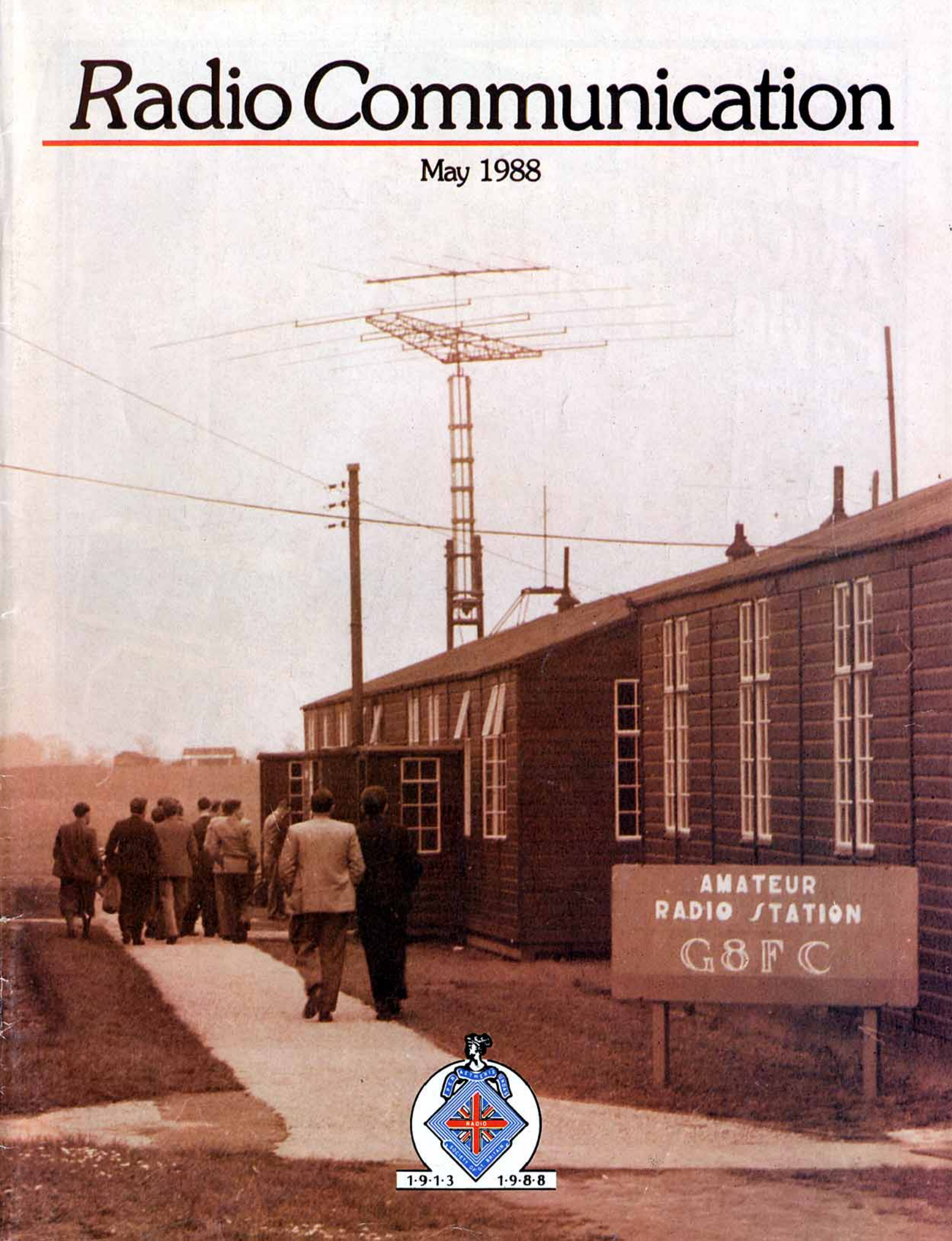
Radio Communication

May 1988



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

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FRONT COVER

The antenna system at RAF Cranwell in 1950

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.

Radio Communication is published by the Radio Society of Great Britain as its official journal on the last Friday of each month and is sent free and post paid to all members of the Society

ABC MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

36,070 copies per issue average circulation in 1987

Closing date for contributions unless otherwise notified: five weeks before publication date

The TR-751E from Kenwood

Now for something completely different – or how I found 2 metres and discovered the true secret of life.

Kenwood have always tried to give the radio amateur a sensibly thought out range of equipment, and the TR-751E occupies that particular place devoted to the all purpose go-anywhere, high performance 2 metre multi-mode transceiver. Many of you will remember what an impact the TR-9000 had on 2 metre operation when it was introduced, and with other manufacturers scrambling to keep up, the success was repeated by the TR-9130. The TR-751E follows and improves upon those earlier successes, and it's no wonder, when you consider what is contained in this tiny package.

The TR-751E does not simply give you high performance: it presents it in such a way as to be easily used, logical in operation, and a lasting source of satisfaction. Is it any wonder that Angus McKenzie said in his review (Amateur Radio):-

"Trio (Kenwood) have clearly thought out the ergonomics very carefully and I found it one of the easiest mobile rigs to use, especially considering its comprehensive facilities." He also said, commenting on the actual performance of the receiver:-

"The receiver sounded alive, and seemed to be giving a performance very similar to that of the Icom IC271 with MuTek front end. I found this rather stunning, and it is clear that Trio have achieved a far better noise figure in the front end than every before on a 2 metre rig."

Chris Lorek, in his review (Ham Radio Today) confirmed what had already been said:-

"The receiver appeared remarkably efficient at pulling weak signals in. When I connected in an external GaAsFET preamp at the aerial socket I noticed very little improvement."

This level of performance also extends to the transmitter, and Kenwood transceivers have always been noted for their high quality audio on the air. With 25 watts of RF available, the signal has more than enough "punch" to get through, and all in all there is little one can find about the TR-751E which is less than ideal. So-what does it all do?

You know by now that I dislike quoting long specifications, particularly considering that one could describe both a Metro and a Porcshe as having four wheels on the outside and one in front of the driver – doesn't really tell you a lot about the true differences does it? Well, I believe that the TR-751E gives you a most versatile 2 metre multi-mode station; small enough to use mobile or portable, but comprehensive enough to use as a full-spec. base station at home. In that respect, it's also attractive enough to be domestically acceptable, and discreet enough in styling to go anywhere in the house. The facilities provided are quite remarkable considering the size of the set, but as always easy to use, in Kenwood tradition.

Also in Kenwood tradition, a comprehensive colour brochure is available which describes the TR-751E in complete detail, together with the range of matching accessories (no, there isn't a matching handbag...) The information is free, but the Post Office demand payment for getting it to you. If you want something weightier to read, send us £1 and we will fire back the complete full colour Kenwood catalogue and other interesting reading. If you want to have a moan, my name is:-

John Wilson G3PCY/5N2AAC

73 (or for 2DYM 73s) see you soon Richard...

All prices subject to confirmation

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Chesterfield Road, Matlock, Derbyshire DE4 5LE

Telephone 0629 580800 (4 lines)

send £1 for complete mail order catalogue.

The 45 watt wonder for 2 metres. Common sense facilities, ease of use, and a massive 45 watt output make the TM-211E probably the most wanted FM mobile around. All this and an amazing receiver (see Ham Radio Today July 1987). All you need in a compact package, including all channel spacings (5, 10, 12.5, 15, 20, and 25 kHz). P.S. it also has a 70 cm brother, the TM-421E, and a remote controller available for operating them both together.

TM-221E

TM-221E...£317.30 (carr. £8) **TM-421E...£352.84**

Called by many "The perfect 2 metre Base Station", the TS-711E is as close to perfection as state of the art can make it. All mode operation, full band coverage, continuous tuning or step tuning for FM channels. Two separate VFO's, 40 memories storing frequency, mode, repeater shifts, even whether or not you need a tone burst. Optional voice synthesiser, the list of features is almost endless. (And it too has a 70 cm brother, the TS-811E).

TS-711E

TS-711E...£940.00 (carr. £8) **TS-811E...£1094.00**

Versatile 2 metre multi mode mobile or fixed station, the TR-751E again shows that Kenwood magic touch in making a complex transceiver so easy to use. Virtually a miniature version of the TS-711E, the TR-751E set new standards of performance at its introduction, and has continued to win friends ever since, continuing as it did the line started by the TR-9000 and TR-9130. (And, you guessed, it has a 70 cm counterpart, the TR-851E).

TR-751E

TR-751E...£599.00 (carr. £8) **TR-851E...£699.00**

To be perfectly honest, the RZ-1 came as a surprise to us. We didn't expect Kenwood to come up with a mobile monitor receiver covering 500 kHz to 900 MHz, but here it is. Designed to fit in a standard car radio slot, the RZ-1 seems to have everything. Direct frequency entry, manual tuning, 100 memories, readout of station name on display, scanning, stepping, am/fm modes, unbelievable... Of course this level of facilities does not come cheaply, but the RZ-1 really adds a new dimension to the wide range monitor market.

RZ-1

RZ-1... £465.00

Top of the range, the TS-940S has everything the discerning HF operator requires. Amateur bands from 160 to 10 metres, together with a general coverage receiver tuning from 150 kHz to 30 MHz. Operating modes USB, LSB, CW, AM, FM, FSK. Forty memory channels, each effectively a separate VFO. Easy keyboard frequency entry. Leadership in the field. The TS-940S is the transceiver everyone wants to own one day.

TS-940S

TS-940S...£1995.00 (carr. £8)

Kenwood common sense. The TS-140S shows the way to go in balancing performance, operating features, and ease of use; all at an attractive price. All mode amateur band transmit with an excellent general coverage receiver. Full break in CW is provided for the real operators, but so is FM for idle chatting on ten metres (although why one would use FM in preference to SSB or CW, I cannot imagine). Every TS-140S we can obtain is instantly sold. Ask around and you will find out why.

TS-140S

TS-140S...£862.00 (carr. £8)

Virtually the receive section of a TS-940S, the R-5000 is probably the best HF receiver right now. Notice the family resemblance to the TS-440S which gives it a clean, easy to operate look, and of course Kenwood have applied all their ergonomic skills to make you "at home" the moment you begin to use the R-5000. All mode of course, and has an optional internal VHF converter which extends you to 108-174 MHz.

R-5000

R-5000...£875.00 (carr. £8)

You brute. If it wasn't for all the safety interlocks I would operate my TL-922 with all the covers off, just to admire the sheer engineering beauty of the innards. The TL-922 is THE linear amplifier, and once you own it you will never part. The effortless ease with which the TL-922 produces RF power has to be experienced to be believed, and it is probably the world's most sought after station accessory.

TL-922

TL-922...£1495.00 (carr. £8)

LOWE ELECTRONICS LTD.

Chesterfield Road, Matlock, Derbyshire DE4 5LE
Telephone 0629 580800 (4 lines)

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

KANTRONICS

Packet radio is one of the fastest expanding areas in Amateur Radio. Access is available to national and international data, messages may be left or 'mailboxes', and of course you may conduct a QSO just like RTTY or AMTOR.

KPC2 £159 inc. vat. (carr £8)
This is not just a basic TNC but more of a 'Packet Special'. Over 100 user commands are available, and operation can be on HF or VHF/UHF via its single port. Features include 3 – state squelch, multi connect, digipeat, TTL or RS2322 compatible, personal mailbox – and now WEFAX is included.

KAM £265 inc. vat. (carr £8)
All the features of the KPC2 but with two independent ports for HF and VHF, allowing gateway operation. All mode operating via the HF port – Packet, AMTOR, RTTY, CW, ASCII, and now WEFAX included.

KPC4 £298 inc. vat. (carr £8)
A dual port TNC allowing simultaneous operation on two bands (if you can keep up the pace). All the features of the KPC2 plus gateway between ports.

P.S. WEFAX means you can receive those wonderful Met forecast pictures off-air.

DAIWA meters.

CN410M. . .3.5 to 150 MHz, forward 15/150 W, **reflected 5/50 W,** SO239 connectors. . .**£61.72 inc vat,** carriage £1.50.

CN460M. . .140 to 450 MHz, forward 15/150 W, reflected 5/50 W, SO239 connectors. . .**£65.40 inc vat,** carriage £1.50.

NS448 with remote head. . .900 to 1300 MHz, forward 5/60 W, reflected 1.6/6.6 W, N type connections. . .**£86.60 inc vat,** carriage £2.50.

NS660P with switchable meter reading (average, normal PEP and hold PEP) and provision for optional remote head (U66V), 1.8 to 150 MHz, forward 15/150/1500 W, SO239 connectors. . .**£115.00 inc vat,** carriage £2.50.

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

SC20 extension cable for U66V, approx 20 metres long . . . **£29.21 inc VAT,** carriage £1.50.

THIS AND THAT

Our Head Office is at Matlock, but we have conveniently placed branches around the country. Each branch is run by a manager who is an active radio amateur and also keen to help you. He normally stocks everything in our extensive range and can demonstrate all major items of radio equipment to you. Note though that all mail orders must be sent to Head Office at Matlock.

In Glasgow, at 4/5 Queen Margaret Rd.,
(off Queen Margaret Drive). Tel. 041 945 2626.

In Darlington, at 56 North Road. Tel. 0325 496121.

In Cambridge, at 162 High St., Chesterton. Tel. 0223 311230.

In Cardiff, at South Wales Carpets, Clifton St.
Tel. 0222 464154.

In London, at 223 Field End Rd., Eastcote, Middx.
Tel. 01 429 3256.

In Bournemouth, at 27 Gillam Rd., Northbourne.
Tel. 0202 577760.

Branches are normally open from Tuesday to Saturday inclusive, with lunch breaks to suit local conditions. If in doubt, just telephone your nearest branch.

Words of Wisdom from the Workshop
If your clever new microprocessor controlled rig seems to be off its head, do try the resetting procedure for themicro before sending the thing for repair. If you don't know how to reset it, look in the manual or ring your supplier – it will save you a fortune on carriage charges.
STOP PRESS. Coming soon from JRC, the JST-135 matching transceiver fortheNRD-525 receiver. Now you know why we did not handlethe interim JST-125 model.

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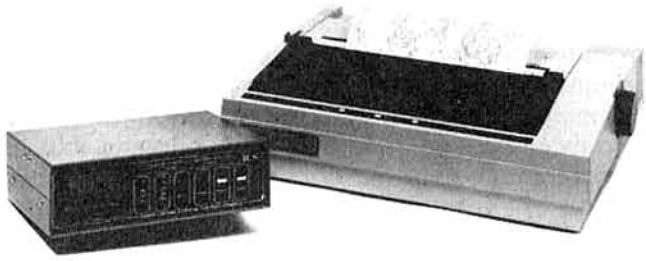

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Super Value Fascimile, RTTY and Navtex Receive System!

FAX-1 demodulator, printer, power supply, cables, ribbon and paper. Nothing more to buy. Just plug it into the audio output of your receiver and switch on to be amazed at the clarity of the weather maps. All system components are available separately.

The FAXPACK cost an amazing **£399.95** inc VAT plus £9.50 Securicor delivery.

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Prices include 12 months parts and labour warranty, but may vary according to prevailing exchange rates.
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PM-1	HF Packet Modem	£149.50	£4.00
PK-90	Commercial Packet Radio TNC	£368.40	£4.00
2400 Baud	Internal PSK Modem for the PK-90	£129.95	£1.50
PK-232	7 mode Intelligent Terminal Unit	£269.95	£4.00
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HR3	150 MHz Marine Handheld Antenna	£14.95	£1.00
HR4	440 MHz Handheld Antenna	£14.95	£1.00
ISOPOLE 144	2 Metre Base Station Vertical Antenna	£39.95	£3.00
ISOPOLE 440	70 cms Base Station Vertical Antenna	£59.95	£3.00
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PK-FAX	IBM-PC Facsimile Software for the PK-232	£39.00	£2.50
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PK-232/BBC	BBC Software for the PK-232	£35.00	£1.50
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PK-87/BBC	BBC Software for the PK-87/88	£35.00	£1.50
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NEW FIRMWARE	Upgrade for PK-232 (i)	£15.00	£1.50
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SC-1500	180 cps 80 Column Printer. With NLQ	£172.44	£9.50
SC-5500	180 cps 132 Column Printer. With NLQ	£229.94	£9.50
	Technical Manual: PK-232	£25.00	£2.50
	User Manual: PK-232	£15.00	£2.50
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Access

ICOM

IC-4GE 70cm FM Handportable

The IC-4GE is the first in a line of new handportables to be announced from ICOM. The small compact style provides easy operating and rugged durability. Other models for 2mtrs and 23cm will be released later this year.

A full 6 watts of RF power is available when using the IC-4GE with the option IC-BP7 nicad pack. The IC-4GE is equipped with a total of 20 memory channels. Each memory can independently memorise frequency, offset direction and frequency.

All circuits are designed using low power dissipation techniques to create a special power save circuit in the transceiver. The power saver circuit functions if no signal is received or no switch operation is performed for more than 30 seconds. In addition, the power saver circuit can be turned off for packet communications.

Two different scans, programmed scan and memory scan are provided and in addition memory skip channels can be programmed to skip selected memory channels during memory scanning operating. The squelch monitor function allows you to monitor weak signals without having to adjust the squelch control. The high impact case is splash resistant by the inclusion of rubber gaskets. The IC-4GE is supplied with a IC-BP3 nicad battery pack, flexible antenna, AC wall charger, belt clip and wrist strap. It is compatible with many of the existing accessories for ICOM's IC-2/4 and IC-02/04 series of handportables.

Also available for the IC-4GE is a large range of optional accessories including a variety of rechargeable nicad power packs, dry cell battery pack, desk charger, headset and boom mics and new slimline speaker mics. For more information on the IC-4GE or any other ICOM handportable contact your local ICOM dealer or ICOM (UK) LTD.

◀ Actual Size ▶

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Count on us!

IC-575, 28/50MHz Dual band multimode.

The ICOM IC-575 base station has been developed to meet the demand for advanced communications for the recently acquired 6m band. Similar in appearance to the IC-275/475 2m and 70cm base stations, the beauty of this new transceiver from ICOM is that it gives you the best of both worlds, 6 & 10m in one compact unit. The IC-575 covers 28-30Mhz and 50-54Mhz. Operating modes are SSB, CW, AM & FM. Power output is 10 watts (AM 4 watts) with a front panel control to reduce output for QRP operations. A pass band tuning circuit narrows the I.F. passband width, eliminating signal in the passband. A built-in notch filter eliminates beat signals with sharp attenuation characteristics.

Some PLL systems have difficulty meeting the lockup time demands placed on them by new data communications. This is why ICOM developed the DDS (Direct Digital Synthesizer) method. With a lockup time of just 5msec the DDS method allows the IC-575 to handle data communications such as packet or AMTOR. 99 programmable memories can store frequency, mode, offset frequency and direction. A total of four scanning functions for easy access to a wide range of frequencies, memory scan, programmed scan, selected mode memory scan and lock out scan. The IC-575 has an internal A.C. power supply, but can also be used on 13.8v DC for mobile or portable operation.

Optional accessories available are the UT36 voice synthesizer, the IC-FL83 CW narrow filter, SM7 external loudspeaker, HP2 communication headphones and SM8/SM10 desk microphones. Other transceivers available in this range are: IC-275E 2m multimode 25w, IC-275H 2m multimode 100w, IC-475E 70cm multimode 25w, IC-475H 70cm multimode 75w.

IC-505, 50Mhz Transceiver

The IC-505 is a 6mtr BAND SSB, CW, FM (Optional) transceiver. It can be used as a portable or like other transceivers of this type as a base station unit. When used with an external 13.8v power supply the 505 gives 10 watts RF output, 3 watts or 0.5 watts on low power is available when using internal batteries. Other features include 5 memories with memory scan, program band scan, dual VFO's with split operation.

The easy-to-read LCD readout includes frequency, memory scan and call modes. Full metering of battery condition signal strength and power output is provided. When fitted with the optional EX248 FM unit the IC-505 offers 50MHz operation at an affordable price.

Helpline: Telephone us free-of-charge on 0800 521145, Mon-Fri 09.00-13.00 and 14.00-17.30. This service is strictly for obtaining information about or ordering Icom equipment. We regret this cannot be used by dealers or for repair enquiries and parts orders, thank you.
Datapost: Despatch on same day whenever possible.
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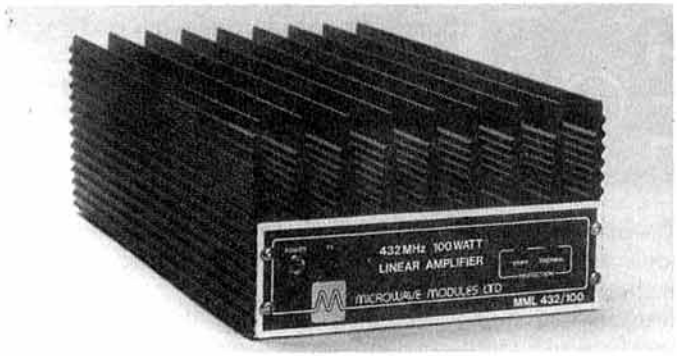
MICROWAVE MODULES LIMITED

THE COMPANY. . .

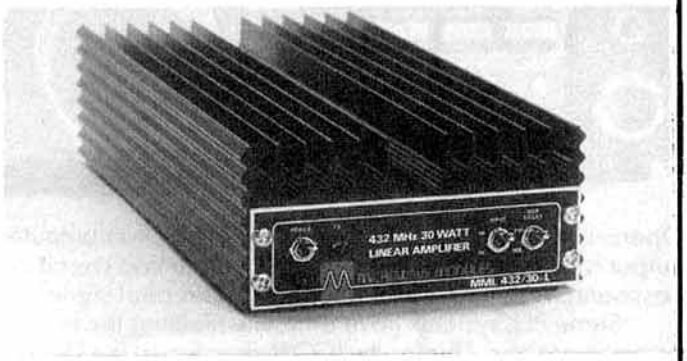
MICROWAVE MODULES LIMITED is a British manufacturing Company, established over 18 years ago, and currently employs over 40 staff in its two modern factories. The Company currently manufactures on an annual basis more than £1,000,000 of radio equipment, all of which has been designed and manufactured in the UK.

AND ITS PRODUCTS. . .

The Company offers what is probably the widest range of amplifiers and transverters available from any single manufacturer. The range of amplifiers and transverters is listed below, together with the other popular items manufactured by the Company such as preamplifiers, converters and amateur TV equipment.



MML432/100



MML432/30 L

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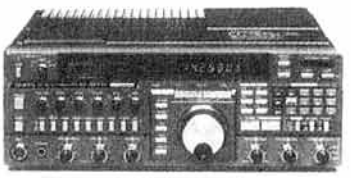

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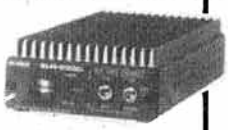

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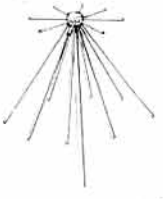

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ALL PRODUCTS WE ADVERTISE ARE NORMAL STOCK ITEMS OUR NEW MAIL ORDER DEPARTMENT CAN NOW DESPATCH MANY LINES SAME DAY, BUT PLEASE ALLOW UP TO 14 DAYS DELIVERY TIME IS SUBJECT TO CARRIAGE METHOD. IF ORDERING BY MAIL PLEASE INCLUDE CARRIAGE AND STATE YOUR DAYTIME TELEPHONE NUMBER ALL PRODUCTS OVER £750.00 CARRIAGE FREE. PLEASE ALLOW TIME FOR PERSONAL CHEQUES TO CLEAR. PLEASE CALL **BEFORE ORDERING** AND FOR MORE DETAILS

NEW HELPLINE 0836 282228 (until 9pm Daily)

Telephone 021-544 6767

THROUGH YOUR CONTINUOUS AND VALUED CUSTOM, RAY WITHERS COMMUNICATIONS LTD. HAS MOVED AND EXPANDED TO ENABLE US TO OFFER YOU EVEN BETTER SERVICE AND PRICES – STILL WITH THE RAYCOM GUARANTEE, BEST EQUIPMENT, BEST SERVICE, BEST PRICES, BEST BACK. PLENTY OF PARKING FACILITIES AND EASIER TO GET TO! WE NOW BOAST THE BEST CENTRAL FACILITIES IN THE COUNTRY, WHY NOT POP ALONG AND SEE THE LATEST TRANSCEIVERS, SHORTWAVE/SCANNING RECEIVERS AND ACCESSORIES? MOST OTHER PRODUCTS ADVERTISED IN THIS MAGAZINE ARE AVAILABLE AT RAYCOM, AND DON'T FORGET OUR EXCLUSIVE PRODUCTS AND MODIFICATIONS!

NEW PRODUCTS

NEW IC781

ICOM

Come and see the NEW ICOM IC781 HF Professional transceiver with built in Band Scope, Auto ATU and PSU, the new KENWOOD RZ1 Mobile Scanner, the new YAESU VHF Base Station and Mobile, and the new FOX mobile Scanner . . . because of our purchasing power and overseas contacts we get the new models first! And offer the best introductory prices!

SPECIAL OFFERS

WHILE STOCKS LAST!	NORMAL	SPECIAL
YAESU FT726 BASE STATION C/W 2MTRS	£999.00	£695.00
YAESU YD844A BASE STATION MIC 600/50K	£39.95	£19.95
YAESU FT77 5W-120W 1.6-30MHz PA UNIT	£149.00	£75.00
YAESU HORN RELAY ALARM UNIT WITH 555	£12.50	£4.50
ICOM ICA20 AIR BAND CAA APPROVED H/H	£429.00	£379.00
ICOM ICA2 AIR BAND CAA APPROVED H/H	£399.00	£279.00
KENPRO KT400EE 2W UHF H/H C/W CHARGER	£279.00	£199.00
COLOUR-ROTA 40KG ROTATOR 3 CORE CABLE	£45.00	£37.50

Please ask for our SPECIAL OFFERS LIST, USED LIST, SCANNERS LIST, and LATEST PRODUCT NEWS. Please send a large S.A.E.

BASE STATIONS

YAESU FT767GX RWC/MK2 ALL MODE/BAND BASE STATION	£1499.00
YAESU FT767GX RWC/MK2 AS ABOVE C/W 2 OR 6 METRES	£1590.00
YAESU FT757GX MK2 MODEL WITH IMPROVED FEATURES	£895.00
YAESU FT726R MULTI-BAND MULTIMODE SPECIAL OFFER	£695.00
YAESU FT747GX NEW MULTIMODE 100W HF TRANSCEIVER	POA
NEW YAESU FT736R MULTIMODE BASE STATION C/W 2 METRES	POA
ICOM IC735 HF HIGH PERFORMANCE MINI HF TRANSCEIVER	£892.50
ICOM IC275 25W 2 METRE MULTI-FEATURE SUPERB BASE STATION	£949.00
ICOM IC575 10W 10 & 6 METRE ALL MODE SUPER BASE STATION	£949.00

CALL FOR BEST PRICES ON OTHER ICOM AND YAESU BASE STATIONS

YAESU

FT767GX RWC Mk2

YAESU

Raycom offer our own improved version of this fabulous HF-UHF transceiver, we fit a small SMD chip component mod board in the VCO to improve the RX dynamic range by up to 20dB, FOC when purchased new from us. If you are lucky enough to own the FT767 already, send your unit + £59.50 and we will fit it for you! (inc. return carriage). Also available at some Yaesu dealers. **SEE REVIEW FOR DETAILS OF THIS ACCLAIMED MODIFICATION.**

ANTENNAS & ACCESSORIES

NOW AVAILABLE AT RAYCOM: CUSHCRAFT, BUTTERNUT, HY-GAIN ATNENNAS, JAYBEAM, TONNA, MET, HAM-M ROTATORS, Call for full details, prices, availability and delivery costs.

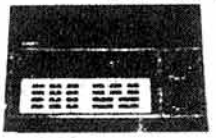
ICOM AH7000 SUPER 25-1300MHz DISCONE	£79.50
G5RV HALF SIZE HF ANTENNA ready to use	£16.50
G5RV FULL SIZE HF ANTENNA ready to use	£18.50
G8KW-TYPE 7.1MHz TRAP DIPOLE KIT SO239	£24.50
G8KW-TYPE as above for use with 300 OHM	£23.50
G8KW-TYPE 2X 7.1 TRAPS ONLY. LESS CABLE	£9.95
RAYCOM AIRBAND-VHF SIX ELEMENT DISCONE	£12.50
RAYCOM DISCONE VHF 60-600MHz 8E.80239	£29.50
SUN KG209 2M 5/8 MOBILE TILT-OVER 259	£14.50
RAYCOM CAST GUTTERMOUNT C/W SO239/COAX	£8.50
GAMMA TWIN 2 METRE SLIM JIM KIT inc. instr.	£14.50
RAYCOM/RWC HB9CV 2 METRE 2E MINI BEAM	£12.50
RAYCOM/RWC HB9CV 70CM 2E MINI BEAM	£8.95

The above popular products POST FREE.
(UK mainland only)

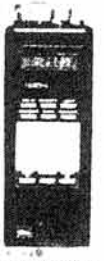
SCANNERS

BEARCAT by Uniden

UBC 175XL

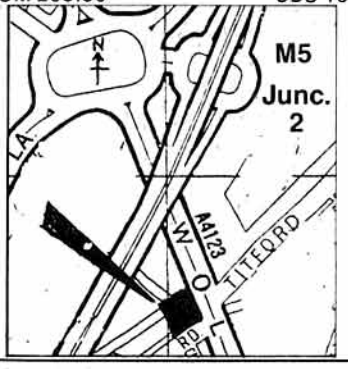


RAYCOM ARE TRADE AND RETAIL DISTRIBUTORS FOR THIS SUPERB RANGE OF QUALITY SCANNERS. THE POPULAR UBC 100XL HAND HELD HAS SOLD IN THOUSANDS, BUT IS NOW COMPLIMENTED BY THE UBC 70XCL POCKET SIZED HANDHELD. ALSO THE NEW COST EFFECTIVE UBC 50XL HANDHELD. SEE THE NEW MODELS IN OUR SHOWROOMS OR SEND A S.A.E. FOR DETAILS.



FROM £99.50

UBC 100XL



SCANNERS

YAESU FRG9600 from the company who specialises in fitting extra options, as supplied to Government departments and professional bodies. We also upgrade existing models, please call for more details, prices, delivery and information.

Yaesu FRG9600 Basic Model Improved 'S' Meter + Sens.	£465.00
Yaesu FRG9600/RWC Mk2 60-950MHz 'N' Connector Fitted	£495.00
Yaesu FRG9600/RWC MK3 HF 100KHz-950MHz plus Mk2 Spec	£595.00
Yaesu FRG9600/RWC Mk5 HF 50KHz-950MHz Active Mixer	£625.00

Package deal on above Mk3/5 FRG9600 c/w AH7000 discone, G5RV, PA4 AC PSU, complete receicing station HF-UHF including delivery UK mainland. Add £100.00 to above price.

Icom ICR7000 25M-2GHZ superb quality professional Rx	£859.00
Icom ICR7000/AH7000 Receiver plus Matching Discone	£937.50
KENWOOD RZ1 New 25-950MHz Mobile. Wide & Narrow AM/FM	POA
Fox VHF-UHF Multi Function Mobile Scanner FM only	£139.00
UNDEN BEARCAT UBC 50XL VHF-UHF 10ch H/held Scanner	£139.00
UNDEN BEARCAT UBC 70XL VHF-UHF 20ch Minature H/held	£199.00
Uniden-Bearcat UBC 100XL VHF-UHF-Airband H/held Scanner	£189.00
Uniden-Bearcat UBC 175XL VHF-UHF-Airband Desk-Top	£175.00
BJ200 Mk2 VHF-UHF-Airband-Military Airband H/held	£220.00
AOR 2002 25-550, 800-1300MHz Desk-Top/Mobile AM/FM	£469.00
Sony Air 7 Top Quality VHF-Airband Handheld Scanner	£245.00

PACKAGE DEAL AVAILABLE ON ALL MAKES.

SHORT WAVE RECEIVERS

Yaesu FRG8800 Short Wave 100KHz-30MHz all Mode + Mem	£589.00
Yaesu FRG8800/FRV8800 as above with VHF Conv. fitted	£679.00
Icom ICR7 HF Top Grade Communications Receiver	£799.00
Sony PRO80 HF/VHF Handheld Scanner c/w accessories	£345.00
Sony 2001D Short Wave/Airband DEI IIXF RX with ANI kit	£395.00

Many more makes and models in stock, PLEASE CALL FOR PRICES. DELIVERY COSTS and any advise or information, or send large SAE. (Insured post and packing £10.00. Carrier £12.50).

HANDHELDS

* = Extended Receiver coverage available, call for details

YAESU FT727R/FNB4A 2.5W (5W) DUAL BANDER C/W CHRGR	£395.00
*YAESU FT23R/FNB10 2.5W (5W) 2MTRS C/W CHARGER	£249.00
*YAESU FT73R/FNB10 2.5W (5W) 70CMS C/W CHARGER	£259.00
*ICOM MICRO 2E 2.5W 2MTR HANDHELD WITH CHARGER	£209.00
CTE1600 (SAME AS ICOM IC2E) C/W NICAD CHARGER	£179.00

Many other types of handheld stocked, please enquire.

PORTABLES

FT290RMK2 2.5W MULTIMODE STANDARD ACCESSORIES	£399.00
FT290RMK2 2.5 WATT M/M AS ABOVE C/W NICADS CHRGR	£425.00
FT 290RMK2/FL2025 (STD) WITH 25W LINEAR AMPLFIER	£489.00
FT690RMK2 6MTR 2.5W MULTIMODE STANDARD ACCES	£399.00
FT690RMK2 6MTR 2.5W M/M AS ABOVE C/W NICADS CH	£425.00
FT790RMK2 NEW 70CM 2.5W MULTIMODE DUE OUT SOON	£499.00

MOBILES

YAESU FT211RH 45W 2MTR MOBILE WITH FREE 1/4 WAVE ANT	£299.00
YAESU FT212RH NEW 45W 2MTR MOBILE DVS FEATURE OPT	£349.00
*ICOM IC28E 2MTR 25W MOBILE WITH FREE 5/8 ANTENNA	£359.00
ALINCO Dual Bander ALD-24E	£445.00
ICOM IC-48e 70cm 25W	£429.00
ICOM IC-3200 Dual Band 25W	£499.00

Many other types and makes stocked, please enquire.

Opening hours 9am-5.30pm 6 days, late nights Thursday & Friday till 7pm.

SONY. RAYCOM now appointed official Sony dealers, full range of both professional and domestic models available to order. Worth waiting for!

RAYCOM COMMUNICATIONS SYSTEMS LTD.
INTERNATIONAL HOUSE, 963 WOLVERHAMPTON ROAD
OLDBURY WEST MIDLANDS B69 4RJ
Telephone 021-544 6767. Fax 021-7124. Telex 336483 Identi-G

South Midlands Co

S M HOUSE, SCHOOL CLOSE, CHANDLERS FORD INDUSTRIAL ESTATE,
Opening hours 8.45 pm-5.15 pm Monday-Thursday,

Serious about VHF/UHF? Then the FT736R is for YOU!

- ★ UP TO FOUR BAND CAPABILITY
- ★ LSB/USB, CW & FM
- ★ FULL DUPLEX CROSSBAND OPERATION
- ★ MEMORY STORAGE OF UP TO 230 FREQUENCIES
- ★ KEYPAD FREQUENCY ENTRY
- ★ FOURTEEN VFO's
- ★ GLOBAL CALL CHANNEL
- ★ PROGRAMMABLE CHANNEL STEPS
- ★ ELECTRONIC KEYER OPTION
- ★ REMOTE PREAMPLIFIER SWITCHING
- ★ TXCO HIGH STABILITY REFERENCE OSCILLATOR

The FT-736R is a frequency synthesized amateur transceiver incorporating up to four band modules covering the 50, 144, 430, and 1200 MHz amateur bands. The standard model provides 25 watts RF power output on the 144 and 430 MHz amateur bands in SSB, CW, and FM modes. (10 watts output on the 50 and 1200 MHz bands).
Operating conveniences usually found only on HF transceivers, such as front panel adjustable IF shift and IF notch, a noise blanket, all-mode VOX and three-speed selectable AGC are included. GaAS FET receiver RF amplifiers are provided in the 430 and 1200 MHz band modules.
The innovative memory system includes one hundred general purpose memories plus ten full duplex cross-band memories, one global call channel memory that can be recalled from any band or mode and up to four band-specific call channel memories, all of which store mode and receive and transmit frequencies independently.
In addition, fourteen vfos are provided: two general purpose plus one PMS (Programmable Memory limit Scanning) on each band, two special-purpose full duplex vfos, and up to four clarifier memories, one per band. Each of the two full duplex vfos can be selected so that its receive and transmit freqencies and modes can be displayed and tuned independently, or linked to tune synchronously in opposite directions for satellite operaiton. You can retain twelve satellite uplink/downlink modes in the special vfos and ten full duplex memories at all times.
Naturally, with FM the predominant mode on the VHF and UHF bands, the FT-736R includes all manner of convenient features for both FM simplex and repeater operation, like a discrminator center tuning meter, special narrow FM mode (to cut adjacent channel interference in crowded areas) and Automatic Repeater Shift when tuned to 2-meter repeater subbands.
The FT-736R also includes a t/r switched DC supply line for masthead preamplifiers, activated from the front panel, and digital output connection directly to the modulator for high performance packet radio tnc interfacing (preamps, personal computers and packet tncs not supplied by Yaesu).

OPTIONAL ACCESSORIES

FEX 736/50	50MHz module	£239.00	XF455MC	600Hz CW Filter	£60.00
FEX 736/1.2	1.2 GHz module	£425.00	SP767	External Spkr c/w Audio Filters	£69.95
FMP-1	AQS Message Processor c/w display	£189.00	MD-1B8	Desktop Microphone	£79.00
FTS-8	CTCSS Tone Squelch Unit	£45.00	MH-1B8	Hand Scanning Microphone	£21.00
FVS-1	Voice Synthesiser Unit	£33.00	FIF232Cvan	CAT/TNC Interface for Packet & CAT	£69.85
Keyer Unit B	Internal Iambic Keyer Unit	£15.95	FIF232C	CAT Interface for RS232 O/P	£75.00
TV-736	Fast Scan TV(ATV) Mod/Demod Unit	£159.00	FIF65A	CAT Interface for Apple II series	£60.00

FT736R RRP £1450 C/W 2m & 70cms

NEW from TOKYO HY-POWER
The HT-100 SERIES

The HT-100 series is a series of compact light weight HF/VHF SSB/CW mono band transceivers from TOKYO HI-POWER. Despite being so compact the transceivers feature everything necessary for the dedicated HF operator, including 20W (PEP) output (10W (PEP) HT106), digital display, 'S' meter and semi break-in on CW. Options available for the radios are HP-100S external PSU c/w loudspeaker, 500Hz CW filter, noise blanker unit and mobile mounting bracket.

HT-106 6m £325.00 HT-120 20m £299.00 HT-180 80m £299.00

HP-100S	External PSU c/w Loudspeaker	£99.00	HNB-100	Noise Blanker Unit	£19.95
HBK-100	Mobile Mounting Bracket	£9.00	HCF-100	500Hz CW Filter	£45.00

All TOKYO Hy-Power products carry 1 year Guarantee

BIRMINGHAM
SMC (Birmingham)
504 Alum Rock Road,
Alum Rock, BIRMINGHAM
021-327 1497/6313
Tue-Fri 9.00-5.00
Sat 9.00-4.00

LEEDS
SMC (Northern)
Nowell Lane,
Industrial Estate,
Leeds LS9 6JE.
Leeds (0532) 350606
9-5.30 Mon-Sat

CHESTERFIELD
SMC (Midlands)
102 High Street,
New Whittingdon,
Chesterfield,
Chesterfield (0246) 453340
9.30-5.30 Tue-Sat

BUCKLEY
SMC (TMP)
Unit 27, Pinfold Lane,
Buckley, Clwyd,
Buckley (0244) 549563
10-5 Tue, Wed, Fri
10-4 Sat

JERSEY
SMC (Jersey)
1 Belmont Gardens,
St Helier, Jersey.
Jersey (0534) 77067
9-5.30 Mon-Sat
Closed Wednesday

N. IRELAND
SMC (N. Ireland)
10 Ward Avenue,
Bangor, CO Down
Bangor (0247) 271875

AXMINSTER
Reg Ward & Co Ltd,
1 Western Parade,
West Street,
Axminster, Devon EX13 5NY
Axminster (0297) 34918
9.00-5.30 Tue-Sat

AGENTS: JOHN DOYLE, TRANSWORLD COMMS, NEATH (0639) 52374 DAY (0639) 2942 EVE
DAVID STENNING G4JA. LOUTH (0507) 604967

A CATALOGUE SELECTION

ROTATORS

Superb engineering standards combined with pin sharp setting accuracy means new technology from the rotator company
—SMC

ANTENNA ROTATORS

G-250	Bell type, Twist/Switch ctrl	**£78.00**
AR40	Bell type, Turn/Push control	**£135.00**
G-400RC	Bell type, 360 deg. meter	**£169.00**
AR50	Bell type, 5 pos. pre-select	**£149.00**
CD45	Bell type, meter readout	**£219.00**
G-600RC	Bell type, 360 deg. meter	**£219.00**
T2X	Bell type, meter readout	**£399.00**
HDR300	Bell type, Digital readout	**£699.00**
G-800SDX	Bell type, 450 deg. var. spd	**£325.00**
G-1000SDX	Belltype, 450 deg. var. spd	**£368.00**
G-2000	Bell type Meter ± 90 deg.	**£445.00**
G-400	Bell type, Meter ± 180 deg.	**£149.95**
G-500	Elevation, Meter ± 90 deg.	**£149.95**
G-500B	Elevation, H/D KR500	**£259.95**
G-5400	Azimuth/Elev. Dual control	**£279.00**
G-5400A	Azimuth/Elev. Computer cont.	**£339.00**
G-5600	Azimuth/Elev. Dual control	**£369.00**
G-5600A	Azimuth/Elev. H/D Comp. cont.	**£389.00**

ROTATOR HARDWARE

9523	Support bearing Chan. Master	**£19.95**
9523/FU200	Support bearing FU200 etc	**£21.95**
9525	Rotary bearing Guy type	**£19.95**
KS050	Rotary bearing 1 5/8" mast	**£19.95**
KS065	Rotary bearing 2" mast	**£29.95**
KC038	Lower mast clamp G-400/600	**£16.95**

ROTARY CONTROL CABLE

RC5W	5way for G-400RC etc.	per/mtr	**£0.48**
RC6W	6way for G-250/400 etc.	per/mtr	**£0.66**
RC8W	8way for CD45 etc.	per/mtr	**£0.72**

Free carriage on all rotators.
Prices are inclusive of VAT.
Carriage on Rotator Hardware £2.50.

P.S.U.'s

NEW FROM SMC

A range of 12VDC power supplies to suit all needs. Specially manufactured to the highest quality using only the best in components and materials. With a choice of either 4.8 or 26A continuous output (6, 10 & 35A surge handling) these P.S.U.'s are built to stand the rigours of everyday operation. Both the 8 and 25A units are fitted with overvoltage protection.

All the above power supplied are keenly priced and are available from all leading retail outlets.

		Carriage
3A	only **£19.95** inc VAT	£2.50
8A	only **£59.95** inc VAT	£3.50
25A	only **£175.00** inc VAT.	£6.50

POLARPHASER

MARK II

NEW

70cms VERSION NOW AVAILABLE

Have you ever wanted to control the polarisation of your xy crossed Yagi from RH-LH, CIRCULAR, VERTICAL or HORIZONTAL, even whilst transmitting? Then this revolutionary product is what you have been waiting for! The SMC POLARPHASER enables you to alter the polarisation of your aerials continuously through the full 360°. For satellite users the benefits to be obtained from instantaneous shack control of polarisation are obvious, enabling effective utilization of receive capabilities and power resources along with the ability to reduce or even totally eliminate co-channel interference for terrestrial use.

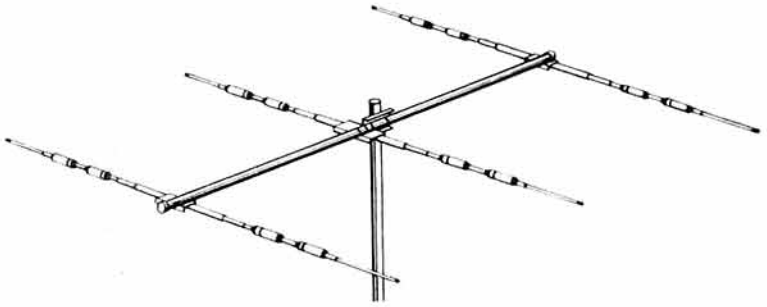
	2 metre	70cms
VSWR	less than 1.5:1.	less than 1.3:1
Frequency	144-146MHz.	430-440 MHz
Power	150 watts.	100 watts
Connectors	SO239 or 'N' (please specify).	'N'

£49.00 inc VAT (SO239) **£69.00** inc VAT

£54.00 inc VAT ('N') P&P £2.25

UK Patent No. 2157894A. Manufactured by S.M.C. Design by G2HCG

HY-GAIN – LOW PRICES



Due to the strong pound and our special purchase we can now offer for a limited period up to 15% discount on their range of antennas and 10% on their larger rotator Ham IV. Buy now whilst stocks last (from January 1st they increased their prices and if the dollar recovers prices could go up by 30% to 40%).

			Offer Price	P&P
12AVQ	Vert. 10-15-20M	~~£78.95~~	£71.00	£3.75
14AVQ	Vert. 10-15-20-40M	~~£106.00~~	£95.00	£3.75
18AVT	Vert. 10-15-20-40-80M	~~£172.00~~	£146.00	£3.75
18V	Vert. 10-80M tapped coil	~~£48.50~~	£43.65	£4.50
TH3Jnr	3 Ele. Yagi 10-15-20M	~~£299.00~~	£254.00	£4.50
TH2MK3	2 Ele. Yagi 10-15-20M	~~£279.00~~	£249.00	£4.50
EX14	5 Ele. 10-15-20M Explorer	~~£499.00~~	£449.00	£7.50
QK710	EX14 to cover 40M	~~£499.00~~	£449.00	£6.50
TH5MK2	5 Ele. 10-15-20M T'bird	~~£649.00~~	£575.00	£7.50
TH7DXX	7 Ele. 10-15-20M T'bird	~~£755.00~~	£669.00	£7.70

			Offer Price	P&P
105BA	5 Ele. Yagi 10M	~~£220.00~~	£187.00	£3.95
153BA	3 Ele. Yagi 15M	~~£135.00~~	£121.00	£3.95
155BA	5 Ele. Yagi 15M	~~£338.00~~	£288.00	£5.90
203BA	3 Ele. Yagi 20M	~~£259.00~~	£233.00	£4.90
204BA	4 Ele. Yagi 20M	~~£420.00~~	£357.00	£7.30
205BA	5 Ele. Yagi 20M	~~£499.00~~	£425.00	£9.40
DB10-15A	3 Ele. Yagi 10-15M	~~£209.00~~	£199.00	4.80
AR40	Famous Bell Type		£125.00	Free
CD45	Medium Bell Type		£219.00	Free
Ham IV	Heavy Duty Bell	~~£359.00~~	£329.00	Free
T2X	Very Heavy Duty Bell	~~£449.00~~	£399.00	Free

JAYBEAM

Want the best, then why not buy Jaybeam. High quality materials and heavy duty construction for long maintenance free life.

JAYBEAM 2 METRE			£	p&p
HO/2M	Halo head only	0dBd	£9.78	A
HM/2M	Halo with 24" mast	0dBd	£11.50	A
C5/2M MK2	Colinear vert. omni	4.8dBd	£90.85	A
LW5/2M	Yagi 5 element	7.8dBd	£18.69	B
LW8/2M	Yagi 8 element	9.5dBd	£23.98	B
LW10/2M	Yagi 10 element	10.5dBd	£29.04	B
LW16/2M	Yagi 16 element	13.4dBd	£42.55	C
PBM10/2M	Parabeam 10 ele	11.7dBd	£57.50	C
PBM14/2M	Parabeam 14 ele	13.7dBd	£70.15	C
Q4/2M	Quad 4 element	9.4dBd	£37.09	B
Q6/2M	Quad 6 element	10.9dBd	£48.59	B
Q8/2M	Quad 8 element	11.9dBd	£60.38	B
D5/2M	Yagi 5/5 slot	10.0dBd	£33.93	B
D8/2M	Yagi 8/8 slot	11.1dBd	46.58	B
5XY/2M	Yagi 5 ele cross	7.8dBd	£36.23	B
8XY/2M	Yagi 8 ele cross	9.5dBd	£46.00	B
10XY/2M	Yagi 10 ele cross	10.8dBd	£57.50	B
PMH2/C	2 way harness circ. polar.		£13.51	A
PMH2/2M	2 way harness 144MHz		£14.89	A
PMH4/2M	4 way harness 144MHz		£36.80	A

JAYBEAM 70 CENTIMETRES				
C8/70 MK2	Colinear vert. omni	6.1dBd	£97.75	B
D8/70	Yagi 8/8 slot	12.3dBd	£33.90	
PBM18/70	Parabeam 18 ele	13.1dBd	£41.40	B
PBM24/70	Parabeam 24 ele	15.1dBd	54.05	B
LW24/70	Yagi 24 element	14.8dBd	33.35	B
MBM28/70	Multibeam 28 ele	11.5dBd	27.60	B
MBM48/70	Multibeam 48 ele	14.0dBd	44.28	B
MBM88/70	Multibeam 88 ele	16.3dBd	61.50	B
8XY/70	Yagi 8 ele cross	10.0dBd	52.90	B
12XY/70	Yagi 12 ele cross	12.0dBd	65.55	B
PMH2/70	2 way 432MHz harness		14.09	A
PMH4/70	4 way 432MHz harness		£29.04	A

JAYBEAM 6M/4M			
4Y4M	4 ele 4M yagi	40.54	B
4Y6M	4 ele 6M yagi	49.45	B

All prices include VAT @ 15%.
Carriage extra, mainland rate shown.
A = £1.75, B = £3.00, C = £4.00, D = £5.00.

FREEPOST SOUTH MIDLANDS COMMUNICATIONS LTD
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RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded 1913 Incorporated 1926 Limited by guarantee Member society of the International Amateur Radio Union

PATRON: HRH PRINCE PHILIP, DUKE OF EDINBURGH, KG

Membership is open to all those with an active interest in radio experimentation and communication as a hobby. Applications for membership should be made to the secretary, from whom full details of Society services may also be obtained.

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YOUNG BEGINNERS

Doing the homework!

Imagine that you are 12 years of age, and that a local radio club has come along to your Scout/Guide group to tell you about amateur radio. They start by showing you a short video — the one currently being prepared by the RSGB — and then answer your questions. Think of all the questions a 12-year-old might ask!

If the video and the club members have done a good job you might be left wondering . . . "That sounds fun, I think I will find out more".

But here is the crunch . . . "What do I do next?" Join a club, buy a book! How many of the 800 RSGB affiliated clubs could cater for dozens of 12-year-olds at each club meeting; certainly some, but not too many. How many clubs have a beginners' training officer and have literature and programmes aimed at young people — some, but not very many. How many clubs could run a programme for young people week-in, week-out, to sustain and develop their interest in amateur radio? Indeed, where are the books and magazines aimed specifically at the young beginner. The presentation and writing style suitable for an adult will do little but put off a 12-year-old.

One wonders what a typical 12-year-old would make of "your average" amateur radio club. Most lectures/talks would be quite inappropriate or too advanced. Junk sales would hold little attraction to the raw beginner. Contests ? . . . Well, perhaps. Without mincing words, there is likely to be a generation gap with the established amateurs and old-timers chatting away about their favourite bit of amateur radio, with the beginners left in a corner to talk among themselves. Perhaps this is put a little dramatically, but it does emphasise the point. We do not want that to happen, but it will unless we all rethink the future of amateur radio.

Most clubs are at present not able to cope with young beginners, yet they are essential to the future of our hobby. Indeed, judging by the great shortage of skills in science, engineering and electronics today, they are essential to the future well-being of the UK.

Now what would be quite wrong would be for each and every club in the UK to "re-invent the wheel". The RSGB is developing that video, it is involved in posters and literature aimed at young people, it is developing a Student Licence to help get young people on the first rung of the transmitting ladder, it is in contact with youth groups to learn how to communicate with young people, it is developing publications — books and a special young person's monthly – it is developing training courses, and is doing lots more. The entire package is a big one which is stretching our resources. However, many clubs, individuals and groups have come forward in a positive way to assist with specialised knowledge. To them, as always, a big thank you. National co-ordination, often cumbersome, because volunteers can only give a limited time to a given task, can and does actually work.

We expect to unveil all our plans at this year's National Convention at the NEC in July. In the meantime, write in if you have any positive suggestions or watch the pages of *Rad Com* as more of the component parts of the RSGB plan reach fruition.

One thing is quite certain. What motivated beginners 10 or 20 years ago will not work today, however much we might wish that to be. A fundamentally new approach is needed to capture the hearts and minds of today's young generation amidst today's high technology communications and all of the other pursuits which are now available.

David Evans, G3OUF

Members' Mailbag

THE EDITOR,
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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.

STUDENT LICENCE

Sir – It would appear that every time someone puts pen to paper and mentions the introduction of a novice class of amateur radio licence in the UK, they give a false impression of what is actually being proposed. I know of no one who is seriously putting forward to the DTI that the novice licence should be a no exam CB type of licence, yet this is the impression always given.

My own novice proposal is for a CW-only licence. The equipment would be made up from a kit. It would be a simple, inexpensive, low powered transceiver, on 28MHz only. The novice written exam and the cw test at 5wpm, would take no more than eight weeks of study. Courses could be held at the local radio club.

The novice licence would put "homebrew" back into the hobby. Which is what the amateurs did in the 'twenties and 'thirties at a time when there was no commercial equipment.

We need to get back to basic, inexpensive low-tech equipment, as a start for the newcomer. As amateur radio equipment gets more and more complex, in future the only qualification may be an examination on an understanding of the instruction manual of the equipment. To work, the novice licence will need the support of all radio amateurs. Now is the time for it to be discussed at your local radio club.

Ian Abel, G3ZHF

This view seems to be complimentary to, though not the same as, the present view of the RSGB Council expressed in "From the secretary's office" in the April issue.

FIRST RUNG ON THE LADDER

Sir – In response to Ron Taylor's letter in your February issue, I heartily agree with his sentiments of putting the "amateur" back into amateur radio. Unfortunately I cannot agree with all his deductions.

The younger generation is surprisingly not put off by miniature components – ics or chips, as he puts it – they have after all been brought up with them. Many youngsters build computer add-ons and appear to take to it like ducks to water; it is the older generation which is reluctant to ditch their Denco coils, large resistors and mod transformers. The average youngster has no junk box and can only use the modern bits currently available.

To a large extent the appeal of amateur radio depends upon the activities currently practised by those who are already amateurs. How many amateurs can claim to have gained their interest in the hobby after visiting an amateur's shack and marvelling at the activities that were carried on there. Alas, today all we see is the expensive paraphernalia that adorns the advertising pages of any radio magazine, so often tucked into a domestic location rather than in the garden shed as it once was.

Many amateurs are only interested in operating, many cannot read a simple circuit diagram, while other openly display contempt at any form of technical QSO or activity that precludes them. Is it any wonder that few youngsters are attracted to our hobby.

My initial disapproval of a novice licence has changed since I have become familiar with the USA licensing system, which has many merits over our current two-tier system. CW is an essential ingredient of such a system,and the novices are not segregated on their own as Ron suggests, try listening on 21MHz.

The problem of attracting the younger generation lies within our own ranks, and let us not forget it.

Mike Grierson, G3TSO/KD3CL

Sir – I enjoyed reading G3AVQ's letter in your February issue. While I agree with much of what he says, I must take issue with "I know we can't go back to the valve era".

Why not, pray? In August last year, I overheard a Class B licensee saying that he would not be sitting the morse test, because "Where would I get the money for an hf rig?". What does he think us old head-bangers did in 1947, when there were no hf rigs (or any other kind of rigs) to buy?

Thus intrigued, I sat down with an old ARRL handbook, and built a small co-pa (6AG7 crystal oscillator – 807 power amplifier), which ran about 25/30W DC input. The cost of the parts I had to buy came to £21, plus items from my junk box – the £21 included two crystals, one for 3·5MHz, and one for 10MHz, and a small tin of paint for the cabinet.

During the next six weeks I worked all over Europe and up to the Faeroe Islands with it, and the only problem I had, was convincing the other end of some of my contacts that co-pa was not a new Japanese manufacturer of amateur radio equipment!

I submitted an article on the rig to *Rad Com*, but it was rejected on the grounds of being too simple for the old-timers, and too complex for the newly-licensed, which does not say a lot for the current RAE.

Laugh if you like, but centrally-heated jam-jars are still the simplest way of building something which will put 50W of rf up the spout.

Alasdair M Fraser, GM3AXX

Sir – The letter from G3AVQ in your February issue raises many interesting points, but merely touches on one vital one. He says that in 1937, 3–5W would give many QSOs, but today an inexperienced operator with 3–5W in a typical suburban plot will be lucky to have one QSO a day. Why is this? Is the state of the bands such that a signal like this no longer propagates? Or is it the amateurs themselves who have changed.

I myself, having relatively recently achieved a G0 callsign, operate 30–50W from a typical suburban plot, with a fairly inefficient antenna because of planning problems etc. I do not expect to work dx every day. I envy those with linears and large antenna farms who can, but I accept that my installation has its limitations. For me it is still exciting to talk (via speech or morse) to others on the air, no matter how close or how far. However, my experience is that, on hf or vhf, many amateurs will only talk to those who are "rare dx" or those they know well. This makes it very difficult for a newcomer with a relatively ineffective signal to make any contacts at all. There are those, with a competitive spirit and the installation to match, who want to work as many stations as far away as possible. But there must be others, perhaps in the majority, who actually just want to use their equipment to communicate with other like-minded souls. For them, the cult of "cq dx" is one which leaves them on the sidelines.

If we want to bring more people, and younger people, into amateur radio, we ought to try to place less emphasis on rare dx, and more on communicating with a wider meaning. There ought to be room for all of us on the bands, but the danger is that by concentrating on the narrow dx aspect we may give many, particularly the young and the newcomers, the impression that, since they cannot aspire to this, there is nothing in amateur radio for them.

F Allen, G0CNH

Sir – Hooray for Mr Taylor, G3AVQ! How I agree that we need a beginners' page (yes, or even better, pages). Most of *Rad Com* is above my head or beyond my practical expertise. A series to help beginners in construction (and that must include a lot of us) would be especially welcome.

I tried to construct an OXO QRP transmitter. No one told me that the wire for the coil should be wound *through* the little bead (rather than round it) and that the ends of the wire would need tinning before soldering (I had got used to pre-tinned components). No one told me that if you clean a new printed circuit board with an ink rubber, the solder will then stick to it. I hope Mr Taylor's letter isn't "the start of a good debate". I hope it actually brings about a *Rad Com* which more ordinary amateurs can understand and learn from.

Rosemary Hill, G4DLT

Sir – The letter in your February issue from Ron Taylor, G3AVQ, whose "First rung on the ladder" probably echoes the thoughts of many of us who were licensed in the 'fifties and 'sixties. It is a shame that Ron never mentioned the fact that although he may be correct in saying that the "amateur" should be put back into the hobby, we are now well and truly submerged in amateur radio more or less dictated by money. We live in a world of never-ending credit, easy payments and hire purchases, and a never-ending supply of people offering the very latest from the Orient. I remember well that during and after the cb boom, the RSGB was very active in trying to gain members from this new batch of "communicators", and the promotion of a fun hobby. A lot of the serious side of amateur radio was discarded, and the membership rose to record levels.

It is accepted that we cannot go back to the old days of Labgear, and Geloso vfos, and Class B 807s, but nevertheless a lead from the top must come with a re-classification of the amateur licence into those who wish to experiment (the minority) and those who wish to communicate (the majority). Each has his own right to exist, but the inbalance must be corrected in order to promote a healthy amateur radio movement into the next century.

It is not easy to convince the novice that a home-built rig works just as well as the latest black box, because it often doesn't, nor is it often any great saving in cost/time to build your own. It seldom looks like a nice chunk of commercial gear, is often much larger and heavier, and has little second-hand value. The specialist components can be expensive and hard to find; costing the parts for an hf receiver I am planning ran to several hundred pounds (a vhf crystal filter was around £40, and was more or less unobtainable off the shelf). Getting it all going may be good fun, and interesting, and a great deal of satisfaction can be gained, but to try and convince anyone it is all worthwhile is another job! A difficult problem and the reason why the "technical folk" stay off the air, and the bands are overflowing with "communicators".

It would be nice to see a serious lead from Potters Bar over this matter, as another 20 years is going to see an even greater dilution in the technical aspect of amateur radio. What thoughts does the DTI have on this matter or is it only concerned with gathering more cash from licence fees? The lead must come from the top, with changes in the RAE, licence, and clearly defined areas of amateur radio interest, with perhaps a graded structure.

Let's see some positive action before too long.

S Gilbert, G3OAG

WHAT WE WANT IS . . .(?)

Sir – Overheard the other day, "I shall get an American 'Technician' licence and then I shall be able to get a British 'A' licence". Is this true? If so, having taught the RAE for the past seven years, I feel I have *almost* wasted my time!

Reference the letter about the lack of members in the RSGB from "Name & address supplied"(?) in your February issue. One of my students (a member of the RSGB) made this comment: "There's not one thing I have attempted to construct from *Rad Com*. However, I've put together several items from *Ham Radio*". He thinks, and I tend to agree, that the technical information is aimed at "those who know" and not to newly-licensed "B" operators. Come to think of it, I cannot think of a lot of useful information I've used either, and I've been a member for very many years.

R Briggs, G3UDX

On the basis of what we hear we get the impression that more people built Rad Com *technical projects than those featured in other magazines, largely because readers know that they're looked at by knowledgeable people prior to publication and therefore have both a good chance of working well and being repeatable. Are we mistaken?*

TO JOIN, OR NOT TO JOIN

Sir – It is not often that I am tempted to write to magazines, but the letter from the unidentified gentleman, and your editorial comments, both regarding non-membership of the RSGB (Feb *Rad Com*) really annoyed me.

The RSGB can be likened to a trade union. It is not necessary to be a member, but it is advantageous. Like a trade union, the RSGB fights for the rights of its members, and non-members reap the benefits. Good luck to them. I know that amateur radio would be worse off without the RSGB but you must let people decide for themselves.

I am a member of the RSGB and I try to stick to the band plan. I'm also a trade union member, and not against such things. But I just hope the day never dawns when it becomes compulsory to be a member of the RSGB. This is, after all, only a hobby, and we do still have the freedom of choice.

B J Thompson, G6TXB

Sir – It is generally agreed that the amateur radio movement includes some of the nicest people on earth – I have listened with pleasure recently, on 144MHz, to the welcomes and good wishes being extended to newcomers, G7s . . . but, oh dear, we do have our share of dafties – and you must pardon me for raising again two hoary old subjects.

My first irritant is the amateur who begrudges joining the RSGB. I spoke to a chap thanking him for his £700 cheque for equipment advertised in "Members' Ads". He confessed that he had seen the ad in a "borrowed" copy of *Rad Com* – there you are, that sums up the lunacy of some of our fellow amateurs –umpteen pounds for a rig and pleading poverty when it comes to joining the Society that protects and advances amateur radio. As they're supposed to say in Yorkshire: "There's nowt so funny as folk!"

My second moan is directed at the sheer nonsense of the *Call Book* of "Particulars withheld . . ." What do they have to hide? Abandoned wives tracing them for maintenance? The taxman? Burglars? On this last point I can speak with some intimate knowledge of villains after working for many years in HM prisons – the lads are simply not interested in lugging away a damn great heavy rig; they prefer nice little portable things like cash, credit cards and jewellery. So why are some chaps so coy about their identity? If one of them tells me to mind my own business, I should like to retort that I object very much to paying out good money for a *Call Book* containing so much "non-information" - perhaps their callsigns could be omitted, leaving more space to accommodate bleary old eyes like mine! Will one of these shy people write and justify their behaviour? – I am particularly intrigued by the all-to-frequent inclusion of large slabs of consecutive callsigns "particulars witheld . . .". Have we got bunches of secret agents or some lunatic group instructors advising their successful licensees to preserve their anonimity?

On my first point I would suggest a levy, to go straight to the RSGB, on every licence fee!

L Barratt, G4GHG

CONTEST CONSIDERATIONS

Sir – I can only surmise that the inclusion of a letter on contesting by G0GQK in your February issue was intended to stimulate vigorous debate. It made me see red: perhaps another symptom of contesting? What does one achieve from contests and especially the 24h ones? I can only speak from the hf cw standpoint, but I'm sure the same holds true across the board.

Being on the bands for long periods, propagation patterns become something more than statistics on charts. The dx edge and beam headings take on new meanings too. The discovery of band openings may be accidental but can best be studied prior to the contest. Whichever way, at the end of the period one has a pretty good idea of what is around, where and when.

Regular contesting is a good way of testing out different antennas or sites, and plotting improvements with an eye to further achievements. The limitations of one's equipment become apparent. A high-power transmitter is no substitute for a first-class receiver. Can the rig cope with strong signals in close proximity? Is there enough selectivity? Could QSK help? Are the filters adequate or would i.f shift and vbt enhance your chances of a score increase?

Improvement of operating skills is hopefully an outcome of any contest. One soon learns when to call and when to listen; when to hunt and when to call CQ. The ears become finely tuned through weeding out and locking onto weak signals among the cacophony. Learning how to work stations, keep a log and a check log all at once is just as important as in team operation – learning how to work closely with a second operator without coming to blows.

I have only touched on a few of the things which G0GQK's friend **may** have achieved during his time in the CQWW Contest. Those disciplines learned and developed are surely the fundamental basis of our hobby – self-training in the art of communications.

Whether there are too few or too many contests on the bands is another subject altogether. And piles? I'm glad to report I only get pile-ups.

Hilary Claytonsmith, G4JKS

OPERATION ON 50MHz

Sir – I write in answer to G1YOU's letter in your February issue about a 50MHz ssb calling frequency. The practice of having a calling frequency or centre of activity works well when activity is low. However, when the popularity of a band increases, the practice tends to become counter-productive, as has happened on 144MHz. The calling frequency of 144·2MHz (later 144·3) was introduced 15 years or so ago to concentrate activity in areas where the 144MHz population was sparse. The "call and QSY" technique now generally used was never envisaged but gradually grew. Today it is not uncommon at busy times, especially if propagation is good, to hear several stations on 144·3MHz calling CQ simultaneously. Any weak dx calling does not have a chance. It would be far better if the callers spread out. This also avoids the need to change frequency with the resulting danger of losing contact if signals are weak or the new frequency selected is already in use. Incidentally, in the early 'fifties, when ssb was in its infancy and only a few stations were equipped for it, there was a *de facto* centre of activity on 3,720kHz – long since unnecessary.

The VHF Committee felt that, although 50MHz activity is low at present, action should be taken now to prevent the band going the same way as 144MHz in a few year's time, so the "centre of ssb activity" has been deleted from the band plan. The "centre of cw activity" remains. (How many can remember what it is?) Of course, if everone still calls on 50·2MHz there will be a problem. If callers spread out, there will not. Certainly, I avoid calling CQ on 50·2, and move off to one side. For those who wish to monitor one frequency, call when they hear someone they want to work and then move to another channel, the answer is fm. The calling channel is 51·51MHz (easy to remember); there is little activity as yet and more would be welcome – give it a try.

Brian Bower, G3COJ
(Secretary, VHF Committee)

"IN PRACTICE"

sir – The article on the proper use of mains connectors in your March issue brought to mind the misuse of mains plugs and sockets; ie using 13A plugs and sockets in cars and caravans for 12V equipment. I know of at least three cars where the item has been taken into the house and, with the 12V lead, plugged into the mains. The result of 240V ac up the 12V line can be a very expensive saving on the cost of buying a proper 12V connector, not to mention dangerous.

Also, it should be mentioned that the practice of using the outer metal shell of a connector as the sole earth return, be it mains or ht, can cause danger. In some types the metal shell can separate before the pins, and if you are holding the two halves at the same time you do not need telling where the circuit path is. Unless specially designed to be used as an earth connection they should be treated only as a screen and the earth taken via one of the pins.

M R Perry, G8AKX

Sir – In your February issue you invited comments on the article listed "In Practice".

Although I have only recently joined (or should I say rejoined) the RSGB and have therefore limited knowledge of *Rad Com* articles, I think "In Practice" an excellent innovation.

It brings back to my mind very interesting articles in the then *RSGB Bulletin* of 1945–8 vintage. I still retain copies of these old articles, which deal with such subjects as "The construction and operation of klystrons" and "Quartz crystals".

"In Practice" also reminds me of Smithy and Dick, who "operated" from the *Radio and Electronics Constructor* workshop. Their articles, too, were both entertaining and informative. A sure way to attract the interest of the younger amateur or would-be amateur.

K R Bolton, G1WGQ

Smithy and Dick were wonderful characters, and several RSGB staff learned a tremendous amount from their exploits in Radio Constructor. *Maybe we ought to resurrect them . . . Regarding G8AKX's letter, he's "dead" right – make sure you're not.*

ANNIVERSARY BADGE

Sir – I am moved to express delight in regard to the design on the front of the 75th Anniversary January issue!

The regular diamond will only remind me of this "new" jewel; a Badge of History – and real distinction.

D R Bourne, G1IAI

PS: Could it not be featured in perpetuity on the Certificate of Membership? If so, I would welcome the chance of an update for mine.

and now . . . .

A FINAL MESSAGE *FROM* THE EDITOR

After a working life spent entirely in the radio field — first as a Marconi Marine radio officer, then as editor of that company's house journal *Mariner*, and, since 1969, editor of *Radio Communication*, the time has come for me to vacate the editor's chair. This issue, therefore, is by way of being my swan-song, as from 1 May I will become the Society's only pensioner.

I depart with many memories — most of them happy — but those which predominate are of the many advances which have taken place in the communications field — both radio and publishing. It seems as far a cry to the days of printing sheets of paper from cast metal type as to those of all-valve transmitters and receivers. Advances will, of course, continue into the future — even as I write this, a desk-top publishing system is being installed in RSGB HQ — and I hope that *Radio Communication* will always reflect and benefit from them.

It certainly gave me great satisfaction to see *Radio Communication* expand from the 64-page, 15,000 circulation, technically-orientated magazine which it was in 1969, to the more operating-orientated hobby magazine of well over 100 pages produced by computer type-setting and web-offset printing by the early 'eighties, and with a circulation rising to over 36,000.

To all those many hundreds of radio amateurs with whom I have made contact over the past 19 years, particularly those whose help, co-operation and encouragement have made my task easier, I send my warmest regards and grateful thanks. To all members of the RSGB I wish every joy in their hobby, and to my friends and colleagues who work for them, best wishes for the future.

Alf (Hutch) Hutchinson

FITTING COAXIAL CONNECTORS

Roger Blackwell, G4PMK*

FITTING COAXIAL CONNECTORS to cable is something we all have to do, whether you are a home-brew equipment fanatic or someone who only rarely uses a soldering iron. Like most things there are probably more wrong ways of fitting connectors than right ones. The methods I'm going to describe are not necessarily the only right ones, but they work, and hopefully if you (like me) have had trouble in the past fitting connectors, you may find them helpful. Although specific styles of connector and cable are mentioned, the methods are applicable to many others.

Cables and connectors

The main secret of success is using the right cable with the right connector. If you're buying connectors, it is important to be able to recognise good and bad types, and know what cables the good ones are for. Using the wrong connector and cable combination is sure to lead to disaster. Any information you can get, such as old catalogues, is likely to prove useful, especially if you can get the cable cutting dimensions and equivalents lists. Two further sources of dimensions and techniques are [1] and [2]. Some excellent general advice on cable and connector selection is contained in [3].

Cables commonly are of one of two families, the American "RG" (RadioGuide MIL specification) types and the English "UR" (UniRadio) series. URM67 is equivalent to RG213, is 10·5mm in diameter and is the most common cable used with type N and PL259 connectors. URM43 (5mm od) is one usually used with BNC connectors, although these also fit RG58 cable since both have similar dimensions. If there is any doubt about the quality of the cable, have a look at the braid. It should cover the inner completely. If it doesn't it is unlikely to be worth buying. There are a lot of so-called "RG8" cables about these days, intended for the cheap end of the cb market, that are anything but good. Avoid them like the plague – *RG8 is an obsolete designation* – the modern equivalent is RG213 or URM67.

