quad Yagis for 1·3 and 2·3GHz and power splitters for the two bands, along with some nicely engineered 2C39 amplifiers and cavity kits for such amplifiers (all from Micromax). □

Members of the Teleford group, Martyn G0CZD, Kevin G8UPF, Jim G8UGC, Martyn G3UKV, on Brown Clee, site of the 1·3GHz beacon G3ZME/P.

QRP

*Rev George Dobbs, G3RJV**

Will the Argonauts sail again?

The American QRP ARCI have been looking into the chances of the re-introduction of the flagship of commercial low power transceivers: the Ten Tec Argonaut. The Argonaut has been a favourite for QRP operators from he early 1970's until it ceased production a few years ago. It is a five band (80/40/20/15/10 metre) ssb and cw transceiver capable of 5W RF output. The Argonaut ran through three models: 505, 509 and 515 and, for a limited period, a 100W linear was available. Ten Tec's replacement transceiver for the Argonaut was the Argosy, a transceiver with power output options of 10 or 50W.

I have owned both the Argonaut 505 and the 515 and have shared in the owners love of these transceivers. The circuitry is understandable and reliable and the transceiver is built on accessible and serviceable sub-boards. Usually owners praise the receiver and the full break-in facility. The Argosy has never been so acclaimed probably because of endemic receiver problems.

Members of the QRP ARCI have approached Ten Tec about the possibility of a further production run of the Argonaut 515. The reply has been kindly but cautious. The commercial truth is that it is almost as expensive to produce a low power transceiver as a conventional power output transceiver and the market is smaller for QRP dedicated radios. Ten Tec feel kindly disposed toward QRP operators who have given years of unflagging support to the company's products and would consider a further production run if sales were assured. They seem to require commitments for some 200 units worldwide.

I suspect they would sell their 200 Argonauts without any problem but that it is difficult to obtain such commitments in advance. If you wish to see the Argonaut 515 for sale again and would be interested in buying one, please let the company know. Send a postcard to Ten Tec UK via: Rowley Shears, G8KW, KW Ten-Tec Ltd, Vanguard Works, Jenkins Lane, Chatham, Kent, ME4 5RT. I wonder if the Argonauts will live to fight again?

Eastern European QRP

During the summer I had the pleasure of visits from two QRP operators from eastern europe. Vitak, SP9MRO, called for a very brief visit and later Petr, OK1CZ, stayed at our home for a few days. Both told me of the interest in QRP operating and equipment construction in their countries.

In the UK, we have a vast array of commercially available amateur radio equipment but very little commercial equipment is avialable in either of their countries. Amateur radio and equipment construction go hand in hand, rather in the manner I recall from the early days of my licence. The availability of suitable components is variable and a lot of adaptation and ingenuity is required to build up a station.

It may sound like a difficult state of affairs for the radio amateur but the overall result seems to be a hobby in which people know what they are doing and what they are talking about. I was most impressed by the expertise and ingenuity of Petr and his station. His only piece of commercial equipment is an old AR88 receiver. His multiband transceiver equipment is driven by the local oscillator of the AR88. The result is a station which is known, and frequently worked, by QRP operators throughout Europe. How many of us would, or could, run an amateur radio station on this basis? OK1CZ did buy a little commercial equipment on his visit here which, I am sure, will be fully exploited and lovingly maintained to its full advantage.

There have always been good links between QRP operators in the UK and Czechoslovakia and in recent years we have shared in activity periods. Once again in the New Year we are to have a joint activity weekend. Any radio amateurs are invited to seek cw contacts using 3W rf output, or less, according to the plan set out below:

OK/G activity weekend: 23 and 24 January 1988.

0000-0100	1,815/1,845/1,900kHz	1100-1400	14,060kHz*
0500-0600	1,815/1,845/1,900kHz	1400-1600	10,106kHz
0600-0700	3,560kHz	1600-1700	7,030kHz
0800-0900	3,560kHz	1600-1700	7,030kHz
0800-0900	7,030kHz	2100-2359	3,560/70kHz
0900-1100	10,196kHz		

1700-2100 rest period *Also 18MHz if open

UK QRP operators active during this period are invited to submit logs and notes to G8PG, see below for address.

*St Aidan's Vicarage, 498 Manchester Road, Rochdale OL11 3HE.

The G QRP Winter Sports

In my profession, there are many complaints about the hijacking of Christmas by self-interest groups. Certainly Christmas suffers from the ice cream van syndrome. Have you noticed how if anything interesting is happening anywhere; the ice cream vans turn up? The arguments about the peripherals of Christmas are best fought elsewhere, but one worthy Christmas tradition I can commend here is the G QRP Club Winter Sports. This event has been going for several years now and for many people it marks the highlight of each year's QRP operating.

It is not a contest but an activity period, what our American friends call a QSO party. The idea is to achieve as many two way QRP QSOs as possible. The Winter Sports runs from 26 December to 1 January, inclusive. It is a cw event centred around the QRP calling frequencies of 3,560. 7,030, 10,106, 14,060, 21,060 and 28,060kHz. Operators are asked to call, or listen for CQ QRP using an rf output power of 3W or less. There are no appointed times for each band but a good rule of thumb is to try the highest band open at the time of operating.

Although not a contest, one award is available for the best overall log received for the event. This is the G4DQP Trophy: a plaque, which is held for a year, with a small keepsake. So we invite all radio amateurs to join us over this period and to submit logs and comments to: Angus Taylor, G8PG, 37 Pickerill Road, Greasby, Merseyside L49 3ND.

Transcontinental QRP nets

As the conditions on the hf bands gradually improve, operators may like to try a couple of QRP transcontinental nets in North America. The American Transcontinental Net has been running for many years and has provided many UK operators with their first intercontinental two way QRP contacts. The net is every Sunday on 14,060kHz at 2300 with W5LXS as net controller.

The Canadian Transcontinental Net also operates on 14,060kHz on every Sunday at 1900. The net controller is VE6BLY. Both of these nets are worth trying for transatlantic two-way QRP QSOs.

The annual AGCW-DL Winter QRP Contest

Twice a year the German AGCW runs a QRP contest. The winter contest is on 16–17 January (third complete weekend). The rules are as follows:

1. **Date** Each year in the third complete weekend in January.
2. **Time** 1500 (Saturday) to 1500 (Sunday) gmt.

G8PG (right) presents the G QRP Club Suffolk Trophy to OK1CZ during Petr's recent visit to the G3RJV shack. Photo: *Rochdale Observer*

3. Mode cw only.

4. Frequency 1.8MHz to 28MHz amateur radio bands. Contests may only be conducted in frequency segments as authorised by the IARU for the designated mode of operation.

5. Participants Licensed radio amateurs and swls

6. Classes Class A = below 3·5W input = 2W out, single op
Class B = below 10W input = 5W out, single op
Class C = below 10W input = 5W out, multi op
Class D = below QRO-stations, more than 10W input = 5W out to contact QRP-stations only
Class E = swls
Class C stations may operate fulltime 24h; stations in classes A, B, D and E must take a 9h break, which may also be taken in two segments.

7. Call "CQ QRP test"

8. Exchange Exchange RST and QSO number and input, for example 559005/5 for QRP station (adding "X" if crystal controlled). QRO station: 439002/QRO

9. General Operation on any one band must be in one class. Operation on any one band may be crystal controlled or vfo, but not both. In case of crystal controlled stations, no more than three crystals may be used in any one band. Stations may be contacted only once on each band. Crystals must be listed in log. VXO=VFO!

10. Scoring QSO with own **DXCC-1** and ..... 1 point
QSO with own continent ..... 2 points
QSO with dx (outside own continent) ..... 3 points
(in accordance with latest DXCC list, but call areas in JA, PY, VE, W and ZS count separately)
Multipliers:
For each country 1
For each DX-QSO 1

11. Total score Band result = QSO points x multipliers
Total result = sum of band results
For crystal controlled stations, result points are doubled.

12. Logs Separate logs must be submitted for each band. Special log sheets may be requested from DK9FN (see below address) for one denomination in stamps or irc. Logs and points calculation are to be sent no later than six weeks after date of contest, to Sigfried Hari, DK9FN, Spessartstaße 80, D-6453 Seligenstadt, West Germany.

13. Results For placement list showing winners in each class and band, send one irc to contest manager with your log. Certificates are awarded for the first three places for each class and band.

Michigan QRP Club annual QRP Contest 1988

The Michigan QRP Club is 10 years old in 1988 and to celebrate this anniversary, they hope for extra entrants in this their annual contest. Unfortunately it is on the same weekend as the DL AGCW Contest. The rules are as follows:

1. Date. January 16, 1988 – 1200Z to 17 January 1988 – 2359 (36h). cw only, (WARC bands excluded). Contest is open to all amateurs and all are eligible for awards.

2. Frequencies. 1,810, 3560, 7030, 7040, 14060, 21060 and 28,060kHz. Novice: 3,710, 7,110, 21,110 and 28,110kHz.

3. Exchange. RST, QTH (State/Province/Country) and M-QRP membership no. (non-members send power output).

4. Classes. A. Less than 1W output. B. 5W to 1W output. C. Over 5W output.

5. Scoring. Stations may be worked once per band for QSO points. Member contacts are five QSO points each. Non-member contacts are one QSO point each. Multiply total QSO points (all bands) by the number of states/provinces/countries worked per band, for total points. **Bonus points:** Total points x 1·5 for 100 per cent battery or natural power.

6. Award certificates will be issued for the highest score in each state/province/country. Logs must contain: full log for **each band**; name, call address, equipment used, **power output** and signature.

Logs must be received no later than 1 March, 1988. Please send an sase (or two ircs) for results. All logs to: L T Switzer, N8CQA, 654 Georgia Marysville, MI 48040.

A set of one log sheet and one entry form are available for an sase to K8DD, 1640 Henry, Port Huron, MI 48060.

Help the MI-QRP Club celebrate its 10 anniversary; join us in January.

OBITUARIES

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

Mr H A Bartlett, G5QA
Herbert Arthur Bartlett (Herby) died on 19 September 1987. During the war he was involved with the Radio Secuirty Services and the Voluntary Interceptors which he helped to organise in the southwest. As regional representative for Devon and Cornwall, he organised the very first official regional meeting which was held at Plymouth and chaired by the then RSGB President Bill Scarr, G2WS. He was responsible for the Coronation Loyal Rally when greetings for the Queen on her coronation were relayed to RSGB headquarters from societies and individuals by amateur radio and presented to her together with an illuminated address. In 1955 he became president of RSGB and he stressed the international aspects of amateur radio and the comradeship and fellowhship to be found. In 1960 he was elected executive vice-President, after which office he retired from direct public view but he continued to promote amateur radio over the air and wherever he went.

Mr E H Bone, GOGWT
Ted Bone died aged 70 on the 24 August 1987. He was a founder (treasurer) member of the North Cheshire Radio Club.

Mr Tony Marcantonio, G3TLC
"Marc" died on 3 August 1987. He was well-known to Italian amateurs. From his early amateur days he was an rtty enthusiast.

Mr J L Milner, G1GZA
John 'Jack' Milner died on 6 September 1987 aged 71. He was a member of Thornbury and DARC and also of the Bristol RSGB Group. He became licensed in August 1985 and was active on 144 and 432MHz.

Mr Hugh Oak-Rhind, G2AUD
Hugh died on 27 July 1987. His interest in wireless started while at school after visits to the North Forland radio station. He made his own 2-valve radio in 1926 and in 1930 he obtained his G2AUD. While in Singapore after the war he borrowed a large army transmitter and set up the station VS1FP and was on the air again. In Singapore he did considerable experimentation on 144MHz. In recent years he was well-known as an active Raynet member in Suffolk and Whiltshire.

Mr A Painter, G4HUJ (G8EAQ)
Alec died on 16 August 1987 aged 52. As treasurer of the Worthing and District ARC for the past 15 years, an active member of the Brighton Rally committee, and a member of the RNARS.

MR C J Reed, G2IP, ex-GW2IP
John Reed died on 6 July 1987 aged 81. He first held the AA licence G2AWV in Bristol in 1925 and then G2IP in 1928. He was a founder member of the ex-Bristol Net and a member of the Organ Net on 3·5MHz.

Mr P J Revill, G3ZZR
Phil Revill died on 17 August aged 63. He was a keen member of RAFARS and could be heard nightly on the 3·7MHz net either on ssb or cw.

Mr W Robertson, GM6RI
Walter Robertson died on 2 September 1987 aged 77. He was first licensed at the age of 15 and was a keen cw dx operator and well-known on the hf bands. During the last war he was second-in-command of a key radio station waging an intelligence role against the Germans. He was a member of FOC and held many operating awards.

Mr D R Saunders, GOAKB
'Sandy' Saunders died on August 1987. Known as 'Sandy' to all his friends, he was a member of Stockport Radio Society. Heard frequently on 144·700MHz teaching and sending cw, he helped many amateurs to obtain their Class A ticket, being an originator of the '700 Club'.

Mr G J Stuck, G3AMR (C6ABA)
Gordon Stuck died on 19 September. He was a member of the Royal Signals Amateur Radio Society. After the war he spent each winter at his other home on Abaco Island, in the Bahamas, where he operated daily using his callsign C6ABA. He worked cw almost exclusively and was active on all bands except 1·8MHz.

Mr M Tapson, G6IF
Maurice died on 5 September 1987 aged 73 years. He was a member of the RSGB since 1932 and also of RAOTA. An amateur since 1932 he was a keen dx-er on both cw and ssb, and was well-known in the Southend and the High Wycombe areas.

Mr L T Taylor, G3RMG
Len Taylor died on 4 October 1987 aged 81. Originally a member of the Southgate Club he continued with his club activities on moving to Cornwall, and was well-known on the 3·5MHz band. He and his widow, Pat, were instrumental in raising large sums in Cornwall for the RAIBC.

Also:
Mr J H Baileff, G3GIP, on 12 September 1987
Mr S C Barrell, GW3IPB
Mrs Leila Bevington, GOAVL, on 12 October 1987
Mr J E Chissell, G3ERT, on 5 January 1987
Mr G Derouineau, F9XY
Mr T G Dunsford, GOALG, on 21 March 1987
Mr J R Greenwood, RS27551
Mr J R Hodgson, G4CVB, on 20 August 1987
Mr F A Holyland, G6CHU
Mr A W Joyner, G3EIY, on 6 February 1987
Mr G N Kent, G6NXD
Mr A H Ledgar, RS43079
Mr M McDermott, G6MLO, on 20 August 1987
Mr P L G March, G4RYR, on 26 July 1987
Mr P G Medcalf, GOCMC, in February 1987
Mr A T O'Connor, RS39596, on 24 August 1987
Mr R W B Parsons, G6RP, on 11 July 1987
Mr E A Riches, RS47690
Mr H Rose, G4JLH, on 19 June 1987
Mr N P Sadwick, G4PWW, on 28 August 1987
Mr M H Slingsby, RS88444, on 15 April 1987
Dr F M (Max) Smith, G5KD, on 5 May 1987
Mr H L Stumbles, G1ETJ, on 22 May 1987
Mr R P Swaffield, G3JM, on 26 August 1987
Mr G Thomas, GW1MLA, on 14 October 1987
Mr R F G Thurlow, G3WW, on 26 May 1987
Mr E Tully, G3WBE
Mr J W J Tyrrell, G2CBN, on 19 June 1987
Mr R C Warrick, G3VCJ, on 29 May 1987
Mr A C Wilberforce, G2IY, on 29 August 1987
Mr G Wilson, G8JRK, on 13 May 1987
Mr J R Wright, RS42737, on 29 June 1987

Club News

The following is the latest information received by RRs from the RSGB affiliated societies, clubs and groups in time for inclusion in this issue. Basic unchanged information on other affiliated organisations will be published again in January 1988.

RSGB affiliated organisation are requested to report all programmes and new items to their regional representatives regularly. Information for inclusion in the February issue should reach them by 1 December.

