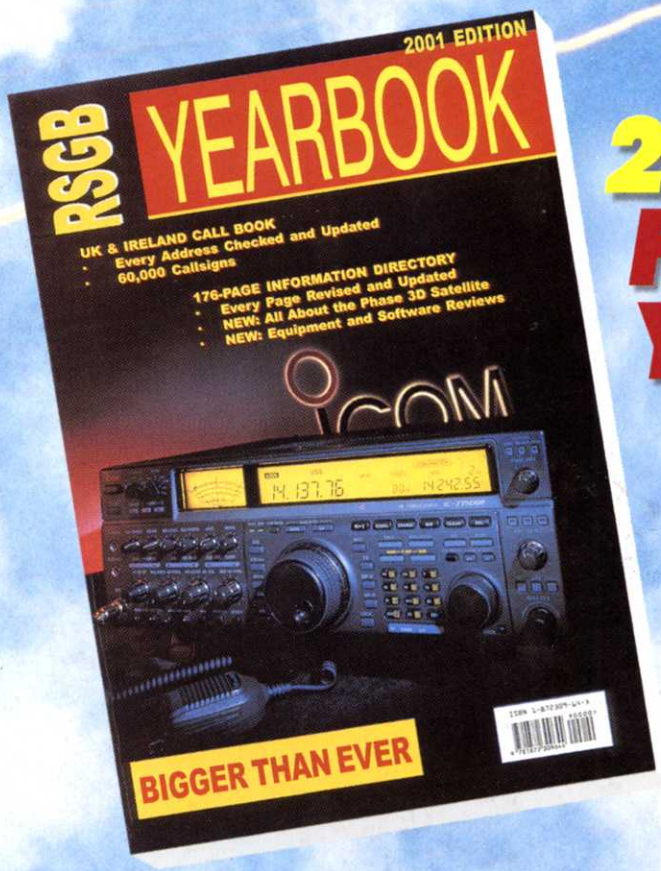
Bumper edition: Annual Report and Accounts

www.rsgb.org

1100

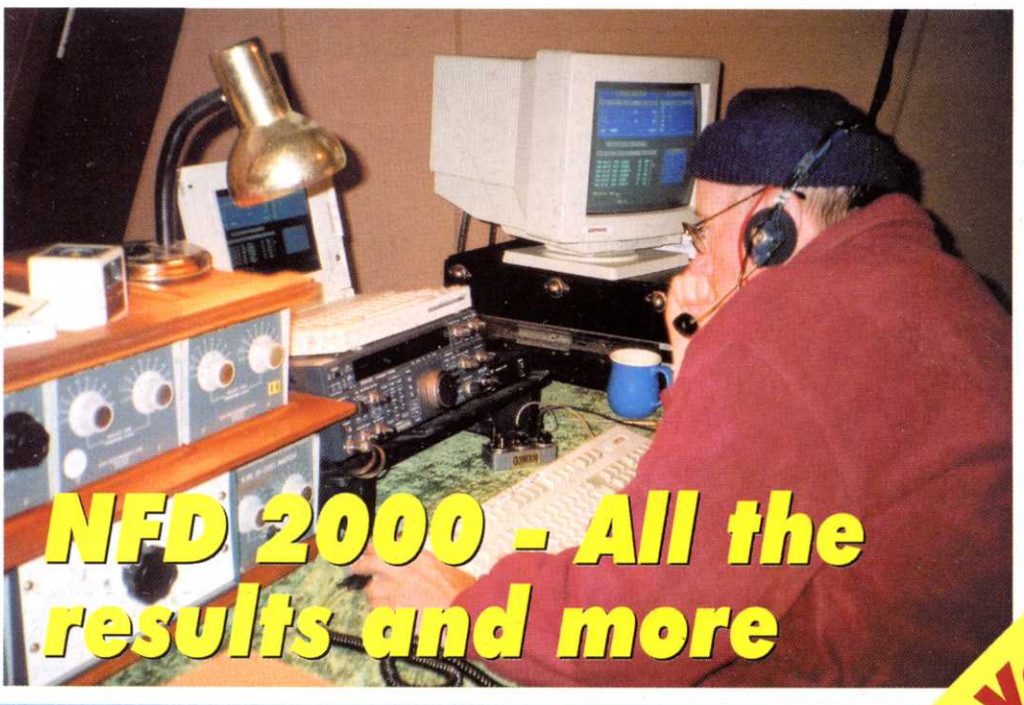
RadCom

£3.95 Volume 76 No 11 ♦ November **2000** Journal of The Radio Society of Great Britain



2001 YEARBOOK Have You Got Yours Yet?

Construction - Direct Digital Synthesiser Project



NFD 2000 - All the results and more

Vote For The Future
full details inside

WATERS&STANTON

WE WILL MATCH OR BE
COMPETITIVE PRICES O
GENUINE UK STOCK.

RETAIL MON-SAT 9.00-5.30pm

22 Main Rd, Hoo

Want an M5 Call?
We'll pay your RSGB Morse Campaign tuition fee if you are successfull on the day!

The RSGB are running Morse weekends and for a fee of £20 maximum you can paticipate and if you wish take you 5 wpm test. Provided you pass during the weekend and purchase a 100W HF transceiver from us within 60 days of your pass, we will refund the course fee up to a maximum of £20. Simply provide us with a copy of your receipt and pass slip.

W&S Helping Amateur Radio and Helping to keep the cost Down

NEW 2000 sq. FT. SHOWROOM

FT-1000 MP Mk V
The Industry Standard

By the time you read this, the "Mk V" will have arrived. You will also have had a chance to read the reviews in Radcom and Radio Today, both of which confirm the very high performance achieved by this transceiver. The FT-1000MP Mk V is set to become the industry standard by which others are judged. The only decision you have to make is do you buy "the others" or the industry standard!

YAESU FT-100

The FT-100 covers 1.8 - 440MHz. 100W HF + 6m, 50W 2m and 20W 70cms. Comes complete with UK 2-year warranty.

YAESU FT-847

The new FT-817 arrives after Christmas (W & S got their hands on the first sample!). All bands 1.8 - 70cms, around 5W output SSB, CW, FM and can run off internal cells. The most amazing possibility for travel etc. Circa £900.

YAESU FT-840 160-10m

Look at our new low price for this 100W radio. Impossible to fault, it just goes on and on! But stocks limited at this price.

24-Month FREE Warranty on Yaesu

ICOM IC-756PRO 1.8 - 52MHz 100W

You've read the rave reviews, and you have seen our recommendation on the web site. This radio with its amazing receiver and digital filtering, also includes auto ATU and real-time spectrum scope. A great DX rig.

YAESU FT-847
160m - 70cm All Mode
£1329 with switch mode power supply

SCOOP!

The FT-847 has firmly established itself as a true all-band, all-mode transceiver. Loved by the VHF & UHF operators, and superb for satellite operation, it also offers great HF performance. We have sold more than any other dealer, which says a lot about our reputation and our price. Phone for free leaflet today. And remember, our stock is genuine UK, not modified overseas models!!

YAESU FT-1000MP AC
160 - 10m All Mode

SAVE

19.4% APR Available

If you are looking for the rig with every feature including dual receive - then look no further!

It has stood the test of time and used by the worlds top DXers and DXepeditions. Its excellent receiver combined with its superior transmitted signal makes this a natural choice for the HF enthusiasts.

YAESU FT- 920AF
HF 160m-6m-100w

SAVE

Includes full DSP and internal ATU. High tech receiver with dual tuning controls. Uses many of the FT1000 MP features but at a more attractive price. Full break-in on CW and includes a data port for TNC.

ICOM IC-746
160m - 2m All-mode

Your chance to purchase one of the most popular "all-band, all-mode" transceivers at a very competitive price. The IC-746 offers 100 Watts output on all bands and has a receiver performance to match.Limited stock at this price.

ICOM IC-706IIG 160 - 70cm All Mode

Still a firm favourite with mobile operators and those who want a compact all-mode, all-band station. Phone for latest leaflet.

KENWOOD TS-570DG
160 - 10m All Mode

19.4% APR Available

Probably the most underestimated transceiver on the market. Don't be fooled by the low price, the TS-570 has one of the best receivers around. One of the best buys if you want top HF performance on a budget.

FIRST IN RADIO COMMUNICATION

ISO 9002 REGISTERED FIRM

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Leigh, Essex, SS5 9QS

VISA MasterCard

ADI AT-600
Dual Bander Airband Rx

£199 Plus £6.00 Carr.

* 2m & 70cm Handheld
* 5W Output on 13.8V DC
* Full CTCSS & 12.5/25kHz Steps
* 110 Alphanumeric Memories
* 29 Programmable Functions
* DTMF Keypad & AM Airband
* Ni-cads & AC charger

KENWOOD TM-D700E
2m / 70cm Data Mobile

£429 Plus £7.50 Carr.

SAVE!

Just arriving, this new model has built-in TNC, port for GPS, Data connector for SSTV, RTTY etc., CTCSS/DCS, Switchable TX/RX deviation, Dual receive, Wide receive option, Detachable head unit, 50 Watts on 2m, 35 Watts on 70cm, 200 memories, Alpha tag memo capability and a lot more. And who has the best price? - look no further!

HOKA Software
The Secret's out!

We are now the UK distributors. As used by governments, it can decode just about any form of data transmission on HF and VHF. Simply connect between PC and RX audio. Can be loaded on any number of PCS. This is a very advanced programme.

£349.95

C-150 2m Handy

£99.95 Plus £6.00 Carr.

* 2m Handheld
* 5W Output on 13.8V DC
* 1750Hz Tone Included
* 25 / 12.5kHz Steps
* 20 Memory Channels
* Wideband Receive
* Uses 6 x AA cells (not inc.)

YAESU VX-5R

£269 Plus £6.00 Carr.

* 6m / 2m / 70cm Handheld
* 5W Output on 13.8V DC
* CTCSS Encode / Decode
* 25 / 12.5kHz Steps
* Auto Repeater Shift
* AM Airband Receive
* Lithium Cells & Charger

YAESU FT-50R

£199 Plus £6.00 Carr.

* 2m / 70cm Handheld
* 5W Output on 13.8V DC
* CTCSS Encode / 1750Hz tone
* 25 / 12.5kHz Steps
* 30 Memory Channels
* AM Airband Receive
* Ni-cad Cells & Charger

SAVE
C-408 70cm Handy

£69.95 Plus £6.00 Carr.

Previously £89.95

CTCSS
Repeater Shift
Digital Display
12.5 / 25kHz Step
20 Memories
230mW Output
Uses 2 x AA

NEW
Optoelectronics
CD-100 MULTICOUNTER

Reads Frequency & Codes

£379.95 Plus £6.00 Carr.

Range: 10MHz -1GHz
Memory: 100 Channels
Decode:
CTCSS, DCS, DTMF, LTR.
Power: Internal ni-cad battery
Charger included

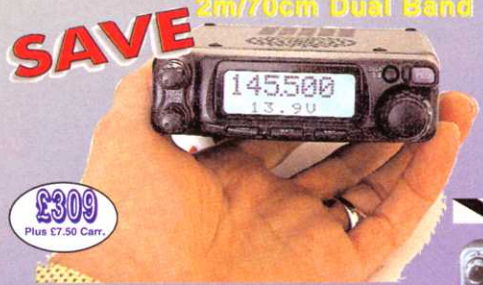
KENWOOD TH-D7E

£259 Plus £6.00 Carr.

* 2m & 70cm Handheld
* 6W Output on 13.8V DC
* CTCSS & 1750Hz Tone
* Built-in Packet Modem
* 200 Alphanumeric Memories
* DTMF Keypad & AM Airband
* Ni-cads & AC charger

YAESU FT-90R
Can you believe the size? 2m/70cm Dual Band

SAVE!



£309 Plus £7.50 Carr.

The tiny dimensions of the FT-90R from Yaesu, are hard to believe. Yet it produces 50W on 2m and 35W on 70cm. Auto repeater shift on UK channels and switched 12.5 / 25kHz deviation, make this a number one choice.

ADI AR-147
AM Airband Receive

£199 Plus £6.00 Carr.

* 2m 50 Watt Mobile Airband Receive
* Full CTCSS Encode / Decode
* 81 Memories 25 / 12.5kHz Steps
* Keypad microphone & Mounting Kit

SCOOP!
YAESU FT-11R
2-Metre Handheld

£119 Plus £6.00 Carr.

Another find in a warehouse! Brand new, boxed with AC chargers and ni-cad packs. 75 Alphanumeric memories, AM airband rx mod possible. Last selling price £249! Very limited stocks.

GARMIN GPS-III Plus

Detailed maps of UK and Europe plus street data upload feature via PC. Great value. Sits easily on the dash board and gives extremely comprehensive data including GB national Grid. Powered by AA cells or external 13.8V

£359 Plus £6.00 Carr.

ICOM IC-2800H
In Full Colour!

£310 Plus £7.50 Carr.

* 2m & 70cm Mobile
* Colour TV Screen
* Full CTCSS and 1750Hz Tone
* 50W 2m 35W 70cm

Includes FREE Remote head cable.

ICOM IC-207H

£245 Plus £7.50 Carr.

* 2m / 70cm
* 50W / 35W
* 180 Memories and 7 Tuning Steps
* Detachable Head Unit / Clear Display
* Microphone, Mounting Bracket etc.

KENWOOD TM-G707E

£259 Plus £7.50 Carr.

* 2m and 70cm
* 50W and 35W
* Full CTCSS
* 180 Alphanumeric Memories
* Detachable Head with Amber Display

YAESU FT-8100R

£349 Plus £7.50 Carr.

* 2m and 70cm
* 50W and 35W
* Wideband RX AM & FM 208 Memories
* 7 Tuning Steps DTMF Remote Front panel
* Very compact, supplied with all hardware.

KENWOOD TM-V7E

£339 Plus £7.50 Carr.

* 2m / 70cm Mobile
* 50W 2m, 35W 70cm
* Clear LCD Readout
* CTCSS & DTMF
* 8 Frequency Steps & 280 Memories
* Includes Microphone & Mounting Bracket

WATERS&STANTON

FREE MFJ CATALOGUE-Just Phone!

BEWARE of grey imports. All MFJ products should have serial numbers and U.K Warranty cards issued by us.

MFJ-969 300W ATU

£169.95 Plus £7.50 Carr.

160 - 6m Wire, Coax or Balanced

Includes VSWR / Power Meter, Ant. Selector, PEP feature, Roller Coaster Tuning

1.8 - 30MHz ATUs		
MFJ-989C	3kW roller coaster - metered	£299.95 C
MFJ-986	3kW Differential - metered	£289.95 C
MFJ-962D	1.5kW T-match - metered	£239.95 C
MFJ-949E	300W + load - metered	£139.95 B
MFJ-948	300W - metered	£119.95 B
MFJ-934	ATU + artificial ground	£139.95 B
MFJ-941E	300W compact - metered	£89.95 B
MFH-945	1.8 - 50MHz mobile	£99.95 B
MFJ-901B	300W no meters	£75.95 B
MFJ-16010	200W random wire - no meter	£44.95 B
VHF Models		
MFJ-921	144MHz 200W - metered	£69.95 B
MFJ-924	430MHz 200W - metered	£69.95 B
MFJ-903	50MHz 200W no meters	£49.95 B
MFJ-906	50MHz 200W - metered	£79.95 B

Carriage charges:
B = £6.00 C = £7.50

SGC-230 Smart Tuner

£329.95 Plus £7.50 Carr.

Covers 1.6 - 30MHz and handles 3 - 200W. Designed for end fed wires, just connect to 12V and feed with RF via coax. Can be mounted outside or at top of mast.

Microset Amplifiers

All FM/SSB with GaAsFET pre-amps and RF switched. 13.8V DC powered.

R-25	2m 1-4W in / 30W max out	£84.95 B
RV-45	2m 3-15W in / 45W max out	£95.95 B
R-50	2m 1-7W in / 50W max out	£89.95 B
SR-100	2m 4-25W in / 100W out	£169.95 B
SR-200	2m 10-50w in / 200W max out	£299.95 B
VUR-30	2m/70cms 1-5W in / 20/30W out	£199.95 B
RU-20	70cms 3-15W in / 20W max out	£119.95 B
RU-46	70cms 3-15W in / 45W max out	£165.95 B
RU-432-95	70cms 6-12W in / 95W max out	£499.95 C

WCN-3 Adaptor. For all transceivers using SMA connector. Converts to BNC **£3.95 A**

Speaker Mics.

QS-112

Including Yaesu and Icom 4-way jack.

QS-112-Y Yaesu **£16.95**
QS-112-K Kenwood **£16.95**
QS-112-Y4 4-way **£16.95**

Phone if in doubt about suitable model.

£16.95 Plus £2.00 Carr.

Hands-Free Mobile Mics.

£42.95 Plus £2.20 Carr.

Comes complete with PTT switch box for mounting on gear lever. Head/shoulder band makes for easy wear. Models for almost every transceiver. Phone for confirmation of model number to suit your rig.

Cushcraft Ham Radio Antennas

£299 Plus £7.50 Carr.

MA5B Mini-Beam

2 El. on:	20m, 15m 10m
Gain:	3.6dB, 4.8dB, 5.3dB
F/B	10dB, 12dB, 22dB
Dipole:	17m and 12m (0dB)
Power	1.2kW (2:1VSWR)
Boom:	2.2m
Element	5.2m
Radious	2.7m

A3-S	10-15-20m 8dB 2kW 3 el. 4.27m boom	£389.95 D
A-743	10/7MHz kit	£129.95 C
A4-S	10-15-20m 9dB 2kW 4 el. 5.84m boom	£469.95 D
X7	10-15-20m 13dB 2kW 7 el 5.48m boom	£549.95 D
X9	10-15-20m 14dB 2kW 9 el 8.5m boom	£799.95 D
R-6000	6 - 20m vert.	£299.95 D
R8	6-40m vert 8.7m	£399.95 D
TEN-3	10m 3 el.	£159.95 D
D4	10-40m 10.92m 2kW rotary dipole	£259.95 D
D3	10 - 20m 7.86m 2kW rotary dipole	£189.95 D
XM240	40m 2 el	£569.95 D
XM520	5el 20m	£629.95 D
XM515	5 el 15m	£359.95 D

Phone for catalogue.

MFJ-269 Analyser

160m - 70cm On-site Antenna Analyser.

£299.95 Plus £6.00 Carr.

MFJ-259B 1.8 - 170MHz £229.95

Imagine being able to plug into your antenna or feed line and make meaningful adjustments on site. Or be creative and turn hours into minutes and ideas into antennas! Read what RadCom says and make your own mind up. One of the best investments you will ever make!

Heil Audio

Appointed by Heil as UK Distributor

Proset-4	H'phone/boom mic	£129.95
Proset-5	H'phone/boom mic	£129.95
Micro-4	Lightweight ver.	£99.95
Micro-5	Lightweight ver.	£99.95
AD-1	Cables Y. K. or I	£14.95
HM-10-4	Stick mic	£69.95
HM-10-5	Stick mic	£69.96
CC-1	Cables Y. K. or I.	£25.95
HC-4	Spare insert	£32.95
HC-5	Spare insertt	£32.95

You can convert your mic to Heil by simply purchasing HC-4 or HC-5 insert.

Coil Stock

We are now carrying B & W air inductors. Phone for list and specs. 10" long £22.95

Capacitors

7.5kV RF ceramics. 25, 50 and 100pf. Brand new. £11.95 each Great for traps!

NEW MFJ-Cub QRPers

The MFJ Cub **single band transceivers** are small enough to sit in the palm of the hand. They provide up to **2 Watts CW output** (variable to mWs), have **full break-in** and on-air sidetone.
Available ready **built or as a half kit.** The kit version has all the surface mounted components installed. You only need to add the larger items, knobs and case.

Kit £89.95 Built £139.95
Models available for 80m, 40m, 30m, 20m and 15m. Includes cabinet and controls.
Postage £6.00

The Toughest Japanese Rotators

Theseare tough rotators that weigh almost twice as much as similar priced units and have great turning capacity. Made by Create of Japn, they will handle 4 element HF yagis with ease. Our own Create model has been on our roof for 12 years turning a 4-element HF beam.

RC5-1 Standard control box, OK for 4-el Yagis - needs 7-core cable **£349.95 C**

RC5-3 Control box features pre-set or manual control. Otherwise the same as RC5-1 above **£449.95 C**

MC-2 Lower mast clamps **£49.95 B**

Avair AV-600

£59.95 Plus £6.00 Carr.

1.8 - 525MHz VSWR Meter 5/20/200W scales. Dual sensors, PEP reading. More accurate than built-in meters.

Carolina Windoms

CW-80 Special

Just 66ft long yet covers 80m - 10m. It will out perform a G5RV and give lower angle of radiation because of the 10ft vertical section which is forced to radiate. It will handle 1.5kW

£89.95 Plus £7.50 Carr.

Other Models (all with low angle radiator stub)

CW-160	160 - 10m 171ft long	£109.95
CWS-160	160 - 10m 133ft long	£99.95
CW-80	80 - 10m 133ft long	£84.95
CW-40	40 - 10m 66ft long	£79.95
CW-20	20 - 10m 34ft long	Plus £7.50 Carr. £77.95

80-40-20m Mini Dipole

The "80 plus 2" Mini - Dipole was designed by our Director, Peter Waters, G3OJV. Just 52ft long, it uses linear loading - no tuned traps. It can be directly fed without ATU and also operates at 2.5:1 VSWR on 15m. Amazingly efficient, it handles 400 Watts and is balun fed. Erect it as an inverted V and it takes up less than 40ft of space. If you have a small garden, don't miss out on the LF bands anymore. **£79.95** Carr. £6.00

Telescopic Masts

Much Stronger than Alloy Poles!

NEW

We are now able to supply a range of telescopic tiltover masts, galvanised to BS729. These masts are extensively used for commercial purposes and built to a very high standard. Heights available from 7.6m to 12m extended. Models for wall mounting or post mounting are included. The post mounted versions tilt-over and are supplied with a socket for mounting in concrete. Models are available to support antennas from VHF to HF tribanders.

AAM	**7.6m** Wall mount (VHF & Mini HF)	£250 (£30)
AAM	**10m** Wall mount (VHF & Mini HF)	£295 (£35)
TML	**7.6m** Self supporting (VHF & Mini HF)	£340 (£35)
TML	**9.2m** Self supporting (VHF & Mini HF)	£415 (£40)
TMS	**10.7m** Self supporting (HF 3 el beams)	£579 (£52)
TMS	**12m** Self supporting (HF 3 el beams)	£659 (£57.50)
TMS	**10.5m** (3 section) (HF 3 el beams)	£659 (£52.50)

Price in brackets are carriage charges. Delivery is normally 3 - 5 days from date of order. We suggest you discuss your requirements with us by phone to make sure that you choose the right model for your needs.

Phone or write for full information and drawings

Power Supplies

SEC-1223
13.8V PSU
23 Amps - 3.2lbs!

£99.95 Plus £6.00 Carr.

Back In Stock

Beware of cheap noisy supplies that have poor filtering & construction!

Lighter than an IC-706 and about the same size! The **SEC-1223** switch mode power supply delivers 23 Amps at 13.8V Thermo fan cooled, it measures just 57 x 177 x 190mm. Will power all 100W rigs and can be changed for 115V AC

LINEAR AMP UK Amplifiers

British made Amplifiers with a Pedigree

Full Range Stocked

Challenger	HF 2 x 3CX800 AT 1.5kW out	£2095 D
Explorer	HF 2 x 3-500ZG 1.3kW out	£1595 C
Hunter	HF 1 x 3-500ZG 750W out	£1195 C
Hunter	6m 1 x 3-500ZG 800W out	£895 C
Ranger	HF 4 x 811A 800W out	£895 C
Discovery	2m 1 3CX800 400 - 1KW out	£1395 C

WATSON

UK's top selling power supplies.

£89.95 Plus £7.50 Carr.

Watson power supplies guarantee the very best performance and value for money. Tried and tested, they have been submitted for independent laboratory testing for safety and electrical performance.

W-3A	3 Amp fixed supply.	£22.95
W-5A	5 Amp fixed supply	Plus £6.00Carr. £29.95
W-10AM	10 Amp variable supply	£59.95
W-25AM	25 Amp variable supply	£89.95
W-30AM	30 Amp variable supply	Plus £7.50 Carr. £119.95

NEW W-40SM 40 Amp Switch Mode

£149.95 Plus £6.00 Carr.

Digital display, 3 - 15V rated at 40 Amps continuous. Fully protected and very low noise. Ideal for a wide variety of ham applications. Light weight of 3.5kg and measuring 220 x 110 x 300mm Fixed 13.8V switch.

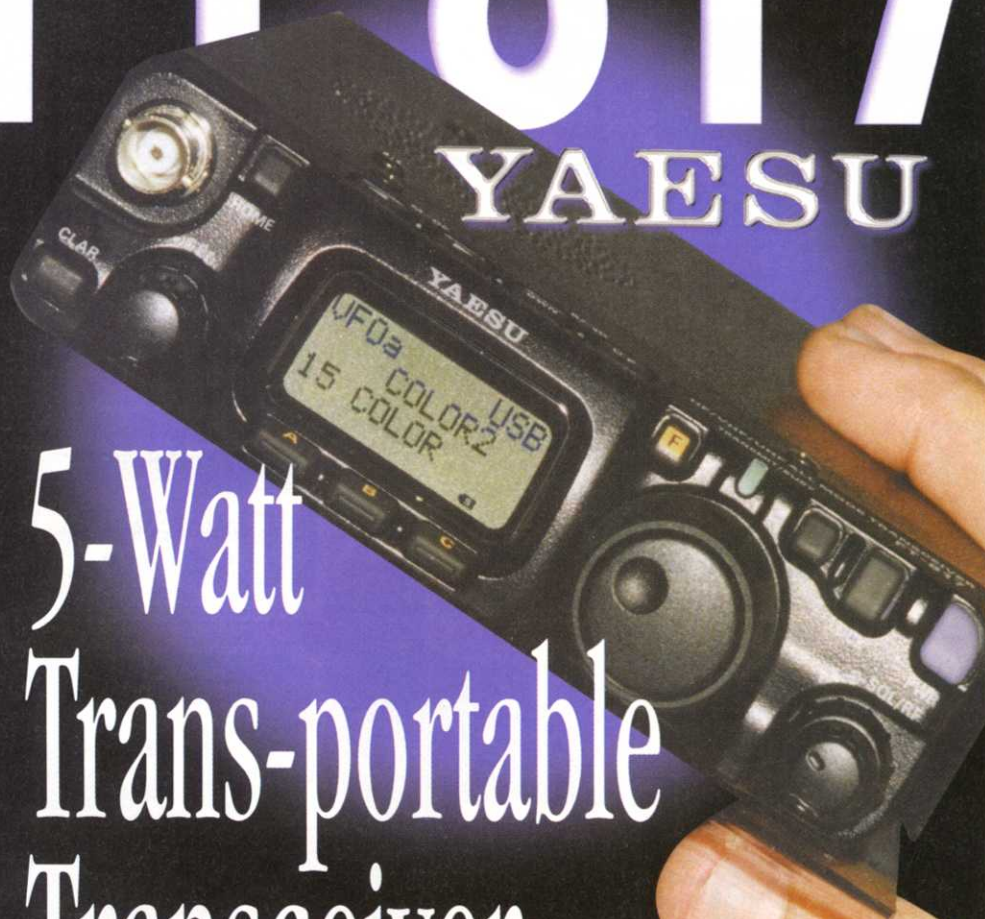
Compact 10 Amp Switch Mode PSU

£49.95 Plus £6.00 Carr.

The W-10SM is small enough to fit in a brief case. Measuring just 230 x 100 x 65mm, it's ideal for 50 Watt mobile's etc. Over voltage and current protection.

FT-817

YAESU



5-Watt Trans-portable Transceiver

HF ♦ 6m ♦ VHF ♦ UHF

All this in the palm of your hand!

TX Frequency:	160-10m, 6m, 2m and 70cms
RX Frequency:	100kHz-56MHz, 76-154MHz, 420-470MHz (Exact frequency range may be slightly different)
Power Output:	5 Watts SSB/CW/FM with 13.8V External DC: 1.5W AM Carrier 2.5 watts SSB/CW/FM with 9.6V NiCad or 8 "AA" batteries (AM: 0.7W)
Operating Modes:	USB, LSB, CW, AM, FM, W-FM, Digital (AFSK), Packet (1200/9600 FM)
Digital Modes:	RTTY, PSK31-U, PSK31-L & user defined USB/LSB (SSTV, PACTOR etc).
Case Size:	5.31"x1.5"x6.5" (WHD)
Weight:	2.6lb (with alkaline batteries, aerial but without microphone).

- Two Colour LCD Multi-function Display (Blue/Amber).
- Bar-graph Metering of Power output, ALC, SWR and Modulation.
- Optional Narrow CW and SSB Filters.
- AGC Fast-Slow-Auto-Off Selection.
- RF Gain/Squelch Control.
- Built-in Noise Blanker.
- IPO (intercept point optimisation) and ATT (receiver front end attenuator)
- Dual VFOs, Split Capability, IF Shift and R.I.T. ("Clarifier").
- Wide/Narrow FM Selection.
- AM Aircraft Reception.
- Dedicated SSB-based Digital Mode for PSK31 on USB/LSB, AFSK RTTY etc.
- Built-in CW Electronic Keyer with Semi-Break-In (adjustable down to 10ms delay).
- Adjustable CW Pitch; CW Paddle Normal/Reverse Connection Selection.
- Built in VOX.
- Built in CTCSS and DCS.
- ARTS™ (Auto Range Transponder System).
- Smart Search (automatic memory loading system).
- Spectrum Scope.
- Front and Rear Panel Aerial Connectors (BNC on front, SO-239 on back).
- 200 Regular memories, plus Home Channels and Band Limit (PMS) Memories.
- Alpha-Numeric Labelling Memory Channels.
- Automatic Power-Off (APO) and Tx Time-Out Timer (TOT).
- Rear Panel Data, Accessory and Key jacks.
- CAT System Computer Control Capability (4800/9600/38400 bps) and Cloning Capability.

Estimated RRP:
A Staggering
£799

Call now on 0208 566 1120 or see our web site for more details
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Martin Lynch can also offer finance terms up to 48 months with no deposit. We welcome your part exchange against any new (or used!) product, provided its clean and in good working order. Call the Sales Desk today. APR: 21.9%. Payment protection is also available up to 36 months. All units are brand new and boxed and offered with full manufacturers RTB warranty. All prices quoted for cash/cheque or Switch/Delta card. No additional charges for credit cards. Martin Lynch is a licensed credit broker. Full written details are available on request. Finance is subject to status. E&OE. £10 p&p on all major items.

Front Cover:

Scenes from Field Day. See the results and read the reports of this, one of the Society's most popular HF contests for clubs and groups, on page 28.

RadCom
Radio Communication

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ADVERTISING
All display and classified advertising enquiries (excepting Members' Ads) should be directed to:

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All material in RadCom is subject to editing for length, clarity, style, punctuation, grammar, legality and taste.

No responsibility can be assumed for the return of unsolicited material (if in doubt, call us first!)

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THIS MONTH INCLUDES 36 PAGES COMPRISING: ANNUAL REPORT AND ACCOUNTS; MEMORANDUM OF ASSOCIATION, ARTICLES AND BYLAWS OF THE SOCIETY; NOTICE OF ANNUAL MEETING AND COUNCIL ELECTION.

November 2000

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Annual Report and Accounts

Regulars

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded in 1913 incorporated 1926. Limited by guarantee
Member society of the International Amateur Radio Union

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

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 Subscriptions Department from which full details of Society services may also be obtained.

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GM.Dept@rsgb.org.uk (managerial)

Annual Subscription Rates

Home Corporate	**£38.50**
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Telephone 0870 904 7373
Fax 0870 904 7374
Website www.rsgb.org

All calls to the RSGB are charged at National Rate

Your Vote Counts!

You will have noticed that this is a much thicker issue of *RadCom* than usual. This is because it includes all the papers relating to important changes to the structure of the Society, being proposed by Council.

Earlier this year, the General Manager and I set out in *RadCom* the main points of the changes Council were considering. A number of you were good enough to write to Peter Kirby about the proposals, and most of the comments received were very favourable. You felt that the Society's structure was in need of freshening-up and that the objectives we had were laudable.

Now is the time for you to express your views formally. Later in this edition of *RadCom* you will find the proposed new Memorandum, Articles of Association and Bylaws set out in full. These have been checked by our specialist legal advisors (KPMG). I apologise for the sheer volume of words, but we are required by statute to present the new Memorandum and Articles of Association to all our members for approval. Because we have moved some elements currently in the Articles to the Bylaws, Council has also decided that members should have the opportunity to approve the Bylaws. On page iii of the centre pull-out you will see a summary of the principal changes being proposed.

At the Extraordinary General Meeting which will immediately follow this year's AGM, we will be putting resolutions before our members formally to adopt the new Memorandum and Articles.

Whether or not you plan to attend the AGM, you have the opportunity to express your view, and I am asking you, please, to do so. With this copy of *RadCom* you will find a voting form. Please take time to register *your* vote on this matter.

I do hope you will feel able to support Council in the changes it is proposing, by voting "FOR" the resolutions, and so allow the Society to become even more effective in its work.

Don Beattie, G3OZF
President

RadCom NEWS

Repeater News

GB2RS via repeaters

The RSGB Repeater Management Committee has recently received a number of new requests to broadcast the GB2RS news bulletin via existing repeaters. There are already several such broadcasts and these provide a useful service to all radio amateurs and are generally popular.

The requests were taken to the Radiocommunications Agency and, while being generally supportive of the principle, it wishes to formalise the existing permissions, along with any new requests, by introducing a system of Notices of Variation to existing and new newsreaders where repeaters are in use. This is because GB2RS is a broadcast service and repeaters are not licensed as broadcast stations.

All repeater keepers should have received a letter requesting up-to-date details of the existing schedule and new requests for this service. The RMC has gained agreement that pending issue of the new Notices of Variation all of the existing services via repeaters can continue uninterrupted.

Please address any queries regarding repeater matters to Carlos Eavis, G0AKI, Chairman, RSGB Repeater Management Committee, c/o RSGB HQ.

GB3CJ

News regarding the UK's first 10-metre repeater, GB3CJ in Northampton, was given on page 10 of the September *RadCom*. The repeater came into service on 23 September, and requires a 77Hz CTCSS access tone.

● The Midland Amateur Radio Society, organisers of the Birmingham Radio and Computer Rally, regret to inform patrons that the next rally, due to be held on **12 November**, has been *cancelled*. It is hoped to run the event as usual next year. Further information is available from Norman Gutteridge, G8BHE, on 0121 422 9787 or 07730 132 726.

Sergei presented with top-line Kenwood transceiver

UK Station for Sergei Rebrov M0SDX

THE UKRAINIAN striker Sergei Rebrov, UT5UDX, has now received his UK callsign - M0SDX - just in time to move into his new home in North London. Sergei, who was planning to move in mid-October, wasted no time in getting on the air, planning to be active in the RSGB 21/28MHz CW Contest on 15 October.

Helping in no small measure has been the presentation to Sergei by Kenwood UK of their top-line TS-870S HF transceiver. The ceremony took place in the Kenwood box at White Hart Lane after a recent home match. Kenwood has supported Spurs for many years, and it hopes that Sergei will soon be active on the air as effectively as he is on the pitch. David Wilkins, G5HY, presented Sergei with the transceiver and a certificate marking his honorary membership of the Kenwood Amateur Radio Club, GX0TKU.

David Wilkins, G5HY, of Kenwood UK, presenting Sergei, UT5UDX/M0SDX, with the TS-870S transceiver and certificate.

John Kay, G3AAE, is a Silent Key

AMATEURS ACROSS the world will be saddened by the news of the death, at the end of September, of John Kay, G3AAE.

John, who was in his mid-70s, was probably the UK's top DXer, holding top British position in both the DXCC and IOTA Honour Rolls. John had also been Chairman of the RSGB HF Committee in past years. Up to the time of his sudden death, John continued to be very active on the HF bands. Our sympathies go to his wife, Helen, and his son.

● The South Bristol Radio Club will no longer organise the Bristol Radio Rally, due to falling numbers of traders and buyers. It will now support the Longleat Rally.

What's Cooking, Mikiko?

MANY READERS will remember the news item in the November 1999 *RadCom*, p11, about Mikiko Shepperley and the accident that ultimately led to her marriage. She now lives in Mitcham, Surrey, and was a winner in the 14 August TV programme *Ready, Steady, Cook*.

She is now an accomplished SWL, and can be seen below at her new station, comprising a 733MHz Pentium III computer, and an Icom IC-PCR1000 receiver fed by a 25m long wire and a Global ATU.

Mikiko with her new equipment.

Licence Changes

A GAZETTE NOTICE effective from 8 September has made a number of changes to the Full (A, A/B and B) and Novice (A and B) Amateur Licences. (Clause numbers refer to the current versions of BR68 Rev 7, dated March 2000, and BR68a/N). To obtain full details of the changes, an updated copy of BR68 can be requested from the RA Library on 020 7211 0502 or by e-mail: library@ra.gsi.gov.uk

The following is a summary of the effect of the changes. Some of the changes mentioned here will not be relevant to the Novice licence, where it did not have the facility originally.

The main changes are restrictions on the conditions under which unattended operation is allowed in Clause 2(4) of BR68. The frequencies allowed are as per the existing BR68, but with the changes shown in the box below.

Other Changes

There are several other changes:

- Powers are now shown in the schedule in both watts and in dBW.
- Note (aa) to BR68 (note (y) in the Novice), relating to restrictions on CB equipment, has been deleted following the changes in the WT Order SI 1013, May 2000, which removed the restrictions on the import or manufacture of commercial single band amateur equipment for 28 - 29.7MHz. The General Authority to modify legal FM CB equipment for the 28MHz band still stands.
- It clarifies the wording, introduced in a Gazette notice in January 2000, which prohibited connection between the station and other telecommunications networks. It now only requires an NoV for the *automatic* reception and transmission of messages between amateur stations and other telecommunications networks (not applicable to the Novice).
- Malta has been added to the countries with which greetings messages may be exchanged (not applicable to the Novice).
- During operation in other countries under TR61-01, the wording now acknowledges that the host country may instruct visitors to use callsign formats other than their home callsigns after the host country prefix (not applicable to the Novice).

Errors

Two errors have been found in the Gazette notice. The modification to Clause 2(4)i which imposes restrictions on the unattended operation of beacons the10GHz band incorrectly states the band as 1000MHz - 10,125MHz. This should, of course, read 10,000MHz - 10,125MHz.

The NGR for the restrictions around Harrogate should read SE202577, not SE302577.

Comments

Whilst the RSGB is unhappy that these restrictions have been made, in these times of increasing pressure on spectrum, it is inevitable that we, as Secondary users, will suffer some constraints. However, the Society is far more concerned that restrictions are being imposed on bands where we are the Primary and exclusive user, eg 28MHz, 50MHz, 144MHz, 24GHz and 47GHz.

These changes will have a significant impact on personal unattended digital operation on 50MHz, 144MHz and 432MHz. However, these geographical restrictions only apply to unattended operation under Clause 2(4) of BR68; it does not directly affect existing frequency-cleared stations, and it may still be possible to obtain permission to run unattended operation for Nodes or Mailboxes in these areas by applying for frequency clearance and a GB7 callsign via the DCC.

The changes will also have a significant impact on the use of personal beacons in the microwave bands, and the loss of unattended facilities on 3.5MHz and restrictions on 28MHz and 144MHz will impact on ARDF activities.

The RSGB will be raising these matters with the RA.

- The facility for unattended operation for DF competitions in the 3.5 - 3.8MHz band has been removed in the whole of the UK.
- Unattended operation for DF competitions in the 28 - 29.7MHz band is unavailable within a 50km radius of a location south of Lincoln, and in the 144 - 146MHz band within a 50km radius of a location west of Scarborough (TA012869).
- Unattended operation for digital communications in the 50 - 51MHz band is unavailable within a 50km radius of Harrogate, and in the 144 - 146MHz band within a 50km radius of a location west of Scarborough.
- Unattended operation in the 432MHz band for digital communications has been withdrawn in the whole of the UK. However, unattended operation of a low power device under clause 2(4)b is still allowed from 432.5 - 432.5875MHz.
- Unattended operation of all types mentioned in Clause 2(4) (beacons, low power control and digital communications) is unavailable within a 50km radius of the locations mentioned in the following sub-bands:

1,298 - 1,300MHz	Bude / Harrogate
2,310 - 2,310.4125MHz	Bude / Harrogate
2,355 - 2,365MHz	Bude / Harrogate
2,392 - 2,450MHz	Bude / Harrogate
3,420 - 3,430MHz	Bude / Harrogate / Cheltenham (SS206127 / SE202577 / SO916223)
3,450 - 3,455MHz	Bude / Harrogate / Cheltenham
5,670 - 5,680MHz	Bude / Harrogate
10,000 - 10,125MHz	Bude / Harrogate / Cheltenham / S Lincoln
24,000 - 24,050MHz	Harrogate / S Lincoln
47,000 - 47,200MHz	Harrogate / S Lincoln (SE202577 / SK985640).

- Unattended operation is now allowed on a temporary basis for using automatic position reporting software, for a period not exceeding 30 minutes, on the spot frequency of 144.8MHz, except within a 50km radius of W Scarborough (not applicable to the Novice licence.)

Morse Campaign's 100th Graduate

LAURA RUSSELL is the youngest candidate, at 13 years old, to attend the Morse Campaign and pass the 5WPM Morse test.

She also has the distinction of being the 100th graduate of the Morse Campaign. Her father David, now M5IGE, was the 101st! They both attended the Morse Camp held at RSGB Headquarters over the weekend of 30 September / 1 October. Laura now has to tackle the theory examination before she can apply for a licence!

Watch this space for the Morse Campaign 2001 schedule.

Satisfied: Laura Russell, the 100th graduate of the Morse Campaign, pictured with her father, David, the 101st graduate, now M5IGE.

Twin Radio Towns

ELGIN, AN HISTORIC town in the North-East of Scotland, like many UK cities and towns, has a twin town with whom various cultural exchanges are made. During 1998 the Moray Firth Amateur Radio Society decided to extend the twin-town concept to amateur radio with a Christmas greetings exchange with twin town Landshut in Bavaria. After gaining permission for such exchanges with Germany (which is not on the list of countries with whom greetings messages can normally be exchanged by non-licensed people), a tenuous link was made from the club premises. Conditions were poor, and the town centre location full of electrical noise, but lots of fun was had by both sides. This was a start, and encouraged further activity.