Having obtained your cable, the easy bit is over. Now to select the connector. The three most popular connector types are the UHF, BNC and N ranges. I'll cover these in some detail, and mention a few others later. It goes without saying, of course, that one of the universe's natural laws is that the number of connector types in any shack tends towards a maximum! If you can, buy connectors from a reputable manufacturer. Some names that spring to mind are RS Components, Greenpar, Suhner, Radiall, Transradio, Kings and Amphenol, among many. There are some good surplus bargains about, so a trawl through the boxes at the local rally may prove worthwhile.

It cannot be too widely known that the iniquitous UHF connector is no good much beyond 200MHz, because the impedance through the plug-socket junction is not 50Ω. The suitability of N and BNC connectors for use at uhf and beyond is due to their maintaining the system impedance (50Ω) through the connector. PL259 plugs, like the RG8 cable they were intended for, have a lot of nasty imitations. Beware of any that don't have ptfe insulation. They might be ok, but many cheap types are lossy and badly made. OK for receiving, maybe, but you put 400W p.e.p of 144MHz through that sort only once! The plating should be good quality (silver solders best, although some proprietary plated finishes are just about as good), and there should be two or more solder holes in the body for soldering to the braid. There should be two small tangs on the outer mating edge of the plug, which locate in the serrated ring of the socket and stop the body rotating. If you are going to use small-diameter cable with these plugs, get the correct reducer. Often two types are available, one being for 75Ω cable. The 50Ω type is often called UG175. Using the wrong one is certain disaster. Incidentally, buy your reducers at the same time, as some manufacturers use different reducer threads.

With BNC, TNC (like the BNC but threaded) N and C (like N but bayonet) types, life can be more complicated. All these connectors are available in 50 and 75Ω versions. Be sure you get the right one! To help those of you who like hunting for bargains at rallies, Table 1 shows some common manufacturers' designations. All of these connectors have evolved over the years, and consequently you will meet a number of different types. The variations are mostly to do with the cable clamping and centre pin securing method. The original cable clamp type is usually called "unimproved MIL", the later modification the "Improved" and the best, for most uses is the "pressure sleeve" type. If you are buying new, then for normal use go for the pressure-sleeve type. It is *much* easier to fit. If you are fortunate enough to have some of the double-braided ptfe dielectric cable such as RG142, you may find it easier to use the older clamp types, although the pressure-sleeve type will fit properly with care.

All original clamp types use a free centre pin that is held in place by its solder joint onto the inner conductor. Captive contact types have a two-part centre insulator between which fits the shoulder on the centre pin. Improved MIL clamp types may have either free or captive contacts. Pressure sleeve types have a captive centre pin. As an aid to identification, Fig 1 shows these types. Pressure clamp captive pin types are easy to

Table 1: Some common connectors and equivalents

Type	Pin	Clamp	Fits cable	MIL No	Part numbers RS Components	Greenpar
BNC types						
Plug	C	P	URM43	UG88D/U	455–624	GE35070C10
Plug	F	I	URM43	UG88C/U	—	GE35018–10
Plug	F	O	URM43	UG88	—	GE35001–10
Angle plug	C	P	URM43	—	455–646	GE35002C10
Line skt	C	P	URM43	UG89C/U	455–652	GE35060C10
N types						
Plug	C	P	URM43	UG536B/U	455–949	GE15055C10
Plug	C	P	URM67	—	455–753	GE15015C1
Plug	F	I	URM67	UG21B/U	—	—
Angle plug	C	P	URM67	UG594/U	455–898	GE15003C1
Line skt	C	P	URM67	UG23D/U	455–775	GE15022C1

Pin types are: C, captive, and F, free.
Clamp types are: P, pressure sleeve, I, improved, and O, original.

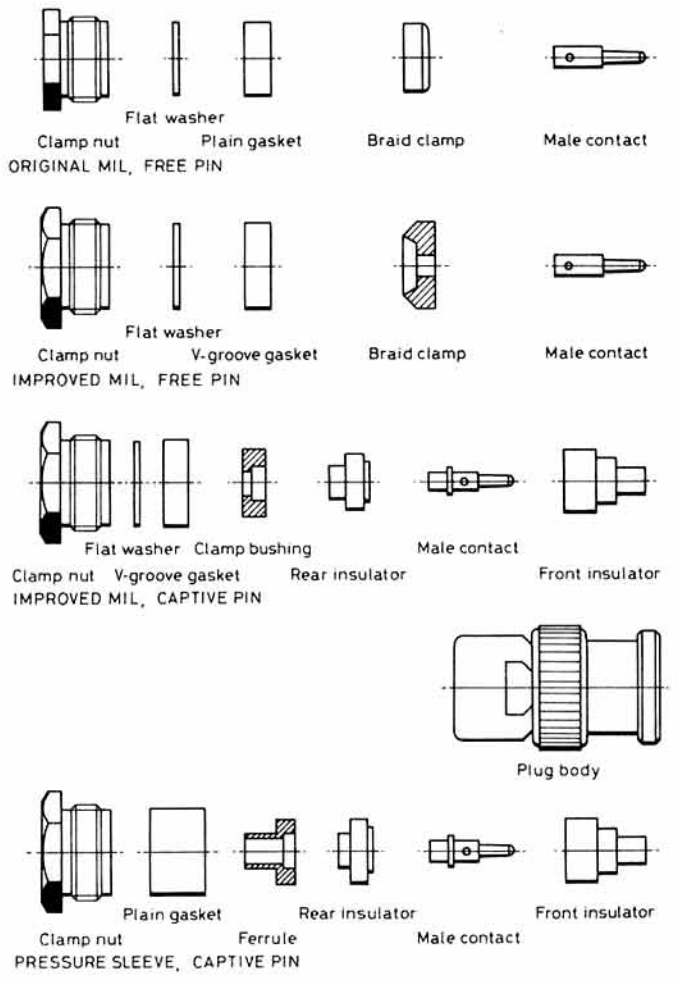

Fig 1. Types of BNC/N cable clamps

*57 Station Road, Scholes, Leeds, West Yorkshire LS15 4BY.

spot, they have a ferrule or "top hat" that assists in terminating the braid, a two-piece insulator and a centre pin with a shoulder. Unimproved clamp types have a washer, a plain gasket, a cone-ended braid clamp and a single insulator, often fixing inside the body. Improved types have a washer, a thin ring gasket with a V-groove and usually a conical braid clamp with more of a shoulder. There are variations, so if you can get the catalogue description it helps!

Tools for the job

To tackle this successfully, you really need a few special tools; while they may not be absolutely essential, they certainly help. Most of them you probably have anyway, so it's just a matter of sorting through the toolbox. First and foremost is a good soldering iron. If you never intend to use a PL259, then a small instrument type iron is sufficient. If you use PL259s, or intend to use some of the "dirty tricks" described later, something with a **lot** more heat output is required. Ideally a thermostatically-controlled iron is best; as with most tools a little extra spent repays itself handsomely in the future. I'm still using a venerable Weller TCP1 iron that is coming up for its twentieth birthday!

A *sharp* knife is another must. A Stanley-type is essential for larger cables, provided that the blade is sharp. For smaller cables, you can use a craft knife or a very sharp penknife. I use a scalpel (available these days from Electromail, for example). A word or two of warning is in order, however. Scalpels excel at the job they were designed for – cutting flesh. Make sure it isn't yours! Use sharp blades, cut away from you, and keep the object you're cutting on the bench, *not in you hand*. Although sharp, the steel blades are brittle and will shatter if you apply excessive force or bend them, with bits of sharp blade shooting all over the place. Dispose of used blades in a box or plastic jar. Model shops have a good range of craft knives which will also do an excellent job.

A pair of sharp small scissors (not the xyl's nail scissors!) is needed for cutting braids, and a blunt darning needle (mount it in a handle made from a piece of wood dowelling) is useful for unweaving the braid; so too is a scriber. You will find a small vice a great help as well. For BNC, TNC and N type connectors, some spanners are essential to tighten the gland nuts. The BNC/TNC spanners should be thin 7/16in AF. Those for type N need to be 11/16 x 5/8in AF. BNC spanners are sold in pairs by RS Components (available via Electromail) and are 7/16 x 1/2in AF, the other end suitable for BNC line sockets. A junior hacksaw is needed to cut larger cables such as URM67. Finally, if you intend to put heatshrink sleeves over the ends of plugs for outdoor use, some form of heat gun helps, although the shaft of a soldering iron may work. (You probably have a heat gun already – thinly disguised as a hot-air paint stripper).

Preparing cables

Fitting a plug requires you to remove various bits of outer sheath, braid and inner dielectric. The important knack to acquire is that of removing one at a time, without damaging what lies underneath. To remove the outer sheath, use a sharp knife or scalpel. Place the knife across the cable and rotate the cable while applying gentle pressure. The object of doing this is to score right round the cable sheath. Now score a line from the ring you just made up to the cable end. If you have cut it just enough, it should be possible to peel away the outer sheath leaving braid intact underneath. If this is not something you've tried before, practice on a piece of cable first. For some connectors, it is important that this edge of the sheath is a smooth edge at right angles to the cable, so it really is worth getting right.

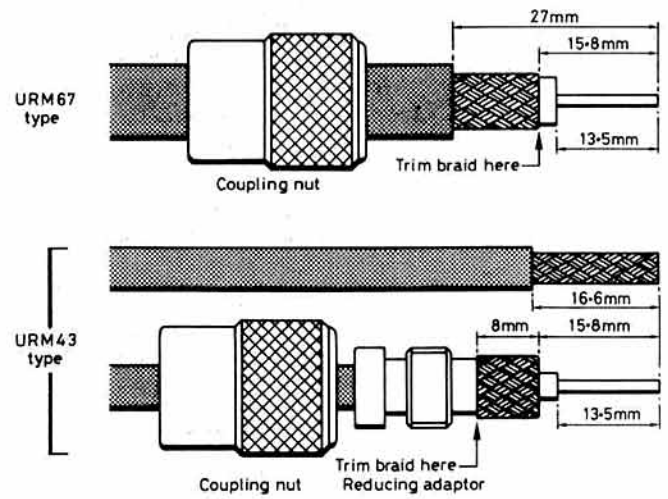

Fig 2. PL259 plug assembly

Braid removal usually just requires a bit of combing out and a pair of scissors. Removal of the inner dielectric is most difficult with large-diameter cables with laid multi-strand inner conductors like URM67. Again, it is important that the end is a clean, smooth cut at right angles to the cable. This is best achieved by removing the bulk of the dielectric first, if necessary in several stages, and finally trimming the dielectric to length. There is a limit to how much dielectric you can remove at one go; 1-2cm is about as much as can be attempted with the larger sizes without damaging the lay of the inner. For the larger cables, it is worthwhile to pare down the bulk of the unwanted material before trying to pull the remainder off the inner. If you can, fit one plug on short cables before you cut the cable to length (or off the reel if you are so lucky). This will help to prevent the inner sliding about when you are stripping the inner dielectric.

Fitting PL259 plugs

WITHOUT REDUCER, URM67 TYPE CABLE.

First, make a clean end. For this large cable, the only satisfactory way I have found is to use a junior hacksaw. Chopping with cutters or a knife just spoils the whole thing. Having got a clean end, refer to Fig 2 for the stripping dimensions. First, remove the sheath braid and dielectric, revealing the length of inner conductor required. Do this by cutting right through the sheath and braid, scoring the dielectric, then removing the dielectric afterwards. Next carefully remove the sheath back to the dimension indicated, *without disturbing the braid*. Examine the braid; it should be shiny and smooth. If you have disturbed it, or it looks tarnished, start again a little further down. Now the tricky bit. With a **hot** iron, tin the braid carefully. The idea is to do it with as little solder as possible; I find that a trace of a non-corrosive flux such as Fluxite helps. Lightly tin the inner conductor also at this stage. Take a breather while the cable cools.

Now slide the coupling piece onto the cable (threaded end towards the free end). Examine the plug body. If it isn't silver plated, and you think it might not solder easily, apply a file around and through the solder holes. Now screw the body onto the cable, hard. When you've finished, the sheath should have gone into the threaded end of the connector, the inner should be poking out through the hollow pin, and the end of the exposed dielectric should be hard up against the inside shoulder off the plug. Look at the braid through the solder holes. It should not have broken up into a mass of strands; that's why it was tinned.

If it has, it's best to start again.

If all is well, lightly clamp the cable in the vice, then apply the iron to the solder holes. Heat it up and then apply solder. It should flow into the holes; if it stays there as a sullen blob, the body isn't hot enough. Now leave it undisturbed to cool before soldering the inner by heating the pin and feeding solder down the inner. Finally, when its all cool, cut any excess protruding inner conductor and file flush with the pin, then screw down the coupling ring. Merely as a confidence check, of course, test for continuity on both inner and outer from one end of the cable to the other, and check that the inner isn't shortened to the braid.

WITH REDUCER, URM43 TYPE CABLE.

First, slide the outer coupler and the reducer on to the cable. Next, referring to Fig 2, remove the outer sheath without nicking the braid. Now, using a blunt needle, gently unweave the braid a bit at a time until it is all straight and sticking out like a ruff around the cable. Remove the inner dielectric, without nicking the inner conductor, so as to leave the specified amount of dielectric. Tin the inner conductor. Bring up the reducer until the end of the reducer is flush with the end of the outer sheath. Fold the braid back so it lies evenly over the shank of the reducer, then cut off the excess braid with scissors so that it is not in danger of getting trapped in the threads. Smooth it down once more, then offer up the plug body and, *while holding the reducer and cable still*, screw on the plug body until it is fully home. The only really good way of doing this is with two pairs of pliers. Now hold the assembly in the vice and ready the soldering iron. There has been a spirited discussion from time to time about the advisability of soldering the braid through the holes; the best information that I have is that you should. If you don't, the cable will sooner or later fail. So with a **big** iron, solder the braid through the holes. See the section above for advice. Finally, solder and trim the inner conductor and test the assembly as described earlier.

Fitting BNC and type N plugs

These are "constant impedance" connectors; that is, when correctly made up, the system impedance of 50Ω is maintained right through the connector. It is vital that the cable fits the connector correctly, therefore check that each part fits the cable properly after you prepare it. Refer to Fig 3 for BNC dimensions, and Fig 4 for N types.

ORIGINAL OR UNMODIFIED CLAMP TYPES.

Slide the nut, washer and gasket onto the cable in that order. With the sharp knife, score through the outer sheath by holding the knife and rotating the cable, without nicking the braid. Run the knife along the cable from the score to the end, then peel off the outer sheath. Using a blunt needle, for example, start to unweave the braid enough to enable the correct length of dielectric to be removed. Now slip the braid clamp on, pushing it firmly down to the end of the outer sheath. Finish unweaving the braid, comb it smooth then trim it with scissors so that it just comes back to the end of the conical section of the clamp. Be sure that the braid wires aren't twisted. Now fit the inner pin and make sure that the open end of the pin will fit up against the dielectric. Take the pin off and lightly tin the exposed inner conductor. Re-fit the pin and solder it in place by placing the soldering iron bit (tinned but with the solder wiped off) on the side of the pin opposite the solder hole. Feed a small quantity of solder (22swg or so works best) into the hole. Allow to cool and examine. If you've been careful enough, the dielectric should not have melted. Usually it does, and swells up, so with the sharp knife trim it back to size. This is essential as otherwise the plug will not assemble properly. Remove any excess solder from around the pin with a fine file. Now push the gasket and washer up against the clamp nut, check the braid dressing on the clamp, then push the assembly into the plug body. Gently firm home the gasket with a small screwdriver or rod and then start the clamp nut by hand. Tighten the clamp nut by a spanner, using a second spanner to hold the plug body still; *it must not rotate.* Finally, check the completed job with the shack ohmmeter, sit back and relax!

MODIFIED OR IMPROVED CLAMP TYPES.

In general, this is similar to the technique for unmodified clamp types described above. There are some important differences, however. The gasket has a V-shaped groove in it, which must face the cable clamp. The clamp has a corresponding V-shaped profile on one side; the other side may be conical or straight sided, depending on the manufacturer. If the clamp end has straight sides, then the braid is fanned out and cut to the edge of the clamp only, not pushed down the sides. Some types have a small ptfe insulator which is fitted before the pin is put on (common on plugs for the small RG174 cable). You now appreciate why having the assembly instructions for your particular flavour of plug is a good idea! Still, by using these instructions as a guide, it shouldn't be too difficult to get it right, even if it does not fit the first time. One important point – if the plug has been assembled correctly and tightened up properly, the clamp will have (intentionally) cut the gasket. It is then rather difficult to re-use it as the gasket, being thin, will not stand a second attempt. The thicker gasket types will often allow careful re-use.

CAPTIVE CONTACT TYPES.

These have a small shoulder on the pin, and a rear insulator which fits between the pin and the cable. Most types use a thick gasket and a ferrule, although some use a V-grooved braid clamp and thin gasket. I shall describe the ferrule type, as these are the most commonly available, and the easiest to fit.

First, slip the nut and gasket on to the cable. Refer to Fig 3 or 4 for cutting dimensions, then strip off the correct amount of outer sheath by rotating the cable, producing a neat scored circle. Score back to the end of the cable and peel off the unwanted sheath. Comb out the braid, and with it fanned out evenly around the cable, slide the ferrule (small end first) on to the dielectric-covered inner conductor. Push it home so that the narrow portion of the ferrule slides *under* the outer sheath, and the end of the outer sheath rests against the ferrule shoulder. Trim the braid with scissors to the edge of the ferrule. Slide up the gasket so that it rests gently against the ferrule shoulder, which will prevent the braid from being disturbed. Using the sharp knife, trim the dielectric back to the indicated dimension, without nicking the inner conductor. Fit the rear insulator, which will have a recess on one side to accommodate the protruding dielectric. Incidentally, if you don't have the size for your particular plug, trim the dielectric until it fits; but don't overdo it! Now trim the exposed inner conductor to length and check by fitting the pin, whose shoulder should rest on the rear insulator unless the inner has been cut too long. Tin the inner lightly, then fit the pin and solder it by

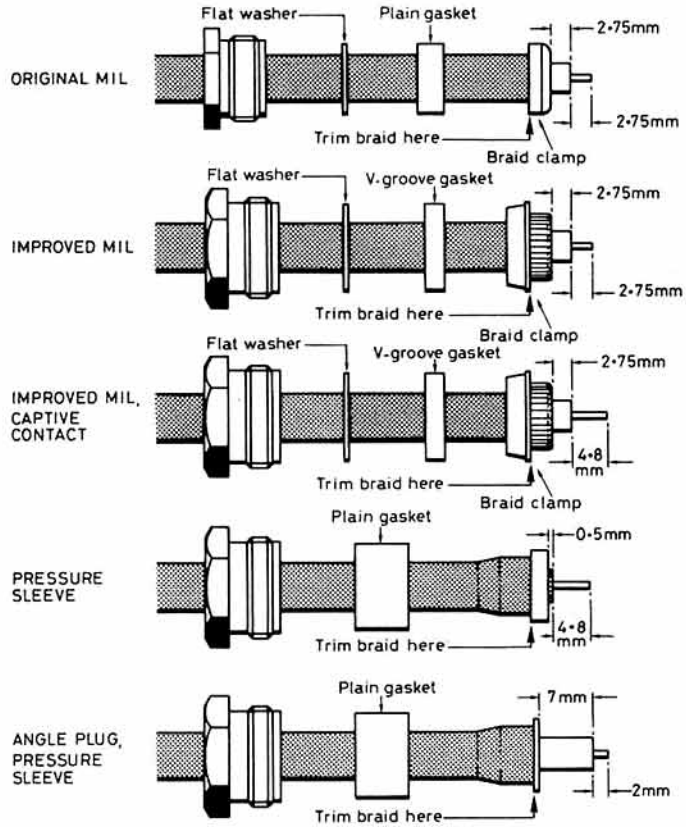

Fig 3. BNC dimensions, plugs and line sockets

applying the iron tip (cleaned of excess solder) to the side of the pin opposite from the solder hole and feed a small amount of solder into the hole. Allow to cool, and remove excess solder with a fine file. Now fit the front insulator (usually separate from the body) and push the whole assembly into the body. Push down the gasket gently into the plug body with a small rod or screwdriver. Start the nut by hand, then tighten fully with one spanner, using the other to prevent the body from rotating. Check with the ohmmeter, then start on the other end — remember to put the nut and gasket on first!

Variations

Angle plugs generally follow a similar pattern to the straight types, except that connection to the inner is via a slotted pin, accessed via a removable cap screw. Tighten the connector nut before soldering the inner. Line sockets are fitted in the same way as plugs.

Fitting N-type plugs to Popes H100 cable

This should really be classified as a "dirty trick" but requires a section all of its own. Popes H100 is rather different in construction to normal coaxial cable, and there seem to be no connectors that have been specifically designed for it.

This technique will only work with pressure sleeve clamp plugs intended for URM67 or similar cable. Proceed as follows: First, slide the nut and gasket on to the cable, then carefully remove 3cm or so of outer. If you can, slide on a length of polyolefin heatshrink sleeving of about 12·5mm diameter (such as RS 399-625) about 4cm long. Make three or four short slits in the outer jacket of the cable back from the cut and about the same length as the ferrule shaft. Carefully fit the ferrule; note that both the braid and foil go *inside* the ferrule. Push the ferrule up as far as it will go, then secure in place by sliding the sleeving down and heatshrinking it. If you cannot get the sleeving, wrap two turns of pvc tape over the jacket at the ferrule end and also back up the cable where the nut will lie when the connector is assembled. Fan out and spread the braid over the flange of the ferrule. Carefully slit the foil into five or so strips and fold down on to the flange over the braid. Trim both to the flange edge. Now cut back the dielectric to 0.5mm from the flange of the ferrule and cut the inner conductor so that 4·5mm is left protruding past the dielectric. With

a fine file remove the burr from the end of the inner conductor, and carefully reduce the diameter a little so that the pin will fit easily. Fit the rear insulator, then fit and solder the pin. Fit the assembly into the plug body, slide down the gasket and nut, then tighten the nut without the plug body rotating. For added water resistance and to provide some additional strength, a heatshrink sleeve can be placed over the cable and rear part of the plug body. The best type is that which has an adhesive, such as RS399–748, which is 19mm in diameter. A check with a time domain reflectometer (tdr) has shown little variation in impedence along a plug fitted in this way.

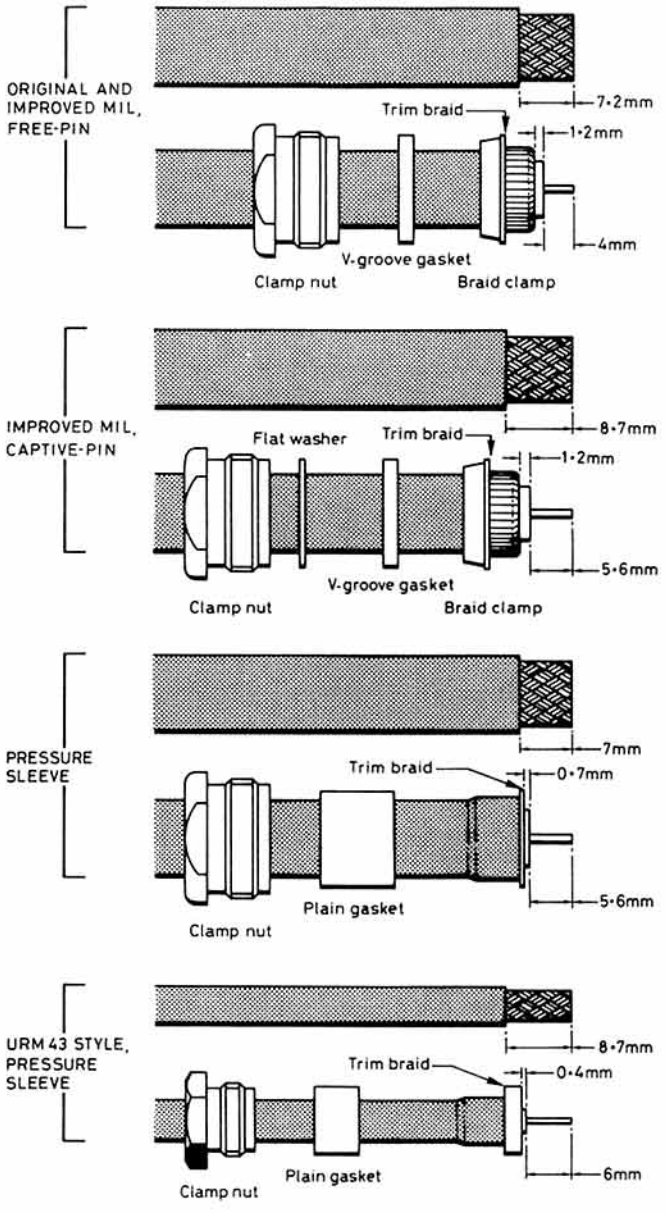

Fig 4. N-type dimensions, plugs, angle plugs and line sockets

Dirty tricks

Most of these were originally described in "The Golden Treasury of Connector Abuse" in the December 1985 issue of the VOWHARS newsletter. The author gratefully acknowledges the contributions by a number of connector abusers, who wish to remain anonymous, and also including G3SEK.

We would like to use new connectors every time, but often a pressure sleeve type can be reused if the gasket is not too deformed. Get all the solder you can out of the pin and then carefully ream out the rest with a small drill, held in a pin chuck. The sizes to use are 1mm for URM43-style pins, and 2·6mm for URM67 ones.

Tarnished silver-plated connectors can be made to shine by dipping the metal parts in Goddards "Silver Dip" silver cleaner, or a solution of photographic fixer. Rinse carefully afterwards, then bake in a slow oven.

BNC connectors for URM67 cable can be rather hard to find. A standard captive contact BNC plug can be fitted to URM67 in the following way: First, discard the nut, gasket and ferrule, and prepare the rear insulator by removing the ridge from it with a sharp knife. Now prepare the cable by cutting with a knife, right through the jacket, braid and insulator about 5mm back from the end. Cut sufficiently deep so that you notch the inner conductor strands, and remove the remains. Carefully bend the six individual outer strands of the inner so they break off flush with the end of the dielectric, leaving one straight inner strand. Now remove sufficient outer jacket (about 2cm) such that when the body is pushed on the cable, some braid is still visible. Tin the braid and inner conductor lightly, then fit the rear insulator, pin and front insulator and push home the assembly into the plug body. With the **big** iron, heat the plug body and feed solder down the joint with the braid. After it has cooled, put some heatshrink adhesive lined sleeving over the plug and cable join to protect it. Testing of this trick with a tdr has shown it to be almost as good as the real plug, and certainly better than an adapter. This assembly will happily stand 100W of 1,296MHz.

An N-plug can be *carefully* pushed on to a BNC socket; OK for quick test equipment lash-ups, but don't do it too often or too hard as you will eventually damage the socket. In a similar vein, the pin of a PL259 is about the same diameter as a 4mm wander plug; after all, what is a PL259 but a screened wander plug?

To make a PL259 to BNC adapter, solder a length of copper wire to the back of a BNC single-hole socket. Drop it (without the nut) on to the top of a PL259 so that the wire pokes through the pin of the plug. With a **big** iron or a careful blowtorch, solder the body of the socket and plug together. After it has cooled, solder the inner wire to the pin. Not exactly a precision job, but good enough for a PL259!

Finally, to waterproof a connector-cable joint and to provide added strength where flexing of the cable will occur, heatshrink a piece of adhesive lined heatshrink sleeving over the plug body and cable. For N connectors, a 19mm diameter variety (that shrinks to a minimum of 6mm, such as RS399-748) can be slid on to the cable and connector after assembly.

Conclusions

With a little practice, care and patience, I hope that these notes may make the fitting of connectors a little less of a chancy business. Practice on some short leads (there is no such thing as too many spare short coaxial leads in any shack) and remember that the best time to put new connectors on the feeder is not 2min before the start of the contest!

References

[1] *The Radio Amateur's Handbook* (any year). ARRL.
[2] *Microwave Measurements and Techniques*, T S Laverghetta. Artech 1976. (Good advice on cable, connectors and how to fit them. Much useful practical advice on many subjects, not just for microwavers!)
[3] *The Buyer's Guide to Amateur Radio*, Angus McKenzie, MBE, G3OSS. RSGB 1986.

Appendix — The Greenpar part numbering system

Greenpar connectors are numbered systematically in a way that should enable you to quickly identify connectors suitable for your use, and to check through those rally "bargains". The part number is "GE" followed by a five-digit number, a letter, another number and lastly some more letters. The first digit is the connector series (N, BNC etc) which is already apparent from looking at the connector. The second digit is vital — it is 5 for 50Ω connectors, and 7 for 70 or 75Ω types. The next three numbers are the connector style. The letter refers to the cable clamp method — it is "C" for pressure sleeve types, "A" for modified MIL clamp with captive contact, "D" for crimp types and "–" for MIL clamps with non-captive pins. The next group of numbers is the cable series. Useful ones are "1" for URM67 and RG213, "4" for RG214 *and* URM67 and RG213, "10" for URM43, URM76, RG58 and 142, and "22" for URM95 and RG174. There are many others for less common cables. The final group of one or more letters refers to the panel mounting holes and optional finish (if any). So a connector numbered GE3507C22 is a BNC plug suitable for RG174 or URM95 50Ω cable with a pressure sleeve clamp. □

WIND LOADING

D J REYNOLDS, G3ZPF*

(PART 2)

Guy rope anchors

For taller masts, guy ropes are often needed with large headloads. The same guidelines apply to the concrete blocks which secure them as to the tower base. Always ensure at least 50mm of concrete around all metalwork below ground, and concrete free from voids. Fig 12 shows an arrangement I have seen suggested, but all that prevents the eyebolt being pulled out is the local bond between the curved surface of the bolt and the surrounding concrete. This is not likely to be very much, especially if the concrete has voids or if (and this is a real no-no) the anchor block was formed first and then the bolt was just pushed into the wet concrete. Adding a plate to the eyebolt (Fig 13) provides a much more secure fixing, or alternatively Fig 14 could be used. The literature I was sent by the various tower makers contained no reference to guy anchors, since few amateurs aspire to monster setups, but, as always, their advice should be sought as to the size of each anchor block.

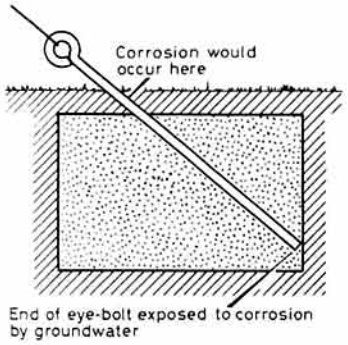

Fig 12. A guy anchor of this general type was seen in the amateur press recently. Apart from the fact of corrosion where the metalwork is in contact with the ground, all that prevents the eye-bolt from being pulled out is local bond between the surface of the bolt and the surrounding concrete

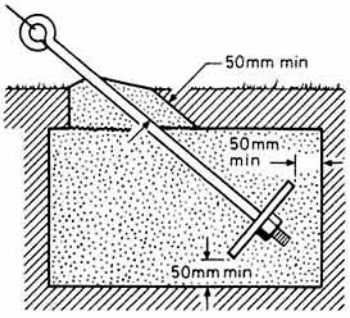

Fig 13. By fixing a plate to the eye-bolt, a far greater pull-out strength is obtained. Always provide a minimum of 50mm of properly compacted concrete around all metalwork below ground

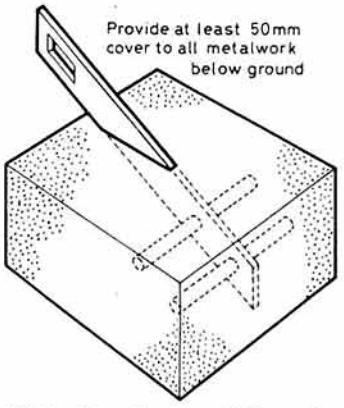

Fig 14. An alternative type of fixing to Fig 13

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Locating the tower

The precise location of a tower within the boundaries of any QTH will be dependent on a number of factors, but one which is often overlooked completely is the location of underground services. Although the loads presented to the ground from amateur tower bases are usually negligible, the blame for any damage to adjacent services could well be laid at the amateur's door even if it was due to entirely "natural" causes. Site plans are often available at local authority offices, especially for recent developments, and the short time it takes to go and look at them can save a good deal of heartache later on. It is not a good idea to discover the location of the electricity service by putting a shovel through it, or the gas feed by putting a pick through it. When I moved into my QTH I found my gas feed while digging a hole to plant a conifer. It was less than 2ft down, and if my neighbour had been at home at the time I would probably have borrowed his pick to break up the ground. Funny how a conifer suddenly looks better somewhere else though!

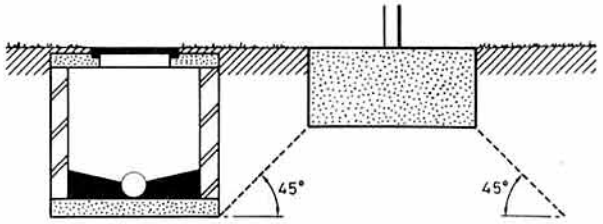

Fig 15. Although the forces involved with amateur tower bases will usually be negligible, it pays to keep well clear of manholes. Most manholes will only be about 900mm deep anyway, but it pays to check

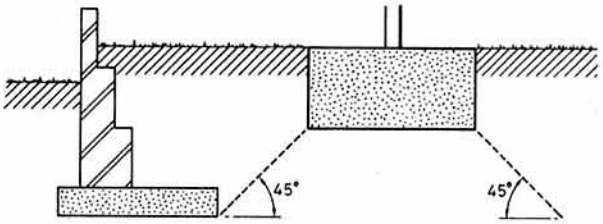

Fig 16. Keep well away from retaining walls, because any problems incurred due to other causes could well be laid at the amateur's door

Most manholes on housing developments will be about 900mm deep, but they might be deeper where the ground is flat for considerable distances. Make sure that the tower base does not surcharge the walls of the manhole (however insignificantly), or the actual drain runs themselves. There will usually be at least one manhole close to the house, for the foul drain, so lifting the lid will show what direction the pipe runs away. Figs 15, 16 and 17 show the desirable distances to keep from manholes, retaining walls and pipe runs. The dotted lines show the boundary of the soil zone surcharged by the base. As I said previously, the loads will be negligible, but in the case of any future problems it helps to be "squeaky" clean. In any case, if workmen ever need to attend to the services, keeping a good distance avoids the embarrassment of them having to dig up your tower too!

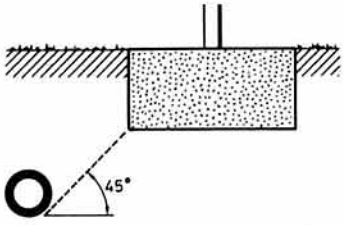

Fig 17. Find out where the various services crossing the property are located and keep well clear of them. Gas and electricity supplies can be quite close to the surface sometimes. It is not pleasant to find them the hard way!

Rotators

These are one of the most abused items of an antenna system. The most important properties of a rotator which must not be exceeded are its torque, and axial load capacity. The torque capacity is the ability to resist any twisting effect caused by the wind on the antenna. Even if the antenna is arranged symmetrically on the top of the mast, the wind may not blow evenly across it. Fig 18 shows the worst case, with the full force of the wind striking exactly half of the antenna, causing an imbalance of half of the antenna's quoted wind load. The torque, or twisting moment is evaluated as half of the wind load multiplied by one quarter of the element length. Note that in vhf long-Yagis the proportions are such that one quarter of the boom length should be used instead.

When studying rotator specifications it is important to find out whether the quoted torque capacity is a working load or an ultimate load. If the figure quoted is the ultimate load, take half as a safe working load. Rotators are expensive. It pays to look after them, and to allow for the possible enlargement of the antenna array in the future. It also pays to put rotators in a cage, especially if an extension tube is to be used. Remember to consult the tower maker before adding extension tubes, as they will reduce the permitted headload of the tower. To see the effect of an extension tube on an uncaged rotator, consider the following hypothetical example.

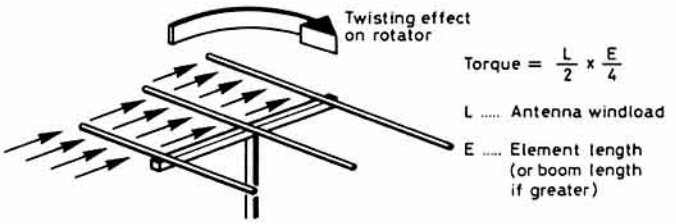

Fig 18. Wind pressure is not always exerted uniformly across the surface of an antenna. As a worst case, for the rotator, the wind force strikes only one half of the antenna. This causes a twisting effect which the rotator must be capable of resisting

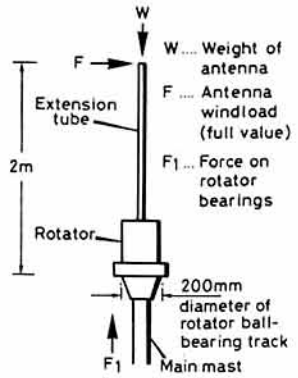

Fig 19. The effect of an extension tube is to magnify the horizontal wind load of the antenna(s) and present it as an axial load on the rotator bearings in addition to the weight of the array

A rotator is available with an ultimate torque of 500kg/cm, and an axial load capacity of 40kg. It is proposed to use this with a 2m extension tube to support a vhf/uhf array with a wind load of 5kg, and a total weight of 1kg. The total torque from the combined array is known to be 200kg/cm, so will the rotator be adequate?

First check the torque capacity. Since the 500kg/cm is an ulitmate load, this has to be halved to give a safe working load of 250kg/cm, which should be adequate as the applied torque is 200kg/cm.

Looking at the axial loading of 3kg, the capacity of the rotator at 40kg would appear to be easily adequate. Indeed, it would be if the rotator were caged, but Fig 19 shows the forces involved in this case. When the wind blows on the antenna it will attempt to twist open the body of the rotator. The rotator tries to prevent being broken apart, and the weakest point is inevitably the ball-bearing ring. In this example, to maintain equilibrium . . .

$$F \times 2000 = F1 \times 200 \text{ (assuming a ring diameter of 200mm)}$$

or in other words

$$F1 = 10 \times F$$

In this example that means a value of 50kg being presented to the rotator bearings, **plus** the 3kg self-weight of the antenna array. This will almost certainly lead to breakdown of the bearings, especially if the axial load capacity quoted was an ultimate value. As with torque, a factor of safety of two is desirable. Fig 20 shows how a rotator cage removes the overturning forces. A simple sleeve bearing (packed with grease) takes most of the strain.

As a final point, in areas where rotators are prone to freezing solid during the winter, why not try lagging the rotator cage with insulation of some kind?

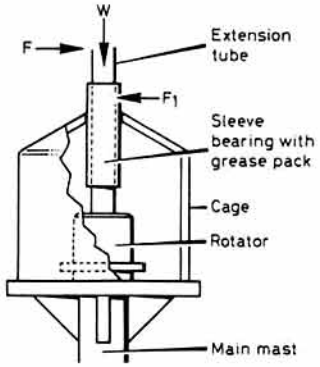

Fig 20. The sleeve bearing takes out the horizontal force, leaving only the vertical weight of the antenna to act on the rotator

Maintenance

However well designed a tower and antenna are, their longevity will be greatly influenced by how well they are protected from the elements. In coastal regions the main problem will probably be from the salt air, whereas around centres of industry, chemical attack will predominate. Even where the air is free from contaminants, rainwater will corrode unprotected steelwork and it is important to make regular checks to ensure that the integrity of the manufacturer's protective coating has not been breached. Aluminium develops a thin "patina" on exposure to the air whereupon further corrosion should be almost totally inhibited, but in aggressive industrial atmospheres this may not be the case. There are a variety of surface sealants available on which the antenna supplier should be able to advise, and which should pay for themselves in terms of the increased life of the antenna.

In commercial applications all towers have to be regularly inspected, especially for insurance purposes. Amateurs would seem to have a much easier time of it at the moment, since the ARIS cover extends to antennas and masts seemingly without any checks being made. I did write to them to clarify this, and although at the time of writing had received no reply it is possible that an inspection would be made in the event of a claim, whereupon "contributory negligence" could well affect your cover. I have no idea where home-made masts would stand in this situation, so it might pay to check.

Even with a well-maintained tower and beam, designed to meet the full rigours anticipated by the appropriate codes of practice, the weather is such a variable item that there can be no absolute guarantee that a tower will not succumb to the wind. There will always be a very slight possibility of something unexpected happening, and given the potential for secondary damage or injury caused by a collapse, it would be unwise not to insure against it.

Acknowledgements

Extracts from CP3: Chapter V: Part 2: 1972 are reproduced by permission of the British Standards Institution. Complete copies can be obtained from them at Linford Wood, Milton Keynes MK14 6LE.

The basic wind speed map is based on information provided by the Meteorological Office and reproduced with the permission of Her Majesty's Stationary Office.

Bibliography

The following publications also contain information about wind loadings:

BRE DIGEST 119 "The assessment of wind loadings".

BRE DIGEST 283 "The assessment of wind speed over topography".

They can be obtained from HMSO bookshops, and possibly loaned from local libraries. □

MOXON SLOPES AT VHF AND OTHER THOUGHTS

M Gibbings, G3FDW*

G3FDW was first licensed early in 1949. His interests have ranged from dx hunting all the time, vhf since 1957, ssb since 1958, 70MHz contests since 1964, and preventing his xyl from going home to mother since he can't remember when.

Counter to popular belief he's never eaten his lunch off the top of the transceiver, worked DXCC, or achieved anything except a great deal of enjoyment from amateur radio. He still loves the RSGB, his children, the cat and especially his xyl, who have all had more to put up with than he could rightly expect.

THIS STORY STARTED in the manner of all great scientific discoveries, in that certain facts were stumbled upon and then a theory was half-inched from others which fitted these facts. Historically, starting in about 1967 and continuing for six or seven years, much head scratching went into the problem as to why one vhf site gave good results while an equally-promising site was definitely "bad".

In the search for the ideal site, much effort went into poring over Ordnance Survey maps, visiting sites, trying them out, and then finally settling for the one that gave the best results; only to start all over again, convinced that the ideal site was somewhere out there, but as yet had not been stumbled upon. Many happy weeks were spent wandering around the North Pennines, the Borders and along the Solway Coast, trying out any likely or known sites used by other successful vhf contest groups. Slowly – and it took several years – it became possible to judge sites on sight and then to "tune" the site for maximum performance.

As the investigation continued it became clear that nearly all the preconceived ideas regarding what constituted a good vhf site were far from true when it came down to practical results. Slowly, certain points became clear and the "best performance site" had certain common characteristics. So let us examine the characteristics which go to make up an ideal site for vhf contest working.

The height of any particular site turned out to be not as important as was at first thought. Certain very good sites were only at from 300-1,000ft, but it was found that the very low sites all looked out over a sea path in the most favoured direction. Most were within only a mile of the coast. The further back from the coast, the greater the height the site needed to bring it into the "good" category. Without a sea path you need height in plenty, and certainly you must have an unobstructed view from the site horizontally in the most favoured direction, but see afterthought No 2. Conversely, a further advantage that a low site has is that should good conditions with ducting develop, then if your site is too high you may well be above the duct and your signals will never get down into the duct but be refracted upwards from the duct surface.

The reason that the most clearly-defined characteristic of a good site did not become apparent until much work had been carried out, was that the characteristic was always masked by a practical consideration – roads rarely run over the top of hills but tend to go round the sides. The site which was selected practically some way down from the top of a hill turned out to be a good site, but it was always thought that if you could have got to the top of the hill it would have been even better. Yet the rare site that you could get to right at the top of a hill was often quite disappointing in its performance. Almost instinctively you went on the road round the hill to select the slope in the correct direction using a compass. Then it dawned, all the good or very good sites had a long, fairly steep but flat slope in the direction in which best performance was required. Now just why was this?

"Proof of the pudding". Representations of the Westmorland VHF Group with the Arthur Watts Trophy, 1982: G3JYP, G4RCE, G3FDW and G4RCD

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The winter after this discovery found me talking to anyone who would listen in an effort to find an answer. It was Tom Douglas, G3BA, who produced a lead in the right direction and brought to my notice an article by Les Moxon, G6XN [1]. This article, though based on work on the DC (sic) bands, produced a clear answer to the gain of a sloping site at vhf which was a bit of a paradox as usually vhf men tend to think that their antenna systems work completely independently of their surroundings. How wrong they are!

It should be borne in mind that from a site at 1,000ft asl the horizon, at sea level, is approximately 40 miles away, but to get an ear-crunching signal to that point 40 miles away, you must get the signal launched from your antenna system tangentially to the earth's surface with a minimum of attenuation. It is no good sending the best part of the signal up into the ionosphere never to be heard of again! This is where the "slope gain" comes into play.

Here a little maths and one or two diagrams tell a very revealing story [2]. Analysis of the problem, taking into account the fact that the ground is not a perfect conductor, gives an optimum high h:

$$h = \frac{\lambda}{\sin 2\theta}\left[\frac{1-\phi}{360}\right] \quad \ldots\ldots(1)$$

where ϕ is the phase change suffered by a horizontally-polarised wave reflected from the boundary between the air and the ground. For most commonly-encountered grounds the term $\left[\frac{1-\phi}{360}\right]$ in equation (1) has a value in the range 0·5 to 0·51; hence h is given approximately by:

$$h = \frac{\lambda}{2\sin 2\theta} \quad \ldots\ldots(2)$$

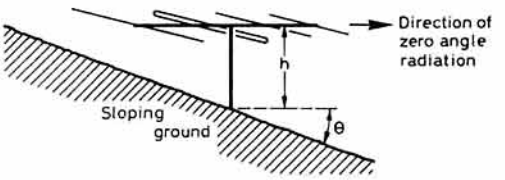

Fig 1. Diagram of how to establish optimum height using formula (2)

Some example curves calculated from equation (2) for values of ϕ corresponding to 70MHz, 145MHz and 433MHz are shown in Fig 2.

It should be noted also that equation (1) is really only valid for the case of a single horizontal dipole above sloping ground. There is some limited evidence, however, obtained from computer studies of three-element Yagi antennas over sloping ground to suggest that equation (2) is sufficiently accurate for amateur use to predict the optimum vertical height above sloping ground at which multi-element Yagi antennas should be placed to obtain zero angle radiation.

From the curves of Fig 2 it can be deduced that if your antenna mast is, say, 6m high for your 70MHz antenna it will perform with a minimum of attenuation over a slope of 10° or greater. It should be noted that for 145MHz you only need an antenna mast some 3m high to get the same results. It is well to note also that flat ground does not come on the curves at all!

It is very difficult to explain away the poor results of certain sites, which should be good sites from the characteristics which have been previously considered, but which nonetheless are definitely of poor performance. A common feature of these poor sites are that they were all very rocky, ie were of low earth conductivity. Poor conductivity below, and more importantly at the point of reflection, produces lower signal strengths as the reflected wave will be smaller than the direct wave from the antenna. When conductivity is good, the reflected and direct waves will be almost

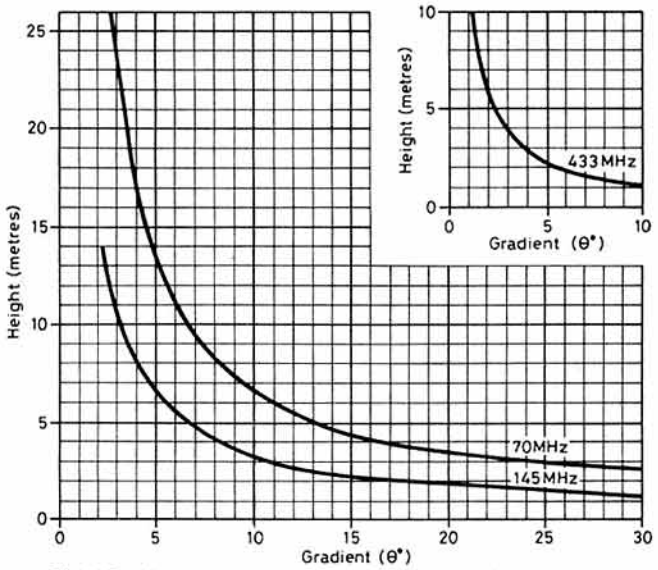

Fig 2. Graphs used to deduce optimum height of vhf antennas

equal in strength and there will be a doubling of the signal in the desired direction. Sadly, most mountain sites are of very poor conductivity, if rocky, to fair if with grassy slopes, but every little helps.

Incidentally, a favourite site in County Durham from where VHF NFD (restricted section) and the VHF Managers Trophy have both been won twice, is the site of much mineral workings with well-grassed slopes facing towards SE England, which seems to prove the idea by "the proof of the pudding is in the eating" theorem.

If you don't believe any of this article try the following simple test:
Select a suitable site with a clearly defined peak and slopes all around. Try the Malvern Beacon.
Items required:

1. A handheld 144MHz fm rig with an s-meter. I use a TR2300 with a whip antenna – not a rubber duck.

2. A large-scale map of the area and a compass.

Procedure: Select a distant busy repeater, adjust the handheld's antenna to get a mid-scale s-meter reading. Start at the peak of the site and, holding the handheld at arms length and at about 3ft above ground, walk up and down the slope with the handheld correctly positioned for 50yds or so, and see which direction gives the highest S-meter reading. Carefully "tune" the site for maximum s-meter reading. Now plot the bearing from the point at the top of the slope and you will have the direction to the repeater. Check on your map to confirm this result. Watch the s-meter carefully. The increase in signal strength may surprise you, the steeper the slopes the more marked the results and you will find you can access repeaters at up to 100 miles with 1W or so. Don't forget to extend the whip antenna correctly to transmit. I don't give any hard and fast guarantee but the exercise will do you good! Please don't all go to Malvern Beacon on the same day!

After thoughts

Let me examine the conditions which enhance the performances of a vhf contest site which are outside the constraints of the actual site selected.

1. Within the UK it seems without doubt that vhf sites in the southern counties and the Channel Islands perform on average better than sites in the North of England or GM. The further north your go, the worse in general are vhf performance (ask any GM).

2. Sea paths enhance signal performance but long land paths definitely attenuate signals to a large degree, produce more scatter and deeper QSB. If you do have to suffer a land path it seems better if it is over low, gently rolling or fen-like countryside. Nearly all GM is "hidden" behind the most mountainous and broken parts of Northern England, and unless with a sea path or at great height, tend to give poor results.

3. The performance of a site in regard to winning vhf contests is to a large extent dependent on certain variables. The contest rules, with a scoring system based on the radial rings system, produce a very fair system of results but there is a critical distance versus practical vhf range performance which determines results. Go too far away from what is laughingly referred to as the centre of gravity of the UK amateur population (somewhere just north of Watford) and the results drop to a very poor level. Go to GM and they rise again!

(Continued on page 350)

KEEPING THE TOWER IN TRIM

R W Addie, G8LT*

A tower is a sizeable investment for the amateur and therefore merits some care and attention. It is assumed that it is already erected, and this article deals with the various forms of protection suitable both for the structure itself and for the running rigging involved. The author goes on to discuss points involved in mounting rotators and bearings. Particular attention is focused on matters of safety. He concludes with a look at antenna rigging in more general terms and from the point of view of the amateur at home rather than the more nautical outlook of the yachtsman. The object is to take the worry out of having things aloft so that the operator may sleep more soundly o'nights!

The tower

So, that big hole was dug and has been backfilled with much care, the compass has done its job, the concrete hardens and the last of the helpers depart, leaving you to admire your pride and joy finally pointing skywards. Forgotten is that awkward planning authority and the attack of financial cramp occasioned by your purchase. At such times the mind does not dwell on possible disasters to come, but it pays to spare some thought to simple measures to look after the thing now that it's up. Whether it be free-standing or the popular crank-up and luff-over type, if it is made of welded steel it most likely has a galvanised finish, whereas light alloy versions will have only rudimentary protection, if any.

Those living within reach of salt-laden winds should consider, at an early stage, some way of preventing the resulting damage. The effect of sea salt on zinc galvanizing is well known to those living near the sea and, if time allows, it is a good idea to apply a coat of protective marine paint or Galvanite *before* the tower is put in place. While this is a tedious business, the long-term advantages are enormous and can add years to the tower's life. If you have the tilt-over type, the job is more easily done in the horizontal position. A red-lead undercoat followed by a mid-leaf green blends well with most home surroundings.

Ropes and rigging

Running rigging, which is usually semi-flexible wire rope, merits different treatment. It is not necessary to de-rig this but, if not already assembled or in the case of replacement, the following ideas may help. Most wire rope consists of several "lays" of steel wire surrounding a hemp core. If a good grease such as multipurpose lithium-based "Retinax A" can be worked in the core, the life is much extended. I experimented by stretching the new rigging between two points, applying the grease with an old paint brush, and then coiling the lot up and stowing it in a large plastic sack which was left in the sun for as long as possible. The heat in the sack effectively allowed the grease to work through the steel lays and into the hemp core. (You could try using a low oven in the kitchen if the xyl isn't looking; the smell is nowhere as bad as potting homemade transformers in black pitch!) If this treatment has to be done *in situ*, first apply a liberal coating to the cables that operate the luffing gear, since these are under great strain when in use. At the same time, grease the pulley blocks over which the cable runs; the pulley bearings can be oiled to avoid dismantling for greasing. The telescopic hoist cable should be treated similarly and, in both cases, ensure there are no "spikes" sticking out of the wire which indicate a broken strand and future weak spot. There is no reliable cure for this condition and replacement of the affected rope should be carried out. In general there is no need to grease the sliding sections of a telescopic tower, as that makes it messy and dirty to handle when dust and insects stick to it.

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Safety

The consequences of catastrophic failure in the running rigging are both dire and expensive. If a hoist cable fails, you are left with an hf beam looking like an umbrella that's been in a gale. It takes a lot shorter time to come down than to wind up! A luffing gear disaster can be really dangerous and happens all too quickly. When luffing a tower, *always* wind it down to its lowest height before removing a locking pin, and do not let any helper stand in the area into which the tower is to be tilted. By the same token, unless you have a braked winch, do not let go of the luffing winch handle. If you do, it will take off, revolving at high speed and could well break a wrist or arm. It won't do the antennas much good either! I have seen this happen and what a frightening sight it was. It came down with the end of the hf boom pointing downwards, as the beam had been swung to this position for best access to the antennas when luffed. It taught me another lesson; namely, that a good sleeve bearing for the drive shaft above the rotator is worth providing; nothing but my pride suffered.

Some torsional movement, especially in the section carrying the rotator, is a positive advantage in reducing stresses when a heavy beam assembly is braked. The mounting of a rotator in a head section gives rise to problems of its own. I have already touched on the subject of head bearings. While the main downward thrust from the weight of the beam(s) is taken by bearings in the rotator, provision must be made for containing lateral forces induced by wind. Most head sections provide for one or more sleeve bearings through which goes the drive shaft that is clamped to the rotator itself. The alignment of these needs care in getting the shaft exactly on the rotator centre line. Failure to do so cannot only damage the rotator bearings but, in extreme cases, cause the fixings to break. Rotators such as the HAM-M can either be fixed directly to the platform in the head unit or fitted with a spacer which lifts it clear of the platform to allow easier connection of the control cable. Final centering of the drive shaft is achieved by inserting shims between the shaft and rotator casting.

The fixing bolts so often provided are simple 0·25in mild steel, albeit plated, which mate with threaded holes in the bottom casting of the rotator. In my experience these, in the longer term, are useless and tend to shear off under the torsional forces occasioned by braking and wind. It is a good idea to throw them away at the start and substitute high-tensile bolts of the same size and with good lock washers. Stainless steel is excellent for such bolts, though more expensive. Having suffered in this way, I finally dismantled my rotator, drilled the fixing holes and re-tapped them for 8mm, and fitted stainless steel bolts, since when no further trouble has arisen. If you decide to drill the casting without dismantling, use lots of thick grease on both drill and tap to remove all traces of swarf. Ideally there should be no "slop" in your top bearings, and grease well before tightening down that rotator.

Standing rigging

If your tower is to be self-supporting, there is little else that needs doing at the start. If you decide to fit guys, then the standing rigging will need thought. Ropes suitable for guying purposes are best chosen from one of the man-made fibres, such as polypropelene or terylene. The latter is the better choice in countries where they are exposed to bright sunlight. These materials, while having good strength, do not rot and are impervious to oil and the hazards of weather. Like their steel counterparts, they follow the traditional form, consisting of three strands laid spirally together. When purchasing, remember that the old method of specifying size was by quoting the circumference and not the diameter. Now that metric units are established you may find the rope size given as a diameter in millimetres, eg 8mm dia = 1in circumference. A popular size approximates to 0·75in circumference; this fits other useful rigging items such as pulley blocks, thimbles and rigging screws, of which more will be mentioned.

These man-made fibres, being plastic, are susceptible to heat, which can cause damage if chafing occurs, but this is a most useful property as it greatly assists cutting and sealing. For this, you can use either a chisel-pointed soldering iron or a naked flame, but try not to use a knife as the lays and the individual filaments of the material will spring apart, leaving you with something akin to a very small bunch of flowers! Choose the place for cutting, lay the rope flat on a hard surface, such as a piece of sheet-metal offcut, and press the hot chisel bit down on the rope with steady pressure until it parts. This proceedure will most probably have sealed off the two ends. The same effect can be achieved with a pencil-thin gas flame, where you hold the rope in both hands and offer the selected spot to the flame while keeping a gentle pull. When it parts, the two ends will be molten, and I do advise a quick squeeze with pliers to compact them; do not use fingers, as the molten plastic can stick to them and give a bad burn. Alternatively, rotate each end in turn in the flame until a blob forms, and cool it by blowing. This invariably works.

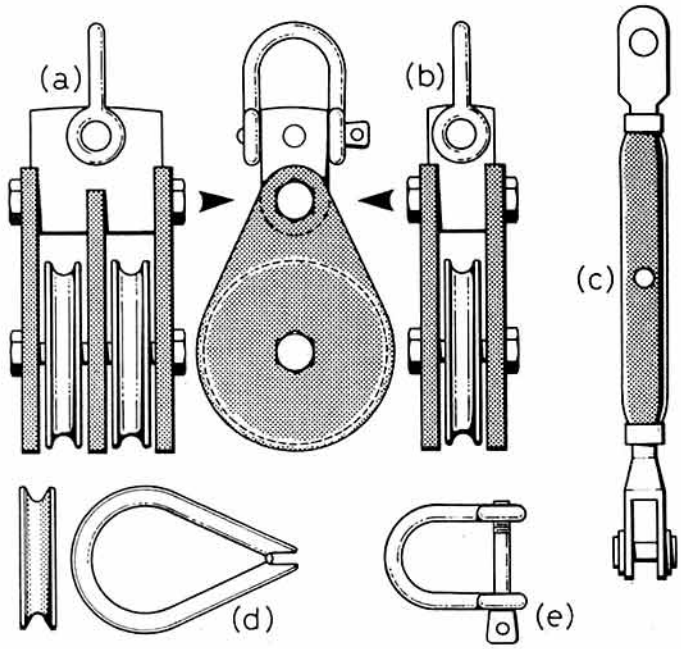


Fig 1. (a) Twin-sheave marine type block. (b) Single-sheave block. (c) Rigging screw. (d) Heart-shaped thimble. (e) "D" shackle

Should you decide to make a super job by then splicing the rope end into an insulator, thimble or rigging screw, you should unlay each of the strands and seal each in turn, just as you did the rope itself. Splicing these ropes need not be as daunting as it sounds, and it provides an immensely strong fixing that will last for years and looks good too. A spliced rope retains 90 percent of its initial strength, whereas, if knotted, it is reduced to only 50 percent. This fact may surprise the "galvanised pulley and washing-line" brigade who have to rush outdoors after every storm! A little book by C L Day published originally by Adlard Coles entitled *Knots and Splices* contains excellent photographs and explanations to enable even the beginner to achieve success.

While halyards can be spliced directly into insulators, guys are best terminated in thimbles. These are heart shaped with a groove round the outside in which the rope lies and the rope end may be spliced into the guy close up to the pointed end of the thimble. The cheapest thimbles are of galvanised steel, although nylon can sometimes be used; stainless steel is far too expensive. Be sure to buy the right size of thimble to fit your guy rope. The guy with its thimble in place can now be attached either to an eye on the tower or to a steel picket, suitably drilled and driven into the ground. (It is wise to wrap something like sacking round the picket head after driving it in as, unprotected, it can inflict nasty injuries on the shins of the unwary). Use "D" shackles to attach the guys (again, galvanised steel is cheaper) by putting the shackle body through the thimble, and the shackle pin through the body and the eye or drilled hole in the picket, and then tightened up. Unless you have a "shackle knife", use a hardened tool like an Allen key to fit the hole in the shackle pin. Pliers are not recommended. A touch of grease on the thread will assist removal in the future.

To keep guys strained up to the required tension, rigging or "bottle" screws are useful things. At each end of the screw is an eye with a long threaded stud which fits the rigging screw body. These threads are cut in opposite sense so that, depending on the direction in which the body is rotated, the length between the two eyes can be varied. Thus inserted in a guy, the screw can be lengthened or shortened at will. The body may be of the open type but performs the same duty.

Raising the antenna

To raise and lower antennas, some form of pulley block is required, and it is well worth buying the marine type with Tufnol cheeks and sheaves, which may also have stainless steel straps at the side and an integral swivel. Unlike galvanised pulleys, these really do last for years and do not rust and chafe the halyard. To fix one to a handy tree branch, try making a strop; ie a length of rope with a thimble at one end and a loop at the

(Continued on page 350)

Technical Topics

Pat Hawker, G3VA

IT WOULD BE UNFORTUNATE if recent items in *TT* were interpreted by readers as implying that there is an unbridgeable gap between those who accept that there is a continuing and justifiable role for thermionic valves and those who regard anything less than all-solidstate as being far from state-of-the-art. As Ray Howgego, G4DTC, puts it: "I feel that the 'valve versus transistor' debate has been over-stated. As a physicist, I regard any electrical effect, whether naturally occurring or within a man-made device, as simply a phenomenon. When one applies physics to practical situations to produce a desired end result, one chooses the phenomenon which is the most suitable or most cost-effective in the circumstances. How easily the anti-thermionic lobby changes its opinion when valves are placed alongside solidstate devices on bright, shiny, double-sided printed circuit boards. What if Yaesu or Icom were suddenly to re-introduce valves into their receivers? On recently touring the radio rooms of a modern frigate in the Devonport dockyard, I was surprised to see a considerable quantity of valve equipment, receivers and transmitters."

Low-cost linears

G4DTC continues: "To add insult to injury, with what device can one obtain 180W p.e.p output on the hf bands for £5? Why, a valve of course! I have never understood why so many constructors of linear amplifiers search tirelessly, and often in vain, for cheap American 'sweep tubes' (6JS6, 6LQ6 etc) or even such transmitter tubes as 811s and 813s, when the excellent British (European) PL509 and PL519 are still in abundant supply, rarely cost more than £5 or £6 new, and are much tougher than their more expensive American/Japanese counterparts.

"Many happy hours have been spent here evaluating the performance of these valves as a grounded-grid linear amplifier using the test circuit of Fig 1. Associated component values were mostly cribbed from equivalent USA designs. The 40V heaters of the PL509 and PL519 have possibly put off prospective users but are really a blessing in disguise since 40V transformers are readily available and the relatively low heater current (0.3A) means that the mandatory heater choke (RFC2) becomes a far more modest component."

Using a two-tone test signal from an FT200, the results obtained for an undistorted two-tone test pattern are shown in Table 1.

G4DTC adds: "There was no discernable difference between the PL509 and PL519. However, the PL519 is mechanically a more substantial valve having a thicker glass envelope, higher permissible control-grid dissipation and improved electrode connections. The valves seemed almost indestructable and ultimately limited by envelope temperature. Hence, a draught of cold air was blown at them from a small fan on a gramophone motor. During tests, the valves were often run for 10 to 15min continuously at full power. One PL509, known to have given daily service for 10 years in a domestic television receiver, measured up as though it were new!

"A few notes for intending constructors:

(1) All tests *must* be carried out on a two-tone signal with an oscilloscope lightly coupled to the dummy load.

(2) The grid voltage must be adjusted to give zero cross-over distortion. Very little change was discernable up to 5V, and zero bias might prove acceptable.

(3) Both control grid pins (1 and 8) *must* be decoupled to ground.

(4) The input resistance was not measured but matched well into the driver transmitter with no adverse effects.

Table 1. PL509/PL519 with two-tone signal from FT200

The following results were obtained with an undistorted two-tone test pattern:

Test frequency	3·70MHz
Anode volts (Va)	710V
Anode current (Ia)	162mA (max signal)
Grid bias voltage (Vg)	Approximately 5V
Average output current (rf) into 70Ω load	1·15A
Peak envelope power output	185W
Peak evelope power drive	20W (estimated)
Anode load resistance (R_L)	1,900 – 2,100Ω (estimated)
Valve anode/ground capacitance	22pF
Grid current (maximum signal)	60mA
Zero signal (quiescent) current	30mA (PL509), 20mA (PL519) at Vg = 5V

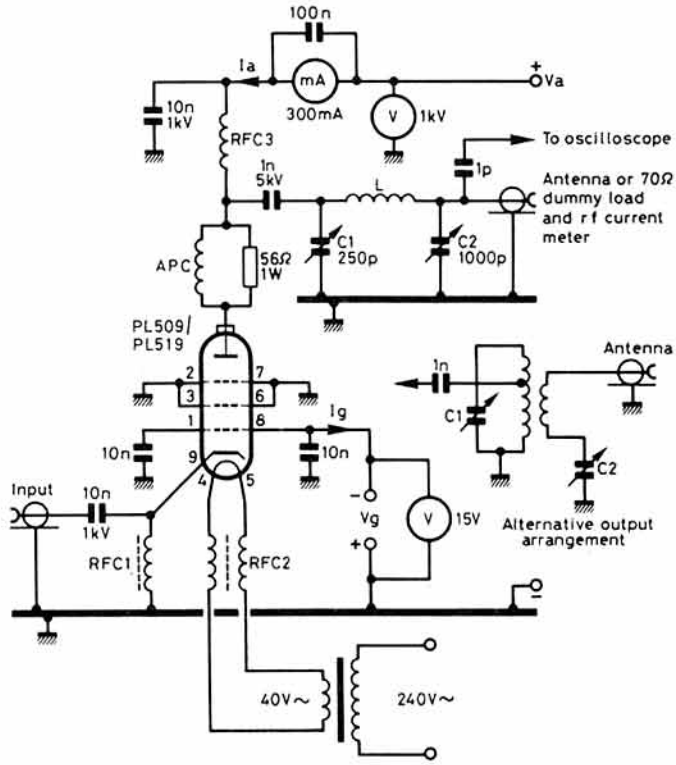


Fig 1. G4DTC's test circuit of the PL509/PL519 linear amplifier. RFC1 80t 20swg enam on ferrite rode. RFC2 two windings of 20swg wound bifilar for 10cm along ferrite rod. RFC3 113t, 24swg on 0·75in diameter former in four sections (16t, 25t, 30t, 42t from anode end). APC 8t 22swg on 56Ω resistor

(5) The pi-network at 3·7MHz comprised: C1, 145pF; C2, 425pF; L, 34 turns, 16swg, diameter 1·25in, length 3·5in (this is not ideal, but useful for starters).

(6) PL509 bases (B9D) are readily available from television service departments.

"Four of these valves in parallel would run at full legal output with plenty to spare. However, the low anode resistance (500Ω) and high capacitance (88pF) would make a pi-coupler difficult to implement above 7MHz, and the alternative output network shown in Fig 1 would be more attractive. A plug-in coil system would allow automatic selection of the best arrangement. I am hoping to carry out tests on such a parallel combination soon."

Audio filter/clipper

For many years I have used a simple crash-limiter using back-to-back diodes across the output to high (4,000Ω) or medium (300Ω) headphones using af transformers to raise (and where necessary then lower) the impedance when fed from a low-impedance socket on the receiver. Although this type of approach has been criticised (G3OYU, *TT* March 1987) I have always found it invaluable for cw reception, using it in conjunction with a passive filter (the old FL8).

Bill Wright, G0FAH, has designed and built a more elegant combined audio filter and clipper (Fig 2), for use with his Ten Tec Argosy 2 transceiver, but which should prove equally suitable for use with any receiver that provides about 0·5V p–p audio output. With the Argosy 2, only one soldered connection is made to the transceiver (to obtain the 8V supply). Construction of the unit is being described in detail in *Sprat* (G-QRP Club) but the following notes cover the principles. The circuit board is shown in Fig 3.

The unit is built around a dual-fet op-amp(TL072) and has an output

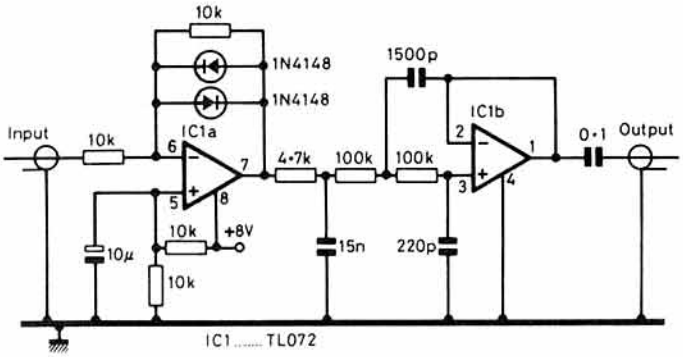


Fig 2. G0FAH's audio clipper/filter, designed initially for use with Ten Tec Argosy 2 but suitable for use with many rigs

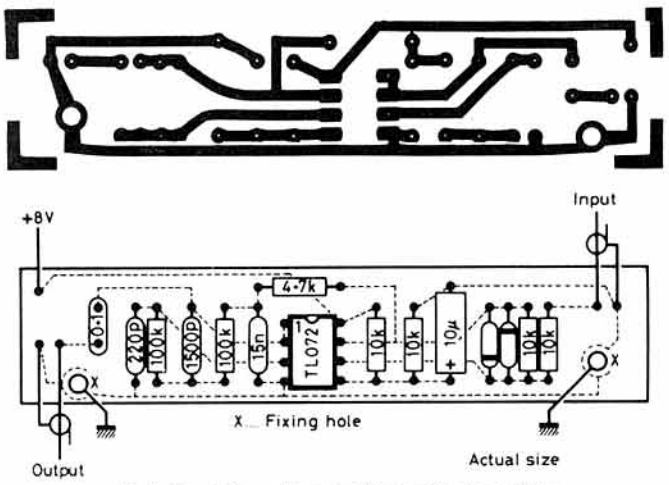


Fig 3. Circuit board layout of the audio clipper/filter

limited by the diodes to about a maximum of 1V p–p. If germanium rather than silicon diodes are used, the device would clip at about 0·5V p–p. The clippper is quite "soft" and followed by a lowpass filter so that there should not be any steep wavefronts to harm the ears, and thus overcomes G3OYU's objections to the simple diode limiter.

The first op-amp (IC1a) functions as a soft clipper with a gain of unity. The af then passes through a three-pole lowpass active filter which removes any harmonics produced by the clipper together with high-frequency hiss. The filter is flat to 2·7kHz, 3dB down at 2·9kHz, −10dB at 4kHz and −20dB at 5·8kHz, with an output coupling capacitor chosen so that, with the Argosy's internal cw filter switched off, the output is −6dB at 100Hz. There is no dc isolating capacitor on the input as this is already provided by C27 on the Argosy's i.f-af board. For other equipments not having an isolating capacitor a 1µF capacitor should be fitted.

G0FAH reports that the performance of the clipper is very good, with no distortion on peaks while removing all the crashes. The filter removes hiss without reducing speech quality, which means that G0FAH finds that he can continue to use his hi-fi headphones which do not have the odd resonances and nulls of some cheaper headphones; he once tried a pair of well-known Japanese communication headphones which proved to have virtually no response at 750Hz; fine for speech but useless for cw.