Club programmes are given in order of date, subject, time and place of meeting. All callsigns of club secretaries and other contacts are QTHR (correct in the current RSGB *Call Book*) unless otherwise stated.

All clubs welcome visitors and would be pleased to hear from potential new members.

REGION 1—RR B Donn, G3XSN, 7 Thurne Way, Liverpool L25 4SQ. Tel 051-722 3644.

Blackburn (ELARC, G3NTJ/G1ELC)—1 Dec (AGM). 7.30pm. Conservative Club, Cliff St, Rishton. Details G6LXU, tel 0254 887385.

Bury (BRS, G3BRS)—8 Dec (AGM). 8pm. Mosses Community Centre, Cecil St, Bury. Details G1VQE, tel 061-796-5296.

Chester (C&DARS, G3GIZ/G8GIZ)—1 Dec (Committee meeting), 8 (tba), 15 (Construction contest), 22 (Christmas meeting), 5 Jan (AGM). 8pm. Chester RUFC, Hare La, Vicars Cross, Chester. Details G6IFA, tel Chester 336639.

Darwen (DARC, G4JS)—16 Dec (AGM). 7.30pm. Highfield WMC, Ratcliff St, Darwen. Sec G2AKK, tel 0254 73767.

Fylde (FARS)—1 Dec (Construction competition), 15 (hot pot supper), 5 Jan (AGM). 7.45pm. The Kite Club, Blackpool Airport. Sec G8GG, tel 725717.

Leyland (Central Lancs ARC)—7 Dec (AFS 144MHz post mortem), 14 (Committee meeting), 21 (Christmas party and disco). 8pm. The Priory Club, Broadfield Dr, Leyland. Details G4YZN, tel 0257 452287.

Manchester (South MRC G3VFA/G3UHF)—4 Dec ("Satellite tv"), 11 (Mini lecture contest), 25 and 1 Jan (Closed). 8pm. Sale Moor Community Centre, Norris Rd, Stale. Details G2AKR.

Penrith (Eden Valley RS)—18 Dec (Buffet and dance at RAFA club, Penrith). Sec G4FUI, tel Penrith 66728.

Preston (PARS)—3, 17 Dec (tba). 8pm. Lonsdale Club, Fulwood Hall La, Fullwood, Preston. Sec Godfrey, tel 0772 53810.

Rossendale (RARS)—16 Dec (Christmas dinner). 8pm. The Huntsman, Burnley Rd, Loveclough, Rossendale. Sec G4VVK, tel 0706 214076.

Stockport (SRS)—9 Dec (AGM). 7.45pm. Dialstone Community Centre, Lisburne La, off Dialstone La. Sec G4ECI, tel 061-439 3831.

Taporley (Mid-Cheshire ARS)—2 Dec (Construction and night on the air), 6 (144MHz contest), 9 (Cheshire Raynet group meeting), 16 (Activity night), 23 and 30 (Closed). 8pm. The Cotebrook Village Hall, Cotebrook, Nr Tarporley. Details tel 0260 271505.

Thornton Cleveleys (TCARS)—7 Dec ("Weather satellite reception", G4EZM)14 (Informal), 20 (Christmas dinner at Pendale Hotel), 21 (Christmas social), 28 (Closed). 7.45pm. 1st Norbreck Scout HQ, Carr Rd, Bispham, Blackpool. Club net Sundays 11am, G4ATH on 1·865MHz. Details Jack, tel 0253 821827.

Wirral (WARS)—2 Dec ("Practical packet", G3VQT), 16(Film night). 8pm. Club Room, Ivy Farm, Arrowe Park. Sec G3VEB.

Wyre (WARS)—11 Dec (Annual dinner), 23 (Closed). 8pm. Breck Squash Club, Breck Rd, Poulton. Sec G4UHI, tel 0253 854745.

I wish to thank Wirral & DARC for the hospitality shown to Julie and I on the occasion of the annual trophy presentations. Also thanks to the organisers of the Trafford Rally where I spent a most enjoyable afternoon. I apologise to the North Cheshire RC for missing their party due to a mix-up in dates. Finally, a very Happy Christmas and healthy New Year to you all. *RR1*

REGION 2—RR P Sheppard, G4BEJP, 9 Elvington Crescent, Leconfield, Beverley, N Humberside, HU17 7LX. Tel 0401-50397

Barnsley (UK FM Group Northern G8KRM)—6 Dec (Monthly meeting). 7.30pm. Royal Hotel, Barnsley. Details G4UNA.

Goole (GR&ES G0GLE)—4 Dec (Christmas evening out), 11 (Natter night), 18 (Festive quiz night). 8pm. West Park. Details GOGLZ, tel 0405 69968.

Halifax (H&DARS, G2UG)—15 Dec (Christmas social). Running Man ph. Details GODLM, tel 0422 202306.

Halifax (Northern Heights ARS G4NOK)—2 Dec (Alignment evening), 16 (Social evening), Bradshaw Tavern, Halifax. Details G3UI, tel 0422 60574.

Hambleton (HARS)—7 Dec (RAE course), 14 (Future activities discussion). Alletonshire School West. Details G1IGH, tel 0274 496222.

Keighley (KARS RS 84851)—8 Dec (Informal). Victoria Hotel. Details G1IGH, tel 0274 496222.

North Ferriby (NFUARS, G0ECR)—4 Dec (Christmas and second brithday party). North Ferriby FC. Details G1LSZ, tel. 0482 493777.

Sheffield (SARC)—7 Dec (Morse forum), 14 (Pea and pie supper), 21 (Rendezvous with G1JAJ), 28 (Christmas present swapshop). 8pm. Firth Park Pavillion, Sheffield. Details G8ZHG, tel 0742 395287.

Spen Valley (SVARS, G3SVC)—3 Dec (RSGB video), 17 (Christmas social). 8pm. Old Bank WMC, Mirfield, W Yorks. Details G4PHR, tel 0924 499397.

Todmorden (T&DARS, G4WYT)—7 Dec (G3RJV Christmas Lecture and social), 21 (Natter night). Queen Hotel. Details G1GZB, tel 0706 817572.

Wakefield (North Wakefield ARC G4NOK)—17 Dec (Christmas dinner). White Horse ph, Wakefield. Details G4RCH, tel 0532 536633.

Wakefield (W&DRS, G3WRS)—1 Dec (On the air), 22 (Christmas social). 8pm. Ossett Community Centre. Details G4VRY, tel 0532 820198.

Many thanks to all contributors and all the best to Region 2 for Christmas. Please support your RLO next year. 73. *RR2*

REGION 4—RR M Shardlow, G3SZJ, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. Tel 0332 556875.

Derby (DADARS)—2 Dec (Junk sale), 9 (Constructors contest), 16 (Christmas party), 23 (Closed), 30 (The year in retrospect), 2 Jan (Junk sale). 7.30pm. 119 Green La, Derby. Sec G3KQF, tel Derby 772361.

Loughborough (LADARC)—1 Dec (Night on the air), 8 (Audio-visual show with G0FTT), 15 (Construction night), 29 (Closed). 7.30pm. Hind Leys Community College, Forest Rd, Shepshed. Sec G0FTT.

Mansfield (MARS)—4 Dec (Christmas party), 15 ("The Oscilloscope", G8GNN), 1 Jan (No meeting). 7.30pm. Victoria Social Club, Princes St, Mansfield. Sec G4AAH, tel Mansfield 642719.

Melton Mowbray (MMARS)—18 Dec ("Communications through the ages", G4PZQ). 7.30pm. St John Ambulance Hall, Asfordby Hill, Melton Mowbray. Sec G3NVK, tel Melton Mowbray 63369.

Spalding (SADARS)—December meeting (Christmas social). 7.30pm. The Ship Albion, Albion St, Spalding. Sec G4NBR.

This will be the last club news item published during my term of office as RR4. I would like to thank all the clubs and societies who have shown such wonderful hospitality to Jenny and myself. During the last seven and a half years the most memorable times have been the visits around the region. 73. Martin, G3SZJ and XYL Jenny, G4EYM.

REGION 5—RR J S Allen, G3DOT, 77 Rosslyn Crescent, Luton LU3 2AT. Tel 0582 508515.

Cambridge (C&DARC)—4 Dec (Informal), 11 (tba), 18 (Christmas party), 25, 1 Jan (Closed). 7.15pm. Coleridge Community College (visual aids room), Radegund Rd, Cambridge. Sec G4TRO, tel 0223 353664.

Dunstable (DDRC)—11 Dec (Christmas tv show via GB3TV), 18 (Christmas party), 25 (Closed). 8pm. Room 3, Chews House, High St, South Dunstable. Sec G0COQ, tel 0582 508259.

Luton (Kent Process Controls Ltd ARC)—This club has now closed. The club call has been cancelled and the licence returned. Further details from G3DOT.

Milton Keynes (MK&DARS)—12 Dec (Christmas party at the Barley Mow, Cosgrove), 14 ("British fighter aircraft of the piston engined era", G0GOF. Meeting Place, Hodgelea, North Milton Keynes. Sec G0GOF, tel 0234 767904. Advanced notice is given of an EGM in March 1988 to discuss the society's constitution.

Shefford (S&DARS)—5 Dec (Chistmas dinner) 24 & 31 (Club closed), 7 Jan (tba). Sec G4PSO. tel 0462 711364.

Slough (Burnham Beeches RC)—7 Dec (Christmas social), 21 (Natter night). 8pm. Haymill Community Centre, 112 Burnham Lane, Slough. Details G6EIL, tel Maidenhead 25720.

REGION 6—RR NP Taylor, G4HLX, 87 Hunters Field, Stanford, in the Vale, Faringdon, Oxon. SN7 8ND. Tel 03677 503

Aylesbury (A Vale RS)—2, 16 Dec (tba). 8pm. Village Hall, Hardwick, Aylesbury. Sec G4XZJ, tel Aylesbury 81097.

Banbury (BARS)—2 Dec ("Amateur satellites", G4HLX), 16 ("Packet radio", G4OCO). 7.30pm. The Mill, SpiceBall park, Banbury. Sec G1IIO, tel Banbury 51774.

Chesham (C&DARS)—2 Dec (Natter night), 9 (tba), 16 (General meeting), 23 (Social evening at Queen's Head). 8pm. Stable Loft, Bury Farm, Pednor Rd, Chesham. Sec GOETU, tel 09278 3911.

Didcot (Vale of White Horse ARS)—1 Dec (tba), 15 (Christmas social). 7.30pm. The Waterwitch, Cockroft Rd, Didcot. 6, 13 & 20 Dec (GB4GWR at Didcot Railway Centre). Sec G4SYL, tel Didcot 816845.

Harwell (HARS)—15 Dec (AGM & quiz), 7.30pm. Harwell Lab. Social Club. Sec G6LNU, tel Wantage 68453.

High Wycombe (Chiltern ARC)—9 Dec (Christmas party). 8pm. Sir William Ramsay School, Rose Ave, Hazelmere. Details G4XVP, tel 0494 33377.

Maidenhead (M&DARS)—3 Dec (Christmas social & construction contest), 15 (quiz). 7.30pm. Red Cross Hall, The Crescent, Maidenhead. Sec G3VTS, tel Maidenhead 25443.

Oxford (O&DARS)—9 Dec (Natter night), 23 (tba). 7.45pm. Oxford Civil Service Sports Association Club, Govt Bldings, Marston Rd, Oxford. Sec G4PUU, tel Oxford 52859.

Reading (R&DARC)—15 Dec (Christmas dinner, venue tba), 22 (Informal). 8pm. Clubroom, White Horse, Emmer Green, Reading. Details G4YFB, tel Reading 867820.

REGION 7—RR R Sykes G3NFV, 16 The Ridgeway, Fetcham, Leatherhead, Surrey KT22 9AZ. Tel 0372 372587.

Ashford (Echelford ARS)—21 Dec (Christmas social and bring & buy). 8pm. The Hall, St Martins Court, Kingston Cres, Ashford, Middx. Sec G4VAZ, tel Sunbury 783823.

Bexleyheath (North Kent RS)—1 Dec (Field day films/videos), 15 (Christmas meeting). 8pm. The Pop-in-Parlour, Graham Rd, Bexleyheath. Sec G4DIB, tel 01-467 2603.

Biggin Hill (BHARC)—8 Dec (Tape and slide show). 7.30pm. The Victory Social Club, Kechill Gardens, Hayes. Sec G3UMI, tel 01-462 2689.

Coulsdon (CATS)—14 Dec (AGM). 8pm. St Swithuns Church Hall, Grovelands Road, Purley, Surrey. Sec G6HC, tel 01-684 0610.

Cray Valley (CVRS)—3 Dec ("Scanners"), 17 (Natter night). 8pm. Progress Hall, Admiral Seymour Road, Eltham SE9. Details G3TAA.

Crystal Palace (CP & DRS)—19 Dec (Social evening). 8pm. All Saints Parish Room, Upper Norwood, SE19. Sec G3FZL, tel 01-699 6940.

Dorking (D & DRS)—8 Dec (Sussex Repeater Group road show). 8pm. Ashcombe School. Sec G3AEZ, tel 0306 77236.

Guildford (G & DRS)—11 Dec (Debate), 18 (Christmas party). 8pm. Model Engineers HQ, Stoke Park, Guildford. Sec G4VRN.

Kingston (KDARS)—16 Dec (Christmas film show). 8pm. Alfriston, 3 Berrylands Rd, Surbiton. Details G3IMK, tel 01-397 6924.

Redhill (RATS)—15 Dec (Construction contest). 8pm. Constitutional and Conservative Club, Warwick Rd, Redhill. Details G3YSX.

Sutton and Cheam (S & CRS)—18 Dec (Christmas get together). 8pm. Downs Lawn Tennis Club, Holland Ave, Cheam. Sec G0BWV.

Thames Valley (TVARTS)—1 Dec (Christmas social). 8pm. Thames Ditton Library, Watts Rd, Giggs Hill, Thames Ditton. Sec G3ENI.

Wimbledon (W & DRS)—11 Dec (Social evening). 8pm. St Andrews Church Hall, Herbert Rd, Wimbledon SW19. Sec G4RBQ, tel 07373 51559.

May I wish all members in Region 7 a very Happy Christmas and prosperous New Year. My thanks to all the clubs for their help and hospitality during my vistis during my term as *RR7.*

REGION 8—RR M Elliott, G4VEC, 20 Haysel, Sittingbourne, Kent ME10 4QE. Tel 0795 70132.

Burgess Hill (Mid—Sussex ARS)—3 Dec ("Operating evening in club shack"), 6 (144MHz fixed station contest), 10 (Christmas dinner, The Priory, Haywards Heath), 17, 24, 31 (Closed). 7.45pm, Marle Place, Leylands Rd, Burgess Hill. Details G0GNV, tel Burgess Hill 41407.

Dartford (DDFC)—8 Dec (Pre-hunt meeting), 13 (DF hunt), 15 (EGM). Pre-hunt meetings held at Horse & Groom ph, Leyton Cross, Nr Dartford after 9pm. Details G8DYF, tel Greenhithe 844467.

Dover (SE Kent YMCA ARC)—2 Dec (Natter night), 9 ("Meteor scatter", G8VR), 16 (Christmas social), 23, 30 (Closed), 6 Jan (Natter night). Dover YMCA, Godwynehurst, Leyburne Road, Dover. Details John Dobson, tel Dover 211638.

Eastbourne Electronics (EEARC)—Sundays, 8pm. Shinewater Community Centre, Milfoil Drive, Langney Eastbourne. For details, phone above centre (Sundays 8-10pm), Eastbourne 768614.

Eastbourne (Southdown ARS)—7 Dec ("AX.25 packet radio", G4BMK), 4 Jan (AGM at Chaseley Home, Bolsover Rd, Eastbourne). Hailsham Lesiure Centre, Vicarage Lane, Hailsham. Sec G4VOS, tel Heathfield 3168.