The next attempt was in July 1999, when GM3TKV/P was set up in a park near Elgin's town centre. This time SSTV facilities were arranged at both ends. The Convenor of the Moray Council passed Elgin's congratulations to Landshut's Burgermeister, and various other dignitaries managed to pass their best wishes also. Members of the Twin Town Association arrived at the club caravan to see what this unusual hobby was all about, and why all this effort was so much better than just ringing on the telephone!

The NFD station operated by the 'twinned' team.

Visits then followed, culminating in a combined team entry for the SSB National Field Day from a field between Elgin and Lossiemouth. The highlight of the contest came at the very end. With only seconds to go, a call from DL0LA became QSO number 999 in the log. This is the club call of the Landshut club which, unknown to the team, was waiting, hoping to be the last QSO in the log!

The Moray club can recommend this twin-town type of activity as one which works, attracts interest, makes friends, airs the club call, and promotes international cooperation in amateur radio. Give it a try!

Ben, DL6RAI, operating the Moray Firth ARS NFD station.

● Telecoms sans Frontières (TSF), on behalf of the United Nations, seeks volunteers qualified in the maintenance of VHF and HF radiotelephones, satellite phones, GPS and peripherals, antennas, power supplies, etc. See the notice in last month's *RadCom* on page 10.

Keeping a Watchful Eye

A UNIQUE voyage from Southampton to Falmouth also provided a good public relations platform for amateur radio. *Tenacious* is the largest wooden ship to be built for over 100 years, being 190 feet long and weighing in at 586 tonnes. Her building costs totalled £14.3m.

As the ship sailed from Southampton to Falmouth in Cornwall, where she was moored from 11-14 October, the Jubilee Sailing Trust callsign G7JST was used by Michael Prowse, G7ERQ, to transmit the progress of the ship every hour, on the hour.

Michael was asked in July to run the station and had no hesitation in accepting: "I think I was asked because I got chatting over the radio to so many people involved with the *Tenacious* project," he said.

Commentator: Michael Prowse, G7ERQ. (Photo: *Falmouth Packet*)

Amateur radio has a very good image in the south-west, and this latest exercise has certainly helped to enhance that image.

More RAE, NRAE, Courses and Venues

● **Milton Keynes Amateur Radio Society**, based in the museum in **Bletchley Park**, runs courses for both the **NRAE and RAE** and, from December, it can offer *both examinations*, together with **Morse** courses and tests. Contact Dave, M0BZK on 01908 647 662 or e-mail exam@bletchley.net

● **Widnes & Runcorn Amateur Radio Club** is running **NRAE and RAE** courses on Friday evenings at The Beacons, Simons Lane, **Frodsham**, Cheshire at 7pm. Contact Dave Bibby, G1PIX on 01928 591 401 or Dave Wilson on 01270 761 608.

● **Kingston College** is running a course for the **NRAE**. For full information, contact the Senior Instructor Tony, G7DGW, at Kingston College, **Kingston-upon-Thames** KT1 2AQ. He can be contacted by telephone on 020 8268 2994 or by fax on 020 8268 2996.

● **North Lincolnshire College**, Monks Road, **Lincoln**, will be providing an **RAE** course, starting on 7 November. For more information or to register, contact John Maddison in the Technology Department, or Bill, G3XZF, on 01522 524 014.

New RSGB Phone Numbers

THE EAGLE-EYED amongst members will have noticed that the RSGB phone numbers have changed. The Society has invested in some more readily-remembered numbers that seem appropriate - 7373 will no doubt strike a chord. The old numbers are retained indefinitely so those living locally can still use the local rate on 01707 659 015 (and 645 105 for the fax). There is no doubt, though, that these new numbers will prove to be much easier to remember: phone 0870 904 7373; fax 0870 904 7374.

Aurora Watch Site Announced

A NEW 'Aurora Watch' Internet site has recently been launched by the University of York, well-known in radio circles. The site provides fascinating information about geomagnetic activity and offers a service to e-mail alerts whenever an Aurora is likely to happen - clearly of great interest to many in the amateur radio community. Take a look at www.aurorawatch.york.ac.uk/ for further details.

● G7ERQ (pictured above) called the emergency services when Terry 2E1HYC reported a serious road accident via amateur radio.

Awayday for the Society's AGM

Due to the popular demand of its members, the Society's Annual General Meeting will this year be held outside London for the first time since 1993. The event will take place at Harrogate Ladies' College, Harrogate, Yorkshire, on Saturday 2 December 2000.

For the first time the meeting will be a whole day event, featuring the AGM, an Amateur Radio Forum, and an evening dinner. Members and non-members are welcome to all events.

The RSGB bookstand and information booth will be open until 2.30pm.

Dress for the dinner is jacket and tie. Tickets priced £15 are available from the General Manager's Department, RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Telephone bookings can be taken on tel: 0870 904 7373.

Programme

11.00am	**Annual General Meeting**
	The Society Awards Ceremony and President's Address
1.00pm	**Buffet lunch**
2.30 - 4.30pm	**Open Forum**
	Subjects for discussion include:
	The Society's new regional structure
	Amateur radio licensing pre- and post-WRC2003.
7.30pm	**Amateur Radio Dinner**
	Guest speaker Gaston Bertels, ON4WF, Chairman of the Eurocom Group.

TEAM RSGB - Working For and With the UK Amateur Radio Community

RSGB VHF AWARDS

Summary of Award Recipients for August

50MHz:

25 squares: M1DVT
50 squares: MM1ALC
125 squares: G3FIJ
150 squares: MM5AHO
325 squares: G4DCJ

20 countries (2-way): M1DVT, MM1ALC, M1DUD
70 countries: G3KPT
25 countries (DX): G6BFP

144MHz:

80 squares/18 countries: G3FIJ

IARU 2000:

G0VOK, G6BFP, M1DVT, M1DUD

Details of all VHF, UHF and Microwave awards can be obtained from Tony Jarvis, G6TTL, Dovecote Farm, Patman's Lane, Friskney, Boston, Lincolnshire PE22 8QJ, or from www.argonet.co.uk/users/tonyg6ttl/awards/awards.htm

● The Wyre Forest Packet Radio User Group ('WyrePAK') has been formed to promote the use of packet radio and to support the local packet network node and BBS in the Wyre Forest area of Worcestershire, which includes the towns of Kidderminster, Stourport-on-Severn and Bewdley. The group meets on the third Tuesday of every month at the Sutton Arms, Sutton Park Road, Kidderminster. Contact the Club Secretary, Phil, G4SPZ, on 01299 403 025 or e-mail g4spz@aol.com for more details.

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www.amateurantennas.com

Log Periodic

MLP32 TX & RX 100-1300 Mhz one feed, S.W.R. 2:1 and below over whole frequency range. professional quality.....**£99.95**

Mobile HF Whips (with 3/8 base fitting)

AMPRO 6 mt.....**£16.95** *(Length 4.6' approx)*
AMPRO 10 mt.....**£16.95** *(Length 7' approx)*
AMPRO 12 mt.....**£16.95** *(Length 7' approx)*
AMPRO 15 mt.....**£16.95** *(Length 7' approx)*
AMPRO 17 mt.....**£16.95** *(Length 7' approx)*
AMPRO 20 mt.....**£16.95** *(Length 7' approx)*
AMPRO 30 mt.....**£16.95** *(Length 7' approx)*
AMPRO 40 mt.....**£16.95** *(Length 7' approx)*
AMPRO 80 mt.....**£19.95** *(Length 7' approx)*
AMPRO 160 mt.....**£49.95** *(Length 7' approx)*
AMPRO MB5 Multi band 10/15/20/40/80 can use 4 Bands at one time (length 100").....**£65.95**

Dual band mobile antennas

MICRO MAG 2 Metre 70 cms Super Strong 1" Mag Mount (Length 22").....**£14.95**
MR 700 2 Metre 70 cms (¼ & ⅝ wave) (Length 20") (⅜ fitting).....**£6.99**
MR 700 2 Metre 70 cms (¼ & ⅝ wave) (Length 20") (SO239 fitting).....**£9.99**
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (5/8 & 2x5/8 wave) (Length 60") (3/8 fitting).....**£16.95**
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (5/8 & 2x5/8 wave) (Length 60") (SO239 fitting).....**£18.95**
MR 750 2 Metre 70 cms 5.5 & 8.0 dBd Gain (¼ & 3 x ⅝ wave) (Length 60") (SO239 fitting).....**£38.95**

Single band mobile antennas

MR 214 2 Metre ¼ wave (⅜ fitting).....**£3.99**
MR 214 2 Metre ¼ wave (SO239 fitting).....**£5.00**
MR 258 2 Metre ⅝ wave 3.2 dBd Gain (⅜ fitting) (Length 58").....**£12.95**
MR 650 2 Metre ⅝ wave open coil (3.2 dBd Gain) (Length 52").....**£9.95**
MR 775 70 cms ⅝ wave 3.0 dBd Gain (Length 19") (SO239 fitting)..... **£14.95**
MR 775 70 cms ⅝ wave 3.0 dBb Gain (Length 19") (⅜ fitting).....**£12.95**
MR 776 70 cms ⅝ over ⅝ wave 6.0 dBd Gain (Length 27") (SO239 fitting).....**£18.95**
MR 776 70 cms ⅝ over ⅝ wave 6.0 dBd Gain (Length 27") (⅜ fitting)**£16.95**
MR 444 4 Metre loaded 1/4 wave (Length 24") (⅜ fitting).....**£12.95**
MR 444 4 Metre loaded ¼ wave (Length 24") (SO239 fitting).....**£15.95**
MR 641 6 Metre loaded ¼ wave (Length 56") (⅜ fitting).....**£13.95**
MR 644 6 Metre loaded ¼ wave (Length 40") (⅜ fitting).....**£12.95**
MR 644 6 Metre loaded ¼ wave (Length 40") (SO239 fitting).....**£13.95**

Tri band mobile antennas

MR 800 2 Metre 70 cms 6 Metres 5.0, 7.9 & 3.0 dBd Gain (¼, ⅛ & 3 x ⅛ wave) (Length 60") (SO239 fitting).....**£39.95**

¼ Wave Vertical Fibre Glass (GRP) Base Antenna 3.5 dBd (without ground planes)

70 cms (Length 26").....**£19.95**
2 metre (Length 52").....**£22.95**
4 metre (Length 92").....**£34.95**
6 metre (Length 126").....**£44.95**

Vertical Fibre Glass (GRP) Base Antennas

SQ & BM Range VX 6 Co-linear:- Specially Designed Tubular Vertical Coils individually tuned to within 0.05pf (maximum power 100watts)

BM100 Dual-Bander.....**£29.95** (2 mts 3dBd) (70cms 6dBd) (Length 39")
SQBM100*Dual-Bander.....**£36.95** (2 mts 3dBd) (70cms 6dBd) (Length 39")
BM200 Dual-Bander.....**£39.95** (2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")
SQBM200* Dual-Bander.....**£47.95** (2 mts 4.5dBd) (70cms 7.5dBd) (Length 62")
BM500 Dual - Bander Super Gainer.....**£49.95** (2 mts 6.8dBd) (70cms 9.2dBd) (Length100")
SQBM500 Dual - Bander Super Gainer.....**£59.95** (2 mts 6.8dBd) (70cms 9.2dBd) (Length100")
SM1000 Tri-Bander.....**£49.95** (2 mts 5.2dBi) (6 mts 2.6dBi) (70cms 7dBi) (Length 62")
BM1000 Tri-Bander.....**£59.95** (2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")
SQBM1000* Tri-Bander.....**£69.95** (2 mts 6.2dBd) (6 mts 3.0dBd) (70cms 8.4dBd) (Length 100")
***SQBM1000/200/100/500** *are Stainless Steel, Chromed and Poly Coated. Full 2 year Warranty on these Antennas.*

2 metre vertical co-linear base antenna

BM60 ⅝ Wave, Length 62", 5.5dBd Gain.....**£49.95**
BM65 2 X ⅝ Wave, Length 100", 8.0 dBd Gain.....**£69.95**

70cms vertical co-linear base antennas

BM33 2 X 5/8 wave Length 39" 7.0 dBd Gain.....**£34.95**
BM45 3 X 5/8 wave Length 62" 8.5 dBd Gain.....**£49.95**
BM55 4 X 5/8 wave Length 1002 10 dBd Gain.....**£69.95**

Tri-Bander Beam

TBB3 3 Element 6mts, 2mtr, 70cms, Boom Length 1.1mts, Longest Element 3mts, 5.00 dBd Gain. **.£65.95**

HB9CV 2 Element Beam 3.5 dBd

70cms (Boom 12").....**£15.95**
2 metre (Boom 20").....**£19.95**
4 metre (Boom 23").....**£27.95**
6 metre (Boom 33").....**£34.95**
10 metre (Boom 52").....**£64.95**

Mini HF dipoles (length 11' approx)

MD020 20mt.....**£39.95**
MD040 40mt.....**£44.95**
MDO80 80mt.....**£49.95**

Crossed Yagi Beams (All fittings Stainless Steel)

2 metre 5 Element (Boom 64") (Gain 7.5dBd).....**£64.95**
2 metre 8 Element (Boom 126") (Gain 11.5dBd)...**£84.95**
70 cms 13 Element (Boom 83") (Gain 12.5dBd).....**£54.95**

Yagi Beams (All fittings Stainless Steel)

2 metre 4 Element (Boom 48") (Gain 7dBd).....**£19.95**
2 metre 5 Element (Boom 63") (Gain 10dBd).....**£34.95**
2 metre 8 Element (Boom 125") (Gain 12dBd).....**£44.95**
2 metre 11 Element (Boom 156") (Gain 13dBd).....**£65.95**
4 metre 3 Element (Boom 45") (Gain 8dBd).....**£39.95**
4 metre 5 Element (Boom 128") (Gain 10dBd).....**£54.95**
6 metre 3 Element (Boom 72") (Gain 7.5dBd).....**£49.95**
6 metre 5 Element (Boom 142") (Gain 9.5dBd).....**£69.95**
6 metre 6 Element (Boom 15') (Gain 11.5DBd).....**£99.95**
10 metre 3 Element (Boom 110") (Gain 6.0 dBd).....**£79.95**
70 cms 13 Element (Boom 76") (Gain 12.5dBd).....**£39.95**
23cms Beam, 11 Element Boom Length 1 Metre, Gain 12.5dBd .....Price **£44.95**
23cms Beam, 19 Element Boom Length 1.5 Mts Gain 17 dBd .....Price **£64.95**

ZL Special Yagi beams All fittings stainless steel

2 metre 5 Element (Boom 38") (Gain 9.5dBd).....**£31.95**
2 metre 7 Element (Boom 60") (Gain 12dBd).....**£39.95**
2 metre 12 Element (Boom 126") (Gain 14dBd).....**£65.95**
70 cms 7 Element (Boom 28") (Gain 11.5dBd).....**£24.95**
70 cms 12 Element (Boom 48") (Gain 14dBd).....**£39.95**

Halo Loops

2 metre (size 12" approx).....**£12.95**
4 metre (size 20" approx).....**£18.95**
6 metre (size 30" approx).....**£24.95**

Multi purpose antennas

MSS-1 Freq RX 0-2000 Mhz, TX 2 mtr 2.5 dBd Gain, TX 70cms 4.0 dBd Gain, Length 39".....**£39.95**
MSS-2 Freq RX 0-2000 Mhz, TX 2 mtr 4.0 dBd Gain, TX 70cms 6.0 dBd Gain, Length 62".....**£49.95**
IVX-2000 Freq RX 0-2000 Mhz, TX 6 mtr 2.0 dBd Gain, 2 mtr 4dBd Gain, 70cms 6dBd Gain, Length 100".....**£89.95**

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MD37 SKY WIRE (Receives 0-40Mhz).....**£29.95** Complete with 25 mts of enamelled wire, insulator and choke Balun Matches any long wire to 50 Ohms. All mode no A.T.U. required. 2 "S" points greater than other Baluns.

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I used the new MARK IV FT1000mp recently on a big antenna system, and was impressed! The new VRF control is smooth and easy to use, it enabled me to work alongside S9 plus 40 signals on 40 mtrs without a hint of strain. I frequently change between CW and SSB operation chasing rare DX The new IDBT ensured that the DSP system tracked my receiver IF bandwidth settings automatically giving me the best opportunity to "grab" that rare one before the pile up got to him. All in all this is a radio I can fully recommend, to the serious DX enthusiast! **Mike Devereux - G3SED**
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EDC37	12V DC Cable for DJ190/191/491/G5/X10	£6.95
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FT920	HF Transceiver with 50MHz	£1,249.00
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MH19A2B	Earpiece/Tie Clip Mic	£22.00
MH26D8	Speaker Mic w/ Toneburst	£48.00
MH34B4B	Speaker Mic for FT10/40/VX10	£27.00
MH35A2B	Handheld Speaker Mic	£34.00
MH37A4B	Earpiece Mic for FT10R/40/VX10	£22.00
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ZX 15-3	3 Element 21Mhz Beam 9.1dB Gain	£149.00
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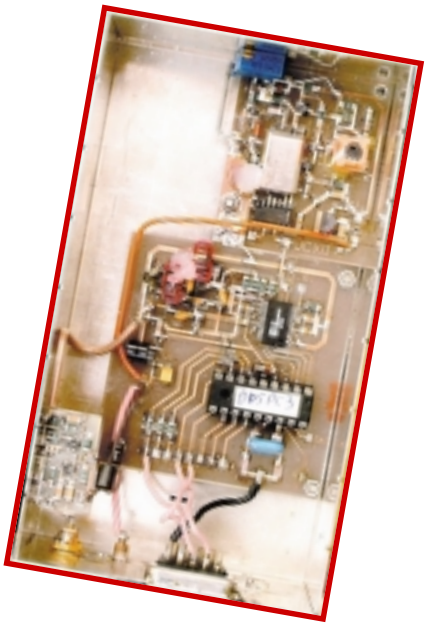

By Andy Talbot, G4JNT *

THE PRINCIPLES BEHIND Direct Digital Synthesis (DDS) have been described before in *RadCom* [1] and so will not be described further here. This reference describes a DDS signal source using the same device as employed here, in a self-contained stand-alone unit with LCD display and rotary control for frequency setting. Now, a different approach is adopted, with the DDS chip being included in a small stand-alone module controlled by straightforward text-based messages from a PC. The module has been designed to be used as a drop-in component in larger projects such as receivers or transceivers. An onboard PIC microcontroller allows control of the DDS chip from a standard PC via the serial port, and a straightforward command syntax has been developed so that standard software commands, written in any language, can be used to set the operating parameters. This PIC can easily be reprogrammed to suit any user's requirements in a stand-alone project and enough spare Input / Output lines are provided to allow for this.

This article is intended to provide an overview of the DDS module as a component for larger projects, and only limited details are included. Complete constructional and programming data are available from HF-Instruments [2].

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DDS MODULE DESIGN

THE MODULE IS BASED around an Analog Devices AD9850 DDS chip, full details of which are available from Analog Devices [3]. The device will accept a clock signal up to 120MHz, although a suitable source is not provided within the module. This is best left to individual constructors. For most purposes, any low-cost packaged oscillator module will suffice. The DDS can generate an output up to approximately one-third of the clock frequency with a resolution of over 4 billion so, for a 120MHz clock, frequencies from DC to 40MHz can be produced in steps of approximately 28 millihertz (mHz), and so the actual frequency of the clock is unimportant, provided of course it is known with reasonable accuracy. The RF output is at a level of 1V p-p (0.35V RMS) from a source impedance of 100 ohms.

The supplied PIC controller translates text-based messages received from the serial port into command codes for the AD9850, and (optionally) stores these in non-volatile RAM for immediate setting at switch-on. Spare memory in the PIC allows user information, such as the exact clock frequency, to be read out on request, allowing common software to be written that can drive individual modules, each having different clock frequencies. Another option available in the firmware is a 'times-four' output, where the output from the module is designed to drive a quadrature frequency generator which performs the final frequency division.

A single hex-digit module address is included as part of the command syntax, to allow multiple modules to be driven in a multi-drop arrangement from a common controller with one COM port.

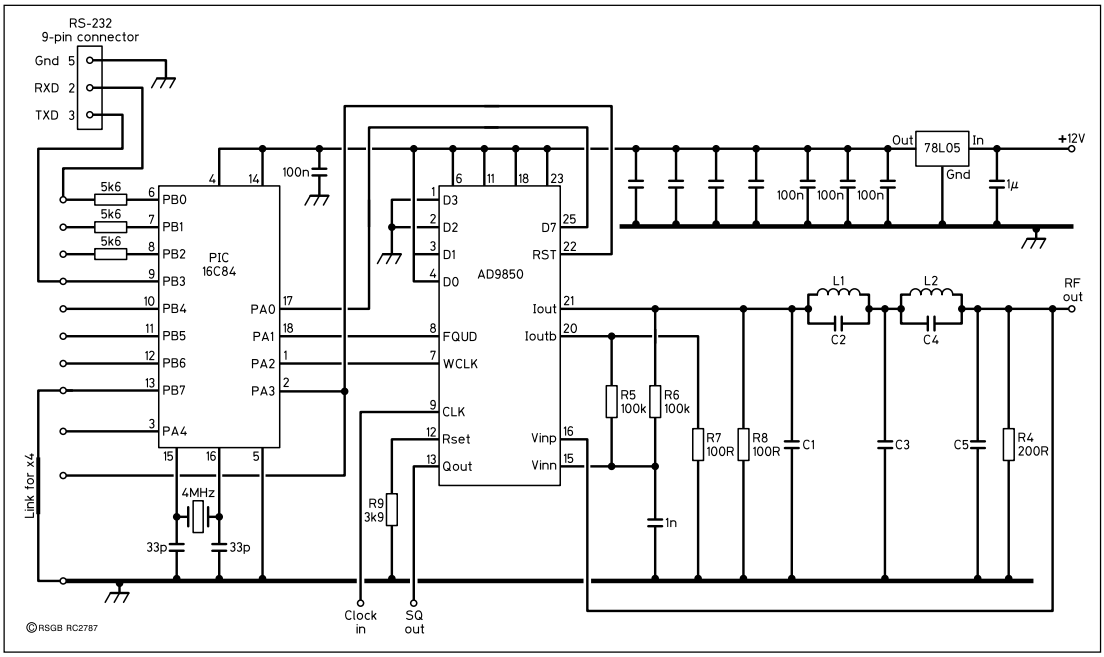

Fig 1: Circuit diagram of the AD9850 DDS module. Filter components and some decoupling components are dependent upon clock frequency.

OUTPUT SPURII

SPURIOUS output signals from a DDS are complex in their nature and are not harmonically related – the device data sheet gives more details. All spurii from the design here are at levels of –60dB or better. This figure is obtained from the manufacturer's specification and is affected by the design of the output filter. One useful facet about DDS circuitry is that the spurious levels below the output filter cutoff are inherently dependent on the circuits internal to the DDS chip, and are not affected by poor circuit layout; this aspect is often trouble-

some in other synthesiser designs, as filtering cannot remove close-in products.

60dBc spurious levels may be considered a bit excessive if this module were to be used alone as the local oscillator of a high-performance wide-band receiver, but there are additional techniques such as Phase Locked Loops that can clean up this signal which will not be covered here. An example is given in Reference [4]. For narrow-band receivers, such as are used for LF, the filtering needed for other purposes should be sufficient to eliminate the effects of most of the DDS-generated spurii.

CONSTRUCTION

THE CIRCUIT DIAGRAM is shown in **Fig 1**, from which it can be seen that the module actually has very few components, most of them being for decoupling and output filtering. A ready-made PCB with plated-through holes is available from HF-Instruments [2]. This can be supplied with the tiny surface-mount AD9850 device already soldered on and removes the biggest hurdle for most constructors - soldering the tiny chip with its 0.6mm pin spacing. All other components are of the larger size 1206 or 0805 surface-mount style; for the output filter, wire ended components are used. The PIC controller is mounted in a socket for easy re-programming.

The photograph shows a prototype version of the DDS board, together with a high-stability 94MHz source on the PCB top right and an output buffer amplifier bottom left.

Values of components for the output filter depend on the clock frequency chosen, as do the values of decoupling capacitors. With a clock input that can range from a few kHz up to 120MHz, the optimum values of these can vary over a wide range. Guidelines for selecting appropriate values are given in the constructional and programming data available from [2].

SOFTWARE CONTROL

COMMANDS ARE SENT using ASCII / Hex characters over a bi-directional RS-232 link with no handshaking. Parameters are 19,200 baud, 8 data bits, no parity, 1 stop bit. A simple terminal programme such as HYPERTRM (Windows®) or PROCOMM (DOS) can be used to command the frequency source. Set this to 19200 N 8 1, full-duplex, no flow control and all start up and modem commands set to null. Alternatively, custom software can be written to drive the COM port with the commands.

The first character sent is a board address which precedes all commands. This is a single Hex character sent as ASCII 0 – F and potentially allows up to 16 modules to be driven from the same COM port.

The next character is a command which may have hex data following it.

- Q followed by eight hex digits for the frequency command word terminated by a carriage return [CR]
- P followed by two hex digits for phase word and [CR]
- U writes the data sent above to the AD9850 DDS chip
- W as for U, and also stores all data in the PIC's non-volatile EEPROM memory for switch-on next time
- Y followed by one Hex digit, changes the board address and stores in EEPROM. No [CR] needed
- K followed by 10 hex digits and [CR]. User data, not used for driving the DDS. (In practice, read as decimal number for user data, typically clock frequency)
- R read back current data values – not necessarily those in EEPROM

The 32 bit or 8 hexadecimal character, value N (required for frequency-setting), can be derived from:

$$N = F_{out} / F_{clock} \times 2^{32}$$

Phase can be set to any one of 32 values in increments of 11.25 degrees. These form the five highest significant bits of the phase word Pxx. The lowest three bits are ignored.

Data is sent back from the DDS in text strings which can be read directly by application software.

An example of a command to set the output frequency is:

5Q03D70A3D [CR]	Board address 5, set frequency word N = hex 03D70A3D
5U	Programme the DDS to this value (with a 120 MHz clock, this gives an output at 1.8MHz)

APPLICATIONS

ANY EXPERIMENTS or testing that needs an agile frequency source is a candidate. Just about any programming language that includes commands to drive the serial port can be employed, and does not even have to be PC-based. The only requirement is that you can actually write suitable software!

One application written to demonstrate the functionality of the module is for generating a narrow-band Multi-Tone Hellschreiber signal for LF use. SMT-Hell transmits visible text as an image, and can be received on a frequency / time plot, commonly known as a spectrogram or waterfall display, using public domain commonly-available audio analysis software. The software generates SMT-Hell signals by directly commanding the DDS module (in real time) to set the frequencies that make up the vertical elements of each character sent. The horizontal components are made up by appropriately setting software delays. Transmissions as narrow as 2.5Hz bandwidth have been sent on 137kHz and successfully decoded as visible letters even where the signal is completely inaudible below the noise.

The ability to set the output signal phase to one of 32 values means that slow Phase Shift Keying is also possible by direct command. An additional command code (T) allows frequency and phase updates to be synchronised to an external trigger input on port B1 such as that from a GPS receiver. The DDS chip is updated within 3µs of the trigger signal rising edge and will allow, for example, precisely-timed low data rate signalling experiments.

By using the DDS output to drive the reference input to a conventional Phase Locked Loop synthesiser, the best of both worlds becomes possible. The high-frequency capability of PLL synthesisers, up to many GHz, can be coupled with the tiny step size of the DDS. For example, a PLL operating with an output at 2.4GHz could be made with a step size of 0.55Hz.

DDS frequency resolution is considerably better than the stability of most crystals will allow. In fact, the actual crystal frequency can be measured, stored in the user data area of memory and then used in subsequent high-accuracy output frequency calculations.

REFERENCES

[1] 'PIC 'n' Mix Direct Digital Synthesiser' Peter Rhodes, G3XJP, *RadCom* January 1999.

[2] The Printed Circuit Board is available from HF-Instruments who can supply a bare version for users who wish to obtain their own AD9850 devices, and also a PCB with the DDS chip ready-mounted. Phone 01420 590 000. Costs are £8.00 and £40.00 respectively. Discounts are available for purchases of two or more. Full constructional details are available from their website at www.hf-inst.co.uk.
For anyone without web access, HF-Instruments will provide printed copies of the documentation on request.

[3] Analog Devices' web site: www.analog.com

[4] 'A PLL Spur Eliminator for DDS VFOs', Rick Peterson, WA6NUT, *QEX* July/August 2000. ♦

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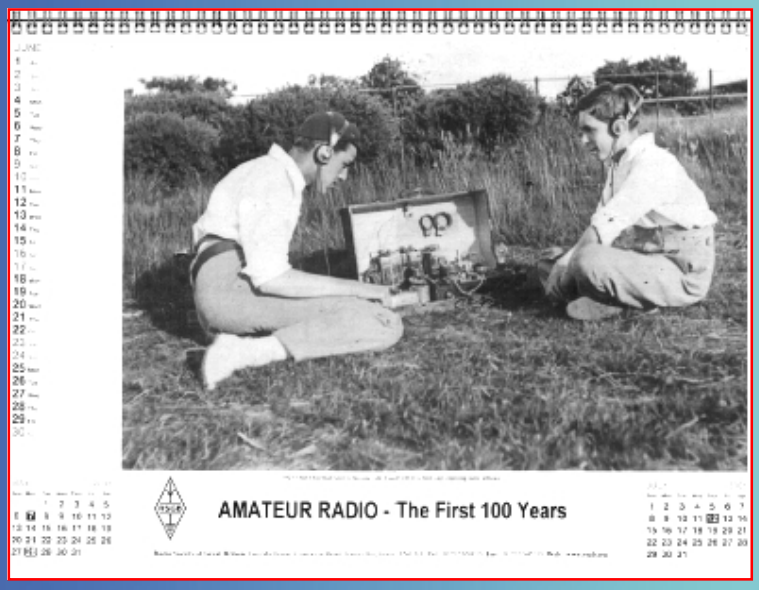

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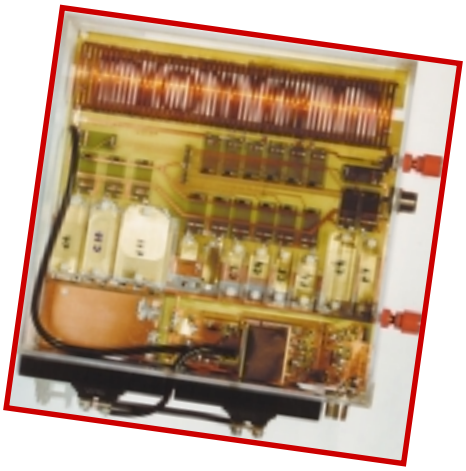

*Part three, by Peter Rhodes, BSc, G3XJP **

THIS MONTH, the overall approach to constructing PicATUne is outlined, along with specific details and techniques for building the RF deck.

COMMAND UNIT

THIS IS the shack end of PicATUne and, as you can see from **Fig 14**, it is not very elaborate. Its purpose is to route DC power up the coax to the remote ATU. The operation of S1, the Command Switch, may look obtuse, since it evidently does the same job in both switch positions. The secret lies in the brief break in supply during the changeover period. This break is detected by the PIC in the ATU and interpreted as a command.

Constructional detail is left to you. It should be built into a screened box. You may also want to take the opportunity of fitting a power on/off switch.

It is, however, very important that this unit be fitted *last* in the coax line up to the ATU since many SWR bridges, power meters and coax switches could be damaged if you apply DC power to them via the coax inner. To prevent you from ever fitting the unit the 'wrong way round', I suggest you wire the coax to the Tx/Rx as a flying lead and fit a connector for the lead to the ATU - as illustrated.

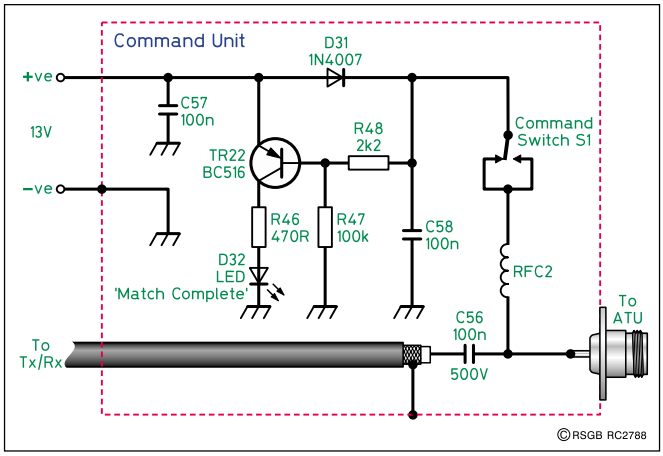

Fig 14: Command Unit circuit diagram. This unit goes in the shack 'in series' with the coax feed to the remote ATU.

CONSTRUCTION STRATEGY

THE CORRECT construction sequence for building the RF deck is important - and not intuitive. Specific details for each step follow as required.

The first task is to wind the main L-match coil, L1. This then allows you to locate and drill its mounting holes correctly on the main PCB.

Make a start on modifying the relays. This is a somewhat boring task so, depending on your attitude to such things, you may want to set a target of doing, say, five a day at about five minutes each; there are 19 to do - so you get an early finish on the last day.

Then manufacture the RF deck PCB, fit L1 to the board and complete the population of the board - with the specific exception of capacitors C1-C11.

You can also build the Command Unit and start to build the 4-sided polystyrene housing - slowly. Slowly, so that you don't get impatient waiting for glue to set.

Build the logic board and populate it fully. The functionality of the PIC on this board can be independently tested.

Fit the main PCB to the polystyrene housing, followed by the input and output connectors and the dummy load.

Now build and trim the L-match capacitors. You should allow about two days for this.

Then mount the logic board on the main PCB, complete all the interstage wiring, and you are ready for commissioning.

WINDING L1

THE SPECIFIED 250g reel gives little margin for waste, so don't be generous with the ends.

Clamp the free end of the reel in a bench vice or similar, pass a screwdriver blade through the reel centre hole and walk away, unreeling (absolutely *not* unwinding) the entire length (about 8.75m) in a straight line.

Take a tubular mandrel at least 35cm long by 40-43mm outside diameter (eg waste pipe, scaffold pole etc). 43mm is ideal. Drill a 2.5mm hole about 20mm from one end. Pass the wire through the hole and bend back about 3cm. Keeping the wire under tension using your body weight, wind on about 5 turns, close spaced. The winding sense (left- or right-hand thread) does not matter. Then apply as much pull as you and the far support will stand. This will help to take any slight kinks out of the wire and tighten up the existing turns. You may care to sit down first to do this, since the risk of injury from enforced sitting is considerable.

Wind on the remaining length. You may find it easier to maintain tension by facing away from the far mounting point with the wire passing under your arm - leaning forwards and walking backwards. If you are using a 43mm OD mandrel you will have to work hard to get 63 turns out of 250g. Keep giving it a good pull after every few turns and if you are not out of breath at the end, you are pretty fit.

Release the far end and let the coil spring out. Check that the achieved ID is between 42-46mm. Gently stretch the length to about 22cm by pulling the ends apart. Now count the complete turns and trim both ends to give exactly 63 full turns plus an extra 1cm (or so) for making off the ends. File back the diameter of the ends since the act of cutting will inevitably have crushed them. Finally, remove the enamel for about 5mm both ends.

You can now lay off the achieved L1 diameter onto the main PCB by adjusting the location of the 63 holes nearest the board edge. Note that this row of

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E-mail: pirhodes@aol.com

holes is displaced from the inner row (of 64 holes) by half the distance between adjacent holes - to give the required helix.

PCB TECHNOLOGY

THE RF DECK AND logic board are quite different in nature and are probably amenable to different approaches. One of the rewarding features of my two previous articles was the amount of feedback I got from people who had tackled a major project for the first time - with the satisfaction of not using a commercial board. So I make no apologies for elaborating a further approach to one-off board manufacture which is suitable for the style of board used in this project - and many others. The devil is in the detail.

MAKING THE RF DECK PCB

THIS IS A LARGE BOARD (see **Figs 15** and **16**), so the first issue is that it may not fit your UV exposure box (but you don't need one) or your usual etching tray. If necessary, the board can be cut (there are several obvious places) and rejoined with epoxy resin later, but you are still left with the longest dimension intact.

Garden centres have trays which are large enough for etching. Photographic developing trays, old oven trays, cat litter boxes also spring to mind. If you get really stuck, you could use the final casing (4 sides and a base) thereby testing its environmental integrity.

The second issue is that there is a lot of copper contrast from large fully-etched areas through quite fine lines to large un-etched areas. These arise from RF design practice and a desire to achieve minimal residual capacitance. You would be very brave to attempt to etch all this in one pass through the etch tray.

Let me describe how I did it as a three stage process without cutting the board, but with no claim that this is the only possible approach.

Firstly, centre punch all the holes through from the artwork and drill them with a 0.8mm bit. This is the finished hole size for most holes and a pilot hole for others. At this point I took the opportunity to make a start on the polystyrene capacitor clamp plates. Clamp a strip of polystyrene sheet (226 x 55mm) to the board with some scrap wood backing. Register it centrally to the board edges and the holes for C11. Then drill the holes for all the capacitors at 0.8mm through the polystyrene using the board as a template - and then again using a 4mm HSS bit. This gives final size holes in both the board and polystyrene.

A note on drilling polystyrene. Always use a soft wood backing. Use a sharp bit, slow speed and light pressure - otherwise you will melt the hole rather than drill it. Clear the swarf from the flutes frequently or it will fuse to the drill leaving you with a polystyrene rod.

Now cut the slots in the board for the SWR head and under L1. The latter, by the way, is because no effort should be spared in the quest to keep the Q of L1 as high as possible. At this point I lowered the L1 edge of the board into some old room-temperature etching solution - not quite up to the inner row of holes - and went to bed. In the morning, the vast majority of the copper was gone and the solution was totally exhausted. Use this doubtful practice only when there is no possibility of over-etching. Keith, G3OHN, recommends scoring the board into 1cm strips and then pulling off the copper with some thin nosed pliers while applying heat with a large soldering iron. That completes stage 1, a crude etch to chunk off the big area of copper around L1. Stage 2 is slightly less crude - to remove other large areas of copper.

Lightly rub over the board with some fine wet and dry (used wet with a drop of washing up liquid) until the board has a lightly-scratched - but absolutely *not* polished - finish. Rinse thoroughly under the hot tap and air dry.

Using matt black spray paint, give the board two light even coats of paint, letting it dry in between coats. At this point there should be no copper sheen showing through the paint. Register and tape a copy of the artwork to the PCB. Using a craft knife, cut out areas on the artwork where you are confident no copper is to remain - playing it safe. Any area with one dimension greater than about 3mm is a fair target. Can I emphasise, this is not a precision process so do not waste time by over-elaborating it. Cut right through to mark the paint and reinforce the marking with a pencil if necessary. Remove the destroyed art work.

Using a sharp chisel-shaped blade about 2-3mm across, crudely remove the paint from the defined areas. You don't need to get absolutely all the paint off, just enough for the etchant to get a good first look at the larger areas. Now etch the board. Slight under-etching is acceptable, because it is going to get another dip later.

Clean off all the paint using cellulose thinners. Make sure you get it all off or it will resist the final etch. Give the board a light rub over with wet and dry again just to be sure.

Now 'back to the drawing board'. Draw in all the wanted tracks and areas using an indelible waterproof pen. Most stationery shops stock the Staedtler Lumocolor Permanent Black, 317 (Medium) and 318 (Fine). Some other colours do not work - and I have consistently had worse results using an 'etch-resist pen'. As long as you join up the right dots roughly following the layout, you won't go wrong; but keep the DC leads to the L-match relays as far from the wider RF tracking as you can. Making it look beautiful is another dimension which is down to your personal taste. By the way, I also used cellulose paint with a brush to cover the larger areas rapidly.

There is a definite technique for using the indelible pen,. That is, you do not 'float' the ink onto the board - which is particularly easy with a new pen. You have to press continuously quite hard and rub the ink on with the nib - in order to get etchant-proof adhesion to the board. It should feel like trying to write with an empty biro on greaseproof paper.

Now give the board its final etch. Do not raise the etchant temperature to the point where there is visible steam or it can leach under the ink. If there was ever a moment to use new etching solution, this is it.

RELAY MODIFICATION

IF YOU USE the relays I have specified, then 19 of them will need modifying. **Fig 17** shows the general picture. See also the assembly drawing in Part 2, **Fig 13**. Note that the protective diodes are not all the same way round physically, but the cathode is always connected to the common +12V rail.

Removing the relay case

The relay case is glued to the base with a weak adhesive. Start on a long edge. Holding the relay firmly on a flat surface with the base vertical, insert the point of a craft knife into the meniscus formed by the adhesive around the base. Press firmly in and down and the adhesive will split - see **Fig 18**. Run the blade all the way down to the corner, turn the relay the other way up and again run the blade to the corner.