Small antenna elements

While the vhf/uhf operator seldom needs to worry about the size of his dipole elements, this is by no means the case on hf, and even more so on our single mf band (1·8MHz). The restricted size of the average British garden and the limited scope for antennas for the flat-dweller has encouraged the use of electrically-short antennas: elements brought into half-wave or quarter-wave resonance by means of coils, capacitance hats or the various forms of linear loading, including the simple dropping down of the ends of a dipole element, zig-zag or meander or helical elements etc. Over the years, *TT* has included many novel forms of small antennas, many developed initially for professional applications.

Recently, skimming through a library copy of *Small Antennas* by K Fujimote, A Henderson, K Hirasawa and J R James (Research Studies Press), I was relieved to find that the majority of the loading techniques in this high-cost book have been featured in *TT*, though by no means all have subsequently received the attention that they perhaps deserve.

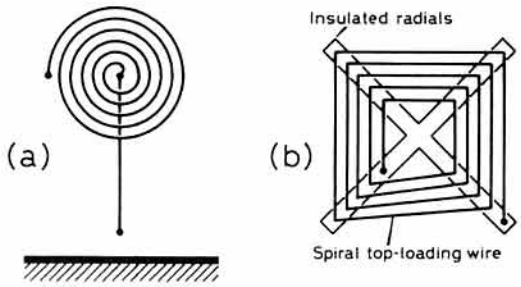


Fig 4. (a) Basic configuration of the spiral top-loaded antenna (stla) designed initially for use at vlf but later investigated by the Canadian Broadcasting Corporation and shown to be effective at mf and hf. (b) Practical implementation as used by CBC

The long-established "T" and "inverted-L" form of top-loading, although requiring two supports, remains among the most effective vertically-polarised antenna where there is not sufficient height for a full quarter-wave monopole. Less recognised is the spiral top-loaded antenna (stla) which was described in *TT* November 1974, pp764-5: Fig 4. This is a more effective form of loading, provided that the turns are far enough apart, than the more usual top-loading coil plus capacitance hat of equivalent area. Another little-used arrangement is the folded umbrella arrangement (*TT* July 1974) which allows a mast radiator of only 0·1λ (or more) to be fed directly from coaxial cable: Fig 5.

The use of short linear or helical dipole elements with capacitance hats, however, is now quite widely used. Both Doug Harris, GW3NDR and Dr Constantino Feruglio, IV3VS, have recently reported good results from the use of this class of antenna.

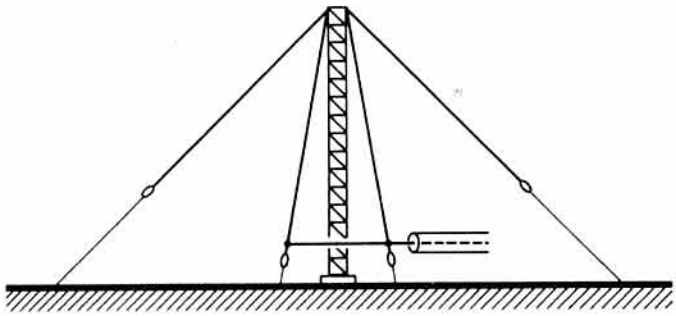


Fig 5. The folded umbrella antenna configuration which allows mast radiators of one-tenth-wavelength or more to be fed directly from low-impedance coaxial feeder cable as developed for mf broadcasting

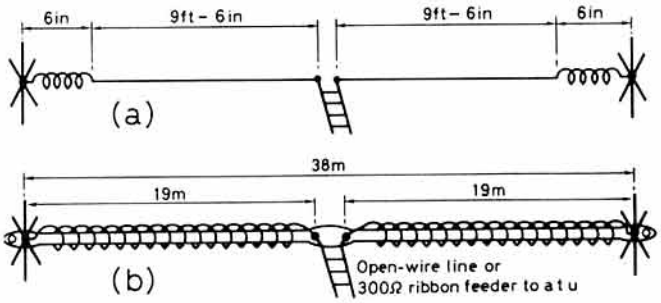


Fig 6. Shortened dipole antennas. (a) GW3NDR's 14MHz dipole with 20ft span using aluminium tubing with loading coils and capacitance hats. (b) IV3VS's multiband dipole for 1·8 to 30MHz using helically-wound wire element wound on nylon rope with capacitance hats that serve also as corona dischargers

GW3NDR, with a span limited to about 20ft, uses the arrangement shown in Fig 6(a) on 14MHz with excellent results, the element being mounted 30ft above ground on a chimney. He writes: "The end-loading coils are wound with 18swg on 0·75in plastic waste water pipe. The capacitance hats were made from copper-plated mild-steel welding rods (from Halfords). The loading coils have spaced turns (about single wire diameter spacing) and consist of about twice the length of wire of the portion of the element missing from a full-size dipole (in this case each coil comprises about 13ft of wire). The element was checked with a gdo at ground level, and adjusted by means of the coils so that the antenna was

roughly resonant on 14MHz. Because it is fed with open-wire feeders this is not critical. Using aluminium tube the antenna is very light and easily mounted on a single pole or support. I feed it with a Z-match atu and find it will work also on 21MHz. The results seem comparable to a full-sized dipole. It is easy to make, cheap and requires little adjustment. The hardest part is making the open-wire feeders."

IV3VS noted relevant references in *TT* November 1974; *QST* June 1971, and the Teletron Slinky Dipole (*QST* February 1974) as well as some references to helically-wound dipoles in the 1986 *ARRL Handbook*. He built a helically-wound dipole using nylon rope (diameter 10mm). Each arm is 19m long wound with 80m 1·6mm-diameter enamelled copper wire (total of 160m of wire). The turns are about 7/8mm spaced. The ends of the helical diple have capacitance hats, which prevent corona effect (three wire spokes, each wire 1m long) and which also lengthen the antenna electrically. The antenna is fed directly using 300Ω ribbon feeder and atu. This works well from 1·8 ro 28MHz (some peculiar radiation patterns). IV3VS considers this a really good multiband compromise for those without space for a full 1·8MHz dipole.

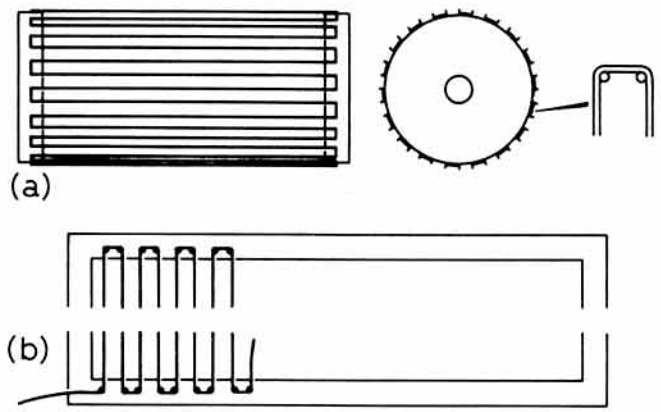


Fig 7. Non-inductive end loading for very short end-fed 1·8MHz antennas. (a) Coil-like construction suitable for external use. (b) A flat frame may be more suitable for indoor/attic antennas. As described by G2QM in 1958

It is not effective to end-load an antenna element with a close-wound coil unless this connects into a capacitance hat. However, as for the stla it *is* possible to end-load with a wire having relatively little mutual inductance between the turns. As long ago as 1958, Dr M J Heavyside, G2QM ("Aerials for confined spaces", *RSGB Bulletin* January 1958, pp318-9) showed how a loading "coil" comprising 37 wires each 3ft long (114ft in all) could be "wound" between two circular end pieces spaced 3ft apart, using insulated pegs, and winding as shown in Fig 7(a). With this amount of loading, a 14ft length of antenna wire, fed as a quarter-wave Marconi antenna, was claimed to radiate well on 1·8MHz. G2QM also used an end-loaded indoor antenna in his attic, for which he found a flat 3ft square frame, suitably insulated, more convenient. Then, with a 15ft wire and 8W input to his transmitter, he could work around the UK on 1·8MHz, even reaching Paris and attracting a letter of complaint from the GPO saying he was causing interference to marine traffic at a Danish coast station!

Care and testing of coaxial cables

The February *TT* included a number of comments on the high attenuation that can be experienced on coaxial feeder cables that have been subject to rough handling or ineffective weatherproofing, leading to the ingress of moisture. As Kurt Grey, VE2UG, has commented in *QST:* "Coaxial cable is particularly vulnerable to flexing damage at connectors and bulkheads. Protect it well, flex it minimally, keep bending radii as large as possible and take the action of weather into consideration".

The *TT* notes showed how a lossy cable has the effect of reducing the swr measured at the transmitter end (see Fig 10, February p111). It seems worth adding that this characteristic can be used to check the extent of cable loss in any odd piece of cable (old or new) before using it as a feeder. The procedure was described many years ago in the *RSGB Bulletin* (November 1961, p211) by O J Russell, G3BHJ, as the following extracts show:

"A common check upon a length of coaxial cable is to terminate it in a dummy load matching its impedance, and to measure the standing wave ratio (swr) when rf is applied. This test indicates very little, as the effect of cable loss is to ensure that the meter reads close to unity swr even if the cable is mismatched. It is not generally appreciated that such a test will indicate unity swr, or nearly so, with a very lossy cable that is badly mismatched. . . . The swr test on a piece of matched cable is a futile and often misleading test. By reversing the test and measuring the swr on a completely mismatched cable, a sensitive indication of cable loss is obtained. A complete mismatch is most conveniently arranged by short-circuiting the far end of the cable, making this truly short in a physical sense since the inductance of some inches of wire at rf is sufficient to disturb the readings . . . the cable should be cut short and the outer braiding bridged sharply over to contact the stub of the inner connector. Fig 8 shows the values corresponding to a given cable loss. . . . In practice an indicated short-circuit swr of 20:1 or greater is perfectly acceptable, and 15:1 tolerable, with about 12:1 debatable. A figure of 8:1 or less would be good grounds for rejecting it, although it should be appreciated that cable attenuation increases with frequency so that at vhf it may be necessary to accept that there will be feeder losses exceeding 1dB."

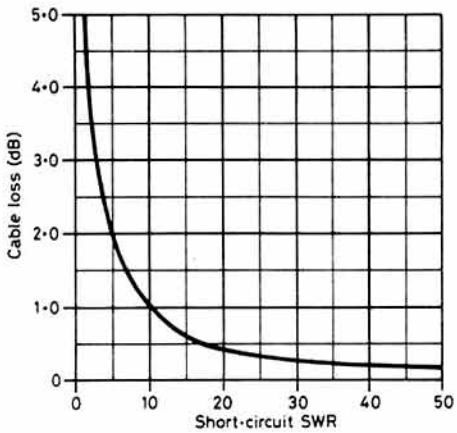


Fig 8. Attenuation plotted against swr of a short-circuited coaxial feeder cable

In 1961, it was possible to connect a transmitter to a short-circuited feeder without risk. Today, it would be necessary with solidstate amplifiers to use either a separate source of rf or, for example, the tune-up protection device featured in recent *TT*s.

Vehicle emc affects reliability and safety

The growing professional interest in the problems of electromagnetic compatibility (emc) that have long been of concern to radio amateurs, was strikingly reflected in a recent IEE colloquim on "vehicle electromagnetic compatibility". Two trends have transformed vehicle emc from being largely a question of suppressing ignition and accessory interference to in-car entertainment systems to one with important safety and reliability overtones: **(a)** the proliferation of car electronic systems based on cmos microprocessors; and **(b)** the increasing use of "composites" such as glass reinforced plastics (grp or "fibreglass") rather than metals in vehicle bodies, with rfi/emi and esd (electrostatic discharge) now recognised as "probably the most effective killers of electronic modules in cars". While car manufacturers have begun to take seriously the question of immunity against strong rf fields, including those from nearby radio, television, radar and carphones, it should not be forgotten that few manufacturers contemplate the possibility that a radio amateur may wish to install a high-power transmitter in the vehicle.

Dr Andy Marvin (University of York) defines emc thus: "Electomagnetic compatibility is attained when an electronic system consisting of two or more sub-systems operates in the manner defined in its specification, without the individual sub-systems, or other external electronic systems, suffering from, or being the cause of, electrical disruption". Two possibilities for disruption arise; first, from unwanted interactions between sub-systems taking the form of cross-talk between cables, inductive pick-up from transformers or scan coils, or ground loop noise; the second is disruption or interference between electronic systems which would not normally be interactive, including interference from local high-power radio transmitters, or impulsive noise voltages introduced on mains cables by electric motors, power electronic devices, or ignition systems.

The problems of rfi/emi generated within a vehicle are seen as bound to rise as the electronic complexity of motor vehicles increases. M T Crowther (Jaguar Cars) put it thus: "There was a leap in the quantity and type of technology employed in motor vehicles which happened with the launch of such cars as the new BMW7 series, the new Jaguar XJ6 and the new Opel Senator. From cars with, perhaps, (electronic) engine manage-

ment and a trip computer, our industry has jumped straight to cars routinely containing seven or more microprocessors. Since susceptibility to, and generation of, radio energy seems to be poorly understood by hardware engineers, it appears that this aspect of component design has been largely ignored. Understanding the mechanisms involved requires a knowledge of both antenna and transmission line engineering. Until recently, problems in this area have been rectified as they have manifested themselves at a stage in design too late to influence fundamentals such as pcb layout and logic design."

He added: "Most interference to date has proved to originate from clock harmonics, in some cases the emissions have been from the gate output, in others from the supply lines to the gate . . . In all instances of interference (to in-car radio receivers) emissions have been reduced to acceptable levels by decoupling of ic devices and filtering of clock outputs or by reducing current rise time of the clocks by other means. Careful attention should be paid to the family of logic selected, the component layout, power supply bussing and signal trace layout . . . the use of 'slow' logic such as 4000 series cmos is recommended. If another logic family, such as the 74HC series, is used, far more care must be exercised in its implementation. It is not uncommon to see harmonics beyond the twentieth radiating from a module. In every case of interference it was found that the system clock was responsible for narrowband interference, while data busses were responsible for broadband interference. . . . Isolation of i/o from digital circuitry is important . . . isolated digital and analogue power supplies should be used when mixing digital and analogue circuitry on the same board. Good power supply bussing is characterised by low impedance and good decoupling over a wide bandwidth, which is achieved by maximising the capacitance between the power lines and minimising their self-inductance."

It will be appreciated that such advice applies equally when considering the incorporation of digital circuitry, microprocessors etc into fixed station design.

Keith Price (Jaguar Cars), in discussing the use of test chambers for checking the immunity of vehicle equipment to strong radio fields (to about 50V/m), drew attention to the curious phenomenon of "windowing": "Some components are susceptible at relatively low power levels, but revert to normal operation as the power level is increased. No satisfactory explanation for this phenomenon has yet been found. The effect is sometimes referred to as 'windowing' and has been found to be much more common than would at first be expected."

In describing the provision of "emc/esd protection in composites", K L Longmore (Lotus Engineering) commented that: "For both radiation of, and susceptibility to, rfi and protection against esd, behaviour of metal-bodied vehicles is now well known. The increasing use of composites in vehicle bodies and the existence of totally composite construction prototypes present a rather different picture, adding up to a step into the unknown, especially in light of tougher emc requirements, product liability etc."

Here again there is a parallel situation in regard to the use of plastics etc rather than metal for equipment enclosures such as personal computers. Mr Longmore suggested there are three main approaches to providing shielding/screening of composites: **fillers** (ie loading the resin with conductive particles); **meshes/weaves** ("since composites are based on casing a strong mat in a resin, clearly if the mat can be made conductive it could form an effective screen"); and **surface coatings**, for example by making the gel coating of grp conductive, applying a conductive paint (by spraying) or by sticking a metal foil on to the surface. For the low-volume production of Lotus cars, self-adhesive aluminium foil has proved effective. In the USA, for high-volume production, an alternative approach has been to enclose the vehicle engine in its own metal box.

As with all rf shielding problems, it is usually not sufficient to screen, no matter how effectively, the source of rf unless one also takes care to filter and isolate all leads emerging from the enclosure. In the case of vehicles, problems can arise due to radiation from, or cross-coupling within, the main wiring harness. Screening of individual or associated wires depends on the effectiveness of the shielding. It has been pointed out (*TT* July 1984) that the percentage coverage of the outer conductor of standard coaxial cables now tends to be between 40 and 60 per cent. Such cables "leak" rf to a significant degree.

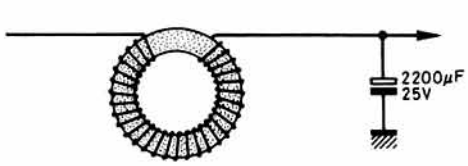


Fig 9. G3MEW's method of suppressing a difficult case of alternator whine for 144MHz mobile operation. A single layer winding of the power feed to his rig on ferrite toroid plus 2,200μF capacitor

G E R Denman, G3MEW, has added a tip to the notes on vehicle interference suppression given in the May 1987 *TT*. He writes: "I find that the advice given in *Radio Communication Handbook* does not really help in the more difficult cases. I encountered a case of alternator whine on my FT290 (144MHz) although the *Handbook* considers this should not cause problems above 27MHz. Simply adding a suppressor to the alternator made no difference. I cured the problem by a single layer winding around a ferrite ring core with a 2200μF capacitor to earth on the rig side of the winding: Fig 9.

Building stable tunable oscillators

In the December 1987 *TT*, it was noted that the free-running "Kalitron" oscillator used, with good buffering, by Ray Howgego, G4DTC, for his "ultimate" receiver has proved "exceptionally reliable, providing a very high output, independent of LC ratio". The single-conversion approach contributes to the total absence of spurious carriers over the entire tuning range. Oscillator stability was measured as "after drifting about 4kHz in the first 10min, it then settles down to within 20Hz for an indefinite period (measured at 30MHz)".

I gather from G4DTC that some readers have questioned whether such stability could possibly be achieved over the entire tuning range of a band-switched oscillator. In this connection one must stress once again that the stability of any free-running LC oscillator cannot be guaranteed simply by selecting one "special" type of oscillator circuit, but depends on the care taken in the choice of components, the mechanical construction, and the precautions to overcome the main causes of drift in oscillators: heat, humidity and operating parameters. Particular emphasis needs to be given to such factors as the change in coil *inductance* with change of temperature. It is also important that the construction should be such as to render unimportant any flexing, expansion or movement of the chassis or pcb. Leads and components should be rigid but *not* under stress when secured in place.

G4DTC explains that he has adopted a "no compromise" technique: capacitors are mica type; he uses heavy gauge wiring with a reinforced double-sided pcb and liberal coatings of Araldite. The band-change switch was chosen with care: the wafer switch assemblies from RS proved excellent with the rotors Araldited to the shaft ("Makaswitch" units were *not* suitable for this application).

A single-range 5·8 to 6·3MHz Vackar fet oscillator built and described by Peter Martin, G3PDM, many years ago (see *ART* and *Radio Communication Handbook*) achieved ±2Hz/30min after a short warm-up period. This resulted from strict observance of some 15 points. These included use of a strong box (diecast or better); use of high-quality variable capacitor; use of air-spaced trimmer; very effective prior cleaning of variable capacitors (preferably using ultrasonic bath); adjustable temperature compensation (Oxley "Tempatrimmer" or lower-cost "Thermo Trimmer"); use of silver-mica capacitors Araldited to surrounding solid objects; use of 2W solid-carbon gate resistor for minimum heating and low inductance; use of buffer/isolating amplifier essential, preferably incorporating negative feedback to maintain low harmonic content; oscillator components with single earthing point; preferred use of ceramic coil former, avoiding use of ferrite cores; and short leads with stiff wires for interconnections in the oscillator tank circuit.

So far it has not proved possible to trace the origin of the "Kalitron" push-pull oscillator in spite of an extensive library search of likely journals etc. Its first appearance (called only a "push-pull oscillator") in the *RSGB Bulletin* (predecessor to *Rad Com*) was in January 1953 in an article "Mixer master oscillators" by Bert Allen, G2UJ, and based on a heterodyne-type vfo built by A E Livesey, G6LI, with the variable oscillator tuning over an mf range.

The next appearance, this time identified as the "Kalitron" (one *1*) was for "A 72MHz vfo for 144MHz drive" by "Oxo" (G5OX) (*RSGB Bulletin* September 1958) and included the note: "The writer is indebted to G W Slack, G5KG, for suggesting the basic circuit of an oscillator which is reputed to have a high degree of stability. It is a twin-triode (12AT7) push-pull circuit, very reminiscent of the multivibrator, and glories in the title Kalitron. It comprises very few components and is one of those delightful circuits which function not only in 'breadboard' form but repeats the performance when re-engineered for final use."

Don Napphin, G3MLS, has a 1931 reference to a two-valve circuit developed by an L B Turner "The Kallirotron, an aperiodic negative resistance triode combination" and notes that *Kalli* is a prefix derived from the Greek word *Kallos* meaning "beautiful". Neither G3MLS nor I

have been able to check the original 1920 publication (*Radio Review*) but I have found a note on the Kallirotron in the classic *History of Radio Telegraphy and Telephony* by G G Blake (1926) from which it appears to have no connection with the Kalitron oscillator but was intended as a means of reducing static crashes: "In this circuit, two valves are connected with their filaments in parallel. Weak signals are amplified by this arrangement, while powerful atmospherics are actually reduced to a strength below that of the oridinary received signals". In other words an early form of noise limiter rather than an oscillator.

Rather worryingly, my dictionary defines "Kali" as "the Hindu goddess of destruction . . . Her cult characterised by savagery and cannibalism".

Nicad batteries – facts and fallacies

Rechargable nickel cadmium batteries have, with reason, become a popular source of power for portable and handportable equipment. They can provide reliable service over many years if due account is taken of their peculiarities. Yet it remains true that many amateurs are failing to appreciate not only the full capabilities but also the limitations of nicad cells used in battery packs.

J Fielding, ZS5JF, in "Nickel cadmium batteries for amateur radio equipment" (*Radio ZS* September 1987, pp4-5) provides a useful survey of the facts and foibles of nicads. The following extracts from his article attack some of the common myths and also provide some safety hints.

(1) "Rapid charging causes a decline in cell capacity."

Not true provided that the charge is always terminated at a safe point.

(2) "You should not charge only partially discharged cells as this causes a loss in capacity."

Not true. It is not necessary to discharge fully nicad batteries before recharging. In fact, *the opposite* is true. Repeated partial charging gives an increase in the number of charge/discharge cycles compared with full-discharged cells.

(3) "White crystals growing on the tops of nicad cells mean that the seal is faulty and the cell should be scrapped."

Not true. The electrolyte (potassium hydroxide) is extremely searching and can penetrate the seals used in minute quantities. These crystals are potassium carbonate, which is harmless and can be removed with soap and water. The action of the carbon dioxide in the atmosphere reacts with the electrolyte to form the crystals. After removing the crystals, it is recommended that a smear of silicon grease is applied to slow down regrowth of new crystals. The amount of electrolyte lost in this way is insignificant.

4. "I have a cell which appears to take a charge, but after the normal charging period the open circuit voltage is very low. I have been told I should throw it away."

Not true. The reason the cell won't take a charge is usually due to minute crystalline growth across the internal electrodes, caused by prolonged storage. A cure that nearly always works is to pass a very high current for a very short time through the affected cell. This fuses the internal "whisker". Discharging a large electrolytic capacitor is one method of doing this. But note that in a battery the faulty cell *must* be isolated from the other cells since zapping the complete bettery will not usually result in a cure. Charge the capacitor to about 30V and then discharge it through the faulty cell. Several attempts may be required to clear a stubborn cell.

(5) "A battery contains a cell with reserved polarity. The only cure is to replace it"

Not true. The reversed cell can usually be corrected by a similar technique to that given for (4). After re-polarising the cell, the complete battery can be charged in the normal way. Full capacity can be regained after about five cycles.

(6) "A nicad battery should be stored only in a discharged state".

Not true. It can be stored in any state of charge. Due to its inherent self-discharging characteristics it will eventually become fully discharged after a sufficiently long period of storage. To recharge the battery before returning it to service, a "conditioning" charge of 20h at the normal charging rate is recommended. Afterwards charge normally; full capacity can again be expected after about five cycles.

(7) "It is not advisable to keep a nicad battery on permanent trickle charge as this causes permanent degradation of the cells."

Not true. So long as the trickle charge current is adjusted correctly, the charge can continue indefinitely without loss in cell capacity. The safe current can usually be obtained from the manufacturer's data, but 0·025C is a reasonable guide (ie about 100mA for a 4Ah cell and *pro-rata*). This enables the battery to remain fully charged.

ZS5JF also lists seven safety points that should be considered by users:

(1) **Do not** short circuit a fully-charged battery. This, if prolonged, can cause excessive gas production with the danger of possible rupturing of the sealed case.

(2) Nicads contain a caustic electrolyte: this is perfectly safe as long as common sense is used in use and handling of the cells.

(3) A nicad can supply a very high current for a short period (a 4Ah cell can supply over 500A for a few seconds). Sufficient thought should be given to selecting a fuse between the battery and the equipment. The connecting wires should be capable of passing enough current to ensure the fuse blows quickly in the event of a short-circuit.

(4) **Do not** use partially-discharged cells with fully-charged ones to assemble a battery. Assemble the battery with all cells discharged and then charge them as a battery.

(5) **Do not** carry a fully- or partially-charged battery on an aircraft without taking proper safety precautions. A short-circuited battery pack can be a time bomb in such situations. Consult the relevant IATA regulations or ask at the airline check-in.

(6) **Do not** subject battery packs to very high or low temperatures. Never dispose of a battery pack in a fire or throw it out with domestic waste. If it cannot be disposed of properly it is probably best to bury it in the garden in a safe spot.

(7) **Do not** discharge battery packs below about 1V per cell, otherwise there is the possibility of cell reversal.

ZS5JF provides a good deal of other information on charging nicad batteries, and gives as a reference a Varta publication of 1982 *Sealed Nickel Cadmium Batteries* from which some of his notes may have been derived.

Tips and topics

Brian Smith, GW0IER, passes along two useful tips:

(1) A tip passed to him from G0GCM. Cheap (about £10) digital thermometers with a probe that can be taken to the pa compartment of a transceiver or linear amplifier enables the rig temperature to be monitored continuously and appropriate steps taken if this rises above, say, 100° or 90°: Fig 10.

Fig 10. GW0IER finds an inexpensive digital thermometer useful for monitoring the temperature of his transceiver pa compartment

(2) A component puller can be made from a bent paper clip: Fig 11. Simple, but proves invaluable in salvaging resistors, transistors, capacitors etc from surplus circuit boards.

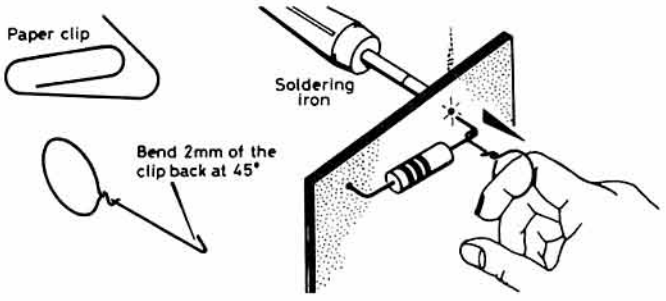


Fig 11. A handy component puller can be made from a bent paper clip. GW0IER cannot recall the origin of this idea but finds it very useful for salvaging components from surplus circuit boards

Ray Howgego, G4DTC, has received several enquiries from readers seeking pcb layout diagrams for his "ultimate" front-end. He is willing to supply these if a suitable sae is enclosed. His address is 31 Campbell Road, Caterham, Surrey CR3 5JP (tel Caterham 43838).

M J Gould of Self Adhesives Supplies Ltd, 9-10 Southview Park, Marsack Street, Caversham, Reading, Berkshire RG4 0AF (tel 0734 483833) writes to point out that the firm is a Preferred Distributor for 3M "Scotch" self-adhesive tapes No 23, 33 and 88 as noted for weatherproofing antenna external connections in *TT* February 1988. The firm will supply radio amateurs with single rolls (No 23 £4.83, No 33 £5.52, No 88 £3.77 or one roll of each for £12.67 including VAT). Quote your callsign when ordering.

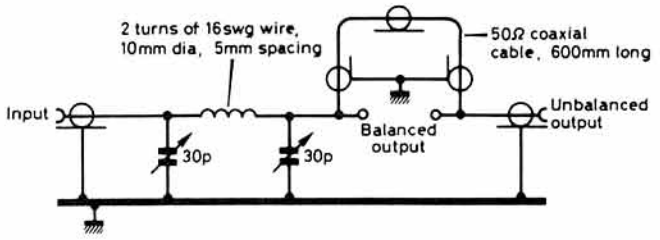


Fig 12. A 144MHz pi-network atu providing balanced and unbalanced output as described by G3UUS in a 1983 *Ham Radio Today*

Dave Ackrill, G0DJA, finds a 144MHz atu (Fig 12), described originally by G3UUS in a 1983 *Ham Radio Today*, useful when experimenting with vhf long-wire antennas along the lines of that described by G8NDJ (*TT* December 1987). He uses a 30m wire, with 94cm of 75Ω and a counterpoise 381cm long.

In the March 1988 *TT*, Del Arthur, G0DLN, showed how he had converted a wartime BC348R receiver (i.f 915kHz) into a six-band exciter for a QRP cw transmitter/transceiver, using the bfo and the local oscillator as a mixer (heterodyne) vfo. This has prompted John Roscoe, G4QK, to warn that problems of spurious radiation could arise, particularly with receivers having the more common wartime i.f of 455kHz. He writes: "If I follow G0DLN correctly, he is in danger of producing two frequencies on transmission, the unwanted one being the usual "second channel" spaced twice the i.f away (ie 1,830kHz) from the desired frequency. There may be sufficient post-mixer selectivity to reduce to an acceptable level the image frequency with the i.f used in the BC348R but this is unlikely to be the case with an i.f of 455kHz (second channel 910kHz spacing) with the limited attenuation likely to be produced in a single rf stage. This is a pity. In the HRO, for example, the first oscillator, running at enormous output (sufficient sometimes to cause tvi to vhf television) had the valve anode at zero rf potential. An output taken from that point had some buffering from the tuned circuit and could be used to drive a transmitter. I did just that – but only on 3·5MHz."

In the March 1988 *TT* I gave the old address for the Siliconix publicity department in connection with the application notes for the Si8901 mixer ic. The new address is: Marketing Services, Siliconix Ltd, 3 London Road, Newbury, Berks RG13 1JL (tel 0635 30905). □

MOXON SLOPES AT VHF AND OTHER THOUGHTS

(continued from page 343)

4. These days, being in a rare county or rare QRA locator square can enhance site performance, as can a GM, GI, GD or GW callsign.
5. It's just an afterthought, but saying you are in GM when you're not, or you're in AN square when you're in ZN or using 1kW instead of 50W on 70MHz helps enhance your score no end but in the spirit of amateur contest working is not to be recommended. All seem to be undetectable in practice!

References

[1] L Moxon, G6XN. *Wireless World* April 1970.
[2] B Chambers, G8AGN. Sheffield University.

Acknowledgements

1. Mr L Moxon, G6XN, for unknowingly provided aid to a vhf contest man.
2. The Westmoreland VHF Group (in particular G3JYP) for disagreeing with me (some of the time) and helping me move antennas into widely unlikely spots (all of the time) and without who's encouragement and help I would never have been a member of a consistently winning team.
3. G3BA and G3SEK for help and technical know-how.
4. G8AGN of Sheffield University for putting the maths right. □

KEEPING THE TOWER IN TRIM

(Continued from page 344)

other. To fit, pass the loop end over the branch and then pass the thimble end through the loop, and pull tight. The pulley block, with its halyard already in place, is then shackled to the strop. The counterweight I must leave to your ingenuity.

When making metallic connections, whether guys or feeders for direct drive, it must be remembered that dissimilar metals in contact and in the presence of moisture induce an electrolytic action at the point of contact. This is nicely shown in *Radio Data Reference Book*, page 207. If, therefore, a nickel-plated fastening is fixed to the galvanised tower, the risk of corrosion is more likely than if the clamp were silver plated. Bearing this in mind, always ensure that the contact surfaces are first dried and, after the connection is made, the joint is given a coat of protective paint to keep moisture out. Copper and zinc make an effective battery! Should the galvanising have been worn through either by rust or abrasion, it can be rubbed down to the base metal and dressed with Finnigan's Hammerite which inhibits rust and protects the surface at the same time.

Conclusion

Should you decide to buy a secondhand tower, I believe the first and most important point is to determine that it is structurally sound. If of the telescopic type, each section should be inspected to see that it has not been bent by excessive stress and that the sections slide within each other without jamming. Obviously you will look at the galvanising, if any, for signs of rust showing through. An even closer check should be made on the running rigging, for reasons highlighted earlier in this article; your life and that of others may literally depend on it. Have a look for those "spikes" I mentioned, and discount the price if any are in evidence, since that cable ought to be replaced before it is used. Subject the winches to close scrutiny for the same reason. In short, very much a case of *caveat emptor!* I have omitted to mention the herculean task of uprooting a support post embedded in 6ft of concrete. It is probably cheaper to buy a new post from the makers. Once you are the proud owner, you will find it pays to look after it as well as you do your car.

What I have written is largely commonsense but, being culled from the experience of my own stupidity, it is offered to prevent others from being as foolish as I!

Acknowledgements

To Strumech Versatower Ltd, for their Service Training Brochure and Notes to Users on maintenance procedures, and to G4IXD and G5TU for help and advice.

Bibliography

Knots and Splices, C L Day, Granada Publications Ltd/Adlard Coles Ltd.
Ropes and Rigging for Amateurs – A professional approach, J M Gale, G3JMG. *Radio Communication* March 1970, page 144.
Radio Data Reference Book, G R Jessop, RSGB. □

IN MEMORIAM

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

Mr F D J Bartlett, G4JHX, on 3/3/88.
Mr S Brister, G6AK, 18/2/88, aged 78.
Mr D Brown, G0DPW, 27/2/88.
Mr B Cannell, GM3CZX, 29/2/88.
Mr B J Creamer, G4UVS, 20/10/87.
Mr G E Edwards, G4MBX, 3/9/87.
Mr E Edwards, GW3INV.
Mr D Frost, G3UQP.
Mr Gratton, G6ZEE, 16/2/88.
Mr W H Hatch, G0BKM, 29/1/88, aged 62.
Mr P Horwood, G3FRB, Jan 1988.
Mr A H Hope, GW0CKJ, 16/3/88, aged 71.
Mr W Hyams, G0BWH, 6/12/87.
Mr T C Jones, G6OAT, 14/3/88.
Mr K W Lee, G3VSO, Jan 1988.
Mr K S Livermore, G3LOL, 19/2/88.
Mr K McArdle, G4CRI, 27/3/88, aged 64.
Mr G C Pratt, G1NPZ, 28/2/88.
Mr P J Revill, G3ZZR, 17/8/87.
Mr B Saunders, G1ORQ.
Mr R Staples, G3MMD.
Mr S A Taylor, G5TL, 16/10/87.
Mr S G Thorn, G2FSJ, 17/2/88.
Mr R J Wallace, G4DIB, 3/11/87.
Mr S F Whetstone, RS40338, Nov 1987.
Mr A W Wright, G4WTM, Oct 1987.
Mr D Wrightson, G3BTO, 13/11/87.

NEWS

BULLETIN

FRENCH 50 MHz PERMITS HELD UP

You may remember that in the March 1988 Bulletin we published details of the new 50 MHz allocation in France. The source of most of our story was the French national society REF (Reseau des Emetteurs Francais), which sent a letter and map to all its members outlining the details of the scheme whereby French amateurs could use the band. It seems that what we wrote was correct at the time but the REF appears to have been a trifle premature! Both the map and the information which it sent to its members (and which we translated for our story) was based on what amounted to a "first draft" rather than the final plan. It seems that, against all the REF's expectations, the French PTT accepted their technical case regarding protection distances and agreed to relax the limits a little.

We've been ringing people all over La Belle France to get the latest information, but as we went to press it appeared that the "final-final" version of the conditions under which French amateurs could have access to the band were still not completely formalised. First of all, this means that you needn't crouch over your 50 MHz rig for hours and hours hoping to have the first G to F contact - at least, not this month. NO permits have been issued yet, and for reasons which will become apparent in a moment it's likely to take a little time for any to appear. However, the good news is that the conditions under which French amateurs will have access to the band are somewhat less restrictive than they were - apart from one item of really bad news.

Here's the bad news.

The French PTT has said that the originally proposed allocation of 50-51 MHz will be shifted 200 kHz HF - to 50.2 - 51.2 MHz. In other words, the precious lower 200 kHz of the band, in which the majority of the really interesting things happen, won't be available in France. REF is apparently doing its best to get that decision changed, but this situation would obviously be very sad and we'll have to see what transpires. Certainly the technical reasoning behind this move isn't at all obvious and it puts our French bretheren totally out of step with the rest of the world.

Another slight problem - well, not so much a problem, more a "Pyrrhic victory" - is that REF had its technical case for permitting FM accepted, so French permit holders will be able to use FM - but whereabouts in their allocated band? Obviously a certain amount of Deep Thought is going to have to take place in the not-too-distant future.... In fact, any modulation mode will be permitted.

Good news is that the power limits have been revised (which for once means what it says, as opposed to "changed for the worse", like licence fees or British Rail fares). Basically, there will be a limit of 25W on transmitter power and three "bands" of ERP limits based on the distance of a given amateur from a TV transmitter. However, there will also be two possible distance figures; which one is allocated to an individual amateur station depends on its precise position in relation to the TV station. Each permit application will be looked at by the French administration and the appropriate figure allocated. So the situation will look like this:

Power level ERP - Distance from transmitter

3 W - 70 km (possibly 40 km)
10 W - 110 km (possibly 65 km)
100 W - 200 km (possibly 150 km)

These figures apply only to Channel 2, though. French amateurs living within the service area of television transmitters on Channels 3 and 4 won't be able to transmit on 50 MHz at all; happily, these service areas aren't exactly huge.

These are much better levels than the previous ones, and the revised protection distances mean that the "no-go" areas will shrink dramatically. We'll publish a revised map as soon as full information is available. However, it does remind us to mention the implication that every application for a 50 MHz permit will be examined by the French PTT - which suggests that it's going to be some time before any are issued. Other snippets of good news are that the maximum allowable antenna height is to be 40 metres (!) and polarisation is to be horizontal.

Anyhow, there it is - the very latest on the 50 MHz situation in France. Watch this space and we'll keep you posted, since there could still be some fine-tuning before terms are finally agreed and permits issued.

Still with six metres, Brian Bower, G3COJ, of the Society's VHF Committee, wrote in with a gentle reminder that G-PA0 and G-F on 50 MHz are nothing new. He says;

> "....UK stations had permits to operate on 50 MHz in 1947-8, which were available on payment of ten shillings. The only television in those days was from Alexandra Palace and stations within fifty miles of AP could only operate outside TV hours, which were pretty limited....The first 50 MHz contact between the UK and the Netherlands was by the late G6DH and PA0UN on 10 March 1948. Just for the record, the first UK to France was by G6DH with F8ZF on 10 December 1947 and the first UK to Norway by G5WB with LA7Y on 3 July 1948".

■

COVER PHOTOGRAPHS:

We've had many requests for copies of the old photographs used on the covers of Radio Communication. We must admit that we did aim to make this years' covers a bit special to celebrate the 75th anniversary of the RSGB, and we've been pleasantly surprised by your reactions.

Unfortunately we no longer have the negatives for any of these photographs and therefore we're unable to print further copies - making one-offs for the covers was quite tricky, and producing a large number unfortunately can't be done. However, we've given the matter some thought and decided to produce a calendar, which will have six of the old photographs printed on high quality silk-finish paper suitable for framing. The calendar will run for 18 months, starting in July 1988 and running to December 1989. Each sheet will have three month's worth of dates, and when you've finished with the calendar itself you can chop that bit off the bottom and frame the print. We hope that this solution will satisfy those members who have asked for copies of the cover photographs, and that the calendar will grace many a shack wall.

The price of the calendars has not yet been fixed, but they should be available in June and at the National Convention in July.

This month's cover photograph shows the new antenna system installed just in time for the 1950 RAFARS Convention at RAF Cranwell, nr Sleaford, Lincolnshire - (very impressive it is too! - Ed).

It's also appropriate as this year is the 50th anniversary of RAFARS and to celebrate the event the DTI has agreed to issue the special callsign GB50RAF which will be active from various locations throughout the year (see GB Calls in the 'Events Diary').

FIELD DAY PARTICIPANTS IDENTIFIED:

We're indebted to Dud Charman, G6CJ, Mike Smith, G4OKM and others for sheding some light on the photograph used on last month's cover - the one with the group of amateurs relaxing in front of their tent at the 1949 Field Day.

All is now revealed - the photo shows some of the crew which operated the 80m & 160m Slough 'A' station, which was located at Taplow Court on top of the ridge overlooking Boulters Lock on the Thames at Maidenhead. Dud remembered walking up to the station and hearing G3XC knocking off two QSOs a minute with signals audible 100 yards away. Slough was the leading 'A' station that year, and Dud added that if the B station had done as well they would have won the event outright instead of coming 8th!

Anyway, the characters standing are (left to right), G3XC (then G2BAL), G3AHB, three BRS 2nd ops, G3EPA and G3DDG. Seated is G3FJ on the left, and lounging on the right is G2SR - a VK known during the war as 'Digger the Rigger'.

RSGB SUBSCRIPTIONS:

"The subscription rates for RSGB membership were last increased in July 1986. Unfortunately, like almost everything else, the Society is affected by inflation and the time must come to take stock of its impact on our finances. At the time of writing these notes it appears that inflation for the two years June '86 to June '88 is likely to be between 7 and 8 per cent. The "half-way mark" of 7.5 per cent would imply a rise in the standard sub of £1.39 taking it to £19.89.

"Those members who take an interest in the Society's financial affairs will already know that the last few years have involved a struggle to maintain services at the current level and at the same time cover expenditure by income. In fact it has not always been possible, despite careful budgeting, to do so. There are several reasons for this and members are referred to the last annual financial report in November 1987 RadCom, for further reading.

"Sadly every time the subscription is raised a few members drop by the wayside. Obviously this offsets any advantage of an increase and a compromise must be sought. The Finance & Staff Committee and Council have discussed the matter at length - also the urgent need to bring more young people into the hobby and into membership. It has therefore been decided not to increase the rates for Student and Associate grades but to pitch the new standard subscription at £20.50. Other rates will go up in the same ratio."

"Having read this announcement so far, please read on!

"Members should bear in mind two important points. First; taking into consideration the various rates of subscription the average rate is NOT currently £18.50 but £17.08 (at the last calculation). Second; the benefit of the increase is not felt to its full extent in the first year. In the absence of a complicated formula it looks like half the increase being effective in the first twelve months.

"Council is well aware that there are some members who consider that RSGB subscription rates should be at a significantly higher level than they are. Such views are expressed by some individuals at every annual meeting. Council hears what they are saying but believes that such a move would mean the loss of more members than is acceptable to the National Society. However, there are undoubtedly some who wish to pay more and in due course the subscription renewal forms will include a note to enable those to remit something extra in the form of a donation.

"To some, RSGB means RadCom and maybe also the QSL Bureau (free to members). This, maybe, is not the place to list in full what the Society does for the amateur movement but readers are asked to pause for a moment to consider the numerous facilities provided and the spread of its activities. Members are once again referred to last November's RadCom and the reports of the Chief-Executive and the various committees in order to refresh memories if need be. Another matter worthy of speculation is the extent to which the Society benefits from the free time given by volunteers.

"Please think twice and perhaps a third time before allowing your subscription to lapse! The Society needs your membership and, we like to think, all radio amateurs benefit from the Society.

"There are many members of Council who share the view of the present Honorary Treasurer that RSGB should aim at "ploughing back" into its finances each year 5 per cent of its income, ie £50,000. Some years ago (1976 to 1983) the annual retention averaged in excess of £30,000 a year - rather more than 5 per cent! However, this performance now looks very difficult to repeat. Members should note however that it enabled the Society to purchase, free of financial encumbrance, its own Headquarters at Potters Bar. This is a very valuable asset but, as everyone must realise, it requires maintenance to preserve and ultimately enhance its value. Only a steady income from existing members and an increasing one arising from new members, can ensure this."

PLINK PLINK FIZZ - SLIGHTLY, ANYWAY

Remember we enquired a couple of Bulletins ago whether sealed lead-acid batteries were supposed to fizz when you charged them? Several people involved in the industry replied - thanks, gents - and Mr M Pickering summed it up

(cont over)

nicely with a letter containing all sorts of handy hints. He wrote;

"These batteries, when inactive, are quite leakproof unless they are subjected to extremes of temperature or pressure. They should not, for instance, be transported in the hold of an unpressurised aircraft, and should not be sent by air without an exemption certificate from the Civil Aviation Authority. This applies to businesses rather than the innocent holiday-maker, who can safely take his video camera on board with a battery installed and a spare in his bag.

"These batteries can supply a large amount of energy instantaneously. If you short-circuit the terminals you should not be surprised to see a very large spark, or even molten brass! A continuous short-circuit will quickly heat up the battery until its pressure vents allow the release of hydrogen and corrosive sulphuric acid vapour. I have seen the result of this event; the equipment, containing twelve batteries, had caught fire and all adjacent metalwork had been damaged by acidic fumes.

"Overcharging will also cause heating and consequent venting of gases. The correct top-up charge rate is about 2.35V per cell (i.e. 14.10V total for a 12V battery) but this depends on temperature. When I took a video camera to the USA last year I successfully charged the battery every day for a fortnight using a cheap 13.8V power supply intended for CB radio use. Unlike NiCads cells, these lead-acid batteries MUST be charged at a constant voltage. It is impossible to overcharge a healthy battery if the correct voltage is used, but a damaged battery (e.g. one cell internally short-circuit) could overheat.

"To sum up; correctly used these batteries are quite safe and will last for years. Care must be taken to avoid short-circuits and very high temperatures. Charging should be carried out at the constant voltage recommended by the manufacturer, although a slightly lower voltage is perfectly safe. These batteries do fizz slightly during charging but venting should NOT occur. Always charge after use, since a battery left discharged for a few weeks will deteriorate".

In other words, no need to worry about demolishing the shack if you overdo the charging! Mni tnx OM.

MORSE TESTS

The following list shows the dates and locations of all the available test centres from the beginning of June to late July, 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.

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
Guernsey	Guernsey ARS, St.Martins	02/06/88
Wiltshire	Swindon	04/06/88
Dumfries & Galloway	Stranraer	04/06/88
Staffordshire	Stafford	05/06/88
Somerset	Yeovil	05/06/88
Derbyshire	Derby & DARS	06/06/88
Gwent	Newport	06/06/88
Cleveland	Billingham	08/06/88
Co.Tyrone	Dungannon	09/06/88
Northamptonshire	Tiffield, Northampton	09/06/88
Suffolk	Ipswich	09/06/88
Hampshire	Winchester	11/06/88
East Sussex	Hailsham	11/06/88
Cumbria	Penrith	11/06/88
Strathclyde	Mid-Lanark ARS Rally	12/06/88
Greater Manchester	Cliofton, Manchester	13/06/88
Cornwall	Liskeard	14/06/88
Fife	Glenrothes	14/06/88
Essex	Canvey Island	15/06/88
Humberside	Goole	19/06/88
Greater London	Croydon	20/06/88
Greater London	Wood Green, London N22	22/06/88
Lincolnshire	Grimsby	24/06/88
Leicestershire	Wigston Magna	24/06/88
West Glamorgan	Port Talbot	24/06/88
Nottinghamshire	Mapperley	25/06/88
Hereford & Worcester	Malvern	25/06/88
Cheshire	Macclesfield	25/06/88
Avon	Redland, Bristol	29/06/88
Tayside	Kirriemuir, Angus	02/07/88
Lancashire	Fleetwood	02/07/88
Buckinghamshire	Bletchley, Milton Keynes	03/07/88
South Glamorgan	Penarth	05/07/88
Dyfedd	Haverfordwest	07/07/88
Greater London	Dartford	09/07/88
Greater London	Wood Lane, London W12	09/07/88
Isle of Wight	Binstead, Ryde	09/07/88
Mid Glamorgan	Rhydyfelin, Pontypridd	10/07/88
West Sussex	Horsham	10/07/88
Central	Stirling	12/07/88
West Midlands	RSGB 75th Anniversary Convention, NEC	15/07/88
West Midlands	RSGB 75th Anniversary Convention, NEC	16/07/88
Dorset	Dorchester	16/07/88
Norfolk	Norwich	16/07/88
Leicestershire	Mkt Bosworth	16/07/88
West Midlands	RSGB 75th Anniversary Convention, NEC	17/07/88
Merseyside	Liverpool 15	19/07/88
Berkshire	Reading	20/07/88
Kent	Dover	20/07/88
Lincolnshire	Lincoln	20/07/88

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.

Helplines

"THANKS A MILLION":

Brian, GW0IER, of the Pembroke Radio Society has written asking us to pass on his thanks for the tremendous response to the item in March's 'Helplines' requesting literature and circuit diagrams for the club's old Yaesu equipment. We quote;

> "The response to the request was incredible. 'Helplines' really works! There were too many replies to write individually in reply so may I thank the people who contacted me, through the pages of News Bulletin? I already have circuit diagrams for the units and am expecting other literature at any time. Again, many thanks to all concerned."
>
> Brian Smith, GW0IER

Very nice too. We're always pleased to receive follow-up news on items we've run in this column and it's good to know that the true amateur spirit of helping one another is still alive and well. Keep up the good work.

IRTS NEWSREADERS WANTED:

The Irish Radio Transmitters Society is seeking two volunteers to read the news on 144 MHz 2m at 11.45am each Sunday in the Dublin area. A mutually acceptable rota will operate between the two readers. Anyone who would like to offer their services should contact any IRTS Committee Member.

NORTHAMPTON RC 75 YEARS OLD:

Not only is 1988 the 75th anniversary of the RSGB, it's also the Northampton Radio Club's 75th birthday. To help with their celebrations, they'd like to hear from anyone who has any early records of the club or is a past member. If you can help, please contact:

Peter Saul, G8EUX
51 Windsor Close
Towcester
Northants.

RMG MEMBERS WANTED:

The RSGB's Repeater Management Group is seeking volunteers to become full committee members and, in particular, a Special Projects Coordinator. If you are interested, please send a stamped addressed envelope to:-

Mike Dennison, G3XDV
5 Lambs Walk
Whitstable
Kent CT5 4PJ

MORE HELP FOR RNIB:

The Royal National Institute for the Blind is in need of more helpers for its Talking Book Service. With the assistance of RadCom and other publications, the service has now recruited over 3,800 volunteer helpers to look after 68,000 blind people. Unfortunately, there are still some small areas of the country where there are few helpers. If you or your local club feel that you can provide any help with the Talking Book Service, please contact:-

Dr D Finlay-Maxwell
J Gladstone & Co. Ltd
Wellington Mills
Huddersfield HD3 3HJ

DO YOU SPEAK WELSH?:

The Newport ARS is seeking Welsh speaking amateurs to assist on its display stand at the Royal Welsh National Eisteddfod, which will be held in Newport from 30 July to 6 August. The stand will be in the centre of the Science & Technology pavilion and will demonstrate all aspects of amateur radio.

If you can help, please contact Bob, GW4IED on 0633-280958.

LET THERE BE LIGHT:

Mr James, RS 90512 would like to inform any members who have had difficulty, as he had, in obtaining festoon lamps for the Eddystone 770R that he has found a supplier. The company is:-

Power & Process Supplies Ltd
Gladstone House
46 Buxton Road
Luton
LU1 1RE

CQ MERCHANT NAVY RADIO OPs:

Mr Burnet, G0EUC, is looking for any radio books which you no longer need and would like to find a good home for. In particular, he is looking for "The Handbook of Technical Instructions for Wireless Telegraphy" by Dowsett and Walker, 7th edition 1942, and "Technical Instructions for Radio Officers" 9th edition 1950. The books would be for Mr Burnet's personal use in a project and for historical seagoing interest as a radio amateur. They would NOT be for re-sale.

If you can help, please contact Doug Bauden, G3YI on 0703 473425.

HAM AID SPONSORSHIP FORMS AVAILABLE

In the March issue we ran an appeal for help with the Devizes & DARC's 'Ham Aid' special event station (callsigns GB75HAM, GB1HAM and GB4HAM) which takes place over the weekend 28/29 May.

The organisation of the event itself is progressing well and the club has been in touch with the Guiness Book of Records to have the event recorded as possibly the largest portable special event station. They hope to have at least one rig and antenna for each of the amateur bands. The whole shebang is aid of the Disasters Emergency Committee to provide funds for the purchase of a cardiac resuscitation unit (LIFEPAK 5) for Marlborough Ambulances. Monies will be raised by sponsorship in the form of direct contributions or on a cash per contact basis. The sponsorship forms are now available and if you'd like to help you can send for a form from:-

Noel Woolrych, G4TIX
20 Meadow Drive
Devizes
Wiltshire SN10 3BJ

...enclosing a stamped addressed envelope please.

ARIEL RADIO GROUP APPEAL:

In last month's 'Around The Groups' we mentioned the BBC Ariel Group's Summer Festival and special event station GB75BBC. As part of the event, which takes place on 9 July, the group will be mounting a display of old radio equipment. If you have any items which might help them to show the public how amateur radio has evolved over the last 75 years, they would be very happy to hear from you. Transport and insurance can be arranged for any items. If you feel you can help,

If you feel you can help, please contact:-

Trevor Butler on
01-927 4372 or
01-747 0624 (office hours)

(cont on p.366)

In Practice

"....you're a bit wide, old man"

First of all, many thanks for all the nice letters about this new series - we'll certainly do our best to make it a regular feature, and you're more than welcome to send in suggestions about what you'd like to see in it. One thing we didn't expect was that quite a few people who wrote in asked us to deal with various aspects of practical operating as well as practical technical matters. Well, we hadn't originally intended to do that but your wish is our command - so this month we thought we'd ditch the article we'd planned to do about RF connectors, ascend the soapbox and run together a few words about what seems to be something of a perennial and prevalent problem, especially on 144 MHz. It's the dreaded one of wide SSB signals; it's been with us since the Dawn of Man and it's relevant whether you've been licensed three weeks or three decades. It's a double-double problem, actually (sounds like a John le Carre novel) - it has a technical aspect and also a psychological one, and it seems to cause all kinds of anguish whether you're the complainer or the complainee. What follows is an attempt to confront some aspects of this little nasty - and if you think none of it could possibly apply to you, the odds are that it probably does.....

Consider the following scenario. You're sitting comfortably at the rig listening to a station fifty miles away on, say, 144.230 MHz; he's a nice S6-ish with occasional shallow fading but no problem at all to copy. All of a sudden this transmission is totally wiped out by S9 splatter from another station; you tune up the band and find G9*** on 144.250 MHz, who's just moved there from the calling frequency. You look him up in the Call Book and find he's about twenty miles away, and you also note that his transmission is about 10 dB over S9 on your meter - which you know from experience is about 20 dB below the point where your receiver starts to get a bit worried by strong signals. Tuned in on the nose his audio sounds reasonable, although a bit hard, but you find that you can hear nasty spitching noises 30 kHz either side of his transmission - whereas you know that most stations who are 10 over 9 with you disappear about 5 kHz either side. What do you do?

Unfortunately, one thing is all too predictable - which is that, if you call him and draw his attention to the problem, you're quite likely to get an earful of abuse. Furthermore, you may well find that the gentleman concerned a) doesn't care that he's rendering a good portion of the band unusable by neighbouring stations and b) apparently doesn't know what to do about it anyway. We've heard more people say words to the effect of, "well, it's a new rig so it can't be splattering" (or, in the unforgettable words of one special-event station operator heard recently, "if I turn down the mic gain I'll invalidate the guarantee") than we've drunk cups of coffee at the club. So we thought it was about time to give this topic an airing before Someone In Authority begins to get the idea that amateur radio is all about black-box operating....

A few facts of life, folks;

a) This isn't CB, it's amateur radio and we're not just operators of commercial radiotelephones - are we? Don't we know what goes on inside our rigs? Do we care?
b) It's very easy to make an SSB rig splatter all over the band - any band, not just 144 MHz. Try 3.5 MHz in the mornings, or 28 MHz when short skip opens up...
c) It's also very easy to stop said rig doing so
d) An SSB transmission which sounds quite OK when tuned in can be totally wiping out someone else 30 kHz away
e) Most 144 or 430 MHz rigs produce more power out than the maker says they do
f) Most 144 or 430 MHz solid-state amplifiers need less drive than the maker says they do
g) All rigs can go faulty, and brand-new rigs can be faulty straight out of the box. Some rigs, indeed, have inherent design faults and simply can't radiate clean SSB; many others are poorly set-up as manufactured and can be improved many-fold by judicious adjustment
h) If someone politely criticises your SSB transmission and offers to help, they probably mean what they say; they're not necessarily attacking your masculinity or implying that you're a total wally who ought to be shot
i) Probably not more than 1 in 20 radio amateurs knows how to use a receiver to give a meaningful report on an SSB transmission
j) Unfortunately, 19 in 20 haven't really thought about it....could this be a subject for a future "In Practice", perhaps?

Let's bite the bullet and take a closer look at some of these things, because there's no doubt that there are problems in this area. Some of them are technical, but there's also a big problem of attitude - which can actually lead to a breach of the licence conditions.

It's an unfortunate fact that some of us don't seem to have grasped some basic principles of SSB transmitters (and to some extent SSB receivers) and don't seem all that interested in trying to do so. It's probably a combination of deficiencies in the RAE syllabus and the fact that most of us operate complicated black boxes which seldom go wrong and which therefore don't require us to be diving into their innards to mend, although there are probably zillions of other reasons; the bottom line is that too many of us don't have a clue about what's happening inside our Kencomsu FCR675RE and don't mind that we don't know. Do you fall into this category? Ask yourself the following questions and answer them honestly to yourself;

a) Would you know where to start if someone said your SSB transmission was a bit wide?
b) Do you know where the mic gain pot is in your rig?
c) Do you know how to set up the ALC?
d) Do you know how to adjust the carrier suppression?
e) When was the last time you asked someone to take a close look round your SSB transmission, checking for things like carrier suppression and width? Did you know that your licence OBLIGES you to do just that "from time to time"?
f) Do you actually care about the quality of the transmission which you radiate, or doesn't it matter as long as you work the DX or Fred down the road or whatever?
g) Do you know what a two-tone source is used for?
h) Do you know how to set up the loading of a valve linear PA?

(cont. over)

i) Can you measure the PEP output power of your rig?
j) Do you secretly think "Oh well, it's only the RSGB banging on again, it doesn't really matter", or "This is all very well, but it doesn't apply to me - I've been licensed since 1955, my rig's the best in the range, cost a fortune from an accredited importer and it must be OK", or "My rig's brand-new and Yaesu (or Icom, Kenwood, etc) must have set it up properly, so anyone complaining must be wrong", or "Gordon Bennett, the Bulletin is really boring this month. Why don't they get some decent writers in that place at Potters Bar"?

If you answered "no" or "never" to any of them bar the last, you're likely to cause someone, somewhere, sometime a problem. Come on, ladies and gentlemen - rigs are for using and sensibly adjusting when required, not for assuming that their innards are totally and utterly sacrosanct! It isn't a case of "No user-serviceable parts inside", you know.....

When you buy a new SSB-capable rig, one of the first things you ought to do is to ask someone you know has a good receiver and the ability to use it to take a hard look at the transmission whilst you count up to twenty and back or recite some deathless prose out of the Bulletin - why not make this entire paragraph your transmitter test piece, come to think of it? Don't ask just anyone, and especially don't ask a close friend because he's highly likely to give a report that's decidedly flattering. Ask one of the local DX-chasers, especially if it's someone who obviously knows what's what in the technical stakes, or ask the local technical wizard at the club to take a listen for you. Whatever you do, DON'T rely on people who call in with remarks such as "well, I've been listening to you talking for the past ten minutes and you sound fine to me old man" - you're after something a bit more meaningful than that. Specifically, the person listening should be able to say something like this about your new Kencomsu FCR675RE:

"G9*** from G9***. OK, I've had a look round the transmission; you're about S9 on my meter, which is well within the receiver's capabilities, and something like 30 dB above my noise floor. With the filters I have I'd expect a good-quality SSB transmission to be completely inaudible at something like plus and minus 4.5 kHz from the frequency we're currently on, and your signal has more or less gone by then. However, there is a bit of spitch or splatter out to about 6 kHz on the low-frequency side - you might be able to get rid of that by turning the mic gain down a bit, or possibly by a bit of adjustment of the ALC. Even so, I could work a weak DX station about 5 kHz away from you, which is pretty good. On the nose the audio sounds fine. It's a bit toppy, like most 675REs, but you can tweak the carrier oscillator a bit with respect to the filter passband and that makes a lot of difference - if you do that and set the mic gain up properly they've got superb audio. I can't hear any carrier when you stop speaking, so that suggests the carrier suppression is a good 30 dB. So that's how it seems to me - if you like I'll stand by while you back the mic gain off a shade and we'll see whether that takes the spitchiness away. Back to you...."

Which is a bit more useful than "well, it sounds all right to me"!

If the report isn't so hot, and especially if you ask a couple of people and they say much the same, don't jump to the conclusion that the world's against you (jolly paranoid business, this rig testing) or that you need to hot-foot it back to the dealer demanding a new radio. First of all, however, let's stress again that just because a rig is fresh out of its box, it isn't guaranteed to be a superb performer. Angus McKenzie, G3OSS, tells the story of a new FT290R which, as purchased, had a third-order intermodulation performance of -16zdB (higher order performance to match) and sounded like it. Careful tweaking improved this to -30zdB, with the fifths and sevenths and what-have-you disappearing a la textbooks. This meant the difference between a decidedly naff transmission taking up an inordinate amount of the 144 MHz band and attracting grumbles and grouses from stations thirty miles away and a perfectly good one receiving high praise from all and sundry.

At which point you will, of course, retort that it's all very well to do things like that if you have a lab full of test gear worth about three trillion pounds and the skill and knowledge to do it. Quite right - we only mention it to prove that new rigs can be badly aligned (and indeed they often are) and however keen and conscientious you are you simply might not know how to go about improving the rig. Fine; that can be changed. The important point is accepting that it might need improving in the first place.

Basically, you have two choices if a brand-new rig doesn't seem to be behaving itself. You can ask other users of it - especially technically-minded ones - whether there's an easy tweak which will cause the problem to vanish like magic. Alternatively, if it's one-off take it back to the shop from whence it came and ask them to replace it. Take a look at Chapter 10 of the RSGB's "Buyer's Guide to Amateur Radio" (available from Headquarters, nudge nudge) for more information about how to have a meaningful relationship with your local friendly dealer.

Having said all that, we'd also better face the fact that many commercial rigs with transistor PAs - especially in modular or block form - don't perform very well in linear service, i.e. when used for SSB. Part of this is ultimately down to what amounts to a "power race" amongst manufacturers - meaning that a PA which might, for example, work well enough at 10W PEP works pretty poorly at 25W PEP but the rig it's in is marketed as a 25W job to rival the others in that category or to make it sell better. The best example of this was the dreaded Liner 2, which was said to produce 10W of 144 MHz SSB; well, it did but it was extremely grotty SSB! In actual fact the Liner 2 was just about acceptable when the ALC pot was tweaked to reduce it to around 3W output, but getting people to believe this took ages and ages. No modern rig is quite as bad as the old Liner, but some produce SSB transmissions which are a lot cleaner if they're used at about half their rated output. Oh, and while we're on the subject an awful lot of commercial "linear" amplifiers are a whole lot more linear if you knock a couple of dP off the manufacturer's claimed output as well.....

Let's now have a crack at probably the biggest single cause of wide signals - the prime-mover-driving-a-transistor-amplifier syndrome. If you use this configuration in your station, PLEASE PLEASE PLEASE read what follows because it's almost certain to apply to YOU - yes, Y O U!

Let's suppose you're relatively new to amateur radio (or that after fifteen years on the air you've just worked your 300th DXCC country on HF and fancy a change - you're just as likely to run into this problem as a new G7) and you've bought yourself a 144 MHz multimode. Let's further suppose

that, according to the manufacturer, it has an output of 10W on SSB. You spend a happy couple of months on the air and those who know how to use their receivers tell you that your transmissions sound fine. However, you weren't able to make much of an impression on the DX you were hearing during that little tropo opening; also, the big aurora last week was extremely interesting but you didn't seem to do very well and never did manage a QSO with GM3JFG even though he was so loud. Neither did you work UQ2GCI, who you and half the amateur population of Europe called for hours and hours without success. So you begin to suspect that a shade more power would be a Good Thing. You consider getting a pair of tetrodes together for the full legal limit, but ultimately you decide that you'd like to gain a bit more experience first and you plump for a 100W transistor amplifier. The blurb states that this device requires 10W input to produce its full output, so you think you're well away. You get everything all set up and go on the air with a CQ call, ready to work the world and send in earth-shattering reports to G8VR's column and DUBUS - but what's this....?

"Break, from G9***"

"Go ahead"

"G9*** from G9***, sorry to break in but although you're only about S8 here, I can hear you about 30 kHz either side of this frequency. I think you may have a problem - would you like a hand to sort it out, go ahead?"

At which point you can either say "yes please" or tell him that it's brand-new, cost such-and-such and there can't possibly be anything wrong with it. We very much hope that you'll do the first, although it's a sad fact that 50% of people called in this way seem to do the second.

But how can there be a problem? The rig works fine, everyone tells you that, and the amplifier's brand-new - well, it could be the amplifier that's up the creek but it seems a bit unlikely. Nevertheless, you decide to take the amp back to the dealer and he gives you a replacement. You get on the phone to G9*** and ask him to do some tests with you, which being a true amateur he willingly does - alas, you're now 40 kHz either side and a couple of the local DX-chasers chip in and confirm that they're also copying you over rather a lot of the band. Hmmm - now what?

This desperate-sounding scenario - which you might think is improbable, unlikely and a figment of some deranged Potters Bar imagination - is actually a very common state of affairs. It's even more common when contest and special-event stations are assembled using Fred's rig and Joe's amplifier - have you noticed how many GB stations on VHF or UHF SSB sound pretty 'orrible? The reasoning behind it goes something like this. Most commercial transceivers produce somewhat more power than the manufacturers say they do. The reason isn't so much generosity as the facts of production life. Normal manufacturing tolerances on any mass-produced product mean that there will be an inevitable spread on figures like power output. The manufacturer will wish to ensure that he doesn't get disgruntled customers returning a 10W rig because it only produces 8W, so he makes sure that 10W is the lowest power output which a random sample off the production-line will ever produce. This means that, in the case of a nominal "10W" rig, relatively few examples will actually have a power output as low as 10W and the average sample wireless will have - for the sake of argument - more like 14-16W output as delivered to your door.

Bearing that in mind, let's now consider the case of the amplifier which allegedly requires 10W to drive it to full power. Here again, when the manufacturer comes up with a figure like that, he's got in the back of his mind the fact that his worst-case Friday-afternoon product must need no more than 10W to do the business. He'll design the amplifier accordingly, and this means that in all probability an "average" sample off-the-shelf would need something like 7-8 watts to produce its rated output.

See the problem?

Your rig produces 14W but the amplifier only needs 7W to drive it to its full power - net result, gross overdrive, leading to chronic splatter and general ungodliness. This situation is incredibly common and you need to bear it very much in mind when you're mulling over manufacturer's literature. Happily it's easy to cure the problem in the vast majority of present-day rigs - just adjust the internal ALC pot to reduce the output power. Oh, and before you get hot under the collar and say that you'll have to send it back to the emporium to get that done, or that you haven't got a postgraduate degree in electronics and access to a spectrum analyser, etc, don't panic - it's dead easy to do on the air if your friendly assistant tester gives you a hand. Ask him to listen to test transmissions whilst you back the power off, maybe with a power meter in line between the rig and the amp so that you can knock down the drive level about a watt at a time until the signal is nice and clean. Alternatively, if you really can't get hold of anyone to help you, stick a power meter on the output of the amplifier and ask someone to whistle into the mic whilst you adjust the ALC. As soon as the power meter needle comes back from its maximum reading a little, stop there; that should be pretty clean, and at any rate a lot cleaner than it was when you first started! Please DON'T mumble that you'll invalidate the guarantee if you tweak a pot or two - if we hear you we'll send you an application form for a PMR licence....

Even if you're reading this piece in bed as an alternative to a mug of Horlicks and it's slowly sending you off to sleep, please remember one important thing. If you find yourself in this situation you must DO SOMETHING ABOUT IT. It's simply not fair to rationalise not doing something about it by saying to yourself "Oh well, I don't think I'll bother to fiddle with it. I never go on sideband anyway apart from once in a blue moon when the band's up a bit" or "Well, only one station is complaining so it can't be that bad". Bear in mind that for every one station who'll moan at you there are probably a dozen others who would like to but they've got fed up with getting a frosty reception when they've called people in the past, so they suffer in silence.

(In passing, it's very strange how quickly a reputation for having naff SSB signals (or CW signals, come to that) and not doing anything about them spreads. Certain DX-chasing gentlemen on 144 MHz, for instance, are positively notorious for this, but to a man they're quite convinced that anyone who tells them their signals are poor has a duff receiver. Your scribe laughed his head off one evening on hearing one of these chaps telling G4*** that complaints about his (horrible) signal were all really down to deficiencies in G4***'s Rx. Unfortunately, the said G4 doing the complaining that evening designs ultra-high-performance military VHF and UHF receiver front-ends for a living and has more letters after his name than are contained in thirty gallons of alphabet soup....)

That's about it for now on the technical aspects of wide signals. There's a lot more which could be

said, especially when you get into the realms of home-brewing amplifiers and making them work, not to mention the very important matter of getting the loading sorted out in valve amplifiers, but in general terms the most important thing to get right when you drive an amplifier with a prime-mover is DRIVE LEVEL. This is true for the home station and it's true a thousand times over when it comes to temporary stations like those used for contests and special events. People are reluctant to criticise the quality of transmissions from special-event stations, presumably because they're aware of the fact that the public may be breathing down the operator's neck, but far too many of them have nasty signals and won't do anything about it when their attention is drawn to the problem.

At the risk of sounding a bit heavy, folks who decline to respond to legitimate criticism of their transmissions quality could be in breach of Clause 4(1) of the licence which says that thou shalt not cause any undue interference with any wireless telegraphy..... which brings us to Clause 4(2). Go on, dig out your licence and have a look at it. It says;

> "....At all times every precaution shall be taken....to keep the radiated energy within the narrowest possible frequency bands having regard to the class of emission in use. In particular, the radiation of harmonics and other spurious emissions (like whopping intermod products - Ed) shall be suppressed to such a level that they cause no undue interference with any wireless telegraphy (like a station 30 kHz away trying to have a QSO - Ed). To ensure that the requirements of this subclause are met, tests shall be made from time to time and details of those tests shall be recorded in the Log as required in Clause 6 hereof"

Nuff said, except to add that we heard a few months ago of a case in which an RIS officer visiting a station with a G3 callsign asked the licensee to show him when he'd done tests in accordance with 4(2). He couldn't. Could you?

To finish with, we ought to look at our attitude to problems like this - which is really much the most important component of the entire subject. For some reason, people tend to react in a decidedly belligerent way when someone draws their attention to a deficiency in their signal. Not having a practising psychologist on the Potters Bar staff roster, we can't quite work out why this should be - but it's very sad to hear it happening, especially when the usual result is that the complaining station goes off the air convinced that the 144 MHz band (or whichever one it happens to be) is full of wallies these days and that amateur radio is going to the dogs, etc, etc. Worst of all, if an official monitoring station - either in the UK or, if it's HF, anywhere in the world - hears such an exchange, how the blazes are we going to defend our status as experimenters and the "self-training" bit in the licence at the next World Administrative Radio Conference?

It's a bit late in the year for resolutions, but how about saying the following to yourself?

a) "If someone criticises my signal, I will do my best to treat the comments objectively and find out whether the problem is real or is arising because the critic does not know how to use his receiver. If there is a real problem, I will do my best to solve it without making the critic feel guilty for complaining or insinuating that he is a thundering nuisance, since I may be in breach of the terms and conditions of my licence. Neither will I set Helmut, my three-year-old prime-of-life Dobermann Pinscher, on him when I see him at the rally"
b) "Before criticising a signal, I will make sure that its apparent naffness is not due to some artifact of my receiver such as overload. If it is someone who has been on the air for two weeks, I will be friendly and helpful and bend over backwards to help in the same way that old Fred helped me when I got going. If it is someone who has been on the air for two decades, I will be polite; I will, however, be firm in the face of insinuations that his rig is perfect, that he designs transmitters for a living, that he practically invented the tetrode single-handed and that he was an intimate friend of Guglielmo Marconi"
c) "I will carry out tests from the home station in accordance with Clause 4(2) every six months. If I organise a special-event station or go out portable for a contest, I will also carry out tests"
d) "I will henceforth give honest reports; if someone is spreading plus and minus 25 kHz with audio which sounds as though it has been generated by a Martian with a vocoder, I will not say that they are readability 5. I will not shrink from giving a report of 2 and 9 if necessary"

Never mind the quality, feel the width! - Back next month.