Gillingham (Bredhurst R&TS)—3 Dec (Construction and natter night), 10 ("Talk on the new GB3KN repeater", G3YCN), 17 ("Construction and natter night"), 24, 31 (Closed), 7 Jan ("Phase lock loops", G8NVH). 8pm. Parkwood Community Centre, Parkwood Green, Wigmore, Gillingham. Details GOAMZ, tel 0634 376991.

Hastings (HERC)—16 Dec (Christmas social). 7.30pm. West Hill Community Centre, Croft Road, Hastings. Details G4NVQ, tel Hastings 420608.

Herne Bay (East Kent RS)—3 Dec (Annual cheese & wine party). 17 (Natter night), 7.30pm. Cabin Youth Centre, Kings Road, Herne Bay. Details G4RIS, tel 0227 262042.

Horsham (HARC)—3 Dec (AGM), 7 Jan ("Planning permission", G3UDU). 8pm. Guide Hall, Denne Road, Horsham. Sec G4UDU, tel Worthing 60695.

Maidstone (MYMCAARS)—4 Dec (Natter night with RAE & cw), 11 (tba), 18 (Social evening), 25 (Closed). 8pm. YMCA Sportscentre, Melrose Close, Maidstone. Details G0BUW, tel 0622 30544.

Margate (Radio Club of Thanet)—9 Dec (Social evening, G0AHA entertains), 22 (Closed). 7.30pm. Grosvenor Club, Grosvenor Place, Margate. Sec G1HWG, tel 0843 42480.

Meopham (MPRC)—13 Dec (Homebrew contest). 7.30pm. Vigo Rugby Football Club, Vigo Village, Meopham. Details G4XNU, tel 0732 823371.

REGION 9—RR A H Hammett, G3VWK, Rosehill, Ladock, Truro, Cornwall, TR2 4PQ. Tel 0726 882 758.

Axminster (Axe Vale ARC)—4 Dec (Annual dinner). Details G3VW, tel Lyme Regis 5282.

Exeter (EARS)—14 Dec ("Cats whiskers and microchips", D Edmonds), 11 Jan ("DX operating at the dx station", G3HTA). 7.30pm. Community Centre, St Davids Hill, Exeter. Details G3YBK.

Exmouth (EARC)—2 Dec (Christmas dinner), 16 (Christmas party), 30 (Video and film night). Scout Hut, Marpool Hill, Exmouth. Details G1GZG.

Redruth (CRAC)—3 Dec (Christmas party), 14 (Computer section natter), 17 (Activity evening), 7 Jan ("Smiths charts", Simon Rodda). 7.30pm. Church Hall, Treleigh, Redruth. Details G4MSV.

Saltash (S&DARC)—Sec, GOAKH is now at 58, St Stephens Rd, Saltash, OL12 4BJ. Tel 075 55 3277.

Torbay (TARC)—12 Dec (Christmas party at ECC Social Club, Highweek, Newton Abbott). 7.30pm. Details G0FGK, tel 03646-233.

REGION 10—D H Phillips, GW4KQ, 17 Pentre Gardens, Grangetown, Cardiff CF1 7QJ. Tel 0222 35648.

Cardiff (British Telecom ARC)—9 Dec ("RIS", Graham Barry). 7.30pm. GW4ZVY, tel 0222-379732, weekdays 8am-4pm.

Cardiff (CRSGBG GW5BI)—14 Dec (Christmas party and bring and buy sale). Pant Mawr Hotel, Tyla Teg, Pant Mawr Estate, Whitchurch, Cardiff. Sec GWOCUM, tel 04463 3212.

Cardiff (Highfield ARC GW4LFO, GW1LFO)—3 Dec ("General natter night"), 10 (Technical lecture), 17 (Christmas party). Sec GW6ZHM, tel 0222-750315.

Port Talbot (British Steel Corporation ARS GW3EOP)—12 Dec (Bring and buy). 7.30pm. Sec GW4IGR, tel 0639 720416.

Powys (PARC GW4HVN)—10 Dec (Christmas party). 7.15pm. Sec GW4DWX, tel 0938 2068.

I would like to wish a merry Christmas and a happy New Year to all readers and to say thank you to the clubs that have extended invitations to myself and my wife and for the hospitality on these visits. I look forward to meeting you all again in the New Year. *RR10*

REGION 11—RR B H Green, GW2FLZ, 1 Clwyd Court, Tan-y-Bryn Rd., Colwyn Bay, Clwyd. LL28 4AH. Tel 0492-49288.

Colwyn Bay, (Conway Valley ARC GW6TM)—3 Dec (Provisionally, "packet radio", Ken Williams), 7 Jan (Discussion and talk). Note change of meeting day to the first Thursday of the month, 7.30pm. Also note new venue Edelweiss Hotel, Lawson Rd, Colwyn Bay. Sec GW0DSL, tel 07456 5529.

Deeside (Alyn & Dars)—1 Dec (Technical evening, GW0EHB), 6 (144MHz contest), 15 (Christmas social and supper). 8pm. Shotton Social Club, Shotton La, Deeside. Sec GW1ILZ.

Porthmadog (P & DARS)—17 Dec (Meeting). 8pm. Harbour Cafe, Ffestiniog Railway, Porthmadog. Sec. GW1EGQ, tel 0766-2684.

Welsh Language Group—Every Wednesday at 11.15gmt. on 3·750MHz. Join the net for various discussions in Welsh, net controller GW2HFR.

Will club secretaries please send details of their future events for January 1988 onwards to enable it to be passed to the Liaison Officer for Area 46. *RR11*

REGION 12—RR M R Hobson, 17 Well Brae, Pitlochry, Perthshire PH16 5HH. Tel 0796 2140, Prestel 10796 2140

Another year is almost at an end, and with the New Year comes a new representation scheme. My thanks for the warm hospitality received from those clubs I visited in 1987. From Janet and myself, may you have a Happy Christmas and a prosperous New Year. *RR12*

REGION 17—RR T M Emery, 75 Haig Road, Bishopstoke, Eastleigh, Hants SO5 6JF Tel 0703 693673.

Basingstoke (BARC)—7 Dec ("Commercial equipment for the amateur"). 7.30pm. Forest Ring Community Centre, Sycamore Way, Basingstoke. New G1WKK, tel 0256 478232.

Blackmore Vale (BVARS)—8 Dec (Christmas dinner). The Bell & Crown, Zeals (on the A303). Sec G4YXX, tel 0963 32389.

Bournemouth (BARS)—4 Dec (Natter night). 8pm. Next meeting 16 Jan. Kinson Community Centre, Kinson, Bournemouth. Sec G4DJG, tel 0202 526793.

East Dorset UHF Repeater Group (GB3DT)—For information or to join the group and help support the repeater, contact G1VIP, tel 0202 735003.

Eastleigh (Itchen Valley ARC)—11 Dec (Christmas social). 7.30pm. Next meeting 8 Jan . The Scout Hut, Brickfield Lane, Chandlers Ford, Eastleigh. Sec G1IPQ, tel 0703 736784.

Fareham (F&DARC)—9, 23 Dec (Natter night), 2 Dec ("Bobbins, baluns and beads", G3CCB), 16 ("The morse test", G3TZL) 7.30pm. Portchester Community Centre, Portchester, Hants. Sec G3CCB, tel Fareham 288139.

Farnborough (F&DARS)—9 Dec (Christmas social). 23 (Closed). 8pm. Railway Enthusiasts Club, Access Road, off Hawley Lane, Farnborough. Details G0FNW.

Guernsey (GARS) Please note that the secretary is now GU4SXM, tel 0481 25450.

Isle of Wight (IWRS)—4 Dec (Open forum). 11 (Project night), 18 (Members choice), 1 Jan. (New Year dinner dance). 8pm. Unity Hall, Wooton Bridge. Sec G4RGE, 0983 872620.

Liphook (Three Counties ARC)—9 Dec (Quiz night), 18 (Christmas party). 8pm. The Railway Hotel, Liphook. Details G4VKC, tel Liphook 723415.

New Forest Repeater Group (GB3NF)—For information or to join the group and help support the repeater, contact G6DLJ, tel 0703 847754.

Portsdown Hill Repeater Group (GB3PH)—For information or to join the group and help support the repeater, contact Mr A L G Price, tel 0329 281852.

South Dorset Repeater Group (GB3SD and GB3DP)—For information or to join the group and help support the repeaters, contact G3VPF.

Salisbury (SRES)—8 Dec ("The RSGB", G3KWU), (Construction evening). 7.30pm. Grosvenor House Centre, Churchfields Road, Salisbury. Sec G4LDR, tel 0980 22809;

Trowbridge (T&DARC)—9 Dec (Natter night), 23 (Christmas party). 8pm. Territorial Army Centre, Blythsea Road, Trowbridge. Sec G0GRI, tel 0380 830383.

UK FM Southern Repeater Holding Group (GB3SN)—For information or to join the group and help support the repeater, contact Mrs Jan Steele, tel 0323 896287.

Waterside (WSC)—15 Dec (Christmas skittles evening) 7.30pm. Community Centre, Blackfield, Southampton. Sec G0BPA Tel (0703) 893937.

Weymouth and Portland (SDRS)—1 Dec (Christmas fayre). 7.30pm. The Pensylvania Castle, Portland, Dorset. Sec G0FIT, tel Dorchester 67596.

Winchester (WARC)—18 Dec (Christmas party). 8pm. Durngate House, Winchester. Sec G1XCT, tel Winchester 880605.

May I take this opportunity to send all clubs in Region 17 my very best wishes for Christmas and the New Year and will you please support your new RSGB Liaison Officers so that the amateur radio movement in the UK can continue with effective representation. Thank you for your support during my term as your Regional Representative. *RR17*

REGION 18—RR Ian Gibbs, G4GWB, 61 The Gables, Widdrington, Morpeth NE61 5QZ. Tel 0670 790090.

Redcar (East Cleveland ARS-G4CRS)—Friday evenings, RAFA Club, Newcomen Tce, Redcar. New Sec G1VLG, tel 0642 219586.

REGION 19—R J C Broadbent, G3AAJ, 94 Herongate Road, London E12 5EQ. Tel 01-989 6741.

Cheshunt (C&DARC G4MGC)—2 Dec ("Batteries; their use and abuse", G3IGP), 9 (Natter night), 16 (Video and wine and cheese party), 23, 30 (Closed). 8pm. Church Rooms, Church Lane, Wormley, Herts. Secs G3OJI, tel Ware 4316.

Chiswick (ABCARC)—15 Dec (Amateur Licence revision, RSGB proposals discussion). 7.30pm. Chiswick Town Hall, High Rd, Chiswick, W4. Sec G3GEH, tel 01-992 3778.

Edgware (E&DARS)—10 Dec (Junk sale). 8pm. Community Centre, 145 Orange Hill Rd, Burnt Oak, Edgware. Details Jackie Cottrell, tel Garston 672711.

Harrow (RSH)—4, 18 Dec (Activity night), 11 (Talk, tba), 25 (Closed). 8pm. Roxteth Room, Harrow Arts Centre, High Rd, Harrow Weald. Sec Josie Jenkinson.

Harpenden (HARC)—1 Dec ("Radio data service", Reg Marks), 8 (Committee meeting), 15 (Christmas party). 7.30pm. Silver Cup, St Albans Rd, Harpenden. Sec G1BJC, tel 0582 72455.

Southgate (SARC)—10 Dec (AGM) 24 (Closed). 7.45pm. Holy Trinity Church Hall (upper), Green Lanes, Winchmore Hill N21. Details G4YLL, tel 0992 30051.

Stevenage (S&DARC)—31 Dec (Annual junk sale), 15 (HF operation for beginners and puzzle corner). 8pm. Sitec Ltd, Ridgemond Park, Telford Ave, Stevenage. Details GOGTE, tel Stevenage 724991.

SW Herts UHF Group—This group maintains GB3BH on RM0, Bushey Heath; GB3HR on RB14, Stanmore and GB3SWH on 10·368GHz, Bushey Heath. The group would welcome donations to help maintain these repeaters and is available for talks in the area. Sec G4KUJ.

St Albans (Verulam ARC)—10 Nov (Informal), 24 ("Advanced receiver techniques", G3TDR). 7.45pm. RAFA HQ, New Kent Rd, St Albans. Club nets held on Wednesday 7.30pm on 145·350MHz, Sundays 10.30am on 3·522MHz. Details G4JKS, tel St Albans 59318.

REGION 20—C H Hollister, 34 Battersby Way, Henbury, Bristol BS10 7SH. Tel 0272 508451

Bristol (23cms FM TV Repeater Group — GB3ZZ)—

Bristol (BRSGBG)—14 Dec (Christmas party). 7.30pm. Small Lecture Theatre, Queens Bldg, University of Bristol, University Walk, Clifton, Bristol. Details G4SQQ, tel 0272 508451.

Details G4ZQF, Kingsley, 93, Gloucester Rd North, Filton, Bristol BS12 7PT, tel 0272 699947.

Bristol (432MHz Repeater Group, GB3BS & GB3BP)—Details G4MCQ, 50 Quantock Cl, North Common, Warmley, Bristol BS15 5UT.

Bristol (North Bristol ARC)—4 Dec (Committee' meeting & 14MHz activity evening), 11 (QSL card display), 18 (Christmas party), 25 (Closed). 7pm Self Help Enterprise, 7 Braemar Cres, Northville, Bristol. Details G4YQQ, tel 0272 690404.

Bristol (South Bristol ARC)—2 Dec ("Test equipment rally", G4SDR), 9 Dec (Club project discussion), 16 (Christmas party), 23 (VHF activity evening). 7.30pm. The Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol. Details G4RZY, tel 0272 834282.

Cheltenham (CARA)—4 Dec (AGM). 7.30pm. Stanton Room, Charlton Kings Library, Cheltenham, Glos. Details G4VXE tel 0242 36723.

Gloucester (GARS)—2 Dec ("Campanology"), 23 (Christmas Buffet). 7.30pm. St John Ambulance HQ, 2 Heathville Road, Gloucester. Details G6AWT, tel 0452 504515.

Mendip Repeater Group (GB3WR 144MHz, GB3UB & GB3VS 432MHz and GB3UT 1.3GHz TV). Details c/o 191, Charlton Park , Midsomer Norton, Bath BA3 4BR.

Weston-Super-Mare (WsMARS)—14 Dec (Annual constructors night). Details G1DJW, tel 0934 514429.

Yeovil (Y&DARC)—10 Dec ("Broadcasting Techniques, past and present", G3FQO), 17 Dec (Natter night), 23 (Christmas party and junk sale). 7.30pm. The Recreation Centre, Chilton Grove, Yeovil, Somerset. Details G1MNM. Tel 0935 79804.

Yeovil (432MHz Repeater Group GB3YS)—Details G6AGL, 66 Glebelands, Merriot, Somerset.

A very Merry Christmas and a Happy New Year to all in Region 20. *RR20.*

Contest News

1987 144MHz Trophy Contest results

Conditions in the 1987 Trophy Contest were reasonable, but not spectacular. The weather exhibited its usual awareness of extensive /P operation and deluged many operators while they were dismantling their stations, but then it might have deluged everybody while they were assembling as well, which would have been worse.

Two groups realised much to each other's annoyance that advantage was to be had in an IARU event by operating with a relatively rare prefix. Record results achieved by GU4APA/P are certainly spectacular, all the more impressive with the close proximity of GU3CKR/P. Their margin of victory is also extraordinary in view of the very similar nature of the stations, and Warrington must surely be trying everything to find out from the Hillbillies just how they did it.

Scottish stations did well this year, and the single-handed operation of GM0FRT by GM4ZUK in IO87 certainly earns the adjudicator's congratulations.

It, is an alarming fact that the number of entries in this major event is almost a factor of two lower than last year. Judging from the number of late entries received, it appears that many people cannot make the 15-day deadline for sending entries, and perhaps many do not try. Do please let us know whether more time, is what you want. Or is it that many simply feel unable to compete with the likes of GU4APA/P and G8TFI/P? Your comments would be welcomed.