Repeat for the other long edge and then the two shorter ones. After that, the base should lever out using the point of the blade with no effort. If it does not, the predictable cause is that you have not split the adhesive all the way

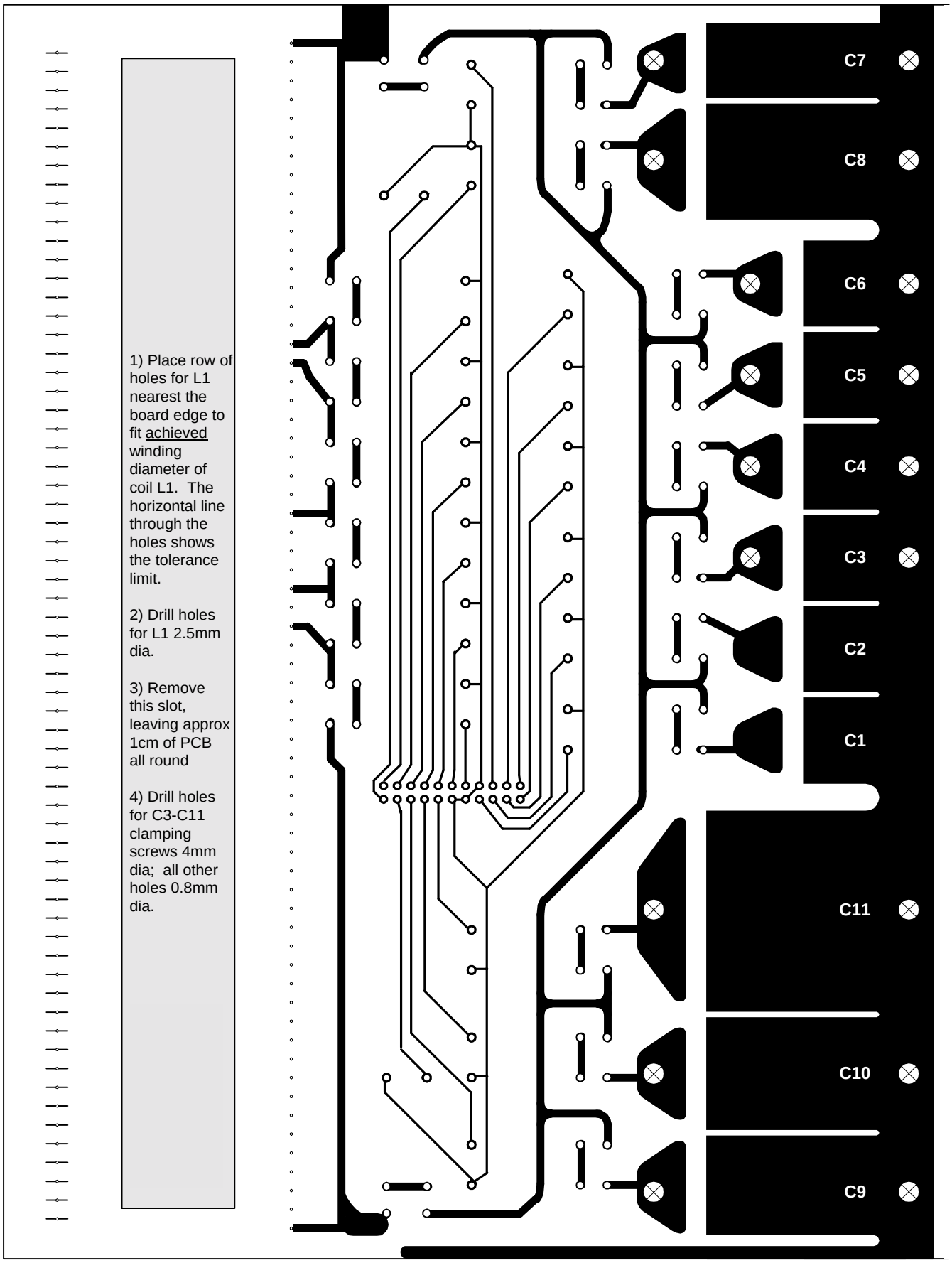

Fig 15: L-match section of RF deck PCB. The illustration edge is also the PCB edge except on the right hand side. The PCB artwork continues on the page opposite with a fully etched gap between the two sections. See text for discussion of etching issues.

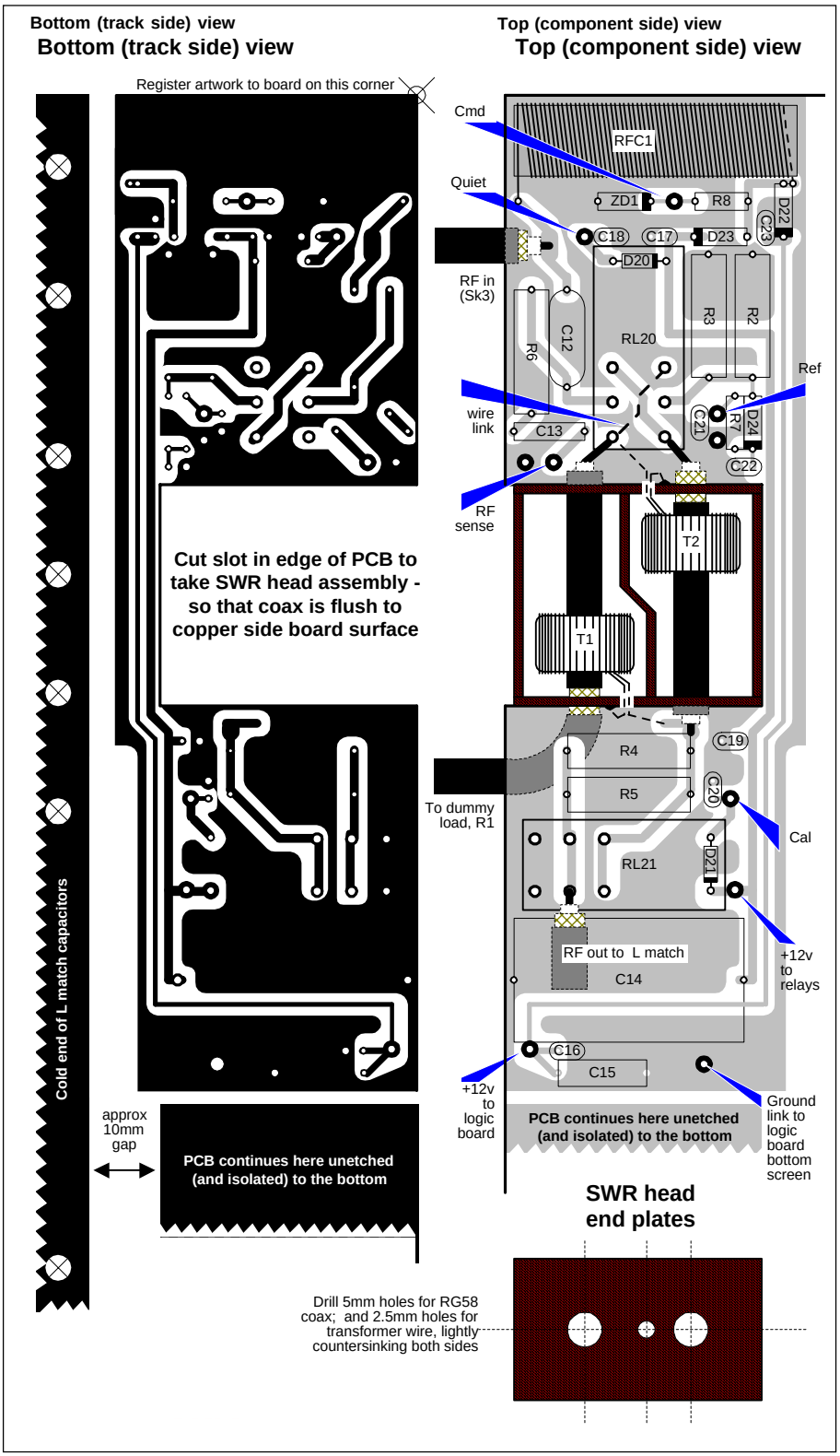

Fig 16: Sensor section of RF deck PCB. Note that all the coax cables are fitted on the underside (track side) of the board. Bond RFC1 to board after fitting board to casing.

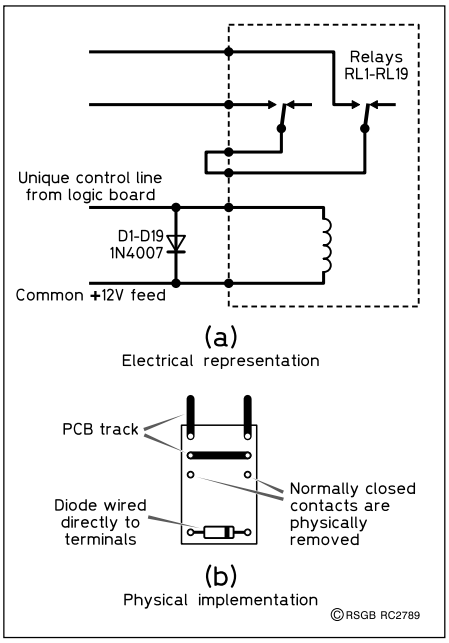

Fig 17: L-match relay detail. Starting with 2-pole changeover the relay is modified and wired to give a logical single-pole normally open contact.

to the corners - in both directions.

Splitting the case can easily happen and it doesn't matter - so long as you keep the cases and bases paired together. Note that the case goes back on with the small vent hole over the contacts. Some come apart more easily than others, but I succeeded with little persistence on my first and only batch of 19 attempts.

Removing the contacts

Grip the relay base in a vice. Using a soldering iron (very hot, if you have the choice) apply heat to the pin of the normally-closed (largest) contact - using some solder to ensure thermal transfer. Count to about 10 (you will determine your own figure) and then quickly grab the contact arm near the contact with a pair of thin nosed pliers - and firmly pull it out sideways from the relay.

If there is any substantial resistance, it is not hot enough. The contact arm will melt its way through the base material which, being thermoplastic, will largely self-heal. Turn the relay over and repeat for the normally-closed contact on the other side. Check the alignment of the remaining contacts. Apply 12V to the coil and verify operation, because it is never easy to remove relays from PCBs if you get problems subsequently. Replace the case (with a little click). I did not re-glue it since the case is not sealed anyway. When you get numb with boredom doing all this, remember that you have probably saved yourself between £200-£500 on real relays.

FITTING L1 TO THE PCB

BEFORE ATTEMPTING to fit L1, the coil must be finished in every other respect - ie 63 full turns (plus a few mm for the end connections). The holes in the PCB must also have been drilled to suit your achieved coil diameter. If there is a significant error on the latter, the coil will bind as you try to screw it into the holes - and in the worst case you could end up with insufficient turns. The PCB itself should be fully etched but unpopulated.

Clamp the board securely in a vice and determine which end feels most comfortable to screw the coil in from - this probably varies between left- and right-handed people.

Offer the coil to the board, passing the leading end of the wire through the end hole in the inner row. The direction through the hole will be determined by the sense in which you wound the coil in the first place - and is unimportant. Start screwing the coil into the holes, supporting its weight with one hand; with the other, hold the coil with your fingers inside, thumb outside. The first few turns are awkward and two pairs of hands are useful.

Thereafter, feed no more than a couple of centimetres at a time into the starting hole - and work it along the length of the coil. If it binds, it will be because the PCB is forming a chord to the coil circle instead of the diameter. Or because you are feeding a different length *out of* the free end than you are inserting *into* the coil at the other. Either way, sighting along the axis of the coil can be useful and a little pulling and pushing will clear it. If the board starts to buckle, this is an extreme symptom with the same causes. Do not be tempted to use any form of lubrication. There is a definite knack to it and, as ever, you will have acquired it by the time you have finished!

Screw the coil in until all turns are in and the ends are at the ends, so to speak. Now you know that these two end points on the coil are in the correct places - and why it was so important to start off with the correct size of coil in the first place.

One end will arrive at the copper side through a hole, the other end from above; the hole at this latter end is not used. For each end, bend it through a right angle and, while holding the plane of the end turn at right angles to the board, solder it to the board, using a large soldering iron. Now adjust all the other turns for an even appearance - as viewed from any and every direction.

Then solder the taps on the coil to the PCB track, starting near the middle of the coil and working out towards the ends. Pull the wire through the hole somewhat to improve access and remove the enamel on the outer diameter with a craft knife. Tin the wire, readjust its position relative to the hole, adjust the angle of the turn and solder to the track.

When all the taps have been soldered, make any final adjustments to the remaining turns and then apply some epoxy resin to all the coil holes - on one side of the board only. Probably the best way is to mix the resin with a nail, and then use the nail to draw out a thread of resin which you let drop across the wire where it enters the holes.

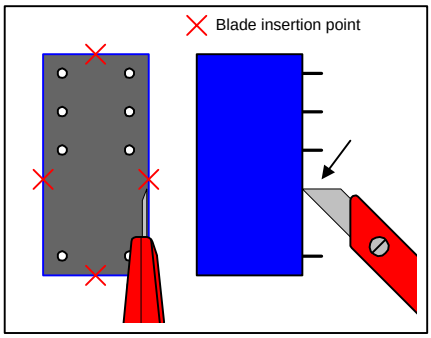

Fig 18: Relay modification, removing the case.

Once the resin has been applied, place the board so that gravity acts to flow the resin into the holes. Fit some temporary spacers between any deviant turns and leave to cure overnight. You will then find that the coil and that end of the board have acquired substantial mechanical stiffness - having effectively applied 63 triangulating struts to the PCB. The result will be a truly fine nearly air-spaced coil of great beauty. Can you imagine the mass-production costs of making something so wonderful?

BUILDING THE SWR HEAD

FIT THE SWR HEAD only after all other components have been fitted to the sensor section of the board.

Symmetry is the keynote throughout. Start by making the two end-plates of the SWR head enclosure from double-sided PCB as per the template in Fig 16. Cut out two side plates and, making sure it fits the slot cut-out in the main PCB, assemble into a four-sided box – seam-soldering the internal corners. Note that although the two end-plates are identical, they are fitted rotated so that the offset hole near the centre of each end-plate is not opposite its partner. Fit the box to the board, checking that it is the correct way up as per the drawing and so that the edges of the holes for the coax are flush with the copper side track.

NB Because of the inherent symmetry, it is very easy in this and subsequent steps to 'get things the wrong way round'. Always look at the board from the component side and compare with the component side view in Fig 16.

When you are satisfied, seam-solder the enclosure into position. Start with the shorter length of RG58, the one passing through T2. Prepare the ungrounded end, leaving as little braid showing as possible. Pass the coax through both holes and cut off to the required length, making an allowance for the slight bending of the inner at each end. Score the sheath at the grounded end just inside the enclosure. Withdraw the coax and fully prepare the grounded end, leaving enough braid exposed to solder to both the inside and outside of the enclosure.

Note that whatever else happens, each piece of coax is grounded at one end only. Repeat a similar (but pretty-well opposite order) process for the longer piece of coax through T1. Make sure you leave plenty of surplus length to reach your dummy load. In this case, prepare the grounded end first. Cut off a ring of sheath about 5mm long some 5cm from one end. Pass the coax through its holes and cut to length. Score the sheath 2mm outside the box, remove the coax and prepare the ungrounded end.

Wind the two transformers, T1 and T2, spacing the turns evenly around the toroid. Put two twists in the leads to stabilise the winding. Offer up T2 to the enclosure, passing both wires through their hole. Using a length of scrap RG58 to centre the toroid, locate it about 5mm from the end-plate inner wall. Trim one of its leads to ground to the outer wall, the other to the track - as per the drawing. Note that the sense of these windings is important, but wire them at random at this stage. Simply leave the leads sufficiently long so that they can be swapped over later if needed.

Withdraw the coax, then the toroid and bare and tin its leads. Refit as above - but this time, use the prepared piece of coax. Solder into position both toroid leads and both coax inners - and the braid of the coax to the inner and outer screen walls. Now cut and bend a piece of brass shim to form the internal divider (full height of the box) and solder it in position. After first ensuring the cross-connecting wire link on RL20 is in position, repeat the above process to fit T1 and its associated coax.

Cut and bend a further piece of brass shim to form either a top or bottom cover - with external lips - and seam-solder it in position to the outer of all four enclosure walls. The other cover may be left until after initial testing - to maintain interim access - and then finally soldered at four points only, to maintain emergency access thereafter. **CORRECTION**: last month, the label for Bits A to E in Fig 12 *should* read "Optional interface...".

NEXT MONTH

THIS WILL CONCLUDE the build phase and cover early testing. ♦

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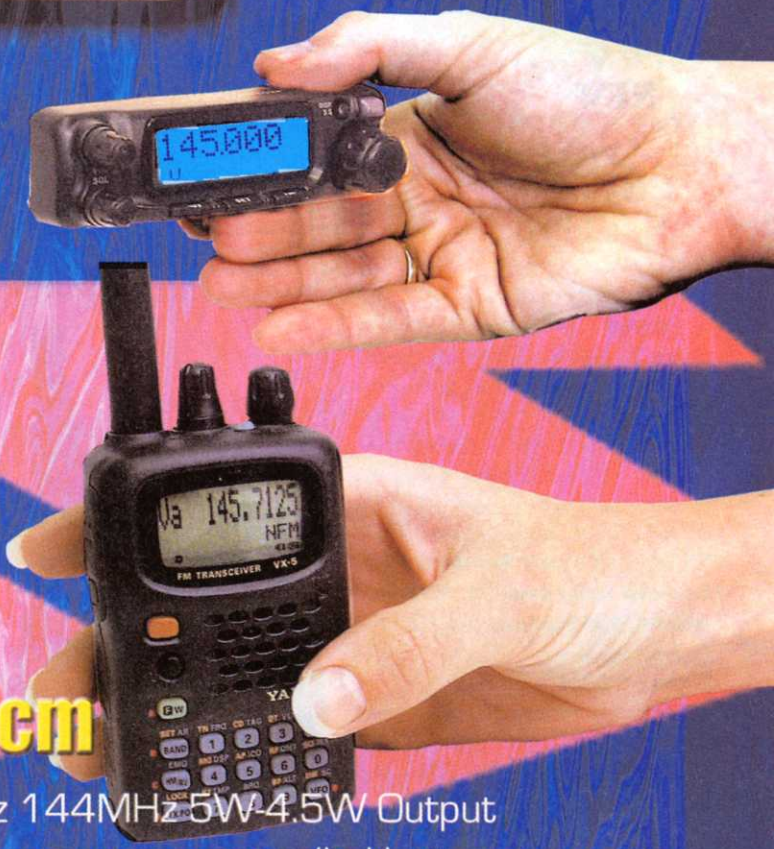
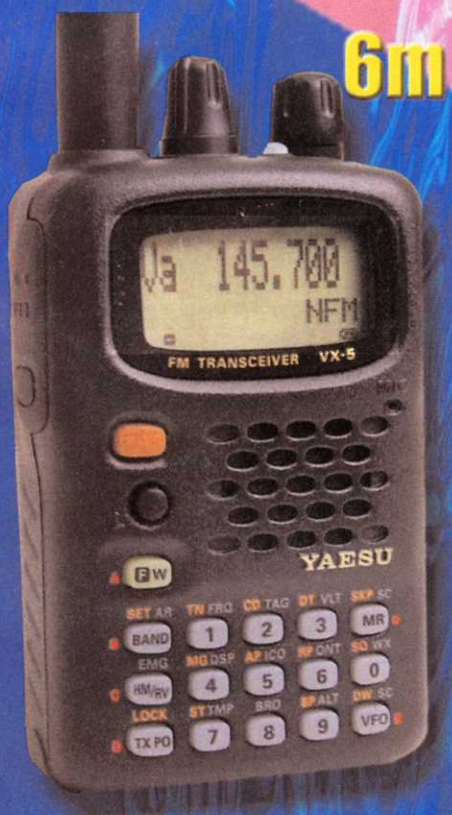


6m /2m /70cm



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National Field Day 2000

*by Dave Lawley, G4BUO**

'Searching and pouncing' on Sunday afternoon. G0OGN (left) and G3MXH of the Stratford Upon Avon club, G0SOA/P.

The HF Contests Committee has spent many hours discussing field day in recent years, debating some esoteric aspects of the rules and seeking to reverse the fall in the number of groups participating. Apart from the Commonwealth Contest this is our oldest contest, and for many Society members it is the only contest they take part in during the year. Surveys show that many hams whose main interest is the competitive side of the hobby were bitten by the bug when they first went to a field day.

There has been a noticeable downward trend in the number of entries in both CW and SSB field days in recent years. This is not a matter of the decline of CW, real or imagined, so much as the difficulty that many clubs experience when trying to get sufficient support for any of their activities. After a few years of falling numbers, I was encouraged before NFD by the increase in notifications for this year's event. As the day approached, however, a number of groups found they had to pull out. Clubs as far apart geographically as Farnborough and Scarborough found their sites were waterlogged following the heavy rains of the preceding weeks. Bracknell ARC, G4BRA/P, had the same problem but managed to find another site at short notice. Taunton had planned two entries this year, but the bad weather meant that silage had not been cut and only one field was available.

Not all cancellations were down to the weather and although eight groups from Scotland registered, most of them cancelled due to difficulties in getting enough people for a team, and five of the eight were forced to pull out.

The changed QRP section with its 12-hour limitation attracted a number of groups, including Stevenage, G3SAD/P, in their first NFD entry. Making a welcome return to NFD after a few year's absence were Hereford, G3YDD/P, and Barry, GW4BRS/P.

Field day is the only one of the Society's HF contests in which we ask you to register beforehand. This is primarily so that we can arrange site inspection, in order to ensure the playing field really is level. This year 10 groups were inspected. I had a report that one group felt the arrival of the inspector somehow impugned their integrity: this is certainly not the case, the idea is just to spread inspections around evenly.

I have always been concerned that missing the deadline for registration may mean some groups miss NFD altogether, so starting in 2001 the Committee has decided that registration will not be mandatory though any group not registering by the due date (usually about three weeks before NFD) will not be eligible for any awards. It is hoped that this will facilitate eleventh-hour decisions to enter NFD, though we would still like groups to register wherever possible.

QRP SECTION

As well as limiting the QRP section to 12 hours, the Committee raised the power level to 10W in line with the UK Novice licence. The year 2000 was perhaps not the best time to limit the section to 12 hours because static levels were high on 80 and 160m, and with 20m open around the clock it was a tough strategic decision choosing which 12 hours to operate, while observing the need for off periods to be at least an hour long.

Some found that the decision was made for them by the lack of operators to man the 'graveyard shift' overnight, but if the QRN had not been so much of a problem, the QRP entrants would have been well advised to spend plenty of time on topband because of the double points available.

The bulk of QRP groups seemed to start the contest with the rest of us at 1500UTC but by doing this, they were competing with everyone else to call and work the stations who were CQing. It is arguable that a better strategy for QRP entrants might be to start the contest after the initial rush has died down, maybe as late as 9.00pm, work as much as possible on 160 and 80m and then get some sleep, returning at, say, 9.00am and then running through to complete the 12-hour allotment.

Congratulations to past QRP section winner John Linford, G3WGV/P, representing Bracknell ARC who had clearly thought long and hard about strategy beforehand. His log shows that he made the great majority of his QSOs after midnight, and he won the QRP section by a handsome margin, to retain the Reading Trophy.

While single-man entries inevitably miss out on many of the social features that make field day such fun for the rest of us, the reduction of this section to 12 hours makes it a practical proposition to consider a one-man operation in this section and I found myself wishing that some of the groups which cancelled at the last minute due to lack of operators might have considered going out anyway but switching to the QRP section.

OPEN SECTION

A few years ago the balance of entries was in favour of the Restricted Section but it seems now that a lot of groups find one antenna *too* restricting, and many like to put up the multiple antennas allowed by the rules of the Open Section. Lichfield, G3NKC/P, have perfected the art of putting together a competitive antenna farm and this year amassed 4246

Steve Taylor, G4EDG, operating the Torbay ARC's station G3NJA/P.

*Carramore, Coldharbour Road, Penshurst, Kent, TN11 8EX.

points to win the Open Section and regain the Bristol Trophy.

Newbury, G3WOI/P, operated by G3RVM, G3ZGC and G0ORH attained their highest-ever NFD place and win the G6ZR Trophy for second place. A feature of their operation was a very strong performance on 28MHz, including four VK QSOs between 0700 and 0800UTC.

A waterlogged Hornsea ARC, G4EKT/P.

RESTRICTED SECTION

Those familiar with NFD will know that GM3POI/P operated from Orkney by two Englishmen, GM3POI and G3MXJ, has dominated in recent years, but the pair had stiff competition from the Three As group who continued their journey around the British Isles and this year managed to book their ferry journey early enough to be able to travel to the Isle of Man in TT week, though finding accommodation proved extremely difficult. Casting aside their trusty TS-930 for a brand-new FT-1000MP, they finished the contest just three contacts behind Orkney. Their score was not so close, perhaps due to the number of two-point QSOs made with Europeans keen to get GD into their logs on CW. GD0AAA/P must settle for the Gravesend Trophy while GM3POI/P retains the NFD Shield and Scottish NFD Trophy.

Congratulations to G4BWP, G4BJM and G5LP operating the Mid-Beds station G4BJM/P for coming out ahead in the tough struggle for third place.

There was a close battle between Telford, G3ZME/P, and Gloucester, G4AYM/P, for the top spot on 14MHz, but both were outgunned by De Montfort University, G3SDC/P, whose greater fire-power with Open Section antennas gained them the Frank Hoosen, G3YF, Trophy.

RESULTS - OPEN SECTION

Pos	Group	Callsign	160m P/Q	80m P/Q	40m P/Q	20m P/Q	15m P/Q	10m P/Q	Total QSOs	Total Points
1	Lichfield ARS	G3NKC/P	114/810	163/574	266/850	273/856	153/500	94/656	1063	4246
2	Newbury & D ARS	G3WOI/P	125/864	128/455	218/689	267/812	171/571	111/719	1020	4110
3	East Notts CG	G3TBK/P	135/929	142/505	224/698	281/864	179/565	46/306	1007	3867
4	Oxford &D ARS	G5LO/P	115/823	146/511	160/542	288/897	126/409	63/409	898	3591
5	Dragon ARS	GW4TTA/P	99/671	80/283	118/375	306/925	145/471	102/635	850	3360
6	North Wakefield RC	G4NOK/P	78/481	78/255	242/761	191/586	216/674	68/456	873	3213
7	Horsham ARC	G4HRS/P	92/646	100/368	199/620	241/752	81/259	54/347	767	2992
8	Knockycoid CG	GM3JKS/P	60/456	55/194	139/475	215/703	198/646	65/453	732	2927
9	Melton Mowbray ARS	G4FOX/P	102/688	64/242	182/579	161/521	120/366	59/409	688	2805
10	Taunton & D ARC	G5JJ/P	93/681	111/415	95/321	111/374	116/410	76/498	602	2699
11	Weston-s-Mare RS	G4WSM/P	61/426	99/348	154/500	240/745	128/401	42/265	724	2685
12	Scunthorpe Steel ARC	G4FUH/P	88/661	76/291	164/539	182/588	126/411	24/172	660	2662
13	Grimsby ARS	G3CNX/P	84/608	58/211	187/633	165/522	32/103	24/144	550	2221
14	Barry ARS CG	GW4BRS/P	12/89	99/334	186/570	344/1015	24/81	4/24	669	2113
15	De Montfort Uni ARS A	G3SDC/P				685/2001			685	2001
16	Ilford RSGB Group	G3XRT/P	70/494	78/287	198/659	119/394	16/52	16/96	497	1982
17	Bromsgrove & D ARC	G3VGG/P			301/919	333/1004			634	1923
18	South Essex ARS	G4RSE/P	46/350	54/192	74/250	146/415	112/303	12/62	444	1572
19	Clifton ARS	G3GHN/P	88/658	43/162		72/225	40/110	45/268	288	1423
20	Burton Upon Trent &DARS	G3NFC/P	5/40	83/304	129/450	75/231	14/44	2/8	308	1077
21	Dundee ARC	GM4AAF/P	16/101	28/102	91/316	64/227	38/128	5/26	242	900
22	Bangor & D ARS	GI3XRQ/P	18/70	29/112	50/162	77/247			174	591

RESULTS - RESTRICTED SECTION

1	Orkney ARC	GM3POI/P	135/929	120/454	179/619	354/1107	223/746	67/498	1078	4353
2	Three As CG	GD0AAA/P	145/988	147/503	237/762	300/932	184/587	62/440	1075	4212
3	Mid Beds CA	G4BJM/P	139/1001	160/554	220/752	265/850	167/546	59/395	1010	4098
4	Gravesend RS	G3GRS/P	118/868	155/566	205/709	268/892	144/491	68/468	958	3994
5	Echelford ARS	G3UES/P	132/980	170/593	219/749	225/759	144/496	50/348	740	3925
6	Park Air Group	G3KHZ/P	144/1029	118/445	302/941	230/744	120/417	44/300	958	3876
7	South Downs CG	G4FNL/P	126/893	162/573	213/681	276/889	150/494	46/308	973	3838
8	Addiscombe ARC B	G3VYI/P	106/763	113/409	176/622	251/841	141/469	62/435	849	3539
9	Guildford & D RS	G5RS/P	93/658	131/467	192/624	241/764	100/325	58/386	815	3224
10	Addiscombe ARC A	G4ALE/P	114/848	102/374	190/667	148/508	97/336	50/333	701	3066
11	Edgware & D RS	G3ASR/P	107/762	138/489	187/593	196/617	114/358	33/210	775	3029
12	Windmill CG	G0FBB/P	101/710	94/346	160/518	203/626	96/297	47/314	701	2811
13	Hornsea ARC	G4EKT/P	71/516	112/412	158/548	172/551	100/339	24/168	637	2583
14	Leicester RS	G5UM/P	69/518	112/393	143/474	135/451	64/211	21/152	544	2199
15	Maidenhead & D ARC	G3WKX/P	70/532	80/308	132/449	146/506	70/254	19/116	517	2165
16	Horndean & D ARC	G4FBS/P	52/405	102/359	166/554	82/277	94/336	29/184	525	2115
17	Harwich ARIG	G0RGH/P	86/608	111/398	132/413	71/224	88/288	20/142	508	2073
18	Hereford ARS	G3YDD/P	48/365	97/358	130/437	139/472	50/153	16/122	480	1907
19	Henry Wiggins CG	G2CP/P	51/364	62/229	161/553	110/383	96/310	8/54	488	1893
20	RAFARS	G8FC/P	22/173	76/283	139/468	139/455	72/245	30/204	478	1828
21	Telford & D ARS	G3ZME/P				401/1174			401	1174
22	Bracknell ARC	G4BRA/P	154/1084						154	1084
23	Gloucester AR & ES	G4AYM/P				373/1076			373	1076

(Low Power Section Results on page 30)

RULE CHANGES

Those who study these things will have noticed that the rules for *next* year's contest in the October 2000 *RadCom* contain a change to the rule applying to the second receiver, in CW and SSB field days. The difference between the Open and Restricted sections has been reinforced, in that we now allow entrants in the Restricted and QRP sections to have only one transceiver on the table, and if that transceiver contains a second receiver, as in the case of the FT-1000MP, then it may be used if required.

The Open Section rule will allow more flexibility in that a second receiver (or transceiver with transmitter section disabled) may be used, if desired, and this can enable a second operator to listen on another band, using another antenna, while the main operator is transmitting. Note that only two receivers may be used, and that the transmitter section of a transceiver being used as a second receiver *must* be disabled for the duration of the contest.

RESULTS - LOW POWER SECTION

Pos	Group	Callsign	160m P/Q	80m P/Q	40m P/Q	20m P/Q	15m P/Q	10m P/Q	Total QSOs	Total Points
1	Bracknell ARC	G3WGV/P	62/480	102/376	126/436	50/185	21/71	2/16	363	1564
2	Torbay ARS A	G3NJA/P	37/138	72/274	93/325	93/326	72/257	38/132	405	1452
3	Stratford on Avon & DRS	G0SOA/P	29/217	46/180	126/431	71/239	24/92	6/40	302	1199
4	Stevenage & D ARS	G3SAD/P	27/208	16/62	72/254	42/153	27/97	17/117	201	891
5	De Montfort Univ ARS B	G0TPH/P		4/16	68/258		51/173	19/118	142	565
6	Stockport RS	M5MDX/P			49/163	32/100	12/38	2/16	95	317
7	Torbay ARS B	G3RMA/P			18/57	39/115	19/65		76	237
8	Lowestoft ARC	G3OEP/P			35/112	20/68	3/8		58	188

Checklogs acknowledged with thanks from G2FSR, G2HLU, G3YRC/P, PA3HBB/P, UA0ZC, VK2AYD, VK8AV.

LOGGING

The task of log-checking has changed in recent years and this time only four entries were received on paper, and had to be keyed into a computer before cross-checking could be carried out. The majority of logs came via e-mail and the great majority of entrants used EI5DI's *SuperDuper*. Whatever method is used for logging, it is worth doing a 'sanity check' of your log. If you work GW4TTA/P on four bands, is it *really* likely that the 40m QSO was with GW3TTA/P? Is 'DJ1M/P', 'S58/P' or 'ON4' a valid callsign? How about AV5ZN, 5B2XC, RH3A, J51TFE or A6ZDF? Some of these may be keying errors, but if you are not sure take time to query the callsign and keep on asking for repeats until you know you have logged the QSO correctly.

Unlike some other contests, such as *CQ* World Wide, checking of RSGB contests includes confirmation of serial numbers logged so you have to copy the exchange correctly as well.

The graph in **Fig 1** plots the percentage points lost as a function of the claimed score, and it indicates generally that the higher the score, the fewer points are lost, as a proportion. This is not surprising since the leading groups in this contest, like any other, are experienced operators who would (or should!) know instinctively that A6ZDF is very unlikely to be a correct callsign.

SOAPBOX

"Thunder / lightning started at 0200 and lasted for three hours but we kept working" – G4EKT/P; "Team enjoyed field day as ever and the barbecue on Saturday evening was a good boost to all" - G5RS/P; "Operated from our usual site, the village football field with antenna across the middle of the pitch, then without warning the footballers decided to play as well on Saturday afternoon"- G3KHZ/P; "Enforced shutdown due to thunderstorm 2130 - 2230. It was quite spectacular. Thank goodness it was dry for packing up the station" – G4FOX/P; "Lightning burnt out the 160m coil in the ATU, restricting our topband activities. All members of the team enjoyed themselves. We had a couple of first-time operators and they both show keen interest in having a go again next year" - G8FC/P; "One of our newer ops found that many stations did not QRS when asked. This may deter beginners" – G4FBS/P; "Our first entry into this section went smoothly, although operating from the same site as the Open Section gave some problems and meant no operation on 14MHz. The new 12-hour format gives lots of scope and is much appreciated" – G0TPH/P. ♦

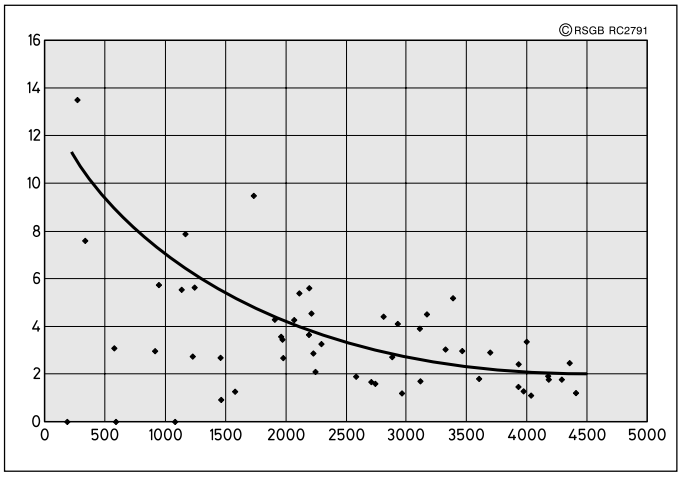

Fig 1: Percentage of points lost compared with the claimed score.

RadCom Helplines FOR MEMBERS

● Bob, K4QQK, is looking for a copy of the circuit diagram and description of the **Liniplex F1** or **F2** fixed HF receivers, made in England by Phase Track Ltd. E-mail: bobm@edge.net

● Peter, G3BPM, is looking for circuit diagrams and technical information of the **Advance B4A5** signal generator, and the **SSB Products Sphinx** SSB transmitter. He is also seeking a source of stranded stainless antenna wire, as used by the RAF for trailing aerials. All costs met. G3BPM, QTHR. Tel: 01935 881 763.

● Don, G0MDO, would like information on connecting a lawnmower engine to a car alternator, to produce a portable **12-volt generator**. G0MDO, QTHR. E-mail: don@rafars.freeserve.co.uk

● John, GM8LMH, is looking for a copy of the circuit diagram and information on the **GEC BRT-400/402K** receiver. This is a non-loctal version, using B7G valves. All costs met. GM8LMH, QTHR. Tel: 01838 200 304.

● Pat, G3MA, is looking for a source of the following transistors: **2SC1815Y, 2SA564AR, 2SK19BL** and **2SK19GR**. They are all associated with the meter circuit of the **Yaesu FT-102**. G3MA, QTHR. Tel: 01452 539 519.

● Norman, M0CGJ, is looking for a copy of the instruction manual for the **Heathkit HD-1250** dip meter. All expenses reimbursed. M0CGJ, QTHR. Tel: 01634 682 472.

● P H Tate, BRS41838, is looking for information on the **RX Reception Set UHF Special Mk2 R.A.P. Cat No. ZA11324**, made in WWII. Costs covered. P H Tate, 32 The Orchards, Bristol BS15 9UF.

● Brook, G0VEB, is looking for a copy of the manual, circuit, or any other information on the **KW Viceroy** Mk4 SSB transmitter. All costs and postage covered. G0VEB, QTHR. Tel: 020 8882 4110.

● Malcolm, G8AKX, would be interested to hear from anyone who has recently bought a **Panasonic WV-CL110AE** colour CCD camera. G8AKX, QTHR.

● Brian, G7WJC, is looking for technical information, circuit diagrams, etc for the **Icom H16** or **U16**. All costs refunded. Please contact Brian, G7WJC, QTHR. Tel: 01254 886384.

● Bob, G0GUZ, is looking for a copy of the manual for the **Icom IC-22A** 2m transceiver. All costs will be reimbursed. Tel: 01223 413 401. E-mail: bob.grimes@btinternet.com

● Harold, G3HQH, is looking for information on the **Realistic** (Tandy) **DX-302** communications receiver. G3HQH, QTHR. Tel: 01663 744 087.

Helplines is a free service to members. Requests for help are published in the order they are received. We regret it is not possible to provide an undertaking of when any submitted request will be published.

eurotek

edited and translated by **Erwin David,** G4LQI*

*The requirements **for high-performance amateur-band receivers** are well documented [1] but they require very careful implementation. **Werner Schnorrenberg, DC4KU,** designed a receiver front-end which combines high sensitivity with outstanding large-signal tolerance and optimum spurii suppression. From* CQ-DL *7 & 8/00.*

The specifications for the front-end are:
IP3 = 26dBm
Dynamic range >100dB
Noise figure <10dB
0dB gain - antenna input to crystal filter output.

SINGLE CONVERSION

THE LEAST COMPLICATED approach calls for single conversion, but this has the disadvantage that the suppression of image and IP2 mixing products (f1+f2, f1-f2) requires sub-octave (ie with a bandwidth of less than 2:1) preselection filters. If tailored to pass just one amateur band, such filters are useful anyway, as they keep very strong out-of-band signals from swamping the mixer.

In the block diagram in **Fig 1** projected gains and noise figures are indicated for each block, as are IP3 levels.

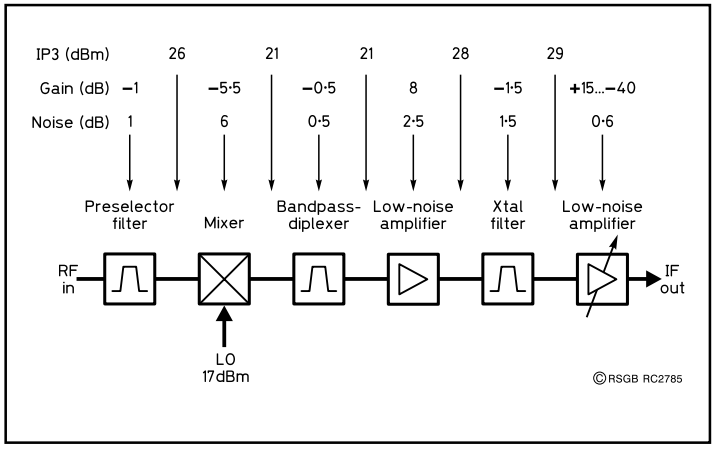

Fig 1: Block diagram with IP3 levels, stage gains and noise figures.

Care was taken to terminate all ports of the diode ring mixer with their nominal impedance of 50Ω; this requires an amplifier between mixer and crystal IF filter as outside its pass band the latter presents wide impedance swings to the preceding block. That amplifier must make up the signal loss between antenna and mixer output without adding appreciable noise.

Note that for the sake of maintaining a very high IP3, there is zero gain from the antenna input to the crystal filter output. This requires that the IF amplifier following immediately after the crystal filter not only properly terminates the crystal filter, but also provides gain with very low noise.

Space limitations do not permit a description of DC4KU's IF circuitry; please refer to the receive chain in *The Belthorn SSB IF Module,* by G4GXO [2], which mostly differs in the crystal filter: DC4KU uses three 500Ω KVG 9MHz filters [3] for different modes, while G4GXO uses a home-brew 10MHz ladder filter.

FRONT-END DETAILS

THE DIAGRAM IS SHOWN in **Fig 2.** Through a switch-selectable 20dB attenuator (not shown) and a separate bandfilter for each of the designer's favourite four HF bands, the signal is applied to a diode mixer, a standard commercial model (SRA-1H for 0.5 - 500MHz or SRA-3H for 50kHz - 200MHz); for general coverage, a separate antenna input feeds into the mixer input (not shown).

The mixer requires a big local oscillator signal for best performance; this is provided by an LO buffer (not shown) which boosts the local oscillator input from -3 to +17dBm and presents a 50Ω source impedance to the mixer's LO port.

The mixer output is fed to an IF bandpass filter / diplexer which passes the 9MHz IF to a grounded-gate FET amplifier, but presents a 50Ω termination to all other mixing products.

THE PRESELECTOR FILTERS

THE COMPONENT DATA FOR the 80, 40, 20 and 10m bands are shown in **Table 1.** Values for topband and other HF bands can be found by extrapolation or interpolation. All coils are wound on Amidon T50-2 toroids. The calculated capacitor values may be fixed types (close-spaced values are available in Maplin's WX-series metallised ceramic plate types) or, for best results, by compression trimmers adjusted using a sweep generator and a 'scope.

Bandfilters are selected by relays, not by switching diodes which may introduce non-linearities [4].

NOTES

[1] See *Radio Communication Handbook*, 7th ed (RSGB), pp 6.9 - 6.14.
[2] See *RadCom* April / May 2000.
[3] *Radio Communication Handbook*, 7th ed (RSGB), pp 5.43 - 5.44.
[4] See *Technical Topics* in *RadCom*s April, July, November, December 1995.

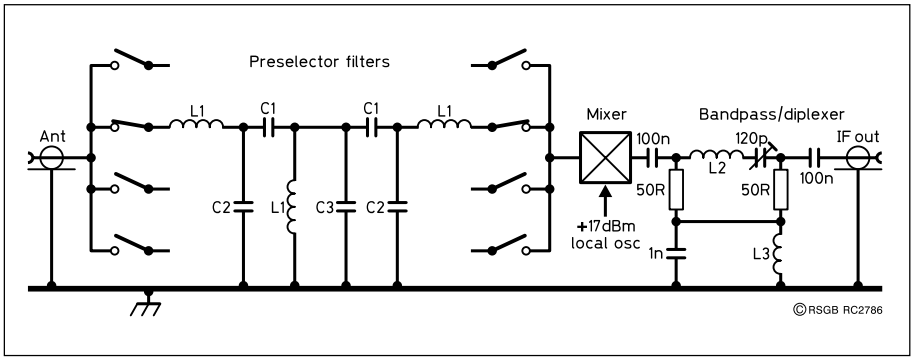

Fig 2: Circuit diagram of the front end.