NEW RSGB 6m AWARDS & CERTIFICATES:

Here's some news from the VHF Committee regarding 50 MHz awards;

"At several of its meetings during 1987, the Society's VHF Committee devoted a lot of time to the subject of proficiency awards to be offered for operation in the 50 MHz band. Because of the different nature of the six metre band from other VHF & UHF bands, it was thought undesirable simply to adapt existing award rules and rubber stamp them "50 MHz". Members had asked for something different and accordingly the VHF Committee has evolved the following three categories of awards for 50 MHz;

1) 50 MHz Squares Award

"The initial qualification needed for this certificate is proof that 25 different locator squares have been worked with complete two-way QSOs within the 50 MHz band. Squares in any country will qualify provided that operation from that country is formally authorised. Additional stickers will be provided when proof is submitted of working 50 squares, then 100, 150 and so on.

2) 50 MHz Countries Award

"The initial qualification for the certificate will be proof of completed two-way QSOs on 50 MHz with 10 countries. Stickers will be provided for increments of every 10 countries worked. Only contacts with countries permitting 50 MHz operation can be considered for this award.

3) 50 MHz DX Certificate

"This certificate takes into account the considerable potential for cross-band working when transmitting in the 50 MHz band. There is therefore no stipulation on the band for the incoming signal or on the status of 50 MHz operation in the country worked or that the QSO be initiated on 50 MHz. The initial qualification is confirmation from 25 different countries of a successful QSO with transmission from Britain taking

(cont. p361)

Talking Point

Direction-finding — a sport for all

I suspect that many readers of RadCom have often wondered what the reports of DF competitions in the "Contests" section are really all about. In the UK these contests have been taking place since the mid-1920s at least, and - like many other fringe activities - have a dedicated band of devotees who are slightly mystified as to why so few outsiders join in. It seemed like a good idea to describe these contests and variations on them, together with the RSGB's attitude to DF and hopes for the future.

All present forms of direction-finding (DF) competitions are based on the need to locate a transmitter by means of a receiver, and there are many different forms of competition and bands used. These range from going on foot with only one transmitter - one that's quite easy to see when you're reasonably close to it - to several well-hidden transmitters cunningly located and working into devious antenna systems. Events such as these would probably use the entire area shown on a 1: 50,000 scale map.

In the UK several different forms of competition have taken place and still do, but the most organised and widespread variety uses top band (1.8 MHz), requires transport to be competitive, uses transmitters which are normally very well hidden and antennas which are often deliberately devised with the intention of misleading competitors. National qualifying rounds require two transmitters to be found in the course of an afternoon's activities, but the National Final is - of course - intended to be more difficult and lasts for an extra half-hour, with three transmitters to be located. Night events have two, three or four transmitters which have to be found, the only difference being that it is dark.... A number of clubs and groups organise midweek evening and weekend events with only one transmitter, in which many a newcomer gets blooded, figuratively and literally!

In the UK anyone can take part; only the transmitter operator(s) must be licensed. All that is needed in the way of equipment for basic competitions is a simple receiver for the band in use, with an antenna which can indicate the direction of the Tx. Conversely, for UK-style top band DF events, a 1:50,000 scale map, compass, protractor, straight edge, pencil, rubber, a "sense" circuit added to the Rx and suitable transport will be required. Tough old clothes, reliable transport and assistants may help in the quest to do well.

The common factor in most events is the need to find the required number of transmitters in the shortest possible time during the contest period. Some events require the transmitters to be located in a set order, but most accept as the winner the competitor who finds his last transmitter in the shortest time. One event used the accuracy of plotted bearings and the shortest distance travelled on the car's mileometer as the winning criteria; cars have been known to be driven backwards.....

Like many other participants, the writer believes that top band DF in this country has now developed to such a degree that no other form of DF used in the world can match it for quality. Even though there does appear to be such a thing as "beginner's luck", usually the skills, perceptions and abilities have to be developed. This has its own penalties insofar as many would-be competitors are put off by the high standards which are necessary, and many potential DF competitors are lost to other aspects of amateur radio. This has also put the UK out on something of a limb in respect of DF in Europe, where many hundreds (if not thousands) take part in 3.5 and 144 MHz events. A rather narrow specialisation has developed in its own right, and this has tended to negate the possibilities of competition between us and them.

The RSGB believes that a broader attitude should prevail and that "European-style" DF should be encouraged in the UK. To this end the Society has set up a working group, which will examone and put forward proposals and hopefully organise practical "Euro-DF" demonstrations and events. A number of British top band competitors (and the writer) feel that this will not only provide an easier introduction to DF for licensed amateurs and SWLs but will also encourage members of scouting, orienteering and similar organisations to consider DF as an extension of their usual activities. As with top band DF, the Society hopes that competitors and/or their clubs will take on the responsibility of organising and running these events, together with regular evaluations and reconsideration of their development and rules.

As they stand at present, the E-ARDF (European Amateur Radio Direction Finding) Rules and Regulations are probably much too onerous and complex in interpretation and organisation for a fledgling operation. A draft set of simple rules for "Euro-style" DF in the UK has been formulated, in the hope that this will not only encourage activity and the formation of teams and groups but will also allow a natural development of the existing conditions. Hopefully the level of skill achieved will become comparable with that of European participants; perhaps we shall also be able to create a European-wide (if not world-wide) conpetition which requires a variety of skills rather than just the preponderance of physical abilities which appears to be the current main requirement for success in E-ARDF.

Having said that, there are other forms of DF which are capable of being devoped, and the Society intends that suitable ideas should be supported - especially if new approaches and techniques are involved. Any ideas and proposals will be welcome!

MORE NEXT MONTH.....

THIS MONTH:

The introduction to an article on amateur radio direction-finding

by
Robin J. Pearce-Boby, G3JLE,

which will be published in full in next month's News Bulletin

For now, this should whet your appetite — Ed.

Five Go Mad in Gibraltar

- well, four and a rig...

by
Tim Kirby
G4VXE

If our mailbag and some comments on the air are anything to go by, you enjoyed the feature we ran on on Square Bashing in the Isle of Man and Eire. Knowing that the Square Bashers are mounting a major HF-to-light DXpedition to Gibraltar between 31 May and 14 June this year, the editorial armlock was applied once again to wring another piece out of them. This time it's about their initial "recce" visit to Gibraltar last year, and at the end of it you'll find all the details of the forthcoming epic. For now, though, fasten your seat-belts and join the Square Bashers on another voyage into the unknown - Ed

Readers will already be familiar with - if not totally and utterly bored out of their brains by - the exploits of the Square Bashers expedition group. For some "summers" (joke) now, frustration has been mounting within the group at the rigours which the good old British weather seems to put us to, and indeed doubt has mounted by the year as to whether "....Richard's tent can take it". These frustrations and worries culminated in one member of the group pleading poverty as his excuse not to come to the Isle of Man. Something drastic clearly had to be done, and during the 1987 festive season the new, improved version of the Spanish Inquisition was set in motion. This took the form of plying the "subject" with large quantities of food and wine and asking awkward questions of the form, "come on, we won't hurt you, tell us why you don't want to go on any more DXpeditions". It was duly revealed that it was really the thought of camping out during the delights of yet another British summer that had caused the temporary aberration!

Oddly enough, the idea of a more exotic location for an expedition had been becoming more and more attractive. Prior to our departure for the Isle of Man we had decided that Gibraltar sounded like a good place (proper language, proper money and not much amateur radio activity - the perfect recipe!), so we booked a couple of rooms in a hotel for the second week in October. The "recce party" was to consist of three Bashers; Dave, 'FRE, Chris, 'TFI and Tim, 'VXE, and we were pleased to be joined by David, G8ROU, that well-known "subversive" late of EI2VPX. Very little planning was made for the trip, although Dave took the precaution of applying for a ZB callsign - which duly arrived in the form of ZB2IQ.

I phoned Chris a couple of nights before we were due to leave to ask whether any radio gear was being taken. It was explained that this matter was, in fact, in my hands since my HF rig was the only one available which could be carried by someone not measuring up to Mr Universe. Fine, I thought, well so be it - actually I didn't need much persuading! Mind you, goodness knows what the security man at Gatwick thought about the contents of our bags - and the reaction of the X-ray machine operator as the IC740 went through was quite spectacular.

We landed in Gibraltar just after 8pm. The first impression was of the sheer height of the Rock, particularly since the airport is at sea level. Indeed, the airport itself is worthy of mention. The runway is a standard RAF affair 6,000 ft long, which juts out into the harbour at both ends. The main road from Spain to Gibraltar crosses the runway and a system of barriers and traffic lights stops the maniac motorists when the runway is in use. Imagine that at Heathrow or JFK! Immigration and Customs were cleared without any trouble, although the next "adventure" was just around the corner. We had arranged to hire a car, which was supposed to be waiting for us at the airport; however, a quick foray round the buildings revealed nothing. A policeman (in distinctly familiar attire, incidentally) said that we should have found the driver waiting for us in the terminal building. At about this time it became apparent that "Easton" (surname of 'TFI) is spelt "Ealton" in Spanish, as a driver appeared bearing a placard....which we'd completely failed to notice. Said driver gestured us to follow him - fine, but it rapidly became apparent that we were heading for Spain! The driver was waved through Immigration and Customs without a passport; not so ourselves, and our passports appeared to be run through a computer in Immigration. Customs was even worse. The duty officer appeared to be somewhat bored and insisted on going through our baggage. He was considerably less than impressed - indeed, in the words of the old American cliche he lit up and said "tilt" - when he discovered an Icom IC740 hidden under a towel in 'FRE's bag. Dave explained that, yes we were intending to use the rig on holiday and no, we didn't intend staying in Spain longer than half an hour at the outside, or preferably half a nanosecond. His explanation was clearly making less than no impression on the Customs man, and indeed he was ultimately ushered away to a "troublemaker's" queue. Concern grew, especially on my part since he still had my rig! Fortunately nothing sinister happened and Dave was sent on his way, his passport apparently having been checked on another computer. With a large smile on his face, no doubt at the expense of the crazy English, the driver showed us to the hire vehicle and we finally got under way. Snag No.2 immediately reared its head; how to find the way back to Gibraltar? Not as easy as you might think - the border is open but there are no signs in Spain which indicate the way to Gibraltar! Eventually we found the

border, tucked away down an unlikely-looking side street, and this time we encountered no problems from either Spanish or British border controls.

Finally we reached the hotel, having had an impromptu tour of the Rock as a result of a minor misunderstanding of the one-way system. After all that, we thought a beer or two was in order....

Next morning we awoke to a clear blue sky - that, the sun and the sea put paid to any thoughts of getting on the air. By lunchtime, however, we began considering how to get an antenna up. Space was limited, so we decided on a 14 MHz dipole. At this stage a constructional difficulty was identified; we had nothing with which to measure the length of the dipole! Ever resourceful, 'FRE remembered that flooring tiles are made to a standard size and armed with this information we laid each half of the dipole on the kitchen floor and cut it to the requisite multiple of tiles! Next problem was where to put it. The most convenient place appeared to be the gutter, with the feeder being brought down the drainpipe (not much rain in Gibraltar, you know). It wasn't much of an antenna and DX was hard to come by, but 14 MHz CW is always fun and we were happy to sit there and work anyone who called. At times it felt as though the entire amateur population of Hungary and the Ukraine was calling us, but split-frequency working soon sorted it all out. Mind you, stations from the UK were almost non-existent - and when we did find one it was intriguing to hear all about the gales and floods when we'd just come off the beach to get a cool drink.

Excursions were made on to 10, 21 and 28 MHz. As ever 10 MHz produced the goods, with contacts with Australia and New Zealand. Less edifying was the RSGB 21 MHz contest. Lots of G stations at S9+, but an awful lot of them apparently lacking either anything resembling a receiver or the patience to dig a rare multiplier out of the noise. 28 MHz went well, with the best DX being Indonesia; the delight in their voices at working what they called "a rare one" was nice to hear.

All in all, about 400 contacts were made in five days of very casual operation. Nothing spectacular, but considering the makeshift antennas we were not disappointed with the results.

Mention should be made here of the Gibraltar Amateur Radio Society. We visited the club's headquarters and received a very warm welcome; they were even polite enough not to wince when we mentioned the possibility of a "major" expedition in 1988. I enquired after the health of the 50 MHz beacon; at that time it was lying defunct in the club shack, although news from Martyn, G3UKV, suggests that ZB2VHF is once more QRV. If this is so, thanks are due both to Martyn and Jimmy, ZB2BL, for getting it back on the air.

In a nutshell, that's all there is to tell you about Gibraltar '87 (for which, incidentally, the QSL information is as follows; via G4VXE, PO Box 136, Cardiff CF4 6YL). What may be more interesting to many is Gibraltar '88, and I am pleased to announce that the 1988 Square Bashers expedition will indeed be to Gibraltar. To try and maximise your chances of working us on the VHF bands we shall be there during the first two weeks of June, when we hope there will be lots of Sporadic E. In addition there are plenty of meteors during that period, so MS contacts will be possible - we'll also be on the lookout for FAI.

Current plans include the following bands:

HF (18-28 MHz)
VHF (50-144 MHZ full legal)
UHF (430-1296 low power only)

Frequencies to monitor will be:

50.200 MHz
50.165 MHz (crossband to 28.885)
70.200 MHz
70.165 MHz
144.300 MHz +/- (Es)
144.050 MHz (FAI)
144.032 MHz (MS)

We'll also be on the VHF net on 14.345 MHz.

The callsign is expected to be ZB2IQ, although others may be used. Because of the magnitude of the operation, some additional personnel will be "taken on" for the trip. The usual crew of GW3NYY, G4FRE, GW4LXO, GW4TTU, G4VXE, G8TFI and GW8TVX will be supplemented by GODAZ, G4HGT and G8ROU. Information about skeds will be given nearer the time, via the VHF/UHF Newsletter and GB2RS.

Don't forget to look for the Square Bashers from ZB - between 31 May and 14 June 1988. We look forward to working you!

(cont. from p.358)
place within the 50 MHz band. Stickers will be provided for increments of 25 countries confirmed.

"Special attention was paid by the VHF Committee to meeting the requirements of those holding class B licences who are now becoming active on 50 MHz in rapidly increasing numbers. The aim was to remove any disadvantage under which class B operators might have to compete, and the only one that remains is that they may not initiate cross-band QSOs by transmitting in the HF band. There is of course no reason for not receiving answers to their calls in the 50 MHz band on frequencies below 50 MHz and almost all stations equipped for cross-band working in Europe initiate QSOs by calling "CQ cross-band" on 28.885 MHz and listen for replies on a specific 50 MHz frequency and thus do not disadvantage class B operators in any way. The VHF Committee therefore considered that any remaining disadvantage was minimal and did not constitute justification for not including cross-band working in one of the awards.

"Some countries issue 50 MHz permits to a limited number of operators or to a limited class of licensee and sometimes to a special event station or expedition. Such authorisation is acceptable for the purpose of these certificates, but the onus shall be on the claimant to provide sufficient evidence to satisfy the Awards Manager, whose normal requirement will be that he is satisfied that the station worked had written authorisation to transmit in the 50 MHz band from the licensing authority of the country concerned.

Applications

"In order to give all classes of licence holder an equal opportunity to qualify for these awards, only contacts made on or after 1 January 1988 will be valid and any contacts made before that date will not count towards the awards and certificates.

"Application forms and a full set of rules are being prepared and will be available in due course from the VHF Awards Manager on receipt of a large stamped addressed envelope"

STOP PRESS — LATE FLASH

His Royal Highness, the Prince Philip, Duke of Edinburgh, KG

has graciously accepted the Society's invitation to open its 75th Anniversary Convention in Birmingham on Friday, 15 July, 1988

NEWS & VIEWS

Around the Groups

This section of the Bulletin has been expanded to include more items of interesting news from clubs, groups and societies. We are looking for the kind of news which will be of interest to other amateurs and clubs - such as special awards, DXpeditions, user groups, special interest groups, etc. In addition, we'd like to know if your club has an interesting project on the go or is doing something to encourage youngsters into amateur radio. Basically, we'd like to hear about anything which might inspire fellow amateurs and clubs to do something similar. Have a look at the items below for examples of what we have in mind.

If you have any interesting items of news, with good black & white photographs if possible, please send them direct to HQ marked "Around the Groups - Bulletin". We may not be able to use all items sent in because of space limitations but we'll try and fit in as many as possible.

The deadline for the JULY issue is Monday 23 May, but if you can send items in earlier it would be much appreciated.

It seems that this year is the year for anniversary celebrations. The first few items in this month's column are all about clubs celebrating their anniversaries and one of them, the Northampton RC, is celebrating its 75th anniversary along with the Society.

GB75WFX:

The Northampton Radio Club is delighted to share its 75th Anniversary with the RSGB this year. The first meeting of the club took place on Wednesday 4 June 1913 at the YMCA in Northampton and was chaired by Mr F H Wright (WFX). During the meeting, the following officers were elected - President, Mr F H Wright (WFX); Chairman, Mr Rolfe; Hon.Treasurer, Mr Hams, senior; Hon.Sec., Mr E H Coleman. The occasion was recorded in the Daily Chronicle and the Northampton Daily Echo on 5 June and in the Northampton Herald on 6 June.

To celebrate the event, the club will be running a special station with the callsign GB75WFX, after its first President's callsign, "WFX".

WESTON-SUPER-MARE RS 65TH BIRTHDAY:

The first meeting of the Weston-super-Mare Radio Society took place on Wednesday 3 January 1923.

Weston-super-Mare has another claim to fame in the history of communications as Marconi made his historic and successful radio transmission from Brean Down, on the south side of Weston-super-Mare Bay, across the water to Lavernock Point in Wales as long ago as 1897. The transmission is commemorated by a plaque on the wall of the main Post Office in the town. A few years earlier, in 1885, the first trans-Atlantic telephone cables were laid from Weston-super-Mare to Waterville, in Ireland and thence to St,John, Newfoundland. An iron beacon was erected in the bay two years later to mark the position of the cable in order to prevent boats' anchors from fouling it. More cables were laid in 1901, 1910 and 1923, and the last of these, described as "the world's greatest cable" contained 4,000,000 miles of copper wire.

In June this year, Mercury Communications Ltd will commence the laying of a new fibre-optic cable from Brean to Manasquan, New Jersey, which will form part of a world-wide network linking Great Britain with Europe, the Middle East, the Far East, Australia and the American continent. To celebrate this latest link, and as part of its 65th anniversary, the Weston-super-Mare RS will be running a special event station from the site at Brean during the time that the new cable is due to be brought ashore. The callsign of the station will be GB0TAC (Trans-Atlantic Cable). Later in the year, the station will be active again during the actual commissioning of the new cable. It is expected that operation will be on a 24-hour basis and special QSL cards will be available for all contacts.

HARC's 50TH BIRTHDAY AWARD:

To celebrate the Horsham Amateur Radio Club's 50th birthday, a special award is being offered to any licensed amateur who can show evidence of having collected the required 50 points. Non-members of HARC may claim 5 points for each contact with a member who was fully paid up at the last AGM or becomes a member during the year. The award will run from 0001 GMT on 1 June 1988 to 2359 GMT on 30 November 1988. Each station may be worked once only on any band using any mode and it is hoped to have two special stations active during the period using the callsigns GB5HC and GB50HC.

There will be no charge for the award except for the normal postage or IRCs. All claims must be postmarked on or before 1 March 1989.

Further details can be obtained from G4LJR (QTHR) on receipt of a stamped addressed envelope.

PEAKS & PLAINS AWARD:

This year sees the 30th anniversary of the Macclesfield & DRS and in conjunction with the celebrations it will be offering the 'Peaks & Plains' award. The award is available to all licensed amateurs for working any one of the special event stations run by the club or one of the club callsigns, G1MWS or G4MWS, plus 10 additional stations located in Cheshire. Further details can be obtained from G1NUS on 0625-24534.

WAB NEWS:

WAB has just released the results of its 1.8 MHz Mixed contest and the leaders in each section are as follows;

Single Operator Section:

1st	G4BWP	- 79,060 points
2nd	G4OGB	- 52,635 points
3rd	G4HPU	- 27,380 points
4th	GOEJV	- 13,780 points
5th	GOAMY	- 9,900 points

Multi Operator Section:

1st	G4HPE	- 51,230 points
2nd	G4CCD/P	- 46,325 points
3rd	G4LAB	- 35,280 points

Mobile Section:

1st	GOING/M	- 26,010 points
2nd	G4WZA/M	- 3,600 points

There will be an expedition to the Orkneys between 12 May and 4 June by Nina, GM4RXW and Randolf, GM3MOR. Activity will be in the 80m and 40m bands and the two stations hope to activate all the all the areas on the mainland either /M or /P between 20 May and 4 June but before that they will be on Westray between 12 and 18 May

and will try to activate as many areas as possible on the island. There will also be flying visits to North Ronaldsay, Sanday and Stronsay with about 3 hours on each island, probably between 10.30am and 2pm, subject to the batteries holding out.

All in all it's an interesting project, which may activate some all-time new areas on the islands and will certainly please those collecting for the 'Islands on the Air' award. More information will be available on the WAB net on 3760 kHz most days.

WAB ON THE ROAD:

WAB plans to have stands at a number of rallies this year and, although some dates are still subject to confirmation, the list looks like this:-

RSGB VHF Convention	1 May
Northern Mobile Rally	15 May
Friedrichshafen	17-19 May
Longleat Rally	26 June
RSGB National Conv.	15-17 July
Anglian Mobile Rally	24 July
RSGB Mobile Rally	4 August
Red Rose Rally	21 August
Telford Rally	4 September
Lincoln Hamfest	11 September
Scottish Conv.	17 September
RSGB HF Conv.	25 September
Leicester Show	28/29 October

RAIBC HQ NEWS:

The Radio Amateur Invalid & Blind Club has recently appointed a new Loan Equipment Manager, Mr Alan Goddard, G3NQR (QTHR) and a new Zone D Co-ordinator, Mr Les Hawkyard, G5HD (also QTHR).

RAIBC will be attending a number of rallies and exhibitions this year and the next one will be the RNARS Mercury Rally near Petersfield on Sunday 12 June.

All correspondence for RAIBC should be sent to Fiona McKenzie, c/o Angus McKenzie, G3OSS (QTHR) and telephone enquiries should be directed to Margery Hey on 0953-454920.

And finally, just a short reminder that the annual Romsey Picnic will be held on Sunday 22 May at the Fairground, Broadlands, Romsey. Further details from John, G4COM, on 0703-693017.

RAIBC N.IRELAND SOCIAL EVENING:

The Radio Amateur Invalid and Blind Club presents its annual social evening with Marjorie Rea and friends in the Earlswood Hotel, 149 Upper Newtonards Road, Belfast on Thursday 2 June staring at 8pm. Supper will be available if required but is not included in the price of the tickets. There will be a late bar and those coming along are asked to bring a prize for the tombola. Tickets are £3.00 each and can be obtained from David Caldwell, GI0HOW, tel: Belfast 673824.

GB75TOT:

Licensed amateurs of British Telecom Birmingham Area and friends will be operating the special event station, GB75TOT on 15 May to raise money for the treatment of toddlers at Birmingham Children's Hospital. The station will be located at the Civil Service Sports Ground, Old Damson Lane, Solihull. Other events include a fancy-dress five-a-side football tournament consisting of 16 teams from the Police, Royal Navy and British Telecom. Amateur radio activity is planned for all bands from 80m to 2m and the station will be open to the general public. Money will be raised by means of private sponsorship on the number of contacts made so the station will be looking for as many contacts as possible. Further details can be obtained by writing to:-

Mr S Granger
BES1.2
British Telecom PLC
Berkley House
245 Broad Street
Birmingham B1 2HQ

CIVIL SERVICE ARS NETS:

The Civil Service Amateur Radio Society runs two nets on Tuesday evenings with Peter, G3ENV, as net controller. These take place on the following frequencies:-

144.370 MHz - 1930 local time
3720 kHz - 2000 local time

GB75PRS:

"75 Years of Radio" is the theme behind a special day celebrating the 75th anniversary of the RSGB. The event, to be run by the Pembrokeshire Radio Society, will take place at the Further Education Centre, Tower Hill, Haverfordwest on 21 May and the doors will open to the general public at 11am.

The Pembrokeshire RS will be running a demonstration station under the callsign GB75PRS and, in common with other special event stations, members of the public will be able to pass greetings messages to amateur radio stations within the UK and other authorised countries. Scouts and Guides will be particularly welcome to sit in and log for their 'Communicators' badges. It is hoped that the station will have three transceivers in operation on the HF bands using phone and CW and on the VHF bands. CW operation will be between 3515 and 3540 kHz.

There will also be a fascinating display of vintage radio equipment on show, much of which will be on loan from Eric Down, GW0DDK, a local radio historian, and visitors are welcome to bring along any items of vintage equipment for identification by a panel of experts. More details from Mr B. Smith, GW0IER, on Milford Haven 2825.

GB2DWR - DISTILLERS WHISKY ROUTE:

The Mid-Lanark ARS starts its 1988 series of special event stations with Distillers PLC on the Scottish Malt Whisky Route. The purpose of the event is to activate by radio, the whisky route which is located in the Scottish Highlands. The stations will be located at four different distilleries over a period of eight days between 15 and 22 May. Operation will commence at 10am and finish at 3pm the following day at each of the locations. A special QSL card and a certificate will be available and the callsign of the station will be GB2DWR. The locations of the distilleries and dates of operation are as follows:

15/16 - Cardhu
17/18 - Cragganmore
19/20 - Royal Lochnagar
21/22 - Blair Athol

Three other events are being planned for the summer months including the World Veteran Rowing Championships (callsign GB2WVR) in Strathclyde Park, Motherwell from 5-14 September. More details on that later but, in the meantime, further information on GB2DWR can be obtained from Paddy, GM3MTH, PO Box 20, Motherwell, Scotland.

GB75WLG AWARD:

To commemorate the 75th anniversary of the RSGB, the Worcester Lions ARG will be promoting a special award. A certificate will be awarded to any licensed amateur station or short wave listener who contacts or hears the special station, GB75WLG on three different bands (NB: 29 MHz FM will count as a separate band for this award). The station will be active for two 28-day periods commencing 29 May and 28 August.

Claimants for the award should send 2 IRCs (UK) or 3 IRCs (overseas) to:-

The Awards Manager
PO Box 67
Worcester
England

B.R.A.R.S. SPECIAL AWARD:

The British Rail Amateur Radio Society, in conjunction with British Rail, is offering a special award to celebrate 21 years of Inter City. The award will run from the start of the new timetable (16 May) and finish on commencement of the Winter Timetable in October 1988. It is open to British and overseas amateurs and short-wave listeners and can be obtained by submitting a signed log-sheet confirming contact with, or - in the case of SWL's, having heard both stations in contact with - 21 different stations whose postal address includes any of the towns listed in the index of the pocket sized 'Inter City Guide to Services' (that's all quite clear then, is it?). In addition, the following conditions must be adhered to;

a) At least one of the contacts must be with a member of the British Rail ARS or with the club station, G4LMR.
b) No cross-band contacts will be allowed.
c) Contacts via repeaters or satellites will not be allowed.
d) Overseas SWLs need only hear the G contact.
e) The log-sheets must be set out showing date, time, band, station worked/heard, and signed by the operator.
f) QSL confirmation is not required.

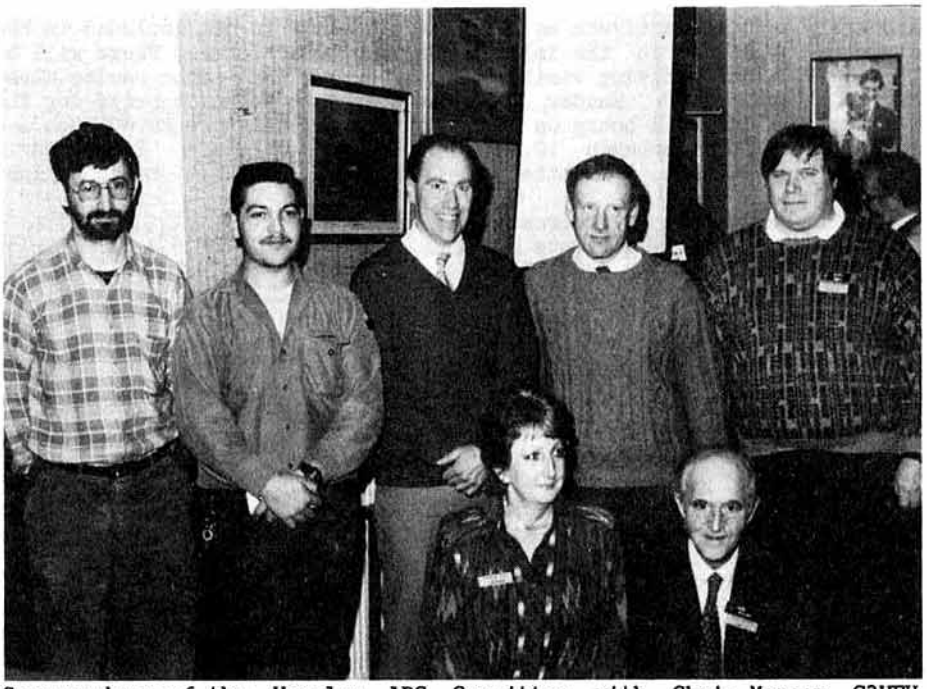
Having completed all that, send your log-sheets, postmarked no later than 10/12/88, to:-

The Awards Manager
B.R.A.R.S.
85 Surrey Street
Glossop
Derbyshire SK13 9AJ

...further details can be obtained by sending a stamped addressed envelope to the above address.

EDGWARE & DRS STRAIGHT KEY EVENING:

The Edgware & District Radio Society's 6th Straight Key Evening will be held on Friday 20 May from about 7pm local time to as late as you like. The special callsign GB2SKE will be active again this year and will try to contact as many participating stations as possible, though it was a difficult task last year. All are welcome to participate, particularly those who are a little hesitant on the key, and please note that this is NOT a contest but more a relaxed and friendly chat on the air. If you'd like more details, please contact John, G3SJE,on 01-204 1034.



Some members of the Verulam ARC Committee with Chris Morcom, G3VEH, presenter of this year's G3PAO Memorial Lecture. (Left to right: G0BZS, G1KPT, G3VEH, G4JKS Chairman, G0IAL, G3PMF and G1YFJ) Photo - G3PZF.

WACRAL NEWS:

The World Association of Christian Radio Amateurs and Listeners will be holding an Activity Day on Saturday 28 May from 9am to 10am, 11am to 12 noon, 2pm to 3pm, 4pm to 5pm and finally, 6pm to 7pm on the following frequencies, 3556 kHz CW, 3768 kHz SSB in the morning and 14.025 MHz CW, 14.140 and 14.260 MHz SSB, 21.025 MHz CW, 21.140 and 21.260 MHz SSB. During the event, GB2JCW (celebrating John & Charles Wesley's 250th Anniversary) will be active from Daw End Methodist Church in Walsall, West Midlands.

Membership of WACRAL is open to Christian amateurs and SWLs of all denominations and further details can be obtained from:-

Mr Len Colley, G3AGX
'Micasa'
13 Ferry Road
Wawne
Hull HU7 5XU

AMSAT-UK COLLOQUIUM:

Just a reminder that the AMSAT-UK Colloquium takes place between 29 and 31 July at the University of Surrey in Guildford. It will comprise of a comprehensive lecture programme, videos, demonstrations, workshops and an exhibition by amateur radio groups and traders. There will be a Grand 'Fun' Junk Sale after the Colloquium Dinner on Saturday evening and visits to the UoSAT Command Station. Two special stations, GB2SAT and GB75SAT, will be available for use by licensed amateurs.

Accommodation, meals and refreshments have been booked on Campus at much lower prices than local hotels and delegates may opt for daily or weekend packages. Full details and a booking form can be obtained by sending a large stamped addressed envelope to:-

The Hon Secretary
AMSAT UK
94 Herongate Road
Wanstead Park
London E12 5EQ
England

Some accommodation is available on the Thursday and Friday nights prior to the colloquium for delegates who wish to travel on either of those days and an overnight stay can be booked for the Sunday night if sufficient prior notice is given. Hotel accommodation cannot be booked by the organisers but a list of local hotels will be sent on request.

Clubs, groups and traders who wish to book space in the concourse area should apply as soon as possible to the address above.

LECTURE BY LOUIS VARNEY, G5RV:

The Chippenham, Devizes and Trowbridge Amateur Radio Clubs have joined together to host a lecture on HF antennas and feeders by Louis Varney, G5RV. The lecture will be held on Friday 10 June at the Devizes ARC's club room at the Football Ground, Nursteed Road, Devizes starting at 8pm. Further details from John, G4ZUV on Chippenham 651001.

QSL BUREAU NEWS:

Following a period of unemployment, Mr C Jones, GW0JCB, has obtained a job at sea and therefore is unable to continue as sub-manager for the GW0, 2, 3, 4 and remaining 5 callsigns. A new sub-manager has taken over at short notice and is:-

Mr K Hudspeth, GW0ARK
67 Bloomfield Road
Blackwood
Gwent NP2 1LX

Ted Allen, G3DRN, our tireless QSL Manager, has written to say that the QSL Bureau will be closed for the whole of July.

Ted closes the Bureau for one month each year so that he can find a space to sit in the lounge and catch up on the last 12 months of RadCom. Please ensure that you DON'T send any QSL cards to the Bureau for a week or so before, or during July.

RAYNET NEWS:

The number of votes cast and results of the recent Raynet election for representatives in Zones 4 and 12 are as follows:-

Zone 4 (East Anglia)

John Slater, G6EOU	30
Derek Gardiner, G4UJQ	89
Invalid votes	2

Therefore Derek Gardiner becomes the new Raynet Zone 4 Representative with immediate effect and replaces Bill Holmes, G4TWT.

Zone 12 (Scotland)

Mike McCreery, GM0ETC	95
Eric Garrington, GM3RFA	98
Invalid votes	3

Therefore Eric Garrington is re-elected as Raynet Zone 12 Representative.

NEW CLUB FOR ABERGAVENNY:

Because of the possible closure of accommodation at Pen-y-fal Hospital, the Abergavenny & Nevill Hall ARS was dissolved at its annual meeting on 17 March this year.

A new club, the Abergavenny Radio Society, has been formed and meets fortnightly during the summer and weekly during the winter at the Hill Residential College, Pen-y-Pound, Abergavenny, on Thursdays at 7.30pm. The facilities at the college are said to be superb and the club has its own clubroom and workshop as well as the use of the lecture rooms, lounge, library and bar. It may be possible to run weekend residential courses on amateur radio once the club has established itself. An application has been made to transfer the callsign GW4GFL and further details of activities can be obtained from Reg Lloyd, GW4IQA.

BRIAN BOWER WINS BBC CLUB AWARD:

The 1988 BBC Club Award has been given to Brian Bower, G3COJ, of the Ariel Radio Group - one of 53 specialist sections in the London branch. He received the award in March at the half-yearly meeting of the Club Council.

Brian joined the Ariel Radio Group in 1955. He was soon involved in organising the Langham station (G3AYC/G8BBC) and became the Treasurer of the group in 1962. After 9 years he became station manager and, more recently, Technical Representative - a post he held until this year.

Brian was also the progenitor of the annual Ariel Radio Group Contest which brings together members from throughout the world. His most recent achievement was to secure a site for an amateur station (G8BBC) inside Broadcasting House for the first time. In the presence of engineers he proved that the activities would cause no interference to the studios and radio links. He worked hard to have the room built and equipped before its official opening last November by the President of the Ariel Radio Group, Mr W Peat, CBE., JP., GM3AVA.

Brian will be retiring from the BBC later this year and the award was made in recognition of all the dedication and hard work he has contributed to the radio club.

ROARS 15th ANNIVERSARY REPORT:

The 15th anniversary celebrations of the founding of the Royal Omani Amateur Radio Society took place between 5 and 8 November last year. The Society was formed on 23 December 1972 under the gracious patronage of His Majesty Sultan Qaboos bin Said, A4XAA.

A special anniversary camp, covering an area of 2,000 sq.m., was constructed on a site at Al Azaiba. The site was levelled by members of the Society and a five-shack radio compound was built. The radio stations were housed in huts built of Barasti palm fronds - a very effective form of air-conditioning!

The special stations were on the air for four days continuously using the callsign A4XXV and operation was in all bands from 1.8 to 28 MHz. Provisional estimates indicate that over 1,700 contacts were made with stations in 112 countries of which 58 were made in the 1.8 MHz band with 15 different countries - a remarkable effort.

One of the shacks housed a display of books, a video presentation and the 144 MHz control station. Three of the others contained equipment for 14 MHz, 21 MHz and 28 MHz with one of them equipped for LF operation. SSB, CW, RTTY and AMTOR were available. The last shack was used as a refreshment and rest area. The operation of the stations was divided into four-hour shifts with 12 members on duty at all times. The camp was opened officially on 5 November by His Highness Sayed Thuwainy Bin Shihab, the Special Representative of His Majesty Sultan Qaboos bin Said.

ROARS now has about 200 members and covers all aspects of amateur radio. The Society moved to new premises in Qurum just before the celebrations began. The new HQ is about twice the size of the previous one and has ample room for two fully-equipped stations, a members' bookshop, technical classrooms, living accommodation and an in-house printing facility.

A commemorative dinner was held on 5 November at the Sheraton Hotel. It was hosted by H.E. Ahmed bin Suwaidan Al Balushi, A4XFK, the Minister of the PTT and President of ROARS. The dinner was attended by many official guests invited by the Society including representatives from Jordan, Kuwait, the United Arab Emirates and Pakistan. The President of IARU, W1RU, the Region 3 Chairman, 9V1RH, and the Region 1 Secretary, John Allaway, G3FKM, were also present.

A special commemorative brochure was produced for the anniversary and in the section entitled 'The Future' the following can be found:

"From this anniversary, the Society will move on with priorities ranging from improving services to members, continued support and participation at IARU and Region Conferences, and our ambition to set up reciprocal licensing with other countries .....not forgetting the planning of our 20th anniversary in 1992!".

All good stuff, and let's hope that the 75th anniversary celebrations of our own Society will be as successful, well supported and enjoyable as those of the Royal Omani Amateur Radio Society.

International Telecommunications Day

17 May, 1988

WORKED EI COUNTIES AWARD:

The Worked EI Counties award, issued by the Irish Radio Transmitters Society, is available to licensed amateurs worldwide who have worked EI or EJ stations located in at least 20 of the 26 counties of EI. It is also available to SWLs on a heard basis.

In accordance with IARU Region 1 rules, a claim for the WEIC award must be by a QSO list and a statement from the applicant's national DX Awards Manager that the applicant is in possession of correctly filled in QSL cards. If this is not possible, the applicant must submit QSLs with the claim.

Contacts made on or after 1 January 1982 only will be valid and no band or mode endorsements will be available. There is a charge of 10 IRCs for the awards and applications should be sent to:-

The WEIC Award Manager
Irish Radio Transmitters Soc.
PO Box 462
Dublin 9

THE 'GOLDEN ANTENNA' AWARD:

For the seventh time, the town of Bad Bentheim will symbolically award a 'Golden Antenna' to an amateur for an outstanding humanitarian achievement in the field of amateur telecommunication. This year, the winner will receive the award during the German-Dutch Radio Week from 25-28 August.

Amateur radio organisations and clubs are invited to submit proposals for the award by 15 May. The decision as to who will be awarded the Golden Antenna will be made by a committee of representatives from the town of Bad Bentheim, IARU, Vereniging van Experimentee-Radio Onderzoek/ Netherlands, Vereniging Radio Zend Amateurs/Netherlands and Deutsche Amateur-Radio-Club.

The town of Bad Bentheim will defray all expenses incurred in connection with the journey and accommodation of the winner and proposals should be sent to:

Stadt Bad Bentheim
Schlossstrasse 2
D-4444 Bad Bentheim
West Germany

...by 15 May 1988 latest.

HCJB NEW HAM RADIO PROGRAMME:

Radio station HCJB - The Voice of the Andes - broadcast from Quito in Ecuador has just added a new programme to its schedule which looks at amateur radio activity. The programme is titled "Ham Radio Today" (not to be confused with the UK magazine of the same name) and its producer is John Beck, HC1QH/WB0RXL, who has been licensed for over 10 years. It is planned for the programme to cover a wide range of amateur radio related topics in a 30 minute slot every Wednesday to the following target areas -

S. Pacific - 0800 & 1030 UTC on 9745 & 11925 kHz

Europe - 2130 UTC on 11740, 15270 & 17790 kHz

N. America - 0230 & 0630 UTC on 6230, 9720 & 11775 kHz

Topics to be covered include news items from all areas of the world, construction hints, propagation news and equipment reviews. Morse code, components, RTTY, AMTOR, packet radio and many other subjects will also be covered. If you have any news of an international flavour, eg. a new operating award or a special station, please send details to:-

Andrew Steele
HCJB-UK
131 Grattan Road
Bradford BD1 2HS
tel: 0274 721810
Dialcom/Telecom Gold
72:MAG100090

A new trophy was presented to the RSGB on 25 February by members of the Telford & District ARS in recognition of the acquisition of the 50 MHz band. The 'Telford Trophy' is to be awarded to the winner of the RSGB's 50 MHz contest each year, at the VHF Convention. The trophy is a scale model of Telford's famous Iron Bridge and is constructed from more than 2,000 screws, nails, nuts and hooks and was created for the Telford & DARS by Gerry Foxall, a local artist specialising in scrap metal sculptures. Seen in the photograph (taken at RSGB HQ) are G3IMP, the RLO for Shropshire, G3UKV, G0CZD and G8UGL.

('Helplines' cont. from p.354)

WANT A PEN-PAL?:

We've had a letter from Jacob Kwadwo Gyan, who lives in Ghana and wants a pen-pal. Jacob is a student in secondary form one and has chosen correspondence with other countries as his hobby/project. If you, or one of your children, would like to write to Jacob his address is:-

Jacob Kwado Gyan
Roman Catholic Middle School
PO Box 73 (honest!)
Japekrom Brong-Ahafo
Ghana

...and we're sure he'd love to hear from you.

WOT... NO TV?:

Gordon, GM3ULP, wonders where all the 430 MHz fast-scan television transmissions which were so popular a few years ago have gone. For that matter, what about slow-scan? If anyone is interested in FSTV or SSTV contacts with Gordon give him a call on 0698 53394 or write to him QTHR.

Please let us know if you get a response to any requests for help via the 'Helplines' column.

Events Diary

CLUB NEWS

In an attempt to reduce the number of pages previously used for Club News, we are using a more abbreviated format listing clubs alphabetically under counties and giving the date and subject of the meeting. As in GB2RS, natter nights and committee meetings are not listed. The full details of when and where clubs meet, the frequency of meetings, the contact person and telephone number will be published twice yearly in the UK Callbook and News Bulletin. However, any changes to these details or details of any new clubs, will be included in the list below. If news is received by the published deadline, it will appear in the listing. It is your responsibility to ensure that items are sent to HQ in good time, either direct or via your RLO. News items should be sent in writing, preferably typed or written legibly, and be signed by the club secretary or the person responsible for publicity.

AVON:
* Bath & DARC - 11, visit by RLO G8VPG; 25, preparation for Longleat Rally.
* Bristol RSGB Group - 23, lecture "Valves for Solid-state Men".
* North Bristol ARC - 13, bring & buy; 20, 144 MHz activity.
* South Bristol ARC - 4, demonstration "Broadcast DX-TV"; 1, club project construction; 18, 20m activity; 25, microwave activity.
* Thornbury & DARC - 10, AGM; 17, preparation for exhibition; 21, "World of Amateur Radio" exhibition; 24, project.
* Weston-super-Mare ARS - 9, lecture "Prince Edward Island Past & Present"; 23, construction.

BEDFORDSHIRE:
* Dunstable Downs RC - 8, DF hunt; 13, junk sale; 20, visit to Fire Station (provisional).
* Shefford & DARS - 5, lecture "VHF Operating Techniques"; 19, lecture "Sonar"; 26, mobile DF hunt.

BERKSHIRE:
* Reading & DARC - 10, lecture "Satellite Reception"; 24, lecture "GB3HV 23cm TV Repeater".

CAMBRIDGESHIRE:
* Cambridge & DARC - 13, rally briefing; 15, rally & car-boot sale; 20, lecture "A Bit of a Lift On".
* RAF Wyton ARC - *REFORMED* Meets Wednesdays at 6pm. Club callsign G3MMH. Details Flt Lt C R Burchell RAF, tel: Huntingdon 52451 ext 6456 (daytime).

CENTRAL:
* Falkirk ARS - Anyone interested in re-starting a club in the Falkirk area please contact RLO. Brian, GM4XQJ, tel: 0324-31258.
* Stirling & DARS - 26, QRP CW activity, GM4TMS.

CHESHIRE:
* Ellsmere Port & DARS - **CORRECTION** meets alternate Mondays.

CORNWALL:
* Cornish RAC Computer Section - 9, club packet project.

CUMBRIA:
* Solway Radio Club - *NEW SECRETARY* Marion Dockray, G1PEN. TNX to David, G0AFP for past services. Club meets 2nd & 4th Wednesdays at 7.30pm in Maryport Educational Settlement, High Street, Maryport.

DERBYSHIRE:
* Derby & DARC - 4, junk sale. *NEW SECRETARY* Kevin Jones, G4FPY, tel: 0332-669157.

DEVON:
* Exeter ARS - 9, annual inter-club quiz.
* Plymouth RC - 16, lecture "Development of Devonport"; 23, rally briefing.

Co DOWN:
* Bangor & DARS - 7, lecture "RTTY/AMTOR".

EAST SUSSEX:
* Brighton & DARS - 4, lecture by Reg Moores "Recent Inventions".
* Southdown ARS - 9, lecture "Weather Satellites".

ESSEX:
* Braintree & DARS - 16, AGM.
* Chelmsford ARS - 3, visit to Police HQ.
* Colchester RAs - 12, construction & RLO Ted Whitworth; 26, lecture, "Kintes 'n' Aerials".
* Loughton & DARS - 6, planning Aylmers Farm Field Weekend; 13-15, Aylmers Farm Field Weekend.
* Southend & DRS - 6, lecture "Radio Controlled Model Yacht Racing"; 13, demonstration & talk "PCBs"; 20, illustrated lecture "The Commodity Market"; 27, talk "The Triumph of Cathie".

Co FERMANAGH:
* Lough Erne ARC - 18, lecture "Can You Read a Map".

GREATER LONDON:
* Acton, Brentford & Chiswick ARC - 17, discussion "Operating Practices & Procedures".
* Civil Service ARS - 16, checking the new antenna system.
* Clifton ARS - **NEW SECRETARY** Mr M E Brown GODCG, tel: 01-691 2341.
* Edgware & DARS - 12, lecture "Navigation by Satellite"; 20, Straight Key Evening (see Around the Groups); 26, NFD Briefing & Constructors' Contest.
* Harrow RS - **CHANGE** new Programme Manager Gerald GOGXM tel: 01-863 2780. 6, activities; 13, lecture "Access Control Using LF Transponders"; 20, activities; 27, junk sale.
* Kingston & DARS - 18, lecture "CW Before & After the Test".
* Southgate ARC - 12, illustrated lecture "The History of Valves - part 3".
* Sutton & Cheam RS - 20, AGM; 30 special event station at Cheam & Worcester Park Fete.
* Wimbledon & DARS - 13, lecture "Allard Motor Cars"; 27, G3PCA Trophy Construction Contest.

GREATER MANCHESTER:
* Eccles & DARS - 3, lecture "Eigenvalues and Eigenvectors".
* South Manchester RC - 6, discussion "Club Policy"; 13, lecture "Conversion of the 88-set"; 20, AGM; 27, lecture by winner of home-brew equipment contest.
* Stockport RS - 11, ladies night illustrated talk "Queensland, Australia"; 25, pre-NFD & QRP evening.

GWENT:
* Abergavenny RS - ***NEW CLUB*** meets Thursdays at 7.30pm in Hill Residential College, Pen-y-Pound, Abergavenny. Details Reg, GW4IQA tel: 0873-890681.
* Blackwood ARS - 13, "Fastest Constructor in the West" competition; 27, lecture "Use of Computers in Amateur Radio".

HAMPSHIRE:
* Andover RAC - 4, junk sale; 18, DF Hunt. **NEW SECRETARY** G8ALR tel: Andover 23741.
* Fareham & DARC - 11, lecture "Mystery of Microwaves"; 25, lecture.
* Farnborough & DARS - 25, HF Field Day review & Morse.
* Horndean & DARS - 5, lecture by DTI's Radio Investigation Service.
* Itchen Valley ARC - 27, lecture "QSL Bureau & Awards".
* Three Counties ARC - 11, lecture "Clandestine Radio"; 25, lecture "Model Railways".
* Winchester ARC - 20, lecture "The Birth of Broadcasting".

HEREFORD & WORCESTER:
* Kidderminster & DARC - 10, construction competition; 24, visit by RLO G0EYO.
* Malvern Hills ARC - 10, visit by RLO G0EYO
* Vale of Evesham ARC - 6, visit to BBC Pebble Mill.
* Wythall RC - 3, lecture "Keeping Out the Wet, Cable Joining"; 10, on air; 17, lecture "HF Antennas for the Small Garden"; 24, construction; 31, treasure hunt.

HERTFORDSHIRE:
* Cheshunt & DARC - 11, lecture; 25, portable on Baas Hill Common; 30, special event GB75 Hertford County Day.
* Harpenden ARS - 3, films; 15, Harpenden Carnival; 17, lecture "Satellites".
* Stevenage & DARS - 3, construction "HF ATU & Noise Bridge"; 10, visit to Chiltern Radio; 17, quiz "Beyond the RAE".
* Verulam ARC - 10, workshop; 24, lecture "Packet Radio Networking in the UK".
* Welwyn-Hatfield ARC - 2, talk by the trade; 16, Field-Day preparation.

HIGHLAND:
* Inverness ARC - 5, lecture "Scopes".

JERSEY:
* Jersey ARS - **NEW SECRETARY** David Reid, GJ0BZF.

KENT:
* East Kent RS - 5, HF antenna symposium; 19, operating at Bishopstone.
* Medway AR&TS - ***NEW VENUE & DAY*** 5th Medway Scout HQ, Roseberry Avenue, Beresford Avenue, Rochester, Kent, Tuesdays at 7.30pm.
* SE Kent (YMCA) ARC - 11, practical fault-finding session; 18, Waldershare Weekend planning; 25, lecture/demonstration "Crystals".

LANCASHIRE:
* Bury RS - 10, talk/demonstration "Microwave Modules".
* Central Lancs ARC - 2, portable HF activity.
* Fylde ARS - 3, equipment sale.
* Preston ARS - 5, booking for Red Rose Radio visit; 19, lecture "Earthing".

LEICESTERSHIRE:
* Leicester RS - 2, HF/VHF activity; 9, HF/VHF activity; 16, lecture "See My Etchings - Making Your Own PCBs"; 23, NFD final arrangements; 30, HF/VHF activity.
* Loughborough & DARC - 3, on air; 10, lecture; 17, DF hunt 2; 24, lecture; 31, construction "10.7 Marker - Part 2".
* Melton Mowbray ARS - 20, fox hunt.

LINCOLNSHIRE:
* Lincoln SWC - 4, on air; 11, AGM.

LOTHIAN:
* Lothians RS - 5, DF hunt.

MERSEYSIDE:
* Liverpool & DARS - 3, preparation for inter-club contest; 8, inter-club on-air contest; 10, open night; 17, lecture "Confessions of a Fault-Finder"; 24, junk sale & raffle; 31, preparation for HF NFD.
* St.Helens & DARC - 19, quiz v Ellesmere Port.
* Sandown ARC (Formerly Riversdale ARS) - Run by staff & students of Dept. of Engineering, Sandown College, Sandown Road, Liverpool L15. Details Jim, G4DKQ.
* Wirral & DARC - 4, treasure hunt; 11, quiz v Wirral ARS; 25, lecture.

MID-GLAMORGAN:
* Bridgend ARC - 4, lecture "Aerials for Restricted Places"; 18, lecture "Packet Radio".

NORFOLK:
* Norfolk ARC - **NEW VENUE** Red Roofs Club, Fifers Lane, Norwich. Meetings on Wednesdays, 7.30pm. 4, NFD first briefing; 11, GB3MB AGM; 25, surplus equipment auction.
* Yarmouth RC - 5, Caravan Maintenance Party; 26, videos/films.

NORTH YORKSHIRE:
* York ARS - 13, home-brew night.
* York RC - 4, social evening/on air; 11, visit to White Rose Club; 18, spring DF hunt; 25, social evening/on air.

OXFORDSHIRE:
* Harwell ARS - 21, sale of surplus electronic components (see 'Other Events')

SHROPSHIRE:
* Salop ARS - 12, fox hunt (2nd club qualifier); 19, lecture "HF Contest Working"; 26, special event HF on air.
* Telford & DARS - 4, construction project; 11, VHF NFD planning; 18, lecture "Reciprocal Licensing"; 25, lecture "Packet Radio".

SOMERSET:
* Mid-Somerset ARC - 6, lecture "Amateur Radio - A Look Back"; 20, lecture "Using Relays in Amateur Radio".
* Yeovil ARC - 8, Yeovil QRP Convention; 12, lecture "Is SWR Harmful?"; 19, lecture "Absorption Wave Meter".

SOUTH GLAMORGAN:
* Barry College of FE RS - 19, video "JARL DX-pedition to China".
* British Telecom (S. Wales Dist) ARS - 11, AGM.

SOUTH YORKSHIRE:
* Sheffield ARC - 2, practical evening; 9, silent auction/junk sale/May munch; 23, computer workshop.

STAFFORDSHIRE:
* Cannock Chase ARS - **NEW VENUE/NEW SECRETARY** - Victoria WMC, Church Hill, Hednesford, 8pm/Tony G0HKF tel: 05436-75301. 29, visit to Port Dinowig Power Station.

NEWS & VIEWS

Events Diary

* Stafford & DARS - *NEW VENUE & SECRETARY* now meets Tuesdays at 7.30pm in Universal Sports & Social Club, Doxey Road, Stafford. Details Bernard, G3ESW, 24 Hartland Avenue, Stafford ST17 0EJ.

SUFFOLK:
* Felixstowe & DARS - 2, social at Grosvenor Hotel; 16, East Suffolk Wireless Revival planning; 29, talk-in/bring & buy at ESWR.

SURREY:
* Dorking & DRS - 10, lecture "SWR - Does It Matter?"; 24, 4m activity at Ashcombe School, Dorking.

TYNESIDE:
Tyneside ARS - NEW VENUE now meets at St.Teresa's Club, 200b Heaton Road, Heaton, Newcastle-upon-Tyne, NE6 5HP. Details Gary, G4KOT tel: 091-234 1148.

WARWICKSHIRE:
* Atherstone ARC - 9, Rig testing by DI RIS; 23, DF hunt 1.
* Mid-Warwickshire ARS - 10, DF fox hunt & barbecue; 24, visit to satellite station.
* Rugby ATS - 10, lecture by RLO G0EDT; 17, preparation for special event station at Rugby Hobbies Festival; 24, hobbies festival de-brief; 31, 2m DF hunt.
* Stratford-upon-Avon & DARC - 9, lecture "Electron Microscope & Telemetry Demonstrations"; 23, technical topics.

WEST GLAMORGAN:
* Swansea ARS - 5, lecture "Trinity House Lighthouse Service".

WEST MIDLANDS:
* Barr Beacon RC - 23, lecture by Midland Amateur Repeater Group.
* Coventry ARS - 6, on air/Morse; 13, lecture/demonstration "Howes Communications"; 20, on air/Morse; 27, visit to Police HQ at Leek Wooton.
* Midlands ARS - 8, Drayton Manor Rally; 17, junk sale;
* Midlands Electricity Board RS - 10, lecture "Communications in the MEB"; 24, open night.
* South Birmingham RS - NEW SECRETARY Winston G1WNZ tel: 021-444 1681. 4, lecture by RLO Alan Bennett.
* Wolverhampton ARS - 10, lecture "50 Years of Amateur Radio"; 17, on air; 24, club project.

WEST SUSSEX:
* Horsham ARC - 5, lecture "After the Hurricane".
* Mid-Sussex ARS - 12, construction contest; 15, fox hunt; 19, on air; 26, lecture "Contest Operating".

WEST YORKSHIRE:
* Halifax & DARS - 17, Components Fair with Birketts of Lincoln.
* Keighley ARS - 31, fox hunt.
* North Wakefield RC - 5, lecture "The Police"; 12, on air; 19, visit to Jorvik Viking Centre;
* Pontefract & DARS - 5, final preparation for 5-Towns Half Marathon Raynet exercise; 15, 5-Towns Half Marathon; 19, lecture "Converting CBs"; 26, lecture "Direction Finding".
* Todmorden & DARS - 16, lecture by Crime Prevention Officer.
* Wakefield & DRS - 17, junk sale.
* White Rose ARS - 4, AGM; 11, visit by York ARC; 18, meet the new committee.

WILTSHIRE:
* Chippenham & DARC - NEW SECRETARY J Barrington G4ZUV.

Items for inclusion in the JULY issue must be sent to HQ marked "Club News - Bulletin", and be received by Friday, 20 May latest.

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'.

1 MAY
* RSGB VHF CONVENTION - Sandown Park Racecourse, Esher, Surrey. Usual traders, comprehensive lecture programme, large RSGB bookstall, RSGB Committee stands. Details G3FZL. Trade - Les, G5HD tel: 040 928-342.
* 5th Anglo-Scottish Rally - Tait Hall, Kelso. Opens at 11am, all the usual attractions. Details Bruce GM4UIB, tel: 0573-24654 (evenings).

2 MAY
* Mid Cheshire ARS Rally - Civic Hall, Winsford, Cheshire. Opens at 11am. Details Mrs Fraser G1SIB, tel: 0606-553401.
* Doncaster Radio Rally - Bircotes Sports Centre, nr Bawtry, Doncaster. Talk-in on S22 by G4YRD. Details Audrey Wilson, tel: 0302-721259.
* Dartmoor Radio Club Mobile Rally - Princetown Town Hall. Opens 10.30am, all the usual traders, display stands from Raynet and local repeater groups, bring & buy stand, refreshments. Talk-in on S22. Details Dave G1YPD, tel: 0572-551955.

8 MAY
* Drayton Manor Rally - Drayton Manor Park, nr Tamworth, Staffs., on A4091 1 mile from A5 junction. Opens at 11am, usual traders, flea market etc. Talk-in on S22 & 7cm. Details Norman, tel: 021-422 9787 or Tom G8CAZ, tel: 021-357 1924.
* Yeovil QRP Convention - Preston Centre, Monks Dale, Yeovil. Opens at 9am. Trade stands, junk sale, lecture programme, old & new QRP rigs (GB2LOW), component stands, home-brew equipment display, refreshments. Talk-in on S22 from 9.30am. Details Dave G1MNM, tel: Yeovil 79804.

15 MAY
* 31st Northern Mobile Rally - Great Yorkshire Showground, Harrogate. Opens at 10.45am. More traders, *RSGB stand*, children's show, raffles, bar & refreshments. Talk-in on S22 by GB0NMR. General parking and entry is from Railway Road, off the Wetherby to Harrogate road. Arrangements for disabled visitors are as last year and entry in the vicinity of the Golf Club in Hookstone Wood Road. Details Harry G3CQQ, tel: 0943-602118.
* Cambridge & DARC Rally & Car-boot Sale - Coleridge Community College, Radegund Road, Cambridge. Opens at 10.30am (10am for disabled), trade stands, bring & buy, car-boot pitches, refreshments. Talk-in on S22 by G2XV. Details Brian G4TRO, tel: 0223-353664.
* Mid-Ulster ARC Mobile Rally - *NEW VENUE* The Silverwood Hotel, just off the Lurgan/M1 roundabout. All the usual activities and more, traders, bring & buy, bookstall, RSGB Bureau, demonstration stands. Talk-in on S22 and HF. Oxford Island recreation area nearby. Details GI3WEM, QTHR.

22 MAY
* Swindon & DARC Radio, Electronics & Model Engineering Fair *CHANGE OF DATE* - Science Museum, Wroughton, nr Swindon, Wilts, signposted from M4 junc 16. Opens 10am, all the usual amateur radio attractions plus museum, model railway swap-meet, model aircraft flying display, radio controlled boats and cars, model steam engine rally, helicopter rides, vintage vehicles, traction engines and many other attractions for the whole family. Talk-in on S22 by GB2SMW and 70cm by GB3TD. Details Ken G8SFM, tel: 066689-307.

29 MAY
* 12th East Suffolk Wireless Revival - Civil Service Sportsground, Bucklesham, nr Ipswich. Opens at 10am, all the usual attractions, children's play area, model flying display, good family day out. Details Jack G4IFF, tel: 0473-464047.
* Plymouth RC Mobile Rally - Plymstock School, Plymstock, Plymouth. Opens at 10am, usual trade stands, demonstrations, raffles, refreshments. Talk-in on S22. Details Joe G1RXR, tel: 0752-662511.

5 JUNE
* Southend Mobile Rally - Rochway Centre, Rochford, Essex. Details G8EFG, tel: 0268-755331.
* Spalding & DARS Mobile Rally - Springfields Arena, next to Springfields Gardens, Spalding. Free entry to the gardens for all rally visitors. Talk-in on S22 and SU8. Details G4TWR tel: 0775-2940.
* Bolton ARC Mobile Rally - The Deane Sports Complex, New York, Junction Road, Bolton. All the usual trade stands, bring & buy, refreshments & bar, £100 free draw. Details Kenneth G6ZJL, tel: 0204-696906.

12 JUNE
* Elvaston Castle Mobile Radio Rally - Elvaston Castle Country Park, nr Derby. Usual traders, bring & buy, flea market, bookstall, arena activities, craft marquee, children's entertainment, full on-site catering. Family day out. Talk-in on 2m and 70cm. Details John G4PZY, tel: 0332-767994. Trade enquiries, Peter, G3WFU tel: 0332-700265 (evenings).
* RNARS Annual Mobile Rally - HMS Mercury, nr Petersfield, Hants. All the usual trade and display stands, attractions for the whole family. Details G4UJR tel: 0703-557469.
* Mid-Lanark ARS Open Day - *NEW VENUE* The Community Centre, Newarthill, by Motherwell (approx 1/2 mile from Wrangholme Hall). All the usual traders, bring & buy stall, demonstrations of packet radio & RTTY, lectures, EHI Trophy presentation, full catering. Talk-in on S22. Details David GM1SSA, tel: 0698-732403.
* Norfolk Annual Raynet Rally - Barford, near Norwich. Opens at 10.30am, trade stands, boot sale, raffle, refreshments etc. Details Tim, G4CTT.

18 JUNE
* RAFARS Golden Jubilee Radio Rally - RAF Halton Air Show, Wendover, nr Aylesbury, Bucks. Signposted from A41 between Tring & Aylesbury. Opens at 10am, *RSGB stand*, usual traders, many attractions for the whole family, air show. Talk-in on S22 by G1RAF. Details Terry G4PSH, tel: 0296-85760.

19 JUNE
* Denby Dale Mobile Rally - Shelley High School, 5 miles SE of Huddersfield, W.Yorks. Opens at 11am (10.30 for disabled), usual traders, sideshows for the family, good food. Talk-in on S8, SU22 and 10m FM Details G3SDY tel: 0484-602905.

26 JUNE
* 31st Longleat Mobile Rally - Longleat House, Warminster, Wilts. All the usual traders and attractions. *RSGB STAND*. Details Brian G4FRG, tel: Portishead 848140.

10 JULY
* Worcester & DARC Strawberry Rally - Droitwich High School. Trade stands, bring & buy, family entertainment, trips to Strawberry fields (weather permitting). Details Steve, tel: 0905-424151.
* Sussex Mobile Rally - Brighton Racecourse. Opens 10.30am, trade stands, large bring & buy, bar and restaurant. Attractions for the whole family. Details Bob G1IOS, tel: 0798-43841.

24 JULY
* McMichael 88 Rally - Haymill Centre, Burnham, nr Slough. Details Bob G0BTY.
* Anglian Mobile Rally - High Woods Sports & Leisure Centre, Severalls Lane, Colchester. *CHANGE OF DATE* Details G6HQI, tel: 0206-862403.

30 JULY
* Hilderstone Radio Rally - Hilderstone College, St.Peters Road, Broadstairs, Kent. Details David, G1YOR, tel: 0843-587170.

31 JULY
* Scarborough ARS Rally - The Spa, Scarborough. Opens at 11am, talk-in on S22, SU8 and via GB3NY. Details Ian G4UQP, tel: 0723-376847.

IN BRIEF - More details later.

7 AUGUST
* RSGB MOBILE RALLY - Woburn Abbey, Bedfordshire. Details RSGB HQ. Trade - Norman, G3MVV tel: 0277-225563.

14 AUGUST
* Derby Rally - Lower Bemrose School, Derby. Details Martin, G3SZJ tel: 0332-556875.
* Flight Refuelling Hamfest '88 & Craft Fair - Merley, near Wimborne, Dorset. *CHANGE OF DATE* Details John G0API, tel: 0202-691649.

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.
* 5th National Amateur Radio Car Boot Sale - The Shuttleworth Collection, Old Warden Aerodrome, nr Biggleswade, Beds. Details Tony G0COO.

10 SEPTEMBER
* Wight Wireless Rally - The Wireless Museum, Arreton Manor, Isle of Wight. Details G3KPO, tel: 0983-67665.

11 SEPTEMBER
* Lincoln Hamfest '88 - Lincolnshire Showground, 4 miles N of Lincoln on A15. *RSGB stand*. 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 Exhibition & Conference Centre, Bridge of Don, Aberdeen. Details Graham GM8FFX, tel: 0224-630526.

18 SEPTEMBER
* Bristol Radio Rally - Brunel's Great Train Shed, Temple Meads Station, Bristol. Details

NEWS & VIEWS

Events Diary

15/16/17 JULY
RSGB 75 - NATIONAL CONVENTION: National Exhibition Centre, Birmingham. Details RSGB HQ. Trade - Norman, G3MVV tel: 0277-225563
This year's event will be the largest ever and will include an exhibition of amateur radio equipment from the last 75 years. Social events will be held on Friday and Saturday evenings. A special 75th anniversary luncheon will be held on Friday.
GB75AC (75th Anniversary Convention) will be active from 9-17 July.

18 JULY
RSGB HEADQUARTERS CLOSED FOR ONE DAY

19/20/21 JULY
RSGB 75 - HQ OPEN DAYS: Visitors welcome from 10am to 4pm each day. Please use booking form (see centre pages) or send SSAE with request giving preferred day and second choice, am or pm and number of tickets required.

22/23 JULY
RSGB 75 - DATA SYMPOSIUM: Harrow School, Harrow-on-the-Hill. 2-day symposium covering all aspects of data communication.

24 JULY
RSGB 75 - FAMILIES' & ACTIVITIES DAY
An opportunity for all clubs, groups and societies to celebrate the RSGB's 75th anniversary in their own way. Almost anything goes but the event should involve the whole family and, if possible, the public. Please run an amateur radio demonstration. A prize will be awarded for the most original idea.

28 JULY
RSGB 75 - INTERNATIONAL SATELLITE SEMINAR: Near Guildford. By invitation only. Details RSGB HQ.

29/30/31 JULY
RSGB 75 - AMSAT UK COLLOQUIUM: University of Surrey, Guildford. First day special technical meeting by invitation only. Last two days full lecture programme and social events for all delegates. Details Ron G3AAJ tel: 01-989 6741 (social hours please)

FULL DETAILS AND BOOKING FORM FOR ALL EVENTS WERE PUBLISHED IN THE CENTRE OF LAST MONTH'S ISSUE

(Rallies cont.....)

Dave G4WUB, tel: 0272-839855.
* Peterborough E&RS Rally - Wirrina Sports Stadium, Bishops Road, Peterborough. Details Fred G4NOG, tel: 0733-77032.

25 SEPTEMBER
* **RSGB HF CONVENTION** - Belfry Hotel, nr Oxford. Details RSGB.
* Harlow Mobile Rally - Harlow Sports Centre. Details G4KVR tel: 0279-22365 (daytime) or G4MIS tel: 0279-722622 (evenings).

2 OCTOBER
* Great Lumley AR & ES Rally - Community Centre, Great Lumley, Chester-le-Street, Co.Durham.
* 4th North Wakefield RC Rally - Outwood Grange School, Potovens Lane, Outwood. Details Steve, G4RCH (QTHR).
* Welsh Amateur Radio Convention - Oakdale Community College, Blackwood, Gwent. Details B.Davies GW3KYA, tel: 0495-225825.

9 OCTOBER
* Midlands VHF Convention - ***CHANCE OF DATE*** Details Peter G3UBX.
* Armagh Rally - Drumshill House Hotel, Armagh. Details GI8RNX.

28/29 OCTOBER
* Leicester Amateur Radio Show - Granby Halls, Leicester. Details Frank tel: 0533-553293 daytime.

30 OCTOBER
* Carmarthen ARS Rally - Leisure Centre, Johnstown, Carmarthen. Details GW3GUE, tel: 026 783 460.

5/6 NOVEMBER
* North Wales Radio Rally - Canolfan Abercony Centre, Llandudno. Details Tony Wilkinson GW4PVU, tel: 0492-49121 or 75666.

13 NOVEMBER
* Bishop Auckland Radio Rally - Venue to be advised. Details Morris, tel: 0525-314638.
* West Kent ARS Tonbridge Rally - Angel Centre, Tonbridge. Details Nigel G4KIU, tel: 0892-515321 or 515432.
* West Manchester RC Winter Rally - Bolton Sports & Leisure centre, Silverwell Street, Bolton. Details David G1IOO, tel: 0204-24104, evenings.

27 NOVEMBER
* Verulam ARC Christmas Rally - St.Albans City Hall. Details G4JKS tel: St.Albans 59318. Trade - Watford 52959.

11 DECEMBER (PROVISIONAL)
* Leeds & DARS Christmas Rally - Pudsey Civic Centre, Dawsons Corner, Pudsey, nr Leeds. Details GOETL.

OTHER EVENTS

15 MAY
* Newport ARS Grand Surplus Equipments & Junk Sale - Brynglas House, Newport, Gwent. Opens 11am (10.30 for disabled visitors), junk & flea market stalls only. Snacks & refreshments. Talk-in on S22 by GW1NRS. Details Bob GW4IED, tel: 0633-280958.

21 MAY
* Harwell ARS Sale of Surplus Electronic Components - 2pm-5pm at Building 155, Harwell Laboratory. Signposted "G3PIA" from main A4185 and talk-in by G3PIA on S22. Details G6LNU tel: Wantage 68453.

22 MAY
* RAIBC Romsey Picnic - The Fairground, Broadlands, Romsey. Details John G4COM, tel: 0703-693017.

14/15/16 JUNE
* Three Counties Show - Malvern, Worcs. Gloucester, Worcester & Hereford Radio clubs putting on combined demonstration station.

28 AUGUST
* Galashiels & DARS Open Day - Focus Centre, Livingston Place, Galashiels. Details John GM0AMB, tel: 0835-22686.

GB CALLS

The list below shows **ALL** the special event stations licensed for operation during February **(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.

NOTE: This list is taken from the Headquarters' database during the first week of the month prior to publication. If you have an event which is taking place during the latter part of the month of issue, you must send your form in to Headquarters at least 10 weeks in advance to ensure that it can be processed ready for the listing, otherwise it will miss the copy date.