There were only a couple of isolated bad-signal reports this year. Logging standards are definitely improving, bearing in mind that the lower number of entries and a much improved checking system allowed every contact to be checked on the leading three logs in each section, turning up errors that could not have previously been detected. Most errors occur on the random characters in callsigns and locators, and almost every log has enough to lose the contest if scores are close. Careful listening is the answer. G4IRB and G4NTY are again thanked for their help in checking.

Congratulations and certificates to the Hillbillies, GU4APA/P; Warrington CG, GU3CKR/P; Chris Easton, G8TFI/P; IC Offer, LX2GB/P, and RS32525, and to the zonal winners listed in the table. Subject to Council approval, the Thorogood Trophy will be awarded to G8TFI/P and the Mitchell-Milling Trophy to the Hillbillies.

G4JLG

MULTI-OPERATOR SECTION

Posn	Callsign	Points	QSOs	Loc	Amp	Ant No	Ant Type	Best dx km	Best dx Callsign
1	GU4APA/P	16,348	1,142	89VR	2x'250	8	17,9Y	891	DD2GA
2	GU3CKR/P	11,953	835	89RM	2x8874	8	17,9Y	860	GM0FRT
3	G4LIP/P	10,752	838	03CE	2x'250	8	16,9Y	904	FF2LY
4	GM0CLN/P	8,167	666	84AT	1x'350	2	14Y	789	F6HPP/P
5	GW4GFX/P	7,529	727	81LQ	2x'250	2	17Y	860	DL8PC/A
6	G6CMS/P	7,404	636	01PU	Tet. ?	4	15Y	902	FF6KOU/P
7	G8LNC/P	7,117	694	90MX	8877	4	19Y	888	FF6KOU/P
8	GW3XBY/P	6,988	741	82JJ	2x8874	–	80c/1	917	HB9LF/P
9	G3EFX/P	6,801	643	90XV	2x'250	2	16Y	953	F6HTJ/P
10	G6URU/P	5,794	519	01QD	4CX1000	2	17Y	925	Y37QM
11	GD4IOM	5,299	470	74QD	8877	4	17Y	716	ON7KM/A
12	G1KMI/P	5,022	550	80W-O	2x'250	2	19Y	966	F6HTJ/P
13	G4SIV	5,012	451	92TR	2x'250	4	16Y	831	HB9S/P
14	G2XV/P	4,619	491	02EB	NAG	2	17Y	817	FF2LY/P
15	G1KAR/P	4,310	420	00DR	1x'250	1	11Y	806	F6HYE
16	G4WET/P	4,238	601	92CA	2x'250	2	14Y	838	HB9S/P
17	G4CDC/P	3,963	438	93UK	2x'250	4	11Y	734	Y26QI/P
18	G5RS/P	3,822	543	91TF	'800A7	2	17Y	778	Y3YQ
19	G4LUA/P	3,756	392	02MN	2x'250	5	9,16Y	775	DK0HA/P
20	G8SMR/P	3,713	471	93BF	1x'250	2	17Y	867	DK0KJ/P
21	G8EOD/P	3,440	493	93EC	Dres	2	18Y	753	DF4IW/P
22	G3WRS/P	3,366	414	94MJ	?	1	16Y	798	F6KSL/P
23	GM4DEZ/P	3,285	304	85WT	2x8874	1	17Y	699	GU3CKR/P
24	G4UHF/P	2,888	488	91LT	1x'250	1	17Y	628	DL8GP
25	G0HSF/P	2,878	377	84SA	2x'250		None	668	F6GOE/P
26	GI4KIS/P	2,546	198	74BU	MM 100W	1	13Y	704	ON9CBT
27	G8ZKE/P	2,022	364	82OL	MM 100W	1	17Y	792	F6GOE/P
28	G8WYR	1,579	231	93EU	? 100W	1	17Y	654	F6CTT
29	G6BSE/P	1,385	179	02HE	? 60W	1	16Y	587	F2EI/P
30	G3TRF/P	1,336	237	01HH	None	2	9Y	675	GM3TSL
31	G3IGQ/P	1,252	227	91XG	Bnos50W	1	14P	709	DL6FAW/P
32	G0ECC/P	911	130	70OG	? 100W	1	13Y	800	PA3BPC/P
33	G5LO/P	783	137	91KS	MM 100W	1	17Y	418	F6HPP/P
34	G5ZG/P	616	96	01CW	Sota100	1	13Y	544	DF1VW/P
35	G3UES/P	615	209	91TJ	Bnos 50	2	8SI	589	DF0LP/P
36	G4SSD	544	76	80FJ	None	2	11Y	580	ON7KM/A

LISTENER SECTION

Posn	Station	Points	QSOs	Loc	Ant No	Ant Type	Best dx km	Best dx Call
1	RS32525	1,313	187	01AL	1	9Y	570	DF0OL/P
2	RS25429	780	92	93FX	1	8Y	620	F6HPP/P
3	RS28198	402	60	00HX	2	8SI	470	DF1VW/P

Check Log: G8PW.
Disqualified: G0BQP (Rule 13). (Rule 2) G4PIQ, G1DXY/P, G1MDG/P, G6BRH/P, G0HAS, G3NZS, G1MZD (Rule 1).

SINGLE OPERATOR SECTION

Posn	Callsign	Points	QSOs	Loc	Amp	Ant No	Ant Type	Best dx km	Best dx Callsign
1	G8TFI/P	6,281	500	80EF	2x'250	4	9Y	1,002	DD9GA
2	LX2GB/P	5,082	508	JN29	2x'2127	1	11Y	648	Y21VC/P
3	GM0FRT	4,066	279	87WB	2x'8874	1	19Y	839	GU3CKR/P
4	G6HKM	2,955	336	01FT	BNOS160	1	17Y	790	FF2LY/P
5	G6IAT	2,819	325	91TV	1x'350	2	17Y	737	DK0JK/P
6	G0CLP/P	2,589	345	84IG	Tr. 60W	1	8Y	717	F6HPP/P
7	G4NBS	1,925	250	02AF	Tr. 130W	1	9Y	595	DK0BN/P
8	G3COJ	1,160	122	91PO	2x'250	1	16Y	753	HB9S/P
9	G6KUI/P	1,077	200	92HT	Tr. 150W	1	8Y	491	FC1BDE/P
10	G1DWQ/P	987	151	80WP	None	1	7Y	713	GM0FRT
11	G6HXU	934	126	83RF	Tr. 25W	1	?Q	609	PI4GN
12	G0EGX	780	118	01IT	Tr. 22W	1	6Q	536	DK0BN/P
13	G4DFI	772	92	01BL	1x'350	1	9Y	620	F/DK0GR/P
14	G4PDP	734	98	92UE	None	1	5Y	554	GM0FRT
15	G8KHR	699	71	02SL	MM 100W	1	8Y	525	F6CTT
16	G1CSR	697	132	91WL	MM 30W	1	7Y	581	DK0BN/P
17	G8PHN/P	593	118	01GP	Tr. 10W	1	10Y	470	GM0CLN/P
18	G1GVA	460	66	91PJ	None	1	6?	500	GM4DEZ/P
19	G8ZRE	398	53	83NE	Tr. 100W	1	8Y	510	ON4ASL/A
20	G4JNT	370	43	90IV	Mir. 100W	1	8Y	688	DF0OL/P
21	G6HLL	340	66	83RE	None	1	9Y	544	FF1MKJ
22	G8FKP	271	55	91PQ	None	1	9Y	566	ON7KM/A
23	G1ARL/P	249	69	91UQ	2xMRF587	1	9Y	565	DF1VW/P

ZONAL WINNERS

Zone	Multi-Op	Single-Op
A	GD4IOM	G0CLP/P
B	G4LIP/P	G6IAT
C	G6CMS/P	G6HKM
D	GU4APA/P	G8TFI/P
E	GW4GFX/P	–
F	GI4KIS/P	–
G	GM0CLN/P	GM0FRT

YHF NFD 1987 results – correction

The score of G4ICM/P in the 1·3GHz Restricted Section should have read 1,461 points.

Chelmsford/Colchester DF Qualifying Event results

In brillant sunshine, 20 teams assembled on Fordham Heath, Colchester, for the start. Both hidden stations provided good signals, so everyone left at 1.30pm.

The "A" station was provided by Ian Butson, G4HKC/P, who was hidden in a wood 20km SE of the start, near St Osyth. This site was guarded by several water hazards provided by inlets and creeks of the River Colne. The transmitter used a long circular antenna with a number of tee-ins to distract those who follow antenna. However, df competitors are determined people who don't shy at waist-high nettles, brambles, etc, so after several teams had "been-in" there was a fair-sized path of flattened woodland leading to the transmitter.

"B" station, G0BTH/P, was concealed 20km SW of the start, among old sand diggings near Heybridge Basin. Here Paul Clark erected another circular antenna which ran along part of the sea wall and over several water-filled dykes. For the second year, the station operators were augmented by "Fred" the dummy, who was given a transmitter of his own and positioned to welcome competitors. Unfortunately some teams turned back, when Fred refused to sign their form, without spotting the real station just a few metres further on.

Posn	Name	Club	Time of arrival Stn A	Time of arrival Stn B
1	C Plummer	Mid-Thames	1541	1438
2	G Whenham	Coventry	1544	1437
3	C Wells	S Manchester	1551	1430
4	B Bristow	Mid-Thames	1553	1430
5	A Collett	Dartford Heath	1554	1431
6	M Hawkins	Chelmsford	1554·5	1429
7	C Metcalfe	Mid-Thames	1443	1607
8	T Gage	Mid-Thomas	1436	1607·5
9	P Larbalestier	Colchester	1441	1610
10	P Cranmer	Colchester	1440	1610·5
11	A Judd	Mid-Thames	1449	1621
12	R DeLaRue	Colchester	1444	1621·5
13	G Foster	Stratford	1437	1629
14	D Newman	Slade	1444	---
15	C Baisden	Chelmsford	1556	---
16	R Whitney	Chelmsford	1557	---
17	P Cunningham	Colchester	---	1609
18	P Woollett	Dartford Heath	1628	---

Two teams failed to find either transmitter.
G Whenham and A Collett qualify for the National Final.

144MHz Low Power Contest results

Once again a very popular and well supported contest, although entries were slightly down on previous years. Log-keeping standards varied from excellent to very poor, points being lost by careless errors in callsigns, suffixes and serial numbers, especially when 56 to 59 signals were claimed. In general this did not impact overall positions but can be costly with county/country multiplier contests.

There maybe a need to standardise on county/country claim format to help first-time contestants, of which there were several , as well as the adjudicators. Conditions were regarded as average although analysis indicated substantial activtiy from EI/GI/GD/GM/GU/GJ/GW/G/F/ON/PA and DL areas. Maybe stations did not spend time listening for the weaker signals? Several portable station acknowledged chosen site limitations in specific directions both due to topography and prevailing weather conditions.

Congratulations and certificates to winners: G3 XBY, single operator; GM0CLN/P, Galloway Contest Group; as well as to runners-up G4SIV, Five Bells Contest Group, and GW4GFX/P, Sheppy Outcasts Contest Group. Honours in the Listener Section go to BRS25429. GB4GD (G8TFI) and G8XTV are thanked for check logs.

G8HHI

SECTION F – FIXED STATIONS

Posn	Callsign	Points	QSOs	Multi	County	Best dx	Km
1	G3XBY	135,198	287	74	WKS	GM3TSL	542
2	G4SIV	124,542	227	51	LCN	DF8VK	635
3	G4HGI	103,672	246	61	MSY	ON1CAK	539
4	G6IAT	100,107	219	63	BFD	EI2VPX	631
5	GW4VEQ	89,907	143	69	GDD	GM4ZUK/P	426
6	G1TRS	86,028	217	67	HWR	GM4ZUK/P	518
7	G3JXN	82,824	227	58	LDN	GM8COX	529
8	G6HKM	72,928	184	53	ESX	GM8AAP/P	563
9	G3NAQ	68,139	190	67	BRK	DL2OM	515
10	G6LOH	67,344	204	61	NHM	GM4ZUK/P	545
11	G0ERE	51,622	166	53	BFD	GM1FML/P	493
12	G0HAS	51,272	162	58	WLT	GM0CLN/P	387
13	G3YDY	49,860	146	45	ESX	DL2OM	510
14	G2BSJ	49,533	149	57	BKS	EI2VPX	599
15	G8ZRE	45,430	136	55	CHS	G0GDL/P	374
16	G4LAD	41,128	108	53	YSW	ON1CAK	513
17	G4FJK	39,900	130	57	NHM	GM4ZUK/P	534
18	G0FCV	29,920	112	44	BKS	GM0CLN/P	451
19	G4TDL	28,395	126	45	BRK	DL2OM	585
20	G6HLL	27,965	92	47	CHS	GM4ZUK/P	416
21	G0GJV	22,356	104	46	BRK	G1JKX/P	433
22	GW3POM	22,140	88	41	GNM	G4SWX	324
23	G4DFI	22,095	98	41	LDN	GI0HYD/P	553
24	G1DNG	20,768	81	44	AVN	FC1LJA	375
25	G4CW	20,444	107	38	KNT	EI2FN/P	465
26	G8MKD	17,595	81	45	WM	GM4ZUK/P	497
27	G4TVI	16,536	78	26	ESX	DF8VK	519
28	G1HSK	16,512	62	43	YSN	GM8AAP/P	356
29	G0EGX	16,344	74	36	ESX	EI2FN/P	485
30	GI4KIS	15,890	44	35	ATM	G3EFX/P	593
31	G8BBC	15,804	118	36	LDN	GB4GD	414
32	G0DNJ	13,498	85	34	BKS	GM0CLN/P	419
33	G6OKU	11,988	52	37	DYS	GM4ZUK/P	418
34	G4FOH	10,730	48	37	CBE	EI2FN/P	420
35	G4PDP	10,574	61	34	BFD	GB4GD	354
36	G1LYQ	9,824	68	32	BKS	ON1KIE	354
37	G4YFN	9,688	74	28	BRK	ON1KNT	464
38	G0BQP	8,526	38	29	CVE	G4ADV/P	491
39	G4XOW	8,415	53	33	HWR	GM0CLN/P	305
40	G8TZJ	4,800	30	25	LNH	G4ADV/P	397
41	G1SJX	4,176	31	24	WLT	GM0CLN/P	410
42	G1AMX	2,171	17	16	NLD	GW4GFX/P	388
43	G0HGA	1,504	36	16	HFD	G4HGI	243
44	G3JJZ	533	15	13	LDN	GW4GFX/P	220
45	G4AGQ	152	11	8	SRY	G0HAX	81

SECTION O ALL OTHER STATIONS

Posn	Callsign	Points	QSOs	Mult	County	Best Dx	Km
1	GM0CLN/P	249,508	292	76	DGL	G1DJA	538
2	GW4GFX/P	218,304	328	72	GWT	DL2OM	748
3	G8LNC/P	176,548	308	76	HPH	GM3TSL	691
4	GW0CDA/P	153,024	311	64	CWD	ON1KNT	652
5	GW4ALG/P	148,104	278	72	GWT	GM4ZUK/P	560
6	G3ZME/P	143,412	307	68	SPE	DL2OM	733
7	G4ADV/P	143,040	199	64	CNL	GM4ZUK/P	713
8	G0CLP/P	140,678	253	62	CBA	G0GDL/P	482
9	G3EFX/P	138,420	281	60	SXE	HB9AEN/P	658
10	G1JKX/P	118,606	184	37	NLD	G0GDL/P	613
11	GI4TAJ/P	114,125	161	55	ATM	G4YST	611
12	GM4ZUK/P	110,684	133	59	GRN	G4ADV/P	713
13	G4KZY/P	104,328	242	69	SPE	ON1CAK	518
14	G1DVU/P	101,745	226	63	SXW	EI4VBM/P	659
15	G4APD/P	96,480	221	72	NHM	FD1FHI	574
16	G6PPD/P	93,310	173	62	TWR	G1ITE	556
17	G4WAR/P	84,280	233	56	LEC	ON1KNT	504
18	G6LKB/P	66,444	160	49	CBA	GU3EJL	500
19	G1DWQ/P	66,316	160	59	DOR	G1JKX/P	514
20	G1WOR/P	48,093	190	51	SXW	EIZFN/P	466
21	G6ZZZ/P	47,196	166	57	NHM	GM4ZUK/P	525
22	G1ELC/P	46,928	134	56	LNH	EI2VPX	450
23	G1VEN/P	44,361	150	53	SPE	-----	--
24	G6VAT/P	44,304	152	52	HWR	GM4ZUK/P	500
25	G6SPS/P	34,470	110	45	ESX	GM0HNX/P	484
26	G1KGR/P	34,068	128	51	MCH	GM4ZUK/P	376
27	G3VEF/P	33,700	119	50	HMP	G1JKX/P	480
28	GW0FKN/P	33,150	111	39	PWS	GM1FML/P	523
29	GM6VGB/P	32,542	82	53	CNT	G4ADV/P	619
30	G0GOK/P	32,338	131	46	YSW	G6LFN/P	405
31	G8YYB/A	30,774	129		LDN	GI4OPH	483
32	G1CRH/P	23,715	65	45	CBE	GM1FML/P	523
33	GM1FML/P	20,007	50	39	SCD	G8LNC/P	583
34	GI0HYD/P	15,097	41	31	ATM	G4DFI	564
35	G6FJF/P	14,196	72	39	NHM	GM8AAP/P	467
36	G4SLH/P	12,648	91	31	ESX	G4ADV/P	374
37	GI8NBW/P	6,048	28	24	LDR	G1CRH/P	491

SECTION SWL LISTENERS

Posn	Station	Points	QSOs	Mult	County	Best dx	Km
1	BRS25429	27,264	86	48	YSN	G4ADV/P	429
2	BRS31976	20,330	92	40	ESX	GI4OPH	522
3	BRS28198	3,213	25	21	SXE	GB4GD	490

First 1·8MHz Contest 1988 rules

1. The general rules for RSGB hf contests, as published in the "Operating Guide" supplement. *Rad Com* January 1988, will apply.