Band	C1	C2	C3	L1	Turns	f_c	BW %
80m	31	136	117	11	47	3.7	20
40m	16	71	61	5.8	34	7.1	20
20m	18	48	39	1.9	20	14.1	30
10m	8.8	23	19	0.94	14	29	30

For 9MHz IF: L2 = 2.57µH, 24 turns 0.33mm Cu-en on T50-2 core; L3 = 308nH, 13 turns 0.8mm air D=8mm L=20mm.

Table 1: Component values - C in pF, L in µH, f in MHz.

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Newcomers' News

News and Comment from and for Amateur Radio's Newcomers. Compiled by Steve Hartley, G0FUW *

IT IS ALWAYS nice to put a face to a name or voice and I was very pleased to meet David Berry, G4DDW, recently whilst in the midlands on business. Regular readers will recall that David's MWRx project was featured in the April 2000 'Newcomers' News', and many readers wrote in for construction details. I haven't heard how you all got on, but David told me he had received some favourable feedback. David showed me his Novice classroom shack where he has trained over 20 newcomers and achieved a 100% pass rate in the NRAE. Well done David and thanks for the coffee!

AGE LIMIT REMOVED

IT'S OFFICIAL, the minimum age limit for the full amateur radio licence has been removed (see p11 of the October *RadCom*). Following recent discussions between the RSGB and the Radiocommunications Agency, it was agreed that the restriction should be completely removed. Until now you had to be 14 years of age or over, or have held a Novice licence for a least a year, to be eligible.

So, if you are under 14 and have already obtained a pass in the RAE (and in either the 5WPM or 12WPM Morse test for a Class A/B and A licence respectively), you may now apply for a full licence. An amended copy of *How to Become a Radio Amateur* is now available from the RA web site (www.radio.gov.uk/), or by post.

* *5 Sydenham Buildings, Lower Bristol Road, Bath, BA2 3BS.*

Jack White, M5PRO, operating G6YB/P, the Bristol Contest Group's station on the Isle of Wight (see 'Jack Goes Island-Hunting').

LATEST EXAM RESULTS

NEWCOMERS STUDYING for the next NRAE would be well advised to obtain a copy of the City and Guilds report from the June sitting. I always find the reports a great help in focusing my attention on topics that have been covered in the exams and, as a trainer, they help me to know what subjects candidates are finding a bit tricky. For example, in this latest report we are told that only 40% of candidates knew the convention of using upper sideband for phone transmissions on the 28MHz band.

One point that crops up again and again is the colour-coding of mains wiring. In this exam, 28 candidates did not know the colour of the live wire in a 13A mains plug. Even though most equipment now comes with a plug ready-fitted, it is a major cause for concern that such a major safety point is being misunderstood. I always remember the colours by thinking of a live brown bear sitting on the green-and-yellow earth staring out at a neutral blue ocean. It may seem a little strange, but it seems to work.

Congratulations go to the 113 successful candidates and commiserations to the 28 who failed. Don't give up. With a bit of revision you should sail through next time.

The examiners' reports for both RAE and NRAE exams can be found at www.kippax.demon.co.uk/c-and-g and members without access to the world wide web can obtain copies from RSGB headquarters in return for an SASE marked with the relevant exam.

Having studied a number of these reports, I have prepared a practice NRAE paper based on the 'tricky' questions. If anyone would like a copy for revision purposes, send me a request via e-mail, or an SASE will get you a hard copy (see below for the addresses).

SOME COURSES NEVER STOP

ONE OF THE MANY to write in for details of the G0BBL active antenna project was Eric Eastwood, G1WCQ, from the Preston Amateur Radio Society. Eric has been a Novice Instructor since 1991 and has held classes since July 1994. He is another instructor to have the proud record of a 100% success rate.

The classes in Preston are run on an on-going basis all year round. Eric's logic is that youngsters impatient to get a licence may lose interest if they have to wait six months for the start of the next course, so newcomers can join the classes at whatever point they happen to be. Once they have completed the syllabus, they sit the next available exam. As Eric says, it seems to work!

JACK GOES ISLAND-HUNTING

TWO YEARS AGO, a very nervous young man started coming to our NRAE classes in Bath. Jack White was just 13 at the time and, having gained an interest in radio through CB, he decided try for his Novice amateur radio licence. He was successful at NRAE and at the 5WPM Morse test, but is now operating as M5PRO after studying hard for the full RAE.

Having visited the Bristol Contest Group operating just outside Bath, and not content with working around 80 DXCC countries from home, he was invited to join the group for their Islands on the Air (IOTA) DXpedition to the Isle of Wight in July this year. The team rattled up a massive score and Jack was lucky enough to be able to work around the globe using equipment most of us can only dream of. Jack says "it's quite a strange feeling having JAs end-stop". That's what a Yagi at 35m AGL can do, Jack! ♦

Spread The Word!

Send your news and colour photos to: Steve Hartley, G0FUW, QTHR.

E-mail: newcomers.radcom@rsgb.org.uk

Down To Earth

An Introduction to ESD

By Ian Poole, G3YWX *

ELECTROSTATIC discharge, or ESD, is a fact of everyday life and is of particular importance in the electronics industry these days. Years ago when valves were used it was not a problem and, even with the introduction of transistors, few considered it a problem. However, when MOSFETs were introduced, their failure rates rose. The problem was investigated and it was found that static build-up was sufficient to cause the oxide layer in the device to fail. Since then, the awareness of ESD has risen considerably, because it has been shown to have an effect on many devices. As a result of the importance attached to ESD, manufacturers of electronic equipment spend many thousands of pounds to ensure their workplaces are protected against the effects of static. They ensure that the products they manufacture do not have high failure rates during manufacturing test, and are able to demonstrate a high reliability over a long period of time.

WHAT IS ESD?

'STATIC' IS SIMPLY the build-up of charge between two surfaces. It arises when surfaces rub together; this results in an excess of electrons on one surface and a deficiency on the other. The surfaces on which the charge builds up may be considered as a capacitor. The charge will remain in place unless it has a path along which it can flow. As there is often no real path along which the charge can flow, the resultant voltage may remain in place for some time and this gives rise to the term 'static electricity'. However, when a conduction path does exist, a current *will* flow and the charge will be reduced. There is a time constant associated with the discharge. A high resistance will mean that a smaller current will flow for a longer time. A low resistance will give rise to a much faster discharge.

Obviously, the levels of voltage and current which are produced depend on a large variety of factors including the size of the person, the level of activity, the object against which the discharge is made and the humidity of the air. All these have pronounced effects, so it is almost impossible to predict the exact size of the discharges that will occur.

However, perhaps the major factor that affects the voltage produced is the material or materials involved. It is found that different materials give different voltages. The voltage produced is dependent upon the position of the two materials in a series known as the tribo-electric series. The further apart they are in the series, the greater is the voltage. The one that is higher up the series will receive a positive charge, and the one lower down a negative charge. Looking at **Table 1** it can seen that combing one's hair with a plastic comb will give rise to a positive charge on the hair, and the comb will become negatively charged.

There are many ways in which charges can be built up. Even walking across a carpet can give rise to some very large voltages. Typically, this might give rise to potentials of 10kV. In bad cases it could even lead to potentials of three times this value. Walking across a vinyl floor may lead to potentials of around 5kV being generated. In fact, any form of movement where surfaces are rubbing together will lead to the generation of static electricity. Someone working at a bench using electronic components could easily generate static potentials of 500V or more.

Positive charge
Skin
Hair
Wool
Silk
Paper
Cotton
Wood
Rubber
Rayon
Polyester
Polythene
PVC
Teflon
Negative charge

Table 1: The tribo-electric series.

While most of these voltages seem to be very high, they may pass unnoticed. The smallest discharges that can be felt are around 5kV, and even these can only be felt on occasions, because the current associated with them is very small. If the voltages rise to values around 10kV the discharges can sometimes be seen in the dark. When values rise above 20kV, they start to be felt more acutely, especially when there is a significant amount of charge stored. The discharges may take only a short time, often only a few picoseconds. However, for the charge to be dissipated in this time, the levels of current can reach several tens of amps, explaining why some discharges feel distinctly uncomfortable.

GaAs FET			50 V
Pre-1990 MOS VLSI	400	-	1,000 V
Post-1990 VLSI	1,000	-	3,000 V
B-series CMOS	2,000	-	5,000 V
Modern small-geometry bipolar	2,000	-	8,000 V
Power bipolar	7,000	-	25,000 V

Table 2:Typical susceptibilities of various types of device.

EFFECTS ON ELECTRONIC COMPONENTS

THE VOLTAGES and currents arising from static charge build-up can have a disastrous effect on electronic components. The fact that we do not normally feel most discharges does not mean that they do not affect semiconductor devices. In fact, most manufacturers of electronic devices treat all semiconductors as being static-sensitive and, along with this, many handle *all* devices (including passive components like capacitors and resistors) as static-sensitive. When looking at this, it must be remembered that most mass-produced pieces of equipment today use surface-mount components, where the dimensions are much smaller than the traditional components; this makes them more susceptible to damage from transient voltages.

Some devices are more sensitive than others, as can be seen in **Table 2**. Those containing FETs should generally be considered the most sensitive. In fact, the first MOSFETs that were produced were particularly susceptible to static burning through the insulating gate layer and rendering the devices useless. Later, manufacturers fabricated diodes into the devices to protect the gates. While this removed the major problem, it did not provide complete immunity. Radio amateurs interested in low-noise

* 5 Meadway, Staines, Middlesex TW18 2PW.

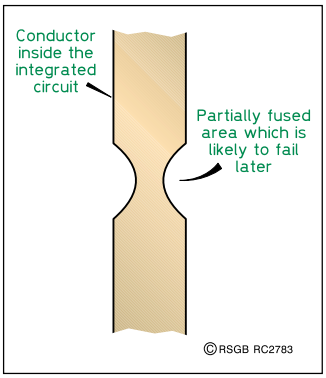


Fig 1: A latent failure in a device.

VHF / UHF front ends should be aware that GaAs FETs are particularly sensitive to static. The minute Schottky barrier diode that forms the gate must not be allowed to pass any current, and it cannot withstand high levels of voltage. Accordingly, these devices should be treated with great care.

It is found that even ordinary bipolar transistors should not be ignored. They have been shown to be damaged by static voltages of around 500 volts. This is particularly true for some of the newer devices that have smaller internal geometries, allowing them to be manufactured by today's smaller processes or to give them the required high frequency response.

With the advance of technology, the levels of integration are rising. Today all new processes employ sub-micron feature sizes. While this enables much greater levels of functionality to be included on chips, it also means that their resilience to high voltages and to static is reduced. In the future it is likely that more care will be needed in handling these devices, as it is unlikely that they will be made more resilient.

STATIC TRANSFER

THERE ARE SEVERAL ways in which static charges can be transferred to semiconductor devices. The most obvious is when they are touched by an item that is charged and conductive. The best example of this occurs when a semiconductor is on a workbench and someone walks across the floor building up a charge and then picks up the device. The charged finger then imparts the static charge very quickly to the semiconductor with the possibility of damage. Tools can possibly be even more harmful. Metal screwdrivers are even more conductive and will impart the charge even faster and this results in higher levels of peak current.

However, you don't have to touch something in order to damage it. Items such as plastic cups carry a very high charge, and placing one of these near an IC can 'induce' an opposite charge on the IC. This too can damage the semiconductor device. Also beware of ties made of man-made fibre, because they can charge up very easily.

FAILURE MECHANISMS

THERE ARE SEVERAL ways in which static can damage semiconductor components. The most obvious is local burn-out caused by a large voltage and the associated high peak current. Even though the current flows for a very short period of time, the minute feature sizes in the integrated circuit mean that damage is caused very easily. The interconnecting wire links or areas in the chip itself can be fused by this current.

Another way in which damage can occur is when the high voltage causes breakdown to occur in a component in the device itself. It may break down an oxide layer in the device, rendering the device inoperable. With dimensions as low as a micron or less, it is hardly surprising that even relatively low voltages can cause this to happen.

While these failure mechanisms can give rise to a total failure, a latent failure can be more sinister. Here the damage only weakens the device and does not cause it to fail - until later. These latent effects cannot usually be detected, and the device then fails after some indeterminate period in service. The result is that the overall level of reliability is considerably reduced. In other instances the level of performance may be reduced. This is particularly true of analogue devices, although digital devices can be degraded as well.

Latent failures may be caused when an interconnection is partially fused as shown in **Fig 1**. Here it can be seen that part of the conductor has been destroyed by the static discharge leaving it vulnerable later. Another way in which chips are damaged is when material resulting from damage is spread over the surface of the semiconductor, and this may result in alternative conduction paths.

Latent damage is one of the reasons why circuit boards that have undergone a considerable amount of work and alteration always fail more regularly than those that have not had so much 'attention'.

WORKING WITH STATIC SENSITIVE DEVICES

THE EFFECTS of static are taken very seriously by professional organisations. Many service engineers have their own portable anti-static work stations. Suppliers like Maplin stock kits for about £50. These comprise a mat, wrist strap and a method of connecting the system to earth, as can be seen in **Fig 2**. This is usually a special mains plug with a connection only to the earth. The mat itself is termed 'static dissipative'. It has a high resistance and will gradually leak any static away to ground in a controlled manner. A totally-conductive sheet would be as dangerous as no protection at all, because it would enable the static to discharge very quickly, apart from being very difficult to use when testing a circuit!

The interconnecting leads also have resistors (typically 1 or 2 Megohm) in them. Not only does this enable the static to leak away slowly, but it also prevents the possibility of electric shock if, for some reason, the earth lead became live.

The wrist strap should be worn whenever working on any electric circuits; it prevents the wearer from accumulating high levels of static. Any tools can also be placed on the mat before using them,to enable any static to be removed.

Manufacturing organisations may take other precautions as well: where full ESDPAs (electrostatic discharge-protected areas) are set up, floor surfaces are often treated to prevent static build up; sometimes people may have to wear special footwear enabling them not to build up a static charge as they walk around; in addition to this, static-protective 'white coats' may be worn - these prevent ties and any other garments of man-made fibre from transferring their charge to any electronic components and circuits.

SUMMARY

IF YOU THINK this is all a bit over the top, ask why electronic equipment is so reliable these days, especially when it is becoming even more sensitive to static. Manufacturers take static and its effects very seriously. By eliminating static build up, costly failures can be reduced during manufacture and long term reliability is increased, thereby improving customer satisfaction. ♦

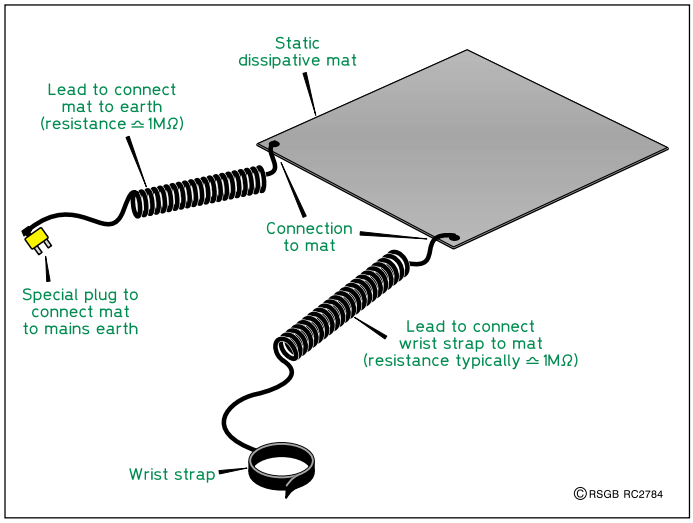


Fig 2: A basic electrostatic discharge-protected work area.

Down To Earth

The Voices

Part five, by Gordon L Adams, G3LEQ *

IN PART FOUR of 'The Voices', in September's *RadCom*, I looked at the broadcasting interaction between the USA and Cuba. This month I consider the United Kingdom's external broadcasting services, and begin the history of a rather unusual and highly secret transmitting site.

As I explained in part one (June 2000 *RadCom)*, the Cold War period extended from the time of the Russian blockade of Berlin in 1948 until the collapse of communist rule in Eastern Europe around 1989. During this 40-year period dramatic changes occurred in the European broadcasting scene, particularly in the number of transmitters and power levels employed.

DIVIDING THE CAKE

AT THE END of World War II it was clear that broadcasting frequency assignments, previously set up at a Cairo international conference in 1938, needed to be reorganised.

The United Nations had replaced the pre-war League of Nations, and it fell to a newly created body of the UN called the International Telecommunications Union (ITU) to bring some order out of potential chaos. The ITU held a conference in Atlantic City, New Jersey in 1947, when a number of broadcasting bands were enlarged.

A European Regional Conference then took place at Copenhagen in 1948 to share out specific frequency assignments to broadcasters. 33 countries were represented in Copenhagen, but outsiders such as the USA were not involved. Furthermore, countries occupied by the Allies (such as Germany) and non-members of the UN (such as Albania) were not represented.

The UK obtained 11 medium wave channels, plus the use of two low power international common frequencies, and one long wave assignment. Two of the MF channels were to be used for external broadcasting to Europe. The new plan was put into effect throughout Europe at 0200UTC on 15 March 1950, when virtually all broadcasters in the long and medium waves had to change their frequencies, in some cases by more than 100kHz.

To a radio amateur operating in the short wave bands such a change would be of no significance, but at LF or MF an alteration of this kind can require radical changes to the antenna system.

The frequencies to be used by the BBC for domestic broadcasting are not considered here, and I shall mention only those which were brought into use for external programming. In 1989 many of the LF and MF frequencies in use were changed by 1 or 2kHz, to make them divisible by a factor of nine, which was determined by the 9kHz channel separation previously agreed upon. This has important ramifications for the solid-state circuitry employed in modern frequency scanning receivers. If you are buying a medium wave broadcast radio for use in North or South America (ITU Region 2), then you need to note that those continents employ 10kHz channel spacing.

MORE AND MORE KILOWATTS

THE UK HAD only two frequencies assigned to its external broadcast transmitters, and these were 1295 kHz (now 1296 kHz) and 1340 kHz (now 1341 kHz) for Ottringham and Crowborough in turn. Furthermore, although these two sites had power capabilities of up to 800kW and 600kW respectively, they were both restricted to 150kW in the frequency table. The idea was that by restricting the power employed by broadcasters throughout Europe, mutual interference might be kept to a low level and that acceptable service areas could be achieved within national boundaries even after dark when F-layer propagation occurs.

This ideal soon collapsed. For a start, occupied Germany became a hotbed of political broadcasting involving the USA, UK, France, Russia and the Germans themselves – none of which was properly provided for under the plan.

By the 1960s numerous pirate radio stations had sprung up, many of them broadcasting popular music from ships in the North Sea. The result was that by the end of the 1960s the number of stations using any particular channel had quadrupled, whilst the power levels set in the plan had, in many cases, been doubled or tripled. The result after dark was bedlam throughout Western Europe.

BIG BERTHA

THE UK HAD TO juggle with its available channels, and five were selected in the medium wave band for partial use by the BBC's European service.

These were 647kHz, 809kHz, 1088kHz, 1295kHz and 1340kHz. They were employed variously by Daventry, Northants (150kW), Crowborough (Aspidistra, 600kW), Ottringham (600kW), Norden Osterloog (British Zone of Germany, 120kW), West Berlin (5kW) and from 1974/78 by Orford Ness (50/500kW).

However, all of these frequencies were used at some stage for local programming within the UK, whilst the West Berlin BBC outlet was deliberately masked by an East German transmitter at Markneukirchen.

During the war Ottringham had radiated on 200kHz, but on 29 July 1945 it handed over this

Radio Caroline, the most famous of the 'pop pirate' stations, which transmitted from the MV *Mi Amigo* anchored in the North Sea.

* *2 Ash Grove, Knutsford, Cheshire WA16 8BB.*

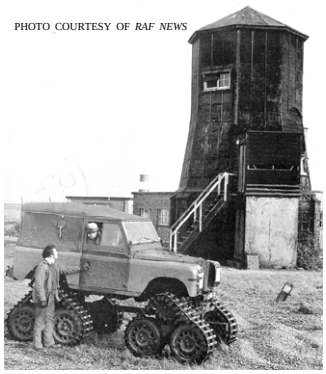
PHOTO COURTESY OF AWRE

The pre-war marine radio tower which originally housed the 1920s Orford Ness beacon GFP. Also on the shingle can be seen the lighthouse which is now within the nature reserve.

channel to Droitwich (5XX). Ottringham then changed to 250kHz with 400kW, but its second harmonic caused interference on the 500kHz marine distress frequency.

Two months later a change was made to 271kHz, and eventually it ended up on 167kHz and restricted to 200kW. With the introduction of the Copenhagen Plan it carried the BBC's European 'voice' on 200kHz, outside domestic broadcasting hours. It also radiated the European service on 977kHz with 100kW, and backed up Crowborough (Aspidistra) on 1122kHz and 1295kHz. What a versatile high-power transmitter! It was the BBC's HPMF 'Big Bertha', and many of their engineers were saddened when it was forced to close down on 15 February 1953. Two of its 200kW senders ended up at Droitwich. Perhaps the other two were purchased by a local radio amateur for use on topband - who knows?

PHOTO COURTESY OF *RAF NEWS*



Close-up of the marine radio tower which housed the Orford Ness beacon GFP in the 1920s. In the foreground is a Land Rover converted to track travel for use on the rough terrain of Orford Ness.

RUSSIAN SPOOKS

AROUND ABOUT 1973 / 1974 some confusion occurs in listings showing the usage of 809kHz and 1088kHz. Some documents show Crowborough as being the transmitter location whilst others state 'Norwich' or 'Norfolk'.

It was at this time that the 'Cobra Mist' installation (which we'll cover next month) was removed from Orford Ness, in Suffolk, but which is only about 40 miles from Norwich and the then designated BBC Midland Region transmitter at Postwick.

An engineering source confirms that a 50kW broadcast transmitter was installed on Orford Ness during this period, but that its actual location was kept under wraps.

After it had lost Ottringham, the BBC started to use its Droitwich 200kHz (now 198kHz) exclusive long wave frequency for broadcasting in Russian after midnight.

The Russians did not take too kindly to this usage of a UK domestic channel and gradually installed a number of high power transmitters of their own on this frequency.

By the end of the Cold War the Russians were employing a total of over half a Megawatt on 198kHz with transmitters located in Moscow, Leningrad (now called St Petersburg) and Ufa, whilst Poland was running 200kW from Warsaw. No wonder listeners to Radio 4 in the London area complained of hearing ghostly voices in the background.

RADAR IS INVENTED

ORFORD NESS is a shingle spit which is almost an island, stretching for nearly 10 miles along the Suffolk coast between Aldeburgh and Felixstowe. It is a rare formation of marshland, mud flats and shingle, separated from the mainland by the River Ore / Alde.

It has been designated as a Site of Special Scientific Interest, and every summer around 15,000 gulls nest there.

Rare visitors such as the black and white plumaged Avocet have also been noted. Not only is it of interest to naturalists, but from WWI, for some 70 years, it has been a highly secret government site.

During the summer of 1915 the Experimental Flying Section of the Central Flying School set up armaments investigations there, and part of the Ness was used as a bombing range. An airfield was laid out, and links were established with an experimental squadron at Martlesham Heath.

The 1920s saw many major developments in radio communications, and during this period Orford Ness sported an unusual wooden tower - located just half-a-mile from the lighthouse. The building housed an experimental rotating navigational radio beacon, which operated in the 300kHz long wave band. About 1928 Dr R L Smith-Rose CBE (made an RSGB Honorary Member in 1942 and President in 1959), a director of Radio Research at the DSIR, was involved in various scientific tests using the Orford Ness beacon (callsign GFP).

In 1935 Arnold Wilkins, a Scientific Officer at the Radio Research Station of the DSIR, was experimenting under Robert Watson Watt at Ditton Park near Slough.

They were working on the concept of Radio Detecting and Ranging (RADAR) using HF transmitters.

Wilkins had noted that the BBC's pre-war 'Voice', or Empire service, put out on 6050kHz by the Daventry short wave transmitter (call sign GSA), was received especially strongly in Slough during anti-cyclonic weather conditions.

It occurred to him that if the ground wave could be severely attenuated, then the tropospherically ducted part of the signal might be reflected from an aircraft and used to track it on a CRT display.

The initial interest in the 6MHz band seems to have been the wavelength of 50-metres. It was felt that many aircraft, with wingspans of between 20 and 25 metres, would act as efficient half-wave passive re-radiators or reflectors of high power transmissions.

Within a few months a development team was set up at Orford Ness, and the basic RDF system was proved there. By 1936 the team had moved to nearby Bawdsey Manor and the legendary wartime Chain Home coastal RADAR system was being developed, operating around 26 to 28MHz.

In Part 6 of The Voices, Gordon Adams, G3LEQ, will be looking at further developments on the Orford Ness Site from 1953 to the present day, including the 'Battle of the Woodpeckers'.

inpractice

by **Ian White,** G3SEK *

http://www.ifwtech.com/g3sek E-mail: g3sek@ifwtech.com

PEP TALK

I HAVE BEEN away from amateur radio for 10 years, and the power limits have changed. I am no longer clear what 'Peak Envelope Power' means, but I also asked several active amateurs and they didn't seem too clear either!

THIS QUESTION KEEPS coming around - or rather, it never really goes away. The place to go for a definition of PEP is *BR68*, the RA's *Terms, Provisions and Limitations* booklet, currently paragraph (e) (iii) of the Notes on page 21. This defines PEP as: "The average power supplied... during one radio frequency cycle at the crest of the modulation envelope taken under normal operating conditions". This is the formal, internationally-agreed definition used by many licensing authorities around the world.

Mode	Duty cycle	Peak Envelope Power
FM (F3E, F1B, F2B, J2E etc)	100%	Same as carrier power
Keyed CW (A1A)	50% typical	Key-down carrier power
SSB (J3E)	Depends on voice waveform and degree of compression	RF power* at highest peak of audio modulation
AM (A3E)	Depends on voice waveform, degree of compression, and also percentage modulation	RF power* at highest peak of audio modulation

* RF power is defined as the average power supplied by the transmitter during one complete RF cycle.

Table 1: Duty cycle and PEP.

To explain that definition, note first that 'average power during one radio frequency cycle' is what we more familiarly call just 'RF power'. That means the average over the *whole* RF cycle. There is a common misconception that PEP has something to do with the instantaneous peak RF voltage - it hasn't! The word 'peak' applies to the modulation envelope, not to the RF. We need to identify the moment during the transmission where the RF power is highest - that's the peak of the modulation envelope - but then we average the RF power over the *whole* of that biggest RF cycle. One reason for the misconception is that you can measure RF power into a known load resistance by measuring the peak RF voltage as viewed on a 'scope, applying a factor of $1/\sqrt{2}$, and then doing a $P=V^2/R$ calculation. But that's just a rather indirect technique for measuring RF power - it doesn't change what PEP *means*.

There was a long, long Internet discussion about the meaning of PEP, which still left some people complaining that PEP has something to do with peak RF voltage or the 'instantaneous' power at the peak of the individual RF cycle. Where all efforts at explanation and persuasion fail, the only remaining answer is the brutal one: the definition that the licensing authorities use is correct and *it's the law*, so you'd better change your mind, because they certainly aren't going to change the definition!

Table 1 shows how the definition of PEP applies to common transmission modes. On CW and FM, every RF cycle is the same, so PEP is just the RF power. In a mode such as SSB or AM, where the RF power varies with the modulation, the meaning of the PEP is the RF power at the highest peak of audio modulation. My interpretation of a 26dBW (400W) PEP power limit is thus very simple: never let the RF power exceed 400W at any time during the transmission.

If you have a monitor 'scope, it can be useful for confirming compliance with the power limit. Under the present regulations, where you can transmit the same PEP on any mode, the best way to adjust to the legal limit is to tune-up on CW and adjust the output power to 400W as measured on a calibrated wattmeter. I don't recommend measuring RF power using the 'scope - it's nowhere near as accurate as you'd like to think. Having set up a 400W carrier as measured by a wattmeter, simply mark the screen along the top and bottom of the ribbon of light. Then switch to SSB, and adjust the modulation so that the spot never goes outside of your marks.

FREE SAMPLES

HOW DO I get hold of free samples? If I don't have a commercial application, am I even justified to ask?

WHY DOES ANY manufacturer provide free samples? It isn't charity, but hard-headed marketing. The offer of free samples is to tempt you to try a new product, and hopefully buy more at the full commercial rate. It doesn't always cost the manufacturers a lot to provide 'freebies'. For example, a new IC may have involved huge development costs, but once the process is working, the actual manufacturing cost per part is very low. Drug companies are in a very similar position, and they are equally willing to provide free samples to practitioners in the hope that they will start to prescribe them regularly.

If you are a professional development engineer, you're almost expected to ask for free samples of new products and, as you know, you'll usually get them. We amateurs are in a much more difficult position. Often it's not the price that tempts us to ask for free samples, but the sheer impossibility of obtaining those particular components any other way. Many manufacturers are geared up to provide either free samples, or commercial quantities with a minimum order of thousands - and nothing in between. The general component distributors such as Farnell, Maplin and RS/Electromail fill some of this gap by supplying the more popular components in small quantities, but only if they're in the catalogue.

What can you *not* get as free samples? Asking for 'freebies' of any of the following will almost certainly be refused:

- Established products that everybody should know about already because they are in the component catalogues. There's no advantage for the manufacturer to provide 'freebies' of those.
- Components with a high individual cost and/or low expected sales volume - it's too expensive for the manufacturer.
- Custom-made components such as crystals or oscillators on non-standard frequencies.
- Complete evaluation kits that include PC boards, possibly a range of components, documentation and software - expect to pay for those.

Before you pick up the phone and ask for the Sales Engineer for the particular product range, ask *yourself* a few questions, and have the answers ready:

- Who am I? The answer to this question may not be as obvious as it seems - see below!
- What am I designing?
- What is the end use? He will probably want to know, and you must have a good answer - see below.

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- Why am I interested in using this particular device?
- Have I downloaded the datasheet from the manufacturer's web site and studied it, to be as sure as possible that this device will be suitable?
- What else do I need to know that the datasheet doesn't tell me? You may not get an answer, but intelligent questions can help establish your credibility.
- How many samples do I need? If there's a significant risk of damaging the device during development, even with a reasonable level of skill and care, then it's often fair and realistic to ask for two samples, and explain why.

What are the ethics of obtaining free samples? The most important ethical consideration is never to ask for a sample merely because it's free. Only ask for a sample if you have a real use for it, and you can't get it any other way because of unrealistic minimum order restrictions. Also, it's unethical to lie and misrepresent yourself. On the other hand, we amateur experimenters can often underestimate and underplay what we're doing. The literal fact that you are an amateur - in other words, that you're not getting paid - is nobody's business but your own. If in all other respects you're going about the work in a professional and businesslike way, you can tell the truth when they ask who you are and what you're doing. For example: you are an independent RF developer working on a VLF/HF/VHF/UHF/microwave/analogue/digital/space communication system (insert/delete as applicable); or you are a designer working on a project for a large-circulation radio magazine; or you are designing a product for commercial sale as a kit; or whatever else happens to *be* the truth. You lose nothing by putting the best face on it.

If you haven't thought these questions through, then don't pick up the phone yet. Free samples are a privilege, and your side of the bargain is to do your homework first and not waste the manufacturer's time. A manufacturer may offer samples from its web site, by asking you to fill in online forms. Once again, do your homework first, and be sure that you know why you're asking.

All these points are important, but I hope they don't put off anyone who has a serious need. I am far more concerned that the many radio amateurs who *do* have good reasons to ask for free samples should have the know-how to get them.

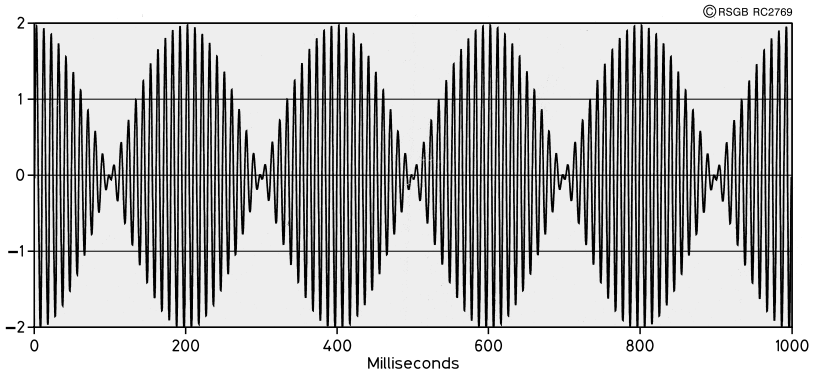

Fig 1: A 100Hz sine-wave linearly added to a 105Hz sine-wave. The added waveforms produce a 5Hz beat-note (the 1000ms plot shows 5 complete cycles).

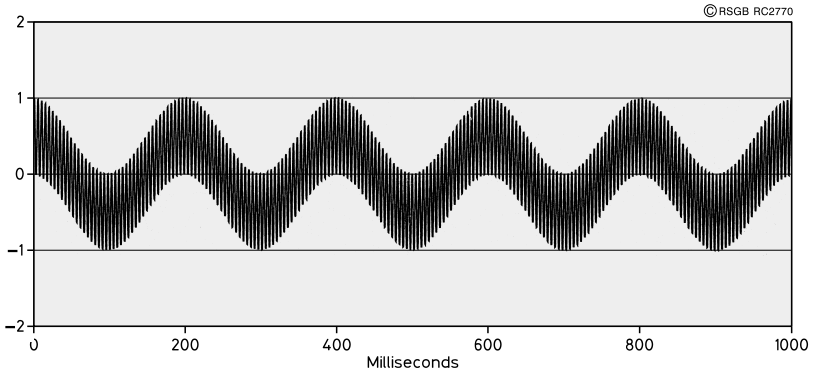

Fig 2: A 100Hz sine-wave mixed with a 105Hz sine-wave by multiplication. Now you see a genuine 5Hz waveform because there is a mixing product at that frequency.

BEATEN, NOT MIXED

IF I HEAR a beat-note between two audio tones, does that imply some non-linear mixing, either in the source or in my ears?

NO - A BEAT-NOTE can be the product of completely linear addition between two tones, producing a difference frequency. **Fig 1** shows the simple sum of a 100Hz sine-wave and a 105Hz sine-wave, plotted for one second. What you see is about 100 cycles of the two waveforms, but also five cycles of the 5Hz beat-note. The maximum amplitude of each waveform is 1, so addition produces amplitude peaks up to 2, while subtraction produces nulls down to zero. What you would hear is the air pressure on your eardrum from the two waveforms superimposed, fluctuating in amplitude between 2 and zero at a rate of 5Hz. This is due simply to the addition and subtraction of the two waveforms - no non-linearity is required. If you did a frequency analysis of the composite waveform, the only frequencies you would find in there are 100Hz and 105Hz. Even though audio engineers commonly talk about 'mixing' sound sources, they actually take enormous pains to make sure that waveforms are *not* truly mixed to produce new frequencies - only added.

In contrast, **Fig 2** shows the result of *multiplying* 100Hz and 105Hz. Mathematically, we have produced a perfect mixer. As you can see, the composite waveform is completely different from Fig 1. This time you can see a real 5Hz waveform, centred on the zero line and with a peak-to-peak amplitude of 0.5; the 'thickened' trace is due to the higher-frequency components at 100Hz, 105Hz and also 205Hz that all add to produce the composite waveform. The products at 5Hz and 205Hz are the mixing products that mathematics predicts if you multiply two different sine functions. Once again you would hear a 5Hz beat-note, but now there is a genuine 5Hz component present in the frequency spectrum.

Sources

'In Practice' finds questions in strange places - this one came originally from the rec.music-makers.squeezebox newsgroup, relating to the beat-notes between accordion reeds. Stranger still, another of the contributors had a very familiar name: David Tong - yes, 'Mr Datong' himself! ♦

If you have new questions, or any comments to add to this month's column, I'd be very pleased to hear from you by mail or E-mail. But please remember that I can only answer questions through this column, so they need to be on topics of general interest.

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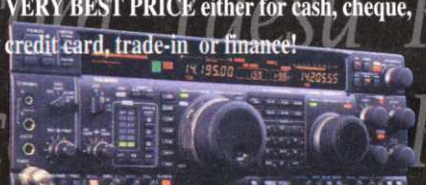

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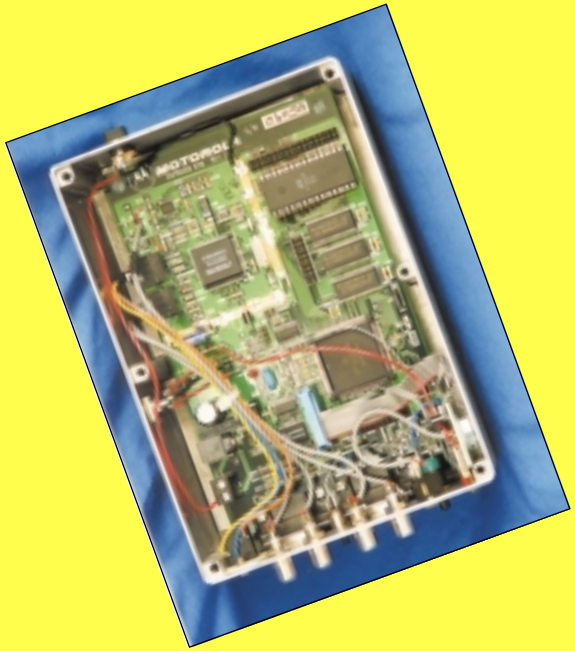


RSGB

Annual Report 1999 - 2000

Radio Society of Great Britain

RADIO SOCIETY OF GREAT BRITAIN

(A Company Limited by Guarantee. Registered in England No 216431)

LAMBDA HOUSE, CRANBORNE ROAD, POTTERS BAR, HERTS EN6 3JE

Patron: HRH The Prince Philip, Duke of Edinburgh. KG KT

The Council

(1 July 1999 to 30 June 2000)

President

D F Beattie, BSc (Eng), CIPD, F Inst D, FRSA, G3OZF (from 1.1.00)

M H Claytonsmith, G4JKS (until 31.12.99)

Executive Vice President

D F Beattie, BSc (Eng), CIPD, F Inst. D, FRSA, G3OZF (until 31.12.99)

D W McQue, G4NJU (from 29.1.00)

Treasurer

K Ashcroft, FCA, FCMA, G3MSW

Secretary

P A Kirby, MIMgt, MISM, G0TWW

Ordinary Members

G L Adams, G3LEQ (appointed 1.1.00)

R H Biddulph, MA, PhD, CChem, CEng, FRSC, MIM, M0CGN

G W Dover, BSc, Dip Ed, G4AFJ

R Horton, BSc, PGCE, G3XWH

Ordinary Members (Continued)

R M Page-Jones, CEng, MIEE, G3JWI

R C Whelan, BSc, MSc, PhD, G3PJT (appointed 1.1.00)

Zonal Members

Zone A: P R Sheppard, DipOS, FinstSMM, G4EJP

Zone B: J F Layton, G4AAL

Zone C: F C Handscombe, G4BWP (co-opted and appointed from 1.4.00)

Zone D: D W McQue, G4NJU

Zone E: E P Essery, GW3KFE

Zone F: J D Smith, MI0AEX (appointed 1.1.00)

Zone G: T W G Menzies, RSSA, GM1GEQ

Retired during the year

J T Barnes, GI3USS (retired 31.12.99)

P E Chadwick, G3RZP (retired 31.12.99)

E N Cheadle, G3NUG (resigned 29.9.99)

M H Claytonsmith G4JKS (resigned 31.12.99)

I J Kyle, GI8AYZ, MI0AYZ (IPP until 31.12.99)

I D Suart GM4AUP (resigned 1.6.00)

F C Stewart, G0CSF (deceased 19.1.00)

Auditors - KPMG

Solicitors - Eversheds

Bankers - Midland Bank PLC

Council members present at the October 2000 Meeting of Council (left to right): Paul Essery, GW3KFE; Bob Whelan, G3PJT; Peter Kirby, G0TWW (General Manager/Company Secretary); Dick Biddulph, M0CGN; Fred Handscombe, G4BWP; Richard Horton, G3XWH; John Layton, G4AAL; Don Beattie, G3OZF (President); Geoff Dover, G4AFJ; Gordon Adams, G3LEQ; Peter Sheppard, G4EJP; Robin Page-Jones, G3JWI; Jeff Smith, MI0AEX.

Headquarters staff (left to right): Front Row - Mike Dennison, G3XDV (Publications Manager); Bob Ryan, 2E1EKS (Publications); Lynnette Ranger, 2E1EKT; Fay Huxley, 2E1EUA (GM Dept). Second row: Catherine Liston (Amateur Radio); Sylvia Manco, 2E1CYL (Sales and Marketing); Jan Hassan (Accounts); Janice Forde (Sales and Marketing). Third row: Marilyn Slade, 2E1GKR (Finance Officer); Hilary Whittington (QSL Bureau); Shirley Martin (QSL Bureau); Jan Case (QSL Bureau); Daisy Cartier (Sales and Marketing); Faye Kirby (accounts); Wendy Beverley (Sales and Marketing); Pauline Reid, 2E1GGN (GM Dept). Fourth row: Steve Telenius-Lowe, G4JVG (Publications); Steve White, G3ZVW (Publications); Annie McVicar (Sales and Marketing); Suzanne Dunnett (Publications); Fiorina Sinapi, 2E1EJL (Amateur Radio). Top: George Brown, M5ACN (Publications); Brendan Callaghan (IT manager); John Crabbe, G3WFM (HQ Services); Mark Allgar (Commercial Manager); John Cannon (Despatch); Derek Lund, 2E1GHK (HQ Service Manager); Peter Kirby, G0TWW (General Manager). Not pictured, Penny Tyler, 2E1GHJ (Accounts).

Radio Society of Great Britain

As I come to the end of my year as President, I am pleased that we have been able to make progress in many of the areas we embarked on in January.We have prepared proposals for a new way of running the Society, which are being presented to our members for approval. These initiatives are designed to give our members more input to the direction of the Society. Also, members of Council have been visiting clubs around the country, and I personally will have spoken at over 20 events by the end of the year.

Our finances, whilst still finely balanced, have been well managed this year, although it is a personal disappointment to me that we have had to withdraw from *Radio Today* because of the immense problems with volume distribution to newsagents.