THROUGHOUT 1988:
GB75RS - 75 (ANNIVERSARY) RADIO SOCIETY (GB): RSGB HQ, Lambda House, Potters Bar, Herts. *Watch out for GB75HQ later in the year*

1 MAY:
GB0TW - TWICKENHAM WEEK HUT: Twickenham, Middx. Details G0AKN.
GB2GOD - GALA OPEN DAY: St.Mary's Church, Leyland. Details G4ZYN.
GB2HPR - HIGH PEAK RAILWAY: Cavendish Park, Derbys. Details G0FWI.
GB2MFC - MACCLESFIELD FERMAIN CLUB: Macclesfield, Cheshire. Details G0AMU.
GB2SJA - ST.JOHN AMBULANCE: The Casino, Canvey Is. Details G4UVJ.
GB2SME - SPEN MODEL ENGINEERS: Royds Park, Cleckheaton. Details G4PHR.
GB4DCA - DROITWICH CHARITY AUCTION: King George Playing Fields. Details G4PQZ.
GB4LAC - LYDNEY AIR CADETS: ATC HQ, Lydney, Glos. Details G4ZFN.
GB4MS - MACCLESFIELD SOCIETY: Fermain Club Macclesfield, Cheshire. Details G0AMU.
GB4MTR - 4 METRES: Details G4SEU.
GB5DP - DENBY (DALE) PIE: Details G0BWB.
GB6BH - BARLBOROUGH HALL: Details G0DAG.
GB6RRR - RED ROSE RALLY: Wigan. Details G6MEZ.
GB75WAB - WORKED ALL BRITAIN: WAB stand, RSGB VHF Convention, Sandown Pk, Esher, Surrey. Details G6CSY.
GB8ATC - AIR TRAINING CORPS: 293 Cowbridge Squadron ATC. Details GW8XAN.
GB8RRR - RED ROSE RALLY: Details G1IOO.

2 MAY:
GB75LRS - LOUGHTON RADIO SOCIETY: Loughton Hall. Details G3OPA.

3 MAY:
GB6RAF - ROYAL AIR FORCE: Leicester. Details G6PFN.

4 MAY:
GB0CDX - COASTAL DEFENCE 'X': Golden Hill Fort, IOW. Details G3RJK.
GB2AVR - ANGLESEY VINTAGE RALLY: Plas Coch Fields. Details GW0IOZ.
GB2HPR - HIGH PEAK RAILWAY: Tha Ranger's Office, Parsley Hay, Derbys. Details G0FWI.

5 MAY:
GB2SSJ - SALOP SILVER JUBILEE: Club HQ, Shrewsbury. Details G0EIY.

6 MAY:
GB1CDY - COASTAL DEFENCE 'Y': Grid: SU 617 001. Details G1WSL.
GB2PSA - PENDAL SCOUT ASSOCIATION: Arndale Centre, Nelson. Details G4UDM.
GB4RRA - RED ROSE AWARD: Details G0FRL.
GB75RAE - RADIO AMATEUR EXAMINATION: Cosham Park House, Portsmouth. Details G4ITF.

7 MAY:
GB1CDG - COASTAL DEFENCE 'G': Fort Gomer. Grid: SZ 587 989. Details G6MWY.
GB1JWC - JOHN WESLEY CELEBRATIONS: Warrington. Details G1EFU.
GB2BHS - BALSHAWS HIGH SCHOOL: Leyland, Preston. Details G4BEE.
GB2JCW - JOHN CHARLES WESLEY: The Methodist Church, Walsall, W.Mids. Details G4FAJ.
GB2LOW - LOW (POWER OPERATION): Preston Centre, Monks Dale, Somerset. Details G3CQR.
GB75SW - Sandye Place Middle School, Beds. Details G4MEO.

8 MAY:
GB1CDS - COASTAL DEFENCE SOUTHWICK: Boundary Fort, Southwick, nr Portsmouth. Grid: SU 628 069. Details G0JEZ.

10 MAY:
GB8BRR - BOLTON RADIO RALLY: Deane Sports Centre, New York, Bolton. Details G6HFF.

13 MAY:
GB0CDB - COASTAL DEFENCE 'B': Fort Brockhurst, Gosport. Details G4LIK.
GB0FTL - FINE TUBES LTD: Estover Trading Est, Devon. Details G4VFG.
GB2CDQ - COASTAL DEFENCE 'Q': Fort Grange. Grid: SU 591 002. Details G4LIK.
GB2LRS - LOUGHTON RADIO SOCIETY: Aylmers Farm, Sheering Lower. Details G4FKI.
GB4HSC - HIMLEY SAILING CLUB: Himley House Park, W.Mids. Details G4DAR.
GB4WCS - WORLD COMMUNICATIONS SUNDAY: Church Hall, Sacred Heart Church, Newcastle-on-Tyne. Details G4MRT.
GB75PRS - PEMBROKESHIRE RADIO SOCIETY: FE Centre. Boembroke. Details GW0IER.

14 MAY:
GB2DWR - DISTILLERS WHISKY ROUTE: Cardhu Distillery, Knockando. Details GM3MTH.
GB2IVS - INTERNATIONAL VENTURE SCOUTS: Monks Rest Park, Leicester. Details G4SJX.
GB2MSG - MIDDLETON ST.GEORGE: St.Goerge's Hotel, Darlington. Details G0BIA.
GB2QDS - QRP (LOW POWER) DX STATION: Haven Hotel, Conwy Court, Gwenedd. Details G0HVH.
GB4RAF/GB5ORAF - ROYAL AIR FORCE: Yorkshire Air Museum, York, Details G3FQH.
GB75SEM - SOUTHERN ELECTRICITY MUSEUM: The Old Power Station, Dorset. Details G3MDH.
GB75TOT - TREATMENT OF TODDLERS: Civil Service Sports Council, Solihull, W.Mids. Details G4NSG.
GB75TSF - TULLYALLAN SUMMER FAIR: Tullyallan Special School, Darwen. Details G2AKK.

15 MAY:
GB2STM - ST.MARY'S SCHOOL: Details G0FCV.
GB75HAC - HAPENDEN CARNIVAL: Rothamsted Park, Herts. Details G3SDG.

16 MAY:
GB2DWR - DISTILLERS WHISKY ROUTE: Cragganore Distillery. Details GM3MTH.

17 MAY:
GB75URC - UNITED REFORM CHURCH: Thornbury. Details G4ZOG.

18 MAY:
GB2DWR - DISTILLERS WHISKY ROUTE: Royal Lochnagar Distillery. Details GM3MTH.
GB2ECR - ELVASTON CASTLE RALLY: Elvaston Castle Country Park, Derby. Details G4PZY.

20 MAY:
GB0JWC - JOHN WESLEY'S CONVERSION: Reddish. Details G0JER.

(cont over)

NEWS & VIEWS

Events Diary

GB2CFG/G6CFG - CHESHIRE FOREST GUIDES: nr Brookvale Farm, Waverton. Details G3CVW/C11VV.
GB2DWR - DISTILLERS WHISKY ROUTE: Blair Athol Distillery. Details GM3MTH.
GB75BRC - BREDHURST RADIO CLUB: The Bell public house, Kent. Details G4ZTF.
GB75LRG - LEICESTER REPEATER GROUP: Victoria Farm, High Cross, Leics. Details G4IPL.

21 MAY:
GBOJAG - JAGUAR (DRIVERS CLUB) - The Paddock, Silverstone Racetrack. Details GOGOF.
GB2LSR - LONDON SOUTHAMPTON RAILWAY: Woking. Details G4VRN.
GB2RGS - ROYAL GRAMMAR SCHOOL: Buckinghamshire. Details GOGNH.
GB2RHF - RUGBY HOBBIES FESTIVAL: Ken Marriott Leisure Centre. Grid: SP 508 746. Details GODLB.
GB4CNS - CENTRAL NEWPORT SCOUTS: Little Thornes Farm, Cowes, IOW. Details G4FYI.
GB4CVS - CHIPSTEAD VALLEY SCHOOL: Coulsdon, Surrey. Details G6HC.

22 MAY:
GB1CDJ - COASTAL DEFENCE 'J': Round Tower, Portsmouth. Details G6MWY.
GB1CDK - COASTAL DEFENCE 'K': Fort Gilkicker. Details G1BHG.
GB1CDM - COASTAL DEFENCE 'M': Fort Monkton. Details G1BHG.
GB1CDQ - COASTAL DEFENCE 'Q': Square Tower, Portsmouth. Details G6MWY.
GB1CDV - COASTAL DEFENCE 'V': Spit Bank Fort. Details G6MWY.
GB75YYY - LINK UP OF RADIO YORK (AUS.): Tollerton. Details G3TMN.

23 MAY:
GBOFOB - FRIENDS OF BRUCHSAL: Llanyrafon Playing Fields. Details GWODHO.
GB75SAC - SUTTON & CHEAM RS: Cheam Park, Surrey. Details GOAXA.

24 MAY:
GBORRS - RED ROSE SILVER: Manchester. Details G4NRN.
GB75USA - GREAT BRITAIN/ USA: Darley ARC, Harrogate. Details GOFWG.

26 MAY:
GB2CDU - COASTAL DEFENCE 'U': Culver Down. Grid: SZ 627 588. Details G4RGE.

27 MAY:
GB1HAM/GB4HAM/GB75HAM - HAM AID MONDIAL: Clench Common, nr Marlborough. Grid: SU 183 644. Details G1FFS/GOHFX/G4TIX.
GB2HR - CLUB ANNUAL SPRING CAMPING: East End Methodist Campsite, Essex. Details G4RNB.
GB4EWD - ENDON WELL DRESSING: Stoke-on-Trent. Grid: SJ 927 537. Details G4KME.
GB4PRS - POOLE RADIO SOCIETY: Commander's House, Poole, Dorset. Details G4XYX.
GB500 - PAISLEY 500 CENTENARY: Town Hall, Paisley. Details GMOBLX.
GB8GS - GLANFORD SCOUTS: Primrose Campsite, New Forest, Scamby. Grid: SE 954 074. Details G3OUX.

28 MAY:
GB1CDP - COASTAL DEFENCE 'P': Portchester Castle. Details G6MWY.
GB2CAS/GB75CAS - CROYDON AIR SHOW: Old Croydon Airport. Details G4WAY.
GB4SKY - SKYE: Isle of Skye. Details GOCNR.
GB75HCD - HERTFORD COUNTY DAY: Hartham Common. Grid: TL 328 132. Details G3WFM.

29 MAY:
GBOTTT - THAMES TV TELETHON: Haymill Community Centre, Slough. Details G4XDU.
GB4KVS - KINGSWOOD VOLUNTARY SERVICE: Kingswood Centre, Bristol. Details G3ZKI.
GB4SWR - SUFFOLK WIRELESS REVIVAL: Civil Service Sportsground, Suffolk. Details G4IFF.
GB75MSD - MABE SHINDIG: Treliever Cross. Details GOFHT.
GB75WLG - WORCESTERSHIRE LIONS GROUP: Halfway Lock Cottage, Stoke Prior, Bromsgrove. Details GOBIR.

30 MAY:
GB2CHF - CLITHEROE HERITAGE FAIR: Grid: SD 74. Details GOIYT.

1 JUNE:
GBORRR - RED ROSE RALLY: Manchester. Details G3BSA.
GBOTAC - (MERCURY) TRANS-ATLANTIC CABLE: Brean Sands, Somerset. Details G4SIY.
GB2JW - JOHN WESLEY: Stockton Heath Church Hall, Warrington. Details G4OEX.
GB2OTR - OLDE TYME RALLYE: The Showground, Main Rd, Colchester. Details G3FIJ.
GB5GC - GEDDINGTON CROSS: Geddington Village Hall, Northants. Details G4KXG.
GB5HC - HORSHAM CLUB: Details GOGMS.
GB5MS - MACCLESFIELD SOCIETY: Details GOAXE.
GB6DDP - DENBY DALE PIE: Clarkemont House, Huddersfield. Details G6TSW.
GB6DP - DENBY (DALE) PIE: Huddersfield. Details GOBFJ.
GB6MWS - MACCLESFIELD WIRELESS SOCIETY: Grid: SJ 949 676. Details GODMU.
GB75WFX - WFX (CALLSIGN OF FOUNDER OF NORTHAMPTON RC): Kingsthorp Community Centre, Northampton. Details G4SVX.
GB75WVW - WALDERSHARE VINTAGE WEEKEND: Waldershare Park, nr Dover. Details GOBPS.
GB8RRS - RED ROSE SILVER: Details G1100.

2 JUNE:
GBOSMC - ST.MARY'S CHURCH: Church Hall, Ipswich. Details G4YUG.

3 JUNE:
GB2MAR - MARCONI (ARS): Details G3FWE.
GB75CL - CARE LINK: Highcliff Day Centre, Highcliff, Dorset. Details G3MDH.

4 JUNE:
GBOCDX - COASTAL DEFENCE 'X': Golden Hill Fort, IOW. Details G3RJK.
GB1CDG - COASTAL DEFENCE 'G': Fort Gomer. Grid: SZ 587 989. Details G6MWY.
GB2RAF/GB50RAF - ROYAL AIR FORCE: RAF Henlow, Beds. Details G4MXG/G3DCA.
GB4BRC - BRITISH RED CROSS: Springburn Parish Church, Glasgow. Details GMOEWW.
GB4RRS - RED ROSE SILVER: Details GOFRL.
GB4WFS - WOMBOURNE FIRE STATION: Wombourne, Staffs. Details G4YVX.
GB75LOF - LEAGUE OF FRIENDS: Southmead Hospital League Fete, Bristol. Details GOCEN.
GB75PL - PONTYPRIDD LIONS: E. Glamorgan General Hospital, Mid Glams. Details GWODIV.

5 JUNE:
GB1CDS - COASTAL DEFENCE SOUTHWICK: Boundary Fort, Southwick, nr Portsmouth. Grid: SU 628 069. Details GOJEZ.
GB2PPC - PRIOR PARK COLLEGE: Bath, Avon. Details G3LYW.
G4ACH - ALNE CHESHIRE HOMES: York Racecourse. Details G3ZKS.

NEWS AND VIEWS

HF

*John Allaway, G3FKM**

NRHF Clandestine Field Day

On Saturday 28 May, Norsk Radiohistorik Forening (NRHF) will be taking vintage communication sets, including equipment used for clandestine operations during the second world war, to an open-air location similar to those used for wartime operations. As many of these sets were used for communication with the UK, it is particularly hoped to work British cw stations during the event, although calls will be taken from any country.

Station LA1D would like to make contact with anyone interested in vintage radio. Tom Mos, LA5CL, comments: "It will be nice if other stations use vintage equipment too, but we don't mind if stations with modern equipment call us. We may have some more up-to-date equipment ourselves in case conditions become too difficult – at least on the receiving side". LA1D will be operational with the following time/frequency schedule; it is thought that it may be difficult to reach G on 3·5MHz, but there should be a good chance on 14MHz: 0700-0800, 3,508kHz; 0800-0900, 14,080kHz; 0900-1000, 3,508kHz; 1000-1100, 14,080kHz; 1100-1200, 3,508kHz; and 1200-1300, 14,080kHz. If QRM is bad, 3,515 and 14,094kHz will be used.

NRHF operates an "antique" net on 3,508kHz cw and 3,603kHz a.m every Saturday from 0730. They call "CQ Ant" and would be pleased to hear from British stations running vintage equipments. Further information is available from Tony Smith, G4FAI, 1 Tash Place, London N11 1PA.

Western Sahara — RASD — new DXCC country

On 12 February, 1988, the ARRL announced the addition of Western Sahara — RASD — to the list of current DXCC countries. The original petition for separate country status was submitted by the Lynx DX Group on 1 August 1987, and the proposal was referred to the DX Advisory Committee for consideration. In mid-January this year the outcome of DXAC deliberations was made public — 15 votes in favour and one abstention. The ARRL Awards Committee took a unanimous 7 to 0 vote to accept the DXAC recommendation on 12 February 1988.

AP2ARS, the HQ station of the Pakistan Amateur Radio Society in Lahore. On the left is the president of PARS, Khan, AP2UR, with Wali, a listener who should have his licence by now

The first amateur radio operation from Western Sahara — RASD by EA2ANC, EA2JG and OH2BH, hit the airwaves on 18 October 1987. Their seven-day expedition put a heavy emphasis on training local Saharawi operators, and the first Saharawi licensee, Naama, S01A, commenced operations under the auspices of the newly-established Club de Radioaficianados Saharauis, S0RASD. Kenwood Corporation made a major equipment donation for the new amateur radio group. The original expedition netted some 12,000 contacts but Naama's continued operating has so far added some 5,000 contacts to that total. Local Saharawi cw operators have recently showed up on the air. Mulai, S01MM, and Mafud, S01MD, have provided S0RASD contacts in a highly professional manner.

QSL cards will be mailed from 20 February 1988. The card is an impressive four-colour affair. All cards for S0RASD will be handled by EA2JG. The S0RASD group — EA2JG, EA9IE and OH2BH — was due to visit the Visalia and Dayton Conventions. A new baby was born — DXCC counter 319 is here today (Thanks, OH2BH).

Changes to DXCC

Several important changes to the ARRL DXCC programme were approved at the ARRL board meeting in January. DXCC is to continue in its present form but endorsable single-band awards will be available for 3.5, 7 and 28MHz. Two-way contacts since 15 November 1945 may be used in claiming them. The Five Band DXCC will also be endorsable for additional bands but these will not, of course, include 10, 18 or 24MHz yet. (IARU Region 2 has decided not to issue awards for 10MHz, and this of course includes the USA; likewise the 18MHz band has not yet been released to USA amateurs.) Full details of the new categories and how to apply are yet to be announced.

The "DXCC Country Workshop" at ARRL HQ in Newington. From left: John, W1XX: Martti, OH2BH; Jules, W2JGR; and Don, W3AZD

DX news

Official news on prefixes shows that United Nations amateur stations should now use 4UA-4UZ. Aruba is P43 followed by not more than three letters. Netherlands Antilles is PJ2AA–PJ2ZZZ (Curacao), PJ4AA–PJ4ZZZ (Bonaire), PJ5AA–PJ5ZZZ (ST Eustatius), PJ6AA–PJ6ZZZ (Saba), PJ7AA–PJ7ZZZ (St Maarten). Tuvalu now has T20AA–T29ZZ available.

More new stations in the **Antartic** — Y24LN is probably active by now and will be at the Georg Forster research station for a year. His callsign is probably to be Y88POL, and he will be on all bands with cw, ssb and rtty. ED0BAE is the Antarctic station "Juan Carlos 1" on Livingstone Is in the **S Shetlands**. Station operator EA4YW is on the air daily at 1400 and 2100 on 14,010, 14,200, 21,010 or 21,200kHz.

According to *DX News Sheet*, G3NOF has received a letter from BY4SZ which says: "For the sake of developing friendly relations with foreign radio amateurs and promoting technical exchange, the Chinese Radio Sports Association, Suzhou Branch, would cordially welcome foreign radio amateurs to visit China, make a tour, give lectures and attend BY4SZ station activities. . . . Suzhou's radio amateurs look forward to meeting their friends on the air, and would warmly welcome visitors from around the world and make every effort to help them to economise on travelling and hotel expenses and assist with visa applications. For further details please write to: CRSA, Suzhou Branch, PO Box 51, Suzhou, PR China."

*10 Knightlow Road, Birmingham B17 8QB.

Julian, LU1XQH, (left) and Terry, G3MHV/W6, with a view of Ushuaia in the background. Ushuaia is on the south side of Tierra del Fuego and is the southernmost city in the world

ZL7TZ is a permanent resident on **Chatham Is** and frequently receives visitors; the *Long Island DX Bulletin* says that he is often on 7,025kHz around 0600. KX6HE has returned to the **Marshall Is** and is expected to appear on rtty and Amtor as well as ssb and cw on all bands from 3·5 to 28MHz.

The *Bulletin* of the Bangaldesh Amateur Radio League issued in December 1987 reports that BARL has a new HQ. However, an application for a licence for the club station had made no progress and those applications which had been made by individuals and cleared by the security services had gone to the Home Ministry but had been lost. BARL is making every effort to have licences issued again.

G3JGB reports that there will be an expedition to Nagorno Karabakh oblast (UD6K — No 003) during the second and third weeks of June. Callsigns may include UA3WAV/UD1K and UA3WAX/UD1K. Operation will be on all bands 1·8 to 28MHz, RS satellites, and also 144MHz.

The Council of Europe Radio Amateur Club, TP2CE, will be using the special prefix TP0 between 24 and 26 June and at a later date to coincide with the visit of His Holiness, Pope John Paul II to Strasbourg in October. This is in support of the 1988 European Campaign for North–South solidarity. The callsign is likely to be TP0PAX. Donations sent with QSLs will go to an amateur radio medical association (DJ0MAR) which is active in developing countries.

It is believed that SM0DQE did obtain permission to come on the air from **Mozambique** for a limited period in mid-February and restricted to one frequency. According to *DX News Sheet*, at the time of writing there was a possibility that there was another station on the air from **Somalia**. TL8SC has a schedule with QSL manger K4UTE at 1830 on Mondays on 21,306kHz and works all-comers afterwards.

DX Report from VK9NS says that due to interference from a harmonic of Radio Tirana and a Soviet rtty station, the well-known 14,220kHz net has been moved to 14,222kHz. Jim believes that the net on 220 was the only one in existence which had Albania always on the frequency! He asks for tolerance if this move inconveniences others.

Plans for the previously-mentioned expedition to **Palmyra Is** and **Kingman Reef** were on target at the time of writing. W0RLX/KH5, on Palmyra, was expected to be on the air from 23 to 30 April, and K9AJ/KH5 on Kingman Reef from 1 to 8 May. Donations with QSL cards would be much appreciated by the group, which includes K9AJ, F6EXV, DJ8NK and WA2MOE.

An amateur gathering at an unusual place, the Canadian Dept of Transport Staff House, Resolute Bay Airport, NWT, on 28 February 1988. L to r (seated) Morag Howell, G1ILL, wife of GM4DMA; Sir Ranulph Fiennes, Bt, leader of the British Expedition which hoped to walk to the North Pole; Barry Garatt, VE3CDX; Tom Atkins, VE3CDM, president of CRRL and Canadian communications chief Polar Bridge Expedition; Garth Hamilton VE3HO; (standing) Lawrence Howell, GM4DMA, base commander British expedition; Jeff Jayson, K2LCI, ABC Television NY; Robert Danelen, KF6SP, ABC Television, Hollywood, Cal

TP2CE

F6FQK has asked for some publicity to be given concerning the unsuccessful applications by the Council for Europe RAC for DXCC status. The original submission drew attention to the fact that the recognition of the Sovereign Military Order of Malta as a sovereign state was approved in 1961, and that it is an organisation which very much resembles the Council of Europe which was created in May 1949. The Council has a secretary-general and a committee of ministers representing the 21 member states and has an extra-territorial location. In reply to this the chairman of the DXCC pointed out that there have been inconsistencies in the past and that as part of the present review of DXCC it has been decided to have deletion criteria — something not previously available. However, it is felt that all countries presently listed should be exempted from the deletion criteria.

Golden Antenna Award

For the seventh time the town of Bad Benthiem will, this year, symbolically award a radio amateur a 'Golden Antenna' for an outstanding humanitarian achievement in the field of amateur telecommunication. This year as well, the winner will receive this award during the "German-Dutch Radio Amateur Week (DNAT)" from 25 to 28 August. Organisations of radio amateurs are asked to submit proposals for this award to: Stadt Bad Bentheim, Schlossstrasse 2, D-4444 Bad Bentheim, FR Germany, by 15 May 1988. It is especially pointed out that only applicants who have achieved an outstanding humanitarian feat in the field of amateur telecommunications will be considered. The decision on this award will be made by a committee consisting of representatives of the town of Bad Bentheim and the presidents/chairmen of IARU, VERON, VRZA and DARC. The town of Bad Bentheim will defray all expenses incurred with the journey and accommodation of the winner. The decision on the award is not subject to the jurisdiction of courts.

Contests

The results of the **1987 UBA SWL Competition** reveal only five UK listeners amongst the 84 entrants. **RS28189** led this group with 76,608 points in the ssb section, and RS88825 74,200. In the cw category **RS52868** scored 58,201 points, and RS84869 47,460.

In the **1987 ON Contest** (3·5MHz cw section) **G4IQM** was 5th with 3,240 points, G4UOL came 8th with 3,240, G4OGB 9th with 2,904, G3XWZ 10th with 2,772, and G3WZ 12th with 2,244. In the 3·5MHz ssb section **G4IQM** came 5th with 3,726 points.

World Telecommunication Day Contest
0000 21 May – 2400 22 May
This is sponsored by LABRE (the Brazilian national society) in celebration of World Telecommunications Day on 17 May.

There are two contests, phone and cw, and they are entirely separate. They cover 1·8 to 28MHz, and there are single-operator multi-band, and multi-operator multi-band single-transmitter sections. Exchange report plus ITU zone (UK is in zone 27). QSOs between stations in different countries on the same continent count two points on 1·8, 3·5 and 7MHz and one on the hf bands. Between stations in different continents these become four and two respectively. QSOs with own country are allowed for zone multiplier credit only. A station may be worked on each band. The multipliers are the total of the 75 ITU broadcasting zones worked on each band added together. Logs must show time, numbers sent and received, if new zone multipliers, and separate sheets must be used for each band. Enclose summary sheet detailing category entered, callsign, name and address, and the usual signed declaration. Post before 31 July to LABRE, WTD Contest Committee, PO Box 07-0004, 70000 – Brasilia (DF), Brazil. Certificates will be awarded to top scorers in each country.

Results of the **Italian DX Contest 1987** single-operator ssb section show that G3VOF scored 75,900 points, GW4HSH 48,380 and GM4ELV 13,924. In the cw category G4UOL scored 51,072 points and G4JMI 5,658. G3VZT scored 24,764 in the mixed-modes section and G4TXM 3,800. **G3VOF** was listed as world sixth in his section.

The CQ-M Contest
2100 14 May to 2100 15 May
Single-operator single and all-band and multi-operator single-transmitter sections.

There is also a listener section. SSB and cw on 3·5, 7, 14, 21 and 28MHz as well as through satellites with downlinks on 28MHz from 144MHz — these count as a further band. Activity must be confined to the following areas: (cw) 3,505–3,600, 7,005–7,100,14,010–14,100, 21,010–21,160 and 28,010–28,200kHz; (ssb) 3,600–3,650, 7.040–7,100, 14,150–14,350, 21,200–21,450, and 28,400-29,100kHz. Exchange RS/T plus serial QSO number. USSR stations will also give the number of their oblast. QSOs in same continent count one point and between different continents three; own country may only be worked for multiplier credit. Stations may be worked once on each band on cw or ssb but not both. Listeners score one point for logging one exchange, three for logging both. The multipliers are the countries listed on the "R-150-S" list. Final score is total of multipliers from all bands times total QSO points. Send logs by 1 July to: CQ-M Contest Committee, PO Box 88, Moscow, USSR.

CQ WW WPX CW Contest
0000 28 May – 2400 29 May
More information was given in the March column. Photocopies of the detailed rules are still available (sae please).

In the **1987 WAE DX Contest (CW section)** UK scores were as follows: (All-band section) **G3FXB** (390,910 points), **GM3CFS (21,110), G3ESF (21,068), GI5TK** (1,035) and G6QQ (1,026); (High-band section) **GW3JI** (488 points). Congratulations to **G3FXB** whose score placed him second in the world listing in the all-band section.

Awards

Council of Europe Award
Issued by the Council of Europe RAC to licensed amateurs and listeners. QSOs may be on all cw, all ssb or mixed modes. The second-class award requires 22 QSOs with the 21 member states of the Council of Europe plus one with the station in the Strasbourg HQ, TP2CE. The first-class needs 22 QSOs with the 21 states plus TP2CE on each of the bands 3·5, 7, 14, 21 and 28MHz — a total of 110. This will be signed by the secretary-general. All QSOs must have been since 1 June 1986. Send QSLs with a detailed list of contacts plus US$9 or 16 ircs to: Award Manager Francis Kremer, F6FQK, 31 Rue Louis Pasteur, F-67 490 Dettwiller, France. The C of E countries are: CT, DL, EA, EI, F, G, HB0, HB9, I, LA, LX, OE, ON, OZ, PA, SM, SV, TA, TF, 5B and TP2CE.

Worked All VK Call Areas Award
GM3VEY reports that there is confusion over which address to send applications to for this award. He has heard from VK5AKH who is Rev Ken Hall, St George's Rectory, Alberton 5014 SA, Australia, who is the current custodian. However, WIA appoints awards managers every three years and there could be another change in November of this year.

Odense Anniversary Award
This celebrates the 1000the anniversary of Odense and is sponsored by the Odense Division of EDR. It is given to those who contact OZ1OOO, OZ3FYN, or OZ5HCA, and other stations in Odense between 1 January and 31 December 1988. Any bands/modes may be used and minimum report accepted is 339. DX stations need five points, Europeans need 10. QSOs with OZ1OOO count five points, with OZ3FYN three, and other Odense stations one. OZ5HCA will only be active from 10 July to 17 July. Each call counts once per band. Listeners may apply. Send copy of log with US$5 or 10 ircs to EDR Odense Division, PO Box 134, DK-5100 Odense C, Denmark, no later than 31 March 1989.

28MHZ COUNTRIES AWARD

The 28MHz Countries Award was introduced by the RSGB to encourage use of 28MHz during the sunspot minimum years. The award requires confirmed contacts with 40 of the countries/regions of the UK, Channel Islands and Isle of Man; contacts to have taken place since 1 April 1983. Endorsement stickers are available for 60 and all 77 counties/regions confirmed.

IARU REGION 1 AWARD

The IARU Region 1 Award, available in three classes, is for confirmed contacts with amateur stations in the member countries of IARU Region 1. The three classes are for contacts as follows:

Class 1 . . . All member countries in the current list
Class 2 . . . *45 member countries*
Class 3 . . . 30 member countries

Applicants should note that there are now 61 countries in the IARU. An up-to-date list is available from the hf awards manager. A special version of the IARU Region 1 award is available, in the same three classes, for confirmed contacts made on 28MHz since 1 July 1983.

These awards are also available to swls on a heard basis.

CONCLUSION

This concludes our short series detailing the RSGB's range of hf awards. It should be noted that the Commonwealth Century Club awards, details of which appeared in the December 1987 issue of *Radio Communication,* replace the earlier Commonwealth DX awards which will gradually be phased out.

All the awards featured this month are available from the RSGB hf awards manager, GW4BKG, QTHR, who can often supply further details and an application form to simplify the process of applying. It is important when applying for awards to include sufficient payment to cover the return postage for QSL cards, in addition to the fee for the certificate itself. At present no awards credit is given for contacts made on the 10, 18 and 24MHz bands. Except where otherwise stated, the fee for RSGB awards is £1.50. UK amateurs who are not members of the RSGB may not apply for the various awards, though overseas amateurs who are not RSGB members may do so. The charge to non-members is £3, 12 ircs, or US$4. In the case of overseas claims, it is not usually necessary to send QSL cards. Send a list of cards, certified by the awards manager of the national society in the applicant's country. However, QSL cards must be sent when the claim is for a cup or plaque. Class B licensees are encouraged to apply for the RSGB's hf awards on a "heard" basis.

Band reports

A full (and very interesting) G8KG report this month which goes as follows: "In an earlier letter it was pointed out that the solar activity does not increase steadily but by a series of sharp rises followed by pauses. The last sharp rise was in the early autumn of 1987, but during the five months to February 1988 there was a very marked pause, with the three-month mean sunspot number hovering between 42 and 45 (monthly mean solar flux between 94 and 108sfu). Except during the several periods of major geomagnetic disturbance, the winter saw much improved conditions on the higher bands up to and including 21MHz. Above that, particularly on 28MHz, conditions from December to February were very disappointing when compared with October and November, but this serves to underline the small, but on this occasion critical, seasonal difference between the periods before and after Christmas. A distinct improvement on 28MHz and some excellent spells on 21 and 14MHz in early March may be an indication that the pause is over.

"The winter dx season will be over by the time this appears in print, so it is a suitable time to survey the current clues to the possible height and timing of the peak of Cycle 22. In doing so we must remember that official prediction methods use 'smoothed monthly numbers' which are approximately (but not quite) averages of 12 consecutive months of sunspot data — the latest smoothed number is 35 for August 1987, the average of March 1987 to January 1988 plus *half* of February 1987 and February 1988. There are good reasons for using this heavy smoothing since the 'spurts' and 'pauses' are not yet predictable, but the *actual* monthly average can be as much as 40 per cent above the smoothed number, something which users of programmes such as Minimuf and Miniprop would do well to bear in mind.

"Despite the 'pause' mentioned above, the smoothed monthly numbers are still rising steeply, due partly to the dropping off of the low values of 1987. A simple forward prediction of the present trend points to a peak of around 230 in the spring of 1990, but this should be seen as no more that the most optimistic 'guesstimate' that the data justifies. It is not entirely fanciful, since Cycle 22 continues to be ahead of Cycle 19 which reached 200, but if it stays ahead it will become the highest on record.

The method used by NOAA Boulder is rightly more conservative, but nevertheless the January data caused another upward revision, the predicted peak now being 181 in late 1989, and this looks set to go higher. SIDC Brussels, using a different method, has now moved its prediction upwards to 130-140 in early 1990. This corresponds closely with the consensus prediction based on the 'geomagnetic precursor' principle which was attempted in *HF News* in November — but only time will tell!

"To summarise, present indications are that readers would do well to prepare for a high, if not very high, solar peak in the 1989-90 winter dx

1988 ALL-BAND TABLE No. 1

	1·8MHz	3·5MHz	7MHz	14MHz	21MHz	28MHz	Total
G4OBK	60	14	36	40	20	13	183
GM4ELV	—	6	20	42	38	31	137 (QRP)
G4FVK	9	2	7	11	4	—	33

Next deadline — scores **to G3GIQ by 9 May** please.

1988 28MHz COUNTRIES TABLE

G3VOF	77
G4MUW	71
G4XAH	62 (ssb)
G4JBR	50
GD0ELY	36
G4XAH	35 (ssb)
GD4XTT	34
G0DNV	34
G4NXG/M	26
G4OBK	11

10MHz COUNTRIES TABLE

	All-time	1988
G3PJT	101	—
G3JJG	100	11
G4VDX	71	—
G4YWG	64	—
G4OBK	57	—
G3SED	26	26
G4XRV	19	18
G4YSN	1	—

QTH CORNER

CI8C	Box 313, Don Mills, Ontario, M3C 2S7, Canada.
ED8ZI	Ulla Nygren, SM5IWC, Langbron 997, S810 65 Skerolinge, Sweden.
EP2ASZ	Saeed Hassany, PO Box 14155-1941, Tehran, Iran (do not mention callsign on envelope).
FO0VU	DJ3HJ, PO Box 1224, D-7814 Breisach, FR Germany.
H44VU	DI1MCY, Birkhahnstr 30, D-8172 Lenggries, FR Germany.
KC6VU	(East) DL2MDZ, Wackersberger Str 28a, D-8172 Lenggries, FR Germany.
KC6VU	(West) DF7CC, Rain 3B, D-8172 Gaissach, FR Germany.
HIDXA	KH1 expedition. QSL to HIDXA, PO Box 90, Norfolk Is, 2899 S Pacific.
KH2/DL1VU	DL1VU, K Hille, Goethestr 3, D-8172 Lenggries, FR Germany.
K9AJ/KH5 **W0RLX/KH5**	WA2MOE, S Greene, 9 Tamarack Dr, Peekskill, NY, 10566, USA.
KH0/DL1VU	DK5EX, Arzbacher Str 7, D-8172 Lenggries, FR Germany.
K2SG/KP1 **N2EDF/KP1**	VIA N4GNR, Dan Cisson, PO Box 433, Tolloa, Ga, 30577, USA.
KX6/DL1VU	DL4YAH, Kolpingstr 14, D-4358 Haltern, FR Germany.
T22VU	DJ9ZB, Carl Kistnerstr 19, D-7800 Freiburg, FR Germany.
ZC4NC	(correction) via ZC4 Bureau, JSB, BFPO 53, London.

season. Of more immediate interest, we can reasonably expect to see some months with mean numbers in the region of 100 by the third quarter of this year and they might even approach the 150s. If they reach the middle of this range this would mean that, on an average day, we should expect dx on 14MHz throughout the 24h, 14h or more of dx on 28MHz and medial mufs on some of the more southerly paths reaching the 40MHz mark — 50MHz enthusiasts please note and apply their own 'HPF' multiplier!"

So with these encouraging comments, on to list of stations reported, which this month has been supplied by G2HKU, G5JL, GM3CSM, G3s GVV, IGW, JJG, SED, G4EHQ, GW4KGR, G4s MUW, NXG/M, UZN, XAH, GD4XTT, GD0ELV, and G0HGA — to all of whom, many thanks. As always, stations which were using A1A are listed in italics:

1·8MHz 0300 *UA9FAR, W1-W4, W8, W9.* **0700** *J6LTA.* **2100** *UD6BDN.* **2300** *VE1ZZ.*

3·5MHz 0100 *WP2ABX.* **0400** *K8WW/VP9.* **0500** *J3VA, 8P9EK.* **0600** *CN2AQ, J34LTA, PY, YV, 4K1LPU, 7X3DA.* **0700** *ZL2QW.*

7MHz 0000 *PY0FZ, V31HE, OH6XYI4UIYK, 4S7EA.* **0100** *C53/DF3ZJ.* **0300** *CO7MF.* **0500** *LU2YE, NP4A.* **0700** *J6LTA, W6-W7.* **0800** *ZL0AFG/9.* **0900** *V31TP.* **1600** *4K0E.* **1700** *VS6DO.* **1900** *KX6CS, OX3KD, VU, ZS.* **2100** *VK8AV.* **2300** *H13JH, P4/DL7AEY, PY0FC, S0RASD, VS6DO, VU2FOT, ZD9BV, ZS, 5H1HK.*

10MHz 0900 *UH8BAF, VK2, VK5.* **1200** *OY7ML.* **1800** *JW0B.* **1900** *VK9LM.* **2000** *J34WG.* **2200** *J6LAD/9Y4.*

14MHz 0800 FK8s *FG,* KAD, KC6HA, VS6EC, ZD7AL. **0900** BV2FA, G4DUW/DU1, *TU4GR, VK9NS, WL7BDK/QRP.* **1000** *FK8/DL4MBE.* **1100** EP2ASZ, PA3AXU/SU. **1200** *JW0B.* **1500** J28IO, 9V1VY. **1600** FR5ZN, *N6EK/IHC8,* VU, YB, 4K0D. **1700** A61AB, CI8C, KC7K (Nev), NL7BL, *W6KG/4S7.* **1800** S92LB, TL8HW. **1900** KH6FKG, *P43ARC,* T5GG, 3B8FP. **2000** J87BO, PY0FC, V31AR, *4K1J,* 5X5GK. **2100** S0RASD, *VP2VI,* 3D6AN. **2200** J52US, TZ6VV. **2300** *9L1GG.*

18MHz 1400 *J34WG.* **1600** *VK1BBL.*

21MHz 0000 FG5RM. **0900** *A61AB,* BY4AA, JA, TU4CT, *VS6UN,* 3C1MB. **1000** D44BC, P29KGW, PY0FC. **1200** AP2ZR, FY5EM, VP8QP. **1300** F2JD/A6, C56/DL6NA, FT52ZM, J52US, DK8JZ/J7, XX9JN. **1400** VS6BL, *ZF2HM.* **1500** *S0RASD.* **1600** *N6EK/IHC8, 4KIJ.* **1700** *C56/DJ1RL, TR8JLD,* VE6–VE7, W6–W7. **1800** EL8BS, VR6ID, ZD8HCF. **2000** *HK0BKX,* W1–W0, 5H3RB. **2100** FH5EM, VP8BGA.

24MHz 1100 *KP2J.*

28MHz 0800 VO1KS/SU. **0900** TU2QQ, VK6, YB0SY, *ZC4EE.* **1000** OD5RF, UM8MIG, VK6, YC0SGT, YI1BGD, 3B8DB. **1100** OD5QZ, VU2RCK. **1200** A92BE, *EA8ATB,* S0RASD, 4S7EF. **1300** A4XVT, J52US, JY9LC, LU, PY0FZ. **1400** D68AM, FR5EL, FT5ZB, PA3AXU/SU, 6W100ME. **1500** DU1AO, S0RASD, VP8BPZ. **1600** A22FN, K2NG/P/PJ4, TA3D, *TZ6F,* 7Q8DP. **1700** PY5TT. VP8BDA, **5N9GM. 2200** ZD8MB.

Thanks go to the authors of the following for news items: *CQ Magazine* (W1WY), *DXNL* (DL3RK), *Long Island DX Bulletin* (W2IYX), *DX News Sheet (G4DYO), The Ex-G Radio Club Bulletin* (GI3OEN/W6), *Long Skip* (VE3IPR), *Lynx DX Group Bulletin* (EA2JG), *DX Report* (VK9NS), and *DX'press* (PA3CXC).

Please send everything for **June** issue to reach me no later than **Saturday 7 May.** □

HF F-layer propagation predictions for May 1988

The time is presented vertically at two-hour intervals 00(00)gmt for each band, ie 00=0000, 02=0200, 04=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 50MHz F-layer and 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	.....	.....	...12221232.	...345445651	214666667885	766544445789	753211112468	42.....45
MALTA	.....	.....1..	...12222243.	...355445762	423777677897	977655455789	986322223578	++3.....24+
GIBRALTAR	.....	.....	....1...122.	32222541	2..466666885	855765555799	987532223578	++42.....24+
ICELAND	.....	.....	.....	.....111112.	1...34444564	633455555678	776532223456	5542.....24
** ASIA								
OSAKA	.....	.....	....11111...	...13333312.	1.1243234463	....2...2463	.....23.	.....
HONGKONG	.....	....11..1...	...1232233..	..1244345531	1.1133235774	2.....2475	253	.....2.
BANGKOK	.....	...1121111..	..123433442.	..1345446641	211113235786	3.....2477	1.....255	22
SINGAPORE	.....	...1121121..	..134433442.	..234544664.	211123235784	3.....2477	1.....256	23
NEW DELHI	.....1.....	...1121121..	..133433442.	..2334446652	322112235786	62.....2478	4.....256	24
TEHERAN	....111.11..	...22222331.	..2444445651	1.4544457873	545322235788	852.....2578	63.....257	4.....24
COLOMBO	....111.1...	...223223...	..144544622.	..2445457452	432113235687	73.....2578	5.....257	2.....24
BAHRAIN	...11111221.	...22332342.	..2445556752	1145445578884	655211235798	862.....2578	73.....257	4.....24
CYPRUS	...11111221.	...23333453.	..1566667762	2147777778885	767655566899	986322234689	8631....1368	+3.....35
ADEN	...1122233..	...234445521	1.1545567853	3245445578886	865311235799	973.....2478	751.....257	52.....24
** OCEANIA								
SUVA/S	.....	.....	......11.1..	....1122122.	..1243223542	..2321..243.	...1.....11.	.....
SUVA/L	.....1.	...1.....31	11.3.....63	32161.....74	22463111.263	..342...1431	...1.....11.	.....
WELLINGTON/S	.....	.....	.....	...12111..2.	112442121153	11332...2352	..11.....12.	.....
WELLINGTON/L	.....	1	11.1.....3	3213.....25	44561.....55	22442....253	..11.....12.	.....
SYDNEY/S	.....	....11.....	...232.....	..24541.11.1	113643223424	1.132...2464	...1.....251	.....2.
SYDNEY/L	.....	1	1.....4	31.1.....16	42253.....56	11242....163	...2.....141	.....
PERTH	....11.....	...223.....	..14551.....	1.35653.....	423353211122.	42..2...2462	1.....256	23
HONOLULU	.....	.....	.....11..	....11..2211	..11321144421	.13321..12..	..11.....	.....
** AFRICA								
SEYCHELLES	...1122231..	...2334453:.	1.1545667642	3145445577765	855212235789	963.....2478	74.....257	5.....24
MAURITIUS	...11222331.	...334445631	..1546667864	3.3545557887	715323235799	953.....2478	751.....257	52.....24
NAIROBI	...1123344..	...234556621	2.1545668854	523644557887	966421235799	9851....2478	772.....257	54.....24
HARARE	...11234552.	...233567741	2..555678974	511754557897	966622235799	9863....2478	774.....257	54.....24
CAPETOWN	....113541..	...1335662..	...46567861.	...675557732	42.653225776	87142...2478	7731....257	54.....24
LAGOS	....1135562.	...13256785.	21.3546668983	531664457896	985642124799	99741....1478	8741.....157	542.....24
ASCENSION Is	....1112463.	32346861	64457983	21..75446896	761153123789	98532....1478	7751.....157	552.....24
DAKAR	....1113453.	32356761	21.264566884	432475445897	876653122689	99742....378	7751.....47	552.....24
LAS PALMAS	....1..1122.	22233541	1..155556773	311476677896	865776666799	998643333589	886321..1268	++3.....35
** S. AMERICA								
Sth SHETLAND	......1343..	......25651.	......46784.	1457871	1.1..2224786	74521...1468	7751.....146	552.....3
FALKLAND Is	......13353.	......34576.	1567882	2....3556895	734213224688	98742...1358	7751.....136	552.....3
R DE JANEIRO	.....112243.	2244661	2....4466884	421.15555787	875233222589	99742....258	7751.....36	552.....4
BUENOS AIRES	......12233.	1244651	2..1.3466784	4213.5455787	8756.3223479	99741....148	7752.....15	552.....2
LIMA	.....12.	122241	2...1.344464	41.131444467	853452222247	98642.....14	7752.....2	442.....
BOGOTA	.....1.	111131	2....2233354	4...24444456	842343221136	98642.....4	6752.....1	342.....
** N. AMERICA								
BARBADOS	.....12.	1112231	2...14333464	41.125444477	853443221257	98642.....25	7752.....3	442.....
JAMAICA	.....1.	11121	1....1222244	4....2343346	742213221126	786421....3	5752.....1	242.....
BERMUDA	.....	11121	1....2222244	4....4333366	832223221246	786421....14	5752.....1	242.....
NEW YORK	.....	.....1.	112132	2....2223245	631.13222236	685321....13	4742.....1	.42.....
MEXICO	.....	.....1.	111132	2.....233234	5311..222113	47532.....	1542.....	.22.....
MONTREAL	.....	.....	111122	2....1222244	621.13222246	675321....13	3642.....1	.42.....
DENVER	.....	.....	1	1.....11112	4211..122123	35531.....1	1441.....	.....
LOS ANGELES	.....	.....	11	1.....11122	3111...23222	24531....1...	.241.....	.....
VANCOUVER	.....	.....	.....	11	21111..12222	23532....1...	.141.....	.....
FAIRBANKS	.....	.....	.....	.....	111232112221	123321..2211	..11.....	.....

The provisional mean sunspot number for February 1988, issued by the Sunspot Index Data Centre, Brussels, was 40·2. The maximum daily sunspot number was 74 on 4 February and the minimum was 12 on 23 February. The predicted smoothed sunspot numbers for May, June, July and August are respectively: (classical method) 50, 52, 53 and 55; (SIDC adjusted values) 52, 56, 61 and 64.

VHF/UHF

*Ken Willis, G8VR**

Happy Days, Hutch!

This is my last submission of copy to our editor, Alf Hutchinson, who is retiring after many years as editor of *Radio Communication*. There have been several occasions when Alf and I have not agreed over space allocations, but despite, or perhaps because of, this we have become, over the years, very firm friends, a relationship which I hope very much will continue into the future. I have always found Alf to be completely fair and unbiassed, and as a professional editor, prepared to stand firm rather than deviate from his determination that *Radio Communication* should set high journalistic standards. To achieve this was not always easy and there were occasions, particularly recently, when he had to face situations, beyond his control, which made it difficult for him to give the service to his readers which he always assumed to be their right.

Have a happy retirement, Alf. Let's hope that your successor is as determined as you have always been to keep the prose clear and readable, the commas in the right places and the quality of our journal up at the top where you carried it.

144MHz from Gibraltar

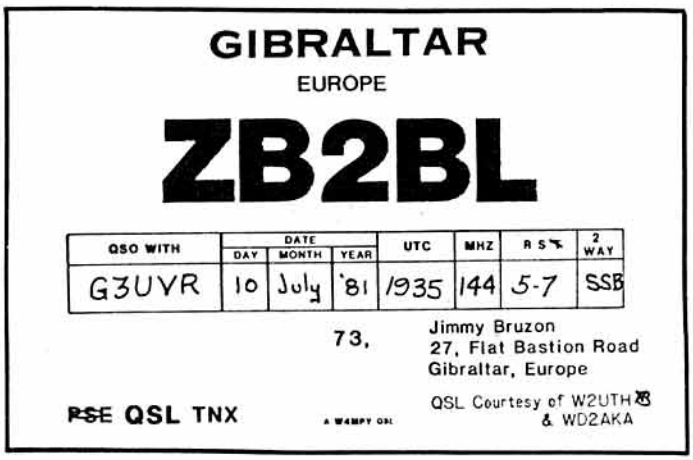
In March I asked how many stations had worked Gibraltar on 144MHz. G3IMV certainly had, and was very much hoping to receive a card to confirm the contact. An immediate response came from Denis Jones, G3UVR (Merseyside), who provided the QSL card illustrated here providing further proof, if any were needed, that ZB2 can be worked on 144MHz and a card received to confirm the QSO.

Gibraltan vhf interests have been firmly in the hands of Jimmy Bruzon, ZB2BL, for several years. His main interests have been in 50 and 70MHz operation, so while he has worked in the UK many times via sporadic-E on those bands, we have lacked an active 144MHz operator to activate this somewhat "rare" prefix when the band was open to neighbouring countries such as EA7, EA8 and CN.

Help is at hand, however, for I understand that the Square Bashers Group plan to be QRV from "Gib" from 31 May to 14 June this year, operating on the 50, 70, 144, 432 and 1,296MHz bands.

Whether it is still relevant I do not know, but G3UVR obtained his ZB2 card by sending an irc to W2UTH, who at the time was the QSL manager for Jimmy. He suggests it is worth a try since W2UTH may still hold the logs.

Over the air, Clive, G3POI, told me that he had worked Jimmy, ZB2BL, on 144MHz via meteor scatter "some years ago" and had a card to confirm it. Incidentally, Clive has worked no fewer than 66 countries on 144MHz. It is true that he had had the advantage of eme operation for some of the otherwise unobtainable prefixes, but can anyone beat this total for the band?



GIBRALTAR

EUROPE

ZB2BL

QSO WITH	DATE DAY	DATE MONTH	DATE YEAR	UTC	MHZ	RST	2 WAY
G3UVR	10	July	'81	1935	144	5-7	SSB

73,

Jimmy Bruzon
27, Flat Bastion Road
Gibraltar, Europe

~~RSE~~ QSL TNX

QSL Courtesy of W2UTH & WD2AKA

Proof of the pudding. ZB2BL – G3UVR sporadic-E contact, July 1981

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

70MHz

Roger Banks, G4WND (Staffs), is establishing a newsletter entitled *QSB* devoted to 70MHz operation, issued quarterly at a subscription price of £4 per annum. He emphasises that it is intended to complement rather then replace existing vhf news publications, and sees it fulfilling a similar role to that of *Six-News*. Having been active on the band for many years, Roger feels that it lacks a proper information service. It is a fact that the information I receive related to this band (and 432MHz!) is small by comparison with a typical month's input connected with 50 and 144MHz activities. For further details write to G4WND at Rivendell, Kiln Way, Polesworth, Tamworth, Staffs B78 1JF, or contact him on 144MHz packet through G4JBX-2 his local mailbox. Or call him on 70MHz of course!

Alex, GM3ZBE (Ayrshire), has been off the air due to matters which took him away from home, but he is now back and threatens to "come back to 70MHz and forsake 144MHz altogether". I am sure that he will be made very welcome on the band if he does so. Alex lives in a part of the world where he can put up antennas without fear of planning officers or neighbours. This was brought home to him recently when his temporary accommodation included "a postage stamp garden and very close neighbours" and where his 25ft long wire "proved about as effective as a dummy load!" I mention this because if, like most of us, you live in a built-up area where a three-element 70MHz beam is regarded as a monstrous array, then it is no wonder that 144MHz with its antennas having element lengths shorter than those used for broadcast antennas is preferred to the "longer" wavelengths. This goes for 50MHz operation of course, because here the antennas are even larger. I keep hoping that one day someome will come up with a really effective "miniaturised" vhf array. To a certain extent they do it on the hf bands, so why not on vhf? The late G6RH used a home-brew "squeezed-up" two-element antenna on 28MHz for his satellite work (he managed a satellite DXCC) which was smaller than my current 50MHz antenna and worked like a dream. So let's hear from some of you who have met and solved these problems.

Beacon notes

Costas, G7AHN (our first G7 correspondent), received a letter from SV1RD saying that a new vhf beacon, SV1VHF, has been established at the headquarters of the Radio Amateur Association of Greece. It operates on 144·900MHz, and the good news is that it is planned to relocate it soon at a much better site on Mount Pentell, near Athens. Reports of reception of this beacon would be appreciated, sent to PO Box 3564, GR-10210, Greece.

In his report to members of the 50MHz Reporting Club in February, Ray Cracknell, G2AHU, confirmed that the 50 and 28MHz beacons ZD8VHF and ZD8HF were shortly to leave for Ascension Island, and that thanks were due to Mike, G3JVL, who built them.

Ted Collins, G4UPS, has prepared a very fine list containing details of 75 50MHz beacons around the world which I will send to anyone who provides a sae plus 20p in stamps. I also have much other information of this type provided by Harry Schools, KA3B (Philadelphia), which I propose to reduce to more manageable form and offer to readers.

The report of reception of beacon VK6RTT on 52·300MHz by LA6QBA caused quite a stir. Most of us never listen as high up the band as this. RSGB *News Bulletin* reported that near the time of the report, G4ASH made contact on 28MHz with Mauritius and could hear stations in Turkey and Cyprus.

On 10 March, Geoff, G3ENY, was monitoring 28,885kHz when out of the blue cameVK6RO calling for 50MHz contacts, and no doubt beaming towards Japan. Since the beam direction favoured the UK, Geoff was able to have a 28MHz contact with the VK6, though the opening was very brief. The moral seems to be, monitor above 51·00MHz, you never know what might be lurking up there.

Alan Doherty, GI8YDZ (Co Antrim), has applied for authorisation to establish a 50MHz beacon in N Ireland in locator IO65PA at the home of GI0EYC. The specification is for a 20W transmitter feeding a half-wave dipole beaming 320/140°. The preferred frequency is 50·040MHz.

Jan-Martin Noeding, LA8AK, has built two new beacon transmitters. The first is LA9UHF (JP4OCM/EU32g) on 432·845MHz, running 20W to 2×21-element F9FT antennas beaming 030°. This is intended as a 432MHz auroral indicator and it transmits A1A from a site 1,200m asl. The second is a new transmitter for beacon LA6VHF which has been in operation for some years. The locator is KP59AL (PD4lh), an area where there is very little vhf activity which, Jan-Martin says, makes it a good spot for dxpeditions. LA6VHF runs 25W on 144·865MHz to a six-element Yagi beaming 210° from a site 70m asl. Its main purpose is for meteor scatter observations, the message format being "LA6VHF QTH

PD4lh" (15s) followed by callsign at 1,500 lpm for 60s. Jan-Martin says that beacon LA3VHF, mentioned in *4-2-70* July 1985, is in a bad location, but he hopes to find a better one and mentions DS78f in this context.

Improve your FT690

Many operators use the FT690 in either its Mk1 or Mk2 forms on 50MHz. This rig suffers from a lack of audio "punch" on transmit, very noticeable under weak-signal conditions and especially when used for ssb meteor scatter. I own one of these rigs, as does Mike King, G3MY (Derbys), but when we worked, his audio sounded much superior to mine. He told me that he was using a home-brew speech processor ahead of the rig; no great surprise because more than 40 years ago Mike was designing equipment for vhf/uhf, much of which was written up in the journals of the day. He subsequently sent me details of the circuit which I found easy to construct on a piece of experimenter board, though a printed circuit diagram has been prepared for those who like to roll their own. The design is purposely kept simple, incorporating five cheap transistors such as BC108 or BC109 types, a single diode and a mere handful of resistors and capacitors. I have received very good reports on the air with mine, so if you would like to build one and be better equipped to penetrate the QRM during any openings this summer, send me a sae plus 20p in stamps for photocopying and I will pass on the relevant information. I have no knowledge of the FT290, but if it is basically the same circuit as the 690, it too would benefit greatly from some simple speech processing of this type, as would several of the other cheaper rigs with no built-in processor.

Miles per watt

In February, I commented that it was a pity that awards did not always recognise the achievements of operators who use low power in poor locations. This prompted Dave Ackrill, G0DJA (Birmingham), to draw attention to the American "kilo-mile per watt" yardstick, based on 1,000 miles for 1W, 2,000 miles for 2W etc, so that to achieve a "kilomile/watt" using 5mW of power (0·005W) one needs to work over a distance of five miles.

Dave compared some of his recent contacts on 144MHz using QRO of 25W as opposed to QRP of 2·5W the antenna being a five element Yagi resting on an orange box in his loft, fed through 100ft of cable, with a gain assumed to be 6deB. Hardly a moonbounce system, but using erp rather than input watts; here are his figures:

Callsign	QRB	Miles/W (erp)	Pwr
DJ3UF	360	36	QRP
ON4EV	300	30	QRP
ON4ASL/A	260	26	QRB
F6HSL	200	20	QRP

Callsign	QRB	Miles/W (erp)	Pwr
OK2TU	804	8	QRO
OK1DEF	650	6·5	QRO
GU4HUY	200	2	QRO
FD1JLQ/P	190	1·9	QRO

Before jumping to any conclusions that QRP is best, the figures need to be analysed. First of all, remember it is erp which is used in the calculation, not input power. Also, since FD1JLQ/P happened to be using an erp of only 1W, had it been possible for Dave to reduce power to the same level and still maintain contact, the figure for that QSO would have risen tenfold. Another point is that as soon as his input power increased from 2·5 to 25W, his best dx jumped up from 360 to 804 miles. This leads to all sorts of interpretations. For example, could he have worked OK2TU using 2·5W on a quiet band without the need to be heard through layers of "legal limit" splatterers? Probably, if cw were used. Anyway, this may give rise to some consideration of awards which reflect any adverse conditions under which contacts are achieved. I am sure that there are many operators who have worked "barefoot" into the USSR or Greece via sporadic-E who will be able to claim figures as good as these, especially those legendary folk who work Poland from a car being driven at speed in the outside lane on the M1. It never seems to happen to me.

Though Dave's vhf installation may not be over-ambitious, his microwave set-up is much more sophisticated, since he mentioned almost casually his "16ft dish". Using this on the 10GHz band, his best dx so far has been 51 miles with an input to the dish of 5mW, which gives 10,200 miles/W of input, or 10·2 miles/W erp assuming the dish to have a gain of 30dB.

50MHz and the solar cycle

Another dimension was added to vhf amateur radio in the UK when facilities to operate on 50MHz were granted. Since amateurs have had a long period of exposure to the capabilities of the 144 and 432MHz bands, it is probable that most of what is technically feasible by way of long-distance working on those bands has already been achieved by the exploitation of tropo, meteor scatter, auroras, sporadic-E and, for the few, tep and moonbounce. It is unlikely that some new form of propagation will now be discovered which significantly extends 144 or 432MHz coverage.

With 50MHz, a different situation arises. At times near the maximum of the solar cycle, 50MHz can behave more like an hf band than a vhf one, should the muf rise high enough. At such times worldwide coverage becomes possible on the band, dwarfing the distances covered by extended vhf/uhf propagation. As well as ionospheric propagation, during 1987 incredible 50MHz transatlantic paths opened up, generally attributed to sporadic-E, with distances covered far in excess of anything ever achieved on 144MHz.

The duration of a solar cycle is generally accepted to be 11 years, and on this basis we are not due for another maximum much before 1990/91. However, this is a generalisation. "Smithy", G8KG, well known for his studies and writings on ionospheric phenomena, says that of the past seven cycles, only one lasted more than 10·5 years, the others between 10 and 10·5 years. He says also that, whereas it has been reported that the magnetic minimum measured early in 1988 was lower than its predecessor in 1976 (the low point of the previous cycle), it was nevertheless the second most active minimum in the 120 years since the "aa" index started to be recorded. He says that the cycle is currently rising faster than an "average" one, and "we may be in for a whopper". Smithy is not alone in his views. An article in the *New York Times* talks of "a steep and surprisingly early increase in magnetic disturbances on the sun in the last few months" which might have drastic effects on satellites in low orbits, causing them to return to earth prematurely. Plans are afoot to "rescue" expensive satellites, so serious is this possibility. One scientist is quoted as saying that he "suspects that the solar maximum may come as early as the end of the year".

Whether early or late, be ready for some new experiences if you have never before been around when the muf goes above 50MHz. The enlightened Merriman report, and the readiness of the DTI to implement that part of it which gave us 50MHz, opened the way for allocations in several neighbouring countries, adding them to a long list of overseas and exotic-prefixed countries with operators on the band. Thanks to the efforts of some of the Six Metre Group, ZD8MB is now active from Ascension and has already worked into EA7 (OZ2BG/EA7) as well as parts of the Caribbean and South America. VP8PTG has been provided with a rig by SMIRK which he is taking back to the Falklands. ZS6XJ has worked an F5 station, while several ZSs have worked Malta, and more recently Greece (SZ2DH). On 13 March Japanese stations were working into VK6, and a VK6 beacon was copied in Norway.

It is possible that licences will be issued soon in Saudi Arabia (HZ), and word has it that, by the time you read this, Sweden may have joined the 50MHz "gang", to be followed by HB9, OH and OZ. Whether true or not, there is already enough dx around the world QRV on 50MHz to make one's mouth water. There should be lots of fun ahead.

Aurora

I thought that the very intense aurora of 22 February, which extended out to Finland and the USSR to the east and down to the Italian border in the south, was rather unexpected for this part of the solar cycle, but "Smithy", G8KG (Suffolk), who has for years studied these matters, said that it was not so surprising considering that the minimum of the current solar cycle was rather shallow, with solar activity rising steeply since the spring of 1987. He went on to say that there were several days in the latter half of 1987 when the A index was between 30 and 40 and, with current figures being comparable with those experienced early in 1985, the trend should be upwards for at least another year, although the peak of the solar cycle will come later than this (see "50MHz and the solar cycle"). Good news for the 144MHz dx-chaser if we can hope for a few more auroras like that one.

In this event, Ron, GM4ILS, missed much of the action, being at work. However, Terry, VP8BFM, a keen cw operator, was in Ron's shack and heard or worked a dozen countries on 144MHz, including UR2 and UQ2; beam headings being 90°. He noted that the polarisation of received signals appeared to vary quite abruptly from horizontal to vertical and back again during the event.

Further afield, DK3UZ (EN20C) made an initial contact on 144MHz at 1138gmt, and over the next four or five hours had several very interesting QSOs; including OH1NSJ (KV) OH2TI and OH3TU (MU), SP5EFO (KM) and UA1ZCL (RC). His furthest contact to the west was with GW3KJW.

John Lincoln, GM8DFX, who recently started operation from IO78 (XM) fired up his FT290 and "an old SEM Sentinel 40W linear plus a 75Ω six-element Yagi from the old days" and proceeded to work into JO20, 21, 22, 23, 31, 32 and 43, as well as many G and GM stations.

Very much further south, in London, George, G3NOH, worked 13 countries between 1330 and 1730gmt and heard RQ2GAG, all on 144MHz. On 50MHz, GM0EWX (Skye), had his first experience of an aurora on the band, starting by working LA3EQ at 0020gmt on 22 February. Although unable to get on again until 1725gmt the same day, by which time most of the action on 144MHz seemed to have died down, he still managed to work 36 stations in 20 squares and seven countries before things really petered out at 2021gmt. More than three hours later, though, he heard beacon OX3VHF which he reported as 59+A, suggesting it was not auroral-E as might have been expected following such an intense aurora.

Rolf, DK2ZF, was at work when he learned of the aurora. Unable to get home, he telephoned his wife, DD1HY, who then relayed signals on the 50MHz band to him over the telephone. In this way, Rolf heard beacon GB3RMK at 56A. By the time he got home from work, all was quiet again. Ted Collins, G4UPS, also used 50MHz to great advantage in this event, working into GW, GI and LA as well as hearing EI9Q and several GM stations. Ted also reported that Leroy, ZS6XJ, telephoned to say that during this aurora, at 1630, he could hear the Cyprus beacon 5B4CY on 50MHz for 30 minutes, for the first time in more than four years.

Kjell, SM4GVF (Gothenburg), in his letter last month complained that too many UK operators chasing a dx station all call simultaneously on the same frequency, simply increasing the noise level at the far end. He suggests spreading out a bit more, especially since the doppler shift on auroral signals makes for a wider signal, and in any case the dx station will tune around for the best reception. Kjell also said that when doppler is as pronounced, as it was in the 2 January aurora, stations should try to get some indication of whether it is positive or negative and be sure that the signal from the remote station falls within their rit coverage.

From here and there

When next you feel like complaining about bureaucracy and the delays and frustrations it can cause, spare a thought for Doug Barnsley, originally from Kent, but now EB5FYQ in Alicante. When I visited him recently, Doug said that having passed the Spanish RAE (in Spanish language no less) on 27 October 1984, the certificate confirming this was not dated and issued until 7 May 1987. As if this was not enough, it finally reached him by mail in January 1988! Doug also has to cope with other obstructions, like a mountain, the Montgo, right in his backyard, not the best of locations for vhf, but has a good take-off along the Mediterranean. EA6VHF is his local beacon on 144MHz, and I was pleased to find it in good health while I was there.

The RSGB QSL Bureau will be closed for the whole month of July for summer vacations, so no cards during this period please or they may lie there unattended. I will give another reminder next month. Ted Allen, G3DRN, who runs the bureau, treats our precious cards with the greatest respect, and wants no harm to come to them in his absence. You can make his job easier by avoiding sending any cards from about the middle of June to give him a chance to clear his files before leaving. He'll be back in time to cope with the hoped-for influx of cards arising from sporadic-E openings.

Sandy Anderson, GM3BCL, sent details of an interesting award, sponsored by the Scottish Tourist Board, whose chairman, incidentally, is Alan Devereux, GM8VJV. It is the "Worked All Scottish Districts Award", overprinted with the words "Aurora Country". It came as a surprise to learn that there are no less than 56 separate Scottish districts, some of them in very remote areas, and probably only accessible on vhf during auroras. However, for this award contacts are not limited to vhf/uhf bands, nor indeed must they be all on a single band, provided they are dated 1 January or later. There are three classes, Bronze (35 districts), Silver (45) and Gold (56), with endorsements for single-band, all-bands and mobile operation. On receipt of the prescribed fee (£1, $2 or eight ircs) Sandy, who is custodian of the award, will send you a very handsome booklet giving maps of all Scottish districts, which I have found to be very useful since most of my maps still show the names which existed before the Local Government (Scotland) Act of 1973 came into force. Write to Sandy at West Balfour House, Durris, Banchory, Kincardineshire AB3 3BJ. Gold awards have already been claimed by stations in G, GM, EI, OH, YU, W, VE and 4X4.

In the March issue I mentioned that it was becoming difficult to find 2102 chips for simple memory keyers of the type developed by G4IJE. David Johnson, G4DHF, and Keith Orchard, G3TTC, both QTHR, have small supplies. Dave's are ex-equipment at 50p each, while Keith's are new (some 2102-2s among them) at 70p, postage extra in both cases.

Bob Treacher, BRS32525, who writes the "SWL" column, can provide check-lists which give old locator alongside the current Maidenhead one plus space for filling in personal contact details. These are available from him (address at foot of his column) for a nominal £1 to offset copying costs.

John Lincoln, GM8DFX (Sutherland), who was reported active from IO78 (XS) square in April, wrote to say that he has identified some more active amateurs there. Two new stations, GMs 7ASN and 7AUN have been licensed, so with GM4NGY and John this brings the total to four.

Bud, K2YOF, says that the call issued for the Saba Island expedition (see April column) is PJ0M, not PJ6M as originally notified.

Derbyshire Hills Contest Group plans to operate from the Scillies (WJ) during the second week in August. Full details nearer the date.

Repeater news

Several newsletters have been received since the last "Repeater news," and almost without exception they point to the fact that with the costs of operating and maintaining a repeater rising, year by year, group treasurers are often hard pressed to balance their books and at the same time avoid increases in annual membership fees. Several groups complain of regular users who never become members.

Guildford UHF Repeater Group's newsletter gave an interesting history of its formation and the birth pangs of its repeater GB3GF (RB13). Secretary of the group is Peter Brooks, G4UMI, and the newsletter editor is Derek Wilde, G0FGB. By a stroke of diplomacy, they managed to site their machine at the private house of a non-radio amateur!

Dave Ackrill, G0DJA, has taken over the newsletter of the Midland Amateur Repeater Group which runs GB3AM (R6) and GB3CB (RB14).

Kent's newsletter No 51 reported a clean bill of health for GB3CK, EK, KN, KS, NK, SK and RE, and commented on the need to retain and increase membership (contact G0AMZ for further information).

North Cambs RG has recently produced its tenth newsletter, which gives some background on its repeater GB3WI (RB15) which first came on the air in April 1984. They, too, have had financial problems, now largely overcome by generous donations from users (and swls!). Secretary of this group is John Arnold, G4NPH.

The spring edition of *FM News*, No 64, produced by the Central Scotland FM Group (GM8LBC) continues to be more of a magazine in its own right than a newsletter. This issue even describes how to resurrect someone found in an unconscious state. Something to do with the local brew, perhaps?

Finally, Speyside RG (GB3SS) said in their January newsletter No 4 that in future they will publish three times per year instead of four, for financial reasons. They have had a difficult time making ends meet, but hope for better things in future. Group secretary is Eileen Scott, GM8RMR, and the treasurer is Alan Wills, GM4IZY.

MICROWAVES

*Mike Dixon, G3PFR**

Microwave Committee design sponsorship

The John Rouse Memorial Trophy was "mislaid" for several years but has been resurrected and, with Council's approval, the rules were extended by the Microwave Committee in June 1986. No doubt due to scan' publicity we have so far given to it, the response from members was disappointing (nil!) in the year 1986-7. Any Society member is eligible to enter a design or designs, as described below.

In order to remedy this situation, here are the full details of the design sponsorship now associated with this trophy. It is hoped that members will not be backward in coming forward with entries for this award!

Aims

1. To foster interest in the design and development, by RSGB members, of new narrowband equipment capable of home construction for use on the microwave bands at and above 3·4GHz.

2. To make details of new designs available to all radio amateurs, via *Rad Com* and/or the *Microwave Newsletter*, as appropriate.

3. To award a trophy and premium to the leading entries.

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

The design should be . . .

1. Equipment capable of transmitting and/or receiving narrowband signals.
2. Built, as far as possible, using readily-available, inexpensive modern devices.
3. Relatively easy to construct at home, reproducible and capable of alignment without elaborate, professional test gear.
4. Inclusive of basic documentation; eg photos, basic descriptive notes, pcb layouts and circuits.

Awards

1. The winner will receive the John Rouse Memorial Trophy which will be held for one year. In addition he/she will be awarded a permanent plaque and a premium, at present £75.
2. The runner-up will receive a certificate and a premium, at present £25.
3. Adjudication will be carried out by the RSGB Microwave Committee, whose decision is final. The committee reserves the right to withold the award(s) in any particular year if the design(s) submitted are judged to be of insufficient merit or originality.

How to enter

1. As soon as possible, send a letter of intent to the chairman of the Microwave Committee (currently G3PFR), c/o RSGB HQ or QTHR.
2. By 1 September, send a basic description and documentation (eg photos, circuits and pcb layouts) to enable the committee to make an initial assessment prior to making arrangements for viewing of the equipment(s) by committee members.

In order to fulfil the terms of reference applicable to the John Rouse Memorial Trophy, we would like to display (retrospectively) as many entries as possible at the NEC and/or Sandown and the various round tables, and to be able to make the award at the RSGB agm immediately following the close-date, hence the timing of entries.

Perhaps a little more explanation of our objectives would not go amiss! For a long time now, many of the UK microwave fraternity seem to have concentrated on simple, wideband gear for 10GHz, either neglecting the "middle" bands or relying on commercial kits or ready-built equipment for the lower bands or, more recently, for 10GHz too! The result of this concentration of effort is that our European counterparts, particularly the Germans, have pulled ahead in the exploitation of modern devices and the more advanced design concepts involved in narrowband equipment. This is not to say that no work at all has been going on in the UK, but it has to be admitted that most of the recent bright ideas have come from the Continent!