2. Date and time. 2100gmt Saturday 13 February to 0100gmt Sunday 14 February 1988.

3. Sections. Single-operator entries only. British Isles entrants must be members of RSGB. **(a)** British Isles. **(b)** Overseas (including EI).

4. Band and mode. 2100gmt Saturday 13 February to 1100gmt Sunday 14 February 1988.

5. Exchange. RST plus serial number started 001. British Isles stations must also give their county code as shown in the "Operating Guide".

6. Scoring.

(a) British Isles Section: three points for each completed contact, with a bonus of five points for the first contact with each British Isles county and for the first contact with each country outside the British Isles.

(b) Overseas Section: three points for a contract with a station in the British Isles (not EI), with a bonus of five points for the first contact with each British Isles county.

7. Documentation. Logs to be headed; date/gmt; callsign; RST/number sent; RST/number received; code received; bonus; points. Duplicates must be clearly marked without claim for points. Unmarked duplicates will be penalized at the rate of 11 times number of points claimed, and logs containing more than five unmarked duplicates, for which points have been claimed, would normally result in disqualification. Each entry must be accompanied by a cover sheet and the following signed declaration: "I declare that this station was operated strictly in accordance with the rules and spirit of the contest and agree that the decision of the Council of the RSGB shall be final in all cases of dispute".

8. Name and address for entries. Address logs to "HF Contests Committee" as follows: British Isles entrants to J C Burbanks, G3SJJ, "Southlands", 16 Cotgrave Road, Plumtree, Nottingham NG12 5NX. Overseas entrants to PO Box 73, Lichfield, Staffs WS13 6UJ, England.

9. Date for entries. Logs must be postmarked not later than 15 days after the end of the contest.

10. Awards

(a) The Somerset Trophy will be awarded to the winning station in the British Isles Section, and certificates of merit to second and third placed entrants.

(b) The Maitland Trophy will be awarded to the Scottish entrant with the highest aggregate number of points in this contest combined with the Second 1·8MHz Contest 1987.

(c) Certificates of merit will be sent to the first three stations in the overseas section.

(d) A certificate of merit will be awarded to the highest placed log from an entrant who has not previously entered any RSGB hf contest. Candidates for this award should mark their entry "First-Time Award".

11. Receiving Section

(1) Transmitting Section rules 1,2,3,4,5,6,7,8,9 will apply.

(2) A station may appear only once in the column headed "Station heard". The callsigns of the station being worked may only repeat once in every three contacts logged. Logs to be headed: date/time gmt; callsign of station heard; RST/serial number/county code sent by that station; callsign of station being worked.

(3) Certificates of merit will be awarded to the leading three entrants.

(4) Holders of UK Class B licences may enter the receiving section.

Ropoco 2 Contest results

A team of HF Contests Committee members met in London to mark the Ropoco 2 Logs, as G4DJX was unable to do so. This was necessary in order to have the results ready for the HF Convention and the presentation of trophies.

All except four logs had errors: many of the problems occurying in transcription. The most popular mistakes were as usual, the confusing of zeros with Os. It must be remembered that in this contest when sending the postal code, full and not shortened forms of digits should be sent; eg, 9 should not be sent as N and 0 should not be sent as T or O. From comments noted on entries, the Ropoco contests are much enjoyed, not only because they are a test of one's skill in copying cw, but also because of the amusement caused as the postal codes change in the time honoured fashion of "Chinese whispers".

Congratulations to Alan, G4DJX, who wins the G3XTJ Memorial Trophy for the highest-scoring accurate log, and to Derek, G4BWP, who made the most contacts against all odds!

All Ropoco addicts please note that next year there will also be a trophy for Ropoco 1.

G4JKS

Posn	Callsign	Claimed Score	Checked Score	Posn	Callsign	Claimed Score	Checked Score
1	G4BWP**	730	724	24	G3JJZ	410	400
2	GW3YDX**	710	704	25	G3SOX	400	397
3	G0EOW**	700	665	26	GM3RAO	410	388
4	G4WQN	650	641	27	G4HSD	400	384
5	G3JJG	620	617	28	G3HJF	380	374
6	G4DJX*†	600	600	29	G3DPX	480	370
7	G3JKS	600	597	30	G3MCX	360	357
8	G3OLU	610	595	31	G3HKO	350	344
9	G4OGB	600	590		GW3SB	340	337
10	G3LET	600	588	32	G3AWR	340	337
	G4OTU	590	584	34	G3GLL	350	331
11	G3NOM	590	584	35	GM3UM*	320	320
13	G4BUO	580	568	36	G4KLO*	320	320
14	G4SND	560	551	37	G3JSK	350	306
15	G3SWH	560	535	38	G4FUI	300	300
16	G4HZV	550	534	39	G3GMS	300	297
17	G4KWI	520	514	40	G0CGB	300	287
18	G3RZP	490	487	41	G3GMM	290	284
19	G4WZV	480	452	42	G3YLC	290	274
	G4PKU	450	447	43	G3JSR	290	264
20	G4WYG	450	447	44	G4ZME	250	247
22	G4CWH/A	440	428	45	G0EBV	210	207
23	G3BPM	440	418	46	G3DOT	190	177

*Accurate logs. **Certificate. †Trophy
Check logs with thanks from G4UOL, G3WRR.

Contests Calendar

	RSGB HF CONTESTS
Nov-Dec	28MHz Phone Cumulative (Rules in July issue)
1988	
Jan	1·8, 3·5 and 7MHz Cumulative (Rules in October issue)
10 Jan	AFS
6,7 Feb	7MHz Phone (Rules in October issue)
13, 14 Feb	First 1·8MHz
27, 28 Feb	7MHz CW (Rules in October issue) (Note new dates)
12, 13 Mar	Commonwealth
19 Mar	Town & County
3 Apr	Ropoco 1
17 Apr	Low Power Fixed
15 May	Region Round-up
4, 5 Jun	NFD (IARU CW)
25, 26 Jun	Summer 1·8MHz
9, 10 Jul	SWL
17 Jul	Low Power FD
7 Aug	Hopscotch
28 Aug	Ropoco 2
3, 4 Sep	SSB FD
Sep-Oct	28MHz Cumulative CW
9 Oct	21/28MHz SSB
16 Oct	21MHz CW
12, 13 Nov	Second 1·8MHz
Nov-Dec	28MHz Cumulative Phone
	RSGB VHF CONTESTS
3 Dec	1·2·3GHz Cumulative (Rules in August issue)
6 Dec	144MHz Fixed & AFS (Rules in November issue)
11 Dec	432MHz Cumulative (Rules in August issue)
13 Dec	70MHz CW (Rules in November issue)
19 Dec	1·3/2·3GHz Cumulative (Rules in August issue)
1988	
31 Jan	70MHz Cumulative
7 Feb	144MHz CW
14 Feb	70MHz Cumulative
21 Feb	432MHz Fixed & AFS & SWL
28 Feb	70MHz Cumulative
5, 6 Mar	144/432MHz & SWL
13 Mar	70MHz Cumulative
27 Mar	70MHz Cumulative
2 Apr	50MHz Fixed
3 Apr	70MHz Fixed
9, 10 Apr	144MHz & SWL
17 Apr	10GHz Cumulative
7, 8 May	432MHz–24GHz
15 May	10GHz Cumulative
29 May	432MHz Trophy & SWL
12 Jun	432 MHz FM
19 Jun	10GHz Cumulative
2, 3 Jul	Jubilee VHF NFD
10 Jul	10GHz Cumulative
30 Jul	144MHz Low Power & SWL
31 Jul	432MHz Low Power & SWL
7 Aug	10GHz Cumulative
14 Aug	1,296MHz Trophy & 2320MHz Trophy
3, 4 Sep	144MHz Trophy/IARU VHF & SWL
11 Sept	10GHz Cumulative
18 Sept	70MHz Trophy & SWL
1,2 Oct	432MHz-24GHz/IARU UHF/SHF
6 Oct	432MHz Cumulative
14 Oct	1·3/2·3GHz Cumulative
22 Oct	432MHz Cumulative
23 Oct	50MHz Trophy
30 Oct	1·3/2·3GHz Cumulative
5, 6 Nov	144MHz CW
7 Nov	432MHz Cumulative
15 Nov	1·3/2·3GHz Cumulative
23 Nov	432MHz Cumulative
1 Dec	1·3/2·3GHz Cumulative
4 Dec	144MHz Fixed & AFS & SWL
9 Dec	432MHz Cumulative
17 Dec	1·3/2·3GHz Cumulative
	OTHER CONTESTS
4-6 Dec	ARRL 160m (Rules in December HF)
1988	
Jan-Dec	UBA SWL (Rules in December HF)
1 Jan	Happy New Year (Rules in December HF)
9, 10 Jan	YL/OM Midwinter (Rules in December HF)
16, 17 Jan	AGCW-DL Winter (Rules in December QRP)
16, 17 Jan	Mitchigan QRP Club (Rules in December QRP)

National Final DF Event 1987 results

The late summer sun shone warmly at Tog Hill near Bath on the morning of Sunday 20 September 1987 to greet the 17 top amateur hf-df experts in Great Britain gathered together to compete for the RSGB National Final Trophy.

The welcome sunshine was in marked contrast to the heavy and persistent rainfall of the previous day when the organiser, Trevor Gage, G1MPJ, aided by Colin Boyce, G4XWP, strung out copious lengths of fine wire for antennas at the three sites carefully selected to test the cream of the country's df men to the full.

The Mid-Thames RDF Club, responsible for organising the event, decided to use the Bristol and Bath map as no competitors lived in the area.

At 1250bst good signals were heard from all three transmitters and competitors departed at 1300bst in a spectacular cloud of dust.

Station A G4MDF/P, manned by Bud Mepham and his xyl, was situated in a small wood near to the canal aqueduct at Dunda, five miles southeast of Bath. A superbly camouflaged site was constructed in the undergrowth and a dummy antenna was erected about a quarter of a mile away near to where the aqueduct crossed over railway line and the river Avon. Several teams were deceived this ploy, losing them vital minutes.

Station B, 17 miles from the start, operated by Paul Kelly, G3SDH, and Steve Redway, G4TRA, was in a cave high in the overgrown side of a long disused quarry at Compton Martin. The site was planned to be the most difficult of the three locations, but such are the peculiarities of hf–df, that all teams managed to locate Paul and Steve but not without picking up several bruises as they struggled up, and in a few cases fell down, the slippery, wet, rock strewn slopes. Paul and Steve, never having been involved in real df before, had the time of their lives as they witnessed the effort and colourful language employed by the contestants in their struggles to reach the hidden transmitter.

Station C, was located 14 miles from the start in a wooded valley near Flax Bourton. Manned by Ron Ray, G3NCL, and Min Standon, G1PSY, the site was high up the side of the valley on a ledge on a well-overgrown cliff. The antenna was strung right across the valley and turned through 90° to run along the path through the gorge. The radiation pattern appeared to indicate that the transmitter was on the opposite side of the valley and some of the most experienced teams thrashed about, at the wrong end of an antenna they could not see, convinced the transmitter was only a few feet away. This station proved to be the most difficult one to find.

After the event 62 persons enjoyed an excellent tea at the Family Feeder on the A46 where Willie McClintock, immediate past-President of the RSGB, presented the National Final Trophy and the High Wycombe Cup to the winner, Alan Simmons, G1THD. A special prize was presented to Mrs Christine Bristow as the first lady in a team taking part.

Willie McClintock thanked the organisers for a first-class contest. He had visited each site and marvelled that eight of the teams had managed to find all three within the allotted time. He expressed the hope that such an exciting sport would spread to other parts of the UK to become truly national instead of being mainly confined to southern England.

Eric Mollart, national df organiser, replied that he was pleased to announce that, after a break of some 17 years, Grimsby Radio Society had volunteered to run a qualifying event in 1988 and furthermore, some interest was being shown in parts of Scotland — Ayrshire in particular.

			Time of arrival		
Posn	**Name**	**Club**	**Stn A**	**Stn B**	**Stn C**
1	A Simmons	Mid-Thames	1419	1512	1604
2	C Wells	S Manchester	1408	1446	1618
3	B Bristow	Mid-Thames	1426	1511	1619
4	P Lisle	Mid-Thames	1421	1526	1620
5	I Butson	Colchester	1429	1521	1621
6	A Collett	Dartford Heath	1417	1526	1625
7	G Whenham	Coventry	1428	1521	1626
8	M Hawkins	Chelmsford	1427	1536	1628
9	D Holland	S Manchester	1405	1515	—
10	D Newman	Northampton	1407	1520	—
11	B Poole	Mid-Thames	1409	1536	—
12	A Malbon	Mid-Thames	1434	1537	—
13	P Larbalestier	Devizes	1442	1617	—
14	C Plummer	Mid-Thames	1436	1620	—
15	G Taylor	Aerial	1442	1625	—
16	C Metcalfe	Mid-Thames	1452	—	—
17	A Judd	Mid-Thames	1536	—	—

Alan Simmons (l) winner of the national df final receives the 1950 Council Trophy from Willie McClintock, G3VPJ, immediate past-President of the RSGB

South Manchester Quad Night DF

Date: 12 March 1988.
Map: OS 109 1:5000 series, Manchester.
Start: Sale Moor Community Centre, Norris Road, Sale NGR 798909.
Assemble: At 1900 GMT, for first transmission at 1920 GMT.
Any competitors requiring supper, after the event, should advise Mr D. Holland, 32 Woodville Drive, Sale, Cheshire, M33 1NF. Tel: 061 973 1837 (Home) 061 224 5650 (Office) at the number in their party, by 7 March 1988.