The threats to the freedom of radio amateurs to pursue their interests continue to increase, and whilst much of the work of the Society in the EMC and planning areas goes unnoticed, these represent perhaps two of the most important areas for safeguarding the ability of us all to transmit from our homes.

Work with the Radiocommunications Agency on the pattern of future licensing is gathering pace and, as we approach the end of the year, we are sharing our thinking with our members and inviting comments. Helping shape the future direction for amateur radio in the UK will be a priority for us all over the next year.

We have begun to develop our web-based member services, and these will become a major focus for us in the coming year.

As ever, the Society is deeply indebted not only to its headquarters staff, but also to the large number of volunteers, who give their time so willingly to support amateur radio in this country. Thank you all very much indeed.

Don Beattie, G3OZF
2000 President

This has been an extremely dynamic year for amateur radio and for the RSGB in particular. During the year we have seen the introduction of the new M5 licence which is proving very popular with the amateur community. The knock on of this new licence was the birth of the 'Morse Campaign' which recently passed its 100th successful candidate. There has been an encouraging start to the Satellite Test Centre scheme, which now has around 40 clubs enrolled and more coming on stream day by day. This year has also seen the introduction of Internet linking and a relaxation in the Greetings Message facility.

Further, your Council has worked hard in updating and modernising the Society's Memorandum, Articles of Association and Bylaws and we can look forward to the new Regional Organisation coming on stream early 2001, which will give our members a greater say and input into Society affairs.

On the international front our team put in a splendid performance at the IARU Region 1 Conference which was held in Lillehammer, Norway, in September 1999. It is fair to say that the Society had a great influence in the majority of the decisions taken at the conference. We continue to work hard on the international scene, which is of great benefit to the UK amateur in the protection of our rights and privileges.

Commercially the Society has had a reasonably successful year despite the pressure of a declining UK amateur radio market. Our membership numbers have held up well and our percentage membership ratio set against amateur radio licence holders is the envy of most of the major societies around the world.

Our honorary officers and committee members continue to do sterling work on behalf of us all and for that I am extremely grateful.

This report is an insight and overview of the Society's work throughout the year. As always it makes interesting reading and I have no hesitation in recommending it to you.

Peter Kirby, G0TWW
General Manager

Radio Society of Great Britain

HF

The total solar eclipse in August 1999 resulted in a large number of 'on air' observations being passed from the Society to our colleagues at the Rutherford Appleton Laboratory for analysis. The participation by members in this type of scientific exercise can only enhance the reputation of the RSGB and its members.

The International Amateur Radio Union Region 1 Triennial Meeting took place in Lillehammer, Norway, in September, with a number of HF items being discussed. Amongst these was the decision to form a working group to discuss band planning, especially taking into consideration the growing number of new modes of transmission. The RSGB took a lead role in recommending working practices to cater for the growing number of operators using 136kHz.

Progress is being made on the subject of 7MHz realignment and following discussions during the World Radio Conference 2000 the subject has now been placed on the preliminary agenda for WRC2003. It is hoped that an expanded 7MHz band for stations within Regions 1 and 3 will result.

The 5MHz activity currently licensed on an experimental basis in the United States has generated interest in the UK and discussions have taken place between interested parties. It is generally agreed that this is a long-term project.

The Society has brought in two new LF operating awards. The LF Experimenters' Trophy, sponsored by Nevada and known as the Nevada Cup, was awarded to Dave Pick, G3YXM, at the 1999 RSGB HF Convention. The second, the LF Transatlantic Challenge, jointly sponsored by AMRAD, DARC and RSGB and in memory of Peter Bobek, DJ8WL (one of the pioneers of LF experimentation) has yet to be awarded. On the 73kHz front the RA kindly agreed to extend the duration of existing NoVs for 12 months with a further review to be carried out at the time.

The 1999 RSGB HF Convention was another success. Several DXpeditions to rare entities were assisted by donations from the HF Committee DXpedition Fund. The fund, which is run at no cost to the Society, is supported by income from the raffle held at the Convention, donations and legacies. The average donation is £200.

HF Awards

The year in review has again been a busy one for the HF Awards Manager, with an increase in the overall numbers of awards issued and applications and enquiries arriving from all over the world.

A total of 58 certificates and seven endorsement stickers were issued during the year. The most popular was again the IARU Region 1 Award (29 were issued this year) and the DX Listeners' Century Award for SWLs, with four certificates and six endorsement stickers being issued. In addition 21 WAC award applications were verified and forwarded to IARU HQ, and six applications by RSGB members for other overseas awards were checked.

Whilst applications for the other awards are not in such large numbers, they have a small but ardent following. During the year G4GVC endorsed his 136kHz award for 15 countries, and G3SWH leads the chase for the first Supreme WARC band endorsement to his Five Band Commonwealth Century Award.

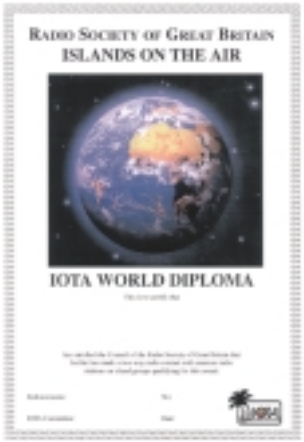
The DXLCA Award continues to attract interest among the SWLs. This year Gim Dawans, ONL7681, from Belgium maintained his top SWL spot with a claim for 320 countries.

Award checking was carried out during the HF Convention in October. RSGB has continued its participation in the ARRL Field Checking Program for the DXCC Award. G3RTE and GM3YTS continue to provide a great service as field checkers. During the year ARRL revised the rules for the field checking process and many more entities can now be field checked.

IOTA

IOTA has established itself as the fastest growing activity programme on the HF bands. While not everyone has the intention of applying for IOTA awards, a significant proportion of active amateurs will work IOTA stations when they hear them. The number of amateurs ready to activate an island for the programme has reached record levels. IOTA DXpeditions with quite modest equipment regularly work 5000 or more contacts over a three-day period and on any one day there may be 25 or more IOTA operations taking place world-wide.

The IOTA Millennium Activity Programme, starting on 1 January under the delegated management of the Chiltern DX Club (CDXC) - the UK DX Foundation - attracted widespread participation from amateurs worldwide and interest has continued unabated.



The RSGB Islands on the Air programme continues to go from strength to strength.

The main task for 1999 / 2000 was the production of a new *IOTA Directory* to include a listing of valid islands sufficiently comprehensive to act as a definitive reference. This was the culmination of an exercise, the principal objectives of which were:

- to define in as precise terms as possible the boundaries of each IOTA group and within each group to specify all known qualifying islands with the aid of detailed charts;
- to enable the QSL checking process to be placed on a sounder basis by ensuring that only islands listed by name in the Directory would count for the awards;
- to determine, as part of a five yearly review, applications from the IOTA community for new island groups to be added to the Directory;
- and, generally, to review IOTA rules.

This exercise involved several thousand hours of work. As a result, some 58 new groups were added to the listings and 40 individual islands were removed from the list for non-compliance with IOTA qualification requirements.

A significant rule change was agreed in order to accommodate both a VHF version of the award and allow VHF QSOs to be counted for credit in the main award categories. The *IOTA Directory 2000* was published in time for the Friedrichshafen Convention at the end of June.

The last year has seen a 50% increase (to over 150) in the number of expeditions to new or rare groups which, under IOTA rules, require the submission of 'evidence of presence' to validate the activity. This procedure has the advantage of encouraging early contact with the IOTA Committee - there are now few 'surprise' operations - and then regular contact through until well after completion of the event. Publicity for the IOTA Programme was enhanced by the inauguration of the new IOTA Committee web sites.

The IOTA Committee Chairman attended IOTA sessions at the Visalia DX Convention in California and the Dayton Hamvention in Ohio. The IOTA Manager attended the Friedrichshafen Convention and gave a presentation / Q&A session in the main lecture stream. A major IOTA lecture stream and IOTA buffet were organised for the RSGB's own HF and IOTA Convention at Windsor in October 1999.

HF Contests

Amateur radio contesting remains a popular aspect of the hobby. While some events have seen a slow decline in participation, others such as the 21 / 28MHz and IOTA contests have shown a marked increase, no doubt due in part to the overall improvement in HF band propagation in the current solar cycle.

The number of special contest callsigns (eg G1A, M2B) issued as of the end of July 2000 was 64. There was a steady take up of new applications in the first half of 2000, especially from groups intending to compete in the IOTA contest. Now attracting substantially over 1000 entrants, it has become a major event in the world-wide contest calendar. During the past year Chris Burbanks, G3SJJ, stepped down from the position of Chairman to concentrate on managing the IOTA contest, the position of Chairman now being held by Justin Snow, G4TSH. The committee established its own web site to provide improved communications with the membership and foreign amateurs who support our events.

Despite advances in electronic communications there is still a requirement for the committee to have face-to-face meetings to get to grips with the many difficult issues that arise. With the increasing pressure on members' spare time, full membership of the committee has fallen slightly to seven, but with an expanded pool of out-workers and adjudicators. Even so there is still a requirement for more volunteers to help with adjudication of events. One area that has substantially improved is the issuing of certificates, thanks to the efforts of Dave Sharred, G3NKC. The committee is seeking the co-operation of software authors and other Region 1 societies to agree a standard for contest log entries and develop adjudication software. This will be one of the key focus areas for the committee during the coming year.

VHF

The VHF Committee remains under the chairmanship of Mike Adcock, GW8CMU. It has been proposed that the VHF Committee Chairman should meet at least once a year with the Chairmen of the VHF Contest Committee, Repeater Management Committee, Data Communications Committee, Propagation Studies Committee and Microwave Committee, plus the President and the General Manager, to discuss items of VHF interest which would not impact on the work of the other committees.

The high-speed data link between the Isle of Wight and Guernsey on 145.790MHz was approved.

The application for a frequency for Internet access was discussed and some of the 2-metre 12.5kHz channels (V23, V25 and / or V27) were proposed, as were some channels between 434.25 and 434.60MHz in the 70cm band.

Two special research permits were dealt with and these have been approved by the Radiocommunications Agency with Notices of Variation being issued.

VHF Contests

During the last year the VHF Contest Committee (VHFCC) has undertaken a complete review of VHF Contests' General Rules, with a view to making contest entry much easier. A survey was sent to all clubs and affiliated societies in order to gain opinion and ideas for a change in the format of VHF NFD 2000. The responses were used to aid the Committee to make changes that would benefit smaller clubs and to encourage new entrants for this year's event. This year's result is eagerly anticipated.

One change is that all contests have been 'deregulated', allowing portable entries into events which were once for fixed stations only. The VHF Contest Committee contin-

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ues to strive to make the adjudication process quicker and to turn around results in faster times. Some good work is being done by Mike, G0GJV, in providing adjudication software, although this is still in its early stages.

The Committee continues to make use of the latest technology and most business is done via the Committee's own reflector, which not only saves time, but helps to reduce expenditure on meeting rooms and travel expenses.

Electronic contest entry is being actively encouraged via the Committee's 'electronic post box', to which completed logs can be sent. The VHFCC web site provides a forum for the latest results, rules, news and views. The Committee would welcome input, including pictures of events, to display on the site. It typically has 150 - 200 'hits' a week, particularly when a new set of results has been posted. Late rule amendments are also posted on the web site.

VHF / UHF Awards

The year has been one of continuing success, with an increase in the number of awards issued: 115 in the current year compared with 96 in 1998 - 99.

Award claims for 50MHz continue to be the mainstay of the programme, with a total of 67 individual awards issued. There was also a substantial increase in the number of Microwave Distance Awards issued, helped in no small way by the introduction of an incremental scheme for the 'millimetric' bands. Interest is generally concentrated on the 'squares component' with the occasional 'Standard' or 'Senior' being issued. January saw a Supreme Award being issued and the start of the replacement awards using post-codes - as yet there have been no claimants.

Award news is carried on the web site and on GB2RS and *RadCom* when space permits. Following the IARU Region 1 meeting at Lillehammer, the RSGB sponsored a Millennium 2000 Award for Sporadic-E contacts over 2000km.

The following is a summary of the numbers of awards issued during the year: 6 Metres and Down Certificates 20 (compared with 15 in the previous year); Squares / Countries Awards 28 (compared with 39); RSGB 50MHz Award 67 (compared with 34).

IARU

Much of the Committee's work during the year was concerned with the triennial Region 1 Conference held in Lillehammer in September 1999. The committee had previously worked with other committees to prepare 16 papers covering such topics as contest rules, beacon planning, common licensing standards, and the management of Region 1 itself. The delegation to the conference comprised G3ZNU, GM4AUP, G4OUT, G4ASR, G3PSM, G3PFR, G4JKS, G3OZF and G0TWW, with G3VZV as an Observer.

The discussions and decisions taken at the Conference were fully reported in *RadCom*. Some significant steps

The RSGB plays an important role in IARU Region 1. Here Region 1 Secretary Tim Hughes, G3GVV (third from left) attends a Region 1 executive committee meeting with Wojciech Nietyska, SP5FM; Lou v d Nadort, PA0LOU; and Audrey Jefcoate (Office Manager).

forward were taken towards the revision of the ITU definition of amateur radio, and towards a restructuring of Region 1, particularly stabilising the finances. Delegates left the Conference more confident that the Region would be able to meet all its commitments without increasing the financial burden on Member Societies. G3GVV, a long-standing contributor to IARU and former RSGB IARU Committee Chairman, was formally elected to serve as Secretary for the coming three years.

Other routine work carried out by the Committee consists of: maintaining liaison with the IARU International Secretariat, secretariats of IARU Regions 1 and 3 (of which the RSGB is a member), Region 2, and with other national member societies world-wide; liaising with Region 1 working groups, including Common Licence Group, Eurocom Group, International Beacon Project, and the IARU Monitoring System, enabling lines of communication to relevant RSGB Committees; and raising significant matters of international co-ordination with Council and Committees and establishing an RSGB position on such matters as appropriate.

AROS

The work of the Amateur Radio Observation Service (AROS) is that of an advisory and reporting service, intended to assist those who may be affected by problems which occur within the amateur bands or which develop on other frequencies as a result of amateur transmissions. Reports, complaints and associated supplementary information are accepted from any source and the contents of each communication are kept confidential.

Where there is evidence of deliberate malpractice or malicious abuse of amateur radio facilities, a formal report may be made to the appropriate authorities. This report will contain sufficient detail and evidence to enable further investigations to be made and the authorities may take such action as is appropriate. However, AROS prefers to settle all problems within the Amateur Service; problems arising are referred to the authorities only as a last resort.

During the year AROS has investigated reports of licence infringements, and instances of poor operating practice which might have brought the Amateur Service into disrepute. At present there are five cases outstanding all of which are 'work in progress', awaiting further information from complainants.

A liaison meeting took place between AROS and the RA during the course of the year. AROS consists of a co-ordinator and 14 anonymous observers . The co-ordinator, who has only recently taken over the role from his predecessor, intends to consolidate work with his present observers and recruit extra cover in a few under-represented areas.

Planning Advisory

Much of the Committee's work is now carried out by e-mail and it has met only once during the year, as there was insufficient business to warrant convening further meetings. The *Planning Advice* booklet is still in demand and the feedback from members suggests that its advice is soundly based and easy to assimilate. Occasional comments received from Local Councils clearly endorse that opinion. The booklet is about to be re-printed and the opportunity has been taken to update it where necessary. It will be sent to all Councils throughout England, Wales and Scotland, as was last done over three years ago.

During the past 12 months, the planning panel has continued to give detailed advice to approximately 40 members against the previous year's figure of 70. One can only speculate about the reasons for such a fall, but perhaps the presence of the advice booklet and the fact that most local authority planning staff now seem to have heard of the RSGB enables members to conduct their own cases without professional help. Unfortunately there is no evidence to suggest that members are (or are not) more successful in obtaining their planning permission.

It remains difficult to detect any meaningful change in the attitude of planning authorities to mobile masts, and the matter still demands some caution.

The Committee was again represented at rallies and the VHF Convention. Talks to affiliated clubs and conventions are given on an occasional basis. The Committee maintains its close link with the EMC committee.

Propagation Studies

Work continued on several projects, including the multiband HF / VHF beacon mentioned in last year's report. G2AHU has completed and satisfactorily tested a working beacon, with G3IMW taking responsibility for the antenna. Issues relating to location and licensing are in hand. G0DJA continued working on the VHF Sporadic-E database. Preparations are under way for a systematic assessment of how well professional propagation prediction programs relate to results in the amateur service, using the NCDXF / IBP beacons as the yardstick. Volunteers are being sought to assist in this project.

The bulk of the Committee's time was directed towards providing the fullest possible range of information on propagation to members. This included circulation by G0CAS of a daily packet bulletin and a fuller weekly report in GB2RS News. An updated solar report and forecast was prepared every Saturday for transmission on Sunday by G3USF and G0CAS.

This was carried by a growing number of newsreaders and has been well received by listeners. It is also available on the Internet. G4FKH, assisted by G2FKZ, transmitted a Sunday propagation update on 80m CW and G4FKH produced monthly propagation predictions for *RadCom*. G4FKH made available an experimental weekly update to these predictions on the web.

Production continued of the monthly *Six and Ten Report* (by G0AEV, G3USF and G3IMW) and *SunMag* (by G0CAS). G4FKH contributed basic explanatory articles and an evaluation of HF propagation prediction computer programs to *RadCom*. G3USF maintained his list of HF beacons, which was reproduced by a number of national societies and widely accessed via the web.

Members of the Committee gave talks at conventions or to societies and / or manned stands at major rallies and dealt with a wide range of queries from members.

Data Communications

The DCC was saddened by the unexpected death of the Council Liaison Member Fred Stewart, G0CSF, early in the year. Fred had become a significant contributor to the work of the Committee, with his infectious enthusiasm and warm friendship a major asset. He will be greatly missed by all who knew him.

Work on the updated Mailbox Notice of Variation finally drew near to a close. The RA circulated the draft documents to all interest parties for comments and the new scheme is expected to become operational late this year. Negotiations with the RA have resulted in greatly reduced processing times for the majority of applications which are dealt with by the Committee.

A close working relationship with the VHF Committee has facilitated additional VHF / UHF frequencies for data purposes, enabling flexibility when dealing with network planning difficulties. This has been necessary in part due to increased demand for Notices of Variation to allow connections to Internet facilities. Of this class of connection, the major areas to benefit have been the DX Cluster network, which has continued to expand at a healthy rate, and the 'unconnected net' traffic (APRS, UI-View etc) which now enjoys almost world-wide routing of position information.

The demand to allow experimental 'Internet voice links' (a capability that was announced by RA in late October) has been satisfied. With the agreement of the VHF and Repeater Management Committee Chairmen, along with the Gen-

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Last year's annual meeting of committee chairmen with Council. Left to right: 2000 President Don Beattie, G3OZF; 1999 President Hilary Claytonsmith, G4JKS; General Manager Peter Kirby, G0TWW; and Council Member Fred Stewart, G0CSF (now a Silent Key).

eral Manager, DCC has carried out the task of co-ordinating frequency assignments for this purpose. The Committee's work in researching and producing prototype high-speed linking equipment has resulted in the construction of two 115kbps complete links, along with a particularly cost-effective solution for 9600bps user access facilities.

Intruder Watch

Problems associated with broadcast station transmissions were a prominent feature of Intruder Watch activities over the last year. Spurious emissions from faulty or badly-adjusted transmitters affected virtually every HF amateur band at one time or another. The main problems came from Turkey, Portugal, Spain, Romania, Albania and Russia. Most problems were sorted out as soon as the RA's station at Baldock informed the relevant authorities on our behalf.

A jamming signal which moves up and down the 7MHz band has been identified as coming from Iran. It follows what appears to be a low-power broadcast station in Iraq which changes frequency constantly in order to avoid it.

Over-the-horizon radar (OTHR) has been around for some time, but this year saw two new problems. On one occasion, one installation developed a fault and obliterated most of the 7MHz band until the appropriate authorities were informed by Baldock at our request. A second, potentially more serious, event occurred when a Canadian OTHR was 'parked' on 3600kHz. A concerted international effort, mainly by Canadian and US amateurs, and assisted by RSGB Intruder Watch, succeeded in having the source of the transmission identified and moved outside the band.

There have been several cases of unmodulated carriers operating on 14001kHz for days at a time. They have been identified as coming from such widely differing sources as a NATO base in the Mediterranean, a ship off southern France, and a location believed to be on or near Sakhalin Island. The NATO and French Naval signals disappeared as soon as Baldock contacted the relevant authorities, the Russian carrier still appears occasionally.

The positioning beacon on 1895kHz and located on the Butt of Lewis caused problems over much of Europe when it developed a fault - the fourth in three years. The manufacturer has removed the transmitter for a complete overhaul; this one will be watched carefully when it starts up again.

Licensing

Pressures on the spectrum are ever increasing, and the stakes are now extremely high - a fact which is evident from the tens of billions of pounds paid for the new mobile radio bands. It is clear that our microwave allocations are especially at risk. A considerable part of the Committee workload involves defending our existing facilities and responding to proposed legislation.

Discussions were held with the DTI CII to clarify the position over connections to other telecommunications networks. In January the RA made changes to the licence, formalising this process by the issue of NoVs, in particular for remote landline access to speech repeaters. At WRC2000, there was a major re-planning of all allocations above 71GHz; the frequencies of the amateur bands have changed slightly, but the width of our allocations has not changed. Items placed on the agenda for WRC2003 are Article S25 (which includes the Morse issue), extensions to 7MHz and the format of callsigns.

The 73kHz and 136kHz bands continue to stimulate interest, and the RA has agreed to extend the duration of the existing 73kHz NoVs for another three years. A special high-power permit was granted for some brief experiments on these bands at one of the Decca stations which was being decommissioned.

The subject of aeronautical mobile was raised again, and is still under consideration.

Microwaves

The Amateur Services continue to be under extreme pressure to relinquish many, if not most, of their microwave allocations and require the active support of other 'user groups'. Proposals to re-organise all the ITU frequency allocations above 71GHz were on the agenda for WRC2000. Input was made to the preparatory meetings via the RA and IARU. The frequencies of the amateur bands have changed slightly (see above) and some of these bands are now shared with radio astronomy. It remains to be seen if the potential EMC problems produce any difficulties in practice. The bandplans will need to be revised as a result of this, and new international narrowband segments agreed.

With the active participation of the British Amateur Television Club, represented by Graham Shirville, G3VZV, the RSGB, other national societies and European ATV users, new microwave ATV standards were agreed at the IARU Region 1 meeting in Lillehammer. These new standards (which do not differ greatly from existing standards) should ensure that few, or no, EMC problems will jeopardise the future of ATV in the shared 1.3 and 10GHz bands in particular. Negotiations concerning allocations and unattended operation in the 2.3 and 10GHz bands continue at a national level.

The usual programme of microwave round tables was held at Martlesham, Didcot, Crawley and Cheltenham. Following G4JNT standing down as Chairman, G3YGF was appointed in his place. A Committee stand was manned at the VHF Convention at Sandown, and a stream of three lectures provided.

The *Microwave Newsletter*, under the able editorship of Peter Day, G3PHO, has continued to flourish.

Emergency Radio

A long-awaited meeting of all the major players in amateur radio emergency communications took place with the Radiocommunications Agency. Discussions took place about the licence document *BR68* and its effects on emergency communications within amateur radio. All parties were satisfied with the changes and *BR68* will be amended.

The Emergency and Deputy Emergency Radio Liaison Officers visited many rallies throughout England, Scotland and Wales, and have dealt with enquiries by letter, phone and e-mail. Representing the RSGB, the ERLO attended the Radio Amateurs' Emergency Network (RAEN) AGM in Glasgow, providing valuable liaison with emergency communications groups from around the UK.

Morse Practice Service

The day-to-day business of volunteers providing UK radio amateurs with scheduled Morse practice broadcasts under the special callsign GB2CW has continued. The changes in the Morse test system have meant that many of these volunteers have amended their schedules to provide more 'QSO-style' practice at the slower speeds required for some of the tests, while continuing to provide adequate practice for those operators aiming at the existing 12WPM tests.

In addition to practice being provided for those aiming to pass the Morse tests, weekly practice sessions are being maintained at speeds of 15, 18, 20, 22, 25, 27 and 30WPM each Thursday evening on 80 metres. These are specially designed for operators anxious to improve their Morse reading capability, and a number of foreign amateurs also periodically check in.

The 'Morse Practice Tape Service' has seen around 200 tailor-made Morse tapes being produced for members since the announcement of this service appeared in the September 1999 *RadCom*. This service will receive regular publicity in future.

Operators from the Morse practice service are continuing trials with the intention of broadcasting more Morse practice via VHF and UHF repeaters. Trials are proceeding to place Morse practice texts (including mock test papers in QSO format) on the packet radio network, so that suitably-equipped radio amateurs have a ready source of Morse 'receive' practice.

Morse Testing

The Morse Test Service examined a total of 752 candidates during the past 12 months, compared with 503 in the previous year, an increase of 50%. There were 388 tests at 5WPM and 364 at 12WPM. The pass rate fell slightly to 79% (last year 82.3%). This compares very favourably with the pass rate of 68% for the old plain-language Morse test.

The Morse Test Service continues to run smoothly, with few problems. Morse tests on-demand remain very popular, with county Morse testing teams attending more than 30 amateur radio rallies during the past year. New Senior Examiners were appointed for the Midlothian region and Essex. DTI inspectors again continued with spot-checks through the past 12 months, arriving unannounced at scheduled tests sessions and rallies. Again, there were no complaints from these inspections.

More than 25 county Morse test teams were active on the air with GB callsigns over the second weekend in May, this time to mark the 14th anniversary of the Morse Test Service. The level of enthusiasm for this event remains high, and the weekend is a very popular annual event, particularly enjoyed by QRP and Novice stations. The teams made approximately 3,500 contacts and the event again produced many letters of appreciation to the Morse Test Service.

Novice Training

In July 1999 a review was undertaken of all Novice Instructors to determine if they wished to continue in that role. The review identified a number of areas where there is now a shortfall of active instructors and action is being undertaken to fill the gaps.

There was an unexpected and surprising downturn in the numbers enquiring about the Novice licence when the announcement of 144MHz being added to the Novice licence was made. However, this appears to have been a 'blip' and the number of enquiries is now increasing again.

More effort is being applied into getting involved with youth organisations. Tolmers Scout Camp is now a recognised satellite exam centre and it held a successful Novice course for the December exam. The number of ATC instructors has remained static but there are several courses which have been run for the ATC and the camp at RAF Cranwell is expected to have introduced nearly 2,000 cadets to amateur radio. Interest has also been expressed in introducing the NRAE courses by both the Sea and Army cadets.

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In the past year, 482 students sat Novice exams, with 413 passes achieved, an average of 85.7%. It is hoped that when 'exams on demand' for the RAE and NRAE are introduced, the number of candidates will increase. The number of candidates does not reflect the numbers of people who start the *NRAE* course and progress to take the *full* RAE without first applying for a Novice course completion certificate.

Technical and Publications

The Technical and Publications Advisory Committee (TAPAC) continues to function as a reviewer for *RadCom* articles and as the generator of nominations for three trophies (Ostermeyer, Wortley-Talbot and Courtney-Price) and the Norman Keith Adams Prize. There have been few problems and those are mostly connected with the time taken to complete the review. Unfortunately, a few authors are reluctant to make necessary changes to their articles.

For the last few years, TAPAC has been an all corresponding committee. Most business is carried out by post or e-mail, with occasional resort to the telephone. Nearly all members are on e-mail and this provides an efficient and economical method of working.

A little while ago, the Chairman of TAPAC gave a talk to a local club on the RSGB and, during questions and answers afterwards, it transpired that no-one had heard of TAPAC. This surprised him, since this report appears each year in *RadCom*. However, it could explain why TAPAC's third function, to provide technical help to members, has been very little exercised. The alternative is that the RSGB's membership is very expert, has expertise close at hand, or is not very interested in the technical side of the hobby! [Any member requiring technical help should write to the Chairman, TAPAC, c/o RSGB HQ, enclosing an SASE - *Ed.*]

EMC

This has been a year of change for the EMC Committee. It had been evident for some time that re-organisation would be needed to keep pace with the changing role of the committee. The EMC Committee no longer simply deals with members' interference problems, a large part of its work is looking after the long-term interests of amateur radio in an increasingly difficult electromagnetic environment. This involves not only meetings with the appropriate organisations, but also preparing papers and reading a large number of technical documents.

Towards the end of 1999 the EMCC obtained the agreement of Council for two radical changes to the committee structure. The first of these was that members who directly represent the Society on outside bodies, such as the BSI and specialist telecommunications groups, should be made Honorary Technical (EMC) Consultants. They would be responsible to Council and could, if the need arose, act independently of the EMCC, though in normal circumstances consultants will be members of the Committee.

Several committees were on hand to answer questions at the first RSGB event at Hatfield in 1999.

The second change was the appointment of a 'Membership Services Administrator' to organise the co-ordinator scheme and deal with members' enquiries. Fortunately the current administrator, G4UJW, has also volunteered to take on the task of webmaster of the EMCC web site. He has reorganised and expanded the site ; it is now an important feature of the Society's EMC activities.

Requests for advice from members have followed the usual pattern, with roughly equal numbers of cases of breakthrough and interference to amateur reception . However, there has recently been a disturbing number of high-profile breakthrough cases.

G4JKS resigned from the Committee at the end of 1999, to concentrate on other interests. She had been a member for many years. This is one of the few cases where the word 'irreplaceable' can truly be used. Hilary's ability to contact the right people and get things done is legendary.

On the whole this has been a successful year, thanks to the efforts made by everyone concerned with the Committee. Special thanks are due to the EMC Co-ordinators whose work in fielding the day-to-day EMC queries makes all the other Committee activities possible.

ARDF

Amateur Radio Direction Finding (ARDF), or 'Foxhunting' as it is sometimes called both here and overseas, continued to enjoy increasing popularity during the past year.

The eight Qualifying Events for participation in the RSGB 160m National Final were organised by the clubs in Coventry, South Manchester (on behalf of Ripon), Salisbury, Echelford, Banbury, Colchester / Chelmsford, Mid-Thames and Torbay. The 16 qualifiers plus the 1998 victor assembled in Manchester to take part in the National Final, which was ably organised by Chris Plummer and the South Manchester Radio Club.

On 2 metres two weekend events were held by the Basingstoke Amateur Radio Club in the New Forest. These events are not only competitive but great fun as well.

Thanks are due to the Basingstoke Amateur Radio Club who organised the Direction Finding Hunt at the RSGB Hatfield House Radio Hamfest on behalf of the Committee.

In addition many 160m and 2m events are organised by clubs around the country for their members, and at least two clubs (the Mid-Thames DF Club and the Arden Forest DF Group) are dedicated to direction finding.

Owing to the high cost of attendance, it was only possible to enter a team for one of the International ARDF Championships. This was held near Utrecht in the Netherlands and the team comprised Robert Vickers, G3ORI; Phil Smith, GW1XBG; and Geoffrey Foster, G8UKT.

Presentations on direction finding were given to several clubs as well as at the VHF Convention during the year. It is hoped that these will encourage more members to participate in this healthy, outdoor branch of amateur radio.

Repeater Management

The Repeater Management Committee (RMC) continues to enjoy an excellent working relationship with the Radiocommunications Agency (RA), with whom we have been working closely to formulate the new *Guide to Repeater Licensing*.

Over 30 applications for new repeaters and site moves have been successfully progressed during the year. Key developments included the implementation of linking the Internet to repeaters, which takes this aspect of amateur radio into a new dimension. We will continue to assist with the development of repeater-Internet linking and welcome comments and views from those who have used it. The RA has agreed to consider dedicated Internet repeaters using wide spacing in the 70cm band.

The first UK 10m repeater was licensed during the year and the RA has indicated that when we have some experience of operation they are willing to license further units.

The loss of many of the high sites has forced many groups to reconsider their future and we have been able to assist in re-planning available frequencies. Implementation of 12.5kHz channel spacing on 2m has helped to release more channels and we are looking into further reducing co-channel interference by offering existing groups the opportunity to move if they wish.

The RMC has proposed to the RA that a Spectrum Mask for ATV transmissions be implemented. This will enable all modes including digital to be accommodated, enabling ATV enthusiasts to experiment without the need to define complex specifications.

RMCWEB, the Committee's website, has been revamped. Committee minutes are now published on the site enabling all to see the work of the Committee. Its members enjoy meeting repeater users and keepers personally at rallies, repeater group meetings and local amateur radio clubs, at which several lectures and presentations have been delivered. These valuable interactive sessions give us opportunities to discuss the work of the Committee and to gain the views of users, which can then be represented during discussions with the RA and other government departments. The RMC often receives requests from abroad as to how the UK repeaters are managed.

Management Committee

The Management Committee reviews with the Society Executive the financial and commercial performance of the Society. It meets formally six times per year and in addition meets to consider special issues as required. The Committee's review of the corporate governance of the Society has resulted in proposals to improve the regional representation and to focus the responsibilities of Council members in order to help the Society meet the challenges for the future. This work is ongoing and the first stage will be put to the Membership at the Annual Meeting in 2000.

The financial performance of the Society is being affected by a slow decline in the number of members. The main impact of this is felt in subscriptions and advertising, two of the main income sources. The Committee has spent a considerable amount of time with the Executive identifying reasons and implementing actions to stabilise membership numbers and finances.

Radio Today costs have been reduced significantly to contain any drain on the Society's resources. Because news-stand sales of *Radio Today* have not met expectations and the news-stand distribution system continues to frustrate our promotion of the magazine, it was decided to cease publication with the October 2000 issue.

Advertising sales have been brought in-house and this has resulted in better control and more hands-on contact with advertisers. However, the loss of some key accounts due to change in the number of amateur radio dealers has not been recovered yet. This mainly affects *RadCom*.

Book sales have also been subjected to detailed review with the result that a more aggressive approach to sales and stocks should result in further changes to publication and distribution. These are expected to bring better sales and cost savings. A Commercial Manager has been recruited to take responsibility for book sales and other commercial activities. This appointment is starting to bear fruit.

In a business environment of static or declining income growth and slowly escalating costs, it is clear that the financial state of the Society is under pressure. The identification of quite new ways of operating the Society is of concern to the Committee. Action has been taken to exploit electronic commerce and the Internet much more extensively and further changes are being evaluated.

Many of the committees run their own web sites. These are all accessible via the main RSGB web site at www.rsgb.org

RADIO SOCIETY OF GREAT BRITAIN

(A Company Limited by Guarantee Registered in England No 216431)

Report Of Council For The Year Ended 30 June 2000

The Council of the Radio Society of Great Britain ("the Society") presents its Annual Report and the audited financial statements for the year ended 30th June 2000.

Principal Activities

The principal activities of the Society are to provide services to members who are radio amateurs, short wave listeners or others with interests in radio communication. The Society represents the interests of UK licensed radio amateurs to the regulatory authority in the UK, the Radiocommunications Agency (RA) and via the IARU to other international bodies.

Review of the year

The Society continues to work on improved paths for newcomers to access amateur radio, with continuing discussions with the RA and the City & Guilds of London Institute (C&G) on the future direction of licensing and the RAE. The membership of the Society on 30 June 2000 was 25,640, a reduction of 1,364 during the year.

Following the changes to the licensing requirements in 1999, the Society has encouraged growth in the M5 licence with a series of "Morse Camps". By 30 June 2000 413 licensed amateurs had obtained the new licence. The programme continues.

Work on improving access to the Radio Amateurs Examination continues, and at 30 June 2000 38 clubs had volunteered to provide satellite examination facilities.

The Society mounted a strong and successful defence against the threat of Power Line Telecommunications. A similar watch is being kept on the effects of the xDSL systems being launched by BT, which use high speed data over unscreened telephone lines.

Since the year-end the Society has decided to cease production of *Radio Today*. Despite the significant improvements achieved over the two and a half years of production of this newstand journal, the growth in sales achieved was not sufficient to justify the costs. Council was of the opinion that the editorial content had been significantly improved, but the distribution to the High Street had become difficult to influence, with the major high street player tightening its grip on the magazines to be placed on the shelves. The Society will retain the intellectual property in the title for possible future use.

Financial report

The operating result for the year before non-recurring items, but after interest income, was a surplus of £9k. Non-recurring revenue of £3k resulted in surplus of £12k in the Statutory Accounts.

The Society always plans for a break-even position which, despite budget contingencies, can be affected by non-recurring items. For the year to 30 June 2001, this is the current plan.

Outlook

The Society will continue vigorously to promote Amateur Radio in the new Millennium. The coming year, subject to the approval by the Membership at the forthcoming Annual General Meeting, should see the implementation of the new regional structure with the aim of supporting the grass roots at local and club level. The positive presentation of radio amateur activity in local communities and the stimulation and support of individual amateurs in their experimentation and on the air activities, are seen as key parts of the Society's strategy.

Working with other partners, such as the RA and the teaching profession, the Society intends to present Amateur Radio as a route into a lifelong interest in communications technology. The basic ideas for a new progressive licensing structure will be put in place, aimed to stimulate a new generation of radio amateurs in tune with the interests of society at large.

In an environment of increasing commercial pressure and potential encroachment into amateur spectrum, the Society will influence policy makers by providing a valuable, impartial and expert opinion in both national and international spectrum negotiations.

To meet these goals a secure financial base for the Society is essential and Council will continue to keep all aspects of the Society's commercial activities under close review.

Personnel

The Society maintains a headquarters establishment of 27 salaried staff. The Society gives full and fair consideration to employment applications from disabled persons.
The Society is supported by a large number of unpaid volunteers who work tirelessly for the benefit of members. Their efforts are greatly appreciated. With the approval of the new constitution, the numbers representing regional membership will be increased, as will the responsibilities of some Council members.

All references to "The Council" throughout these financial statements should be considered to be equivalent to "The Directors" under the Companies Act 1985.

Composition of the Council

During the year the Council comprised:
President D F Beattie, G3OZF (appointed 1 January 2000); Immediate Past President - Vacant. Treasurer K Ashcroft G3MSW.

Ordinary Members of the Council:
G L Adams, G3LEQ (appointed 1 January 2000); R H Biddulph M0CGN; G W Dover G4AFJ; R Horton G3XWH; R M Page-Jones G3JWI; R C Whelan, G3PJT (appointed 1 January 2000).

Zonal Members of the Council:
Zone A: P R Sheppard G4EJP ; Zone B: J F Layton G4AAL; Zone C: F C Handscombe, G4BWP (co-opted 1 April 2000); Zone D: D W McQue G4NJU; Zone E: E P Essery GW3KFE; Zone F: J D Smith MI0AEX (appointed 1 January 2000); Zone G: T W G Menzies GM1GEQ.

Members retired during the year:
J T Barnes, GI3USS (retired 31 December 1999); P E Chadwick, G3RZP (retired 31 December 1999); E N Cheadle G3NUG (resigned 29 September 1999); M H Claytonsmith G4JKS (resigned 31 December 1999); I D Suart GM4AUP (resigned 1 June 2000); F C Stewart, G0CSF (deceased 19 January 2000).

Political and charitable contributions

The Society made no political or charitable donations during the year (1999: £nil).

Annual General Meeting

The 74th Annual General Meeting of the Society will be held at Harrogate Ladies' College, Harrogate, on Saturday 2nd December at 11.00am.

Auditors

In accordance with section 385 of the Companies Act 1985, a resolution for the re-appointment of KPMG as auditors of the company is to be proposed at the forthcoming Annual General Meeting.

By order of the Council
P A Kirby, Company Secretary,
Lambda House,
Cranborne Road, Potters Bar,
Hertfordshire EN6 3JE.

Statement of the Council's responsibilities

Company law requires the Council to prepare financial statements for each financial year which give a true and fair view of the state of affairs of the Society and of the surplus or deficit for that year. In preparing those financial statements, the Council is required to:

(a) select suitable accounting policies and then apply them consistently;
(b) make judgements and estimates that are reasonable and prudent;
(c) prepare the financial statements on the going concern basis, unless it is inappropriate to presume that the Society will continue in business.

The Council is responsible for keeping proper accounting records which disclose with reasonable accuracy at any time, the financial position of the Society and to enable it to ensure that the financial statements comply with the Companies Act 1985. The Council has general responsibility for taking such steps as are reasonably open to them to safeguard the assets of the Society and to prevent and detect fraud and other irregularities.

START OF AUDITED ACCOUNTS

Income and Expenditure Account for the Year Ended 30 June 2000

	note	2000 £	1999 £
Gross income from all sources	3	1,572,824	1,585,989
Direct costs (cost of books and products sold)		(144,706)	(138,224)
Gross surplus		1,428,118	1,447,765
Administrative expenses:			
Sales and distribution expenses		(431,001)	(465,785)
Other operating expenses:		(1,005,967)	(1,058,638)
Total expenditure		(1,436,968)	(1,524,423)
Operating (deficit)/surplus		(8,850)	(76,658)
Write back of diminution in value of land & buildings previously charged to the income and expenditure account in 1995		-	77,113
Other interest receivable and similar income	6	21,282	26,636
Surplus on ordinary activities before taxation	4	12,432	27,091
Tax on surplus on ordinary activites	7	-	-
Retained surplus for the financial year	11	12,432	27,091

All income and expenses for both years have been derived from continuing operations.
The movement in reserves is shown in Note 11.

Statement of Total Recognised Gains and Losses for the Year Ended 30 June 2000

	2000 £	1999 £
Surplus for the financial year	12,432	27,091
Property revaluation excess after reversal of the 1995 write back	-	171,831
Total recognised gains and losses relating to the financial year	12,432	198,922

Balance Sheet at 30 June 2000

	note	2000 £	1999 £
FIXED ASSETS:			
Tangible assets	8	572,085	550,178
CURRENT ASSETS:			
Stocks	9	146,577	96,157
Trade debtors		69,672	56,307
Other debtors		15,951	-
Prepayments and accrued income		105,801	69,441
Cash at bank and in hand		363,395	380,011
Total current assets		701,396	601,916
CDEDITORS: amounts falling due within one year:			
Trade creditors		(123,684)	(87,622)
Obligations under finance leases	10	(11,202)	(4,492)
Subscriptions in advance		(370,938)	(359,964)
Accruals and deferred income		(171,929)	(124,824)
Other creditors		(29,322)	(28,683)
Other taxation and social security		(18,474)	(19,629)
Total creditors: amount falling due within one year		(725,549)	(625,214)
NET CURRENT (LIABILITIES)/ASSETS		(24,153)	(23,298)
TOTAL ASSETS LESS CURRENT LIABILITIES		547,932	526,880
CREDITORS: amount falling due after more than one year:			
Obligations under finance leases	10	(12,619)	(3,503)
NET ASSETS		535,313	523,377
CAPITAL AND RESERVES:			
Income and expenditure account	11	359,641	347,209
Restricted funds	11	3,841	4,337
Revaluation reserve	11	171,831	171,831
MEMBERS' FUNDS		535,313	523,377

Approved by Council on 7 October 2000 and signed on its behalf by D F Beattie (President), K Ashcroft (Treasurer)

Auditors' Report to the Members of the Radio Society of Great Britain

(A company limited by guarantee)

We have audited the financial statements on pages 52 to 55.