It was felt that, with the advent of affordable GaAs devices, laminates and surface-mount components, the time has come to rectify this situation. Many "domestic consumer" devices, aimed at satellite broadcasting and catv, are usable at nearby amateur frequencies, which is why we stress the use of readily-available, inexpensive modern devices! Using them ought to confer the necessary degree of reproducibility so essential to encouraging more use of the bands: it really should not now be necessary to possess elaborate test gear or have particularly "green fingers" to make a success of microwave design and construction.

The other main objective is to make such designs more freely accessible to others, and to this end the committee is prepared to support any designs judged to be of sufficient merit; not necessarily technically highly advanced or demanding in the sense of being complex. Indeed, simple concept, reliability and reproducibility are more important, provided that the performance of the design in these respects fulfils the designer's objectives. We would, for instance, help in preparing fully written-up constructional articles for *Rad Com* or the *Newsletter* as appropriate, organise/supply pcbs to design specification, resource difficult components if necessary (although using the kind of components we have in mind, this should not be needed!), or give any other assistance which may be needed to promote building and operating the design(s).

At the time of writing, one letter of intent has been received from G3BNL which covers the design of a phase-locked transceiver for 24GHz. We would dearly love to see some new designs for 3·4 and 5·7GHz too, both bands having been sadly neglected in recent years. Even designs not coming into the winner or runner-up category will get a mention and be brought to the attention of others, maybe to result in further development or improvement not apparent to the original author. Why not go to it and make an entry?

Remember that, if you feel you are too late this year, there is always next year – commencing after 1 September!

Beacon news

More information has come to hand on the transfer of the 2·3GHz Andover beacon (GB3AND) to Westbury (GB3WWH). A letter from David, G8ADM, the original licensee, gave the information that the beacon hardware is "still alive and well" and that he is giving Bert, G3RHI, full support to refurbish and install the beacon when clearance comes. What Bert really needs now is local interest from licensed amateurs to form part of the "close-down" and occasional maintenance team – offers please, direct to Bert, QTHR.

Due to the nature of the power supply (24V batteries recharged daily from a diesel generator) it has been necessary to modify the beacon to conserve power. For instance, the modulation mode will be changed from fsk to a.m (cw), with the callsign given about four times/min with intervening dots instead of full carrier. While the generator is charging the batteries (about two hours daily), the dots will change to dashes in order to give remote indication that the generator is functioning correctly. The beacon psu will be based on a switch-mode 24V to 12V converter, again in order to keep up the efficiency.

David has indicated that he may make the 1·3GHz beacon hardware available to any individual or group willing and able to provide a suitable site for its operation – he has, so far, not found any interest from anyone to take it on as a project. Unless a genuine interest is expressed quite soon, he will strip the beacon down, as it is occupying valuable space at home! He may be prepared, as with the 2·3GHz beacon, to restore it to full working order if a suitable home can be found. Please contact me or G8ADM, QTHR, directly, as soon as possible. □

SWL

*Bob Treacher, BRS32525**

HF Challenge results

Nineteen logs were received for my 1987 HF Challenges, a welcome increase. Conditions during the weekends of the CQWW contests were good and many interesting dx stations were found in most logs. Some entrants managed to log a total of over 100 countries. Indeed, Arthur Miller, BRS88969, sent a check log which showed 134 countries logged. The logs were all of a good quality, with few callsign errors. There were several big scores in the ssb leg, with Jean-Jacques Yerganian, ONL383, romping home again in first place. He logged a total of over 470 countries on the six bands (148 different countries). Few could live with that, but another Belgian, Dirk Debacker, ONL5810, copied nearly 350 countries, while I entered a check log with over 320. Leading G was Colin Tait, BRS88825, but his score of 82,000 was a good distance behind Jean-Jacques' huge score.

Much has already been said about the contests themselves as they took place over six months ago, but it is worth recording the large number of Carribean and South American stations active on 7MHz during the ssb leg, including a colossal signal by HC8DX from the Galapagos Is. Several KL7s also showed up in logs on this band, with KL7RA being the most widely reported. Some also logged the VU4GDG expedition and S79WS. The 1·8MHz band was good in patches, with HC8DX the best dx reported. The winner of K4TWJ's book *Secrets of Ham Radio DXing*, donated by John Goodrick, BRS44375, for the best UK entry in the ssb leg of the Challenge is Colin Tait, BRS88825.

Once again the cw leg was poorly supported, but the two logs received show that much dx was available. Jean-Jacques came home first here, too. Finally, the scores.

SSB LEG

Posn	Station	Points	Multi	Score	Posn	Station	Points	Mult	Score
1	ONL383	944	472	445,558	8	ONL4333	222	111	24,642
2	ONL5810	696	348	242,208	9	RS87949	170	85	14,450
3	ONL4318	440	220	96,800	10	BRS8841†	114	57	6,498
4	BRS88825	406	203	82,418	11	G1VUD*	92	51	4,692
5	BRS25209	354	177	62,658	12	BRS52543**	90	45	4,059
6	BRS28198	314	157	49,298	13	BRS31976**	86	43	3,698
7	F11AGD	266	133	35,378	14	BRS62088†	64	32	2,048

†=14MHz only, *=28MHz only, **=1·8MHz only
Check logs from BRS32525, BRS88969 and NL8272

CW LEG

Posn	Station	Points	Mult	Score
1	ONL383	604	302	182,408
2	BRS8841	380	190	72,200

*27 Ingarsby Lane, Houghton-on-the-Hill, Leicester LE7 9JJ.

Sporadic-E

Last month we looked at Es as it affected tv Band 1. This month we shall take a closer look at Es at 144MHz. In 1987 I was delighted to have correctly predicted an Es opening on 144MHz in early June. This year, I am pleased to reproduce here a matrix produced by Mick Toms, BRS31976, which shows Es openings in late May and June at 144MHz for the last 11 years. You will see that Mick has given each opening a "star" rating. These are a subjective assessment of the opening but based on the following:

*	Small, localised event, probably less than 15 min
**	More widespread, duration of about 30 min
***	Major event, widely reported, probably over an hour in duration

As for whether 1987 was better than previous years depends on how many openings you caught. There were certainly more reported events (28), but it would be wrong to draw too many conclusions from this. Equipment has certainly improved to a great degree over the last few years, there is much greater activity both here and abroad, and there is also a greater awareness of the possibilities for dx. More operators are monitoring Bands 1 and 2 for early signs of an opening. It is feasible to suggest therefore that the apparent increase in the number of reported events in 1987 is simply that with more know-how, fewer have been missed!

Predictions for 1988 are, of course, difficult. However, from the matrix, it would seem that the week of 5-11 June is still the best period. A similar matrix to be published in June will show Es openings in July, and the week of 7-14 July as another good week. One thing which is apparent is that on the approach to the sunspot minimum, the Es favoured June, but at the last maximum (and now we are coming out of the current minimum) there is a small shift towards July.

If readers have information on events not included in the matrix please let me know and I will pass it on to Mick.

Matrix showing sporadic-E openings on 144MHz, 1977-87

Year	'77	'78	'79	'80	'81	'82	'83	'84	'85	'86	'87	'88	'89
22 May													
23													
24													
25	*					**							
26													
27													
28											**		
29			*						*		*		
30											*		
31							*						
1 Jun			*	*									
2			*	*				**					
3			*						*				
4		*											
5						***			**	*			
6					*		*		*	*	*		
7					**		**			*	***		
8	*	*				*		***			*		
9					**				*				
10				*	*		*		*				
11					**				**		**		
12													
13													
14	**												
15	*						***						
16							*		*		*		
17							*	*			**		
18							**				*		
19		*											
20		*					*						
21							*						
22							**	*					
23											*		
24											*		
25	**												
26									*		*		
27									**				
28	*		**										
29													
30								**			*		

Contest logsheets

The March column referred to there being no contest logsheet for the swl. Malcolm Harrington, BRS20249, has changed that. He has produced a logsheet just for the swl, which can be used for both hf and vhf contests. A specimen of the logsheet is reproduced here, and Malcolm has volunteered to "personalise" them by printing your callsign at the top. Any listener requiring a supply should write to him at 123 Clensham Lane, Sutton, Surrey SM1 2ND, enclosing a large stamped, self-addressed envelope (an 18p stamp will cover the posting of about 15 logsheets).

RECEIVING CONTEST LOG

BRS BAND MHz PAGE of

TIME (GMT)	CALLSIGN OF STATION HEARD	CALLSIGN OF STATION WORKED	REPORT SENT BY STATION HEARD		MULT	POINTS

Calling keen cw listeners

G4FAI has sent me a copy of the latest UK-produced issue of *Morsum Magnificat*. Many swls are keen morse enthusiasts, and there are a number of items in the magazine to interest them.

It is a quarterly journal written and produced by morse enthusiasts, which aims to publish anything and everything about morse telegraphy from its earliest beginnings up to the present time. If any keen cw listeners have anything to offer, G4FAI will be pleased to hear from them. A subscription to the journal costs £6, from G4FAI, at 1 Tash Place, London N11 1PA.

Awards and contests

In the last few months I have collected information relating to the German DIG Award programme, which features many awards which are available to the swl; the French Worked All Zones SWL Award, and a list of nets and bulletins of the Scandinavian CW Activity Group. I also have a copy of a comprehensive four-page contest calendar for 1988. These are all available from me upon receipt of a large stamped, self-addressed envelope, but please state which details you require.

VHF news

Mick Toms, BRS31976, and David Whitaker, BRS25429, both provided fresh information of their confirmations for the 144MHz Squares Award following earlier reference in the column. Mick now has 130 confirmed out of 185 heard, but David reported his 150th confirmation (more business for G5UM?) thanks to a card from OK2KYC/P (JN99).

Mick mentioned hearing signals via meteor scatter from LA1TV, UZ3DD, HG5CW/7 and I1TXD all on cw during the Quadrantids meteor shower, but missed the auroras on 2, 6 and 14 January. He had spent some time with G8ALM's signal generator trying to get his 50MHz converter working, with success. A suitable antenna is all that is now needed to get Mick on to 50MHz. David has also been looking around for a 50MHz converter; he will probably purchase a Microwave Modules unit, as there appear to be no others on the market.

Martin Parry, BRS52543, has checked the uhf and vhf bands for ms and aurora but had been unlucky on both counts. He took part in the 432MHz AFS Contest in February, as did David and myself. Did I stimulate any other swls into entering vhf contests following my piece in the March issue?

HF news

I shall pick out the best from the dozen reports I received for this issue. Brad Bradbury, BRS1066, had heard AH2/DL1VU, K2SG/NP1, N6EK/HC8 and VK9YA on the high bands, with SV1NA/SV9 heard on 1·8MHz. He entered the 7MHz CW Contest in February, with good results. Dale Dhuglas, BRS32755, is ex-GM4ELV. He provided a note of some of the dx he had been hearing from his QTH in Scotland, including TP2CE (Council of Europe), S0RASD and 5H1HK.

Robert Small, BRS8841, reported a very good month with the ZL9 and NP1 expeditions heard. The 14MHz band had been staying open late to Africa, Asia, the Far East and the Caribbean. At around 2000 he had copied signals from A22, ZD8, 9L3, 9M2, 4S7 and J88 within the space of a few minutes. The 10MHz band had been in fine shape. He had heard his first JA (JH6SOR), VK3NC, JW0B and KP4TIN. YI1BGD had been heard on 3·5 and 1·8MHz cw, but the operator was giving W1BPY as his

QSL manager, so Robert is understandably cautious about its validity. He already has a table score of 511 for 1988. I will try to find space for the table next month.

Colin Watson, BRS46598, had heard a good selection of dx, the pick of his log being ZD8 on 28MHz and J56 and FM5 on 3·5MHz. Martin Parry had been more active and sent a fine list of stations heard during February. The 14MHz band had given him 3D2, VK9 and KH0, while 7MHz had produced V3, KL7, PY0, A6 and a KH6. I took a look at 1·8MHz during the CQ contest in February and found the band in good shape; J52US was country No 117 on ssb. David Whitaker is now up to 122 heard on that band and had boosted the heard total to 274 on 7MHz ssb. Recent QSL additions included P40GD, 4M0ARV, ZC4DX and YO2IS all for 1·8MHz, taking his confirmed total on that band to a fine 113.

QSL Bureau closure

G3DRN has given his usual early warning of the annual closure of the QSL Bureau. This year there will be no bureau facility during the whole of July. Listeners should ensure that any outgoing cards are with G3DRN well before the end of June.

Finale

The rules for the Society's SWL Contest, to be held on 9/10 July, will appear in next month's "Contest News". Anyone wanting an advance copy should send me a stamped, self-addressed envelope. Let me have your countries scores to include in the table, too. News, views, photographs for inclusion in the July issue should reach me by 6 May with late news to be received here by 13 May. □

DATA COMMS

*Ian Wade, G3NRW**

Packet frequencies on 144MHz

Bob, G1ZPU, remarks on the somewhat overcrowded scene on 144·650MHz, where most packet traffic is carried in the UK, and the increasing number of pbbs (packet bulletin board systems) using 144·675MHz for mail forwarding, but he wonders what has happened to 144·625MHz. He says he has listened for long periods, with his beam "whirling round", and has heard not one single data bit on that frequency.

He has even pointed the beam towards Cambridge, in the hope of hearing a Cambridge packet signal, but still nothing! Is Cambridge packet dead, he asks? Assuming it is, he proposes the following use of the three frequencies: 144·625MHz for local packet chat, 144·650MHz for pbbs access and packet calling, and 144·675MHz for dx packet and digi-hopping. Any comments?

However, all is not totally quiet on 144·625, according to Gareth Howell, G6KVK. Gareth is the co-ordinator responsible for allocating TCP/IP Internet addresses in the UK, and says that AMPRNET (Amateur Packet Radio Net) stations using TCP/IP are active on that frequency. Internet traffic is transmitted in unnumbered information (ui) frames, so if you are monitoring the frequency and come across what appear to be unusual "beacon" messages, you are probably listening to TCP/IP traffic.

Talking of packet dxing, Malcolm Newsome, G6GUW, reports on the activities of a small group which is conducting experiments on upper sideband between 144·585 and 144·590MHz, using 300bps and 200Hz shift (the same settings as commonly found on the hf bands). Horizontal and vertical polarisation have been tried, but in common with most people who have experimented with both, he finds that horizontal is superior and to be recommended.

He says that ssb is used to great effect on hf packet, so it naturally followed for it to be used on 144MHz. If you would like to get back to what amateur radio is all about (that is, communicating directly with other licensed stations, instead of relying on a third party to do it for you), he invites you to join the fast-growing group and be pleasantly surprised at the dx that can be worked. There is a net most nights from 10pm locally in North Yorkshire, so open the squelch right up, set the tnc threshhold to accept anything just above the "sharsh", and join in.

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

And packet on the hf bands

Following the cb boom, a fair number of amateurs have converted fm cb rigs for use in the amateur 28MHz band. These ex-cb rigs work well and are cheap. G4FRO in Bristol says that with the improving conditions on the band in the next few months, sporadic-E will be widespread for hours on end, making European contacts very easy, even on low power. All we need now is a suitable frequency, within the usual range of converted cb sets, for 1200bps fm AX.25. Any suggestions, or does anyone already use a frequency in this part of the band for packet?

A little further afield, Jim DeLoach, EL2GA/KB6EH, reports on the packet scene in Liberia. At the time of writing, there were five active packeteers in Liberia (EL2BB, EL5G, EL2FE, EL2BN and himself), EL5G and EL2GA having Kantronics KAM tncs on hf and vhf. Mark, EL5G, is a missionary doctor located in a remote village in the interior of Liberia (he has a solar-powered station), and he and Jim regularly work packet on 7MHz. They are active on other hf bands, but find that 14MHz is practically useless because of QRM. As Jim rightly says, hf packet really needs to spread out!

As an interesting aside, Jim also says that together with EL2BB and EL5G he has been working with the Liberia Rural Communications Network (a series of low-power a.m broadcast stations) to develop an hf AX.25 packet radio based data network. This is an excellent example of how amateur experimentation and development make a real contribution to the state of the art, and it is particularly significant that this new technology is being applied in the third world where low cost is a must.

PK-232 tnc users unite

Ken Marshall, G8WPE, is interested in making contact with other users of the PK-232, with the aim of sharing knowledge and exploiting the full potential of this multi-faceted communication controller. He plans to compile a list of known users, and from them he would like to know: the release date of the tnc; if the fax chip is installed; if the siam (signal identification and acquisition mode) is installed; what computer system is in use; what other modes and frequencies are used, and any information or tips to pass on to others.

The Eastnet trunk network comes together

Eastnet is the name of a new high-speed trunk network planned to link together the packet repeaters located in East Anglia. Philip Howarth, G3YAC, is the Eastnet co-ordinator, and he reports that the packet groups involved in running the repeaters held a meeting on 14 February to discuss the proposals. As a result it was resolved to push ahead and to aim for an operational network by the beginning of July. Trials to check out the site-to-site links were planned for the middle of March.

Assuming the licences to be forthcoming as presently understood, Eastnet will operate in the 1·3GHz band, and will provide a dedicated node-to-node path for the four NET/ROM repeaters on 144·650MHz (GB3PX, GB3EA, GB3NP and, soon, GB3HX). The result will be reduced congestion on 144·650, as all the internode traffic will be passed on 1·3GHz. The provision of high speed 9,600bps modems will also speed up the traffic between the nodes. Eventually, links to other repeaters beyond East Anglia will be arranged.

Packet operators will reap all the benefits without any apparent change to normal operation. Each node will operate as at present on the user access frequency of 144·650MHz, but traffic for distant stations will then be routed via the trunk network and will not reappear on 144·650 until it is transmitted to the final destination.

To gain an idea of potential traffic loading on Eastnet, Philip monitored 144·650MHz during the period 26 January to 9 February, logging all messages which would have gone via the Eastnet route had it been in operation. During the 291 hours of monitoring from his location, 5km north of Cambridge, he logged a total of 296,152 packets, an average rate of 1,018 per hour. Of this total, 33,869 would have travelled on the Eastnet trunk route; that is, an average of 116 per hour.

Detailed study of the log showed potential Eastnet traffic representing up to 27 per cent of the total traffic over a typical eight- or nine-hour period. Thus the expected improvement to the general performance of the packet network by moving trunk traffic away from the user access frequency will obviously be considerable, even at these relatively modest rates. As more nodes come on line and are eventually linked up by trunk routes, the performance improvements will be even more marked.

However, as with all such plans, there is the usual snag: where the money is to come from. It is estimated that Eastnet will cost about £2,000

in total, which amounts to £500 for each of the four groups. So Philip puts in a plea for those likely to benefit from Eastnet to join their local packet group and help to make the network a reality. The people to contact are: Malcolm Prestwood, G3PDH (for GB3NP), Phil Mellor, G4BIK (for GB3PX), Mark Rainer, G6TIU (for GB3HX), or Neal Entwistle, G0BRM (for GB3EA).

Incidentally, in the list of packet groups included in this column in February, the Eastnet group was inadvertantly called the "Cambridge Packet Group", with James Miller, G3RUH, given as the person to contact. James is indeed very much involved with Eastnet, but he says that the so-called Cambridge group does not actually exist, and as a result of the entry in February's list he has received a number of enquiries about the old "Cambridge Packet" system which runs at 300bps on the BBC. So if you are really interested in the Cambridge system, do not write to James, as he knows nothing about it; instead, the persons to contact are Peter Robinson, G3MRX, or Alan Jones, G8WJL.

Packet software for the Commodore

Dave Castle, G6OQJ, passes on information about the Digicom package, written by DL8MBT, to run packet on a Commodore 64 or 128 machine. The package does not require a tnc, as all packet processing is done by software. The only special hardware needed is a simple modem, which could be based on the AM7910 or TCM7910 chip, costing less than £35.

The software handles all the tnc functions inside the computer, and features the following: read/write of sequential files to disk; read/write of program files on disc; MHEARD lists of stations heard; digipeating; printer support for CBM and Centronics printers; four operating ports on one band, and user-selectable monitoring.

While this software is freely available from Dave, on receipt of a disc and an sae, he suggests that a modest sum of DM10 be sent to DL8MBT, who is a university student and who has developed this package in his spare time. Dave also acknowledges the support of G4FZL, PE1MII and PE1CDE in getting the package and regular updates into the UK via the packet link across the North Sea. His address, which is not QTHR, is 21 Snowdrop Close, Chelmsford, Essex CM1 5XD. □

SATELLITES

*Bob Phillips, G4IQQ**

LOOKING BACK over the issues of this column spanning the last six years, I have noticed one rather common feature – something to the effect that the launch which was confidently expected last month will now be next month or perhaps the month following. Such is the difficulty of trying to be topical without being too historical. Needless to say we haven't yet quite made it with the launch of the Phase 3C satellite, but all being well the launch should take place before the end of the month.

Oscar 10

In early February it was evident that the satellite was suffering from insufficient power production resulting in fming of the beacon and the transponder as well as erratic operation. As a consequence, all operational use of the satellite was suspended, and this is likely to remain the situation for several months. Even if the 145·810MHz beacon is heard, please do not resume use of the satellite until the go-ahead is given by the spacecraft controllers.

Uosat

Uosat 2 has been attracting a lot of media attention recently in its role of communications link with the team of Canadian and Russian skiers taking part in the transpolar skitrek expedition. The skiers set out in early March for a three-month trek from Cape Arktichesky on the Severnaya Islands to Cape Columbia on Ellsmere Island, a total of 1,730km. At regular intervals a member of the party activates the emergency locator transmitter whose signal is picked up by one of the cospas (USSR) or sarsat (USA) polar orbiting satellites. By means of doppler measurement of the received signals it is possible to obtain a fairly good position fix on the skiers. The position information is then passed to the Uosat command station at the University of Surrey where it is up-loaded to the Uosat 2 spacecraft for subsequent transmission on the satellite's digitalker. In this way the ski party is informed of its progress in a matter of hours. As an added benefit the action has also been monitored by thousands of radio amateurs and other observers around the world.

Recently the university confirmed that the Spacecraft Engineering Unit would be actively engaged in the design and construction of a further satellite in the Uosat series. Agreement has been reached with NASA for the launch of the spacecraft on a Delta launcher currently scheduled for late 1988 into a 43° inclined orbit with an altitude of around 500km. The project is an extension to the earlier work which resulted in the flight of Uosat 1 and 2, and confirms the leading role of the university in low-cost spacecraft engineering.

As before, the payload will comprise a variety of packages intended to serve the interests of the amateur and professional communities. Drawing on the experience gained from the Uosat Oscar 11 digital communications experiment, Uosat and Vita are developing a high-performance store and forward payload. Uosat-C will carry a Mode J (435 to 144MHz) Pacsat communications experiment which, unlike UO-11, will be open to all operators. Several experimental payloads will be carried to evaluate the effect radiation on vlsi devices.

The array of microprocessors to be flown is very impressive and includes 1802, 80C86, 80C186 as well as a four-CPU parallel-processing array for image and data compression. Additionally, consideration is being given to the inclusion of a digital signal processor which could be used to evaluate modulation/demodulation schemes.

For operators in the northerly (or southerly) latitudes, the characteristics of the orbit are some way from ideal. With its low orbital height and inclination of 43°, the visibility in the UK will be considerably less than for the two existing Uosats. However, "free" launches are becoming increasingly difficult to organise, and the satellite will undoubtedly prove of great interest to many operators. It is intended that the new satellite will provide a variety of information on its 145MHz downlink, including telemetry, whole orbit data and news bulletins, using packet radio techniques.

Other news

In the January issue I referred to a suite of orbital tracking programs for IBM/Amstrad computers and available from Amsat-UK. I have been asked to point out that this particular set of programs is only suitable for the Amstrad pc series (eg 1512 and 1640) of computers and not for the pcw or cpc ranges.

Arrangements for the third Amsat-UK satellite colloquium are well in hand for the 29/30/31 July 1988. An early invitation has been sent to Leonid Labutin, UA3CR, and indications are that he will be able to attend. As in previous years the venue will be the University of Surrey, and if last year is anything to go by, an early booking will be necessary. More details next month.

As I mentioned earlier, this column has run in its present form for just over six years, during which time we have seen the launch of four amateur radio satellites and a considerable increase in activity. Circumstances change and it is now time that I pass the pen (or, more accurately, the keyboard) to someone else. If you would be interested in taking over responsibility for preparing the column, please contact the editor for more details. □

Retirement must be in the air. Not only am I retiring at the end of April, but Bob Phillips has also given notice that he wishes to give up the "Satellites" column in the near future. I am grateful for the excellent way in which he has maintained the column over the years since it was inaugurated as, I am sure, are the regular readers of the feature.

Best wishes for the future, Bob.

The appointment of a successor will fall to the editor who succeeds me, but any member who would like to take on the role of contributor on satellite matters is invited to write to: The Editor, *Radio Communication*, Lambda House, Cranborne Road, Potters Bar, Herts, EN6 3JE, giving details of relevant qualifications and experience.

AWH

*Transvaal Cottage, New Barn Road, Swanley, Kent BR8 7PW.

Contest News

21/28MHz Telephony Contest 1988 rules

TRANSMITTING SECTION

1. The general rules for RSGB hf contests, Published in "Contest News", *Rad Com* January 1988, will apply.
2. **Eligible entrants.**
   (a) British Isles – RSGB members only.
   (b) Overseas (including EI) – All licensed amateurs.
3. **Period.** 0700 to 1900gmt, Sunday 9 October 1988.
4. **Sections.**
   (i) British Isles single-operator.
   (ii) British Isles multi-operator.
   (iii) Overseas single-operator.
   (iv) Overseas multi-operator.
5. **Frequencies/mode.** 21MHz band within the limits 21,150 – 21,350kHz. 28MHz band within the limits 28,450 – 29,000kHz. Telephony only.
6. **QSY rule.** An entrant who QSYs from one band to the other and makes a scoring contact may not change bands again until at least 10 minutes have elapsed since the last scoring contact on the original band.
7. **Exchange.** RS report and serial number, commencing with 001.
8. **Scoring.**
   (a) British Isles entrants. Three points for a completed contact with a station in the rest of the world. Multipliers: each DXCC country worked will count as a multiplier; additionally VO1, VO2, VK and ZL call areas, and USA, Canadian and Japanese call areas, irrespective of prefix, will count as separate multipliers. Contacts with other British Isles stations will not count for points or multipliers.
   (b) Overseas entrants. Three points for each completed contact with a station in the British Isles. Multipliers will be the British Isles prefixes, which are: G0, G2, G3, G4, G5, G6, G8, GD0, GD2, GD3, GD4, GD5, GD6, GD8, GI0, GI2, GI3, GI4, GI5, GI6,, GI8, GJ0, GJ2, GJ3, GJ4, GJ5, GJ6, GJ8, GM0, GM2, GM3, GM4, GM5, GM6, GM8, GU0, GU2, GU3, GU4, GU5, GU6, GU8, GW0, GW2, GW3, GW4, GW5, GW6, GW8.
   (c) Special event callsigns. Contacts with stations using GB prefixes will not count for points or multipliers.
   For all entrants the total score will be the number of points on each band added together, multiplied by the number of multipliers on each band added together. Unmarked duplicate contacts will attract a penalty of 10 times the QSO value, in addition to the loss of the claimed score for the QSO. Entries containing five or more such duplicates will normally be disqualified.
9. **Logs.** Log sheet columns are to be headed: date/time gmt; callsign of station worked; RS and serial number sent; RS and serial number received; multiplier (if new); points claimed. Every column must be completed for each contact claimed for points. Points will not be deducted if a serial number cannot be obtained from a non-participating station, but if a contest exchange is sent it must be recorded.
   Separate logs must be submitted for each band, accompanied by lists of the multipliers worked on each band. Entrants making more than 80 QSOs are requested to submit, in addition, a "dupe sheet" for each band (a list of the callsigns appearing in the log in alphabetical order, and with either the serial number sent or the time of the contact appearing beside each callsign).
10. **Declaration.** Each entry must be accompanied by the following declaration, dated and signed: "I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the decision of the Council of the RSGB shall be final in all cases of dispute.
11. **Address for logs.** RSGB HF Contests Committee, c/o S V Knowles, G3UFY, 77 Bensham Manor Road, Thornton Heath, Surrey CR4 7AF, England.
12. **Closing date for logs.** British Isles entries must be received by 31 October 1988. Overseas entries must be received by 5 December 1988.
13. **Awards.**
   (a) British Isles. The Whitworth Trophy will be awarded to the leading British Isles single-operator entrant. The Powditch Trophy will be awarded to the leading British Isles single-operator entrant on 28MHz, unless poor conditions drastically reduce the number of contacts made on 28MHz. Certificates of merit will be awarded to those stations placed second and third overall, and to the leading station in the multi-operator section.
   (b) Overseas. Certificates of merit will be awarded to those stations placed first, second and third overall, and to the leading station in the multi-operator section. Additionally, certificates of merit will normally be awarded to the leading entrant from each country, provided that a score of at least 50 per cent of that of the overseas section winner is achieved.

RECEIVING SECTION

Rules as for the transmitting section except as varied below.

2. **Eligible entrants.**
   (a) British Isles – RSGB members only.
   (b) Overseas (including EI) – All swls.

Note that holders of transmitting licences for frequencies only above 30MHz are eligible to enter the receiving section.

8. **Scoring/multipliers.** British Isles swls may log only overseas stations in contact with British Isles stations participating in the contest. Overseas swls may log only British Isles stations in contact with overseas stations participating in the contest. Scoring and multipliers as for the transmitting section.
   Logs. Log sheet columns to be headed: Date/time gmt; callsign of station heard; callsign of station being worked; RS and serial number sent by station heard; multiplier (if new); points claimed. For each band a summary sheet listing the multipliers heard on that band must be included. Note: in the column for "station being worked", the same callsign may only appear once in every three contacts logged, except when the station "heard" constitutes a new multiplier.
10. **Declaration.** Each log must be accompanied by the following declaration, dated and signed: "I declare that this station was operated within the rules of the contest, and that I do not hold a licence to transmit on frequencies below 30MHz.
13. **Awards.** The Metcalf Trophy will be awarded to the leading British Isles entrant. The Powditch Receiving Trophy will be awarded to the leading British Isles entrant on 28MHz unless poor conditions drastically reduce the number of contacts on 28MHz. Certificates of merit will be awarded to those placed second and third overall. Additionally, certificates will normally be awarded to the leading entrant from each overseas country.

Summer 1·8MHz Contest 1988 rules

1. **Eligible entrants.** Single- or multi-operator British Isles entrants must be members of the RSGB.
2. **Period.** 2100gmt 25 June to 0100gmt 26 June 1988.
3. **Sections (a)** British Isles stations.
   (b) Foreign stations (including EI).
4. **Frequency/mode.** 1,820-1, 870kHz. CW only.
5. **Contest call and exchange.** "CQ Test". Exchange RST plus serial number of QSO beginning from 001. British Isles stations must also give their county codes (as published in "Contest News" *Rad Com* January 1988).
6. **Scoring.**
   (a) British Isles section. Three for each contact, with a bonus of five points for the first contact with each county code and the first contact with each new country outside the British Isles.
   (b) Foreign section. Three points for each contact with a station in the British Isles (but not with EI), with a bonus of five points for the first contact with each new county.
7. **Logs.** Log sheets to be headed: date gmt, callsign of station worked, RST/number sent, RST/number received, if bonus points claimed.
8. **Declaration.** Each entry must be accompanied by the following declaration, signed and dated: "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".
9. **Address for logs.** G3FKM, HF Contests Committee, 10 Knightlow Road, Birmingham B17 8QB.
10. **Closing date for logs.** Logs must be postmarked no later than Monday 11 July 1988.
11. **Awards.** Certificates of merit will be awarded as follows:
   (a) The leading scorer and runner up in each section and at the discretion of the HF Contests Commitee, the leading entrant from each foreign country.
   (b) The highest placed entrant in the British Isles section who had not reached 18 years of age by the date of the contest. Candidates should mark their entries "Under-18 Award".

21MHz CW Contest 1988 rules

Special note for both sections: entrants are particularly requested to use standard size (A4) log sheets.

TRANSMITTING SECTION

1. The general rules for RSGB hf contests, published in "Contest News", *Rad Com* January 1988, will apply.
2. **Eligible entants.** Single operator stations only. British Isles entrants must be members of RSGB. Overseas entrants, all licensed amateurs.
3. **Period.** 0700 to 1900gmt, Sunday 16 October 1988.
4. **Sections.**
   (a) British Isles.
   (b) Overseas section (including EI).
   (c) QRP. (Stations using less than 10W input).
5. **Frequency/mode** 21MHz. CW only. Entrants are requested **not** to operate in the band 21·075 to 21·125MHz.
6. **Exchange.** RST report plus a progressive QSO number starting with 001.
7. **Scoring.**
   (a) British Isles stations. Only contacts with overseas stations will count for points. Each contact shall score three points. The final score is the number of countries worked multiplied by the total number of points. The ARRL Countries List will apply with the exception that VO1, VO2, VE, VK, ZL and USA and Japanese numerical call areas, irrespective of prefix, will count as separate countries. Contracts with British isles stations will not count for points or multipliers.
   (b) Overseas stations. Each completed contact with a British Isles station will score three points. The final score is the number of British isles prefixes multiplied by the total number of points. British Isles prefixes are: G0, G2, G3, G4, G5, G6, G8, GD0, GD2, GD3, GD4, GD5, GD6, GD8, GI0, GI2, GI3, GI4, GI5, GI6, GI8, GJ0, GJ2, GJ3, GJ4, GJ5, GJ6, GJ8, GM0, GM2, GM3, GM4, GM5, GM6, GM8, GU0, GU1, GU2, GU3, GU4, GU5, GU6, GU8, GW0, GW2, GW3, GW4, GW5, GW6 and GW8. Contacts with GB stations will not count for points or multipliers.

Duplicate contacts. Unmarked duplicate contacts for which points have been claimed will be penalized at 10 times the claimed points. Entries containing more than five such duplicates will be automatically disqualified.

8. **Logs.** Log sheets to be headed: Day/time gmt; station worked: RST and serial number sent; RST and serial number received; multiplier; points claimed. They should be submitted with a cover sheet indicating antenna, equipment and power used and must include a separate list of countries worked as specified in rule 7 above, and a "dupe" sheet.

9. Declaration. Each entry must be accompanied by the following declaration signed and dated: "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 will be final in all cases of dispute".
10. Address of logs. RSGB HF Contests Committee, Box 73, Lichfield, Staffs, England.
11. Closing date for logs. British Isles entrants, 27 November 1988: overseas entrants, 31 December 1988.
12. Awards. The leading British isles station will be awarded the T E Wilson G6VQ Cup, and will also receive RSGB publications to the value of £10. Certificates of merit will be awarded at the HF Contests Committee's discretion to the leading three stations in each overseas country.

RECEIVING SECTION

Rules as transmitting section except where specified below.
2. Eligible entrants.
(a) British Isles. RSGB members only.
(b) Overseas (including EI) all swls.
Holders of transmitting licences for frequencies above 30MHz may also enter the receiving section.
7. Scoring. British Isles swls should only log overseas stations in contact with British Isles stations participating in the contest.
Overseas swls should only log British isles stations in contact with overseas stations participating in the contest. Scoring and multipliers as in transmitting section.
11. Logs. Log sheets to be headed: date/time gmt; callsign of station heard; report and serial No sent; callsign of station being worked; multiplier; points claimed.
Note. In the column headed station being worked, the same callsign may only appear once in every three contacts except when the logged station is a new multiplier for the receiving station.
Each entry should be accompanied by a completed declaration: "I declare that this station was operated within the rules of the contest and that I do not hold a transmitting licence for frequencies below 30MHz".
12. Awards. Certificates of merit will be awarded at the HF Contests Committee's discretion to the leading three entries from the British Isles, and to the leading entrant from each overseas country.

Low Power Field Day 1988 rules

Please note. Changes to rules 6, 8·2, 8·3, 8·4 and 11 have been made to encourage QRP activity and to emphasise the portable aspect of this contest.
1. The general rules for RSGB HF Contests, as published in "Contest News", *Rad Com* January 1988, will apply.
2. Date and time. 0900-1200gmt and 1300-1600gmt, Sunday 24 July 1988.
3. Sections. (a) 10W rf output maximum. **(b)** 3W output maximum. RSGB members resident in the British Isles. Single- or multi-operator.
4. Frequencies. 3,510-3,560kHz and 7,010-7,040kHz, (IARU Region 1 contest-preferred segments). CW only. Contacts may be made on both bands during each session and outside the UK.
5. Exchange. RST, plus serial number starting 001 and continuing through both sessions, together with location (defined by a place name) and county code as shown in "Contest News", *Rad Com* 1988.
6. Scoring. Fifteen points for each contact with another QRP portable or mobile station, 10 points for each contact with a QRP fixed station and five points for all other contacts. Points may be claimed for contacts with stations on both bands during each session and outside the UK.
7. Documentation. Standard RSGB hf contest log sheets (HFCI Rev79) should be used, with column (5) headed "Location and county code received". Duplicates must be clearly marked without claim for points. Unmarked duplicates will be penalised at the rate of 10 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 (HFC2 Rev80) or a standard RSGB declaration signed by the operator responsible for the entry.
8. Special Conditions.
8·1 Power. The power for all parts of the station must be derived from dry batteries, accumulators or "natural" sources (eg solar cells or wind-driven generators). Float charging batteries from petrol, gas or diesel driven generators is not permitted.
8·2 Equipment. The transmitter or out board p.a stage should not be capable of rf output power in excess 15W.
8·3 Antennas. The maximum height must not exceed 35ft (10·66m) above ground level and should not have more than two elevated support points. It is not permitted to use permanent buildings or structures as support points for antennas; trees are an exception to this.
8·4 Accommodation. The portable station may not be located in a permanent building.
9. Address for entries. Logs should be sent to: "HF Contests Committee", c/o J C Burbanks, G3SJJ, "Southlands", 16 Cotgrave Road, Plumtree, Nottingham NG12 5NX.
10. Date for entries. Logs must be postmarked not later than 15 days after the end of the contest.
11 Awards. The Houston-Fergus Trophy will be awarded to the leading station in section (a). Certificates of merit will be sent to the first three stations in each section and to the QRP fixed station submitting a check log giving the most points to QRP portable stations.

RSGB SSB Field Day 1988 rules

1. Eligible entrants. Members or groups of members of the RSGB located in the British Isles.
2. The general rules for RSGB hf contests, published in "Contest News", *Rad Com* January 1988 will apply.
3. Period. 1500gmt Saturday 3 September to 1500gmt Sunday 4 September.
4. Sections.
(a) Open. Multi-operator, maximum licensed power. Equivalent: one transmitter and one receiver, or one transceiver plus an additional receiver if desired. Antenna: no restriction.
(b) Restricted. Multi-operator, 200W p.e.p input maximum. Equipment: only one transmitter and one receiver, or one transceiver. Antenna: only one antenna may be used which must be a single element such as a dipole, long wire, W3DZZ, or trapped vertical, having not more than two elevated support points. No part of the antenna may be higher than 15m above ground level.
Notes (these apply to both sections).
(i) Stand-by equipment is allowed, but it may not be connected at the same time as the main equipment.
(ii) The use of support points for antennas for permanent buildings or structures is not permitted.
5. Location. Each portable station must operate from the same site for the duration of the contest and may not be located in a permanent building or use public mains supply.
6. Power. Power for all equipment may be derived only from a portable generator on the site, accumulators, or batteries.
7. Installation. No equipment or antennas may be installed or erected on the site prior to 24 hours before the start of the contest. This does not apply to the storage of equipment.
8. Contacts. Phone only in the 3·5, 7, 14, 21 and 28MHz bands.
9. Contest call and exchange. Call "CQ Field Day". Exchange RS plus serial number starting with 001.
10. Scoring
(a) QSO with a fixed station in IARU Region 1 ..... 2 points
(b) QSO with any station outside IARU Region 1 ..... 3 points
(c) QSO with a portable or mobile station in IARU Region 1 ..... 5 points
See Appendix for list of IARU Region 1 countries.
QSY rule. An entrant who QSYs from one band to the other and makes a scoring contact may not return to the original band until at least 10 minutes have elapsed since the previous scoring contact on the original band; E9. G9ZZZ works W1AA at 1555 on 21MHz, then QSYs to 28MHz and works NP4A at 1558; G9ZZZ may not make another scoring contact on 21MHz until 1605.
11. Multiplier. Each DXCC country worked on each band gives one multiplier.
12. Final score. The total points scored on all bands is to be multiplied by the total number of different countries worked on each band to give the final score (ie total QSO points x multiplier = final score).
13. Logs. Separate logs are required for each band, together with a check list showing the countries worked on each band. Log sheets are to be headed: date/gmt; station worked; RS and serial number received; operator; new country/multiplier; points. RSGB HF Contest Log Sheets should be used.
14. Declaration. Logs must be accompanied by an RSGB HF Contest Cover/Summary Sheet with the declaration signed by the person responsible for the contest entry.
15. Address for logs. RSGB HF Contest Committee, c/o M. Harrington, BRS20249, 123 Clensham Lane, Sutton, Surrey SM1 2ND.
16. Deadline for logs. Postmarked not later than the Monday 22 days after the end of the contest.
17. Awards. The leading station in the open section will receive the Northumbria Trophy. The leading station in the restricted section, and the entrants placed second and third in each section will receive certificates of merit. Certificates will also be awarded to the stations submitting the leading check log from each continent.
18. Any log found to contain more than five unmarked duplicate contacts for which points have been claimed will be automatically disqualified. Points to the rate of 10 times the contact value will be deduced for each unmarked duplicate contact up to five.
19. Data Protection Act. Entrants should note that the contest adjudicator may enter information from their logs into a micro-computer for the sole purpose of checking for duplicate contacts and preparing contest tabulations. If any entrant objects to this, they must clearly state their objection on the cover sheet so that the adjudicator can hand process their information.
Appendix
IARU Region 1 countries include those in Europe and Africa, the USSR, Mongolia and ITU Zone 39. For a precise definition refer to the RSGB *Amateur Radio Operating Manual*.

144MHz Low Power and SWL Contest rules

1500-2300gmt 30 July 1988
The general rules published in *Rad Com* January 1988 will apply. There will be three sections, section F for single-operator fixed stations, section O for all other transmitting stations, and section L for listeners.
County/country multipliers will be used (general rule 14).
Output power must not exceed 25W p.e.p. at the transmitter.
All entries and check logs to: VHF Contests Committee, c/o GMC Stone, G3FZL, 11 Liphook Crescent, Forest Hill, London SE23 34BN.

432MHz Low Power and SWL Contest rules

0900-1500gmt 31 July 1988
The general rules published in *Rad Com* January 1988 will apply. There will be three sections, section F for single-operator fixed stations, section O for all other transmitting stations, and section L for listeners.
County/country multipliers will be used (general rule 14).
Output power must not exceed 10W p.e.p at the transmitter.
All entries and check logs to: VHF Contests Committee, c/o J Pilags, G8HHI, 43 Bartons Drive, Yately, Camberley, Surrey GU17 7DW.

1·3GHz Trophy Contest rules

0900-1700gmt 14 August 1988
The general rules published in *Rad Com* January 1987 will apply. There will be two sections, section F for single-operator fixed stations, and section O for all other stations. Radial ring scoring will be used. The VHF Contests Committee Cup will be awarded to the overall leader.
All entries and check logs to: VHF Contests Committee, c/o D A Yorke, G4JLG, 40 Edge Fold Road, Worsley, Manchester M28 4QF.

DF Qualifying Event – Salisbury

Date: 15 May 1988.
Map: OS Sheet 184 1:50,000 series, Salisbury.
Assembly: 1300BST for start at 1320BST.
Location: Point where Roman Road crosses B3081, NGR 016164.

Competitors requiring tea should notify Mr A Newman, 74 Victoria Road, Wilton, Salisbury, Wilts SP2 0DY; tel 0722 743837, not later than 8 May 1988.

2.3GHz Trophy Contest rules

0900-1700gmt 14 August 1988.

The general rules published in *Rad Com* January 1987 will apply. There will be two sections, section F for single-operator fixed stations, and section O for all other stations. Scoring will be at one point per kilometre, and crossband contacts count for half points. The G6ZR Trophy will be awarded to the overall leader.

All entries and check logs to: VHF Contests Committee, c/o D A Yorke, G4JLG, 40 Edge Fold Road, Worsley, Manchester M28 4QF.

144MHz Fixed and Affiliated Societies Contest results

Entries were somewhat lower this year, particularly in the multi-operator section, despite more contacts being made by the leading stations than last year. The contest still proved popular with participants despite fairly average conditions, although some stations did report more Continental contacts than usual this time. The results tables include several familiar calls in leading positions, with particular congratulations to G4KUX as winner of the multi-operator section, and G8TFI winner of the single-operator section. The leading affiliated society was the Derbyshire Hill Contest Group which fielded a team of well-sited stations in the North Derbyshire and South and West Yorkshire area. All zonal winners (indicated by asterisks in the tables) will receive certificates.

Many entrants still are not eligible for certificates due to not stating their zone on the cover sheet. Several entries were disqualified for not providing correct paperwork or adequate information on the power used. Despite the extended deadline for entries this year, some still failed to get them posted in time, but the extra time for preparing the entry was welcomed by many. No specific bad-signal complaints were noted, but several comments about the poor quality of signals from some solidstate amplifiers were made.

Some entrants would like to see the county multiplier system used in this contest, and one suggested that club names should be exchanged. The general format of the contest generated little comment, so next year's event will follow the established lines.

G3XDY

Checklogs are gratefully acknowledged from: G8XTV, G2DHV, G1GGT/P, PE1EWR, G1YMF/A. Disqualified: G3DSP, G4ILI . . . Rule 6: G1TKX, G4ASR, G4JSN . . . General Rule 3; G4ZYP/A, G3VGG A, G1TZC A . . . General Rule 5: G6XZM, G3YVR, GW4EZW . . . General Rule 13.

Posn	Club	Score			Callsigns			Zone
1	Derbyshire Hills CG*	14,049	G6APZ	G4ZAP	G6XVV	G6OYL	G6RFL	A
2	Washington ARC	13,099	G4KUX	G4OKK	G1GEY	G4VBG	G0EHV	A
3	Sheppey Western CG "A"*	11,695	G8TFI	G4GFX	G3KFT	G6BBG	G0DA	D
4	Colchester RA "A"*	8,187	G4PIQ	G4TZM	G4LKD	G0EGX	G4YIR	C
5	Harwell ARS "A"	7,899	G3NNG	G3NAQ	G4MKF	G4HLX	G0GLB	D
6	Vale of Evesham RAC*	5,488	G0DXX	G0EMH	G0EMS	G0EXC	G4UXC	B
7	Rugby ATS "A"	5,471	G1XJO	G1LVY	G4EPA	G8TWH	G4DDW	B
8	Chesham & D ARS	3,980	G6KZP	G4TBR	G1RDX	G8AHS	G1XET	D
9	Central Lancashire ARC "A"	3,773	G4WXX	G0FDX	G1AHM	G1SWH	G1YKB	A
10	Wythall RC	3,381	G3XBY	G1JWO				B
11	Five Bells	3,345	G8ZHP					B
12	Chippenham & D ARC	3,211	G0GRI	G0HAS	G3UUV	G0HFX	G1DYK	D
13	Sutton & Cheam RS	3,164	G2DMR	G1POK	G3CDK	G3HSK	G1KNB	C
14	Colchester RA "B"	3,157	G1LGF	G4ZKS	G1GNQ	G0DCL	G4DKI	C
15	Crawley ARC	3,136	G3WSC	G6LMU	G3YVR	G3GRO	G1TWK	C
16	Aberdeen ARS*	2,982	GM0FRT	GM0CPQ				G
17	Cambridge & D ARC	2,837	G4NBS	G0GLJ	G8OFA			B
18	Meopham Parish RC	2,797	G0FKL	G4ZRS	G1KEY	G1NRD	G4XNU	
19	South Manchester RC "A"	2,672	G4JLG	G4NTY	G3ZDM	G0AOU	G0FCF	A
20	Mid Cheshire ARS	2,530	G0HHU	G0IRA	G1URR	G3ZTT	G6HXU	A
21	N Wakefield RC	2,163	G4NOK					
22	Macclesfield & D RS	2,073	G1NTR	GiNUS	G1MWS	G0AMU	G0IKB	A
23	Central Lancashire ARC "B"	2,045	G1YJZ	G0EJK	G4ZKA	G3RYY	G1YHZ	A
24	Flight Refuelling ARS	2,015	G4RFR	G1DWQ				D
25	Stirling & D ARS	1,918	GM4XQJ	GM0HZI	GM0GDL	GM6VGB	GM0GMD	G
26	Mid Sussex ARS	1,834	G1ZMS	G0APZ	G3JMB	G1TCH		C
27	Salop ARS	1,562	G1SPU	G3NSY	G4YKX	G6MEN		B
28	Farnborough & D RS "A"	1,517	G0GCI	G1IPO	G0HWL	G4JFN	G8ATK	D
29	Scunthorpe ARC	1,345	G4EQD	G1YNR	G1ZGO			B
30	Newport ARS*	1,241	GW6ZUQ					E
31	Reigate ATS	1,199	G8JXV	G1WIS	G1LNT	G3YSX		C
32	Sheppey Western CG "B"	1,182	G4VXE	G8JAY				D
33	Colchester RA "C"	1,097	G6HQI	G1ZIO	G1SVW			C
34	King Edwards School ARES	1,073	G8ZKE					B
35	Aston ARS	1,053	G8PGM					B
36	Sandwell ARC	883	G0CWC					B
37	Bristol ARC	875	G3TAD					
38	Harwell ARS "B"	856	G6NTN	G2HIF				D
39	Sheffield ARC	804	G4RNA	G0HSA	G0HEE	G1TKX	G1WZY	A
40	Brunel University ARS	629	G3UBR					C
41	English China Clays RC	627	G0ECC					D
42	Rugby ATS "B"	586	G3BXF	G1NPH				B
43	Maidenhead & D ARC	462	G3TWG	G8XYN				
44	Central Lancashire ARC "C"	408	G1BUN	G6WFK	G0EHW			A
45	South Manchester RC "B"	269	G0CBJ	G4BZO	G0FJD	G3SVW		A
46	Bromsgrove & D ARC	66	G4IVJ					B
47	Farnborough & D RS "B"	2	G4VAH					D

MULTI-OPERATOR SECTION

Posn	Callsign	Score	QSOs	Loc	Zone
1	G4KUX*	4,482	419	94BO	A
2	G3UNU*	3,990	452	92JW	B
3	G6APZ	3,406	446	93DC	B
4	G8ZHP	3,345	282	92TR	B
5	G4ZAP	3,233	338	93BV	A
6	GM0FRT*	2,976	200	87WB	G
7	G4OKK	2,948	255	94DV	A
8	G4VBG	2,528	270	94FW	A
9	G4NOK	2,163	219	93FM	
10	G8ECI	2,139	256	03AK	
11	G0ERS* / G4RFR	1,539	231 / 205	90KU / 90AS	D / D
13	G1XJO	1,510	249	92KK	B
14	G0EMH	1,487	252	81UX	
15	G4YCD	1,398	225	81RM	D
16	G6KZP	1,348	267	91RP	D
17	G1LVY	1,319	244	92JI	B
18	G1NRD	1,305	222	01EH	
19	G3WSC*	1,299	195	91VD	C
20	G0EXC	1,261	239	82SG	B
21	G4MKF	1,252	209	91HJ	D
22	G0CLP	1,117	222	92KT	B
23	G8ZKE	1,073	223	92AL	B
24	G3ZTT	1,036	195	83QE	A
25	G2DMR	931	197	91VH	C
26	G4TBR	914	196	91QQ	D
27	G4YIR	897	143	01KU	C
28	G0CWC	883	195	92AL	B
29	G3TAD	875	160	81RL	
30	G6LMU	869	177	91VC	C
31	G0FDX	853	148	83RQ	A
32	G3UUV	849	163	81WK	D
33	G1POK	833	171	91VI	C
34	G1RDX	826	165	91RQ	D
35	G1AHM	789	136	83OP	A
36	GU1HTY	674	64	89RK	D
37	G1ZMS	640	140	90WX	C
38	G3UBR	629	160	91SM	C
39	G0ECC	627	70	70OJ	D
40	G3CDK	590	130	91WI	C
41	G1XET	559	150	91MN	D
42	G1YJZ	547	97	83PQ	A
43	G3HSK	542	136	91VH	C
44	G4DDW	534	130	92KK	B
45	G1YNR	522	124	93PD	B
46	G4ZKA	521	89	83OS	A
47	G8XYS	517	71	80GR	
48	G3GRO	508	100	91VC	C
49	G1SEW	410	106	82XI	B
50	G1ZIO	391	75	01LU	C
51	G4RNA	372	84	93GI	A
52	G4XNU	293	71	01EH	
53	G1KNB	268	62	91VJ	C
54	G1KEY	199	71	01DG	

MULTI-OPERATOR SECTION

Posn	Callsign	Score	QSOs	Loc	Zone
1	G8TFI*	4,342	449	81UQ	D
2	G4PIQ*	3,391	369	01MU	C
3	G3XBY*	3,208	409	92DG	B
4	G6XVV*	3,178	327	93JK	A
5	G3NNG	3,171	399	91EP	D
6	G4GFX	2,699	307	82UC	B
7	G6OYL	2,550	281	93JK	A
8	G1GEY	2,530	247	94FW	A
9	G3NAQ	2,315	313	91HL	D
10	G6IAT	2,114	281	91TV	B
11	G4ARI	1,889	335	92IQ	B
12	G3KFT	1,702	268	91AV	
13	G4NBS	1,693	247	02AF	B
14	G6RFL	1,682	252	93CR	A
15	G6BBG	1,598	224	82TC	B
16	G4TZM	1,555	206	01LU	C
17	G4AHN	1,495	246	91OE	C
18	G4VRY	1,481	215	93GS	
19	G4XEN	1,475	235	92PH	B
20	G0DAZ	1,354	230	82VF	B
21	G4LKD	1,312	186	01KU	C
22	GW6ZUQ*	1,241	225	81PP	E
23	G0EMS	1,156	217	82XC	B
24	G4EPA	1,068	214	92KI	B
25	G8PGM	1,053	223	92AL	B
26	G8TWH	1,040	214	92JI	B
27	G0EGX	1,032	161	01IT	C
28	G4WXX	1,028	173	83QM	A
29	G0FCV	942	184	91LS	D
30	G0HAS	935	181	91BN	D
31	G4UXC	927	210	92BC	
32	G0GRI	925	152	81WG	D
33	G4JLG	909	162	83TM	A
34	GI1JUS*	874	62	74AQ	F
35	G3YDY	840	152	01FQ	
36	G1NOD	814	175	92MC	B
37	G0GLJ	810	142	02BF	B
38	GM0GMD*	759	59	86AE	G
39	G1LGF	755	116	01NX	C
40	G4ZRS	736	123	01FJ	
41	GI4KIS / G4NTY	725	49 / 141	64VR / 83TM	F / A
43	G1RMN	688	104	00DS	
44	G0GCI	685	147	91OF	C
45	G0GAG	677	134	93JD	
46	G4ZKS	676	89	01MU	C
47	G8ZRE	667	140	83NE	A
48	G0DXX	657	179	92BB	B
49	G4SND	652	155	82UI	
50	G1SWH	641	133	83QO	A
51	G1NTR	627	138	83WG	A
52	G1GNQ	626	113	01KW	C
53	G4HLX	624	148	91FP	D
54	G1NUS	622	149	83WG	A
55	G0EHV	611	61	94FW	A
56	G4EQD	606	96	93QN	B
57	G4VXE	601	116	81WV	D
58	GW3POM	597	93	81HN	E
59	G3NSY	596	109	82NP	B
60	G0DCL	585	99	01KU	C

Posn	Callsign	Score	QSOs	Loc	Zone
61	G8JAY	581	112	81WV	D
62	G3ZDM	566	116	83UK	A
63	G1SPU	562	102	82PQ	B
64	G1YAA	549	77	95EJ	A
65	GM6VGB	538	55	86CD	G
66	G0GLB	537	123	91IQ	D
67	G6NTN	528	120	91IO	D
68	G0EJK	518	97	83QO	A
69	G4DKI	515	88	01LV	C
70	G6HXU	504	92	83RF	A
71	G4YFN	503	134	91MK	D
72	G0APZ	489	77	90WW	C
73	G0HHU	479	123	83QF	A
74	G1NRM	476	134	91UO	C
	G1DWQ	476	82	90AT	D
76	G8VPE	469	60	02TP	C
77	G1YKB	462	108	83PQ	A
78	G1TWK	460	100	91VC	C
79	G3JMB	454	89	91WA	C
80	G1GVA	446	114	91PJ	D
	G1MWS	446	104	83WG	A
82	G6HQI	440	83	01LU	C
83	G8JXV	423	101	91VE	C
84	G0IRA	412	80	83RG	A
85	GM0GDL	402	50	86CD	G
	G3BXF	402	99	92JI	B
87	G1EHF	365	80	91SK	C
88	G1LGB	352	118	91VJ	
	G6NUZ	352	63	92XW	B
90	G0AMU	335	90	83WG	A
	G1IPO	335	77	91OH	D
92	G8OFA	334	66	02BE	B
93	G8AHS	333	91	91RR	C
94	G2HIF	328	72	91GO	D
95	G1YOA	309	59	81SN	D
96	G8TZJ	308	45	84OA	A
97	G1WIS	307	80	91WG	C
98	G4YKX	305	77	82OS	B
99	G0HFX	304	70	81VH	D
100	G4LDR	287	49	91CD	D
101	G3TWG	280	86	91PN	
102	G0AOU	270	67	83TJ	A
103	G1SVW	266	62	01LU	C
104	G0FKL	264	57	01DI	
105	G1TCH	251	50	90WW	C
106	G1LNT	249	67	91WG	C
107	GU1XOH	243	21	89QL	D
108	G3RYY	239	59	83QP	A
109	G0HWL	221	73	91OG	D
110	G1YHZ	220	48	83PR	A
	G3YSX	220	61	91WF	C
112	G1ZGO	217	44	93QO	B
113	G0HEE	212	60	93GI	A
114	G4JFN	206	70	91PG	D
115	G0FCF	202	67	83UJ	A
116	G1DYK	198	42	81VH	D
117	G6PMT	195	61	91RJ	
118	G1NPH	184	68	92LL	B
119	G8XYN	182	62	91OM	
120	G1JWO	173	54	92AI	B
121	GM0HZI	171	29	86AC	G
122	G0HSA	169	58	93GI	A
123	G0CBJ	163	59	83TJ	A
124	G1BUN	161	36	83PQ	A
125	G6WFK	144	42	83PQ	A
126	G4SJH	109	21	91SM	
127	G0EHW	103	43	83PR	A
128	G6MEN	99	23	82PQ	B
	G1URR	99	34	83SG	A
130	G3ZPB	75	37	91WH	C
131	G8ATK	70	10	91OF	C
132	G4IVJ	66	37	92AJ	B
133	G6UJJ	53	11	94FV	
134	G4BZO	48	22	83WK	A
	GM4XQJ	48	26	85DX	G
136	G0IKB	43	30	83WF	A
137	G0FJD	41	12	83VK	A
138	G3SVW	17	15	83UJ	A
	G1WZY	17	34	93GI	A
140	GM0CPQ	6	6	87WC	G
	G4ZJN	6	24	93FL	A
142	G4VAH	2	2	91PG	D

RSGB 21MHz CW Contest 1987 results

With excellent conditions prevailing throughout the event, it is disappointing that the entries from G are lower than last year. Perhaps the "hurricane" three days previously wrecked the intentions of some would-be entrants. The overseas entry had a more than 100 per cent increase with 125 logs, thus giving the adjudicator a mammoth checking exercise.

G4BWP is the winner of the T E Wilson G6VQ Cup. All the USA numbered prefixes were worked, as were the Japanese. (For the benefit of one entrant, W1, K1, WA1, WB1 etc count only as one prefix.) The USSR prefixes still cause some havoc and a number of people will find their multiplier total increased as UA1OT was in Franz Josef Land. When you add the Europeans, several stations from each of VK, Indonesia, Africa, South America and all areas except NW Territories in VE, the final total of possible multipliers exceeds 100.

Near-perfect logs from RB5IM and G6ZY/EA6 resulted in a close finish in the overseas section. The overseas receiving section was fairly well supported, which included an excellent log from ORS89020/ZS, which proved very useful in the checking.

As usual nearly all entries were well presented, but a few still fail to come up to the standard which the HF Contests Committee has tried to set. We all know the 599 syndrome but if you do send a different report to that weak dx station, keep a note of it in your log. Quite a few points have been lost due to what is poor log keeping. Unmarked duplicate contacts for which points had been claimed also took their toll of final scores. There were 25 in the G logs and 24 from overseas, and when you consider that every one loses 33 points times your multipliers, it is very expensive.

On the credit side, to those entrants who supplied a check list of their contacts in an alphabetical-numerical order, many thanks. There were also many comments about how much the event was enjoyed, on how many Ws they worked, the pile-ups and no complaints. Check logs were received from G15TK, GW4KVJ, LZ1KBG, LZ1KVF, LZ2KAC, LZ2VP, PY2WR, RL7PHL, UA3PB, UB3IWA, UB4JWI, UT5LF, UV3DN, UV3TD, UV6AM, UY5GG and UZ9YXI to whom the committee is grateful.

BRS20249

G TRANSMITTING

Posn	Callsign	QSOs	Mult	Points	Posn	Callsign	QSOs	Mult	Points
1	G4BWP	580	88	152,592	23	G4WYG	183	53	27,454
2	G3SXW	553	83	137,531	24	G3VYI	173	52	26,728
3	G4BUO	527	83	130,725	25	G4KGK	198	43	25,456
4	G4OBK	564	72	121,752	26	GM3RAO	219	37	24,309
5	G3RTE	560	72	120,528	27	G2QT	162	47	22,513
6	G3LET	448	77	103,180	28	G0EHO	146	44	17,952
7	G4WQN	433	71	92,016	29	G3OLU	163	52	17,420
8	G3SJJ	461	66	90,882	30	G3BPM	129	39	14,976
9	G3RAU	430	67	82,343	31	G4UZN	127	39	14,859
10	G3HVX	408	66	80,520	32	G3MPB	118	42	14,784
11	G3TBK	354	62	65,596	33	G3ILO	118	35	12,355
12	G3LZQ	331	66	65,472	34	G3LIK	116	44	11,352
13	G4ODV	262	67	50,116	35	GM3CIX	125	30	11,256
14	G3JKS	271	61	45,750	36	G3NKS	101	36	10,908
15	G4IUF	302	58	45,414	37	GM3CFS	105	33	10,362
16	G4BKI	252	62	44,330	38	G3AWR	84	29	7,308
17	G3SWH	269	54	43,470	39	G3IQF	72	28	6,048
18	GD3RFH	298	45	39,825	40	G4FUI	84	27	5,940
19	G5MY	227	55	32,285	41	G0CGB	72	26	5,564
20	G4FAS	214	46	29,394	42	G3GMS	58	21	3,633
21	G0DYX	202	47	28,435	43	G3GMM	44	17	2,244
22	G3APN	191	52	28,028					

CONTESTS CALENDAR

RSGB HF CONTESTS

2, 10, 18, 25 May	28MHz Cumulatives (Rules in April issue)
15 May	DF Qualifying Event Salisbury (Rules in May issue)
15 May	Region Round-up (Rules in April issue)
4, 5 Jun	NFD (IARU CW) (Rules in February issue)
12 Jun	DF Qualifying Event Northampton
25, 26 Jun	Summer 1·8MHz (Rules in May issue)
26 Jun	DF Qualifying Event Coventry
9, 10 Jul	SWL
10 Jul	DF Qualifying Event South Manchester
24 Jul	Low Power FD (Rules in May issue) **(Note date change)**
31 Jul	DF Qualifying Event Mid-Thames
7 Aug	Hopscotch **(Note date change)**
14 Aug	DF Qualifying Event Dartford Heath
28 Aug	Ropoco 2
Sep-Oct	28MHz Cumulative CW
3, 4 Sep	SSB FD (Rules in May issue)
4 Sep	DF Qualifying Event Grimsby
20 Sep	DF National Final Colchester/Chelmsford
9 Oct	21/28MHz SSB (Rules in May issue)
16 Oct	21MHz CW (Rules in May issue)
22 Oct	Df Treble Night Event Mid-Thames
12, 13 Nov	Second 1·8MHz
Nov-Dec	28MHz Cumulative Phone

RSGB VHF CONTESTS

7, 8 May	432MHz–24GHz (Rules in March issue)
15 May	10GHz Cumulative (Rules in January issue)
29 May	432MHz Trophy and SWL (Rules in March issue)
12 Jun	432MHz FM (Rules in March issue)
19 Jun	10GHz Cumulative (Rules in January issue)
2, 3 Jul	Jubilee VHF NFD (Rules in March issue)
10 Jul	10GHz Cumulative (Rules in January issue)
30 Jul	144MHz Low Power and SWL (Rules in May issue)
31 Jul	432MHz Low Power and SWL (Rules in May issue)
7 Aug	10GHz Cumulative (Rules in January issue)
14 Aug	1,296MHz Trophy and 2,320MHz Trophy (Rules in May issue)
3, 4 Sep	144MHz Trophy/IARU VHF and SWL
11 Sept	10GHz Cumulative (Rules in January issue)
18 Sept	70MHz Trophy and 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 and AFS and SWL
9 Dec	432MHz Cumulative
11 Dec	70MHz CW
17 Dec	1·3/2·3GHz Cumulative

OTHER CONTESTS

Jan-Dec	UBA SWL (Rules in December *HF*)
1 May	AGCW-DL QRP/QRP Party (Rules in April *QRP*)
14, 15 May	Cd-M (Rules in May issue)
21, 22 May	World Telecommunication Day (Rules in May issue)
28, 29 May	CQWW WPX (CW) (Rules in March *HF*)

G TRANSMITTING (QRP)

Posn	Callsign	QSOs	Mult	Points
1	G4ELZ	156	43	20,124
2	G4ARI	127	37	14,097
3	G2HLU	80	28	6,720
4	G4ETJ	73	25	5,475

G RECEIVING

Posn	Station	Heard	Mult	Points
1	BRS 1066	120	38	13,604

OVERSEAS TRANSMITTING

Posn	Callsign	QSOs	Mult	Points
1	RB5IM	174	18	9,360
2	G6ZY/EA6	178	17	9,078
3	EA7DMF	148	19	8,341
4	YO3CD	137	15	6,165
5	YU5JA	125	15	5,595
6	LZ2BV	121	15	4,995
	UB4FXX	111	15	
8	LZ1KSN	124	13	4,836
9	RB5IA	107	15	4,815
10	LZ1VA	113	14	4,620
11	YU4CC	101	17	4,607
12	YT2IX	119	12	4,284
13	YV1OB	110	13	4,264
14	RA3ZC	109	13	4,238
15	LZ1MG	107	13	4,173
16	K2PZ	105	13	4,095
17	YO8DDP	109	12	3,780
18	UA4HNP	103	12	3,708
19	UW6MA	85	13	3,315
20	UJ8JA	85	11	2,805
21	EC7DJL	79	12	2,760
22	UC2OCH	93	12	2,628
23	UB5FAA	90	14	2,520
24	UA1DZ	76	11	2,508
25	UB4EYT	71	11	2,332
26	PT2KT	63	11	2,057
27	OK1TW	70	10	2,040
28	KA1DWX	76	9	2,016
29	YO9AGI	66	10	1,970
30	HB9AGH	59	11	1,914
31	UB5AEO	62	10	1,860
32	UR2QA	55	11	1,804
33	VE7CC	60	10	1,780
34	UC2OS	59	10	1,760
35	UB5CAL	57	10	1,710
36	SP6HEK	81	9	1,638
37	LZ1TA	54	10	1,610
38	LZ1FR	73	10	1,590
39	YO6EZ	53	10	1,580
40	DJ5GG	57	11	1,529
41	UO5OB	56	11	1,507
42	WB0O	54	9	1,458
43	UA3DAT	59	8	1,408
44	UP3BU	48	9	1,260
45	UC2WBI	52	8	1,240
46	W1DMD	46	9	1,233
47	UB5BDC	69	10	1,170
	YU7SF	39	10	
49	UT5JCW	56	7	1,169
50	RA3QNO	55	7	1,148
51	LZ1FJ	41	9	1,107
52	VO1AW	35	9	945
53	UA9XR	39	8	928
54	UB4IWI	50	6	888
55	UA1OT	42	7	875
56	UA9XHT	32	9	864
57	UA4APF	41	7	840
58	UZ1CXF	46	6	822
59	UB5AJP	49	7	812
60	VE2AEJ/3	30	9	810
61	UA6LFQ	44	8	768
62	VE3KK	33	8	760
63	UA1OOO	41	6	738
64	N8FU	36	7	735
65	WB8TPM	31	8	696
66	UL8CWW	45	5	675
67	UA1QCC	31	7	651
68	W9EBY	28	8	648
69	LZ1KVZ	57	8	640
70	N0FFZ	26	8	600
71	UI9AWX	25	8	592
72	W7GB	29	10	560
73	JH3AIU	31	6	558
74	OK1KZ	26	7	525
75	RZ3DZ	35	7	511
76	YC2CTW	26	6	456
77	LZ1MC	30	5	450
78	F6EPQ	24	6	426
79	UA1OAM	29	5	425
80	VK4XA	29	5	420
81	Y22WF	27	5	405
82	Z23JO	27	5	385
83	UA3TAM	31	4	372
84	KX7J	21	5	315
85	CX6BM	21	5	310
86	LZ2PL	25	4	300
87	LZ2TU	25	4	296
88	JA1BNW	24	4	288
89	OK2PGT	19	5	285
	OK5MVT	19	5	
91	EA7AAW	15	6	270
92	Y23QD	16	5	235
93	UA9XHJ	17	4	204
94	SK0MG	21	3	189
95	OH5RZ	20	3	180
96	YB2FEA	16	4	168
97	JA7YFB	18	3	153
98	JE1JKL	17	3	150
99	UA4QK	13	4	148
100	JA1KI	16	3	144
	VK4XW	16	3	
102	RB5AE	16	3	141
103	OK2KVI	10	5	135
104	JH4UYB	14	3	123
105	JG6OZC	19	2	114
106	WA4JJY	11	3	99
107	JA7FRT	11	3	96
	JJ1EGE	11	3	
109	JA1JGP	9	3	81
110	JA9YAV	13	2	76
	W2KTF	14	2	
112	LA1IE	10	2	60
	UZ9XWV	10	2	
114	JA1OP	9	2	52
115	OH6RC	6	2	36
116	LA1VL	5	2	30
117	JA9YBA	4	2	24
	UL7CEP	4	2	
119	KA7FEF	5	2	22
120	JA3UWB	3	2	18
121	JG3SUP	2	1	6

OVERSEAS (QRP)

Posn	Callsign	QSOs	Mult	Points
1	EA3EGV	53	8	1,216
2	LZ1TD	32	8	288
3	UF6QAE	26	3	234
4	OK2BMA	16	4	192

OVERSEAS RECEIVING

Posn	Station	Heard	Mult	Points
1	URE-204-B	80	12	2,868
2	ORS 89020/ZS	77	11	2,508
3	UA6-101-2900	31	7	651
4	UA4-094-895	31	5	465
5	UB5-077-1791	19	4	220
6	F11ATR	8	4	96
7	UA9-090-1058	3	2	18

VHF/UHF Listeners Championship 1987 results

This year's Championship may only have had five entrants, but the competition was quite fierce for the No 1 spot. It was not until the results of the September 70MHz Contest was available that the overall winner was decided. Once again, the scoring is based on the "normalisation" system used in multiband contests with 1,000 points allocated to the leading station on each band in each contest, and the other entrants' scores being calculated as a proportion of the winning score.

Bob Treacher, BRS32525, was the eventual winner, coming home first in every contest he entered. It is Bob's first success in the championship since 1982. A fine second was Norman Henbrey, BRS28198, who entered all eight events and won two of them. Third was David Whitaker, BRS25429, who came home first in the 144MHz August Contest. Subject to Council approval, Bob Treacher will receive the Hansen Trophy.