Members' Ads

The Conditions of Acceptance are published below the Member's Ad form circulated with every issue of *Radio Communication*.

The current rate is £2.30 for 40 words or less: advertisements containing more than 40 words will cost an additional £2.30 for every additional 40 or less words. Each advertisement must be accompanied by the correct remittance, either as a cheque or postal order made payable to Radio Society of Great Britain.

FOR SALE · · · · · · · ·

FT290R NICADS CHGR, muTek, psu, vgc, case/mic £240 G4BD, QTHR Rotherham, tel: 0709 379 095 daytime or evenings after 10pm.

PRISTINE FT101B, double-balanced mixer, cw filter, mic, manual, G3LLL clipper, spare valves etc, £325 TS510 hf tcvr, psu, mic, manuals, spare valves, needs attn, hence only £99; Turner mic £10. WANTED: Atlas tcvr. G4ILA, QTHR, tel: Lymm 2388.

COLLINS S-LINE, 32S-1 tx, 516F2 psu, 75S-3 rx, cw filter, 312B4 control unit comprising: spkr, wattmeter, phone patch, desk/mic, leads, manuals, some spare valves, separates or transceive, ex condx and appearance, buyer collects, £750. G3SPJ, QTHR, tel: 01-311 8405 evenings.

TRIO 9130 in ex condx and c/w orig accessories and pkg, 25W mobile or home use £365ono. No time wasters please. G6JNS, QTHR, tel: 0905 620041 and leave a message if I am out.

ICOM IC120 23cm/fm incl Yagi £250; Hitachi GP4D colour video camera £50; MML432/50 linear £95; marine scanner £45; sig/R357 handheld airband £25; CTE767 10m linear £30; JVC GRC1 camcorder incl tapes £350. Jim, G4XRU, QTHR, tel: 0903 690415.

COLLINS KWM2A £450; 30L1 £500; various rare accessories incl dig r/out, Collins mics, etc. G14GNZ, QTHR, tel: 0266 880740 evenings.

HANDHELDS 2m YAESU FT207 Ncia/chgr, Yaesu FT208 NC8/chgr, Yaesu FT202 6-chann, Belcom LS20XE chgr, Eddystone rx 640 1.5-31MHz, TCS12 tx/rx stn, rx Army R209 Icom IC2E extras. G40FO tel: 01-949 2317

FT2700RH DUAL-BAND FULL Duplex with voice unit, FVS1 duplexer HS770 and Heatherlite h/phone/mic, fully wired, mint £400ono. Also several Multi/U11 and IC215, £80-£120 depending on what xtals you want. Many available. G4HMF, QTHR, tel: 0473 51319

FREE ST2 BASE QUICK CHGR value £35 if you buy both my Trio handhelds: TR2500 2m £185, TR3500 70cm £200. Both c/w standard slow chgrs; SMC25 spkr/mic £15. All gd condx. Derek, tel: 0689 31028 7pm-9pm.

AR240 2m SYNTHESISED HANDHELD £120; Icom M80 vhf marine tcvr £220; fax machines, Plessey KD111 £25ea. G4CUN, Taunton, tel: 0823 279169.

IC215 2m/FM PORTABLE TCVR, 15-chann with nicads and chgr, orig pkg, little used £119ono. G8LHQ, QTHR, tel: 01-735 0762.

TOWER AND ANTENNA FARM. Westower 3 h/duty, 28-58ft plus extension masts to 87ft, raise and tilt winches, 2x16-ele 2m/Tonna with hi-pwr phase-splitter, 9-ele crossed 2m/Tonna, 19-ele crossed 50cm/Tonna, Ringo Ranger 11, Emoto 1102MXX h/duty rotator and controller, plus elevating 144Mhz, 185m of low-loss feeders. Total cost new over £1250. Bargain at £600ono. Transport arranged extra. G6BZE, QTHR, tel: 0953 860666.

NOVEX COLOUR MONITOR, accepts RGB or composite i/p metal cased (slightly scratched) £200; Creed 444 teleprinter (no tape punch or tape reader fitted), gd condx £30; Pye b&w 14in portable tv, ideal for use with text work with computer £30; wooden table on wheels, suitable for tv/video or comp/mon £30; four Moonraker1 joysticks for use with Commodore computers, brand new £3ea; old RSGB callbooks, various years £2ea. G4KZZ, QTHR Coventry, tel: 0203 444160.

FT290R PLUS muTek, nicads, chgr, fist/mic, Yaesu headset with boom/mic, telescopic rubber duck, 5/8 mobile whip, all immac, £299. Buyer collects. G3WRO, QTHR Harlow, tel: 0279 30609.

YAESU FT101E, mint condx, cw filter fitted, spare valves, matching spkr, manual, leads, mobile operation, £380ovno. Prefer buyer collect. G3UTF, QTHR, tel: Chesterfield 851417.

HATELY DIPOLE OF DELIGHT, 7 and 21MHz, £9. Gone DD multiband. G5KC, QTHR.

TA33JR, KAISUMI electronic keyer EK150, Super 3500 frontier electronic, hf linear. Late G6IF. G2DRT, QTHR, tel: 0494 814240.

IC02E, CASED SINCE NEW, spkr/mic, mobile headset +switching, spare nicad cases £220; FT709R(4), PA3 mobile headset CSC-10, all as new, £210. Boxes for both rigs post extra. G4LTH, QTHR, tel: 0375 674301 night or 385810 daytime.

VINTAGE 78s COLUMBIA morse code tuition records. Beginners to 18wpm on 4 records. 7wpm to 13wpm on 2 records. Not junk! Immac as new condx, audio superb. Optional 4-speed player with 78 stylus. Offers to CEC, tel: 0827 712348.

SILENT KEY SALE: FT757GX, all-mode; FP757HD, psu; FTV707 tvtr; FC707 ant tuner. Used for a few months only. Reasonable offers please. L G Jones, G8JTU, tel: 0785 812916.

HF LINEAR AMERITRON AL84, now surplus to requirements; Yagi 4m met antenna 5-ele linear £350ono antenna £30ono. Cash only. G4CIM, QTHR, tel: 01-304 8975.

TV SONY 12in PORTABLE 11 OUK b&w, little used, ideal for computers £42; atu Amcom 200, as new never used £17; 2 tv Ferranti Baird, pig-in-poke, useful components, take away. G4IQN, QTHR Wembley, tel: 01-902 4732.

FT290R, NICADS, CHGR, case, r/duck, h/set, MM144/30LS £350; FRC7700, FRV7700, FRT7700 £300; D70-tutor £32; 2m/8-ele Yagi £5; GDO £35; 2m valve linear £25; desk/mic £30; HBacv £4; morse oscillator with key £8; 2m/preamp £3. Sorry no phone. Eddie, G1HAY, QTHR.

TET HB35C 5-ELE TRIBANDER, as new £180 or exch for 3-ele tribander and cash adjust. WANTED: 50W linear with preamp for 6m. G100Q, Walsall, tel: 0922 640861.

YAESU FRG965 (Japanese version of FRG9600) 60-950MHz scanner, with psu and h/book, ex condx, orig pkg £360. Peter, G8SGF, tel: Cambridge 350554

SILENT KEY SALE. In four lots: TS120/E-Zee Match key £430; FRG7 rx £120; TR2300/VB2300 amp/pwr meter/colinear £180. Above three lots in super condx. Also Codar top-band tx and sep rx £60. Tel: 01-807 5100 for appt.

CREED TYPE54 TELEPRINTER with integral tape-punch and silence cover; also Creed Type65 tape-reader, gwo, c/w some paper-tape rolls. £25ono the pair, buyer collects. G8CLW, QTHR, tel: 01-979 5304.

YAESU FT901DM am/fm incl external vfo +spkr £750; HFSU +radial kit £120; new Daiwa NS660 1.5kW pep mtr £90; Capco SPC300 atu £120. Phil, tel: 0642 580536.

DAIWA DR7500X ROTATOR, med/duty, preset controller vgc £80; Datong rf speech clipper module £15; Polaroid image system camera with filters etc, as new, used once only, still under guarantee £85ono. Tel: 01-578 4484 after 6pm.

TRIO 711E 2m MULTIMODE BASE TCVR, mint condx, practically unused, bought new from Lowes, boxed with instrs etc, list £940, sale £695. G2FZU, QTHR Notts, tel: Southwell 813847.

TRIO 811E 70cm MULTIMODE TCVR, mint condx, practically unused, bought new from Lowes, boxed with instrs as purchased, list £1094, sale £800; MBM48/70 48-ele Jaybeam antenna foc to purchaser. G2FZU, QTHR Notts, tel: Southwell 813847.

SPECTRUM 48k COMPUTER, i/face1, i/face2, 2xmicrodrives £120; 20xmicrodrive cartridges 2xmicrodrives £120; 20xmicrodrive cartridges 75p/ea; ZX printer, needs attn, £10; 4xrolls ZX/printer-paper £1.50ea; 2xbooks: "Spectrum Programmer", "Making most of Microdrive", £7.50; Datong antenna AD370 £45; Jaybeam antenna 8Y2M £5. G2FCA, QTHR, tel: 0908 613523.

SCOPES: 2 CD1400, one wkg £60, one needs attn £45; manual also available, one Teckman dual-chann Citart rcdr, will haggle, carr at cost or buyer collects. Mike, tel: 0202 432506.

YAESU FT107M, solidstate 160-10m hf tcvr, ex condx has built-in psu for mains or 12V/dc operation, built-in swr meter, APF/notch, I.F width etc, boxed with manual and Yaesu hand/mic £435 incl free delivery UK. Tel: 0476 77708.

YAESU FT690R Mk1, c/w nicads, carrying case and tet SQ-61 antenna. Mint condx due to little use £270ono. Murray, G0FXU, tel: 01-581 1477 extn 257 9am-4.30pm

IC260E 2m MULTIMODE TCVR with ICHM10 scanning/mic and muTek preamp plus mobile mount, unused, £260. Moving to hf. Dave, G0EFB, QTHR S/E London, tel: 01-311 1544.

ICOM 720A WITH ICPS15 psu, mint, rarely used, receive only, £625ono. WANTED: Can anybody assist with repairs to Grundig satellite 3400 (have service manual). Phil, G1CNN, tel: Tamworth 60098 or 01-993 4946.

TRIO TS940S, mint condx, less than 10hrs use, orig boxes, manual £1600; TV502S Kenwood 2m tvtr, used with TS520/TS820, as new £95; TS430S fm board, cw filter with manual, boxed £650. Fred, G3KSG, QTHR Surrey, tel: 0293 773545.

YAESU FT757GX HF TCVR and FC757AT auto atu, both used very little, £850 the pair. Tel: 01-514 5998 anytime.

YAESU FT290Mk2 CHGR, case, helical, never used so as new. Bought to restart hobby but never found time due to work. Only £350, no offers. G6TLP, QTHR, tel: 0206 224308 evenings.

TRIO 2300, gd condx, mobile carrier for 2300 Alinco linear ELH 230, the lot £115; Katsumi electronic keyer model EK150, ex condx £70. Johnny Tel: 0427 5266.

MINIBEAM G4MH, in ex condx with spare spokes £40. G4LNE, tel: 0706 873839.

FT102, FC102, Datong speech processor, YM38/mic, MH1B8/mic, brass key, elec/keyer, psu, Codemaster decoder, Daiwa active filter, monitor screen, S51E scope, dip/meter, dummy load, balun, various lengths coax, trap dipole. All in gd order, £1200. G4XHY, QTHR, tel: 0759 71022.

YAESU FC902 £100; part-built hf linear 4Cx250B £100; 10m multimode £100; 300W cw tx 10-80 £30; lambic keyer £30; Z-match atu £20; G2DYM ant 10-160 £35; Amtor rtty stc with tu Dragon 64 £120. Tel: 09856 274 anytime.

FT101ZD, FM, Mk3, fan, mic, manual, ex condx £450 ono. G10FL, QTHR, tel: 0474 69225.

SHACK CLEAROUT: TTL, 74LS-83, 95, 161, 192, 194, 290, 366, 74S-74, 112 all at 35p; voltage regulators 78M05HC, 78L12AHC at 25p; op-amp/comparators CA339, CA3080E, CA3130E, NE529, UA733, all at 40p; LF355H, LM318P at 75p; PLL/modulators CA3039, CA3146E, MC1496P all at 50p MC4044P at £1.50. Many other types available - sae for lists. Bulk order discounts welcome. Help! I need the space. G8KSM, 10 Shakespeare Gdns, Cove, Farnborough, Hants GU14 9QT, tel: 0252 540558

ALL ITEMS IN FIRST CLASS CONDX UNLESS OTHERWISE STATED. Collins/Amelco R390A communications rx 500kHz to 32MHz in 32 bands, 4 mechanical filters, digital r/out to 100Hz, etc £325; Icom IC290E 2m multimode with mains psu/spkr unit £250; Wayne Kerr wide-range pulse generator type CT500, solidstate, ex-Govt £5; two Solartron laboratory

digital multimeters with service manuals, one requiring attn, Cost £4000+, £20 pr; STC freq standard rx, solidstate, wkg but no info, £5; Collins 51J-4 communications rx, 500kHz to 30.5MHz in 30 bands, full complement of mechanical filters orig cabinet, £325; Ikegami b&w tv camera, C-mount built-in monitor, separate video & baseband rf o/ps, internal or external sync internal mains psu +manual £75; Microvitec uncased 14in RGB monitor, wkg but shabby £25; Revco R2000 scanner, specially modified by "Timestep" for weather satellite reception, boxed and as new £150; Philips GM6001 multi-range vtvm £20. WANTED: Mullard image intensifier tube, 2/)" diameter, (or larger), refractor telescope, 6in (or larger), Battleship binoculars. Add on ROM board for POCOM decoder. Pete, G30JR, 190 Victoria Avenue, Hull HU5 3DY, tel: 0482 43353 anytime.

TRIO TR-7800 with orig box and in mint condx, never used mobile £190 cash. WANTED: Daiwa CN620 in mint condx, reasonable price for OAP. G3GYX, QTHR Notts.

KENWOOD TR-9130, pristine condx, boxed, mic, mobile mount etc £360; Hi-mound HK708 key £15; Datong D70 tutor £35; MET 70cm pwr splitter £15. GODJH, Reigate, tel: 0737 240815.

ICOM 290E 10W multimode £300; BNOS linear amp LPM 144-10-100 £140; 17-ele Tonna £40. All in vgc. WANTED: IC240 or similar for mobile wkg fm only. G4EGB, QTHR, tel: 0723 362537 evenings.

ICOM IC-471E 70cm multimode base stn, boxed with manual, ex condx £575; Jaybeam 16ft portable mast c/w guy wires £12 plus postage. Tel: 01-590 5490 please ask for Martin.

HERNIA-INDUCING TXFMR, 500A 6V, 250A 12V or 125A 24V £45. Various electric motors and valves. G4IOY QTHR.

PORTABLE 16ft MAST £10; HFSR radial kit £15. G4CNG QTHR, tel: 0532 608609.

YAESU FT-209RH c/w h/book FNB4 and chgr, spkr/mic, 1/8, 1/4 and 3/8 wave antenna, 5/8 magmount mobile whip, PA-3 car adaptor chgr, little used, £250. GU4WQP, QTHR, tel: Guernsey 22914.

VHS PORTABLE VIDEO SYSTEM comprising camera, rcdr with leather shoulder carrying case, 12-chann tv tuner and chgr, two new rechargeable batteries and all connecting leads, little used, hence sell £300 or exch gd computer kit. Tel: 051-648 4240 after 6pm.

KANTRONICS KPC-2 pkt communicator 2 with manual, new, boxed, unwanted gift £100. GW3ZEY, tel: 0600 2358 after 6pm.

FDK725X 2m/fm mobile, 30W variable, dual-vfo, 12.5-25kHz steps, 144-148MHz, scanning Heatherlite mobile safety/mic, 5/8+8/8 whips with gutter-mount ideal mobile set-up, lack of use forces sale £155 ono. G0ANC, tel: 01-247 6097 daytime only.