Respective responsibilities of directors and auditors
As described on page 52 the Council members are responsible for the preparation of financial statements. It is our responsibility to form an independent opinion, based on our audit, on those statements and to report our opinion to you.

Basis of opinion
We conducted our audit in accordance with Auditing Standards issued by the Auditing Practices Board. An audit includes examination, on a test basis, of evidence relevant to the amounts and disclosures in the financial statements. It also includes an assessment of the significant estimates and judgements made by the Council in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Society's circumstances, consistently applied and adequately disclosed.
We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error. In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion
In our opinion the financial statements give a true and fair view of the state of affairs of the Society as at 30 June 2000 and of the surplus for the year then ended and have been properly prepared in accordance with the Companies Act 1985.

KPMG, Chartered Accountants, Registered Auditors

Notes (forming part of the financial statements)

1. STATUS:

The Radio Society of Great Britain is a private company limited by guarantee and does not have a share capital. Every member of the Society undertakes to contribute to the assets if it should be wound up while he is a member or within one year after he ceases to be a member for payment of the liabilities of the Society contracted before he ceases to be a member. Every member also undertakes to contribute to the costs, charges and expenses of winding up the same, and for the adjustment of the rights of the contributories amongst themselves, such amount as may be required not exceeding one pound.

2. ACCOUNTING POLICIES:

The following accounting policies have been applied consistently in dealing with items which are considered material in relation to the company's financial statements. The financial statements have been prepared in accordance with applicable accounting standards and under the historical cost accounting rules, modified to include the revaluation of land and buildings.
The Society revalued its land and buildings in the year ended 30th June 1999. The difference between the depreciation based on the historical cost and revalued amount is not material. As a result no note of historical costs profits and losses has been shown.
The company is exempt from the requirement of Financial Reporting Standard No 1(revised 1996) to prepare a cash flow statement as it is entitled to the filing exemption as a small company under sections 246 to 249 of the Companies Act 1985 when filing accounts with the Registrar of Companies.

Fixed assets and depreciation: Depreciation of tangible fixed assets (except freehold land which is not depreciated) is calculated on the cost or revalued amount on a straight-line basis over the estimated useful lives of the assets. The annual rates used are as follows: Freehold buildings: 2%; Fixtures and fittings: 10%; Furniture and equipment: 20%-25%;Computer hardware and purchased software: 20%-33%; Leased assets: over the period of the lease.

Stocks: Stocks and work-in-progress are stated at the lower of cost and net realisable value.

Taxation: The charge for taxation is based on the surplus for the year and takes into account taxation deferred because of timing differences between the treatment of certain items for taxation and accounting purposes. Provision is made for deferred tax only to the extent that it is probable that an actual liability will crystallise.

Leases: Assets acquired under finance leases are capitalised and the outstanding future lease obligations are shown in creditors. Operating lease rentals are charged to the income and expenditure account on a straight line basis over the period of the lease.

Pensions and post retirement benefit: The Society contributes to group personal pension policies to provide benefits for employees on a defined contribution basis.The assets of the policies are held separately from those of the Society in independently administered funds. The amount charged against income represents the contributions payable to the policies in respect of the accounting period.

3. ANALYSIS OF INCOME

	2000	1999
	£	£
Subscription income	864,681	844,556
RadCom advertising income	212,295	236,987
Book sales	308,413	298,227
Other income	187,435	206,219
Total income	1,572,824	1,585,989
Other income comprises the following:		
Morse tests	13,844	11,148
Novice licence	2,833	3,494
Rallies and exhibition fees	33,595	30,444
Repeaters	25,263	26,735
Special event callsigns	5,892	5,592
Newsletters	2,957	29,268
Sundry income	11,800	12,979
Radio Today	91,251	86,559
Total other income	187,435	206,219

4. SURPLUS ON ORDINARY ACTIVITIES BEFORE TAXATION

This is stated after charging:	2000 £	1999 £
Auditors' remuneration:		
Statutory audit	9,700	9,450
Other services	2,396	1,800
Depreciation:		
Owned assets	37,953	22,349
Assets held under finance leases	11,520	5,605
Hire of plant and machinery	11,437	11,452
Council and committee expenses:		
Council expenses	11,249	25,052
Committee expenses	18,133	30,224
Other expenses	3,887	3,841
Total Council and Committee expenses	33,269	59,117

5. INFORMATION REGARDING EMPLOYEES AND COUNCIL MEMBERS

	2000	1999
Council members serve in a voluntary capacity and are not remunerated for their services.		
The average number of persons employed by the Society during the year was as follows:		
Headquarters	**27**	**28**
The aggregate of payroll costs of these persons were as follows:	**£**	**£**
Wages and salaries	479,759	466,917
Social security costs	43,170	43,471
Other pension costs(see note 13)	18,858	17,075
Total Employee Costs	541,787	527,463

6. OTHER INTEREST RECEIVABLE AND SIMILAR INCOME

	2000	1999
	£	£
Bank deposit interest	21,282	26,636

7. TAX ON SURPLUS ON ORDINARY ACTIVITIES

UK corporation tax	-	-

The Society is liable to corporation tax on its investment and book sales income, less attributable expenses. However, due to brought forward tax losses there is no corporation tax charge for the year.

8. TANGIBLE FIXED ASSETS

	Freehold land & buildings	Computer equipment	Fixtures & fittings	Furniture & equipment	Motor vehicle	Total
Cost or valuation:	£	£	£	£	£	£
At beginning of year	490,000	173,509	54,108	103,179	16,832	837,628
Additions	-	22,788	12,321	8,577	27,694	71,380
At end of year	490,000	196,297	66,429	111,756	44,526	909,008
Depreciation:						
At beginning of year	-	141,084	35,484	102,007	8,875	287,450
Provided during the year	8,576	22,443	5,620	1,315	11,519	49,473
At end of year	8,576	163,527	41,104	103,322	20,394	336,923
Net Book Value						
30 June 2000	481,424	32,770	25,325	8,434	24,132	572,085
30 June 1999	490,000	32,425	18,624	1,172	7,957	550,178

Freehold land, included above and not depreciated, amounts to £ 207,000 (1999: £207,000)

On a historical cost basis, land and buildings would have been included as follows:	2000 £	1999 £
Cost	422,046	422,046
Depreciation	(44,874)	(42,381)
Net book value	**377,172**	**379,665**

The freehold land and buildings (comprising Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE) were professionally valued on 30 June 1999. The valuation was performed by AC Marriott, FRICS ACIArb of Wright and Partners Chartered Surveyors. The valuation was in accordance with the RICS Statements of Asset Valuation Practice and Guidance Notes. Based upon that valuation, the Council concluded that the property should be valued at £490,000. Of the above assets, all motor vehicles are held under a finance lease.

9. STOCKS

	2000	1999
	£	£
Work in progress	12,231	12,521
Consumable stock	3,773	51
Goods held for resale	130,573	83,585
Total	146,577	96,157

10. OBLIGATIONS UNDER FINANCE LEASES

	£	£
Gross obligations under finance leases	27,089	9,075
Less: finance charges allocated to future periods	(3,268)	(1,080)
	23,821	7,995
Due within one year	11,202	4,492
Due within the second to fifth years inclusive	12,619	3,503
	23,821	7,995

11. RECONCILIATION OF MOVEMENTS IN MEMBERS' FUNDS

	Restricted funds	Income and expenditure account	Revaluation Reserve
	£	£	£
Opening members' funds	4,337	347,209	171,831
Surplus / (reduction) for the financial year	(496)	12,432	-
Closing members' funds	3,841	359,641	171,831

12. COMMITMENTS

	2000	1999
	Other	Other
Annual commitments under non-cancellable operating leases are as follows:	£	£
Operating leases which expire:		
Within one year	4,637	3,714
In the second and fifth year inclusive	-	10,201
Total	4,637	13,915

13. PENSION SCHEME

The charge for the year was £18,858 (1999: £17,075). There were no outstanding contributions at the year end (1999: £nil).

END OF AUDITED ACCOUNTS

Prize and Memorial funds

RESTRICTED FUNDS

	Balance on 30 June 2000	1999
J Fraser Shepherd Prize Fund	895	953
DXpedition fund	1,901	2,353
K M Bennett Legacy Fund	1,045	1,031
Total Restricted funds	3,841	4,337

TRUST FUNDS

	Balance on 30 June 2000	1999
The PO Norman Keith Adams Prize Fund	828	789
The Legacy fund	13,994	14,277
Total Trust funds	14,822	15,066

Income & Expenditure Account for the Year ended 30 June 2000

	Note	30-Jun-00		30-Jun-99	
Income					
Subscriptions		864,681		844,556	
RadCom Advertising		212,295	1,076,976	236,987	1,081,543
Books and Products for Resale			308,413		298,227
Newsletter, Publications & Radio Today			94,208		115,827
Other Services			93,227		90,392
Total Income			**1,572,824**		**1,585,989**
Contribution from Subscriptions, Radcom Publication and Other Activities					
Subscriptions net of RadCom Publication Costs		687,044		660,464	
Amateur Radio Costs		(115,339)	571,705	(132,995)	527,469
Books and Products for Resale			102,849		119,435
Newsletter, Publications & Radio Today			(25,710)		(55,617)
Other Services with a revenue implication			5,356		8,453
Total Contribution from Activities			**654,200**		**599,740**
Less Non Activity Specific Overheads					
Commercial Costs		(150,889)		(153,998)	
Administration		(294,403)		(283,036)	
Despatch		(59,311)		(50,248)	
Office Costs		(125,865)		(99,305)	
Landlord Costs		(35,627)	(666,095)	(51,446)	(638,033)
Net Surplus/Deficit from Activities			**(11,895)**		**(38,293)**
Interest Income			21,282		26,636
Non-recurring income / (expenditure)			3,045		(38,365)
Building Revaluation			-		77,113
Tax on surplus on ordinary activities			-		-
Retained Surplus for the Financial Year			12,432		27,091

Notes: Activities refer to publications and amateur radio services operated in the normal course of the Society. 1999 non-recurring expenditure relates to Class B Mailout / Maintenance re heating, and HQ restructuring. Simplification of the published accounts is confined to this section of the results.

Radio Society of Great Britain

The Committees of Council

*The name and callsign of each Chairman is shown in **bold.** Corresponding or liaison members are shown in italics.*
The President is an ex-officio member of all committees. Committee members listed served during the period 1 July 1998 to 30 June 1999, and the Honorary Officers were in post at 30 June 1999.

ARDF: **G C Foster, G8UKT;** *D W McQue, G4NJU;* M P Hawkins, G3WMM; G W Dover, G4AFJ; D A Burleigh, G4WIZ; C D Plummer, G8APD; D Pechey, G8NMO; P J Smith, GW1XBG; *D C Holland, G3WFT; G Nicholls, G4DLB; C Mott-Gotobed, G4ODM.*

DATA COMMUNICATIONS: I Philipps, G0RDI; *F C Stewart, G0CSF;* P Overton, GM0MHD; P R Maile, MI0BME; J M Green, G1DVU; D J Koopman, G1TLH; R J Cooke, G3LDI; M J Salmon, G3XVV; R G Harris, G3ZFR; S A Morton, G8SFR; *D Biram, G6TVA; S Weir, GM3SAN, I R Brothwell, G4EAN; Roger Gregory, G4OCO; Len Gurney, G4LBJ, Jason Flynn, G7OCD; Paul Steed, G0VEP.*

EMC: R M Page-Jones, G3JWI: D M Lauder, G0SNO; F Robins, G3GVM; M H Claytonsmith, G4JKS; M J Culling, G8UCP; S N Lloyd Hughes, GW0NVN; *R E G Petri, G0OAT; J Greenwell, G3AEZ; C R Caine, G4IWS; D W McQue, G4NJU; L Hawkyard, G5HD; N R Hooper, G8NLY; D Cossar, GM3WIL; G M Allan, GM4HYF.*

HF: E N Cheadle, G3NUG; *G W Dover, G4AFJ;* K Kahn, G3RTU; S Kahn, G0STU; B M O'Brien, G0UCT; C J Thomas, G3PSM; J W Gould, G3WKL; F C Handscombe, G4BWP; G Williams, G4FKH; R J Nash, G4GEE.

HF CONTESTS: J C Burbanks, G3SJJ; *D F Beattie, G3OZF;* J P Fisher, G0IVZ; K J Chandler, G0ORH; D J Lawley, G4BUO; L E Mason, G4HTD; J M S Snow, G4TSM; A Holdsworth, G0SAH; F Robertson, G4BJM; L Volante, G0MTN; *T G Wylie, GM4FDM; H Owen, G2HLU; C J Thomas, G3PSM; D J Mason, G3RXP; S V Knowles, G3UFY; A R J Cook, G4PIQ; R A Treacher, RS32525; R Everitt, G4ZFE; T Kirby, G4VXE.*

IARU: M S Appleby, G3ZNU; *I D Suart, GM4AUP;* R J Hughes, G3GVV; J Bazley, G3HCT; L W Barclay, G3HTF; M W Dixon, G3PFR; C J Thomas, G3PSM; G Shirville, G3VZV; I L Cornes, G4OUT; E J Allaway, G3FKM (deceased, 3/99); *RJC Broadbent, G3AAJ; W M Dunell, G3BYW; R L Glaisher, G6LX; J D Forward, G3HTA; D J Butler, G4ASR; C Cummings, G4BOH.*

IOTA: M J Atherton, G3ZAY; *E N Cheadle, G3NUG;* R Balister, G3KMA; D F Beattie, G3OZF; A R Williamson, GI0NWG; M Pregliasco, I1JQJ; D L Jones, W4BAA; *S Kahn, G0STU; R S Small, G3ALI; J D Forward, G3HTA; J L Hall, G3TOK; J M J Krzymuski, G4DQW; R D Williams, G4LVQ.*

LICENSING ADVISORY: I D Suart, GM4AUP; D A Peters, G0NSX; J Greenwell, G3AEZ; T I Lundegard, G3GJW; R J Hughes, G3GVV; J Bazley, G3HCT; C J Thomas, G3PSM; P Chadwick, G3RZP; J N Gannaway: G3YGF; C Goadby, G8HVV; B Rider, G4FLQ; *MEC Eavis, G0AKI; I Philipps, G0RDI; E N Cheadle, G3NUG; M W Dixon, G3PFR; M S Appleby, G3ZNU; A C Talbot, G4JNT; I L Cornes, G4OUT; M J Adcock, GW8CMU.*

MANAGEMENT: D Beattie, G3OZF; E N Cheadle, G3NUG; P Kirby, G0TWW; R C Whelan, G3PJT; D I Field, G3XTT; R Horton, G3XWH; M H Claytonsmith, G4JKS (Chairman to 31.12.98); B Cooper, G4RKO; K Ashcroft, G3MSW.

MAGAZINE ADVISORY GROUP: P Kirby, G0TWW; *P Chadwick, G3RZP;* T M Taylor, G0UCX; E N Cheadle, G3NUG; M Dennison, G3XDV; S P White, G3ZVW; S E Telenius-Lowe, G4JVG; B Cooper, G4RKO; M Brimson, 2E1DAY; P Waters, G3OJV.

MICROWAVE: A C Talbot, G4JNT; *D W McQue, G4NJU;* J N Gannaway, G3YGF; S Chettle, G8ATB; D R Edwards, G8BFV; M H Walters, G3JVL; M W Dixon, G3PFR; P E H Day, G3PHO; S T Jewell, G4DDK; S J Davies, G4KNZ; *L P D Kellett, G8KMH; M G Kinder, G0CZD; C W Suckling, G3WDG; E R Jewell, G4ELM; D J Robinson, G4FRE; P G Murchie, G4FSG; P E F Suckling, G4KBC; R A Stewart, G4PBP; A R J Cook, G4PIQ; B Chambers, G8AGN.*

MORSE TEST STEERING: D Waterworth, G4HNF; R Clayton, G4SSH (Chairman to 6.4.99); Deputy C I B Trusson, G3RVM; G Pritchard, G4ZGP (Deputy to 6.4.99); *J F Layton, G4AAL;* F C Stewart, G0CSF; P R Sheppard, G4EJP; M H Claytonsmith, G4JKS;

PLANNING ADVISORY: G J Bond, G4GJB; *J F Layton, G4AAL;* R J Amblin, G3LYN; J W E Jackson, G3TZZ; S J Purser, G4SHF; B K Sankey, G7RWY; L F G Thomas, GW4ZXG.

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Front Cover: The RSGB Millennium Key, which sold out within days of its release; the Pic 'n' Mix Digital Injection System, which was a highly regarded construction project in *RadCom* in the first half of 1999; the Young Amateur of the Year 1999 finalists, gathered around RSGB President Hilary Claytonsmith, G4JKS.

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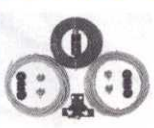

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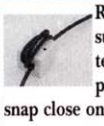

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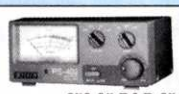

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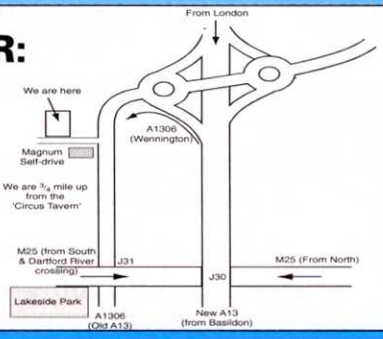

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technical topics

by **Pat Hawker**, G3VA*

MORE ON DIGITAL ('SOFTWARE') RADIOS

SEVERAL RECENT *RadCom* items (eg 'TT' September 2000, pp53-56 and 'Eurotek' July 2000, pp38-40) have emphasised that, whether we like it or not, the future of high-performance communications receivers and transceivers seems virtually certain to fall to the (almost) all-digital approach. Fortunately this does not mean the end of all existing familiarity with current analogue design practices or receiver technology, etc.

It will be some years, if ever, before we have to face up to the bleak outlook suggested by Steve Vaughan, G4WXC, in 'The Last Word' (September 2000, p95). In his letter headlined 'Radio, but not as we know it', he foresees that software radio "offers an end to RF/IF/AF design, technology, skill, experience and anything else radio". He believes that "in their place we should make amateur radio an essential part of the modern computing hobby".

That would, I suggest, be tantamount to putting one's head in the lion's mouth. Did not that wily but astute schemer, Machiavelli, advise strongly against ever inviting into your territory a stronger neighbour who would inevitably end by taking it (and you) over? I have nothing against the use of computers in amateur radio, or indeed in the pursuit of the separate hobby of computing, including communication via the Internet. But that is a very different matter from encouraging radio amateurs to think of themselves as "an essential part of the modern computing hobby". Radio may be part of computing, but is not the essential element.

A note received in late August from Dr Brian Austin, G0GSF, mentions that he would soon have to relegate all his interesting radio and historical research pursuits into the background. This was necessary in order to prepare himself "to face a new batch of undergraduates whose fundamental lack of interest or even a slight awareness of just about everything to do with radio is so apparent these days. One might have thought that the explosion of mobile phones into everyday life would have led to a rediscovery of the wonders of wireless. That certainly has not been my experience. Even the brightest of students is quite bemused by how 'radio' works; some seem not even to be aware that their mobile phone is actually a radio device - though they all claim to acknowledge that it emits 'radiation' of some mystical and possibly harmful kind! I often wonder how amateur radio can possibly survive in such a world."

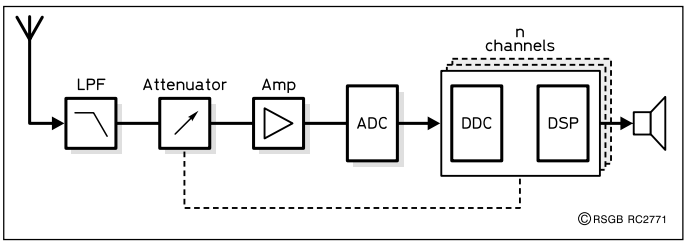

Fig 1: Block diagram of a wide-band HF digital receiver permitting simultaneous reception on n channels.

It thus seems important to stress that, even when transceivers become (almost) all-digital (the so-called 'software radio'), radio communication will remain an engineering and operating discipline in its own right. Antennas, ATUs, wide-band RF amplifiers, radio wave propagation and the like will still form an inherent part of amateur radio rather than information technology. The real problem facing the hobby is how to instil in at least some of the young a sense of wonder and excitement in communicating by radio, whether by Morse key, speech or keyboard - and pride in what has been contributed, for over a century, to the science of radio by amateurs. That *won't* happen, I suggest, by thinking of amateur radio as a part, whether essential or not, of the computer hobby!

Professor Geoff Gott, G3MUO, has kindly sent me a copy of a prize-winning paper *A High Performance HF Software Radio*, presented by N C Davies of the Defence Evaluation and Research Agency (DERA) at the 'HF Radio Systems and Techniques Conference' (*IEE Conference Publication No 474*, pp 249-256). This is introduced as follows:

"For many years, multi-conversion super-heterodyne receiver designs have been dominant in HF communication systems. In recent years, with the development of affordable high-performance analogue-to-digital converters and digital signal processing (DSP) technology, intermediate frequency digitisation has been increasingly popular. Now, for the first time, direct sampling, all-band digital receivers are finally becoming possible for use at HF. This class of flexible, highly reconfigurable receivers, commonly termed software radios, digitise the entire band of interest and then use DSP algorithms to select, down-convert and demodulate signals of interest."

The paper describes an (almost) all-digital 100-watt high-performance HF transceiver that has been developed at DERA as a laboratory prototype using a 12-bit ADC, but now is in the course of being further developed with the recently introduced 14-bit ADC. One of its features is that it makes use of the facility offered with software radios of permitting simultaneous reception on a number (in the DERA case four) of channels, by processing the wide-band digital signal with separate DSP sections, using a common wide-band ADC front-end - **Fig 1.**

This impressive and valuable paper includes a section 'HF Receiver Requirements', that reviews the performance requirements of a high-performance receiver whether based on analogue or digital technology. It is interesting to note, among the references, an article by the late Jim Fisk, W1DTY, editor of the still-missed *Ham Radio*. This section includes the requirements for sensitivity, large signal handling, selectivity, intermodulation products, spurii and spurious free dynamic range (SFDR). The additional requirements of a transmitter based on a digital exciter plus a wide-band power amplifier are briefly noted.

Reception in the HF band is usually externally noise-limited due to galactic, atmospheric or man-made noise. **Fig 2** shows the contributions of these noise sources, assuming a low-loss antenna and feed. It is suggested in the paper that a noise figure of less than 16dB - equivalent to a noise floor of -158dBm/Hz or a -113dBm signal providing 10dB SINAD in a standard 3kHz bandwidth - will fulfil theoretical requirements. Additional sensitivity is still useful to overcome losses in the antenna, feed etc. [At 30MHz, with a simple antenna, a noise figure of about 10dB is optimum, but 16dB is usually sensitive enough even with simple anten-

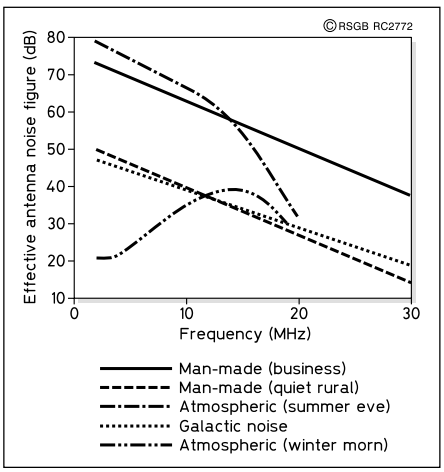

Fig 2: Effective noise figure of a low-loss isotropic antenna due to external noise in the HF band.

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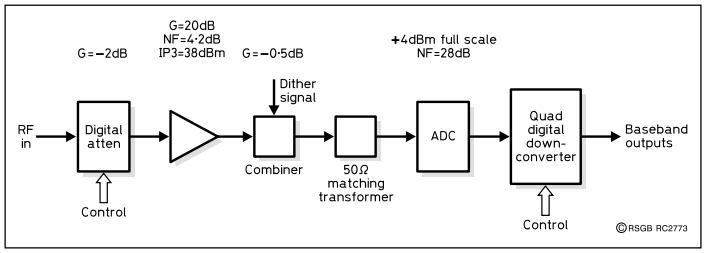

Fig 3: Block diagram of the DERA prototype wide-band digital receiver showing gain distribution.

nas up to about 20MHz - G3VA].

The need for an HF receiver to be capable of handling large signals is much more demanding with a wide-band system. The DERA paper notes that the total signal energy present in the HF band (2-30MHz), measured on a large aperture antenna in the dense European environment, ranges between a daytime minimum of 80dBmV/m and a peak night time maximum of 120dBmV/m, without taking into account the large signal strengths that can be generated by nearby transmitters. When possible antenna gain is taken into account total receive powers as high as +20dBm may be present at the input.

The DERA prototype receiver sub-system contains four independent receivers, each of which may be fed from one of two diversity RF inputs. Protection and filtering are provided from an external module, with each RF fed to a digitally-controlled GaAs FET attenuator, which provides 2-32dB of attenuation, followed by a +20dB GaAS MMIC gain block: **Fig 3.** The ADC is clocked at 62.208MHz with a low phase signal from the master oscillator.

It is stressed that the performance of a wide-band digital receiver is usually defined by the ADC. The maximum SNR that an ADC device can achieve is limited by its analogue noise performance, dynamic non-linearities in the conversion process and sampling clock aperture jitter. For the latest Analog Devices AD6644, 14-bit, 65MSPS monolithic A/D converter, the maximum available SNR is 75dB, and this is critically dependent on sampling clock jitter. To attain the specified 75dB SNR for input signals up to 30MHz, the jitter must be no worse than the ADC's internal 0.3ps aperture jitter. With careful design a high-quality crystal-based oscillator or synthesiser can provide the required sampling clock with a wide-band phase noise performance (better than -80dBc total phase noise power when used with the AD6644).

To summarise some of the other points made by N C Davies: the SFDR with this device is limited to -90dBFS (dB relative to full-scale) for a single-tone full-scale input, and this has a far more serious impact than third order IMD. However, the application of an additional large noise-like signal can improve SFDR as much as 10 to 25dB by redistributing the spurious energy across the ADC bandwidth, a technique know as dither. With dither applied below 2MHz (ie below the main frequencies of interest) the SFDR of the AD6644 is expected to prove to be better than -100dBFS. The DDC can also impose limitations, but the latest generation (eg 14) is making use of longer word lengths and instantaneous dynamic ranges, and an SFDR of better than 115dB is achieved.

To achieve the performance possible with the latest devices, the wide-band analogue pre-amplifier must be extremely linear, with an IP3 of better than +28dBm. Good harmonic suppression (ideally -100dBc) is also critical, as the receiver must be able simultaneously to receive signals over a five octave frequency range.

All these considerations add up to the fact that, with the latest devices, neither ADC nor DDC performance needs to limit HF receiver performance. **Table 1** shows a comparison of the performance of a high-quality conventional narrow-band (professional) HF receiver (type not specified in the paper) with the prototype DERA wide-band digital receiver using a 12-bit ADC, and with the predicted performance of the improved digital receiver now being implemented at DERA using a 14-bit ADC.

Parameter (3kHz b/width, To 290K)	High Quality Conventional HF Receiver (measured)	Prototype Digital HF Receiver (measured)	Improved Digital HF Receiver (predicted)
Freq (MHz)	0.1-30	0-28	0-28
NF (dB)	14	20	14
Block'g DR (dB)	113	108	115
IP3in (dBm)	+25	+18*(21)	+26*(26)
Analog SFDR (dB)	100	91*(93)	97*(100)
ADC SFDR (dB)	n/a	>95	>105

*Limited by selected MMIC amplifier (figure achievable with ideal amplifier shown in brackets).

Table 1: Comparison between conventional HF receiver and DERA digital receiver implementations. The prototype uses the 12-bit AD6640 ADC, with the 14-bit AD6644 being used in the improved receiver.

A prototype VHF (200MHz) digital receiver has also been tested using an under-sampling (sub-Nyquist) mode as the final IF/digital stages with external band-pass filtering. Measured performance came close to theoretical performance with sampling clock phase-noise jitter the most significant limitation. This approach could be used at VHF and above. N C Davies points out that with so few major devices required in the signal path there is potential for further integration and perhaps, before too long, a single-chip HF radio.

It should be appreciated that the above notes are a very brief review of a long and detailed paper that deserves to be studied in full by anyone concerned with developing high-performance digital (software) radios. It shows that, with care, the latest generation of 14-bit ADCs provides designers with the opportunity to break through the final limitations of this form of receiver. Nevertheless, it is clear that we may be some way from reaching the objectives of design simplicity and low-cost promised by some advocates of software radios.

MULTIVIBRATORS FOR OVERTONE CRYSTALS

HERRMANN SCHRIBER in the German-text magazine *Funk Amateur* (August 2000, p865), provides several circuit configurations for high-speed astable multivibrators using 32MHz overtone crystals, and asks the question: "With or without coils?" He also shows that, by using HCMOS logic inverter chips, 50MHz overtone crystals can be used, provided a "secret tip" is incorporated that permits a single inverter to be used when a suitable inductance is incorporated.

Fig 4 shows an arrangement using two discrete transistors as originally described in SGS-Fairchild Application Report No 170, *A Fast Switching Emitter-Coupled Astable Multivibrator* (August 1966). An

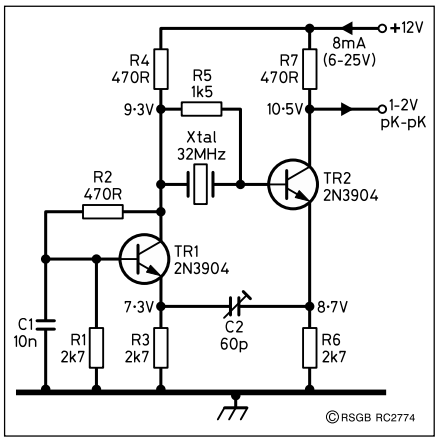

Fig 4: Emitter-coupled multivibrator with overtone 32MHz crystal.

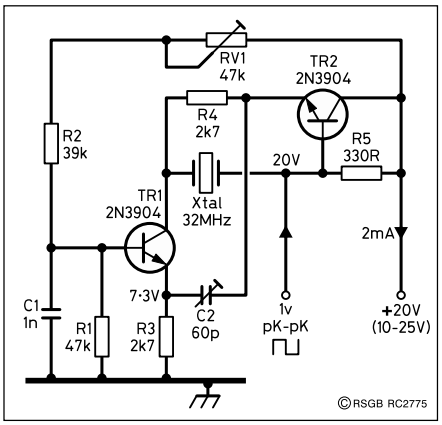

Fig 5: Alternative multivibrator generator for use with 32MHz overtone crystal.

alternative arrangement is shown in **Fig 5.** He then shows various arrangements using three IC inverters, eliminating most of the RC components and still without any coils: **Fig 6(a)** and **(b)**. These can use HCMOS logic inverters such as the 74HC04 or 74HC00 (note voltage limitations). By adding a suitable inductance, the oscillator can be realised using only a single inverter: **Fig 6(c)**.

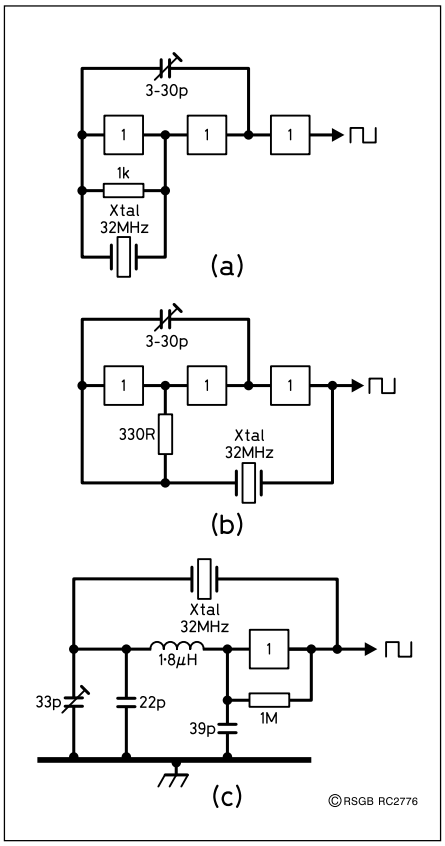

Fig 6: Alternative overtone crystal multivibrators using IC logic inverters. The addition of a suitable inductance permits the use of a single logic inverter.

REFERENCE VOLTAGE SUPPLY

JACK HARDCASTLE, G3JIR, in *QSX WARC*, journal of the Warrington Amateur Radio Club (July 2000), writes: "The June 2000 *RadCom* 'In Practice' by Ian White, G3SEK, describes the use of a solid-state voltage reference device (such as the MAX6190 series regulator with 1.25V output) to check the accuracy of digital voltmeters etc. Several WARC members have expressed interest in these precision devices as sources of accurate voltage levels. I can confirm that a calibrated supply, based on these accurate and stable devices, provides a most useful accessory to have around the shack: **Fig 7**.

"My voltage reference is a REF01CP (Maplin UL08J) rated at 10V 1%. It can be adjusted over a range of 3%. RV1allows the output to be set precisely to 10V, or as required. This feature, in my case, allows the output to be set a few millivolts above 10.0V. This accommodates my 10-turn potentiometer that has a small residual resistance at each end of its travel. It also means that the minimum setting is not quite zero, either. Again, this is not a problem because it can be corrected by the zero offset adjustment RV3 that also corrects for any zero offset due to IC2 (Maplin UL0SF).

"To achieve a satisfactory degree of temperature stability and long term stability, all the resistors should be metal film types. Similarly I used 'Cermet' linear trimmers for RV1 and RV3. The values of

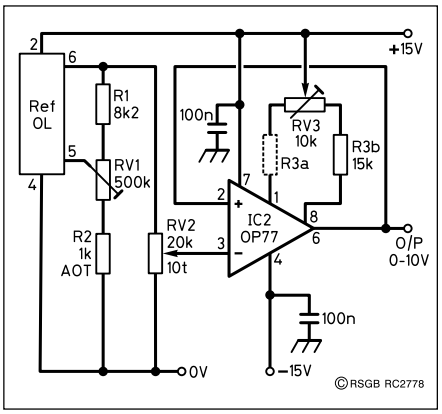

Fig 7: G3JIR's calibrated voltage reference unit.

these trimmers were made as small as possible, restricting their range of adjustment to a few tens of millivolts. This may mean that the value of R2 will need to be specially selected. For this reason, R2 is shown on the diagram as 'AOT' (adjust on test). The same applies to the trimming circuit for IC2. My reason for doing this was to provide a good degree of 'bandspread' on the operation of RV1 and RV3. You will be glad of this when you set-up these controls.

"After a period of time, I found that it was desirable to have a voltage reference that could be used to check DVM readings quickly and without recourse to the main dial. This has been implemented by adding a fixed voltage divider to the output from the voltage reference IC: **Fig 8**. It provides 0.195V to a socket to which a DVM probe can be applied at any time regardless of the setting of the main output. It is an optional extra, but one that I have found well worth including.

"The power supply (**Fig 9**) is quite conventional, but note that the 78L15 and 79L15 regulators have different pin connections. Be extra vigilant when you fit these components.

"The OP77 buffer amplifier has a low output impedance, making it tolerant to a wide range of load resistances. Even at the maximum output of 10V, placing a 1kW resistor on the output causes a fall of less than 1mV. This would not be detectable on a 3.5-digit DVM. It is recommended that loads lower than 1kW should not be used since this will cause IC2 to overheat and the output voltage to drift unpredictably. Remember, this is a voltage reference, not a calibrated power supply. Be kind to it!"

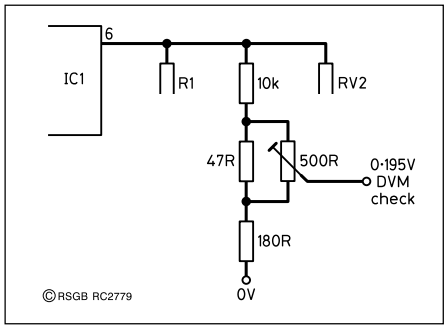

Fig 8: Provision of a fixed quick-check reference voltage.

NEUTRALISING: THE PIONEERS

A PHONE CALL from Ray Herbert, G2KU/G2TV who worked for John Logie Baird in the 1930s and now edits the *Baird Television Newsletter* put me on a quest of discovery. He sought confirmation of who originated the technique of 'neutralisation' – a technique that in these days of FET power amplifiers remains, as it did in the valve era, of fundamental concern to transmitting amateurs. My off-the-cuff reply was Louis Hazeltine. His 1923 five-valve 'neutrodyne' receiver used five triodes, the first two as tuned RF amplifiers, then a grid-leak detector and two AF stages.

But Ray had long believed that the idea of balancing-out the internal grid-anode capacitance of a triode originated much earlier, and that the famous associate of Marconi, H J Round, was involved. At the Baird Company, he had been told not to use a triode amplifier in a transmitter, because the Marconi Company held the patent. Yet Hazeltine is commonly credited. Ray felt that other radio amateurs would be interested to find out whether it was Hazeltine in the USA or Round in the UK or a continental scientist/engineer who first came up with this important means of preventing a tuned RF amplifier from acting as a tuned-grid, tuned-plate oscillator.

By far the single best source of authoritative information that I have come across concerning the many discoveries in radio circuit and practice in the years before 1926 is *The History of Radio Telegraphy and Telephony*, written and illustrated by G G Blake, MIEE. Blake was a member of RSGB and held the call 2JM in the early 1920s. His book was published by Chapman & Hall in 1928 (xx + 425 pages, with some 200 illustrations and a reference list of 1125 patents, professional papers, articles etc). I was able to borrow a copy from the ITC Library (I have never been fortunate enough to own one myself).

G G Blake, who later pursued an academic career in Australia, includes in his book an interesting account of the various trans-Atlantic tests including details of the official RSGB (then still the Wireless Society of London) 1kW station, 5WS, at Wandsworth. In the 1922 tests, this station was heard by at least nine American amateurs. It was sited in a small building belonging to the Metropolitan Water Board with the antenna suspended from the top of a high chimney at the neighbouring generating station of the London Electric Supply Company. Blake was a member of the RSGB sub-committee that built the station. Another special station, 5MS, was erected by the Manchester Wireless Society.

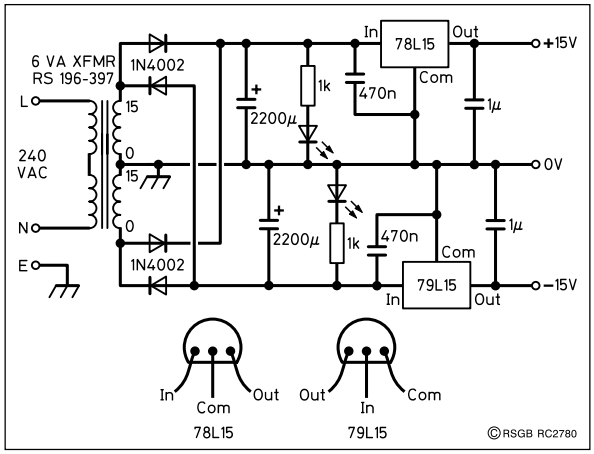

Fig 9: Power supply unit for the voltage reference unit used by G3JIR.

All this was in a period of great creativity in circuit design and experimentation. It was a period during which a vast number of ideas were generated, many virtually forgotten, but still of potential value, even in the present solid-state era.

But I digress. Blake shows that the idea of using a balancing capacitor between grid and plate (yes, he uses 'plate' rather than 'anode'!) was embodied as one of several important circuit developments in H J Round's Patent No 28413 of *1913!* The relevant diagram is shown in **Fig 10**. Blake writes: "According to the patent, C2 is a condenser connected to the grid, which it is sometimes desirable to insert, to negate the effect of the capacity between the plate and the grid" (p262).

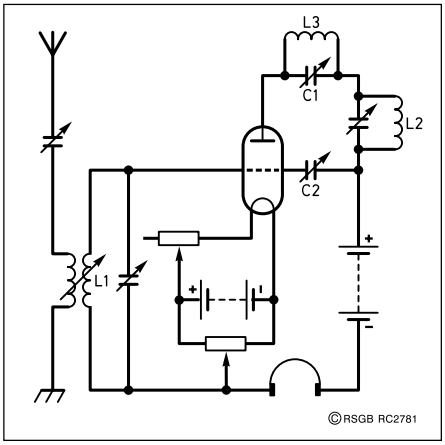

Fig 10: One of the circuit diagrams from H J Round's Patent No 28413 of 1913 showing the use of a capacitor (C2) connected between plate and grid to neutralise the effect of the inter-electrode capacitance.

Later, on p278, he refers again to Patent No 28413 in a section headed 'H J Round's Neutralization of Grid to Plate Capacity', adding "This was probably the first time that the possibility of balancing out the internal capacitance of a valve was suggested". He then went on to mention C H Wright's neutralization method of 1915 using an electromagnetic method of balancing out the effects of capacitance between the grid and plate of a valve, before launching into a full description of Hazeltine's neutrodyne circuit. The relevant stages are shown in **Fig 11**.

Hazeltine seems to have been the first to describe publicly what amounts to Round's circuit as a means of overcoming self-oscillation in tuned radio-frequency amplifiers. He presented a paper on his neutrodyne circuit before the Radio Club of America at Columbia University, New York, on 2 March 1923. Blake comments: "The neutrodyne method has many advantages. The valves are incapable of oscillating, unless reaction is purposely employed. The tuning is much sharper than is possible where stabilizing devices are employed, and much greater amplification per valve is obtained.

The neutrodyne system enjoyed several years of popularity for broadcast receivers although, for this purpose, it was later replaced by the screen-grid (tetrode) valve. It remained an essential part of amateur transmitters with triode power amplifiers and was still often required with high-gain power tetrodes and pentodes. I still have a 'neutralising capacitor' intended for broadcast receivers made by Peto Scott in the 1920s. It is now 'resting' after many years of use in various home-made transmitters, first for a T20 triode, later (more tricky) for a pair of 807s in parallel.