There is a similar number of events having listener sections in 1988. The VHF Contests Committee hopes that there will be an increase in the number of listeners submitting logs so that there may be more competition for the regular entrants. Once again, thanks to those listeners who supported the events in 1987. If you think that the listener events can be improved please write to G3XDY, QTHR.

G3XDY

Posn	Station	Mar 2/70	Apr 2/4	May 70	VHF NFD	Aug 2	Aug 70	Sept 2	Sept 4	Total
1	BRS32525	–	2,000	1,000	2,445	–	–	1,000	1,000	7,445
2	BRS28198	2,000	1,492	156	627	118	1,000	306	657	6,356
3	BRS25429	–	–	593	1,525	1,000	–	594	–	3,716
4	BRS72543	–	–	–	2,073	–	–	–	–	2,073
5	BRS31976	–	–	–	–	746	–	–	–	746

RSGB 21/28MHz SSB Contest 1987 results

The committee is pleased to report that the 1987 event produced a healthy increase in the number of logs received overall, and it is particularly pleasing to note the amount of dx worked on 28MHz. This year's winner of the Whitworth Trophy, G4BWP, seems to have got the equation between points and multipliers just about right, and G3NLY/A had more multipliers than anyone else on 21MHz but was lacking in a few extra QSOs. The Powditch Trophy, awarded to the entrant with the highest 28MHz score, was won by G6LX. The Metcalfe and Powditch Receiving trophies were both won again by BRS32525. In the overseas single-operator section the score of 4X5000 was over twice that of the runner-up.

The standard of log keeping was mixed, and the adjudicator is always surprised at the number of entrants whose logs do not comply with the rules for one reason or another; some entrants run the risk of being disqualified and it seems a pity that this could happen when all that is required is reference to the specific or the general rules for guidance. The major problem seems to be the actual log sheets and cover sheet; some entrants are still using old vhf-style sheets, non-standard logs with anything between 27 and 80 entries per sheet, and home-produced log and cover sheets.

Congratulations to all trophy and certificate winners. The committee appreciates all the time and care taken by the vast majority of entrants in this and all other RSGB-sponsored contests.

Finally, one entrant claimed a score exactly three times what it should have been!

G3KDB

BRITISH ISLES TRANSMITTING – SINGLE-OPERATOR

Posn	Callsign	Points	Multi 21MHz	Points	Multi 28MHz	Adjudicated score
1	G4BWP	1,929	79	261	56	295,650
2	GW4BLE	2,216	64	192	43	257,656
3	G3NLY/A	1,874	84	174	37	247,808
4	G4CNY	1,964	80	138	32	235,424
5	G4YLO	1,992	74	96	26	208,800
6	G3OZF	1,503	68	272	49	207,675
7	G3YDV	1,353	68	105	17	123,930
8	G4OBK	1,095	50	236	40	119,790
9	G3SXW	1,168	49	122	35	108,360
10	G3VOF	1,111	50	132	31	100,683
11	G4IUF	972	69	93	22	96,915
12	GD4PTV	1,229	63	27	7	87,920
13	GW4HSH	997	57	81	15	77,616
14	GW0ARK	1,196	55	33	6	74,969
15	GM4TOQ	953	63	33	11	72,964
16	G3SJX	981	42	96	19	65,697
17	G6LX	180	24	364	71	51,680
18	G3TBK	507	42	150	30	47,304
19	G4LYM	571	37	114	26	43,155
20	G0BIR	278	30	330	40	42,560
21	G2QT	496	37	97	24	36,173
22	G4UJS	809	43	3	1	35,728
23	G4ODV	489	39	116	20	35,695
24	GW0DJX	645	42	15	1	28,380
25	G3WBM/P	499	38	54	13	28,203
26	G4MET	541	36	39	9	26,100
27	G3XMV	491	29	33	9	19,912
28	G4XRX	360	36	27	8	17,028
29	GM4HQF	312	28	–	–	8,736
30	G4PCI/P	258	23	18	6	8,004
31	G4DXW	135	18	69	19	7,548
32	G3UHU	169	13	72	14	6,507
33	G3UKH	222	24	6	2	5,928
34	G4JTR	188	21	24	5	5,512
35	G0EPM	143	14	12	4	2,790
36	G3IQF	48	11	3	1	612
37	G4LZZ	45	6	–	–	270

BRITISH ISLES TRANSMITTING – MULTI-OPERATOR

Posn	Callsign	Points	Multi 21MHz	Points	Multi 28MHz	Adjudicated score
1	G3FYQ	1,328	62	65	14	105,868
2	G4RFR	974	58	162	34	104,512
3	G0CYB	1,152	57	18	6	73,710
4	G4RCG	919	57	63	15	70,704
5	GW4EZW	1,042	45	45	13	63,046
6	G3XEP	921	54	42	10	61,632
7	G4FPQ/P	651	37	72	19	40,488
8	GW3CSA/P	576	34	18	3	21,978
9	G3BZU	354	34	57	14	19,728
10	G8CA	336	24	33	9	12,177
11	G3PGU	259	37	21	5	11,760
12	GI0AZA	273	18	9	2	5,640

OVERSEAS TRANSMITTING – SINGLE-OPERATOR

Posn	Callsign	Points	Multi 21MHz	Points	Multi 28MHz	Adjudicated score
1	4X5000	415	22	900	22	57,860
2	UA6ADC	660	15	180	9	20,160
3	RB5IM	861	22	–	–	18,942
4	LZ1KDP	803	18	–	–	14,454
5	G4DZC/W2	690	16	3		11,781
6	RB5QW	681	17	–	–	11,577
7	UA6LAM	533	16	–	–	8,528
8	UA6LEC	514	15	–	–	7,710
9	EC7DJL	349	22	–	–	7,678
10	ZS6KU	135	11	216	9	7,020
11	UA4HTT	341	14	18	5	6,821
12	RA6LPY	392	17	–	–	6,664
13	UA6LF	369	16	3	1	6,324
14	UT5JCW	391	13	3	1	5,516
15	UB4JDM	336	16	–	–	5,360
16	RW3DW	350	15	–	–	5,250
17	EA5CJC	117	12	144	7	4,959
18	LZ2VP	321	15	–	–	4,815
19	EA7DHK	359	13	–	–	4,667
20	UB0QQ	333	14	–	–	4,662
21	LZ1KBL	322	14	–	–	4,508
22	JG1FVZ/5N27	9	2	288	13	4,455
23	UV9CM	335	13	–	–	4,355
24	RB5MP	287	15	–	–	4,305
25	UA9WFV	299	14	–	–	4,186

Posn	Callsign	Points	Multi 21MHz	Points	Multi 28MHz	Adjudicated score
26	UL7AAC	166	12	71	5	4,029
27	LZ2RS	282	14	–	–	3,948
28	UI8OAZ	270	14	–	–	3,780
29	RW3PW	264	14	–	–	3,696
30	LZ1CW	241	15	–	–	3,615
31	YU4CC	231	15	–	–	3,465
32	RW6PA	287	12	–	–	3,444
33	KA2PHQ	264	13	–	–	3,432
34	CT3BM	257	13	–	–	3,341
35	YU6NF	301	11	–	–	3,311
36	UA3QJC	240	12	–	–	2,880
37	LZ2QV	218	13	–	–	2,834
38	UI8CAJ	236	12	–	–	2,832
39	UA9AKO	234	12	–	–	2,808
40	UA6LLT	191	14	–	–	2,674
41	LZ2TU	212	12	–	–	2,544
42	UY5TE	211	12	–	–	2,532
43	UD6DR	265	9	–	–	2,385
44	UW6MA	198	12	–	–	2,376
45	UL7KA	237	10	–	–	2,370
46	RB51A	212	11	–	–	2,332
47	UB41XZ	197	11	–	–	2,167
48	YC2CTW	199	10	–	–	1,990
49	Z23JO	–	–	174	11	1,914
50	UA4LDJ	170	11	–	–	1,870
51	UV3DN	168	11	–	–	1,848
52	RM8MA	181	10	–	–	1,810
53	UB5AEO	167	10	–	–	1,670
54	UB4JB	141	11	–	–	1,551
55	EA8ANY	47	6	92	5	1,529
56	LZ2SD	135	11	–	–	1,485
57	EA7BYM	87	8	24	5	1,443
58	UB5TDX	141	10	–	–	1,410
59	UA3DNR	135	9	–	–	1,215
60	UF6DG	35	5	72	6	1,177
61	UA3TN	117	10	–	–	1,170
62	LZ1FU	115	9	–	–	1,035
63	LZ1UF	114	9	–	–	1,026
64	UA4CO	98	10	–	–	980
65	UA9XSJ	108	9	–	–	972
66	UA3WAV	117	8	–	–	936
67	EA7ABV	97	9	–	–	873
68	YO6AJI	89	9	–	–	801
69	N4MM	70	11	–	–	770
70	CT1BWW	76	10	–	–	760
71	WK4F	89	8	–	–	712
72	UA3TAM	78	8	–	–	624
73	EA3FGS	–	–	75	8	600
74	RB5AE	71	8	–	–	568
75	HA5KHC/8	56	10	–	–	560
76	RA3DJA	93	6	–	–	558
	UB5AFI	62	9	–	–	
78	LZ2VU	58	9	–	–	522
79	HL1ABR	66	7	–	–	462
80	UA3PNN	60	7	–	–	420
81	KB0C/9	59	7	–	–	413
82	UA3DAT	51	7	–	–	357
83	YU7SF	45	7	–	–	315
84	UA9XR	51	6	–	–	306
85	SM4CMG	29	5	9	3	304
86	JH4UYB	57	5	–	–	285
87	OK1TW	15	4	10	3	175
88	EA3ELZ	–	–	41	4	164
89	JA6QDU	30	5	–	–	150
	JE8FOU	30	5	–	–	
91	RA1OAK	24	4	–	–	96
92	LZ1KZM	15	3	–	–	45
93	YU7KM	12	3	–	–	36
94	XE2FL	14	2	–	–	28
95	ON8WN	3	1	–	–	3

OVERSEAS TRANSMITTING – MULTI OPERATOR

Posn	Callsign	Points	Multi 21MHz	Points	Multi 28MHz	Adjudicated Score
1	U19AWH	707	18	–	–	12,726
2	LZ1KSN	560	14	9	3	9,673
3	LZ1KVZ	491	18	–	–	8,838
4	LZ1KVF	492	15	–	–	7,380
5	UB4EZI	448	14	–	–	6,272
6	UB4TWL	147	12	–	–	1,764
7	LZ1KKZ	138	10	–	–	1,380
8	UZ3XWC	144	9	–	–	1,296
9	UB4FXX	126	10	–	–	1,260
10	UB4IWS	82	10	–	–	820
11	UZ9XWV	68	6	–	–	408
12	UL8CWW	48	4	–	–	192
13	UZ9OXI	18	2	–	–	36

BRITISH ISLES RECEIVING

Posn	Callsign	Points	Multi 21MHz	Points	Multi 28MHz	Adjudicated Score
1	BRS32525	675	59	105	25	65,436
2	BRS28198	264	34	60	16	16,200
3	BRS20249	297	35	27	9	14,256
4	BRS90400	354	29	21	6	13,125
5	BRS44984	105	17	42	10	3,969
6	BRS87949	135	16	21	6	3,432
7	BRS88825	126	14	12	4	2,484

OVERSEAS RECEIVING

Posn	Callsign	Points	Multi 21MHz	Points	Multi 28MHz	Adjudicated Score
1	ORS89020/ZS	228	13	57	6	5,415
2	UA3-170-372	303	15	–	–	4,545
3	UO5-039-267	192	13	27	4	3,723
4	UA4-094-895	251	14	–	–	3,514
5	UR2-083-63	216	10	45	3	3,393
6	UA9-154-2149	222	12	–	–	2,664
7	UB5-077-1791	198	12	–	–	2,376
8	LZ1-1-196	153	12	–	–	1,836
9	LZ1-H-192	156	9	–	–	1,404
10	UL7-023-32	135	8	–	–	1,080
11	UP2-038-1751	87	11	–	–	957
12	Y31-47-B/UB	66	8	–	–	528

Check logs received from: EA4EBB, HA4XX, RV6AF, UA1ZD, UA3ASL, UA3DEV, UA4PBF, UA9CTP, UA0SME, UZ6HXK, 9Q5DA.

February 1988 144MHz CW Contest results

Conditions were very poor for this contest and were little different from February 1987, whereas superb conditions had been experienced in November 1987. The total entry in two sections was 32 compared with a single-section entry of 40 in 1987. GM stations were notably active so that entrants achieved dx QSOs in the region of 500km in spite of the poor conditions. In some cases this was done with only 10W rf.

There were few comments on poor-quality signals. When reports of key clicks or other undesirable features are being heard it is accepted practice to close down and investigate the fault. There was one case of a reluctant response to one such report. Entrants are therefore reminded of our Code of Practice and particularly in respect of poor quality signals. In general the rules met with satisfaction although the weather did not. Certificates go to GM0FRT, G0CLP/P, G4BLX and G3XBY. Check logs were received with thanks from G4UOL/P and G0GKN.

G3FZL

SINGLE-OPERATOR FIXED STATION SECTION

Posn	Callsign	Score	QSOs	Loc	Best dx	Km
1	G4BLX	637	81	IO90WV	GM0FRT	698
2	G3XBY	629	93	IO92DG	DL6BF	616
3	G4ZEC	494	74	IO92MA	GM4AFF	594
4	G4ARI	482	80	IO92IQ	GM0FRT	491
5	G4XEN	466	77	IO92PH	F2GL	585
6	G0HAS	389	53	IO91BN	GM4AFF	621
7	G4OUT	281	45	IO92AT	GM4AFF	501
8	G4SND	258	42	IO82UI	GM4AFF	551
9	G4ZVS	252	52	IO92BK	GM0FRT	515
10	G4XPE	229	43	IO92GU	GM0FRT	470
11	G3KNU	192	30	IO93QN	GM4SUC/P	335
12	G5UM	147	32	IO92MP	GM0FRT	510
13	G0ATR	135	41	IO92KP	GM4YXI	281
14	G3WRJ	123	23	IO91UX	GM4YXI	383
15	G4YTK	112	27	IO92AQ	GM0FRT	487
16	G0DJF	91	17	IO82QB	GM0FRT	557
17	G0HGA	79	22	IO91VV	G4THB	278
18	G2DHV	62	18	JO01BK	G4CDD/P	268

ALL OTHER STATION SECTION

Posn	Callsign	Score	QSOs	Loc	Best dx	Km
1	GM0FRT	870	53	IO87WB	G3TRF	775
2	G0CLP/P	722	75	IO84KD	F6FLE	498
3	G4VXE/A	689	94	IO81OQ	DL6BF	665
4	GM4HAM	600	51	IO85JW	G4BLX	597
5	G4THB	585	89	IO92OE	GM0FRT	549
6	G4RFR	568	65	IO90AS	GM0FRT	700
7	GM4SUC/P	374	30	IO75PK	G4WHZ	557
8	G1WKS/A	348	56	JO01ED	GM4YXI	485
9	G3TRF	327	45	JO01GG	GM0FRT	666
10	G4NOK	315	53	IO93FR	GM4AFF	401
11	G0INF/A	246	47	IO93GI	DL6BF	593
12	G3PRC/P	216	26	IO80AQ	G3VIP	416
13	G4CDD/P	203	43	IO93CN	GM4HAM	279
14	G4WVD/P	194	20	IO70PP	GM0FRT	732

1987 432MHz Cumulative Contest results

This year's contest saw a decline in the overall number of entries, but it was nice to see some callsigns among the entrants for the first time. Conditions were described as "average" with Session 3 producing the best contacts and the most points for the majority of stations.

The change in the normalisation process for the event produced only one comment on the cover sheets, complaining that it was now possible to win the event without operating in all sessions. Those with other commitments viewed the new rules as an encouragement to enter, even if they had missed the best session.

It will be noted that the winner of each section of each session is awarded 1,000 points, something that was not explicitly stated in the rules.

Congratulations to the Five Bells group, winner of the fixed-station section; the Derbyshire Hills CG runner-up, and to C Easton, who won the section again this year from a different site over the Clockwork CG.

FIXED STATIONS SECTION

Posn	Callsign	Normalised Total	Loc	Odx kms	Dates and Points 8/10	24/10	9/11	25/11	12/12
1	G4SIV	2,841	92TR	494	302	536	731	0	0
2	G6APZ	2,787	93DC	452	0	0	575	313	346
3	G8HHI	2,568	91OH	440	359	407	521	143	280
4	G1GEY	1,259	94FW	405	121	163	272	0	225
5	G6IAT	961	91TV	252	166	0	151	92	0
6	G4MUT	855	91NK	392	0	0	170	79	128
7	G3ZJY	694	90FR	384	0	151	91	0	100
8	G6ZHV	678	82SP	255	104	112	131	0	0
9	G8JXV	642	91VE	292	91	0	127	0	75
10	G3KPU	568	93MN	275	57	77	121	0	85
11	G8GTP	391	83UN	–	0	87	23	62	0
12	G4LDR	331	91CD	421	0	70	90	24	22
13	G1NRM	296	91UO	272	37	0	94	33	56
14	G3JJZ	290	01AJ	224	19	34	49	45	28
15	G0FKY	241	80XS	–	25	42	48	29	10
16	G6YLW	222	01HI	312	80	0	0	0	0

ALL OTHERS SECTION

Posn	Callsign	Normalised Total	Loc	Odx kms	Dates and Points 8/10	24/10	9/11	25/11	12/12
1	GW8TFI/P	3,000	81NV	636	0	603	734	444	495
2	G4KZY/P	2,578	91GI	533	349	486	520	343	340
3	GW4MGR/P	2,258	83JA	468	306	392	0	234	362
4	G1KDF/P	1,337	83PN	498	0	259	331	80	226
5	GW4JZF/P	1,308	82JG	681	0	195	450	165	108
6	G6CSY/P	1,165	01BH	322	152	0	0	121	226
7	G4YTQ/P	653	93VJ	375	228	0	0	0	0
8	GU6CSY/P	1	89RK	1	0	0	1	0	0

Check logs received with thanks from G1KDF, G4JZF/P, ZB2IQ, G4MGR and RS31976.

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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 . . . .

SWLER GOING TX. R2000 gen covge rx with conv to 118-172MHz. Boxed BGN £450. Buyer to collect. Will demonstrate. Woolley, 202 Faversham Road, Kennington, Ashford, Kent. Tel: 0233-28393.

SHACK CLEARANCE. IC701 tcvr 100W o/p with psu and keypad SEM transmatch atu, Daiwa cross needle pwr swr meter, £450. IC245E 2m multimode tcvr, 10W o/p £150. G4WTZ, QTHR. Tel: 0260-278132. Buyer must collect.

SILENT KEY SALE. G5KV. Chest 36"Lx18"Wx15"H half full between wars components, £30. FT227R all accs £125. Datong FL1 £35. Hamgear P11F atu/preamp/calibrator £30. BC221 with psu £15. ono/collect. Mrs Leonard, Henley-on-Thames 572713 or G3AVQ 576852.

TELETYPE ASR33 with all manuals good condx. Bill Reilly, 61 Over Nidd, Harrowgate, N Yorks. HG1 3DB. Tel: 0423-504646.

FRG7 RECEIVER vgc, £125. Trio JR310 160m to 10m receiver amateur bands, very selective, £110. G4JFE, QTHR. Tel (Newbury) 0635-41613.

FTdx500 Sommerkamp (Yaesu) 5-band hf tcvr. Max input power 560W PEP, 500 cw, 125 am. Built in pwr/sup. Provision enabling 3 additional tcvr bands to be added. Little used. vgc. £155. G3PKL, QTHR. Tel: 0202-622963.

HAMMARLUND SP600 RX, £80. Daiwa infra red mic, £20.KW dummy load £15. Datong morse tutor, £35. Trio TR7800 with Heatherlite mobile mic, £185. G3VOW, QTHR. Tel: 0635-43048.

RACAL PROFESSIONAL RCVR type RA117E, vgc, 1-30MHz in 1MHz bands c/w manual, £200. G1UUG, QTHR. Tel: 091-252-7141 (Tyne and Wear).

KANTRONICS ALL MODE TNC; cw/rtty/ascii/amtor pkt. Still under guarantee, £215. TAU model SPC3000 atu 3kW PEP swr and power meters, £175. Adonis desk mic model 303G, £30. Kenwood PS20 4a p/s £25. G4DAI, QTHR. Tel: 0602-393404.

YAESU FT301s solidstate QRP tcvr 10W PEP 160-10m (all of 10m) cw filter. RF processor, mic and manual, £250. G4CZB, QTHR. Tel: 0604-830129 (Northampton).

TS830S fitted 500Hz filter, £750. AT230, £170. Or £900 the pair. Any demonstration. G3JLB, QTHR. Tel: 0474-534694

NEW VALVES PAIR 813 with bases £36. Single 813 with base £18. GGV03-20 with base, £10. QQV02-6 £4. Qty of 12AT7, 12AX7, 12AU7, ECF80, EF86, EF91, £1 each. Carr/ins extra. G3XII, QTHR. Tel: (Leyland) 0772-422121.

TET 4-BAND vert ant with radial kit, £35. KW ezee match atu in good order, £30. Kenwood Trio hand mic MC42S never used, £12. Cushcraft, 2m 7-ele beam as new, £10. Tel: 061-320-6941.

YAESU FT1 hf tcvr fitted fm and all optional filters, keyer, RAM board, hand scan mic. All manuals. In mint condx, £1050, to include Securicor delivery. WANTED:PFAS-1-4R remote ant selector for FC102 atu. GW4RLP, QTHR. Tel: 0286-3567 (evenings).

ICOM IC490E 70cm multimode, boxed as new, £395 inc carriage. G6OKB, QTHR. Tel: 0843-821260.

ICOM IC701 tcvr + matching IC701PS 20a psu. Superb pre warc. Boxed with manual. Bargain at £450. No offers. G0AKA, QTHR Gorton, Manchester. Tel: 061-231-2912.

HEATHKIT TX/RX SB101, psu, HP23 in speaker SB600, Heath ceramic mike. All expertly built, £180. Buyer view and collect. G3UDZ, QTHR (Lancs). Tel: 0772-421320.

MET ANTENNAS. 2 x 19-ele and power splitter, £75. Contact Bob, G4ZRS, QTHR. Tel: 0634-712351 (Medway).

CROTECH 3031 95 MM scope, £80. G4DSC, QTHR. Tel: 0765-2230.

70cm EME, contest antenna, eight 21-ele F9FTs, H frame, power dividers, Andrews Heliax connecting cables (16 Andrews connectors). You collect £230. Two 9MHz YF90F ssb filters, one with carrier xtals, £20, without £15. G4DZU, QTHR. Tel: 0532-853564.

COLLINS KWM380 Memory retention board. Retains both vfo's and all memories after switch off. This unique Collins accessory new, £125. Tel: 0247-455162.

TEN-TEC CENTURY 22 cw only tcvr, with matching psu and MFJ901B atu. £425 ono. WANTED: TS120V. Prefer with cw filter, also to complete B2 restoration, spares box and contents, key, phones, WHY? Please write, Maj Kemp, 4 Armd Wksp, BFPO 41.

TRIO TS130S + Filters MC50, £400. TR9130 B09A base Kenwood SW100 up/dwn mic, m/mount £375. FT102 +fm, £510. PS30A £60. SP120, £25. All vgc. Bills, boxed. Inspect, work it.Share petrol cost. WAB. TL39. QTHR. Ivor, tel: Turves 9820-268.

DRAKE TR7A tcvr, PS7 psu, SP75 speech processor, Shure 201 hand mic. All in very good order, £975. (The property of a deceased radio amateur). Tel: G4OYY, John, (Wilmington) 040-483-616 (after 4pm).

JAYBEAM TB3 TRIBAND £85. 23cm 23-ele Yagis with frame £100, 17-ele cue-dees for 70cm £35 each, 4-way power splitter for same £15. 70MHz fm Pye-Olympic 4-chan with antenna, £65. 50MHz 3-ele Yagi £15. G3BSN, SAE. Winter 87-88 Callbook.

YAESU YO901 MULTISCOPE with band scope fitted, perfect condx, hardly used. Boxed with leads and manual, £260. G4PPD, QTHR. Tel: 01-578-6076.

ICOM IC251E MULTIMODE, 2m with SM5 mic. MuTek front end. C/w new unused mobile bracket, £450 ono WANTED: small 70cm beam. Filing cabinet. G8XCL, QTHR. Tel: (Lydd, Kent) 0679-20954.

SUPERSTAR 360FM multimode converted to 10m band by Spectrum. Mint condx, £150. Wood & Douglas 2m 25W linear, £20. Tel: Mark, Belfast 795783.

SOMMERKAMP FT277ZD FAN fm, warc bands, £550: Sommerkamp FT290R Mk1 as new, with nicads, carrying case, £285. Trio 9130 new, never used, £450. Cambridge DC Potentiometer needs batteries, £25. Tel: Joe, 0625-20835 (anytime before 9.30pm).

TANDY SCANNER RCVR. (PR032A) 66-88MHz, 108-136MHz 138-174MHz, 360-512MHz. Cost £250. Bargain price £150. G4GHG, QTHR. Tel: 0803-37050.

ROTATOR AR40 by Hygain. Medium duty c/w handbook and lower mast clamp, £70. 2m yagi 17-ele tonna complete in box with assembly instructions, £35. Reason for sale QSY hf bands. Tel: John (Bradford) 0274-675292 (after 7pm).

PANDA EXPLORER TABLE top tx with cir/dia, £50. RCA Master osc 2-18MHz with manual, £10. Rebuilt RX1155, £10. RX1155, TX1154 cases, £3 each. Oscscope tube CV966, £10. 19SET h/mic £2. Or offers. G3GMM. "Castlebank", School Lane, Sandbach Tel: 0270-766140.

FT77 FM, MARKER, m/mount, mic, vgc. £400. FT230 25W fm, £165. TR2500 h/held mobile charger/psu mains charger, case, flexi-whip, tele-whip, spk-mic, £165. G whip multi-select mobile hf ant 80-10m £50. G4UVQ, QTHR. Tel: 0462-674437.

3-ELEMENT TRI-BAND BEAM TA33JR with two new traps. Buyer collects or arranges transport, £65. ZX81 printer, £10. 5 rolls paper, £10, or £15 the pair. Plus postage. G4ERA, QTHR. Tel: 0424-812350.

HAMEG HM307 OSCILLOSCOPE. 10MHz bandwidth, single beam with built in component tester. Compact and light weight. In very good condx, c/w manual, probe and orig pkg. £100. G0HJQ. Tel: 061-430-6048 (evenings).

PLEASE BUY MY FT208R as money is needed. C/w two nicads, spk/mic, charger, PA3 DC/DC adaptor, £180. 10m FM40 channel mobile, £40. All items vgc.p&p extra. GW8YJN, QTHR. Tel: 0437-781265. Please note transmatch sold.

SONY ICF200D RX gen/cov am/fm/air/ssb/cw, 12 months' old, £175 + post or collect. GW7AOH. Tel: Pembroke 686112.

STORNO CQF13C-14 2m tcvr with remote control unit, working order, £55. Bryans 26000 A3 analogue xy/t plotter with various accessories and manuals, £135 or exchange for FC102 atu or FV102DM vfo. G3XEW, QTHR. Tel; 0322-521722.

FT290R MUTEK C/W Alinco 30W linear, nicads, chgr, case, r/duck, boxed, vgc, £350. Alinco 140-160MHz handheld LCD keypad 3/5W 10 mems. C/w spk/mic, chgr, nicad pack, case, mini r/duck, boxed, under guar ntee, 3 months' old, £225 ovno. G1HQK, QTHR. Tel: Ian, 01-517-8277.

ICOM IC751 HF TX/RX, 250Hz cw filters, £975 ono. Philips CD304 CD player (infra red remote control) £145 ono. Olympus OM-2N 50mm/f1.8 £125 ono. G4WVX, QTHR. Tel: Bruce, 06286-64415.

SUPERB LOCATION picturesque village. 6 miles Dover, 10 Folkestone, 10 Canterbury. Detached house 3 dble/beds, 22' lounge, lge dining room, cloakroom, lge conservatory. Italian bathroom suite with shower. Main bedroom shower ensuite. Full gfch.Weru sealed unit dble glzg. Cavity wall ins. Caraging three cars. Main line station Victoria. Offers in excess of £100,000. G3GAZ. Tel: 0304-830691.

PANASONIC DR31 fm/lw/mw/sw 32-band digital rcvr am/cw/ssb for sale, £200, or exchange for R532 airband rcvr or similar. I am also interested in any expansion units for the SX400 rcvr. G8ZQC, QTHR. Tel: (Devon) 0769-80449.

ICOM IC551 in mint condx and in orig pkg. Reluctant sale due to pressure of work and lack of time to operate, £495. No offers or time wasters please. G6JNS, QTHR. Tel: 0905-620041.

MODEM. The UT55A and circuit diagram. Unused, suitable use with teleprinteres or micros, £27 inc p&p. G3VGO, QTHR. Tel: 0872-864255.

COLLECTORS ITEM: Dynatron Merlin model B129 comprising T690 and LF598 chassis. Mw/lw and sw 4-30MHz. Still pulling in the dx. Offers G3RNM, QTHR. Tel: Storrington 2447.

AOR2002 SCANNING RCVR mint condx, boxed, £385. would exchange for Trio 9130 or Icom IC290 2m multimode in perfect order. Tel: (Banchory) 033-02-3324.

FT208R and FT708R with four nicad packs. YM24 spk/mic and NC1A chgr. Nec 8201A portable computer, 24k ram, disc drive, manuals, £150 each radio/computer. G8PXB. Tel: Simon Hopkins, 0442-42277 ext 2537.

R1000 GEN/COV RCVR, as new c/w manual, accessories and orig pkg, £220. David, G4ERW, QTHR. Tel: 01-397-2555 (evenings/weekends).

FOR BBC COMPUTER. Watford Electronics DDFS disk interface kit, latest issue with 1770 board and rom, £25. Acorn ADFS rom, manual, (works with above) £15. "Analyser" circuit analysis program £25. Microline 80 printer, good for listings, £45. G8BXH. Tel: 01-428-0974.

PACKET, CW, RTTY, AMTOR, for Commodore C64/128. AEA PK64 complete package similar to PK232 but includes sophisticated driver software on Eprom, £140.SEM z-match atu, £50. G4ATZ, QTHR. Tel: 0937-842790.

ICOM 260E 2m all mode tcvr as new, £175 only. FT207 Yaesu h/held speaker mic + chgr, spare battery pack, £120. Steve, GOIJJ. Tel: (Walsall) 0922-640861.

HRO RECEIVERS mint to grotty condx. WANTED; National Company Malden USA receivers, speakers, manuals. National "dancing men", toys activated by gramaphones, reeds, microphone. "Biscuit tin", "suitcase" and other spysets. Millitary equipment and all valved junk. Tel; St Albans 39333.

COLLINS ACCESSORY: Digital readout by Spectronics to suit KWM2(A) or S-line, £80. Drake R2C rcvr £150. WANTED: Collins s-line cabinet for 32S1. Brian, GI4GNZ, QTHR. Tel: 0266-880740 (evenings).

YAESU FT270 RH. 45W/5W low power synthesiser voice box and CCTS tone squelch fitted. As new, boxed, manuals, £245. GOBEE, not QTHR. Tel: 01-958-6400, 0836-262111 anytime (London).

BARGAIN SALE. Pye Vanguard model AM25B and set of spairs, service manual, £42. G6DJE, QTHR. Tel: 01-459-8274.

TRIO TR7500 2m FM. UK model (80-chan), 10W, mobile bracket, desk stand, good condx, boxed, £150. Prefer buyer collects. G1ZFL, QTHR. Tel:(Paignton) 0803-524536 (after 6pm).

APPLE 11+ TWO drives, colour monitor, serial parallel Z80 80-col ram mocking board, CP/M joystick, oodles software, wordstar, dbase, etc. £360 or swap? Phil, G3YPQ, QTHR. Tel: (Swanage) 0929-426091.

SONY AIR-7; 150KHz-2194KHz, 76MHz-108MHz, 108MHz-136MHz, 144MHz-174MHz. 40-mems. vgc, boxed, £180 ono. Sony WA55, vgc, TS830S vgc, £700 ono. Lockwood, G3XLL, QTHR. Tel; Mellis 596.

TRIO 751E 2M MULTIMODE, as new, box, all accessories, £485. SSB 24cm (1268-1270MHz) Satellite (Oscar) up converter 2m IF 500mW out, £125. Commodore amiga 500, monitor, modulator, software, under guarantee, £500. 3 months' old. Paul, G4XHF, QTHR. Tel: 0293-515201.

ANTENNAS IN VGC. Jaybeam 10XY/2m £20, Jaybeam MBM48/70 £20, Jaybeam 4Y/4m £20. 2m s/s colinear, £15. Tonna F9FT 144/435 9+19-ele oscar antenna, £10. All antennas ovno. G1EYL, QTHR. Tel: (Dronfield) 0246-415667.

Sider 10 MBYTE hard disk for Apple 11 and Apple 11e micros. Brand new, c/w all manuals, support software and host adaptor. Supports DOS v 3.3, CP/M, Pascal nad ProDos. Offers please.G3RRA, QTHR. Tel: 0276-25040 or packet @G3WGV-2.

DRAE SSTV converter ideal starter kit c/w JVC b/w video camera, both as new, £350. No offers. G0AZX, QTHR. Tel:0905-423878.

SILENT KEY SALE. FT225RD muTek front end, £450. NAG144 linear 2m £250. Belcom 2m linear, £150. Datong RF clipper, £20. c/o G4WOA, QTHR. Tel: 0992-468394 (Herts).

TL922, MINT CONDX, orig pkg, £1050. ICR70 mint, orig pkg, £400. FL2100Z Good condx, new 572 tubes £475. FT901DM good condx, orig pkg, £450. G3RPD, not QTHR. Tel: 0285-76329.

YAESU FRG7700 GEN/COV rx with FRT7700 atu, FRV7700 vhf converter 118/150MHz, £300. Tel: Shrewsbury 63535 (after 6pm).

RA17L WITH CASE, £110. RA17 without case, £80. Eddystone 8800, £60. All in good wkg condx. G4UOS, QTHR. Tel: 0278-783941.

PHILIPS 1939 "Forces Communications receiver" type PCR. Excellent working order and condx £80. TR 1986 10-channel am tcvr 120-155MHz. Vgc, £40. Telequipment D33R Db oscilloscope, perfect, £40. Ikegami b/w tv camera, requires lens, £15. G3WIF, QTHR. Tel: (Bristol) 0272-293738.

APPLE II EUROPLUS two disks, vdu, centronics printer, data base, software. Offers. G4IXX, QTHR. Tel: 0242-526945.

BBC COMPUTER MODEL B, Watford DDFS, disk drive, monitor, software, £335. Icom R70 receiver 0-3MHz +fm board £425. Gemini Galaxy Development computer, CPM+ software, £200. Printer, £60. G0EVH, Tel: Tony, 021-329-2305.

FT401 QRO HF TCVR, good condx, manual, spare PA valves, matching speaker, £280. Seikosha GP100 dot matrix printer, BBC lead, ribbons, £60. G4AXA, and G4CMM, QTHR. Tel: (Bromley) 01-857-3639.

70CM K2RIW LINEAR c/w power supply £450 ono. 13.8v 35a psu £50. 13.8v 10a psu £25. Many linear parts including EHT supplies, fans, 4Cx250 and vhf bases. Also 5" 240v boxer fans. G4CRF, Chris, not QTHR. Tel: 029671-4888.

EDDYSTONE 770R/1 19-165MHz, £75. Ferrograph series 5 reel to reel tape recorder, £45. New valves, 4CX250B QY3-65 £25 each. QQV06-40 £10. WANTED; for Hallicrafters SX28 receiver, various front panel knobs. G3FYP, not QTHR. Tel: 0947-601567.

YAESU FT221R 2M base with muTek front end, £275. Tono MR150W 2M amp £100. 25a power supply, £60. Yaesu FT290R case, nicads, charger, £225. Drae vhf wavemeter, £10. G6ECM, QTHR. Tel: 0227-362635.

AZDEN 2000 25W 2m scanning multimode tcvr, 9-mems, memory scan, band scan, busy or free freq scan. Rpt shift +/- up/down, mic, no toneburst, £120 post paid. Peter, G4YYO, QTHR. Tel: 0538-702208.

TEKTRONIX 465B SCOPE £1200. Heathkit HW101, SB600 speaker, homebrew, psu £110. Two 5.25" dble sided floppy disk drives, £50 pair. Ten years "Wireless World", three years "Microwaves and rf", offers. G3ZWK, QTHR. Tel; (Crowthorne) 775316 (after 6pm or weekends).

CODEMASTER CWR610E cw/rtty £100. RADCOM mags Oct 83-Oct 87 £12. Buyer collects or pays postage. Mizuho sky coupler KX2 rcvr atu £20. G1CIA, QTHR. Tel: (Oldham) 061-626-5597.

ICOM/DRESSLER CLEAROUT. Mint, boxed, State of the Art. IC275, £800. IC475, £850. IC7000 £750. D200S linear, £650. D70 linear £750. Yaesu FT726R/2m/70cm/SAT £700. G4YXZ. Tel: Chris, 0532-456370 (work).

APPLE 2E ENHANCED, twin drives, 1.2mB ram, extended 80 column and parallel, serial and video interfaces, £545 ovno, could separate. Also other items including mouse and publications. Stradcom plug-in modem for IBM, £95. Mike, GM4UKG. Tel: 0383-416688 (evenings).

AOR 2M HANDHELD, (similar to IC2E) 1/5W output, full 140-150MHz coverage (tx&rx), speaker mic, mobile charger, manual etc. £120 ono. (Access/visa possible). G6DLJ. Tel: (Southampton) 0703-847754

PYE UED6 SELCAL ENCODER decoder desk unit, £300. Philips P5002 word processor 8" disk drives, printer, etc, £185. Pocketfone seventy 10-way charger, £10. Farnell SSG520 sig/gen as new, £1500 G4AJE. Tel; (Cambs) 0354-740441.

YAESU FT101ZD Mk3 9-bands am/fm options, fan, narrow cw filter, FC902 atu, FV101Z vfo 12v dc unit, vgc, £675 or exchange Trio TS811E. Radiometer AFM2 professional modulation meter, £300. Schlumberger 4920 selcal test set, £350. G4AGE. Tel: (Cambs) 0354-740441.

SONY KTX1410UB viewdata monitor. Sony K1.100 full keyboard. £175 or exchange for hf, vhf, ham equipment. Prefer buyer collects RS91283, Devon. Tel: 0803-35973 (evenings), 0803-38586 (daytime).

TRIO TR9000 little used, no mods, boxed as new, plus 1/4 5/8 mag mount and ac psu. £300. G4CSV home 061-225-9686, business 872-2422 Ext 436. Will deliver reasonable distance Manchester, not QTHR.

AOR2002 SCANNER 25-550, 800-1300. Boxed, one year old, As new, £225. Also microwave modules advanced morse talker with key, £75. Also Amstrad CPC6128 computer disc drive. Full colour monitor with eight discs. Boxed, £195. G4XJQ, QTHR. Tel: (Surrey) 04865-3772.

EX NAVY TYPE R1475/T88 receiver, with type 360 power unit and connectors, working, £35. Also FT209RH handheld c/w base, charger, psu, speaker mike, softcase, superod 2 and rubber duck, antennas, £220. Little used. Tel: Lichfield 256137 (evenings) GODYO, QTHR.

COLLINS KWM2. Excellent example of this classic tranceiver. 80-10m , power supply, fitted with Waters rejection tuning. Sure 201 mic, £450. FC102 atu relay input and antenna switching, £150. Homebrew triple bandwidth audio filter, £15. Chris, GOFTU, QTHR. Tel: (Sussex) 0444-450656.

TRIO 530S HF TCVR, 160-10m in immaculate condx with manual and box £525. Also Hitachi 12" b/w monitor suitable for weater satellite display, £50. and 1.2m diameter aluminium petal dish, £25. G3XFB, QTHR. Tel: 0902-850033.

TS780 V-UHF ALL MODE dual bander + SP71 ext speaker + MC60A desk mic up/down scan/lock/PTT. All ex/mint condx, £750 ono. Will not split. G1YWV. Tel: (Bridlington) 0262-670540 (evenings after 6pm).

YAESU FT ONE fitted all optional filters fm keyer, NB unit, RAM mint condx with all manuals, hand/scan mic, £1025 inc Securicor. Western DX6V 6-band vert/ant air spaced inductors UNUSED, mint, £105 inc delivery. GW4RLP, QTHR. Tel:0286-3567.

KATSUMI EK108A electronic keyer. 240v ac, inc monitor speaker, £30. Himound HK704 key, £12. Both items in exc condx. G3HEE, QTHR. Tel: (Stamford, Lincs) 0780-55001.

SLOW SCAN DAVTRON DRAE rx, £100. Scarcely used, with demo tape. G4CIM, QTHR. Cannot deliver. Tel: 01-304-8975.

RTTY. COMPLETE STATION microwave M4001 interfaced with Tandata printer, plus Pye 12" monitor, books, cables. £195 ono. G4POK, QTHR. Tel: 0223-861153.

YAESU FT301D TCVR 10-160m 100W, cw/am filters, matching psu, atu, scope, all boxed, £725. Hy-gain TH6DXX 6-ele beam 10-15-20m, rotator, RG213U coax £380. Yaesu FL2000B linear, 10-80m, £280. KW2000A 10-160m, 80W, mains mobile psu's, valves, £210. Tel: (Northampton) 0604-44341.

TRIO 701D 2M SSB/CW TCVR, £90. King vhf/uhf rotator, £40. G-whip mobile hf antenna, 10m to 80m, £40. All in good order. G4XCT. Tel:(Ipswich) 0473-712573.

EDDYSTONE COMMUNICATION RECEIVER 840A, built in speaker, 30MHz-500KHz, in good working order. GM3BXW. Tel: (Glasgow) 041-638-3924.

SHACK CLEAROUT. Sig/gens TF144H, £100. TF801A £25. Component bridges TF1313, £105. B221, £110. Q meter, laboratory mint condx, plus many accessories, TF1245, TF1246, TF1247, £530. Variac, £20. 100dB attenuator, TF1073, £20. Millivoltmeter TF899, £20. HRO plus coils, offers. Tel: 0293-885701.

PHILIPS V200 colour video camera with inbuilt mic with cables and power supply. Unwanted gift, £120 ono. G6MSC, QTHR. Tel: 0602-731932.

MICROWAVE MODULES, MML144/200S, 144MHz, 200W linear amp. £250 ono. As new, boxed + instructions. Heil desk mic scan buttons, £40. WANTED: hf linear 1kW. John, GOIOR, QTHR. Tel: 0472-358449

2M MONITOR RX-Daiwa SR9-vfo + xtals, £30. Modem prism 1000 for BEEB with rom £30. MPF1/88 16-bit 8088 micro tutor c/w manuals + psu, cost £250+ bargain £99! 35mm slide projector £30. 'phone answering machine, £35. G8LAH. Tel: 0635-297959. not QTHR.

TRIO 120V TCVR, exchange for good communications receiver, Icom IC70, Trio 2000 WHY? Cash adjustment or sell for £350 ono. WANTED: cw filter for FT107 and workshop manual. G4LOP, QTHR. Tel: 0754-810192.

1kW HEATH HA14 LINEAR (2x572B), no psu £200. Cap's 5uF 3kv dc (qty 2)£8 ea. Variac 115/135V in, 0-135v out 6a, £10. PM05 (0-459A/URT) 2-8MHz 19" ovened drive unit, £25. WANTED: valves 4D22 or 4D32. G3RFI, QTHR. Tel: 0767-260800.

DRAKE R4C PASSBAND Notch filter audio mod fitted, good condx, £300. Slow scan monitor, £35. Trio filters, YG455CN, £40, YG88C, £28, YF88H 2.1, £20. G4LW, QTHR. Tel: Trowbridge 3166.

YAESU FT901DM £475. VFO FV901 £119. Transverter FTV901 70cm/2m/4m £395. Oscilloscope YO-901P £325. ATU901, £125. Rtty/cw reader, YR901 plus keyboard YK901, £130. Monitor, YVM1, £35. Speaker/phone patch, SP901P, £25. J-beam 4m antenna 4Y/4M, £10. J-beam 2m quad antenna Q6/2m £10. G4MCJ, QTHR. Tel:0590-45776.

FDK MULT-750XX 2m all mode tcvr, mobile base station, 20W high 1W low. Box, manual., £325. Regulated power supply 7a constant 9a surge, £25. Tonna 9-ele crossed beam, + rotator, £60. G6ZTL, 24 Marmion Road, Coningsby, Lincoln, LN4 4RC. Tel: 0526-42899.

YAESU FT480R plus 9-ele tonna, 2m rig in mint condx, very little used. £340. G3NKC, QTHR. Tel: 0543-257125 (Lichfield).

COMMERCIAL WORD PROCESSOR; Rank Zerox 860 data/word processing system. Monitor, keyboard, twin 8" disc drives, daisy wheel printer. Full software + manual, spare discs. Ideal home/business use. Upgrading system cost £7000+ bargain £750 ono. G4SVQ, QTHR. Tel: 02814-3669.

YAESU FT23R 2m handheld, including 2 nicad packs, PA6 charger. All only 3 months' old, £200. Buyer collects. Tel:01-771-4769.

DEVIATION METER Marconi TF791/D, mint condx, £100. was £200 but no longer required. Ferguson video system camera recorder psu tuner, great pictures. Sacrifice £350 + carriage. G4IZW. Tel: (Carlisle) 0228-20786 (anytime).

SCARAB RTTY PROGRAM for Spectrum, Type ahead buffer with interface, 45.5, 50, 75,100 and 110 baud, and MPTU 1 terminal unit, £50. Microwave modules 2m linear, 10W in 100W out, no preamp

£60. G6IJM, QTHR. Tel: (Blackpool) 0253-47992.

60' 3-SECTION Lattice tower c/w tilt post and mast head. £350. Tel (Leicester) 0533-674112 (after 6pm).

RACAL RA17 good working order, £160. Eddystone 770U, £60. Creed model 444 teleprinter, good condx, £15. RGD model 1046 radiogram orig. condx 1947 offers. WANTED; R1155 plugs power supply 35A. R1082, T1083, TR9, PTR175. G3CWT, QTHR. Tel: 0283-44677.

TRIO TS430S £660. PS430, £110, hardly used. Also offers for Weston anyliser E772 Farnell stabilised voltage supply E350. Receivers R1017 R1018. G3CQU, QTHR. Tel; 01-660-5474 (evenings/weekends).

ICOM IC720A. PS20. HM7 mic, accessories vgc, boxed buyer collects and tests, no offers. £490. Oskerblock twin meter swr, pwr, 2kW, £30. SEM tranzmatch £30. Kenwood TR8300, £75. Many other items to be cleared. GW3CMR, QTHR. Tel: 0639-55059.

COLLINS KWM2A, 516F2, £225. Hallicrafters SR400 Cyclone 2, PS500A, £200. Both rigs good condx, handbooks. Icom IC255E 2m, fm, 25/1W, memory, scan handbook, boxed. Hardly ever used £130. ET2Mb electronic keyer, £20. G3KDA, QTHR. Tel: 0305-832974.

PYE WESSIE PSU £20. Cambridge psu £25. LB fm wessie, £30. UHF W15U, £39. Scope 15MHz dual beam £125. Advance audio generator, £20. Pye UHF sig/gen, £90. Tektronix 1A4 £45, 'O'£20. 'L' £10. Much more. G4YVJ. Tel: (Lincs) 050785-203.

KENWOOD R2000 receiver with integral vhf converter 100KHz-30MHz, 119-180MHz, 10 memories, scanning multimode, boxed, as new £450. JIL SX200N scanner am,fm, 26-88MHz, 118-180MHz, 380-514MHz, built in bargraph "s" meter, neat, boxed, manuals, £150. G6BDY, QTHR. Tel: (Kidderminster) 0562-755501 (after 6.30pm).

YAESU FT726R fitted 2m. Purchased 9.2.88 boxed with manuals, etc. £600. J-beam PBM 14/2 £25. J-beam PBM 18/70 £25. G1UIY, not QTHR. Tel: 0474-328163.

HW101, MATCHING PSU, manuals, spare valves, ex, £200. FC700 antenna tuner, dummy load, power meter mint, boxed, £80. Shure 444 mike, £20. Tet 2-ele hf beam with rotator, £100. 27' telescopic mast, accessories, £20. G4ILA, QTHR. Tel: Lymm 2388.

YAESU FTV107R tvtr with 2m also 6m module for same £240. Will split. Linear MML144 100S 10W in 100W out £100. 17-ele tonna for 2m £30. G0JCM. Tel: Shorne 3797.

TRIO TS520 with Shure mic, immac £325. HQ1, £35. TET hf vertical £30. W3DZZ dipole kit complete, unused, £20. Welz AC38 atu £50. Spectrum 28-50, tvtr +linear, £70. 28-432 tvtr 8W £70. All ono. G4FAT. Tel: (Worcs) 06845-64854.

SINCLAIR SPECTRUM PLUS 48K with DR10 professional series datacorder, both vgc, boxed; selection programmes inc rtty. Exch for hf vertical HF5 w/ radials or VR3 Mk3 in good condx, or sell. Best offer over £60. G0EOL, QTHR. Tel: (Cheshire) 0606-554857.

ICOM IC720A all mode hf £645. Daiwa CNW419 atu with PEP module £140. Yaesu FF501 LPF £25. FT290R £245. MM 10-50W linear, £65. Tokyo HL-30U 70cm linear £65. MM ATV stn with mono camera, £145. Tonna 432/19 £20. G4RNI. 091-4690316.

BBC MODEL B computer (issue 7) 32k sideways ram, double density disk interface, single double sided 40/80 track drive, tape unit, tapes, disks, joystick rtty interface, manuals, £400. Howard, G6NBO Bolton. Tel 0204-51681 (evenings only).

FT77 FM BOARD and marker fitted. c/w FTV707 tsvtr £515. G4UNM, QTHR. Tel: 0983-402273.

MECCANO NO.10 brand new, unused, offers over £400. Vertical antenna 18AVT £75. Heathkit 10.4540 oscilloscope £50. Wavemeter BC221.T £25. 48 bulls offers. G2CBC, QTHR. Tel; 0733-65080.

FT290R SOMMERKAMP model with speaker mike. Nearly new and in ex condx, boxed (no mods) £275. Other sundry items also for sale. G4WAU, not QTHR. Tel: 061-427-4730.

SATELLITE RX. Full band, variable sound £100. Astec AT1020/3010 units plus comex PCB. Complete satellite rx, £75. J-beam MBM46 70cm ant, £15. Tonna 20623, 23cm ant, £20. Wood, Douglas WDV400/1200 23cm PA, £45. 1250 DC50 23cm converter, £50. G13MBB, QTHR. Tel: 0247-461946.

YAESU FT790R with nicads and charger and soft case little used, unmarked, boxed as new, £300. Icom ICB1050 converted to 10m fm 29.310-29.700, 6W o/put with mic, £35. GODWS, QTHR. Tel:(Gravesend) 0474-357795.

TH41E 70CM 1W MICRO. Whip, nicads charger, MN battery box + 'C'size nicads. Aerial adaptor to BNC. Soft case and belt clips, boxes, Manuals, £260 ono. G1LHW, QTHR. Tel: 0202-694322 (evenings)

HIGH RESOLUTION COLOUR MONITOR 14" screen. Sanyo model CRT70. RGB + sync and intensity. Suit IBM compatible or BBC ECT £180. John, G8BXH. Tel: 01-428-0974

FT690 MkII with 10W linear little used, and with orig pkg, £375. G1TWS, QTHR. Tel:(South East Essex) 0268-779484.

KENWOOD SM220 with BS8 £265. KR400RC rotator, unused, £100. Buyer collects or pays carriage. G3LRP, QTHR.

ROLLS ROYCE OF Yaesu. FT107M power pack, memory, £500. G3KFT. Tel: 0242-820883.

SHACK CLEAROUT. Swedish brass key, new, boxed, unused gift, £60. MTC026 cw/rtty automatic reader, (LED) display as new, £185. 10m multimode mobile rig, (two) £99 each. Datong cw keyboard sender, £125. Daytime number Truro 77747. G4WQL, QTHR.

YAESU FTONE tcvr fitted fm all filters, RAM NB mod keyer, hand scan mic, manuals, mint condx £1025 inc Securicor. Western DX6V 6-band vert ant unused, new, £100. New Tentec Corsair 2 psu extra filters, mic, £1125. GW4RLP. QTHR. Tel: 0286-3567.

TRIO TR7850 2m fm mobile 10/40W £225. Yaesu FT1012D hf tcvr. £425. Hf 5-band trap vertical £60. G4OYQ. Tel: 04868-22225 home (Surrey) 0860-362181 (work).

YAESU FT23R 2M handheld, almost new, pristine condx, c/w FNB10 2.5W nicad pack, charger, soft case. £190 + post etc. Peter Martin, G4SDK. Tel: 021-429-7141 (Office hours only).

FT290, BOXED, mmb, charger, flexiwhip, helical, case, mike, £260. Alinco 30W linear £50. Lucas CB converted 10m slide mounted, £30. Monitor, high resolution, amber, tilt/swivel base, immaculate, £55. Hercules mono graphics card £60. Charles, G4YFN, QTHR. Tel; (Reading) 0734-861136.

COMPUTER SINCLAIR QL 128k with mono monitor, £110. Also Mertec double DOS DFS for BBC B, £25. Tel: 01-422-7582 (evenings 7pm-10pm or at weekend).

TRIO TL922 LINEAR amp 2kW PEP absolutely mint, £970. Altron AT42 post mounted lattice tower 42', £300. J-beam TB3 MkII 3-ele triband yagi, £195. Kenpro KR400RC rotator, £95. Tonno 9-ele 2m yagi, £18. House move forces sale. Tel: 0635-60263. G4RKO, QTHR.

SILENT KEY G5KV. 4-way coax switch, £15. 3-way coax switch, £10. Yaesu YE7A mic, £8. MuTek stripline BPF bands IV-V, £2. Toroidal mains XFRMR 2x5v secyc 6'ish amps, £7. Yaesu XF8.2 HCN cw(n) filter (FT102) £15. SMC iambic paddle, £4. Gresham DC psu 9-13v 2a £10. 1982/7 RADCOMS £10. 1976/9 Ham Radio (USA) £10. Datong RFC/M speech processor pcb £15. RF filters (5 off) 250 vac 0-70cps 600vdc 2.5a, £2.50 ea. All above mint/vgc. G-whip helical with loading coils 160/80/40 slight damage, £15. McElroy bug key, well used, £5. Heath 'Cantenna' 1kW dummy load, £12. Homebrew audio filter around MFJ pcb £6. Homebrew freq counter around commercial pcb £10. Homebrew linear 813(1) view/offer. Homebrew 2.5kv psu view/offer. Various valves/books. All items ono, p&p extra. Mrs Leonard, tel: Henley on Thames 572713 or G3AVQ 576852.

EXCHANGE MY GREEN GOLD Honda W reg 250 super dream 18,000m, exts, fairing, panniers, spotlight clock. 80mpg, vgc, taxed/MOT for hf tcvr. GW0FPY, 4 Bryn Deiniol, Valley Road, Llanfairfechan, LL33 0SR, Gwynedd, North Wales. Please write or call.

YAESU FRV7700 VHF convtr type A, 118-150MHz, £33. G2DAF Mk3 tx and psu. tx not completed, £38. G4AUB, 7 Hobley Close, Bilton, Rugby, Tel: 0788-811106.

SEM TRANZMATCH atu, fitted with Ezitune, £65. Sony IFC6800W am/fm/ssb/cw 30 band rcvr, £100. Kent Brass straight morse key, £20. Tel: 031-665-4415 (Edinburgh).

TS430S TCVR. VGC with fm board and am rx filter, £695. Yaesu FT227R 144MHz fm tcvr. Memory and scanning. Quite old but a good workhorse, £125. G3WCS, QTHR. Tel: 0606-891913 (Cheshire).

DATONG MK MORSE keyboard, vgc £60 ono. Trio MC50 desk mic, £25. Various "Howes" boards, all built, please enquire. Kenwood TS440S hf trans vgc. Yaesu CPU2500R 2m fm trans mobile, vgc, £125. Tel: (Weymouth) 0305-813202.

COMMUNICATIONS RCVR; Heathkit GC1A 550KHz-32MHz, inc manual, £49. Datong D70 morse tutor, £40 (it got me through the test). GOGBR (Stephen). Tel; (Reading) 0734-722785 (after 6pm) or write 22 Churchill Crescent, Sonning Common, Reading, Churchill Crescent, Sonning Common, Reading, RG4 9RX (could deliver).

DUAL BAND TW4000A in vgc. £350 ono. HF homebrew linear amp 80m-10m 600W o/put, £250 ono. Tel; Keith, 091-4693955.

70CM TSVTR, MICROWAVE MODULES MMT432/28S recent MM service c/w plugs leads, handbook. Pye U10B 70cm 5W fm tcvr c/w plugs, leads, mic, spkr, h/book. 10a psu to suit both above. Lot £100. G4EZG, QTHR. Tel: 0963-51133.

KENWOOD TH215E 2M handheld, as new, £190. Daiwa PS120M 10 power supply unit only £50. Tel: Ricky, G1RWV on (Farnborough) 0252-51527 (evenings).

YAESU FRG8800 mint condx. Limited use, handbook, boxed, £450. Reason for sale just bought tcvr. WANTED: FC707 atu. Tel: (Gwynedd) 0758-740171.

WW2 BEDFORD DRIVER's handbook. Vintage car manuals, valves. Tx/rx. SAE List. James, RS90512, "Solaby",4 Longview Drive, Huyton, Liverpool, L36 6EE.

TOWER 30' 3 x 10' sections with built in climbing ladder. Easily transportable. £120 ono. G4WYF, QTHR. Tel: (Blackpool) 0253-56811 (after 6pm).

LOWBAND DASHMOUNT Westminster. 3 @ £25ea, 2 @ £40. Base station controller, 2 @ £20. 13.8v 6a psu (Pye) 3 @ £12. Highband cambridges 2 @ £15. 80m xtals £1ea and others. G3SIP, QTHR. Tel: 06582-7086.

URGENTLY WANTED: Olivetti M21 transportable MS DOS micro, or any manuals or spare cabinet. SALE: send large SAE for shack clearance list of computer, amateur radio, military radio items, and surplus Klingenfuss and other books, maps, and charts. Bob, G8IYK, QTHR.

EDDYSTONE S770R plus spares £50. Storno CQM600 2m £30. 600-0-600 transformer £15. 275v, 315v and 250v transformers, offers. Magazines RADCOM, PW, PE, etc. offers. QQV02-6 valves £4. Flying helmet £40. Carriage extra, or buyer collects. G4EUO, Bill, QTHR. Tel: 0747-870959.

YAESU FT620 50-54MHz tcvr, ssb/am/cw. SSB and am filters 8W o/p LPF orig pkg £120. Datong PC1 gen cov receiving adaptor, £75. Microwave modules MMT432/50 tsvtr 50MHz IF £50 (delivery extra). G8AYY, QTHR. Tel: 021-783-2996 (weekends/evenings only).

MFJ RANDOM WIRE TUNER. 1.8-30MHz, 1601O, handles 200W unused. £30 ono, inc postage. GM4LBE, QTHR. Tel: 0595-4270.

YAESU FRG7700 all mode rx and FRV7700 converter 140-170MHz, £275 ono. FDK multi II. All rept chan 1-7 + S18-23. Manual, boxed, £100 ono. Commodore Vic20 complete, recorder + power supply, manual, £40 ono. G1DXO, QTHR. Tel: 0603-745734.

TRIO TH41E, 70cm handheld, c/w charger, case, spare battery pack, mint condx, £180. AR2001 scanner, vgc, little used, £250. Micronova PCB drafting for BBC model B or Master. £70 ono. G4RAJ QTHR. Tel: 0484-535955 (evenings)

YAESU FT707 RADIO, FC707 atu, FP707 psu all in f/b condx. Boxed, £500 the lot, no split. Also HQ1 minibeam f/b condx, £55. Buyer to collect. Phone after 6pm please, 01-941-3081. Genuine bargain goint QRT.

CUSHCRAFT 5-BAND vertical £60. Katsumi message keyer, MK1024, £50. 100W 2m linear amplifier USA heavy duty coax, RG213, 82', 24', £20. Dummy load T150 3.5MHz-500MHz, 150W £10. Wavemeter TC101, £10. ono. C4WLI, QTHR. Tel: 051-327-4280.

STANDARD C146A handheld with 3 USA repeater channels, mint, ideal for USA holiday, £50. Pye PF1 working on RB0, £10. G3VXZ, QTHR. Tel: Maidenhead 27350.

HQ1 4-BAND MINIBEAM. All complete and ex condx, plus manual and instructions, £70. Buyer to arrange delivery or collection. Ring Cowes 293402 (any time).

CUSHCRAFT VERTICAL, AV3, 10-15-20 with approx 20yds UR67, £25. Dipole of delight DD10, £10. Joystick VFA, £7.50. Oldfield, 49 Stansfield Street, Todmorden, Lancs, OL14 5EB. Tel: Todmorden 816165.

YAESU FT708R 70CM handheld keyboard, boxed, mint condx, charger, case, £160. Tel: 0943-74794. G3MBW, QTHR.

YAESU FT707, FP707, buyer inspects/collects, £385. Desk mic, Shure 444, dual impedance, £28. Vomax split-band audio speech processor, £84. WANTED: portable scope, modest spec and price. G6XN, QTHR. Tel: (Hindhead) 042873-5328.

TRIO TS530S HF tcvr 160-10m ex condx orig pkg.

Instruction Manual £530. Also Yaesu FRG7 gen/cov rcvr, ex condx, £135. G4LDC, QTHR. Tel:0703-263893

KW1000 LINEAR. Hardly used, spare output valves, £325. FT1012D FM. Less than two hours' use since new, immac £400. Atlas 210X mobile c/w power unit, £300. A variety of atus, bug keys, dummy loads, etc at give away prices with any of the above. G4KTY. Tel: 06286-65536.

TRIO TR9500 70CM TCVR, as new. Also 50W MM linear. 12X Yagi with phasing harness, 17-ele multibeam, 2x50' coax, £400 ovno. Wont split. G4NTL, QTHR. Tel: 0980-52420.

SWL STATION Trio R300, Trio JR500S, Daiwa all mode active filter, Codar PR40 preselector, Daiwa search 9, vhf rx, full xtalled, m/mod 144MHz converter, £180 complete. Would consider selling separately. COILE. Tel: 07914-2364 (evenings only) Buyer collects.

TRIO TR9130 2M multimode, mobile bracket, £350. Yaesu FT790R, nicads, charger, £280. Trio PS20 offers. Trio HFRX 9R-59DS, £50. GM1JKJ, not QTHR. Tel: 031-447-3734, or as AJ Britton on 031-225-3131.

KENWOOD TR9500 UHF multimode, £200. Converted CB 28.310-29.7MHz am/fm/usb/lsb £70 ono. GOFXG, QTHR. Tel: High Wycombe 29177 (evenings).

TS120V c/w CI-110 100W solid state PA, mic, heavy duty Farnell psu, £390. KW2000E with matching speaker, psu, Shure mic, handbook, £250. All ex condx. Tel: (Waterlooville) 0705-252442.

TRIO R600 rx ex condx. FM fitted, one owner, £195. SX400 scanning rx 26-520MHz ex condx, £649 new offers over £300 or p/ex FT77. GOGSA. Tel: (Rugby) 0788-832887 (after 4pm).

YAESU FRG9600 modified to 950MHz video pcb, fitted power supply and ex speaker, £400. G5HX, QTHR. Tel: 0203-412397.

2M FM RX VFO 144-6 £30. Ambit 2m linear with pre-amp hard wired for FT290 £30. 0-240v Variac, many amps £19. Dragon 32 ok with BMK's rtty program, games etc. £39. All good condx. Tel: 0245-324555, G4XOX.

YAESU FT480R 2m multimode with mobile bracket and manual in orig box, £295. J-beam 2m 5-ele Yagi, brand new in box with receipt, £10. Datong morse tutor, brand new in box with receipt, £45. G6AYI. Tel: 021-311-1068.

UNIQUE QTH over 900' ASL within 3 miles centre of Cheltenham, 3 bedroom bungalow, .5 acre. G3KFT. Tel: 0242-820883.

BELCOM 10m tcvr model LS102 multimode usb/cw/am/fm 10W ssb/cw 3W am, 1 or 10W fm in good condx £145. Maxline ML212 hf linear amp and built in preamp, same size as the Belcom, 4 switchable stages of 15,25,45 and 85W fm switchable to ssb led indication for all functions, £65. Both together, £190. Also will vendor or MuTek masthead preamp to me please contact. Tel: John, 01-857-8096 (evenings please).

VALVES (all plus post & packing). (3)QQV06-40A, brand new £9 ea. (6)6146A brand new £5 ea. (4)QQV02-6 used, ok, £3 ea. (3)KT88, used ok, £3 ea.(2) TT21 used, ok, £3 ea. (1) KT66 used ok, £2 ea. AR88D rcvr, £40. Buyer collects. Tel: 0777-704597.

RAE COMPLETE correspondence course, £25. Morse course records plus instructions, beginner to test speed £5. Kent straight key solid brass on hard-wood base, £20. Crown combined 5" tv and radio, fault on video, £20. GOJCG. Tel: 051-339-9599.

FOLLOWING NEW AIRTEST only. TS830 (£898), MML432/100W (£325), MMX1268 tx conv (£125). Following mint barely used. FT707 (£400), Pace Nightingale (£80), Trio audio gen (£80), Clark Pneum. 21' mast c/w 12v compr. (£200). GW3DZJ, QTHR. Tel; 0745-583786, evenings, 2004 day.

HRO MX GOOD CONDX, gwo suit collector, £45 ono. Professionally built psus modified for 0-12v 8a and 35v 5a only three at £40 ono. CVC 0-5kV 1amp psu type LC031. Sensible offers please, or WHY? GW4BZD, QTHR. Tel: 0248-600241 (after 6pm).

BBC Model B, Watford DFS, 3" Hitachi disc, ATPL or Watford sideways board. Manuals, etc., £225. Nakamichi 482 super-fi cassette deck. True peak meters, double dolby, etc., £225. All immac condx. Paul, G4BKI, Tel; (Towcester) 0327-52819.

ICOM IC275E, hardly used, mint condx. boxed, £850. PK232, multimode data controller, mint condx boxed, £150. KW (E-Zee) match. Antenna tuner. Offers, G4ODK, QTHR. Tel: Basildon 418058.

TRIO TR3200 70cm portable RBO,2,3,4,6,10,11,13,14, 15, SU8, SU20 c/w nicads and charger, £85. G-whip flexiwhip mobile hf ant c/w 80,20,15,10 coils £30.

Cirkit h/held frequency counter c/w vhf pre-scaler £30. Chris, G4UKF, QTHR. Tel: 0935-823475.

YAESU FTV107R transverter with 145MHz suitable FT107, FT102 etc. Plus new 30W linear, £245. Digigraph sketch/graph pad for BBC B. Draw designs on screen and dump to printer, £60. Exchange for 70MHz or 432MHz multimode. G1AJB, QTHR. Tel: 0209-860297.

MICROWAVE MODULES 432S trsvtr, £100. Two off 55' rolls Andrews 7/8" coax, £30 each; large blowers £10; DOD006 valves 2kW plus out on 144MHz heaters ok, £25. You pay carriage. G4DZU, QTHR. Tel: 0532-853564.

FT290R USED very little, orig pkg, case, rubber duck, charger, new set of nicads, £265 ovno. G1NQU, QTHR. Tel: (Bradford) 0274-880927 (evenings please).

SHARP POCKET COMPUTER PC1251 52 chrs keyboard, 24 chrs display. Powerful basic in 24KB ROM 8-bit CMOS processor, 4KB RAM, c/w CE125 micro printer and micro cassette recorder. Unused, as new, all manuals, £65. G4DYM. Tel: 0934-833478 (near Bristol).

SCARAB TU £40, MC desk mic £25, MC42S up/down mic £15. Commodore PET 4016 with Eproms for packet/rtty/amtor £50. C2N Commodore cassette £15. 64k/32k memory expansion boards for Pets, £50/£30. Offers considered. Ted, GOFDR, QTHR. Tel; 0629-823207 (evenings)

YAESU FRG7 receiver vgc, with manual £120. Valve QQV06-40A new, £15. Toshiba HX10 computer as new, manuals, £60. G4YCP, not QTHR. Tel: 0274-569398 (West Yorks).

RECEIVER AR88D with handbook and some spare valves £65. Also wireless set No.19 MkIII (Canadian) with control boxes, headsets, antenna parts, spare valves and some documentation, £85. Tel: (Lindfield) 04447-2740.

YAESU FT225RD with muTek board and manual, vgc, £550. WANTED: FT726R + 70cm +SAT +6m? Must be vgc. Tim, Tel: 0377-89257 (Yorkshire).

CONSTRUCTORS COMPLETE CLEARANCE. Rx/tx signal generators, power units, L/Q-meter, constructors goldmine. Components, transformers, fixed/variable capacitors. Switches, coilformers, meters, valves and much more. Some audio equipment. Note QTH "equipment" must be collected. Large SAE Walsham, Sadgill, Longsleddale, Kendal, Cumbria, LA8 9BE.

FT101E SPARE PA's and fan, FR101 with 2m & 6m boards. Two YC601 digital displays, Kenwood AT200 atu. All exc condx, £650. G4ZUX, QTHR. Tel: 0934-512141.

TRIO 201A, 25W fm mobile £165. Trio 2300 6-chan fm portable £60. SW100 swr meter, £15. Tel: 051-639-5922.

IC275E WITH cw filter and hi-stab oscillator, under guarantee, £825. M/modules MMG144v, mint, £30. Yaesu HM35 mic £10. Trio MC50 mic, £10. M/modules 100mW to 10W PA module, factory aligned to 384MHz, £25. G4PLZ, QTHR. Tel: 061-439-4136 (after 7pm/weekends).

CQ CQ CQ GET ON 10M and 2m all modes. Tristar 777 160-chan, 28-30MHz ssb/cw/fm +mm 10-2m tsvtr, £150 the system or separate. G4DYM. Tel: 0934-833478 (near Bristol).

FR101 DELUXE RCVR, 21 band all mode fitted 2m and 6m converters, cw filter, 4 fix xtal channels, £230 ono. CM Howes 80m QRP transmitter, vfo and sidetone generator, boxed, switched and knobbed, £35. G4DYM. Tel: 0934-833478 (near Bristol).

FT290, nicads, charger, case and handbook. Very good condx, £240 ono. G1EOC, QTHR. Tel: 0525-378138.

2M MOBILE KENWOOD TR7730 25/5W c/w mobile mount, £220. Bob, G4OAC, QTHR. Tel; 0706-50174.

FT480R 2M multimode tcvr. Good condx £275. David, G1XUT, QTHR. Tel; 0274-682457 (evenings).

YAESU FRC8800 hf receiver (150KHz-30MHz). Fitted with FRV8800 vhf converter (118MHz-174MHz), wide-band fm module and FRT7700 aerial switcher and tuner. All boxed and in superb condx, yours for only £525 ono. G6HVZ. Tel; (Worthing) 0903-65900.

VT102 TERMINAL, full function, high performance, professional serial terminal, £210. UHF cavity oscillator, uses 2x6C4 with regulated heater supply, £15. WANTED; elevation rotator. G8NTH. Tel: (Guildford) 0483-34954.

FT208R VHF FM handheld, spare battery, carrying case, manual in orig box, with home made trickle charger. Offers £120? Also Tektronix type 541 scope, dual trace 30MHz needs slight attention, £20. Large and heavy, buyer collects! G1VNU, QTHR. Tel: 0993-775365.

KW2000E PS. VGC, £220. Valves, £20. 6146B's £12; Shure low impedance mic, £15; KW Traps £12; Home built z-match £35; Kenwood 530S £525. MC50 mic £25; Twin swr bridges £10 each. Buyer collects. Noel, G3ZLN. Tel: Ipswich 49139.

ANTENNAS. Allweld AQ6-20 2-ele minibeam, unused £80. Hygain 18V-S selectable 10-80m vertical, £30 Dipole of delight by GM3HAT, 10-40m, £20. Monoband 80m £20. Ken, G4RPV, QTHR. Tel: 021-459-7041 (after 6.30pm).