KENWOOD AT200 atu swr, suit TS520, TS830 etc, gd condx £100; also 2in steel poles various lengths. G3JBU, QTHR Northampton, tel: 0604 401600.

TB3 Mk3 3-ELE TRIBANDER new, 18AVT 5-band, latest Kenwood new TH215E 2m handheld, freq counter hf vhf with probes LAR hf atu, or p/exch hf equip or gd quality hf linear. WHY? Tel: 051-625 2271.

PIONEER CAR HI-FI, KEX33 tuner cassette deck, separate GM120 amp, 120W, recently serviced, cost new £300, accept £120; Trio TR8400 70cm fm mobile, gwo £160. G0AWP, QTHR, tel: 0482 651827 after 6pm.

YAESU FT757GX TCVR plus FP757HD psu, plus FT757AT auto antenna tuner plus MH1B8 mic, 2yrs old, mint condx, as little used £1000ono. G0ATZ, QTHR, Bishops Stortford, tel: 0279 724162.

DNT 10m/FM TX/RX, as new, performs well with circuit, instrs £49; Microwave modules atv cvtr MMC435/600, first class condx £16. G3KZU, QTHR, Oxford, tel: 0865 63000.

YAESU FRG7700 gen/cov rx, 100kHz-30MHz with mem, FRT-7700 tuning unit, dc kit, manuals, mint condx, orig pkg £250. GOGEW, Blackpool, tel: 0253 61966.

YAESU FT767GX WITH 2m module and MD1 desk/mic; all mint and in orig boxes, first £1450 secures. GM3KJZ, QTHR, tel: 0383 417976 evenings only.

KDK FM2030 2m tx/rx with h/book £180; Yaesu FT101E hf tx/rx c/w h/book etc £285; Daiwa CN620A swr/pwr meter, 1.8-150MHz with pep mod £55, all in mint condx and wkg ok. G3BFL, QTHR, tel: 0635 298492.

SCANNER RX Uniden Bearcat UBC100XL handheld, mint condx, purchased new Sept this year, 16-chann, 9-band coverage, ac adaptor/battery chgr, nicads, etc, h/book, save on new price, £150. G4EJH, QTHR, Bristol, tel: 0272 623284 daytime or 843897 eves.

SWAN 100MX TCVR 100W ssb/cw solidstate £320; FC700 atu £100; 80m mobile G-whip with magmount £20, G5RV antenna £10. G0BRN, tel: 0272 719163.

HF LINEAR 2 Qy3 for ample o/p, fully metered and switched, little used, vgc, accept £100 from first caller (North Manchester). G4ISB, QTHR, tel: 061-766 5265.

TAU SYSTEMS ATU, vgc £120ono. GM4WDO, QTHR, tel: Berwick upon Tweed 82464.

PRINTER BROTHER M1109, brand new, 100cps serial/parallel i/faces, tractor feed, cost £276, accept £185. G3XSO, QTHR, tel: 02406 5234.

FT107M MEMORY WARC fm/cw/am filters FTV107R 70cm/2m/6m YO901 I.F unit etc, all manuals, boxes, gd condx £600ono or exch 2.5/3 model traction engine part or complete. G4XOE, QTHR Herne Bay, tel: 0227361585.

SAVE £221. IC290H multimode tcvr, 25W o/p, 2yrs old +mobile brkt and 7/8 ant +feeder, very little used £415ovno; BNOS LPM 144/25/160 2m linear amp 18mths £220ovno; BNOS F146 L/U 2m low-pass filter, 1yr old £20ovno. All in mint condx, going all hf. GM4WHD, QTHR, tel: 0955 2328.

FTONE YAESU PLUS ALL EXTRAS, fm keyer, noise blanker c/w narrow/wide filters, memory, boxed as new £999; atu 1kW £125; two Trio handheld 2400 2m txs £175ea. G4IJS, QTHR, tel: 0925 64075.

TUBES 4-125 BY EIMAC, unused, tested, £60 pr plus p&p. GOEEX, QTHR, tel: 0602 260818 anytime, but not after 8pm.

SUPERSTAR 2200: converted 10m, 28.400MHz-29.700MHz am-8W, fm-15W, ssb-15W, over 5-bands £300; Rotel RVC-240 converted cb/tx 10m £85; both sets perfect Robert, tel: 01-859 2649. To contact Charles/RAIBC Regarding rigs, must sell/not on phone. Charles is invalid, RS54175, 554 Middle Park Ave, Eltham SE9 5QS. NO OFFERS.

TRIO TS700S BASE STN 2m/multimode tcvr, ex condx, boxed £360; Icom IC290H mobile 25W 2m/multimode tcvr, mint condx, boxed £350. No offers. Prefer buyer inspects/collects if poss. G5BM, QTHR, tel: 0531 820960.

COLLINS R/E (1976), KWM2A 312B5 516F2 PM2 CC2 SM3 MM1, unused, offers? Would exch new Marconi H1540 with latest synth or solidstate linear by Racal or SRA. G3YFK, tel: 0743 884858.

AVO MODEL 8 Mk3, probes, croc clips £60. Mark, G4RGB, Medway, tel: 0634 30822.

70cm-2m CVTR incl satband £15; Chapman valve stereo amp ultralinear preamp tuner 15W pc, gwo £30; box valves, some prewar, £10. Carr extra. WANTED: 28-30MHz ssb rx or tuneable I.F strip or WHY? G8ATE, QTHR, tel: Leicester 392842.

YAESU FT726R fitted with 2m, 70cm, sat, c/w YM48, MD1, owners and technical manuals £750ovno, buyer collects. G6PMN, QTHR, tel: 01-236 8861.

YAESU FT708R 70cm tx/rx, hardly used, boxed as new c/w spkr/mic etc £159ono. Mike, G4LAP, QTHR, tel: 0403 790513.

QRO EQUIPMENT, txfmr 1850-0-1850 2kW £35; good QY4-500 valves £30ea +bases and silver-plated anode lines for push-pull on 144MHz £25; 813 valves £15ea; also bases and heater txfmr. G4IEV, tel: Ruislip 677000.

FT690R £200; 6m rf switched preamp £20; 6m Pye A300 35W linear £35; 6m 3-ele met antenna £20. Buyer collect/inspect/pay cash. G6ADL, QTHR, Kettering, tel: 0536 710004.

ATU .YAESU FC902 freq coverage 160m-10m max tx pwr 500W pep @ 50ohms, £130. G3NZY, QTHR, tel: 0904 410385.

KW2000E WITH PSU, vgc, recently serviced, plus spare valves £200. GOGLR, QTHR, tel: 051-608 7946 evenings.

HEATHKIT SB400 TX, spare valves, manual, £75; also Trio 2200GX fully xtalled chgr/mic/case £75. G4MMV QTHR, tel: 0964 622396.

TRIO R600 RX £220, buyer collects. G8WTY, QTHR, tel: Malvern 4968.

KW TEN-TEC OMNI C, WARC, all filters fitted, matching psu plus extras £600ono; VLF cvtr 10MHz I.F £10; Newbury terminal for spares, free. G4BJM, QTHR, tel: 0908 567362.

MOUTH-WATERING FT1 hf tcvr, fm board, sacrifice £1100; Daiwa atu CNW 419, never been used, £180. Tel: 091-416 6195.

YAESU FT23, latest handheld with two FNB10 nicads, chgr, belt clip, case, telewhip, headset/mic, dc/dc cvtr, ptt switchbox, MMB21 mount. Total cost £345 few weeks ago, £275ono.; FT290 £275; Dragon/ G4BMK/pnp modem £90. Paul, G4XTA, QTHR, tel: 09313 359.

FT726R C/W 2m/70cm and satellite board, 20A psu, KR500, MML432-100, 10W, Jaybeam 5-ele XY 2m, Jaybeam 8-ele XY 70cm, £1300 the lot. Ken, GW0GHQ, Brecon, Powys, tel: 0874 2761.

SHACK CLEAROUT: Nems Clarke special purpose vhf rx 60-260MHz am/fm, £110; Telequipment D67 25MHz double-beam scope with manual £95; HP626A X-band sig/gen £95; HP431B pwr meter, tatty, £20; HP415E swr meter £50; Boonton 1.2GHz rf millivoltmeter £40; Tektronix 1L5 spectrum analyser plug-in to 1MHz £75; Marconi inst 0 to 100dB 75R attenuator £20; AVO8, tatty £15; Aim65 computer 6502 based system with keyboard, display and printer £75; Midwest Scientific MSI6800 computer, 6800 based ss50 bus system with twin floppies, dos disks and all manuals £120; Texas Inst silent 700KSR printer with dual-cassette drives £40; IN5155 Varactors, 2W at 6GHz £3.50ea; 64 K 150 nS RAM chips 40p/ea. Chris, tel: Oxford 750681.

SIGNAL GENERATOR, Hewlett Packard 608E, 10MHz-480MHz, attenuator 0.1microvolts to 500 millivolts RMS, with ALC, external or internal modulation, c/w h/book, ex condx £150. G3TEL, QTHR tel: Wantage 4019 evenings and w/ends.

COMPLETE 70cm ATV STN: Microwave modules MTV435 tx £90; muTek TNLA 432U preamp £15; microwave modules cvtr £15; Fortop demodulator £10, Tonna atu aerial £20 or £140 the lot. G4GGK, QTHR Northants, tel: 0933 314797.

TRIO TX-599CS tx 3.5-28MHz with matching JR599CS rx 1.8-28MHz INC10MHz plus 50 and 144MHz cvtrs. Comes c/w Tokyo HC200 atu, all vgc £390. G0CAZ, QTHR, tel: 0886 6741.

FOUR DENCO IFT18/1.6MHz, unused £3; xtal filter QC1246ac 5.2MHz 2.05kHz, unused £8; S625 screened grid 1927 with valveholders, filament kaput, £3; Wireless Constructor July 1927, fair £2.50; RSGB Bulletin Dec 1943, fair £2. All incl p&p. Pre-1955 Vibroplex bug, fair £9; hi-mound BK100 bug, mint £9; factory-assembled Howes DC80RX pcb £12; inspect/collect above, p&p extra; 60ft Andrews 12-50A Heliax, used, collect £4. WANTED: Xtals 455kHz, 465kHz with holders. G3AVQ, QTHR, tel: Henley-on-Thames 576852.

FT290R NICADS, CHGR, CASE £250; 70cm fm handheld AR740A, nicads, chgr £50; buyer to collect +se postage at cost. G3BGR, QTHR, tel: 0905 356576.

RTTY STN: Hal Communications model ST5000 demodulator, DS2000KSR keyboard transmission reception terminal, with 12in monitor display unit Can be seen wkg £400ono. G3BXI, QTHR Trowbridge, Wilts, tel: 0373 830804.

KENWOOD TM221E 2m/fm 45W mini mobile 3mths old. Genuine reason for sale £275. GOHCV, tel: 03265 62356.

RAD COM MAY 1982 TO DEC 1986, less May 1983. Offers? Buyer collects or pays carr. G8BA, QTHR, tel: Burnham 64077.

SOLARTRON INSTR MANUAL for oscilloscope type CD1183. G4ZFC, QTHR, tel: 0965 43385.

COLLINS MECHANICAL FILTER 455kc 2.1kc pass-band with upper and lower side-band xtals, £35ono. G3BXI, QTHR Trowbridge, Wilts, tel: 0373 830804.

ILL HEALTH SALE: Yaesu FTONE (tuning 1.6kHz high, otherwise perfect) £700; KW107 Supermatch £60; Telereader (CWR685E) transceive cw Baudot ASCII £300; Datong PC1 cvtr £80; SOAR freq meter £30. G4GHG, QTHR Torquay, tel: 0803 37050.

VHF CHANNEL MASTER ROTATOR 2yrs old, with h/book £30: CDE h/duty rotator £15, still wks but tatty, hence price. Both pole mounting. GOFQN, QTHR, tel: 0772 423741.

YAESU FT757GX TCVR £600ono, mint condx, box, mic etc. Buyer may examine and use set before purchase Also prefer collects. GW4ZZO, QTHR, tel: 0267 234874.

SEM TRANSMATCH WITH EASYTUNE and dummy load built in. Brand new, never used, unwanted gift, £100. Buyer must collect. Cash please. G6XNQ, NOT QTHR, Bristol, tel: 0272 606117.

ARGOSY 2 HF TCVR cw ssb mint condx, orig box, manual, £500ono; Yaesu FRG7700 rx, mint with orig box and manual, £275ono. G0ADK, QTHR, tel: 0304 823226.

ICOM IC290D 2m/multimode, 25W, little used, mint condx £350. G4SYB, QTHR Farnborough, tel: 0252 549852.

ATLAS 210X solidstate tx/rx, 200W, simple to use £275; Tono terminal computer Theta 7000, tx/rx cw, Baudot, ASCII £395; Facit, 12in vdu 64k, full keyboard, suitable for cw, Baudot, ASCII, Amtor,

packet £45; Corvus multiplexer £20; Icom EX1 extension terminal for any Icom tx/rx £10; Atlas antenna matching txfmr £7; valves, PX4s 829B with base, 832, QQvo310, 6c4, 955, hv psus, 300V, 100mA Various mains txfmrs to 1000V; Avometer EM272, fet vvm £35; model 7 £20. G3NZT, Bunbury, Cheshire, tel: 0829 260323.

FT727R VHF/UHF HANDHELD, 2xFNB4A battery packs, MH-12A2B spkr/mic, NC15 base chgr, 2xFBA5 battery packs and NC18C chgr, mint condx, 18mths SMC g'tee £425 the lot. G8MXE, tel: 0993 813004 eves & w/end

SILENT KEY SALE: CT212 am/fm/cw oscillator 85kHz to 32MHz in seven ranges mains or 12Vdc with all connectors and copy manual; also KW2000A with psu, hand/mic and manual. Reasonable offers please to: G3YMS, QTHR, tel: 0329 43488.

TS430S WITH FM BOARD and filters, AT250 atu, PS430 psu and MC60 base/mic, all pristine. The complete set-up £1050. Prefer buyer inspects/collects. G0BZR, QTHR, tel: 092572 6485.

EDDYSTONE EC10/2 MAINS PSU £80; SEM 2m cvtr £10; Jaybeam Q42M, unused £15; tatty but useful sig/gen £5; similar bench meter £2. Buyer collects. G8LBW, QTHR, Herts, tel: 0707 872948.

SUPER 3500 LINEAR AMP, 1.5kW o/p, 80/40/20/15/10m £300. G4VMP, QTHR, tel: 021-707 3376.

RADIO COMMUNICATION BOOKS, total number 111. Offers please? G3ASL, QTHR Southend, tel: 0702 68254.

YAESU FT726R 2m FITTED, immac, will demonstrate, hardly used, owner lost interest, £630ono. Terry, G6TZS, NOT QTHR, Biggleswade, tel: 0767 316431.

FL2100Z (FL2277Z) HF LINEAR AMPLIFIER, vgc, little used, boxed with manual £590. G4VIO, QTHR, tel: 0388 763501.

IBM TURBO XT CLONE. 640kb, single floppy, keyboard mono monitor, Epson LX86 printer, MS-DOS, manuals etc, excellent basic system £499. Buyer inspects and collects. G4MIB, QTHR, tel: 01-675 0280.

COMPLETE HF STN: FT707, MIC, FC707, FV707DM, manuals, BNOS 25A psu, two antennas, used only in loft, TET 4-band vertical, G-whip 5-band mobile. All in ex condx, £700. G4VDU, QTHR tel: 0322 56625 after 7pm.

SELLING RAD COM Feb 1979 to Dec 1986, two missing, £12. Prefer buyer collects otherwise carr extra. Also other radio and computing mags. G8CGK, QTHR, tel: 0989 62715.