G2KU has a tape of a talk by Round in the USA in the 1930s (?) in which Round says that in 1918 he tried to persuade the Marconi Company to patent the use of a neutralizing capacitor specifically as a means of preventing self-oscillation. He was told that this idea had already been patented in Europe by Walter Schottky (?) whose main work, like that of Round, was in the development of thermionic valves. If in fact Schottky held a patent covering neutralisation, this was missed by Blake.

As a postscript, I recall meeting H J Round, who then looked like a twin of Winston Churchill, at a Marconi 'do' in Chelmsford in 1963. He was one of the great pioneers of radio communication on a par with his colleague Charles Franklin, both of whom contributed much to the Marconi Company, with Captain Round also a key figure in signals intelligence and direction-finding for the Admiralty in World War 1. ♦

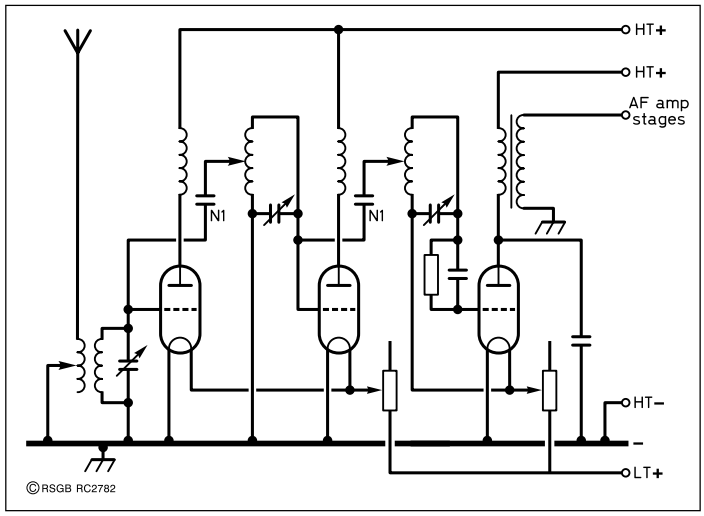

Fig 11: Part of the circuit diagram of Hazeltine's neutrodyne broadcast receiver showing the use of neutralising capacitors (N) to prevent the RF amplifying stages from self-oscillating.

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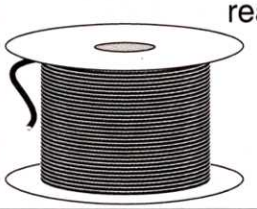

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KENWOOD	TS-780 DUAL M/M BASE	£350.00
KENWOOD	TS-811E 70cm MULTI MODE TRANSCEIVER	£400.00
KENWOOD	TS-830S HG ' CLASSIC' MAINS	£325.00
KENWOOD	TS-850 SAT 100w HF BASE TRANSCEIVER	£850.00
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YAESU	FT-102 BASE TRANSCEIVER 150w	£350.00
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YAESU	FT-757GX11	£425.00
YAESU	FT-767GX 2/70/6M HF inc ATU	£799.00
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YAESU	FT-840 HF MOBILE-BASE TRANSCEIVER	£450.00
YAESU	FT-847 HF/6M/2M/70cm/4m	£999.00
YAESU	FT-8500 DUAL BAND MOBILE TRANS 50w	£295.00
YAESU	FT-890 AT Inc FILTER	£600.00
YAESU	FT-900AT BOXED	£695.00
YAESU	FT-920 HF 50 MHz BASE TRANSCEIVER	£925.00
YAESU	FT-920 AF HF- 50 MHz BASE TRANSCEIVER	£999.00
YAESU	MD1 DESK MICROPHONE	£75.00
YAESU	VX-1R MICRO 2/70 WIDE RECEIVER	£109.00
YAESU	VX-500 HANDY SCANNER	£195.00
YAESU	FL-2025 25AMP FOR FT-290R MK11	£100.00
YUPITERU	MVT-3300EU MULTI-BAND RECEIVER	£100.00
YUPITERU	MVT-8000 BASE	£240.00

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How do I find Lee Valley Leisure Centre?

BY CAR on the A1055. Follow the signs from junction 25 of the M25.

BY PUBLIC TRANSPORT bus W8 from Edmonton Green B.R. Station

Saturday November 25th 10am - 5pm
Sunday November 26th 10am - 4pm

Adults: £3.00
Concessions: £2.50

Lee Valley Leisure Centre
Picketts Lock Lane • Edmonton • London N9 0AS

RadioSport Ltd • 126 Mount Pleasant Lane • Bricket Wood • Herts • AL2 3XD
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Members' Advertisements

RSGB Members wishing to place an advertisement in this section must use the official form incorporated on the label carrier of Radio Communication. This will prove membership and must be for the current month. No acknowledgment will be sent. Ads not clearly worded, or which do not comply with these conditions will be returned. If an ad is cancelled no refund will be due. An advertisement longer than 60 words will be charged pro rata. Trade or business ads, even from members, will not be accepted. Traders who wish to use this facility must send a signed declaration that the items for sale are part of, or intended for, their own personal amateur station. The RSGB reserves the right to refuse ads, and accepts no responsibility for errors or omissions, or for the quality of goods for sale or exchange. Each advertisement must be accompanied by the correct remittance, as a credit card payment, cheque or postal order made payable to the Radio Society of Great Britain. Please note that because this is a subsidised service to members, no correspondence can be entered into. Licensed members are asked to use their callsign and QTHR, provided their address in the current edition of the *RSGB Yearbook* is correct. RS members will have to provide their name and address or telephone number. Please include your town and phone number in the free boxes provided to assist readers. Advertisements will be placed in the first available edition of *RadCom.*

The closing date for copy is the first day of the month prior to publication, eg the deadline for the March issue is 1 February.

Warning: *Members are advised to ensure that the equipment they intend to purchase is not subject to a current hire purchase agreement. The 'purchase' of goods legally owned by a finance company could result in the 'purchaser' losing both the goods and the cash paid.*

FOR SALE

ANDREW LDF2-50 coaxial cable, 3/8in diameter brand new, 1000W at 433MHz, 50 ohm, 7.5dB attenuation per hundred metres (compare H100 or W103!) £1.35p per metre, carriage £6.50p, free over 20 metres, Visa, Mastercard, Amex. G4GYI, QTHR. Yes seven point five dB per 100 metres at 433MHz! 0.47 dB at 2MHz. Watch your meter climb. 01789 763 565 (Alcester). E-mail: word.p@virgin.net

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KENWOOD TS-570D plus SSB filter, exc cond, £450. M0AZE, QTHR. 0121 308 6015 (Sutton Coldfield).

AMERITRON linear amplifier type 811X, 28MHz - 160MHz, £550 ovno, buyer collects. 6m 3-ele beam, unused, boxed, £40. Bob, M0BEU. 01209 843 849 (Redruth).

AMPLIFIER Yaesu FL-7000 160-10m solid-state built-in auto ATU, PSU. Fully automatic, boxed, first class cond, £975. Standard C-7800 UHF mobile, as new, £90. Kenwood dual-band mobile, exc cond, £195. Trio 2200G portable, £35. TS-940SAT HF base, first-class cond, £695. FT-767GX HF base, auto ATU, CW filters, bargain, £325. Dual-band VHF/UHF amplifier, £55. VHF/UHF diplexer, £15. MFJ TNC/mic switchbox, £20. BNOS 70cm/50W amplifier, £90. Alinco 2m/30W amplifier, £25. 01953 884 305 or 07970 214 039 (Thetford).

ARMY R107 comm rcvr chassis rcvr type 78 26V chassis transmitter type 53 26V, both not working. J W Tatum, 48 Jasmine Close, Ipswich, IP2 9HP.

AT-940 automatic ATU for installation inside TS-940S series tcvr, full fitting instructions, vgc, little use, £125 ono. G4TNG. 0116 271 8809 (Leicester).

COLLECTORS! Servicing books. Radio and TV rcvrs of the 50/70s. Molloy and Poole with famous specialist authors for parts. Many diagrams and illustrations, set of 4 volumes. Radio 56/58 single volume. Derek. 01297 348 89 (Axminster).

CUSHCRAFT R5 vertical, gc, £65. Eagle 3-ele 6m Yagi, never used, neighbour not impressed, £55. Kent electronic keyer, £15. Prefer buyer collects aerials, all items ono. G4FAB, QTHR. 01949 831 558 (Bingham, Notts). E-mail: sjfox2@yahoo.co.uk

DRAKE L7 amplifier, 1.8 to 30MHz, gc, £800. Prefer buyer collects. Peter, G3ZSS. 01252 783 124 (Farnham). E-mail: g3zss@6metres.com

DYMAR 1520 HF/VHF sig gen gwo, £55. Commercial IGHz (1.3GHz) counter, £55. PacCom 9.6Kb packet modem, unused, £60. AOR spectrum display unit (near new), £250. Mirage D-1010 100W/70cm PA, £225. Ten-Tec 540 100W HF tcvr (no WARC), £100. MM 600MHz freq counter (no data), £25. Farnell d/beam scope with x10 probe gwo, £55. MFJ-35A DC dist board, £25. RS 12V/5A switch-mode PSU (no circuit), £6. H/book and data with equipment, buyer to collect or pay carriage. 01935 813 097 (Sherborne).

EDDYSTONE rcvr EC10 MkII, £70. Partridge antenna, rcvr, tuner, £10.BC-221 wavemeter and power unit, £30. M40FM tcvr, 6W/2W, £35 all vgc, carriage extra. 0191 455 2223 (South Shields).

FOR sale, Kenwood Trio HF SSB tcvr TS-120S, gwo with man, £250. No offers, Selling due to health reasons. 01634 712 270 (Kent).

FT-847, boxed, man, leads, mint, non-smoker, prefer buyer inspects, £750. Kenwood TH-D7 mint, box etc, £130, genuine reason. 01492 533 611 (Colwyn Bay). E-mail: leach@mcmail.com

FT-902DM, CW filter, Curtis keyer, £275. Versatower P60, ground post, unused, £70. Clark pump-up mast 6-25ft, as new, £150. GM3WED. 01349 877 435 (Dingwall).

G3TSO design HF tcvr with Plessey ICs, KVG filter, 15W output module with digital readout. Cased and complete, but little work required. Another G3TSO (Mk2) with extra bands. Metalwork with IF board and VFO completed analogue readout intended with Eddystone 898 dial. Other boards partially wired. Some spare Plessey ICs. If interested please phone GW3KAJ for further details, reasonable. 01686 413 511 (Llanidloes).

HONDA generator model EV3610, designed for hospitality or demonstration vehicle - 3.3 kVA rated output, 3.6 kVA max, very quiet twin-cylinder water-cooled petrol engine, electric start, remote control etc, still a current model, cost today £2500+VAT. Full demo available, £750 ono. 01332 513 613 (Derby). E-mail: g0mgx@btinternet.com

HP141 spectrum analyser, 1250MHz plug-in, gwo with mans G8GTZ. 01256 462 385 (Basingstoke). E-mail: g8gtz@qsl.net

HY-GAIN explorer 4-element tribander, £90. Heatherlite Hunter amplifier, £350, prefer buyer collects. G3UEN, QTHR. 01262 850 258 (Flamborough, E Yorks).

HY-GAIN triband beam, TH3JR, £50. Learjet USA 4-track stereo multiplex player, offers? G2CVY, QTHR. 01271 343 355 (Barnstaple).

IC-471E gc, boxed, £295. Racal EHT power supply, 2000V, 0.75A, fully regulated, inc heater supplies, very heavy, £185. 2m 4CX250 linear power amp module, inc base and chimney, £75. Marconi TF1247 RF gen, 20-300MHz, £15. All ono. 01483 534 954 (Guildford).

IC-706 Mk1 with mobile mount, head mount, split cable, mic, adaptor and mic, boxed, as new, £430. R-7000 with 80m kit and new spare traps, vgc, £200. 4m 3-ele Moonraker Yagi, 3 months' use, £20. Colin, G3TA, QTHR. 01285 821 571 (Cirencester).

ICOM 706 MkII 0-200MHz, hardly used with box, man, £400 - will swap for bigger HF radio. 01484 682 617 (Holmfirth).

ICOM 756PRO, PS-85, SP-20, SM-20, may split, £2000. Tennamast 10m + ground post, £200. 6m dual driven 7-ele beam, £70. Heathkit SB-200 80-10m + 6m mod, 800W, £350. Butternut HFV6, £100, 10-element 2m Cushcraft beam, £45. G1GCV. 01473 658 999 (Ipswich).

ICOM 765, recent Castle service, £675. MFJ-784B DSP, £125. Daiwa cross-needle SWR/power 1.8-150MHz, 15W-1.5kW, £28. Filters SSB Icom 746/756, FL-222, £30. FL-223 £25. Midland CB 77-104D lovely cond, £18. Cirkit 28/6m transverter, £40. Hi-mound twin paddle key, heavy base, £15. Contra solid state linear amplifier 3-30MHz, 100W with switched input output power levels, £80. 01946 810 047 (Cumbria).

ICOM IC-271E, Mutek, 2m multimode, 25W AC 230V power plus 13.5VDC, gc, £250. 4CX250 linear for above, 300W output, separate 2kV 400mA PSU. Tastefully constructed, £100. Eddystone 830/7 general coverage rcvr, spotless cond, incremental tuning, 30kHz - 30MHz, perfect working cond, £250. Ferrograph series 5 half-track stereo tape recorder, 7in-8in metal spools etc, plus new tapes, £85. Gerry. 01273 454 108 (Brighton).

ICOM IC-2KL 500W solid state linear, original packing, bargain at £575. 01435 883 248 (Heathfield, Sussex). E-mail: brian@g3gsi.freeserve.co.uk

ICOM IC-735 tcvr with keyer, boxed, man, exc cond, £350. PS-30M power supply, 25A, £75. KW Ezimatch with Hansen meter, £40. Yaesu VHF/UHF FT-50R boxed, man, exc charger battery box, mic, earphone, adaptor antenna, £150. Bencher black paddle key, £50. MoD blue box key, £75. Rare Bakelite RAF key, £100. Heath 1kW dummy load, £20. 01438 362 829.

ICOM IC-T8E handy, 2/70/6m FM tcvr NiMH charger, as new, £195. Tektronix 465 oscilloscope, dual trace, 100MHz portable, £250, good order. Advance digital multimeter, gwo, £50. DL-600 dummy load, £40. G0PJI. 01934 812 543 (Weston-Super-Mare).

ICOM-728 boxed + mic, like new, fine compact HF rig for quick sale, £350 ono. John, GM3LBX, QTHR. 01880 820 842 (Argyll).

JRC JST-135 tcvr (150W output) with fitted BWC board and 500Hz CW filter. Matching 30A power supply. MFJ 1.5kW ATU. This equipment is in near new condition and complete with mans. An absolute bargain at £600. (buyer pays carriage).G4WNG. 01670 822 172 (Bedlington). E-mail: tomfurness@bedlington.freeserve.co.uk

KENWOOD TS-450S Nov 1995, fitted CW filter YK 88C-1, £500. SEM TranZmatch, £60. BNOS PSU type 12/20E, £75. 01270 500 339 (Crewe).

KENWOOD TS-520SE HF rig with MC50 desk mic and man, gc, bargain, £180 ono. David, M0GHZ. 01225 810 138 (Corsham).

KENWOOD TS-830S, £100. KPC4, £75. FT-227R, £40. Two 70cm synthesised FM tcvrs TK-801, £35. Storno, £30. 01453 828 011 (Stroud).

KENWOOD TS-870S inc MC-60, SP31, HS-5 (never used accessories) £1500, health reason. Yaesu FT-736R triple band, £700. 01743 874 791 (Shrewsbury). E-mail: alan@g7tpk.freeserve.co.uk

LT23S 23cm transverter, £250. 70cm 200W solid-state linear, offers? 70cm 23-ele Yagis, nearly new (box of four was too much for mast!), £30 each or £55 pair. Tonna 2m 9-ele Yagis, £15 each, £25 pair. 70cm 19-ele as previous. 01442 826 651 (Tring, W Herts). E-mail: g3meh@supanet.com

M-MODULES transverter 144/28, £25. Cushcraft vertical AV5 antenna, £70 plus carriage. John. 01924 470 667 (Batley, W Yorks).

MAST hand winch Pfaff type LB, light duty, max capacity 650kg, brand new, £40 + carriage. G0KWS, QTHR. 0191 252 7141 (Whitley Bay).

MKI IC-706 tcvr with Perth Outbacker mobile antenna, accessories, £500. Hy-Gain T2X Tailtwister rotator and digital readout, £450. Tektronix TDS320/100 digital storage scope, £400. Hewlett Packard 34401A bench multimeter, £200. Eagle 50MHz beam, £30. All new AR-300A scanner, £300. Racal 9082 synthesized signal generator, £175. Farnell FO782 RMS millivoltmeter, £80. Tektronix 2215 scope, £100. 01303 874 852 (Dymchurch). E-mail: bill@g4ljt.freeserve.co.uk

NEW 086 computers, 720K DD VGA mono screens DOS 3.3, BASIC 3.2, 9-pin dot matrix, ideal own programming. Ring for list, buyer collects. 020 8851 7266 (Eltham).

OSCILLOSCOPE Hewlett-Packard 1741A 100MHz, £100 ono. Oscilloscope Farnell DTV-20 20MHz, £100 ono. Oscilloscope Farnell DTV-12-14 12-14MHz, £70 ono. Ken. 01244 676 167 (Chester).

PYE Cambridge 2m FM tcvr, 5 channels fitted, dash mounted, £45. KW 10m FM tcvr, original box, £20. 01376 554 628 (Essex).

RACAL RA1771 HF communications rcvr, mint, £550. Racal HF tactical wide-band antenna type RA905 with 9m mast type MA675, mint, £500. Spy set MK123, with spares and accessories, mint, £450. Granger commercial log periodic HF antenna type 2004, with self-supporting articulated tower, gc. For more details, Nigel, G0UGD. 01327 357 824 (work), 01323 486 822 (home) (Eastbourne).

RACAL RA-1778 rcvr, solid state, digital display, vgc, £225. Yaesu FT-101Z 9 bands 160-10m, plus WARC, in daily use, vgc, £150. Racal RA-17 Mk2, gwo, £125. KW E-zee match ATU, vgc, £20. KW PEP meter, 300W, vgc, £15. Mannesmann T-9104W b&w printer with software, £10. Various 8-pole xtal filters, £3 each to clear or 10 for £25. All plus carriage. 01526 860 546 (Lincoln).

REALISTIC DX-200 rcvr, £30. Tektronix scope 533A, £20. Phillips M3230, £20. Eagle & Jason sine square gens, £10 ea. Muirhead freq/audio analyser, £20. AVO component comparator, £20. Sony all-transistor TV, £20. Memotech computer MTX512, £10. Ferguson monitor, £5. Pair speakers, £5. TV 12in, £15. 020 374 9070 (London).

RECEIVERS AR-88D rack mounting, £45. Pye AP-100339 cat, £50. Collins R-278 military airband, 225 to 400 MHz, £50. B-40A, £50. Marconi 2232A, same as Eddystone 670A, £50. Trio QR-666, £50. Trio 9R59DS, original packing, £50. PCR2, £45. Eddystone 730/4, £75. Sig/gens Taylor 65C, £15. Heathkit RF1U, £15. R-109 rcvr, offers? All the above gwo. 0208 554 6631 (Ilford).

REDIFON R551N HF rcvr, gc, £80. Paul. 01983 821 808 (Newport, IOW).

SCANNERS. AOR5000, £995, as new. AOR3000A plus, £550, as new. Sony ICFSW77 shortwave scanner, £250, as new. Silent key sale. 0191 528 8079 (Sunderland). E-mail: nigelmarston@tinyworld.co.uk

SGC-2020 superb QRP rig, 160-10 metres, boxed and nearly new, £400. Yaesu FT-102 working order, £150. Buyer inspects. G3EGS, Bob. 0121 414 0443 (Birmingham).

SHACK clearance JR-500DS rcvr, homebrew ATU, massive components, class 2 wavemeter, Howes 80m and 100m rcvrs, Codar PR-30, kW coax switch, scrap KW Vespa chassis, plus complete PSU, G5RV ant, factory-made, no reasonable offer refused, GW3YTL. 01824 704 010 after 6pm (Ruthin). E-mail: gw@3ytl.freeserve.co.uk

SILENT key sale, property of GM0UCB. Icom IC-740 tcvr with SM-5 desk mic. AR-146 2m mobile tcvr. Pakratt model PK-232MBX data controller with software and instruction man. SEM TranZmatch. Palstar DL-1500 dummy load. Reace RC-1000 tcvr monitoring system. FC-50 frequency counter. 2-leg flytrap antenna - only traps and centre balun useful. GM4EHB, QTHR. 01688 302 446 (Tobermory).

SILENT key. FT-757GX, keyer, CW filter, man, box, £345. Morse keys, immac 'Bathtub', £45 vg Junkers, £40, immac RAF type B in original 1940 Air Ministry box, £60. Vectronics 1.5kW 1-650MHz dummy load, as new, £50. Tech GDO, boxed as new, 0.44-280MHz, £60. Shure 444 desk mic, £25. Inspect and collect or pay carriage. G3XBE, not QTHR. 07886 077 249 (Notts).

SMART Tuner, 500W version SG-235, £750. SGC-303 500W all-band mobile, aerial, £350. KAM plus. Yaesu BPF-1. MFJ-945E. MFJ-4112. FT-726 satellite board. Yaesu FRG-7 digital. Hy-Gain DX-77 HF vertical. DSP filter NTR-1. MFJ-1278B. SEM QRM eliminator. 01708 374 043 (Romford). E-mail: g3rcq@supanet.com

TA32, 6m 3-ele, 2m 7-ele, 12/17m rotary dipole, Emotator 747SR channel master rotators, dural scaffold tubes, joiners clamps, cash and carry. 01323 643 172 (Eastbourne).

TCS-12, rcvr, transmitter, spare rcvr, scrap transmitter, h/brew p/supply, ATU, fist-mic, h/book, spare finals, lots-bits etc, valve AM pre-amp. Job lot £300, buyer must collect. Peter, G4VUN. 01287 634 397(day) 01677 460 302 (eve), (Ripon).

TOKYO model AL-180V all-mode 2m power amplifier, output high 170W, low 70-100W, £180, vgc. RFC 2m/70cm dualband 30W PA and rcvr preamp for h/held radio, vgc, both items complete with mans and original packing. G3UYM, QTHR. 01462 629 871 (Hitchin). E-mail: harold.groves@ntlworld.com

TRANSMITTING valves Philips QB3/300, 3 pairs, £15 a pair. EEV C1136 equivalent 4-400, £30 the pair. 4-250A (CV2131), £25 the pair. 0116 299 4761 (Leicester).

TRIO 120, lovely QRP radio, £210. BNOS 25A PSU, £55. Star master key, £25 or £280 the lot. Malcolm, G0EBD. 01743 367 087 (Shrewsbury).

TRIO TS-520 tcvr w/s man gc, £200. TS-530 tcvr gc, £200. Kenwood TS-140 tcvr gc, £350. G3DQY, QTHR. 01424 428 064 (Hastings). E-mail: vaughdqy@aol.com

TRIO TS-830S HF tcvr, 100W SSB/CW, 160-10m, h/book, mic, gc, working all bands, but no term guarantee due to age, hence £275. Shure 444D desk mic, £45, prefer buyer inspects, collects or plus carriage. GM3LGU, Ian, QTHR. 01620 825 639. E-mail: rpryd@netscapeonline.co.uk

TRIO TS-930S hardly used tcvr, multiband HF, £375. 01455 291 101 (Leics).

TS-77E 2m tcvr, £395, TS-811E 70cm tcvr, £400. JRC NRD-525 general coverage rcvr £450, all mint. Henry IKD5 linear, £495. 01225 753 166 (Trowbridge).

TS-830, HF, WARC bands, mic, man, box, £250. Also IC-730 HF, mic, PSU, man, WARC bands, £180 ono. 024 7672 1930 (Coventry).

TS-830M HF tcvr, spare PA valves, man, £275. Ten-Tec Century 21 CW HF tcvr, £70. Drake SSR1 HF rcvr 0.5-30MHz, £70. TR-2300 2m handies, £50. All plus postage. Terry. 01462 435 248 (Hitchin).

TWO Eddystone rcvrs in gwo: Models 940 and 770R MkII, £75 each. G1BMK. 020 8551 0408 (Ilford, Essex).

VERSATOWER forty feet tilt-over with rotator and Mosley TA-33M WARC beam 4-ele, Toko linear, must sell due to planning refusal. 01527 837 296 (Bromsgrove).

VIBROPLEX original 1984, £100. Champion 1975, £40, Shure 444D desk mic, £30. Alan. 01253 592 395 (Blackpool). E-mail: m0bfu@freeuk.com

YAESU 101 plus FV-101 VFO, one owner since new, gc, £100. Yaesu FT-757GX, £350. KW-103 VSWR meter, £15. KW Ezeematch, £20. 01353 860 012 (Ely). E-mail: bassford@waitrose.com

YAESU FT-1000MP 1998 model, extra filters plus MP-100 desk mic, man and all packaging, exc cond, £1,400. Yaesu FL-2100Z amplifier plus spare 572Bs, exc electrically and cosmetically, plus man, £450, prefer buyer inspects, carriage extra. G4DXG, QTHR. 01892 662 931 (Crowborough, Sussex). E-mail: g4dxg@qsl.net

YAESU FT-1000MP, mint, original packing, £1100. G3PTN, QTHR. 0113 265 4644 (Leeds).

YAESU FT-101E, gc, with man, but needs servicing, £175 ono. Roger, GU4HUY, QTHR. 01481 247 694 (Guernsey).

YAESU FT-101Z Mk3, WARC, mint cond, boxed, c/w mic, one owner, still on first logbook! £275. G4KCR, QTHR. 01423 885 758 (Harrogate).

YAESU FT-757GX2 plus FP-707 PSU, £350. Lake DTR 7/5 built by Lake, 40m tcvr, £85. Trio TS-520, boxed, £100. Oak Hills Research Sprint 80m tcvr, £50, all w/o with mans, please inspect and collect. Edward, G0WDT, QTHR. 01782 717 837 (Newcastle, Staffs).

YAESU FT-920AF fitted inrad filter, CW/Data, mint, boxed, £795. Diamond GSV-3000 25A PSU, £80. Diamond CP-5 HF vertical antenna, £60. 01900 821 192 (Cumbria). E-mail: julian@tech-pro.co.uk

YAESU Micro Commander FT-90R, VHF/UHF dualband FM tcvr, vgc, c/w box, man, brackets, sell for £270. 01942 830 254 (Wigan).

WANTED

CRYSTAL sets and early valve radios wanted; all old equipment, valves, etc is of interest. Jim, G4ERU, QTHR. 01202 510 400 (Bournemouth).

SPY / Clandestine radio sets. Private collector will pay your price for good examples. Have some items for swaps. Bill, G8PUJ, QTHR. 020 8505 0838 (E London).

AEA morse machine. G2QT. 01303 814 194 (Ashford).

COLLECTOR/researcher requires old QSL cards, especially reception report cards from radio stations world wide. Please contact with prices. 01674 676 480 (Montrose). E-mail: ferryden@btinternet.com

COMET CD-270D SWR/power meter. Icom SM-20 desk mic, must be in as new cond. Tony. 01249 656 702 (Chippenham).

CW filter for TS-520 type YG3395C. Circuit diag Belix PSU type CM5001. 01427 611 160 (Gainsborough).

DAIWA LA-2155E 2m linear man wanted for loan or photocopy, all costs paid. Ian, M1CWB. 02380 327 725 (Southampton). E-mail: ipb@tcp.co.uk

DISABLED enthusiast offers home to unwanted QSL cards, log books, etc, also to buy pre-1970 *RadComs*, *Practical Wireless*, *CQ*, *QST* magazines, valve tester and signal generator. Mike, 8 Windsor Rd, Reydon, Southward, Suffolk IP18 6PQ.

DRAKE C line, R4C, preferably with noise blanker, any cond considered, please phone me if it's in exc cond, or not working. If you only have bits or R4C only or T4XC only. 01708 374 043 (Romford). E-mail: g3rcq@supanet.com

EDDYSTONE. Still require an Eddystone EC958/7 or 7E, would consider version 12. Tony, G0LGT. 01494 778 352 (eve) (Chesham).

EDDYSTONE-type transmitting variable capacitors. Need either a differential unit (not split stator) or two identical gangable single units with straight line capacitance of 250pF plus per section. Good cond parts only please. QTHR. 01473 787 779 (nr Ipswich). E-mail: bwcal@legga.fsnet.co.uk

ERA audio filter wanted, other similar filters considered, best price paid. GJ0KYZ, Paul (not QTHR). 01534 612 532 / 859 080 (Jersey). E-mail: jsyedu375@localdial.com

HEADPHONES, lightweight mini-type, mono with 3.5mm jack plug, will pay reasonable amount plus carriage, must be in vgc. 020 8449 0877 (Barnet).

ICOM IC-215 handy FM 2m portable tcvr. G3JNL. 'Turlington' Salisbury Road, Shootash, Romsey, Hampshire, SO51 6GA. 01794 512 283 (Romsey, Hampshire).

INFORMATION and advice on repairing a Hewlett Packard scope model HP1741 or at least point me the right direction! GW3XJC. 01656 733 729 (Maesteg). E-mail: lukes@btinternet.com

PHILIPS FM1200 STM 22 PMR radio, also PYE PFX h/held UHF radio. Tony. 01424 812 631 (East Sussex).

PLESSEY connector for R216 (female, power, 12pin) or power supply, any cond, required, reasonable price paid. GM4FDT. 01349 852 332 (Invergordon).

PLUSTRON TV5RD portable television, gc and working order please, also Yaesu FT-707S (low power version). Steve, G4VRR. 01784 256 482 (Ashford, Middx). E-mail: g4vrr@freeuk.com

RACAL 1792 mans, loan or purchase, please help, all costs paid. Eddystone 958/7, your price paid. 0141 649 2328 (Glasgow).

SCRAP Yaesu FT-757 or possibly talk to someone who has worked on one. My display has gone out, rcvr appears to work and tune for a short while, up/down band relays click on times then die. GW3XJC. 01656 733 729 (Maesteg). E-mail: lukes@btinternet.com

SILENT key clearout or just not needed, wanted for research project, QSL accumulations, old call books etc. Can collect. 0113 269 3892 (Leeds). E-mail: g4uzn@qsl.net

SINCLAIR ZX spectrum 48K 'keyboard' in good order, or new membrane to fit under keys. Alan, G3MBL, QTHR. 01284 827 379 (nr Bury St Edmunds).

TH2SAT weather satellite decoder card, software and mans wanted, must be in full working order. 01623 479 482 (Mansfield). E-mail: g1eiv-r@ntlworld.com

TS-130 for spares and repair. 01707 328 831 (Welwyn Garden City). E-mail: cyril@g3cse.freeserve.co.uk

TWO remote mics for Philips PRP 76 pocket phones, high band VHF, also Yaesu NC-42 desktop charger. 01773 718 222 (Nottingham).

WANTED complete Kenwood TS-830S HF station with matching external VFO, speaker and desk mic, mint cond only, good price paid. G4ZQL. 0161 653 8530 (Manchester). E-mail: normanhiggs@cwcom.net

YAESU FV-901DM VFO, Yaesu FV-101Z VFO, Yaesu 70TV 4m (70MHz) module for FTV-901R, non-working Yaesu FT-101ZD MkIII for spares. Please help? Bob. 01667 455 338 (Nairn). E-mail: gm7bcc@tinyworld.co.uk

YAESU YM-40 h/mic for FT-780R, part M3090028, Icom HM-10 or basic Icom h/mic for IC-290D. Yaesu YM-30 h/mic, FTS-2 or FTS-9 CTCSS units for Yaesu FTC-4610. Trio TR-2300 h/mic. Richard Perzyna, G8ITB, QTHR. Daytime only 01689 602 948 (Bromley, Kent).

Club NEWS

ABERDEEN ARS

3, Junk sale; 10, Annual General Meeting; 17, Presidential address. Robert, 01224 896 142.

ALDRIDGE & BARR BEACON ARC

6, Talk 'Electronic Control of Pendulum Clocks', by R E Sadler, G4FAJ. Charles, G0NOL, 01922 636 162.

APPLEDORE & DARC

20, Bring and buy auction. Brian, 01237 473 251.

BANGOR & DARS

1, Surplus sale. Mike, GI4XSF, 028 4277 2383.

BLACKMORE VALE ARS

7, On-the-air night and CW class; 14, Talk 'QE2 Radio Officer', by Phil, G3YPQ; 21, Talk 'Raynet', by Chris, G8RXA; 28, On-the-air night and CW class. Tony, G0GFL, 01258 860 741.

BRACKNELL ARC

8, 'Return of the HF Antenna'. Baugh@compuserve.com

BRAINTREE & DARS

6, Jim Bright; 20, Video evening. Keith, M0CLO, 01376 347 736.

BROMSGROVE ARS

14, Annual Dinner; 28, Video evening. B Taylor, G0TPG, 01527 542 266.

CAMBRIDGE & DARC

3, Talk 'Measuring RF Power Using Current Transformers - the Theory', by John Bonner, G0GKP; 10, Maplin's revisited: 'The Latest Goodies'; 17, Talk 'Measuring Power Using Current Transformers - the Practical Design', by John Bonner, G0GKP; 24, Talk 'HF Aerials, Feeders and Baluns - it's just not the rig you know', by Ian Alexander, G4AKD. Bob, G0GVZ, 01223 413 401.

CHELMSFORD ARS

7, Rig evaluation by Malcolm Salmon, G3XVV. David, M0BQC, 01245 602 838.

CHESHUNT & DARC

1, Members' forum; 8, Constructors' contest; 22, Annual General Meeting; 29, Internal lecturer. David, M1DGS, 01920 463 746.

CHESTER & DRS

7, Talk 'Medical Electronics', by Roger Howell, G8GWX; 2, Talk 'Morse Keys', by George Robbins. Bob, G4CMI, 01244 378 699.

CHICHESTER & DARC

7, Junk (antique) sale; 21, Free evening. Graham, G0WSD, 01243 788 292.

COCKENZIE & PORT SETON ARC

25, Club Christmas meal, (proposed possible date). Bob, GM4UYZ, 01875 811 723.

COULSDON AMATEUR TRANSMITTING SOCIETY

13, Talk 'Military Radio', by Dave Tye; 19, CATS Bazaar at Scout HQ in Lion Green Rd, Coulsdon. Steve, G7SYO, 01737 354 271.

COVENTRY ARS

3, Sausage & mash supper; 10, Night on the air, Novice class, CW Practice; 17, Skittles Night - details TBA; 24, Night on the air, Novice class, CW Practice. John, G8SEQ, 024 7627 3190.

CRAY VALLEY RS

2, 15 Years in satellite communications, by Chris, G0FDZ; 16, SARK 2000 DXpedition, by Nobby, G0VJG. Bob, BRS32525, 020 8265 7735 after 8pm & w/e.

CROWBOROUGH & DARS

23, Talk 'Reminiscences of 'Aspi' - Kingstanding Radio Station'. Margaret, G6UIF, 01892 663 666.

CRYSTAL PALACE & DRC

1, Transverter project, construction class, computing and Internet; 18, Surplus equipment sale. Bob, G3OOU, 01737 552 170.

DENBY DALE (PIE HALL) ARS

1, Talk 'RSGB Reorganisation', by Derek Allen; 15, Maplin New Products (Computer). Tony, G4LLZ, 01484 318 750.

DERBY & DARS

1, Junk sale; 15, A visit to the Wirksworth Astronomical Observatory; 22, Video show; 29, Technical Topics. Martin, G3SZJ, 01332 556 875.

DOVER RC

1, Film Show by M1BKI; 15, Talk 'Basic Wire Antennas', by G3ROO; 29, Talk 'paKet', by Stewart. Jim, M1BKI.

DUDLEY ARS

20, Demonstration of latest models of HF transceivers. Bill, G3CAQ, 01902 843 873.

ECHELFORD ARS

9, Talk 'Short Wave Listening', by Bob Treacher, BRS32525; 23, Bring & buy. Robin, G3TDR, 01784 456 513.

EDGWARE & DARS

9, Talk 'Contesting for Absolute Beginners' by Tony, G0IGP; 23, Station on the air. David, G5HY, 01923 655 284.

FALKIRK & DRC

19, Junk sale at the Guide Hall, Jackson Avenue, Grangemouth. Bob, GM4CAQ, 01506 844 418.

FAREHAM & DARS

1, Circuit diagrams and components - part 7; 8, Night on-the-air; 15, Video night; 22, Project planning night - the next club project; 29, The Yaesu FT-2600M, by Brian, G4ITG and Mick, G4ITF. Steve, G7HEP, 01329 663 673.

FARNBOROUGH & DARS

22, Annual General Meeting. Norman, G0VYR, 01483 835 320.

FELIXSTOWE & DARS

13, Speaker from Microwave Round Table; 27, RSGB video evening. Paul, G4YQC, 01394 273 507.

GLOUCESTER AR & ES

6, Test equipment evening - bring & show; 13, 5WPM Morse practice; 20, On the air - 160/80 metres;

27, 5WPM Morse practice. Tony, 01452 618 930, office hours.

GOOLE RES

3, Event planning session at the Barnes Wallis Inn; 10, Contest equipment check at Lionel Winder Ltd, Selby; 17, Amateur television night at the Courtyard Centre, Goole; 24, CW night at the Courtyard Centre, Goole. Richard, G0GLZ, 07867 862 169.

GREAT YARMOUTH RC

10, Operating evening; 24, Multimeter demo. Tony, G3NHU, 01493 721 173.

GUILDFORD & DRS

10, Something old/something new; 2, Pre-Christmas goody sale. Tim, G7JYQ, 020 8399 5125.

HAMBLETON ARS

1, Night on-the-air; 15, ATV; Night on-the-air. John, G0VXH, 01845 537 547.

HARWICH ARIG

8, Lecture and demo of PSK31 by Iain, G0OZS. Eugene, G4FTP, 01206 826 633.

HODDESDON RC

7, Annual General Meeting; 14, Morse night & pre-Pickett's Lock forum. Don, G3JNJ, 020 8292 3678.

HORNDEAN & DARC

7, Club social evening; 28, Talk by Bill, G3TZM. Stuart, G0FYX, 023 9247 2846.

HORNSEA ARS

1, Talk by G8EQZ; 8, Talk by G4YTV; 15, Annual General Meeting; 29, Activity. John, G0TPS, 01964 562 258.

HORSHAM ARC

2, Talk 'Backyard Antennas', by Peter Dodd, G3LDO. David, G4JHI, 01403 750 228.

HULL & DARS

3, Talk by G3PQY; 10, Junk sale preparation; 17, Junk sale. Jonathon, G7DBL, 01482 493 425 or 07867 880 402.

ITCHEN VALLEY ARC

2, Skittles at The Ship, Redbridge; 10, Talk 'The Salvage of the SS Great Britain - part 2', by Doug, G4BEQ; 24, Warm Irons with Brian, G0UKB. Pete, M0CFQ, 023 8034 5052.

KEIGHLEY ARS

2, On-the-air night; 16, Pig racing night (sponsors reqd); 23, Talk by Derek Allan, G3WYP RSGB; 30, RAE quiz night (exam paper quiz). Ian, M1BGY, 01274 723 951.

KIDDERMINSTER & DARS

7, Talk 'Travel Exploits', by G4AAL; 14, Talk 'Travel Talk and DXpeditions'; 21, Wyre Forest Packet Radio User Group - discussion meeting. Tony, G1OZB, 01299 400 172.

LEICESTER RS

6, Constructors' competition; 27, Night on-the-air. A T Wann, G0TNI, 0116 263 0947.

LEISTON ARC

7, Annual General Meeting and boot sale. John, G0FSP.

LINCOLN SHORT WAVE CLUB

1, G5FZ on-the-air; 22, Joe Rose Memorial Trophy - construction contest. John, G1TSL, 01522 793 751.

LOTHIANS RS

8, RF Connectors, with Brian Flynn, GM8BJF; 11, Annual Dinner; 22, Mini-talks. John, GM7REG.

LOUGHBOROUGH & DARC

7, Talk 'Meteorites', by Alan, G7HZZ & Co; 14, Skittle evening - The Beacon, Loughborough; 21, Open forum - using computers and radio; 28, On-the-air evening - try your own gear. Chris, G1ETZ, 01509 504 319.

LOUGHTON & EPPING FOREST ARS

3, Fireworks and social night; 17, Internet night. Marc, G0TOC, 07803 023 501.

MAIDENHEAD & DARC

2, Talk 'PMR to Ham Radio Conversions', by Laurence, G0NMN; 21, Talk 'My 28/50MHz Transceiver', by Roger, G3VCT. John, G3TWG, 01628 525 275.

MAIDSTONE YMCA ARS

3, Club junk sale; 10, RAE - power supplies; 11, (Sat) RSGB official scheduled Morse test; 17, RAE - semiconductors; 24, Lecture. John, G0RHO, 01622 832 259.

MAXPAK

6, 'Modifying Storno PMR Rigs for use on 9K6 Packet Radio', by Chris, G0CNG. Ron Taylor, G6LRD, 01922 684 496.

MID SUSSEX ARS

17, Talk 'The Med', by Les, G0XAM. Sue, G6YPY, 01273 845 103.

MID-WARWICKSHIRE ARS

14, Book reviews by members; 28, Members' home brew evening. Bernard, M1AUK, 01926 420 913.

NEWBURY & DARS

22, Maritime Preservation by Richard, G3ZGC. Mark, M0CUK, 01635 364 44.

NORFOLK ARC

1, Talk 'Rebuilding an HRO Receiver', by Mike, G4UUB; 8, Night on-the-air - construction - Morse practice; 15, Construction contest; 22, Night on-the-air - construction - Morse practice; 29, Talk 'How I Became Involved in Amateur Radio', by various members of NARC. John, G0VZD, 01953 604 769.

NORTH BRISTOL ARC

3, Talk 'EMC', by Peter Chadwick, G3RZP; 17, Club 'Treasured Junk' sale; 24, QSL card night. David, G0GHM, 01275 790 448.

PAISLEY (YMCA) ARC

1, The Colin View - GM0UOU; 15, Learning Morse by computer, with MM5AII; 29, 'It's EDZy - GM3EDZ. Jim, GM3UWX.

QRZ AR GROUP OF SUSSEX

10, Talk 'Fault-Finding - part 2', by David Frederick, G4XXM; 24, Club project evening. Stuart, M0CHW, 01435 863 020.