FDK M750E 2M multimode. Ex condx, with mobile mount £200. PSU to suit £10. 2m converter 4-6MHz IF £15. Eddystone EC10 rx, £40. Prefer buyers collect or carriage extra. Chris, GOION, (East London/Essex area) Tel; 04022-50307.

HEATH SB220 AMPLIFIER 80-10 2kW £690. Bartg ST5MC tuning unit. Beats multimodes. £75. TW4000A £350. Will p/ex for TM401 etc. WANTED: IC740 or omni or Corsair. Psu's not required. Tel: (Oswestry area) 0691-831111 (evenings/weekends).

EPSON PX-8 LAP top computer, c/w batt charger, wordstar, visicalc, utilities, basic. Acoustic coupler. Epson CX-23 c/w charger. Both units and software c/w manuals. Sensible offers. Ken Lax tel: 0952-615321 (Office), 0952-770128 (home).

ICM2E MICRO 2M handheld as new, £180. SEM Tranzmatch built in Ezitune dummy load, £80. G3BPE, QTHR. Tel; 0373-826939.

RTTY SYSTEM. ST5C terminal unit. Acorn atom computer BMK rom. All psu loads of computer extras. Super working system, £110 the lot, post paid. GW4UZL, QTHR 1988. Tel; 034-882-346.

YAESU FT726R with 6m, 2m, 70cm, modules plus satellite board, desk mic, beam aerial for each band, all boxed, £950. G6RFV, QTHR. Tel: 0332-675105 (evenings/weekends).

YAESU FTV707 2M 10W trsvtr, £100, or exchange FC707. Scanner realistic PRO2001 68-88/144-174/430-512MHz, £100. KDK2030 2m 25W tcvr, temperamental, hence £80. Eddystone rcvr 19-165MHz, £60. 23cm Transmit tripler from 70cm plus filter £15. G1BWW. Tel: 0462-711722.

JAYBEAM 2M 5XY. Magmount whip, Welz CH20A (PL239) lot £25. New Cowl gill rotator £15. Maplin multi DMM with temp probe, unused, £40. Atu Rolacstr DL rf ameter 100W homebrew in cabinet. G3KPW, QTHR. Tel: (Camborne) 0209-717612.

YAESU FP757HD heavy duty psu, ex condx £115. Yaesu base mic MD1 as new, £45. Oserblock swr 200 pwr/swr meter 0-145MHz. Instant readout no need for fwd/ref 200W max, £29. Ken, GOHRR. Tel: (Harlow) 0279-26647.

YAESU 757GX. FC700 atu. FP757HD psu. Bearcat 220. Scanner. Good quality multi band dipole wire. Modern desk all good condx, £1050 ono for ALL, or will split. Tel: (Grimsby) 0472-74714.

YAESU FT102 MIC 270Hz filter, £525. FC707 £50. HF6V £130. Star Masterkey MkII £45. Hand key HK808 £20. Katsumi EK121 keyer, £20. Soar FC842 freq counter, £60. RADCOMS, SWM, HRT, PW, from 1973 boxed, £10. QRP QRP QRP unfinished project G2DXK tcvr as in RADCOM 1984, cabinet, pcb's, components plus contents of QRP'ers workshop testgear, sprats £120. G4MPK, QTHR. Tel: (Leatherhead) 0372-375514 (anytime).

EDDYSTONE EB35 GC/RX 12v dc £35. Trcvr A41 covers 50MHz fm £15. Manuals ARB ARR5 ARR7 ARR8B £2 each. Terminal unit h/brew £8. Scarab interface for Spectrum requires attention, £8. G4VPU, QTHR. Tel: (Tyneside) 091-2522304. Would exchange items for 2m Mizuho or similar.

ICOM IC740 with fm, cw filter and handhook, ex condx, £600 (no offers). Sony ICF7600D digital rx £100. Lowe SRX30 rx 500KHz-30MHz am/ssb, £90. GM4UJZ, QTHR. Tel: 031-331-2755.

PR813's WITH BASES £45. Ceramic formers, wide spaced capacitors, electrolytics, etc. QQV0-640A with base, sae for list. Will exchange the 813's for VFO520. WANTED: VFO520 and DC5. G3RB, QTHR. Tel: (Tyneside) 091-2530504.

YAESU FT200 HF TCVR, 100W 80-10m with FP200 power supply. On air demonstration can be arranged, £175. GOIKR, QTHR. Tel: (Northants) 0536-69664.

FT102 NEW PA VALVES, new AF board and counter board, narrow filter, YM38 desk mic, fm, am, £500 ono. CAP atu 1K £100. GOEWT. Tel: (Guisborough) 76887.

JIL SX200N SCANNER. Good condx, c/w psu and manual VHF 26-57.995MHz, 58-88MHz, 108-180MHz. UHF 380-514MHz, £160. Tel; Dave 0602-724505.

ICOM IC28E 2m tcvr 25W/5W. Very compact, 21 memory channels, frequency and memory scan functions. RX range 138-174MHz. Mint. £250. HR05 with 9 coils. Mains psu, vgc £65. Heathkit valve voltmeter, V7A with rf probe, £55. G3IWE, QTHR. Tel; 0925-601485.

FT480R 2M MULTIMODE c/w manual and mobile brkt, £250. Also MM 2m/70cm tsvtr with shift for repeaters, £100. GW8CVC, QTHR. Tel; 03417-7709.

TRIO 9130 2m multimode. All access, only two years' old. Ex condx, used as base station only, £355. GOFGP. Tel; Oxford 52615 (evenings).

COLLINS KWM2A with PM2 power supply, 30L-1 linear, CP1 crystal packet. Prefer not to split. All in ex condx. Buyer to collect. £1000, cash. G3GYX, QTHR. (Notts).

FT7B WITH MATCHING digital display, £275. WANTED: Argosy, Argonaut, Omni, etc. or similar non-synthesized full QSK rig. G4WDZ, QTHR. Tel; 0480-217026.

FT726R MINT, boxed, 2m/70cm hf, duplex board. The COMPLETE satellite rig. With all those extras this must be a real bargain at £699. G6STE. Tel: (Newcastle) 0661-23887.

ICOM IC751 hf tx/rx, 250Hz cw filters, RC10 freq controller, £975 ono. Phillips CD304 CD player (infra red remote control) £145 ono. G4WVX, Bruce, QTHR. Tel: 06286-64415.

CAMBRIDGE FM10D, 145.275, 144.750 dash mount £20. Teleprinter 7E plus tape reader gwo, spare paper roll, £15. H01 mini quad, spare spokes, £50. Call Paul, G3TZO, not QTHR. Tel; 0244-502411 (day), 0948-81429 (evening).

COMPLETE EXWD collection for sale. These are just some of the collection: R109T and WS76T Station, WS19 high power, WS22, complete in transit case, A510,WS18, BC611, GRC9, MAB., DAV., WS62. There is also a small amount of spy equipment. All are working and in very good condx. If you are interested in all or any part, ring Keith, 091-4693955. There is also a quantity of spares for all the equipment, valves, etc. Please no time wasters!!

TRIO TS820D 160-10m tcvr digital display. IF shift Perfect condx. £495. Also Kenwood TS520SE cw filter unmarked, £350. G3TCO, QTHR. Tel: (Bristol) 0272-681068.

BBC B COMPUTER with DDFS. 40-track disc drive. 9" monitor. Wordwise etc RF1 screened. £275 ono. G3TCO, QTHR. Tel: (Bristol) 0272-681068.

IAMBIC ELECTRONIC KEYER. Twin paddle Samson ETM3, with opto-coupler, switched pos/neg keying. Immaculate, £55. G3FCW, QTHR. Tel: 0532-585044.

YAESU FL50 tx ex condx, £25. Xtal filters 9MHz plus c/xtals £10, 455KHz Kokusai £10. Both ssb b/widths. KW ez-match £25. Daiwa swr bridge 0-20W £10. New 4CX250B plus base and chimney, £20.G3XNE, Tel; 0288-83-572.

IC04E 70CM H/H. Case a/e batt/chgr and box. As new, £230. G4WTE, QTHR. Tel; 0634-221061 (evenings please).

C58 2M MULTIMODE, CPB58 25W linear, £250. FT790R, nicads, mobile mount, £250. TS430S hf tcvr, am filter, fm board, £595. MML432-30LS 70cm linear £85. Spectrum 4m tsvtr 2W o/p £50. 4M 3-ele beam £10. Tony. Tel: (Macclesfield) 0625-31880 (eves).

FT220 2M MULTIMODE rx exc tx requires peaking, £115 ono. Would exchange with monitorscope cash adjustment. Roy, G4LJN, QTHR. Tel: 0526-833281 (Lincoln area).

FL7000 SOLID STATE LINEAR only 11 months' old, unmarked, £1100 ono. FL2100Z linear, very little used, unmarked, £590 ono. Howard, GOHZH. Tel: 0394-460-474.

MK2 PROCESSOR VERSION of Yaesu FT727RH dual band handheld, ex condx, boxed with speaker mic, £375. G4TJG. Tel: 0734-866770.

DRAKE TR7 fitted AUX7 FA7 fan PS7 power supply, RV7 remote vfo, £700 the lot. Buyer collects or pays carriage. All vgc. Tel: Okehampton 3131 (day) Launceston 3010 (evenings).

TR7200G 10W FM crystalled RO-7, S11,12,16, 20-23 Exc mobile rig, £70. Chris, G4KNM, not QTHR. Tel: 0865-890461 (evenings).

WANTED....

KW107 ATU would consider faulty unit. G4BLI, QTHR. Tel: 0752-401437.

GEM QUAD. Will inspect and collect. Price to GOCMM, QTHR. or phone day 061-427-1983, evenings and weekends, 061-427-6094.

R1475 WITH PSU. Must be in ex condx. Tel: Norwich 38143.

PLEASE CAN YOU HELP? My Yaesu YO100 monitor scope is sick. Have you a circuit diagram or service literature that I may borrow or copy. All costs refunded. G4YDA, QTHR.

FT7 TYPE TCVR, digital readout, low power; psu. Also 2m handheld (digital)& straight key with nice feel, not at collector price. G3UZZ, QTHR. Tel: 01-560-8104.

SONY 2850 and 2631 u-matic video recorder service manuals to buy or borrow. G1RYU in the process of moving, so not QTHR. Please leave message on (Swindon) 0793-822447.

HW12 MONO BAND TCVR to good home. G4KJJ, QTHR. Tel: John, 0480-68330.

SOUTH KENT RAYNET require cheap and cheerful 2m tcvr for talk-through operations. Up to £75 paid. Also required: mobile mounting bracket for IC255E plus instructions for standard C78 uhf fm. G8XCL, QTHR. Tel: (Lydd, Kent) 0679-20954.

R109 RX. Pref unmodified, your price + carriage paid. Contact Peter, Tel: 0642-45632 (daytime).

CIRCUIT DIAGRAM or service manual for Sinclair micro television, model S USA FTZ. To buy or borrow. G3OEG. Tel: (Staines) 0784-54757.

KW EZEE MATCH or SEMZ transmatch or similar atu. G3VPZ, QTHR. Tel: 0903-45876.

TRIO TR2300 c/w chgr and 10W amp, if possible but TR2300 only will do. G8RHL, QTHR. Tel: 0226-755803

ATC SQUADRON REQUIRES four portable t/rx capable of fm on ATC frequency of approx 149MHz. Any type considered. FOR SALE: AIR-7, WA55, TS830S, all vgc. Lockwood, G3XLL. QTHR. TEl: Mellis 596.

RESTORING EARLY SHORLAND armoured landrover. Details/layout of vhf/uhf equipment fitted. Was hf ever used even in specialised FFR version? WANTED: uhf Westminster. G4MBS. Tel: (Romsey) 0794-390418 (answering machine).

RACAL TRA967/3 vhf tcvr; Racal TRA970/H vhf amp: any info, technical data, brochures, etc on Racal "green" tactical radio equip. Please contact Stuart, G7APL on 021-743-7425, or write 49 Berryfield Road, Sheldon, Birmingham, B26 3UL.

TRIO TS940S WITH built in atu or 930S. Cash waiting. GOIJJ, QTHR. Tel: Steve, (Walsall) 0922-640861.

WS19 OR PARTS INCOMPLETE, case, variometer, control units, any condx. Hammarlund SP600 case, any condx. Eddystone 770R MkII case any condx or scrap receiver. Plus circuit. EMERS for B47, B48. PSU for WS22. G4XWD. Tel: (Kidderminster) 0562-823674 (evenings).

KW2000B WITH PSU for 85yr active ham whose old tx/rx is beyond repair. Must be in good wkg condx and sensible price. G2BFT, QTHR. Tel: 021-705-4467.

EARLY WIRELESS AND XTAL SETS WANTED; particularly WW1 equipment or parts, early valves, horn speakers, old radio books, magazines, catalogues, pre-war tv; keen collector pays well for anything associated with early wireless. James, G4ERU, 5 Luther Road, Winton, Bournemouth, 0202-510400.

WARTIME SUITCASE TYPE radios. A Mk3 (B2 minor), Mk123, or any other clandestine and resistance type radios inc modern for collection. Any condx welcome. Manuals and access are of interest. G4OFO, QTHR. Tel: 01-949-2317.

POWER TRANSFORMER FOR WW2 AR88 rcvr. Advertiser will pay transportation. Tel: (Stevenage) 0438-353636.

BUG KEYS, any semi-automatic mechanical speed keys by Vibroplex, McElroy, Bunnell, Speed-x, Lionel, Martin, Eddystone etc. Any age, any condx. scrap or mint. G3TSS, QTHR. Tel; 043-471-3125.

WANTED, WHY ADVERTISE? FC902 atu and SP902P speaker/patch, both must be mint, unmarked, boxed and manuals, etc. Your prices if as described. Paul, G3PCT, QTHR. Tel: 0245-321086.

TRIO TS120 or 130 V or S model. Also hf mobile antenna. G3XFB, QTHR. Tel; 0902-850033.

DRAKE C LINE OR R4C, T4XC, WHY? Collins S line 75S3, 32S, or KWM2 trcvr, WHY? Gavin Williams, G3YCP, QTHR. Tel: 0273-728322 (7pm-10pm).

COLLECTOR REQUIRES British general short wave tuner circa 1937-39 to complete set. Your price paid even if damaged. G2DGF, 12 Glebe Road, Letchworth, Herts.

WANTED: TS930S; TL922; Versatower 60' HD Racal 1218; Bencher keyer; Sampson memory keyer; NRDC515. FOR SALE; Sure 419B noise cancelling hand mike with clip, £15. Heathkit RF1U sig/gen 100KHz-200MHz, £20. Tel; 0565-873205.

CIRCUIT DIAGRAM OR handbook for Advance instrument OFS1B off air frequency standard, or details of conversion to 198KHz. G8AWN, QTHR, or Prestel MBX 919991418.

TYPE DFC7 digital frequency counter. Hugh, G3XCD, QTHR. Tel: 051-638-6342.

HITACHI WM20 shortwave adaptor or similar sw to mw converter. G4EPL, QTHR. Tel; 0602-638434.

HF RECEIVER WTD about £100. Also vertical hf antenna. Tel: (Blackpool) 0253-791699.

HEATHKIT GDO HD1250, also FL3 filter, also base for RCA 7213 tube. GW4UZL. Tel: 034-882-346. QTHR 1988 only.

HEATHKIT HR10B or Eddystone 888A valve receiver, in gwo, with h/books. G8ITB, 14 Ansford Road, Bromley, Kent. Tel; 01-698-4403.

HF LINEAR AMP. KW G2DAF, etc. Collins 75S3 receiver. American Forces PRM10 GDO or sell head unit with coils. Equipment must be working - appearance not important. Tel: 0229-89635 (any time).

ICOM IC RM3 computer controller and also IC211E or IC245E vhf tcvr in wkg condx. Please telephone Ray, 061-483-0372 (anytime). Any reasonable price paid. Also required rtty software for Sinclair QL computer. G3JLX, QTHR.

GREAT YARMOUTH ARC requires 2m multimode tcvr in good condx for club shack. Details and price to G3VKM or GOFEI, both QTHR. Tel: 050277-622 or 0493-780579.

ZENITH WORLD RADIO, plus any handbooks and/or service information. Tel; 0623-734689.

TRIO TS120S required. Must be working ok. Consider also TS130S if price is right. G3WCS, QTHR. Tel: 0606-891913 (Cheshire).

CAPCO SPC ATU or similar. Also small hf beam or possibly hf vertical for multi band use. Dummy load required for hf about 200W. CW software suitable for pc 5.25 disc. Signals handbook Vol 2. Tel: (Herts) 0707-874494.

"60 TESTED WIRELESS CIRCUITS" by FJ Camm. This fascinating book of somewhat unusual valve circuits from days long gone sought by valve enthusiast. Pref purchase, though short term loan appreciated. Larry, GOHTR, QTHR. Tel: (Tamworth) 0827-898024 (anytime).

RACAL TACTICAL ITEMS: MA934 battery, MA4162B initiate-tune box, MA945 charger, hf loaded whip, programmer box for TRA931P, WHY? Some Racal and other military and aeronautical items for exchange Write with details or for list. Bob, G8IYK, QTHR.

HANDBOOK OR CIRCUIT diagram for Marconi sig/gen type TF937 (CT218), to buy or borrow for photo copying. Gareth, GW4JPC, QTHR. Tel; 0792-896815.

MUTEK SNLA145sb preamp for Yaesu FT290R. GW6RWP, QTHR. Tel: 0443-775949 (evenings).

HF RECEIVER with 2m converter such as FRG7700 or similar. Solid state 2m linear. Manual (photstat ok) or any info for Solartron oscilloscope CX1441. Lucking, 62 Ember Farm Way, East Molesey, Surrey, KT8 0BL. Tel: 01-398-3603. G1IIU.

EDDYSTONE MODEL 958/5 mint condx. New boxed, unused would suit me better. Will pay appropriate price. If you prefer to trade I do have some very interesting gear. Please phone 0672-870866. Neale, RS18568, Shalbourne, Wilts.

YAESU SP102 SPEAKER, good condx/wkg order. Also have SR9 vhf shipping band receiver, 11 crystals hardly used, exchange for Eddystone EC10 or similar amateur band receiver. gwo condx for young listener. G4ZVC, 41 Poets Corner, Margate, Kent, CT9 1TR. Tel: 0843-225445.

CIRCUIT DIAGRAM OF Ferrograph recorder test set, RTSI or MkII. G4KLT, QTHR. Tel: 0706-46428.

SONY ICF7600D receiver in mint condx. Tony Lord, G4KHT, QTHR. Tel: 0482-843457 (home), 0482-223141 Ext 3457 (work).

A FULLER FD keyboard and case, etc. for Sinclair ZX81. Copy of Amateur Radio Techniques. Trimming

tools for AR88LF manual. Trimming tool for GEC BRT400 rx. John, tel: 0302-323650 (after 5pm).

TRIO TS510 or TS515 wanted. Must be in wkg order and decent condx. Contact Steve, G4HXD. Tel; 0785-818634 (Staffs).

RACAL SYNCAL 30. Must be in good condx. Tel: 0244-660510 (after 4.30pm) Mr. Williams.

MAINS TRANSFORMER for National Model NC183D communications receiver urgently required. Top price paid plus postage. Also circuit diagram and information for Yaesu model FC300C antenna tuner. Gerry, G3CBF, QTHR. Tel; 080-45-4480.

YOUR OLD HEATHKIT RA1 rx's for spares and experimental test beds. Any condition. Please send specific details of condx and realistic prices to Richard Marris, 35 Kingwood House, Farnham Road, Slough, Berks, SL2 1DA.

URGENTLY REQUIRED; Metal valve CA8 USA origin, must be new with labels intact. Also required Eddystone four pin plug - in coils. Have six-pin equivalents in ex condx for exchange. G4IMT, BH Litherland, QTHR. Tel: 0225-891254.

MAINS UNIT AND SPEAKER/MIC for Yaesu FT207R, 25W 156MHz module for Bird thruline wattmeter. Hand scanning mic for FT1. Word processor and Radio Amateur programs for use with Commodore Amiga 500. K.Lee, 12B La-Pleta, Ordino, Andorra, Tel: 36347.

STATION MONITOR ANY TYPE. Good condx please. GW4ZXG, QTHR. Tel: 0656-653585.

CRYSTAL FILTER CW 500Hz, 10.7MHz. G4FEN, QTHR. Tel: 0424-210-177.

TS120 OR TS130 V or S model and 530S. G3XFB, QTHR. Tel:0902-850033.

CONTEST NEWS *(Continued from page 387)*

1987 1·3GHz/2·3GHz Cumulative Contests results

Activity was slightly down on previous years, and all sessions experienced very flat propagation conditions. The new ruling of having each session scoring normalised to the leading station gave a slight advantage to the stations not so well situated and the ones who were consistently on throughout all sessions. Insufficient numbers of contest participating stations made it difficult to determine if the new ruling drastically affected the overall results. The main intention was to eliminate scores in a session with exceptionally good conditions outweighing scores in other sessions held under normal conditions.

Two stations objected to this ruling and it will be reviewed. More comments from contest stations please. Best dx on 1·3GHz was at a path distance of 522km, while for 2·3GHz 517km was achieved, both by fixed stations. Thanks to all contest-supporting stations, especially portables – but why no 2·3GHz gear taken?

Congratulations and certificates to GI4OPH, G4MGR and G8NEY/P for 1·3GHz; G8IFT for 2·3GHz, and G8TFI overall two-band winner.

G8HHI

1·3GHz FIXED-STATION SECTION

Posn	Callsign	Points	Loc	Pwr(W)	Ant	Best dx	Km	Sessions
1	GI4OPH	3,000	74GN	130	4×23-el	G4FUF	522	1,4,5
2	G4MGR	2,863	83KH	60	23-el	G3GIM	380	2,3,4
3	G8TFI	2,723	81UQ	250	2m dish	PA0EZ	517	2,3,5
4	G8IFT	2,001	82XJ	150	4×23-el	GI4OPH	330	1,2,4
5	G4ZTR	1,950	01LV	100	55-el	GI4OPH	519	3,4,5
6	G1KDF	1,416	83NN	30	4×23 el	G4FUF	328	1,3,5
7	G8GTP	788	83UN	20	2×15/15	G4FUF	294	2,3,4
8	G8CHW	750	91TQ	100	48 el quad	G6DER	221	3,4,5
9	G6PHJ	477	92LO	70	27 el quad	GI4OPH	364	5
10	G8ACJ	405	91RF	25	15/15	G8TFI	163	1,2,5

1·3GHz CUMULATIVES ALL OTHER SECTION

Posn	Callsign	Points	Loc	Pwr(W)	Ant	Best dx	Km	Sessions
1	G8NEY/P	3,000	81TK	100	55-el	G3ZTR	326	1,2,3
2	G0AWP/P	1,126	93RS	30	23-el	G8NEY/P	287	2,3,4
3	G4YPC/P	988	91PC	2	23-el	GU2FRO	219	1,4,5

2·3GHz CUMULATIVES FIXED SECTION

Posn	Callsign	Points	Loc	Pwr(W)	Ant	Best dx	Km	Sessions
1	G8IFT	3,000	82XJ	20	44-el QL	G4FUF	201	1,2,4
2	G8TFI	2,806	81UQ	50	1·2m dish	PA0EZ	517	2,3,5
3	G4ZTR	609	01LV	1	66-el QL	G4CBW	255	2,3
4	G6PHJ	400	92LO	14	Corner Refl	G3KFD	74	5
5	G8CHW	383	91TQ	0·25	66-el QL	G8TFI	132	2,3,5

OVERALL RESULTS – ALL-OTHER SECTION

Posn	Callsign	1·3GHz	2·3GHz	Total
1	G8NEY/P	3,000	–	3,000
2	G0AWP/P	1,126	–	1,126
3	G4YPC/P	988	–	988

OVERALL RESULTS – FIXED SECTION

Posn	Callsign	1·3GHz	2·3GHZ	Total
1	G8TFI	2,723	2,806	5,529
2	G8IFT	2,001	3,000	5,001
3	GI4OPH	3,000	–	3,000
4	G4MGR	2,863	–	2,863
5	G4ZTR	1,950	609	2,559
6	G1KDF	1,416	–	1,416
7	G8CHW	750	383	1,133
8	G8PHJ	477	400	877
9	G8GTP	788	–	788
10	G8ACJ	405	–	405

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HOWES KIT RANGE includes:		KIT	Assembled PCB
DcRx20, DcRx40, DcRx80, DcRx160	SSB/CW Receivers	£15.30	£20.90
CTX40, CTX80	QRP CW Transmitters for 40 and 80M	£13.40	£19.40
MTX20	10W CW TX for 20M	£21.90	£27.70
CVF20, CVF40, CVF80	VFOs for above transmitters	£9.90	£15.90
HC220, HC280	2M to HF transverters, 10W output	£52.50	£83.50
CSL4	Dual bandwidth SSB/CW filter for DcRx	£9.90	£15.90
ASL5	Dual bandwidth filter for "black boxes"	£14.90	£22.50
TRF3	Shortwave Broadcast receiver	£14.50	£19.90
CTU30	HF bands ATU for receiving or 30W TX	£24.90	£29.90
SWB30	SWR/Relative power indicator, 160 to 2M	£11.90	£16.50
CM2	Quality microphone with VOGAD	£11.20	£15.20
AP3	Automatic Speech Processor	£15.90	£22.80
ST2	Sine-wave side-tone practice oscillator	£8.60	£12.90
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All HOWES KITS include a high quality glass-fibre PCB with screen printed parts locations, full instructions and all board mounted components. Tuning capacitors to suit our receivers and VFOs (except 160M) are available at £1.50 extra (DcRx needs two, TRF3 and CVF need one).

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73 from Dave G4KQH, Technical Manager.

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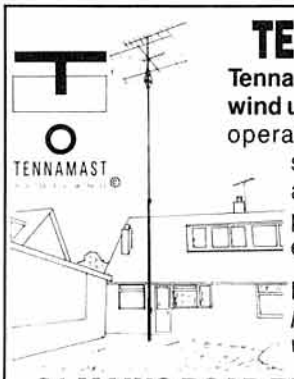
TENNAMAST SCOTLAND



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THE ANNUAL MEETING OF THE SOCIETY

Minutes of the sixtieth Annual Meeting of the Radio Society of Great Britain, held at the Institution of Electrical Engineers, Savoy Place, London WC2 0BL, on Saturday 5 December 1987 at 2pm.

The President welcomed members to the meeting and outlined its format. She said that in fact there were to be three separate meetings. One would be the Annual General Meeting, dealing with business as required by the Companies Act. There would then be an Extraordinary General Meeting, during which two resolutions put forward by the Society's Council would be discussed. Following a break for tea there would be an Open Meeting, which would give members a chance to raise matters of general interest or concern.

The President added that, as members would have noted from the agenda circulated with the November edition of Radio Communication, the Society would for the first time be making an official audio tape recording of the day's proceedings available. At last year's meeting at least one unofficial recording had been made and some members had objected to this practice. She said that before the meeting proper commenced she would like some guidance from the floor by means of a show of hands as to whether unofficial recordings should be permitted. On a show of hands it was clear that the majority of the members felt that unofficial recordings of the proceedings should not be permitted.

The President then announced the formal opening of the Annual General Meeting.

ANNUAL GENERAL MEETING

Present: Mrs J Heathershaw, G4CHH (President, in the chair); Mr W J McClintock, G3VPK (Immediate Past President); Mr D A Evans, G3OUF (Secretary); Mr J Blacquiere of Messrs Moores & Rowland; Mr F D Hall, GM8BZX (Executive Vice President); Sir Richard Davies, G2XM (President-Elect); and 193 corporate members.

The President introduced those present on the rostrum and read out the apologies for absence. She said that since more than 50 members were present, a quorum existed. The President then stated that the notice calling the meeting had been circulated with the November 1987 edition of Radio Communication. The Secretary read the first part of the calling notice and proposed that, to save time, agenda items be read as they arose.

Minutes of the 60th Annual General Meeting

The President stated that the minutes had been available for nine months and reminded the meeting that it was not a requirement of the Companies Act that they were presented at an Annual General Meeting. She said that, nevertheless, Council felt that members should have an opportunity of commenting on them. She asked the meeting to consider the fact that approximately 32,000 words had been spoken in the course of the 1986 annual meeting and that any published summary would inevitably omit elements of what had been said. Eight pages of Radio Communication magazine had been devoted to the published summary of the annual meeting, which implied that in terms of words used the summary was approximately half as long as the meeting itself. The President wished to stress that members addressing the meeting should wait for the microphone to be handed to them before speaking, since otherwise it might not prove possible to identify them later. This had been a considerable problem in 1986, although it had subsequently proved possible to identify some of the unidentified speakers at the meeting. The President invited comments concerning factual inaccuracies in the minutes requiring correction. Mr M Stokes, G3ZXZ, said that he and his friend, Mr I Abel, G3ZHI, were not making an audio recording of the current meeting, in line with the vote taken earlier. He hoped that the minutes of the present meeting would be factually correct. Mr M Bolt, G4SUI, said that he had raised a problem concerning planning permission at last year's meeting and had received an undertaking from the then President, Mr W McClintock, G3VPK, that he would look into the matter. Mr Bolt said that the meeting would be pleased to hear that the problem had been resolved by means of an appeal to the Department of the Environment, although no assistance had been received from the Society. The President pointed out that this did not constitute an inaccuracy in the minutes but that the point had been noted. Mr M Stokes, G3ZXZ, said that he would like to know - and was sure that the meeting would like to know - the identity of the person responsible for producing the minutes of the previous year's meeting and who decided what would or would not be included. He felt that a vote of censure or of no confidence should be passed on the person concerned since the minutes were hopelessly inaccurate.

The President said that the tape recording of last year's meeting had shown that often a great many people spoke at the same time, and many comments had been made which were inaudible since speakers had not waited for the microphone to be brought to them. Consequently it had been difficult to establish who had spoken and on what topic. The President stressed that half the number of words spoken at the meeting had been used in the report; it would not be possible to use the entire space in Radio Communication magazine to report the meeting verbatim. As far as the current year's meeting was concerned, an audio tape recording containing everything said at the meeting which was capable of being heard would be made available to anyone requesting it.

Mr P Crosland, G6JNS, asked what steps were being taken to ensure that what he referred to as the "....enormous number of inaccuracies" in last year's minutes would not be repeated and that the published account was "....an accurate resume instead of a totally inaccurate one". The President replied that she had answered that question. Mr Crosland reiterated his question, saying that some things would inevitably be inaudible but that there was an "enormous number of complete omissions" in the minutes of the previous year's meeting. The President said that any published summary would inevitably leave out something and that clearly not everything could be included. Equally, summaries of a meeting produced by different individuals would be different. She added that only three people had complained about inaccuracies in the minutes of the previous year's meeting, and inaccuracies thereby brought to light had been corrected.

The Secretary added that in view of the length of the previous year's meeting, there would inevitably be inaccuracies. Parts of the meeting had been inaudible, as the President had explained. It was also not surprising that a tape recording made elsewhere in the meeting hall had recorded comments not audible on the one made by the Society. The omissions had been discussed with the gentleman who had made the recording and a list of corrections had been issued to those attending this year's meeting. (Note: a copy of the corrections issued for the 60th AGM is reproduced later). The Secretary could not see how the Society's behaviour could have been fairer. Mr Crosland agreed that the Society had been very fair; he simply wished to express a hope that the minutes of the current meeting would be considerably more accurate than those of the previous year. The Secretary said that this year special arrangements had been made to improve the recording facilities used for the meeting.

Mr N Roberts, G4IJF, welcomed the Society's efforts in promoting greater openness by the presentation of the minutes to the meeting and by allowing time for the discussion which had previously taken place. He hoped to see a continuation of this trend.

Accounts for the year ended 30 June 1987, and the reports of Council and auditors

The President invited Mr John Blacquiere of Messrs Moores & Rowland to read out the formal report of the auditors. In their opinion the accounts, prepared under the historical costs convention, gave a true and fair view of the Society and its subsidiaries as at 30 June 1987 and complied with the terms of the Companies Act 1985. This statement was signed by Moores & Rowland.

The President called upon the chairman of the Society's Finance & Staff Committee, Mr W McClintock, G3VPK, to present and discuss the accounts for the 1986/7 financial year. These accounts had been circulated to members with the November 1987 edition of Radio Communication.

Mr McClintock said that members regularly attending the annual general meeting would realise that it was not usual for either the chairman of the Finance & Staff Committee or the Immediate Past President to present the accounts, but a series of unfortunate events had made it necessary. The Honorary Treasurer, Mr D Cornish, G3COR, had suffered a heart attack in summer 1987 and reluctantly had had to tender his resignation later in the year. He wished to thank Mr Cornish for the sensitive and skilful way in which he had handled the Society's financial affairs in the course of the previous ten years, during which the Society's income had risen from less than £350,000 to well over £1m. Mr B O Brien, the Immediate Past Chairman of the Finance & Staff Committee, had been acting on behalf of Mr Cornish during the latter's illness and had been intending to present the financial report and accounts to the meeting. Unfortunately Mr O'Brien had been obliged to prepare to enter hospital for an operation and was unable to be present. Mr McClintock said that he would endeavour to act as a replacement for Messrs Cornish and O'Brien.

Mr McClintock said that he was sure that members would have read the financial report of Council to members of the Society and the accounts themselves. He wished to highlight some of the points made in the report and to pick out items in the accounts which would benefit from amplification. At the beginning of the financial year it had been recognised that 1986/7 would not be easy for the Society because of the continuing depressed state of the amateur radio market. The budget had predicted a relatively small deficit for the year but long-term prospects were not good since predicted income was not rising as fast as predicted costs. Council had adopted a policy of investing in additional staff for the future well-being of the Society, particularly with an improvement in the business efficiency of the Society's operations in mind. As a result of this, and other significant items of expenditure which had not been anticipated - such as the high cost of involvement in problems relating to electromagnetic compatibility, the need to ensure that the Headquarters building complied with current fire regulations and a change of accounting policy with regard to badge stocks - the accounts showed a deficit of £27,304 before tax. However, Mr McClintock believed that the policy adopted by Council had been correct; there was evidence that the earlier trend had been reversed and that the Society should shortly return to surplus.

Mr McClintock drew the attention of the meeting to the income and expenditure account. Income had increased by some 4% but book sales had fallen; the number of items sold had decreased by 20%. Improvements to this position were being sought.

In the matter of expenditure, Mr McClintock said that the sum associated with repair and maintenance at Headquarters, £6,412, had risen mainly as a result of the requirement for compliance with fire regulations. The associated outlay had certainly not been foreseen at the beginning of the financial year. Staff costs had risen for a number of reasons which were chiefly associated with Council policy. However, Headquarters salaries were on average slightly in excess of £11,000 per annum and had increased by less than 20% over the previous five years. Considering the inflationary effect of London salaries on staff costs in the Potters Bar area, the genuine loyalty of staff at Lambda House could not be denied. The Society ought to be thankful for this.

Referring to legal and professional fees, Mr McClintock stated that the increased costs under this heading were mainly due to provisions made in respect of the Society's involvement in a particular case which could have far-reaching implications for all members.

In conclusion Mr McClintock wished to return to the area of the deficit. He said that in some ways the figure was misleading; the true deficit for the year was £17,804, with the difference being accounted for by the inclusion of badges in stock. An explanation was given at Note 1(f) on page 5 of the accounts, which was paraphrased by Mr McClintock. He added that the figure giving an indication of the Society's true worth, the Accumulated Fund, stood at £345,686. Although there had been a reduction in this figure during the current financial year, every effort was being made to increase it.

The President said that four members, who she believed were present at the meeting, had sent written questions on the accounts. She would try to call upon these members to put their questions, but first she invited questions on the accounts from the floor.

Mr R Broadbent, G3AAJ, said that he had made various comments to Headquarters in the course of the year concerning book prices. He stated that he had some knowledge of what books cost, and wished to be assured that realistic costs would be charged during the forthcoming year; he added that by "realistic" he was implying lower prices, not higher. He was disturbed to see books for sale at prices some 300% higher than they were sold to the Society. The Secretary said that Mr Broadbent's question was interesting since the point had also been raised by a member of Council at its last meeting and the matter was currently being discussed within the Society. A report had been prepared, although the necessity of making arrangements for the Council election and the annual meeting had left the Secretary no time to consider its contents and take action. However, he wished to assure Mr Broadbent that the matter was being looked at.

Mr A Veitch, G8FRB, on behalf of the meeting, asked the President to send best wishes for a speedy recovery to Mr D Cornish, the ex-Honorary Treasurer. He added that two years previously he had made a protest about the then deficit and had received an assurance that the Society would do better. In the previous year there had been a £3,000 surplus. Mr Veitch said that this situation could not continue indefinitely and that "....it had got to be plus or minus nothing next year". Mr W McClintock, G3VPK, said that the matter was being seriously considered and that the Society had instigated a new policy agreed by Council in order to get into surplus.

Mr D Booty, G3KKQ, queried the increase in bank charges from £2,977 to £8,347. In reply the Secretary said that there were several reasons for the increase. Banks had increased their charges and an agreed increase, to be phased in over several years, had now taken effect. Banker's order payments used to pay subscriptions cost some 20p each, and the Society hoped to introduce direct debit payments in order to reduce costs in this area. Although some people did not like direct debit this strategy could help the Society considerably, since banks charged only some 4p for each payment: the Society had estimated that if all members at present paying their subscriptions by banker's order paid instead by direct debit, the saving to the Society would amount to several thousand pounds. If all members paid in this way, the Society would reduce its deficit by between £5,000 and £10,000.

Mr B Sutton, G3TVY, said that an investment figure of £200 appeared each year in the accounts, together with a Legacy Fund. He said that if this amount was always available it should be earning interest. Mr McClintock agreed that profit should be maximised by appropriate use of available money and assured Mr Sutton that his point was currently being considered.

Mr G Smith, G4AJJ, said that a question asked in the previous year concerning income and expenditure on Morse tests had not been included in the minutes but had now been included in the amendment sheet. He could find no reference to this item in the current year's accounts and asked for the figures and why they were not given as separate items. Mr W McClintock, G3VPK, said that the income and expenditure account would be very long if each item was separately included; he thought that the figures might, in fact, be shown in a different way and amalgamated into other expenses. He invited the Secretary to comment. The Secretary said that it was a matter of presentation; the accounts were constructed and displayed in a historical format which was not on occasions very helpful, and the Society would like to see slightly better presentation of the accounts in the future. Part of the difficulty was that items could not be presented in the accounts without comparative figures for the previous year being presented as well. However, the income from Morse tests had been £19,985 and the (direct) cost of Morse tests had been £15,603.

Mr P Nicol, G8VXY, said that when he joined the Society in 1980 the membership fee had been £6.80; it was now in excess of £18, implying an increase of 200%. He added that he knew a number of amateurs who felt that the figure was too high and wondered whether the Society had too few members, causing higher costs. The Secretary queried this member's figure and said that it did not fit his memory of the facts, although he did not have the actual figures in front of him. He added that Council had made a policy of increasing the subscription rate every two years, this representing the best balance between the administrative difficulties involved in increasing it more often and the need to keep the rate approximately in line with inflation. The Secretary said that in the course of the preceding ten years the rate had been generally in line with inflation. A number of members considered that the amount of increases were, as he put it, "....too little too late".

Mr M Bolt, G4SUI, noted that the Society now charged a £2 levy for individuals joining or rejoining the Society. He asked the cost of processing such an application and enquired whether it was covered by the £2. The Secretary replied that the correct figure was £1.50 and explained that the new member was provided with a badge, a membership certificate and a quantity of relevant literature. Staff time was involved in the handling and processing of the application. The figure of £1.50 did not cover the actual cost but was intended to approximate the direct cost of the items sent to new members. Mr Bolt asked whether it would be possible for individuals who rejoined not to receive the items again, and whether the Society would save money if such savings were made on a large scale. The Secretary said that it would be administratively more difficult not to send them and that perhaps the sum involved should be taken as an incentive for not letting membership lapse.

Mr T Tugwell, G6TJT, said that in his view the new membership surcharge was a disincentive to newcomers to join the Society and that perhaps there should be a reduction in the cost of the first years' membership to encourage new members to join. He added that if a new member resigned after one year it was because of the Society's failings. The Secretary said that the position was not so simple. The Society lost about a third of its new members after one year and some 50% after two years, and similar statistics applied to many organisations. He added that the reason appeared to be that individuals tried new things to see whether they derived any enjoyment from them. However, this was certainly a valid point and one which the Society had not overlooked in connection with trying to encourage more young people into amateur radio.

Mr J Wright, RS18582, said that computer errors occurred in the best of organisations, and Mr W McClintock, G3VPK, concurred.

The President then called upon those who had presented written questions. Mr M Mansfield, G2SP, asked for the proportion of Council members who charged their expenses for attendance at the previous year's annual meeting. The Secretary said that as members of the board of directors of the company, the President expected all Council members to attend the annual meeting and in turn it would be expected that they would claim their expenses. He added that this seemed extremely fair to him. Mr Mansfield felt that Council members attended as members of the Society and that the membership attending the meeting should also be entitled to claim, possibly in the form of a reduction in their following year's membership subscription. He felt that attendance at the annual meeting would thereby be encouraged and that the Society would become more democratic. Mr F Hall, GM8BZX, the Executive Vice President, said that he was one of the Council members who travelled a considerable distance to attend. In the course of the year he had been in London approximately 18 times on Society business. Since he ran his own business, this implied some loss of money. He added that surely Society members did not expect him, in effect, to pay to attend the annual meeting and added that he would be interested to hear the views of the membership. The President said that the answer to the question was that directors could claim expenses for attendance at the annual meeting. Mr Mansfield felt that all the members who came from a considerable distance should receive a bonus.

Mr M Stokes, G3ZXZ, said that he endorsed Mr Mansfield's comments and added that he did not mind Council members receiving expenses but hoped that they would all remain until the end of the meeting. He had originally asked a question relating to a breakdown and cost analysis of the staging of the RSGB National Convention held at the National Exhibition Centre earlier in 1987. The Secretary said that the breakdown was rather lengthy and that it would be impractical to go through it in detail in the course of the meeting. He invited Mr Stokes to examine the costing document during the interval if he so desired.

Mr P Crosland, G6JNS, asked whether the auditors were satisfied that the arrangements for valuing stocks of various items were adequate and that all obsolete stocks were adequately written down. The Secretary said that it was normal practice for a member of the auditing team to be present during the end of year stock-taking, and Mr J Blacquiere, of Messrs Moores & Rowland, confirmed that the stocks of the Society were examined and values and future values discussed with Society officials. He added that in general terms they were quite happy with the position.

Mr M Bolt, G4SUI, asked how much had been spent on the despatch of mail-shots soliciting membership of the Society and how many individuals had joined as a result of them. The Secretary said that the cost during the year had been approximately £5,000 and there had been a net increase in membership of approximately 950 as a result. Income from the resulting new subscriptions had amounted to approximately £20,000 plus associated sales of books.

There were no more questions on the accounts.

Members to serve on Council for 1988

The President read the letter from the scrutineers announcing the results of the recent Council election; these were as follows:

Election for Ordinary members:

Dr E J Allaway, G3FKM, 1, 83 votes - Mr G L Benbow, G3HB, 812 votes - Mr T I Lundegard, G3GJW, 667 votes. Therefore Dr E J Allaway was elected as an Ordinary member.

Election for Zone A: Mr P R Sheppard, G4EJP, 269 votes - Mr G R Smith, G4AJJ, 335 votes. Therefore Mr G R Smith was elected member for Zone A.

Election for Zone B: Mr J Allen, G3DOT, 380 votes - Mr P L Crosland, G6JNS, 262 votes. Therefore Mr J Allen was elected member for Zone B.

The President then announced the names of all members who were to serve on Council during 1988. These were: President, Sir Richard Davies, G2XM; Immediate Past-President, Mrs Joan Heathershaw, G4CHH; Ordinary members - Dr E J Allaway, G3FKM; Messrs N Brinkworth, G3UFB; J Heys, G3BDQ, G Jessop, G6JP; A McKenzie, G3OSS; B O'Brien, G2AMV; N O'Brien, G3LP; and F Rose, G2DRT; Zonal members - Zone A, G Smith, G4AJJ; Zone B, J Allen, G3DOT; Zone C, J Greenwell, G3ZEA; Zone D, Dr J Gannaway, G3YGF; Zone E, J Case, GW4HWR; Zone F, J T Barnes, GI3USS.

The President thanked the scrutineers who had performed the count and called for volunteers to act as scrutineers at next year's election. Their names and callsigns were noted.

Mr T Hughes, G4WKJ, said that in previous years he had been sceptical of the vote counting procedure used for determination of the results of Council elections. This year he had taken part in the scrutineering and counting of votes and said that he was perfectly satisfied that it had been conducted in a very proper, efficient, effective and honest manner. He encouraged other persons entertaining doubts about the adopted procedures to do as he had done.

Appointment of auditors and fixing of their renumeration

The President announced the resolution that Messrs Moores & Rowland be re-appointed auditors of the Society for the ensuing year and that their remuneration be fixed by Council. On a show of hands the President declared the resolution carried.

The President declared the Annual General Meeting closed.

EXTRAORDINARY GENERAL MEETING

The President opened the Extraordinary General Meeting by saying that the rules by which the Society conducted its business were laid down in the Memorandum & Articles of Association. From time to time it was necessary to alter the Articles to take account of changing needs, and it was a requirement that such changes were formally approved. A special meeting was therefore convened for the purpose. The President then invited the Secretary to read the calling notice. The Secretary did so and added that the two resolutions to be debated were items 1 and 2 on the agenda.

The President then called on the Secretary to comment on the first resolution. The Secretary said that it was now normal practice for most companies to allow what was known as a "two-way proxy vote". This implied that if a member could not attend a meeting and wished to assign a vote to one who was, it was common practice to allow the person assigning the proxy to indicate to the proxy-holder which way to vote on specific resolutions. For purely historical reasons the Society's Articles had not hitherto permitted this. In recent years members had expressed a desire that such a procedure be allowed; the Society had therefore taken legal advice and and wished to make the necessary change to the Articles.

The President invited comments from the floor. Mr N Roberts, G4IJF, said it made a great deal of sense and should have been carried out years ago. Mr A Veitch, G8FRB, sought clarification of a point, which was given by the Secretary. The President then called for a vote, and on a show of hands the President declared the resolution carried.

The President then invited the Secretary to comment on the second resolution. The Secretary said that the resolution related to the appointment of members of Council who were over 70 years of age. The provisions of the Memorandum and Articles relating to such individuals were administratively somewhat complex, and Council wished to modify them such that, rather than put a motion confirming the appointment of a Council member who had reached the age of 70 to an annual meeting, it seemed fairer to put it to the whole membership at the time of an election. Consequently, Council wished to make the appropriate changes to the Memorandum & Articles of Association, to permit the age of prospective Council members over 70 years of age or who would reach that age during their term of office, to be given on the ballot paper.

The President invited comments from the floor. After a short debate the President called for a vote. On a show of hands the President declared the resolution carried.

A tea break was then taken.

Dr D S Evans, G3RPE, receives his certificate on being elected a Vice-President of the Society

Mr D Willies, G3HRK, who was elected a Vice-President of the Society, was also presented with the Raynet Trophy

PRESENTATION OF AWARDS

The President then proceeded with the presentation of awards. The Calcutta Key, for outstanding services to international friendship, was presented to Mr R Broadbent, G3AAJ. The Founders Trophy, for services to the RSGB, was awarded to Mr P Miles, G3KDB.

The President then announced that Dr D Evans, G3RPE and Mr D Willies, G3HRK, had been elected Vice Presidents of the Society and presented certificates.

The President then announced the names of those appointed to the post of RSGB Liaison Officer and read out a list of counties in which vacancies continued to exist. (See News Bulletins, RadCom December 1987 and January/February 1988 for details).

Mr R Broadbent, G3AAJ, receives the Calcutta Key

Mr M J Grierson, G3TSO, receives the Ostermeyer Trophy for his article "A general-purpose antenna tuning unit". (Most meritorious description of a piece of home-constructed radio or electronic equipment published in *Radio Communication* in the year ended 30 June 1987)

The Wortley Talbot Trophy was awarded jointly to Dr D Last, GW3MZY, (left) and Mr T Goddard, GW6RYH, for their article "The Backlite mobile antenna for 144MHz" (Outstanding experimental work in amateur radio)

Mr I Wade, G3NRW, receives the Courtney Price Trophy for his "Data Comms" column. (Most outstanding technical development in amateur radio during the year ended 30 June 1987)

An associate member from the Amateur Radio Club of Nottingham, who was allowed to address the meeting, said there were three members of 15 years of age in his club, one of whom was a member of the club committee. He pointed out that the RAE could be taken prior to reaching the age of 14 but a transmitting licence could not be held until that age was reached. The Secretary commented that the Society would like to see a Youth Recruitment Officer in every club in the country to help encourage young people but that the Society needed to guide such people as to how to be effective.

Mr J Todd, G4XLM, said that an Amateur Radio Certificate could be held at the age of 10, permitting the use of amateur radio equipment. He mentioned that his club had for some years supported the local JOTA station and the Air Training Corps squadron, and he invited members of other clubs to support local groups in the same way. The President said that this was an excellent suggestion. The Secretary said that the Society itself was working closely with Scout Headquarters at Gilwell Park and that the scout and guide movement was an excellent basis for local liaison with amateur radio clubs.

Mr D Gardiner, G4UJQ, said that the Society seemed to have forgotten how to communicate, and that a good deal of time could be saved if what the Society was proposing was published in its journal. The President said that a good deal of Society thinking was outlined in the "From the Secretary's Office" and via Council Brief items in Radio Communication.

The Secretary commented that the Society was shortly to produce a recruitment video, which would be sent to all groups affiliated to the Society. Another video would suggest methods of using it.

Mr M Bolt, G4SUI, said that for several reasons such as age or unemployment, there were a number of amateurs who would be willing to demonstrate amateur radio to clubs and groups. The President said that it was important for such individuals to demonstrate a variant of amateur radio which was available to the young. At present, what was usually visible was a quantity of expensive equipment and the "....enormous great hurdle" of the RAE. This was off-putting.

Mr T Lundegard, G3GJW, suggested that the Society should sell books at the AGM and make use of the national media and schools. He thought the video was a good idea and suggested the provision to send in tapes or discs to dump information for Students use on home computers. Also a postal service to help Students.

Mr R Broadbent, G3AAJ, said that he was an old, decrepit and retired gentleman who therefore had plenty of spare time. Being involved with the amateur satellite movement he had approached local schools but had never received the courtesy of a reply. He added that he was a member of an education committee and another member, who was an Inspector of Schools, had informed him that little could be done by educational authorities in the way of extra- curricular activities if the school-master himself did not choose to assist.

The President finalised the discussion by saying that many members had written to the Society advising of the work already going on and suggesting ways to encourage the young. The President had found this very stimulating.

Mr I Mitchell, G4NSD, had asked for details of the procedure for handling votes sent to the Society for council elections. The Secretary said that envelopes arrived from the Post Office and were placed in sealed boxes. Prior to the count the callsign written on the rear of each envelope was checked to ensure that the voter was a valid RSGB member. On arrival of the adjudicators the unopened envelopes were handed to them; the adjudicators opened them, sorted them into zones and counted them. A good deal of meticulous effort was put in by Headquarters staff in checking and identifying poorly written callsigns. The Secretary reminded the meeting of the comments made earlier by Mr T Hughes, G4WKJ, concerning the scrutineering system.

Mr R Ray, G3NCL, had asked why the Society's VHF Committee had put packet repeaters on 144.625 MHz, which had been a slow Morse broadcast frequency for the previous six years. Mr M Dennison, G3XDV, explained that this frequency had been allocated to packet radio by the last IARU Region 1 Conference. Mr R Holyoake, G4WAY, asked whether RSGB officials taking part in the Conference had any knowledge of what that frequency was used for. The Secretary explained that RSGB was only one member society out of 41 at the Conference and had only one vote. He pointed out that that was an example of democracy at work.

Mr J Todd, G4XLM, had asked why the Society appeared unable to allocate an interference-free frequency to slow morse in the 144 MHz band. The Secretary reiterated that the Society could not provide instant solutions to problems of this type. An enormous amount of goodwill was required by individuals (in their day to day operations) in order to make bandplans work. If goodwill failed, bandplans would inevitably break down. It was not for Council or the Society's staff to solve day to day problems of the type mentioned. Above all, in amateur radio it was necessary to have goodwill, patience, understanding and time; these were essential to the amateur spirit.

Mr R Smith, G3LVW, said that there was plenty of room at 144 MHz if the band was used more effectively. He asked what was wrong with 12.5 kHz spacing. Mr A McKenzie, G3OSS, of the VHF Committee, said that he had been investigating the possibilities of 12.5 kHz channelling at the behest of the VHF Committee and he hoped to have an article on the subject in Radio Communication during the first part of 1988. He said that the two main problems were the continued fitting of equipment capable of 12.5 kHz channel steps with a 25 kHz filter and the fact that equipment was supplied with 5 kHz deviation as standard, whereas the required figure was between 3 and 3.5 kHz. He added that the prospect of persuading perhaps 25,000 UK radio amateurs to reduce their deviation and fit different filters was rather frightening.

Mr P Manning, G1LKJ, had asked why one of the lightly used Raynet frequencies could not be allocated for Morse broadcast purposes on a shared basis. Mr G Griffiths, G3STC, chairman of the Society's Raynet committee, said that Raynet was happy for frequencies allocated to Raynet to be used by others on a co-operative sharing basis. He reminded Mr Manning that the Raynet zonal representative for the south-east had offered the slow Morse broadcast group the interim use of a Raynet frequency.

Ms T Billett, GOFFP, said that she had appreciated that this was the case. She added that it had emerged from the meeting that Council itself was in no position to dictate local choice of frequency, but Headquarters had granted them written permission to use another frequency which was thought to be clear, but was in fact used by another group. She said that the other group of users had "...pulled every trick they could think of to have us thrown off that frequency" and had succeeded, thus proving that "...they had more clout than we did".

Mr T Hughes, G4WKJ, said that recommendations should be effective and also widely publicised; the effects of changes should be monitored and Council should be kept informed of the success or otherwise of such changes. The President reiterated that the committee structure existed to deal with specialist subjects. Council could not involve itself in individual local problems since it would not be able to get through necessary national-level business. The President said that Council had asked the M & R Committee to consider that a national Slow Morse Co-ordinator be appointed. Council could not do the work of its 18 committees. It was necessary to await the report from the VHF Committee before making further judgments in this matter.

Mr B Bower, G3COJ, of the Society's VHF Committee, said that the committee had been very sympathetic to the slow Morse broadcast groups and felt that slow Morse should be elevated to a service along the lines of the GB2RS news broadcasts. The Committee agreed with Council's decision that the post of Slow Morse Co-ordinator should be revived and the service put on a more formal basis. He said that the committee would attempt to move quickly.

Mr B Woodcock, G4CIB, had asked that consideration be given to a corporate member subscription rate which conferred all privileges of membership apart from the receipt of Radio Communication. He amplified his written question by saying that some things appearing in the journal, notably the centre "News Bulletin", were of poor quality; another problem was that advertising in RadCom tended to be for high-cost equipment and there was little point in sending a journal containing such advertisements to a young person. The Secretary said that Mr Woodcock would be pleased to hear that a separate small publication for younger members was in course of consideration. He agreed that in its present form Radio Communication was not suitable for the beginner.

Mr N Roberts, G4IJF, had asked whether the Society was represented often enough at hamfests and conventions abroad; he also wondered whether the availability of more money would make a difference to the position. The Secretary said that it was essential for the Society to attend formal meetings overseas in order to discuss a range of amateur radio-related matters. He explained that the amount of work involved was very substantial and that various matters had to be co-ordinated internationally. At international conferences RSGB staff and volunteers often worked 18 hours a day. As far as hamfests were concerned, the position was a little delicate; an annual invitation was received from the German society to participate in its event, and space and accommodation was provided free of charge. For events in other countries it was necessary to ask whether attendance would be cost-effective.

Ms A Voss, GOCCI, asked for an update on the implementation of the "common licence" in Britain. Dr J Gannaway, G3YGF, Chairman of the Society's Licensing Advisory Committee, said that there were three different licences which could be considered under that heading. The CEPT licence was being dealt with as part of the overall licence revision currently being carried out, which was expected to come to fruition early in 1989. Ms Voss observed that this was the third year running in which the meeting had been informed that the CEPT licence would be available "....in the new year". Dr Gannaway said that this was not for want of trying on the Society's part; the bureaucratic timescales of government were to blame.

Mr G Smith, G4AJJ, said that the committee system was very cumbersome and ascribed the comment to the Chief Executive. The Secretary said that he was not sure that he would agree that he had said that "all committees are cumbersome". There was a balance to be observed; to address situations in a democratic way, involving a number of people with expertise, was important but it was true that this process could be slow. There was no one person who could "....snap their fingers and come up with an instant answer that would be acceptable to every single person out there". As far as the CEPT licence was concerned, the problem did not lie within the RSGB committee structure. The delay was entirely due to the way in which the Radiocommunications Division of the Department of Trade & Industry wished to handle the matter. The Society had spoken to the Minister concerned and stressed the urgency, but because of pressure on Departmental staff it was not possible to achieve an immediate result. The Secretary pointed out that the Chairman of the CEPT group, which had produced the original plan for the CEPT licence, was a member of DTI staff and it was ironic that the UK should be seen

(The President commenced the open meeting by giving the President's Address. A report of this part of the meeting was given in the January 1988 edition of the RSGB News Bulletin: for reasons of economy of space it is not repeated here).

The President ended her address by announcing that, as members would be aware, the Society had held its annual meeting in London for a number of years. In principle, however, the meeting could take place anywhere in the UK provided that 50 or more members were present. Council believed that affiliated societies and registered groups might like to sponsor the annual meeting at a venue outside London. The 1988 Annual Meeting is scheduled to take place on 10 December 1988 and, if a suitable location was to be offered, it might well be that the next meeting would take place at a venue outside London for the first time.

The President then took questions from the floor. As in previous years, questions were supplied in writing during the interval and drawn at random from a box.

Mr M Bolt, G4SUI, had asked how long the President Elect had been a member of the Society. Sir Richard Davies replied that he had been first licensed in 1936 and had joined the Society in the same year. Having lived abroad for some years after the war his membership lapsed; however, he returned to the UK in 1963 and rejoined - he thought - in the following year. He had been in continuous membership since that time.

Mr T Duncan, G8NLJ, had asked what plans the Society had to encourage younger members to come to the annual meeting. The President said that the Society needed to encourage more young people to join and hopefully they would attend the AGM.

Mr P Howett, G4MD, said that delivery of Radio Communication in his area appeared to be erratic and enquired whether the situation could be improved. The Secretary said that a different printer had been appointed with effect from the September 1987 edition, but within a matter of weeks following their appointment the printers had decided to close their typesetting section. The Society had not been informed by the printers that this action was imminent, apparently because the company did not wish its staff to know of the impending closure. The closure had caused some difficult logistical problems for the journal's editor and consequently printing and delivery had been delayed. An explanation had been given in the News Bulletin, and the Secretary had been informed that by February 1988 the magazine should be back on schedule.

Mr P Beastall, G1WBZ, asked for the status of associate members with regard to the annual meeting to be clarified. The Secretary said that associate members under the age of 18 could not take part in general meetings of the Society and also could not vote. However, there was provision in the Articles for members under the age of 18 but holding a transmitting licence to transfer to full corporate membership.

Mr J Piper, G4NWC, had asked whether the Articles of Association could be reprinted at intervals even though they were being continually revised. The Secretary said that as a result of the earlier EGM, the Articles would have to be republished. Each change to them involved considerable expense and it was difficult to make a substantial number of changes quickly.

Mr T Mansfield, G3ESH, had asked whether the Society was aware of the anger and frustration felt by members in the London area at the apparent reluctance of Headquarters to deal with problems of interference to 144 MHz slow Morse broadcasts; this discredited the Society in the eyes of its members. The Secretary said that he did not follow this reasoning. It was not for Headquarters staff to deal with problems of this nature; it was for the Society's VHF Committee, which had considered the matter at a recent meeting. He asked for comment from a committee member. The secretary of the VHF Committee said that the situation had been discussed at great length and a recommendation had been made in the form of a draft letter to the committee chairman, who because of business commitments could not be present. Mr R Ray, G3NCL, asked when the reply would be forthcoming. The committee secretary said that he hoped that it would be before Christmas. Mr R Holyoake, G4WAY, asked for the frequency which was now to be used in the London area. The committee secretary replied that channel S10, 145.250 MHz, was recommended; he understood that it was one of the least-used channels in the London area. Ms T Billett, GOFFP, said that as one of the broadcasters concerned - and being individual appointed by other broadcasters to speak on their behalf - she felt it her duty to bring to Council's attention the lack of morale amongst the group and the anger and frustration felt by both broadcasters and those who were attempting to learn Morse so as to take their Morse tests. She added that anyone living in London or the south-east would realise the impracticability of using channel S10 for the purpose, since it was heavily used in the area. The President said that it was obviously a difficult problem but a magic wand could not be waved to make everything come right. She hoped, however, that it would come right sooner rather than later.

Mr I Abel, G3ZHI, had asked what plans existed to advance and upgrade the repeater network with features such as cross-linking and inter-working. Mr M Dennison, G3XDV, chairman of the Repeater Management Group, said that the Group's plans were, as always, driven by proposals from the repeater community; the Group itself did not propose changes or enhancements to the system. A number of proposals for linking repeaters were currently being considered, although work had slowed down for a period because of the unavoidable absence of a committee member.

Mr M Stokes, G3ZXZ, had asked for an update on the progress of th student licence and had requested that the membership was kept informe or progress via the Society's journal. The Secretary said that a grou of Council members led by Mr J Case, GW4HWR, was considering variou aspects of bringing young people into amateur radio. At present a draf licence, consisting of a schedule and proposed modes, was at an earl stage of consideration; it had not, however, been fully debated withir the Society. Consequently it was difficult to report progress, since nc conclusions had yet been reached. Some information would be published early next year in Radio Communication, and it was intended to make the best possible use of the journal in order to publicise the Society's thinking in this area.

Mr M Mansfield, G2SP, felt that since the institution of a student licence would be a radical step, a referendum should be held in order to establish the membership's feelings as to whether it was desirable. The Secretary said that the membership would be able to judge the proposals when they had been fully formulated. He added that the word "radical" might not turn out to be justified.

Mr R Dimmock, G1HIJ, said that it seemed to him that more should be happening in this area. He cited the novice licence situation in Holland as a possible basis for consideration in the UK and said that action should be taken now rather than deliberation over a period. The Secretary said that he had been in touch with his counterpart in the Dutch society and that he was not convinced that their system would have positive lasting effects in the UK. He felt that is was essentially "....CB on an amateur radio frequency". However, he added that novice licensing schemes in other countries were being looked at. It was important to get any British scheme right from its inception, and there needed to be considerable debate on the subject within amateur radio.

Mr N Roberts, G4IJF, said that he had been in Holland when the novice licence had been introduced, largely in response to illicit CB operation around 27 MHz. A good deal of resentment had been caused by the existence of the Dutch novice licence, and Mr Roberts felt that it would be totally inappropriate for the UK to consider anything like it. The Dutch intermediate licence would be a more appropriate basis for consideration.

Mr G Wilkinson, G4YKO, felt that the real point was being missed; what was required by young people was not only a licence but assistance, guidance and help. Unless the problem was approached from that point of view, the Society would not acquire new members. The Secretary said that Council agreed with this view and had discussed it in some depth. There appeared to be a "generation gap" which had to be overcome. Much work needed to be done to lay the right foundations to formulate the right approach to attract youngsters. He said that everyone already licensed should be prepared to give up time and effort to assist in this recruitment.

Mr R Glaisher, G6LX, outlined the approach taken by the German society to the problem and asked the Secretary whether he was familiar with it. The Secretary said that he had been in touch with DARC and was aware of their system.

The President said that it would be quite wrong to use the occasion of the Society's 75th anniversary simply to attract more members. Quality was required, not merely quantity, and it was important to attract members who would stay in the Society and whose interest could be retained. The student licence was only one part of this topic. Formulating the right approach involved a vast amount of groundwork in which we are seeking help from many experts.

Mr H Beastall, G1LRI, asked whether the Society was aware of the obstacles put in the way of youngsters wishing to take the RAE. Mr Beastall's son had been specifically forbidden by his headmaster - following a directive of Nottinghamshire County Council - to attend an RAE class, and no reason could be given for this decision.

Mr L Newnham, G6NZ, said that education authorities normally considered the RAE as further education, implying that the junior age limit was 16 years or in their last period at school, whereas the RAE could be taken at 14. He felt that this was wrong and should be changed.

Mr M Butler, G4UXC, asked whether the Society would take up the problem raised by Mr Beastall. The President said that if Mr Beastall would like to supply details, the Society would take the matter up.

Mr S Cook, G8CYE, said that too many established amateurs would not talk to new licensees. He added that many would- be amateurs were put off by the cost of new equipment; even second-hand 144 MHz equipment was expensive.

The Secretary said that publications, licensing and simple kits which could be built, were all areas which needed to be developed.

Mr L Salaman, RS46145, said that the interest of youth had to be inspired and maintained; it could not be commanded. He urged club members to play their part.

Mr R Broadbent, G3AAJ, asked whether the President intended to announce YEAR. In reply the President stated that the "Youth into Electronics via Amateur Radio" scheme (YEAR) would form part of the promotion of amateur radio which would take place during the 75th anniversary year, 1988.

to be delaying the process. The Secretary wished to assure all present that the delay was not the fault of the RSGB.

Mr K Cradock-Hartopp, G4PZR, asked how the Society intended to achieve its objectives, given the lack of Headquarters staff. The appointment of the new Headquarters manager had only reduced the Chief Executive's working week from 110 hours to 70, and he urged Council to re-read a letter which he had written and which had been published in both Radio Communication and Practical Wireless magazines. The President replied that Council remained concerned about the Chief Executive's workload and would be re-examining the matter, but many areas in Headquarters were understaffed and ultimately the problem was money and how to obtain it.

The Secretary said the the Society was indebted to RNARS for providing the Society with an introduction to the Patron of the RNARS, Lord Mottistone. Both the President and himself were grateful to him for providing a link which could be very helpful in the future.

Mr C Newton, G2FKZ, had asked whether a common system of zoning could be introduced. Mr G Smith, G4AJJ, pointed out that in some cases the new RLO areas overlapped zonal boundaries. Mr D Smith, G4DAX, Chairman of the Society's Membership & Representation Committee, said that the old regions had been much too large but it remained the case that there were many different ways of marking out different parts of the country and the problem would at some stage need to be tackled. Many sections of the Society would need to be involved.

Mr M Butler, G4UXC, asked whether more space would be made available in Radio Communication for reporting matters associated with the new RLO scheme. The Secretary explained that the section of Radio Communication dealing with club news would henceforth be written in-house, with a different format. Club venues would be included in the Call Book. Council believed that the social side of amateur radio was nowadays more important than in previous years, and this would now be reflected in the journal.

Mr M Wade, G8OGO, had asked whether a change of licensing conditions could be requested to permit third-party welfare traffic for various organisations, since amongst other things this was a good reason for retention of spectrum space by the amateur service. Dr J Gannaway, G3YGF, replied that the public service aspects of the hobby were important for its image, and the matter was being considered in a number of different ways. It was hoped to expand the greetings message facility, and also to enhance Raynet's facilities. A slow and steady approach was required. Mr M Wade, G8OGO, said that in Regions 2 and 3 third-party traffic-handling facilities already existed and outlined some aspects of how they operated. He added that there were "....people out there who could use our services", and the only bar to greater public awareness of amateur radio via public service was licensing conditions, not technology. The Secretary said that different administrations took very different views of third-party traffic, but he would be interested to see input from Mr Wade. Mr G Griffiths, G3STG, outlined the situation with regard to Raynet.

Mr R Smith, G3LVW, asked why the News Bulletin section of Radio Communication contained material other than that which was recent news. The Secretary said that the News Bulletin was conceived as a "pot-pourri" for amateur radio and was intended to be responsive, lively and informative. He outlined items forthcoming in the December edition. Mr M Bolt, G3SUI, asked why the Council Brief had been omitted from the November News Bulletin in favour of a light- hearted item about Christmas crosswords; he also wished to correct an item concerning an event in which he had been involved.

Mr C Ousbey, GOCHO, wished on behalf of his club to thank the Society for its work relating to allocations at 50 and 70 MHz and to announce that his 30-strong club was intending to operate on 70 MHz. The Secretary added that the co- operation of the DTI in regard to these allocations should be noted.

Mr A Milne, G2MI, congratulated the President on her speech; one of the best he had ever heard at an AGM. He wished to inform the meeting that as a long-term reader of the GB2RS news broadcast, he had been disgusted to note that another newsreader had drawn the attention of the DTI to alleged irregularities committed by a fellow newsreader. Mr S Bryan, G1SGB, interjected with another question, but the President intervened and invited Mr D Smith, G4DAX, Chairman of the Society's Membership & Representation Committee, to deal with Mr Milne's comment. Mr Smith said that the subject was rather distasteful and unpleasant; he outlined the facts of the matter.

Mr M Stokes, G3ZXZ, wished it minuted that by this stage of the meeting more than half those who had been present at the beginning had now left; this included certain members of Council. The President said that the Annual General Meeting itself had finished at 1530 and it was the informal section of the annual meeting which was now taking place. Mr Stokes said that he took the point but was nevertheless amazed that, with such an important issue as the future of amateur radio to be discussed, members could leave the meeting.

Mr J Bluff, G3SJE, said that his recollection was that that part of the meeting had been extremely well attended and a good debate had taken place: it was only in the course of the previous half-hour that members had left in numbers. Mr Stokes said that he begged to differ but did not wish to spoil the mood of the meeting.

Mr M Williams, G4GRS, asked whether the Society was hoping to introduce aeronautical mobile operation and to simplify maritime mobile operation. Dr J Gannaway said that both were being pursued and that he was optimistic about maritime mobile operation in particular. Attention would have to be paid to the safety aspects of aeronautical mobile operation. Mr G Stancy, G3MCK, said that it would be better not to hold up the progress of the overall licence review for the sake of minority interests such as aeronautical mobile operation.

Mr M Bolt, G4SUI, referred to his earlier complaint about the lateness of Council Proceedings. He said that the reports for June, August, September and October were published in the September Radcom. The President explained that Council Proceedings were of the previous year's meetings held over due to Radcom moving to Headquarters. Reports of this year's meetings have been in a different format as Council briefs and utilised the earliest deadlines possible for publication after each meeting.

Mr N Roberts, G4IJF, asked whether the Society had approached the Civil Aviation Authority to discuss the matter of aeronautical mobile operation. Dr Gannaway said that the DTI had been in contact with the CAA on the Society's behalf, although there had been some informal contact.

The meeting closed at 1855.

END OF MEETING

AMENDMENTS TO THE 1986 AGM MINUTES

Reference is made in the Minutes of the 1986 Annual Meeting as published in the March 1987 edition of the Society's journal, Radio Communication.

The following changes to the 1986 Minutes should be noted:-

a) Penultimate paragraph, page 2, G6DZH is Mr K S Killigrew, not Killgrew.

b) Paragraph 6, right hand column on page 3, Mr D Johnson, G1GNS, proposed the reappointment of the Auditors.

c) Add to the section - Members to serve on Council for 1987 - Page 3 - "In response to a question the President confirmed that Mr B O'Brien, G2AMV, would not reach his 70th birthday during 1987."

d) Page 1, under the heading of - Accounts - third paragraph, 7th line to read "....deficits of small sums....." to read "....deficits of substantial sums had been converted to a small surplus."

e) Page 3, under the heading of - Accounts - add a new last paragraoh to read "In response to a question the Honorary Treasurer confirmed hat Morse test income was £5,000 with associated costs of £3,500 to September 1986."

f) Page 2, under the heading of - Accounts - add a sentance to the 16th paragraph, which commences - "Mr R Broadbent, G3AAJ...." which reads - "Mr Chadwick, G3RZP, gave details of RadCom page rates which varied from £50 to £65 per page."

g) On page 3, first paragraph, right hand column, line 3, the unidentified speaker was Mr M Stokes, G3ZXZ.

h) On page 1, the unidentified speaker in the penultimate paragraph on the section dealing with Minutes is Mr N Roberts, G4IJF.

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