COLLINS MINT ROUND EMBLEM 312B4 £130; 516F2 psu £230; CPI xtal pack £105; SM2 mic £50; new 70K2 vfo £140. Tel: 0247 455162.

DRAKE MN2700 ATU, mint £380; Drake TR7 filters 500Hz and 300Hz £45ea. Tel: 0247 455162.

35ft GALVANIZED HAMTOWER with built-in climbing rungs, tube mount, base grillage and cap fitting, facewidth 16in, £120; Mosley TA33Jnr 3-ele beam £80. Prefer buyer collect. G3SPU, QTHR, tel: 0225 703696 after 5.30pm.

EDDYSTONE EA12, manual, vgc £150; Eddystone EC10 Mk1, manual, vgc £50. Prefer buyer to inspect and collect. G8GHB, QTHR, tel: 0302 770944.

COLLINS KWM2 TCVR with spkr and psu, ex condx £450 G3PQC, QTHR, tel: 0252 544268 evenings.

COMPLETE "OSCAR" ANTENNA STN comprising: 19XY Tonna/70cm, 8XY Jaybeam/2m, Hirschman elerotor, AR40 AZIrotor, plus all cables, mast, brkts, rawlbolts, clamps etc for gable end, vgc £110. Harry, G0DQL, NOT QTHR, tel: 0274 634084.

OSCILLOSCOPE DUAL-BEAM £125; audio/gen £20; Pye uhf/gen £90; plug-ins for Tektronix 500 scopes from £5; manuals ditto, Pye Wessie LB/fm dashmount £25; ditto remote £20; Olympic LB/am £39; Europa £39. G4YVJ, North Lincs, tel: 0507 85203.

MOSLEY TRIBAND DIPOLE, can be brought to full 3-ele spec £40; tet vertical, ground plane for 10-15-20 c/w multiband trapped radials £40. Both vgc, stored indoors, only used occasionally portable. G3CRH, QTHR, tel: 05436 6364.

FT208 2m HANDHELD c/w nicad, chgr, case and PA3 car adaptor chgr, mint condx, £185; AT230 vgc £165 G2DYM anti tvi trap-dipole £30; G2DYM feeder matching unit £15; Diamond hf vertical CP5, new, unused £145. Tel: 0983 402273.

BELCOM LINER2, wkg but could look better £50; Heath RA-1 rx, requires realignment £10; Commodore C64 datacorder, MPS801 printer, joystick, parallel i/face, software, all vgc, £250 all in. GM6AWE, QTHR.

TRIO AT250 AUTO-TUNER, little used £240ono. G6FJA, tel: 092 572 2879 after 6pm.

EPSON HI-80 PLOTTER incl HP-GL with manuals and spare pens, condx as new, boxed, ideal for BBC or similar £287ono; 16in colour monitor for BBC £60 with isolating txfmr. Buyer collects. Mike, G6GEJ tel: 0602 729467 evenings.

DATONG MORSE TUTOR, as new £35. Tel: 01-904 3282.

TOWER! TOWER! PLEASE BUY OUR LATTICE STEEL TOWER! In 2x20ft sections, must be sold, hence just £130 or offer. Buyer collects from Brunel University ARS. G3UBR, c/o Students Union, Uxbridge or phone Pete Swynford on 0895 39125.

10m MULTIMODE am/fm/ssb £100; Standard 2m C58 multimode mobile brkt, nicads, case, 25W CPB58 linear, all complete £295ono; Kenwood TS830S and DFC230 controller £750. All +postage or collect. G4YRR, QTHR, tel: 0782 395017.

2xSPACEMARK KEYERS 1klpm 4-mem £55; 2-mem £45; Crotech 3031 scope 20MHz £85; MM144/28 hp conv £20; G3ZVC 9MHz board + 5 to 5.5MHz vfo £30. G4DSC QTHR, tel: 0765 2230.

PACKET MF3 1270/2 TNC, suit Commodore serial port plus RS232 for any micro £95; incl software; Dragon 32k £30; Icom 720A fitted, all options, narrow filter, fm, rtty, gen/cov tx/rx £500; Standard C5800 £300. Laurence, GM0ATQ, QTHR, tel: 0475 87871.

FT290R NICADS CASE HEADSET switchbox, FT209 nicad FNB3, NC15 fast chgr, 4-ele Jaybeam quad, 9-ele Tonna, AR40 rotator, CD1400 'scope, various FT209 accessories. Phone for condx, mainly excellent, and prices. Going hf. Nick, G0HLX, Yateley, tel: 0252 876277.

FT225RD muTek front-end with orig board available xtals fitted for cw ssb and fm calling freqs. First class condx with mic, manual and in orig pkg £600. G3GOT, QTHR, tel: 0245 33229.

YAESU FT902DM, in ex condx, fitted fm filter, cw filter, keyer £600ono; Icom IC490E 70cm all-mode 10W tcvr, as new £400ono; Jaybeam 48MBM £20; Yaesu XF-8.9HCN cw filter £25. G4XEN, QTHR, tel: 0933 677573.

TR TRIO 9000 MULTIMODE, brkts for mobile £340. Tel: 0302 859451.

WANTED · · · · · · · · ·

GERMAN WW2 EX-SERVICE EQUIP, parts, descriptions, museum purposes only. Also not in wkg condx. British/WS11, H2S, SCR720, T1190, WS65, WS66, S2ERT, AD67, SG, YQ and Marconi rx R537. Will collect. WHY? Leads also welcomed. OZ8RO, Rag Otterstad, Vejdammen 5, Dk-2840 Holte.

HY-GAIN TH3-Mk3-SNR, tri-bander, BN86 balun, top price pd for gd example; also 1kW dummy load, either Drake DL1000 or Trio CT1000, MDL1000, Welz CT300. Notts, tel: 0602 609345 anytime.

RF BRIDGE 916A or rf bridge type 1606A by General Radio, rf bridge type Hatfield LE 300A. G3HCT, QTHR, tel: 05642 2176.

WARTIME SUITCASE RADIO: A Mk3 (B2 minor) and Mk123 set or any other clandestine and resistance-type radios incl modern for collection. Any condx welcome. Manuals and accessories are of interest. G4OFO, QTHR, tel: 01-949 2317.

DEVICE CONSISTING OF a set of b&w vanes which pivot on a jewelled needle, sealed under glass in a vacuum, rotating in strong sunlight. Chris Williams, G1FAZ, QTHR, tel: 021-427 5040 evenings or 021-236 8831 extn 162 daytime.

ANTENNA ROTATOR WITH 360deg meter readout, for vhf As new condx essential. G1UUG, QTHR Tyne & Wear, tel: 091-252 7141.

G2DAF Mk2 RX DESIGN, parts, components, metalwork, part-built or completed project or WHY? Tel: 051-334 4012.

FOR R1475 REBUILD: Mounting type 656 10A/17535; mounting type 657 10/17536. Any condx. Derek Sheen G4CCW, QTHR, tel: 01-651 1410.

LINER2. Some ex-stockist or owner must have detailed alignment procedures, modifications. Any info welcome. Purchase or loan. G1NLU, tel: 0305 772759.

TRADER SERVICE SHEETS PRE-1946 on valve radios and service manuals on same, any period; also operating instrs and data on "Lafayette" tube and transistor tester model TE-21. Tom Valentine, GM1XHZ, 38 Grampian View, Montrose, Angus DD10 9SX tel: 0674 76503.

SPLENDID SENSITIVE RX, summat like FRG7 or Trio 600 or 1000 at a remuneration reminiscent of the good old days, ie reasonable! Also wanted, morse keyboard please. Jon, Essex, tel: 0255 554612 anytime.

MANUAL OR PRINTER CONNECTION data for Acorn Electron computer, manual or circuit diagram for Marconi transistor tester TF2703, manual or circuit diagram for SAM 2000 cb tcvr. Buy or borrow. Chris, G3GKS, QTHR Frodsham, tel: 0928 33723 anytime.

BASIC 2m/fm mobile tcvr IC240m TS7500, FT227R or similar c/w mounting brkt, connectors, mic and manual. Also car antenna if available. Must be in gd condx. Particulars to G3JHL, QTHR Southampton area, tel: 0794 512283 evenings or w/ends.

REQUIRE URGENTLY ONE OR PAIR "Magslip" Mk2 tx units, ie Selsyn rotor indicator 50V/ac. Your reasonable price pd and carr. G3FRE, QTHR or tel: Nottingham 892943, reverse charges.

YAESU FC902 ATU, any condx considered, also FT290R mobile mount. Any area. Tel: 0329 231087 (Hants).

CIRCUIT OR H/BOOK FOR sig/gen oscillator test No1 CT212, borrow or buy. G2HOS, QTHR, tel: 021-445 1397.

TO BRING A DEAD 'UN BACK TO LIFE - IFT2 and L16 coils for EC10 Mk1 or info on substitutes. GM4IAO, QTHR, tel: 0466 2673.

ARGONAUT QRP TCVR ssb/cw mod Mark 123 tcvr cw. G3MYE, QTHR, tel: 0295 78331.

LARKSPUR SERIES ex-military radio equip, also accessories and manuals. G4WWX, QTHR.

EDDYSTONE 888 RX, must be in gd condx, your price pd provided within reason. Ken Chorley, 7 Foxfield Everton, Lymington, Hants, tel: Lymington 45231.

COPIES FOR R207 Mk3 Marconi Schematics +info. G0FZV, John Gillie, Asterstraat 3, B-3660 Opglabbeek, Belgium.

70MHz ALL-MODE TVTR, suitable for 144MHz i/p @ 10W nominal. Must be FB condx. Offers G3ADZ, QTHR, tel: 0788 815222.

FL2100Z FV101Z OR FV901DM SP901P EC902, will consider whole stn if with gd FT101ZD.
FOR SALE: New IC3200E or p/exch. G3UQY, QTHR, tel: Torrington 23033 evenings.

WOULD BE MOST GRATEFUL FOR 2 to 4 semi-conductors type TIS58(Y) or info on source. Also for Dynamco 72 series oscilloscope either chann amplifier type 7211 or 7212. Mni tnx. G3GEJ, QTHR tel: 0677 22316

GOOD SOLIDSTATE STORAGE SCOPE, also four EHT capacitors type Bosch 40uF @ 2.5kV, Tektronix or Telequipment plug-in type 3L5, Wavetek o/p amplifier type M10F for model 1001A sweep/gen. Peter, G4HSB, QTHR, tel: 0642 816608 evenings.

WHITE STICK OPERATOR REQUIRES URGENTLY: AEA CK2 contester keyer or similar. G0CBD, tel: 0663 44118

NDH515 MEMORY UNIT, suitable for use with JRC NRD515 rx. Morris, tel: Bolton 40629.

TONO TERMINAL COMPUTER, 9000E or 9100E, psu and console for Atlas tx/rx, Capco atu 3kW, Triband 3-ele beam and rotator, Trio spkr SP930 or SP230, Centronics i/face, Tono to printer. G3NZT, Bunbury Cheshire, tel: 0829 260323.

YAESU FT7B OR FT707 with or without accessories. G4OLC, Northumberland, tel: 0670 855953.

DRAKE R4C RX in full wkg order. G4KME, QTHR, Stoke-on-Trent, tel: 0782 503444.

RADIO FILTER FL30 (USAF) by Borg; Also freq counter by "Nyce" of Japan, Model FC155S. Bernard, tel: 0736 753676.

RACAL RA1217 TECHNICAL H/BOOKS: Your price paid - also related items: LF, ISB adaptors, dc, psu etc. ZX Spectrum 48k; Drake-line equip, Bird Thruline equip - wkg or otherwise. Tel: 03306 613 after 7.30pm or w/ends.

HRO DIAL - A R Bartle, 105 Mayfield Road, Thornton Heath, Surrey, CR4 6DP, tel: 01-684 0610.

EXTERNAL VFO FV102DM to match FT102 tcvr. Must be in mint condx. Tel: 0202 475048 after 6pm.

ICOM IC-SP2 EXTERNAL SPKR boxes and IC-EX1 or IC-EX2 extension terminal for IC251E and IC451E tcvrs. G6DBX, QTHR, tel: 04446 48767 after 6pm pse

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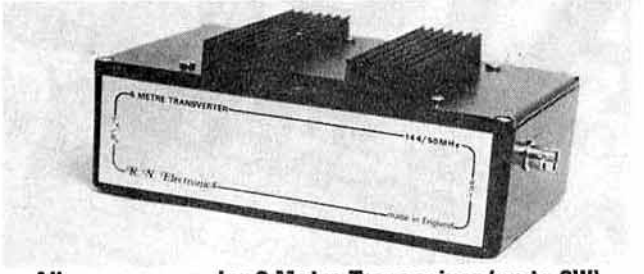

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For a Review of the properties of the Capacitor Loop, see our August advertisement p629.

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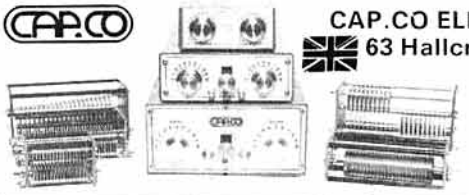

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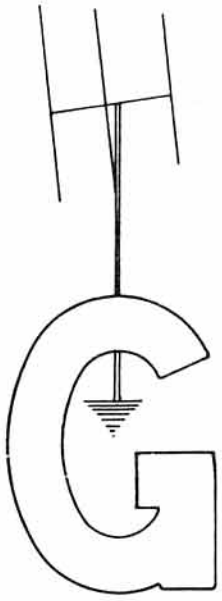

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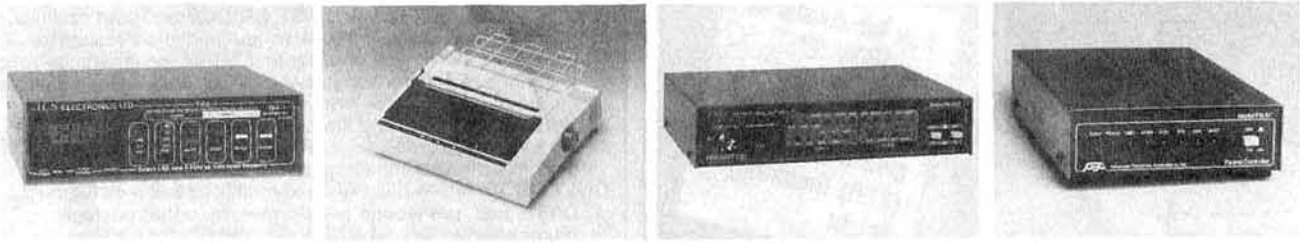

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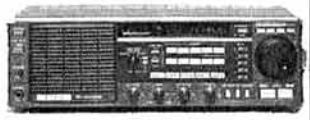

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PRICES. These include postage, packing and VAT where applicable, and are subject to change without notice. For airmail despatch, please ask for price before ordering. Goods are obtainable, less p & p, at RSGB headquarters between 10am and 4pm, Monday to Friday.

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ARRL Antenna Book (ARRL)	£11.85	£10.07
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Chapter titles: *Shortwave Listening; The Amateur Radio Spectrum; Basic Operating; Antenna Orientation; DXing; Overseas DXing/DXpeditions; Contests; Operating Awards; RTTY Communications; Packet Radio; FM and Repeaters; VHF/UHF Operating; Satellites; Emergency Communications; Traffic Handling; Image Communications; Reference Data.*

688 pages; paperback; 1987; £17.40 to RSGB members by post

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This long-awaited book by John Devoldere is essential reading for anyone interested in dxing on the lower frequency bands. With over 300 countries worked on 3·5MHz and nearly three decades of experience in working dx on the lf bands the author is ideally placed to write this comprehensive book. A substantial part of the book deals with antennas relating to lower band dxing. Some theoretical aspects are addressed in more detail than is usual in amateur radio literature, but only because antennas are by far the most important tool in any lower band dx operation. A number of basic programs are given which greatly simplify many antenna calculations.

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