RADIO SOCIETY OF HARROW

3, Don, G0ACK - 'The Novice Licence Explained'; 10, Programme planning for 2001; 17, The (In)Famous RSH Construction Contest. Plenty of warning so get the soldering irons out. Judging will start at 8.30pm; 19, GB2DHH operating day from Mosquito Museum, London Colney. Jim, G0AOT, 01895 476 933 / 020 7278 6421.

READING & DARC

9, Talk 'An Introduction to Yaesu Products', by Paul Bigwood, G3WYW, Commercial Sales Manager, Yaesu UK Ltd. Pete, G8FRC, 0118 969 5697.

SALOP ARS

7, Talk 'EMC', by Bob Harrison, G4UJS; 2, Talk by Air Ambulance service. Fred, G3NSY, 01743 790 457.

SALTASH & DARC

2, Annual General Meeting; 16, Junk and surplus equipment sale. Brian, M0BHG, 01752 844 321.

SILVERTHORN RC

11, Junk sale. David, G0KHC, 020 8505 1871.

SOUTH BRISTOL ARC

1, Computer software exchange - Len, G4RZY; 8, Commencement of Xmas raffle - Steven, G0UQT; 15, Annual General Meeting - Len, G4RZY; 22, On-the-air evening; 29, Annual club darts match - Fred, G7LPP. Muriel, G4YZR, 01275 834 282.

SOUTH NOTTS ARC

1, 10-minute talks by club members; 8, On-the-air HF and VHF; 1, St John Ambulance demonstration; 22, Open forum - members only; 29, On-the-air HF and VHF. 01509 672 846.

SOUTHDOWN ARS

6, Radio for the blind and SW listening - Bill Winchester, SWL. Glynn, M0CHO, 01323 765 731.

SOUTHGATE RC

9, G6QM construction contest; 24-26, LARCS - the last one at Pickett's Lock. Brian, G0MEE, 01707 257 534.

STOCKPORT RADIO SOCIETY

8, G3FYE Memorial Lecture, 'An Illustrated History of Winter Hill', by Mr W G Learmonth, G4YZE; 22, Surplus equipment sale. David, M1ANT, 0161 456 7832.

SURREY RADIO CONTACT CLUB

6, Talk 'LF', by Derek Atter, G3GRO; 20, Fix it and advice clinic. Berni, G8TB, 020 8660 7517.

SWINDON & DARC

2, An Evening with Rob Mannion - Editor of *Practical Wireless*; 16, Talk 'Does Amateur Radio Have a Future?', by Ian Whitworth, G8JHC; 30, PSK31 - The up-and-coming mode - Workshop with Ian Dredge, G4DIE. Den, M0ACM.

THORNTON CLEVELEYS ARS

6, Bring and buy sale; 13, Talk 'PSK31 and Other Digital Modes'; 20, Club on-the-air; 27, Talk - subject to be announced later. Jack, G4BFH, jack@duddington.fsnet.co.uk

SILENT KEYS

WE REGRET to record the passing of the following radio amateurs:

G0HFB	Mr WAW Lankshear	
G0KLS	Mr R S Pangborn	/01/00
G0WDE	Mr M A Bartle	23/06/00
G3CVG	Mr S Jackson	15/09/00
G3EWJ	Mr ERB Harmer	/09/00
G3GAD	Mr G A Day	
G3KQW	Dr R F Williams	13/08/00
G3XUO	Mr K V Edwards	/06/00
G4BUV	Mr P J Dyer	
G4DTA	Mr E R Endersby	
G8AZV	Mr D W Withey	/11/99
G8JD	Mr F L Firth	21/08/00
G8LGB	Mr J L Stephens	
G8YVU	Mr P Kirkup	/10/99
GI6PBV	Rev J Shea	/09/00
GM0TWK	Mr D McKenzie	/04/00
GM0VHC	Mr J G Cutt	16/09/00
GM3FUT	Mr J Hawke	02/09/00
GM3PAE	Mr N V Clarke	01/09/00
GM4FGI	Rev M A McCarthy	30/08/00
GM8DLU	Mr F Bell	/08/00
GW0NSQ	Mr W Sawbridge	12/04/00
RS93074	Mr WWG Cutts	07/08/00

TORBAY ARS

17, Video evening - Campbell DXpedition, ZL9CI. Anna, 07879 840 304.

TROWBRIDGE & DARC

1, Judging of entries for the G2BQY Constructors' Cup. Ian, G0GRI, 01225 864 698 e/w.

VERULAM ARC

14, G8VER 145.350MHz net; 27, Talk 'Multimedia Mobile - 3G System Revisited', by Kin Warwick-Oliver, G3YGA. Walter, G3PMF, 01923 262 180.

WAKEFIELD & DARS

7, Pie and supper night; 14, Talk 'Amateur TV'; 21, Night on-the-air; 28, Equipment sale. John, G7JTH, 01924 251 822.

WARRINGTON ARC

7, Talk 'How We Produce WARC-QSX, the Club Magazine', by Ron, G0WJX; 21, Surplus equipment sale. John, G0RPG, 01925 762 722.

WEST SOMERSET ARC

7, South African holiday video. Alan, M0AOJ, 01643 707 207.

WESTON-SUPER-MARE RS

6, Discussion evening; 27, Workshop. Doug, G0WMW, 01934 629 160.

WHITEHAVEN ARC

2, Surplus equipment/junk sale; 23, The Internet and Amateur Radio; 30, Computer programmes for amateur radio. Norman, M0CRM.

WIDNES & RUNCORN ARC

1, Jacket potato evening/fireworks; 15, Surplus equipment sale. Martin, G4LUQ, 01928 714 843 or Dave, G1PIX, 01928 591 401.

Items for club news should be sent to the *RadCom* Office at HQ to arrive by the 26th of the month, ie approximately a month before publication (eg 26 January for the March Issue). News items should be sent in writing (fax, letter or e-mail gb2rs@rsgb.org.uk) by the club secretary or the person responsible for publicity. Post cards for this purpose are available from RSGB HQ. A database of all meetings is shared by *RadCom*, *Radio Today* and GB2RS, so information only needs to be sent once.

Club News is a service for clubs and societies affiliated to the RSGB. The announcements are intended to notify non-members and potential members of your club of specific events, therefore 'informal', 'committee meeting', 'natter night' and 'ragchew evening' etc will not be included. Basic, unchanged details about RSGB-affiliated clubs are published annually in the *RSGB Yearbook*.

Events Diary

WORTHING & DARC

1, On Digital; 8, Discussion evening; 15, Books and club library; 22, Hints and tips; 29, Computers for the terrified. Roy, G4GPX, 01903 753 893.

YORK RC

18, G4YRC Annual Dinner. Tony, G4XIV, 01132 868 744.

Rallies & Events

This is a list of all rallies, hamfests, 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 'Rally News'.

4/5 NOVEMBER 2000

NORTH WALES RRC Rally 2000 – North Wales Conference Centre, Llandudno Promenade. OT 10am, £2, under-14s free, C, LB, DF, TI on S22. Muriel, GW7NFY, 01745 591 704 or Ted, GW0DSJ, 01745 336 939. Club web page www.nwrrcw.org.uk

5 NOVEMBER 2000

NORTH DEVON RADIO Rally – Holsworthy Memorial Hall. OT 10am. B&B etc. G8XMI, QTHR, 01409 241 202.

TYNE & WEAR Repeater Group Annual Auction – Great Lumley Community Centre. OT 10am, auction starts 12 noon. Brian, G8FBQ, 0192 388 2913 or brian@briancorker.freeserve.co.uk

CONGRATULATIONS

To the following whom our records show as having reached fifty or sixty years' continuous RSGB membership this month:

50 years		*60 years*	
G3HQX	Mr J Brodzky	G2AMG	H W Mitchell
G3IVZ	Mr W E Stephen	GW2HIY	Mr E M Davies
RS18994	Mr H T Mason		

Our apologies go to Mr P J Naish, VK2BPN/G3EIX, who was omitted from a previous list, and who first joined the Society in May 1947.

11 NOVEMBER 2000

GM DX GROUP CONVENTION – King Robert Hotel, Bannockburn, 1pm (postponed from 16 September). Rob, GM3YTS, gm3yts@compuserve.com

12 NOVEMBER 2000

GREAT NORTHERN HAMFEST – Metrodome Leisure Complex, Queen's Road, Barnsley, S Yorkshire. OT 10am. Ernie, G4LUE, 01226 716 339 or 07787 546 515 or ernest.bailey1@virgin.net

MIDLAND ARS 12th Radio & Computer Rally – CANCELLED. Peter, 0121 443 1189.

19 NOVEMBER 2000

COULSDON ATS Annual Bazaar – 4th Purley Scout HQ, Lion Green Road, Coulsdon. OT 10am, £1, FM. Andy, 01737 552 139. or andyg0kzt@hotmail.com

WEST MANCHESTER RC Red Rose Rally – Horwich Leisure Centre, Horwich, Bolton, off jn 6 M61. OT 10.30/11am, £1.50 (£1 OAP), C, B&B. Don, G3BSA, 01942 871 620, or don@g3bsa.freeserve.co.uk

25 NOVEMBER 2000

ROCHDALE & DARS Traditional Radio Rally – St Vincent de Paul Catholic Church, Caldershaw Road, off A680, approx 2 miles W of Rochdale. Follow orange arrows from M62 jn 20. Note: this is taking place on a Saturday! OT 10.15/10.30am, £1, C. John, G7OAI, 01706 376 204 (eves).

25/26 NOVEMBER 2000

LONDON Amateur Radio & Computer Show – Lee Valley Leisure Centre, Pickett's Lock Lane, Edmonton N9. OT 10am, £3 (£2.50 concessions), TS, B&B, SIG, CP free, DF, CS, FAM, LB, C, MT. 01923 893 929.

KEY

Rallies & Events
TI - Talk-In; **CP** - Car Park; **£** - admission; **OT** - Opening Time - time for disabled visitors appears first, eg (10.30/11am); **TS** - Trade Stands; **FM** - Flea Market; **CBS** - Car Boot Sale; **B&B** - Bring and Buy; **A** - Auction; **SIG** - Special Interest Groups; **MT** - Morse Tests; **LB** - Licensed Bar; **C** - Catering; **DF** - Disabled Facilities; **WIN** - prize draw, raffle; **LEC** - LECtures / seminars; **FAM** - FAMily attractions; **CS** - Camp Site.

26 NOVEMBER 2000

BISHOP AUCKLAND RAC Rally – Spennymoor Leisure Centre. OT 10.30/11am, £1, (accompanied under-14s free), TI on S22, CP, B&B, C, LB, MT (two photos needed). Mark, G0GFG, 01388 745 353 or Brian, G7OCK, 01388 762 678.

2 DECEMBER 2000

RSGB 74th ANNUAL GENERAL MEETING – Harrogate Ladies' College, North Yorkshire. AGM at 11am – lunch – Open Forum at 2.30pm – evening Dinner. Tickets for the Dinner available by phoning RSGB HQ, 0870 904 7373, ext 11 or 12, or e-mail gm.dept@rsgb.org.uk

GB calls

These callsigns are valid for use from the date given, but the period of operation may vary from 1 – 28 days before or after the event date. Operating details are provided in an abbreviated form as follows: T = 160m; L = 80 or 40m; H = HF bands (30 – 10m); V = 6 and / or 4m; 2 = 2m; 70 = 70cm; S = satellite and P = packet. Please send operational details of your special event station to the *RadCom* office at least five weeks before publication.

1 Nov	GB0OO: Tattoo. Edinburgh. LH2 (G0WEE)
3 Nov	GB2RCC: Radio Caravan Camping. Thurlaston, Leics. (G4EPN)
	GB4RSL: Royal Signals Llandudno. Llandudno, North Wales. LH2 (GW4XKE)
5 Nov	GB2UCB: United Christian Broadcasting. Dareham, Norfolk. L (G4DCJ)
6 Nov	GB4RSL: Royal Signals Llandudno. Dinas Powis, Vale of Glamorgan. LH2 (GW4XKE)
18 Nov	GB4RN: Royal Navy. Waterlooville, Hants. (G3LIK)
19 Nov	GB5MC: Morse Campaign. Cambridge. L (G3PJT)

HF

DON FIELD, G3XTT
105 Shiplake Bottom, Peppard Common, Henley on Thames, RG9 5HJ.
e-mail: hf.radcom@rsgb.org.uk

SEPTEMBER brought lots of activity to the bands, even if the propagation was still somewhat variable, with almost no sunspots at one stage. As I write this, G4ZVJ is very active from Togo as 5V7VJ, and G3ZEM from Tristan da Cunha as ZD9ZM. In addition, the RSGB President, G3OZF, is signing D68/G3OZF from the Comoros while on a site visit for the big operation planned for next February (see below). It's great to see UK amateurs making such a splash. In addition, DJ6SI and DJ9ZB are active as J5X and J5Z respectively from Guinea-Bissau, HO1A (another German team) is very busy from Panama, and there are quite a few other nice ones about.

Jim, KF7E, is watched by a local visitor at 9G5AA in last year's CQWW CW Contest. The Voodoo Contest group will once again activate 9G5AA in this year's contest.

DX NEWS

SPANISH operators Manuel, EA8BYG, and Jose, EA8EE/EA5CPU, will be active as D44DX from the Cape Verde Islands from 1 to 8 November (or possibly 6 to 12 November - reports vary), from the QTH of D44AC, located in the capital Mindelo, on the Island of São Vicente (AF-086). They plan to be active on all bands, CW, SSB, RTTY, PSK31, HELL, STREAM, MT63, SSTV and PacTOR. An IC-706 MkIIG and a TS-440 will be used along with an A3S and vertical antennas. The logs will be updated daily on www.qsl.net/dxgrancanaria/ and QSL cards will be handled by EA8URL.

Andy, DJ7IK, has announced an IOTA DXpedition to Kerkennah Island (AF-073), which is expected to take place between 15 and 30 November. Kerkennah is located off the coast of Tunisia (3V8) and has never been active in more than 25 years. The group will use the call TS7N. They will also operate the CQWW CW Contest in the multi-single category.

The Five Star DXers Association, closely linked to CDXC, the UK DX Foundation, has announced a very substantial operation as D68C from the Comoros, to take place from around 6 to 26 February next year, allowing for three full weekends on the island. The main objectives will be to provide the possibility for every amateur to make at least one QSO with D68 and offer as many bands and modes as possible for the diehard DXers. This DXpedition will build on the experiences of the group's 9M0C operation of 1998. Six high-powered stations will be active simultaneously as conditions allow, on CW, SSB, RTTY, PSK31 and FM. Mono-band beams will be used on the high bands, plus four square arrays for 80 and 40 and a Titanex vertical for 160m. The multi-national team is still being formed, but already includes operators from the UK, Cyprus, Japan, Sweden, Netherlands, Poland and the US. I will bring you further details in due course but, as a member of the DXpedition myself, and its publicity officer, I am always happy to deal with questions. In addition, a web site is available at: www.dxbands.com/comoros

Hans, WA1LWS, says he expects to be back in Vietnam from 9 to 26 November, including participation in the CQWW CW Contest. He will operate exclusively CW and make as many QSOs as band conditions permit. He will apply for operating privileges on 80, 40, 20, 15, and 10m, but thinks that 80 and 40 may not be allowed.

Bill, G4CWA, writes that he is on the island of Koror in the Republic of Palau with the call T88BA. Present equipment is an FT-840 to a Cushcraft R7 antenna on the top of his apartment block. He is engineer in charge of the Voice of Hope Christian radio station on the island of Babeldaob and travels to work in a 4-wheel drive vehicle through the jungle or, if the rain has been very heavy (it being a tropical area), by a motor boat between the islands. He spends some time in church activities as he is also a clergyman! For anyone needing Palau for IOTA, Bill is happy to try to arrange skeds via the Internet; his address is cacciatore@lineone.net but he is only normally available from 1100 for three hours if other commitments allow. He hopes to be in Palau for at least two years, but will possibly have to oversee the installation of two other short wave broadcast stations in Liberia and Zambia. Bill says that to obtain a licence in Palau is straightforward. Go to the Division of Transportation and Communications office on T Dock Road and speak to Mr Hayes Moses, the manager, who is most helpful. The licence is usually granted on production of passport and UK licence, both of which are copied. The licence is free and lasts for one year from date of issue.

The Prairie DX Group (www.n9pd.com) will be active from Efate (OC-035), Vanuatu, between 18 and 28 November. Multiple stations are expected to operate on 10-160m and the group will take part in the CQ WW DX CW Contest (multi-multi). Side trips to one or more of the other YJ IOTA groups are being planned. QSL for the entire DXpedition via N9PD either direct or through the bureau.

Alan, VK0MM, reports that the supply vessel *Polar Bird* is due at Macquarie Island on 7 November for the annual re-supply of the station and departs for Casey Station (Wilkes Land, Antarctica) on 12 November. The 2000 and 2001 Macquarie crews will change over during this time. The ship is due back in Hobart, Australia prior to Christmas. VK0MM will therefore become permanently off the air, although there may be minor operations as VK0LD from Casey Station. There are no licensed operators on the Macquarie Island 2001 crew. Alan has still not announced a QSL route for his operations.

CONTESTS

THIS ISSUE OUGHT to reach most readers before the CQWW Phone contest, so here are a few more operations that have come to my attention, as well as planned operations for the CW leg of the contest at the end of November. Shoji, JA7MHZ, will activate Pohnpei, Micronesia as V63DX on all bands CW, using WARC bands outside the contest (he is there from 25 to 31 October); QSL to his home call. During the Phone Contest Rick, N6KT, will be active as HC8A; QSL via WV7Y. HC8N will be multi-multi during the CW Contest; QSL via AA5BT. NO2R, W2EN, W2XT and WA2VUY will be in the Grenadines

WARC BANDS TABLE 2000
sorted this month by 18MHz totals

Call	10	18	24	Total
G3SXW	160	187	147	494
G0NXX	152	168	164	484
G3WGV	84	119	77	280
G4UCJ	94	109	84	287
G3YVH	73	97	82	252
G4KHM	77	92	27	196
G4AFI	28	69	80	177
G3ING	41	57	45	143
MU0FAL	95	52	23	170
GM4OBK	32	52	38	122
G4ERP/M	0	47	0	47
G4YWY/M	0	46	30	76
G0VLC	24	37	21	82
G3WP	45	37	30	112
G4OBK	18	35	26	79
M0CAL	0	28	37	65
M0CNP	5	21	11	37
GW0VSW	21	20	40	81
G0TSM	21	18	32	71
G4FVK	2	17	21	40
MM0BQI	18	17	19	54
M5AFA	0	11	16	27
GM3IBU	0	0	52	52

(NA-025) between 23 and 31 October. Before the contest they will use J8/own calls. They may have a special callsign for the contest. QSL is via W2EN. A group of operators from the Kansas City DX Club will be active in the Phone contest from Belize (V31). Four members of the Florida DXpedition Group will be on Guadeloupe from 24 to 31 October, and multi-single in the Phone contest as FG5BG. Look for them before and after the contest using FG/home calls on CW, RTTY and SSB. QSL FG5BG to KR4DA, FG/N2WB to N2OO and others to their home calls. For more information visit www.geocities.com/n2wb23/ and http://members.xoom.com/FDXPG/ KG4MN and KG4VL will use the call KG4VL from Guantanamo Bay. They will be there from 27 October until 3 November, and will use their own calls outside the contest. QSL KG4MN via WV3R and KG4VL via N5VL. Team Antigua will once again activate V26B multi-multi in the Phone contest. They will make special attempts to be active on RTTY, PSK31, using 160 metres and the WARC Bands a few days before and after the contest. A large group will sign VB2R from Zone 2 (James Bay Region, northwest Quebec) between 22 October and 4 November, including the contest. The special call commemorates the 100th anniversary of the birth of E S Rogers, Canadian amateur radio pioneer and inventor of the AC radio. QSL is via VE3BY. A web site is at

QTH Corner

3B6RF	Ambrosi Flütsch, HB9AGH, Lerchenberg 29, CH 8046 Zürich, Switzerland.
4W6FK	Jose Matos, CT1FKN Rua D. Afonso Henriques 83B-3ESQ, 2330 137 Entroncamento, Portugal.
9M0F	Nao Mashita, JA1HGY, I 8-2-4 Akasaka, Minato, Tokyo 107-0052, Japan
A52FH	Jean Raynaud, F8RZ, Bourg De St. Hilaire, F-16300 Barbezieux St. Hilaire, France.
C91RF	Dr.Reinhard Fendler, DL6DQW, Waldteichstrasse 34, D-01468 Boxdorf, Germany.
DL7DF	Sigi Presch, Wilhelmsmuehlenweg 123, D-12621 Berlin, Germany.
DL6FBL	Bernd Och, Christian-Wirth-Str. 18, D-36043 Fulda, Germany.
FR/F6KDF/T	Radio Club de la Gendarmerie, F6KDF, 292 Route de Genas, 69677 Bron Cedex, France.
G0DEZ	Dez Watson, 12 Chadswell Heights, Lichfield, Staffordshire WS13 6BH.
J5X	Baldur Drobnica, DJ6SI, Zedernweg 6, DE-50127 Bergheim, Germany.
J5Z.	Franz Langner, DJ9ZB, PO Box 150, Ettenheim, D-77950 Germany.
JA7MHZ	Shoji Igawa, 17 Shirogane, Yokobori, Ogachi, 019-0204 Japan.
JQ1SUO	Eiji Shinoda, 3-3-17, Tomisato, Kashawa-City, Chiba 277-0081, Japan.
KU9C	Steve Wheatley, PO Box 5953, Parsippany, NJ 07054, USA.
N0KV	12200 Boothill Dr, Parker, CO 80138, USA.
ON4QM	Marcel Dehonin, Eversestraat 130, B-1932 Saint-Stevens-Woluwe, Belgium.
PS0S	Ademir Moreira, PY2SP, Rua Abaitara 108, Sao Paulo/SP, 03714-060, Brazil.
VK2EO	Geoff McGrorey-Clark, PO Box 76, Medowie, NSW, 2318 Australia.
VK3DYL	Gwen Tilson, 3 Gould Crt, Mt Waverley, Victoria, 3149, Australia.
W5BOS/C6A	Lanny Phillips, W5BOS, 8381 FM 2101, Quinlan, TX 75474-4836 USA.
ZD8KW	Jonathan Clingham ZD8KW, PO BOX 3, Ascension Island, South Atlantic Ocean, ASCN 1ZZ.
ZS5BBO	Edwin Musto, PO Box 211032, Bluff, 4036, South Africa.

HFF-LayerPropagationPredictionsforNovember2000

	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122
(UTC)	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802
*** Europe							
Moscow	999744448899	999984468999	...9888899..	....88889...	....98899...	....9999....	....9999....
*** Asia							
Yakutsk	443311..3555	45.43..25556	61..533..5..	....55......	....5....1..	.........1...	....
Tokyo	1.....11231	.111.1..1453	1...21...5.4	....22..1...	...14.......	....3.......	....
Singapore	11	1.....1..22	.....1.222.	....1.1222..	....11124...	....11..4...	.....34...
Hyderabad	41.....1344	641....14445	134561	...1212456..	....32345...	....33356...	....65556...
Tel Aviv	8874....6888	87.831.48888	...8755688..	....877788..	1...87778.1.	....87778...	....8777....
*** Oceania							
Perth	....	3	2.......321	.....14..	....11.24...	....11234...	...111.35...
Sydney	....	.....111.	.....1.13.1	....1.14...	...1...441..	....11334...	....2234....
Wellington	.....1....	...1.......	....445457..	....6666.7..	....76678...	.....77..1..	.....888....
Honolulu	..1.......	..213...1...	.3..311.32.1	.....32..	.....3..	..1..1.....	1..........
W. Samoa	....	....	....422243..	1....43344.1	1....434..1.	1....45.....	.....45....
*** Africa							
Mauritius	32.....1.33	33.....33	34.....2133	..121.1.334.	...32.3144..	....344454..	....333454..
Johannesburg	22.....112	3221.....2	34.....1.433	..131111444.	....3212444.	....4323444.	....332335..
Ibadan	6653.....566	6675....4666	66.52..36666	..1.65456666	....6555688.	....667788..	....8777871.
Nairobi	441.....2444	554.....44.5	56.31...5555	...44233666.	....444466..	....5555....	...155.....
Canary Isles	88885..1.888	99998...8998	.9.987678999	....8888999.	....88889.9.	.....88899..	.....88899..
*** S. America							
Buenos Aires	33221.....2	44441.....3	..4.4.....34	....4.1..24.	.....11223..	....533334..	1....43344..
Rio de Janeiro	55441.....14	55553....145	....4.....55	....521.2566	....5334456.	.....444556.	.....54555..
Lima	33111.....	444.21.....3	....4.....1.	....42...1..	.....1.12..	.1...2233..	.....2234..
Caracas	56552.....5	66665.....26	.....3...15.	.1.1..3345..	.....54455..	556611	.....5566..
*** N. America							
Guatemala	44542.....1	555.4.....3	.5615.11..15	....1.4224..	.....4345..	.....5455..	.....155...
New Orleans	454421.....2	455.4.1...14	.5..5.2.1...	.....4344..	.1.....444..	.....456..	.....566..
Washington	666631....46	65566..11.66	777...214677	.....5467..	.....6567..	.....56....	.....56....
Quebec	655641...166	766.61.12466	.6...544677.	667771	....16677..	.....7888..	.....7888..
Anchorage	54441...2344	355.4..14444	.....4.4.5..	.....4..	..1.....1.	.1...1.1....	....
Vancouver	3442..111111	344.3...31.3	.....12443.	1.....44..	.....64..	.....5....	....
San Francisco	123311.....	244.3....11.	.3....24..3	.....144..	.....44..	.....44..	.....5...

Key: Each number in the table represents an S-meter reading on the average amateur rig, whilst colours represent availability. When the predictions are expected to be 67-100% certain, the numbers are blue; when 33-66% certain, red; when less than 33% certain, black.

The RSGB Propagation Studies Committee provides propagation predictions on the Internet at www.g4fkh.demon.co.uk The page is updated weekly.
The provisional mean sunspot number for September 2000 issued by the Sunspot Data Centre, Brussels, was 109.9. The maximum daily sunspot number was 163 on 24 September and the minimum was 26 on 11 September. The predicted smoothed sunspot numbers for November, December and January are respectively: (SIDC classical method – Waldmeier's standard) 121, 119, 117 (combined method) 126, 127, 128.

www.fortunecity.com/marina/westindia/597/zone2 Lima Alfa Contest Club members Bjørn, LA4DCA; Roy, LA5KO; and Jan, LA9HW, will be on North Caicos, signing VP5L (multi-single) in the contest and VP5/homecall outside the contest. QSL VP5L via LA5KO, and all others via their homecalls. For more information see http://www.qsl.net/vp5l/ Other CQWW CW operations I know of include J37 (Grenada) by a large group, and both Guernsey (GU) and Jersey (GJ) by a group of Finnish amateurs. Francisco Costa, CT1EAT, will sign FO0FRA from the island of Mai Mona Motu (OC-067), French Polynesia from 24 October to 2 November. He plans to operate in the Phone Contest and may obtain a special callsign. QSL to his home call.

The results of the 1999 CQWW CW Contest appear in the table. Congratulations are due especially to GI0KOW and G0IVZ, 2nd and 10th in Europe in the all-band category; GW3YDX 1st in Europe on 28MHz; G4BUO and G5G, 3rd and 5th in Europe on 21MHz; M7Z, World and European 4th on 7MHz; G3WGV, 6th in Europe low-power all-band; MU/OH9MM, 3rd in Europe on 21MHz low-power; G4ELZ, 7th in Europe, all-band QRP; G3LHJ and M2H, 2nd and 4th in World 14MHz QRP; G3VPW, 2nd in World 7MHz QRP, and GM7V 4th in Europe multi-multi. I'd also like to recognise the achievement of the 9G5AA team, which included several UK operators, for their World 5th placing in the heavyweight multi-multi category. I know the aftermath of the CQWW contests always seems to bring a rash of 'letters to the editor' complaining about QRM on the bands due to the contests, but these events, one weekend on Phone and one on CW, really have become the 'World Championships' or 'Olympics' of competitive amateur radio. Those who achieve high world and European standing do so by dint of hard training and a high level of skill and should be applauded. Anyone who has tried to emulate their achievements quickly realises that a high score requires much more than a decent station and an ability to call CQ for hours on end! Well done all.

CQWW CW 1999

Call	Category	Points
ENGLAND		
G0IVZ	A	4,233,732
G3TXF	A	2,437,394
G3UFY	A	1,846,520
G4BJM	A	1,325,340
G3WUX	A	1,041,216
G3RSD	A	599,186
G0LZL	A	591,838
G3LZQ	A	224,145
G3NAS	A	96,432
G3WVG	28	537,840
G3WGN	28	366,288
G8D	28	314,696
G4BUO	**21**	**835,086**
G5G	21	626,316
G3PJT	21	442,636
G3UOF	21	314,360
M7Z	**7**	**826,485**
G4HTD	7	200,655
***G3WGV**	**A**	**2,369,120**
*G4IIY	A	1,460,891
*G3KKP	A	907,062
*G4TSH	A	562,020
*G6QQ	A	525,018
*G3JKY	A	428,532
*G3VQO	A	401,016
*G3GGS	A	346,320
*G4DDX	A	183,887
*G3HZL	A	177,735
*G3JJZ	A	168,720
*G3WRR	A	155,023
*G4IDL	A	128,757
*G4ZME	A	77,088
*G0WHO	A	76,160
*G4SLE	A	44,616
*G0MRH	A	11,466
*G0MTN	28	304,155
*G0DEZ	28	214,764
*G4UZN	28	213,591
*G4IUF	28	53,998
*G3IZD	21	36,848
***M5X**	**7**	**76,950**
*G5MY		7
63,360		
*M0AJT	7	13,395
***G3XWZ**	**1.8**	**6,179**
GUERNSEY		
***MU/OH3GI**	**A**	**67,116**
*2U0ARE	A	66,255
***MU/OH9MM**	**21**	**411,635**
ISLE OF MAN		
***GD4UOL**	**A**	**1,770,952**
NORTHERN IRELAND		
GI0KOW	A	6,918,708
GI4KSH	A	227,268
***GI4SNC**	**A**	**747,520**
SCOTLAND		
***GM4SID**	**A**	**1,038,597**
*MM0BQI	A	54,776
***GM3CFS**	**28**	**154,810**
WALES		
GW3KDB	A	752,388
GW3YDX	**28**	**990,120**
GW3JXN	21	388,088
***GW3NJW**	**A**	**943,008**
*GW3SYL	A	719,394
*GW3KJN	A	155,530
*GW0KZW	A	52,083
QRP		
G4ELZ	A	468,948
GM4HQF	**A**	**152,066**
G0KZO	A	10,920
G3HKO	A	2,376
M0O	28	27,328
G3LHJ	**14**	**108,756**
M2H	14	72,001
G3VPW	7	32,518
Assisted		
ENGLAND		
G3TMA	A	241,082
G4PDQ	**28**	**138,592**
SCOTLAND		
GM0F	**A**	**1,818,180**
Multi-Single		
SCOTLAND		
GM6NX		**4,496,224**
Multi-Multi		
ENGLAND		
M4T		209,440
SCOTLAND		
GM7V		**16,595,772**

An asterisk indicates low power; those entries in bold set new country records.

Jeff 9H1EL, Roger G3SXW and Andy G4PIQ (front to back) operating 9G5AA in last year's CQWW CW Contest.

EUCW CW PARTY

THE EUROPEAN CW Association (EUCW) Fraternising CW Party will be held on 18/19 November. Although there is a contest element in the sense that certificates are awarded to top performers, its real purpose is to give members of EUCW clubs, and other CW enthusiasts, the opportunity to meet each other and demonstrate that amateur Morse is still alive and well. G-stations are always popular, and they can be sure of a warm welcome from their continental colleagues. Additionally, this event offers a good opportunity to make contacts qualifying for the 'Worked EUCW' Award, printed on heavy parchment-type paper, depicting the map of Europe 'at the time of Samuel Morse'. I can provide further details of both the QSO Party and the Award on request, by e-mail or SAE (the event moves from band to band at specified times).

SILENT KEYS

FINALLY, ALL READERS will be saddened to have heard that two radio amateurs were killed as a result of the 6 September attack on UN premises in West Timor. These were Pero Simundza, 9A4SP, and Luis Caceres, KD4SYB. Pero had been active as 4W6SP during visits to East Timor, and given many DXers that rare one.

THANKS

MY THANKS TO all who have provided information. Special thanks go to the authors of the following for information extracted: OPDX Bulletin (KB8NW), The Daily DX (W3UR) and 425 DX News (I1JQJ). Please send items for the **January** issue by **4 November**. ♦

28MHz COUNTRIES TABLE 2000
sorted this month by SSB totals

Call	CW	SSB	Mixed
M0BZQ	28	230	242
G4DUW	180	220	243
G0VHI	0	205	205
M0BIB	10	185	195
G0TSM	78	164	190
G0CAS	1	149	150
M0CTQ	0	149	149
G3MDH	0	147	147
G4MUW	0	146	146
MM5AJN	0	139	139
GM4CHX	0	93	93
M0CAL	0	85	85
G0KDS/M	0	50	50
M0CNP	0	45	45
G0CGV	78	31	87
GW0VSW	27	11	33
G4OBK	51	6	55
GM4OBK	31	1	32
G0NXX	164	0	164
G3SXW	174	0	174
G3WGV	116	0	116
G3WP	48	0	48
G4IDL	100	0	100
G4UCJ	120	0	120
MU0FAL	72	0	72
G0NCS			48 ‡
G0URR			53 †
G3ING			37
G3YVH			108
G4FVK			44
G4YWY/M			41
GI4XSF			92
GM0FNE			36 †
GU0SUP			42 †
M0ASJ			41
M5AFA			22
MM0BQI			50

† RTTY ‡ PSK

VHF/UHF

NORMAN FITCH, G3FPK
40 Eskdale Gardens, Purley, Surrey CR8 1EZ
E-mail: g3fpk@compuserve.com

AFTER several months of hectic activity, there has been a dramatic reduction in the number of reports received this month. Nevertheless, some interesting propagation occurred during the September 144MHz Trophy Contest.

All times are UTC unless stated otherwise and ODX means best DX. An asterisk (*) denotes a CW contact. QTHR signifies that the operator's address is in the current *RSGB Yearbook*, (CR), (SN), etc after a callsign denotes the postal area and (IO93), etc is the Maidenhead grid.

LICENCE NEWS

ON 23 AUGUST the Department of Trade and Industry issued Notices of Variation to all classes of amateur radio licences, effective from 8 September. The variations apply mostly to the unattended operations section in 2(4) in Booklet BR68. Five National Grid References are specified within 50km of which unattended operation is not permitted. These are SE302577, SK985640, SO916223, SS206127 and TA012869. The restrictions also apply to 1298 - 1300MHz in the whole of Northern Ireland.

A new clause 2(5A) has been inserted which states, "The Licensee may transmit on an unattended basis using automatic position reporting software on a spot frequency of 144.800MHz at any one temporary location not within 50km of NGR TA012869. The maximum permitted period of unattended operation is 30 minutes and the Licensee must be present to activate and deactivate the transmissions. The maximum permitted power level is 14dBW ERP." Copies of these NoVs can be downloaded from the Radiocommunications Agency's web site - see the panel.

PUBLICATION

THE ONLY PUBLICATION received this month is the September edition of *The VHF Journal*, the monthly newsletter of the Rochester VHF Group in New York. This issue has a piece on CG-3443/U 50Ω coaxial cable, which turns up at US hamfests. The connectors are of the LQ series, not easy to come by, but dealers usually have a range of adapters and connectors on sale. This cable is about 18mm diameter and the loss per 10m at 144MHz is 0.25dB and at 432MHz, 0.52dB. Above 500MHz losses are greater than Andrews LDF4-50A and LDF5-50A, though. A 24m assembly, selling for $50 - $75 complete with four adapters, weighs 9kg.

There is a report on what members worked in the big aurora on 12 August and an interview with Paul Kelley, N1BUG, a station worked by many EME operators. On the humorous side, one contributor writes, "A friend of mine defines a C connector as a BNC connector on steroids". Another reports a seeing a bumper sticker with the message, "I used to have a handle on life, but it broke!" The Group's address is PO Box 92122, Rochester, NY-14692, USA and there is a website - see the panel.

CONTEST NOTE

A REMINDER THAT for CW addicts the main event is the 24-hour Marconi Memorial Contest starting at 1400 on 4 November. The last six hours on the 5th incorporate an RSGB contest for those unable to operate in the 24-hour effort. Details of other contests are in the October 1999 *RadCom*. See also the 'Contest Calendar' in Tim Kirby's, G4VXE, 'Contest' column.

PROPAGATION

THE SUN HAS been behaving a little oddly lately. A message from the Space Weather Internet site on 12 September read, "Telescopes monitoring the sun recorded something extraordinary yesterday - the solar disk was nearly devoid of spots. With solar maximum in full swing, the Boulder sunspot number dropped to its lowest value of the year."

Shortly afterwards another message read, ". . . less than 24 hours after the sunspot number plunged to its lowest value of the year, the sun unleashed a surprising full-halo coronal mass ejection (CME). The leading edge of

UNUSUAL PROPAGATION

DURING THE IARU contest on 2 September several stations reported some rather unusual conditions on 144MHz. This phenomenon generated some interesting discussion on the vhf-dx-discuss reflector. Mike Tubby, G8TIC, of the Blacksheep Contest and DX Group operated from the Lizard Point (IN79JX) as G8T. The antennas were two 10-ele DJ9BV Yagis at 36 / 48ft AGL, masthead preamp, and fed from a 3CX800 PA. The site is 80m ASL with a sea take-off over 240°.

He reports, "Approximately an hour after the start, received signals gained a large amount of multi-path. Many of the big UK stations (MD6V, G5B, M8L, etc) were stronger via the multi-path / scatter path than direct and it was difficult to determine the correct direction for the source of the signals. You could pan the antennas ±40° and the signal would remain the same strength.

"The multi-path affected nearly all the UK stations (other than those below about 100km) and most of the French stations - F5KUM/P, F5KAR/P, F1CXX/P etc - were also very strong on the scatter path. Other stations (further north and east from IN79) such as OT0M, OT0Z and PA6NL either had no scatter signal or only small traces of it.

"At its peak around 1830 propagation via the multi-path was so strong that some signals (over S9 by scatter path) sounded almost auroral and were difficult to copy. All signals appeared to be arriving by backscatter with the exception of S52ZW (JN86BT) and his signal, via the scatter path, peaked at S 3 - 4 on a heading of 90°. On the first call he was about S1 - 2 at 70°."

Mike asks, "Was this FAI or ionoscatter? What was the MUF at the time in various parts of Europe? Did anyone else observe this, if so when and where? Where was the scattering point? How come signals were being returned over such a large azimuth? How come signals were so strong, as FAI and ionoscatter are so-called 'weak signal' modes?"

Andy Cook, G4PIQ, suggests the two modes were not related. He reckons the S5 contact was "...classic FAI with a scatter point somewhere on a line roughly from JO12 to JO52." He thinks the backscatter was just tropo backscatter at much lower altitudes and that " . . . it may have been made particularly strong by the presence of a lot of 'weather' that afternoon . . ."

Volker Grassmann, DF5AI, says this phenomenon appeared quite often at his North German QTH in the 1980s. When monitoring beacons, using a Hewlett-Packard Wave Analyser with 7Hz-filter bandwidth, five or more beat notes could be heard, the maximum frequency offset being around 250Hz. Each line revealed a fading characteristic independent of the others but none drifted in frequency.

He says, "There is strong evidence that the lines differ in azimuth: swing your antenna and the line spectrum may change, ie the beacon audio is a function of antenna azimuth." He has christened this the 'Mehrton Effekt' - the German for multiple tone effect - and published an article about it in *DUBUS* magazine issue 1/86. An English-language version, translated by someone else, was published in *VHF Communications* issue 1992/2 under the title 'Observation of the Multitone Effect.'

Dave Dibley, G4RGK, says, "As I recall there was a fair amount of this type of propagation during the summers of 1990 and 1991. It always seems to occur during the summer, often in times when CMEs have hit, sometimes preceding an aurora, but most often when the Es is very intense but the MUF is not high enough to reach 2m."

All very interesting and part of the enjoyment we get from our hobby. So, if any other readers actually witnessed this particular event, either from the British Isles or continental Europe, your input would be most welcome.

the CME could reach earth on Thursday, 14 September. Forecasters estimate a 30% chance of severe geomagnetic disturbances (possibly including aurora) at middle latitudes when the shock front arrives."

A further comment was added at 0605 on the 15th, "A solar shock was observed at ACE at 0405. The interplanetary magnetic field has since then been northwards and only a modest increase in geomagnetic activity has occurred so far. Should the IMF swing southwards, active to major storm conditions may occur.

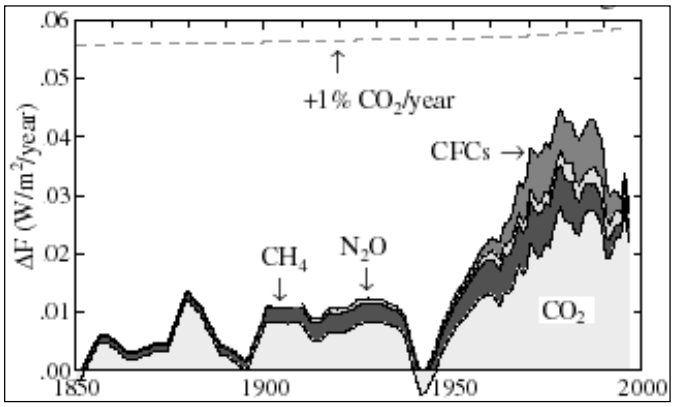
"Region 9165 produced a long duration M2.0 flare peaking at 0532. Early images indicate a fairly large CME as well. As the region is currently near the centre of the solar disk, the CME will highly likely impact earth, most probably on the 17th, and cause minor to severe storming."

The July edition of *The Six and Ten Report* includes many pages of reports on 6m propagation and activity in the month. Co-editor Steve Reed, G0AEV, reckons it was a good month for Sporadic E (Es) although not quite up to the standard of June. He notes a quite marked periodic rise and fall in activity between seven and 10 days; good spells were 1 - 3, 9 - 13, 17 - 18, 22 - 25 and 29; only on the 19th was no Es reported.

There are over three pages of tables recording Es propagation to Europe, North Africa, the Middle East and multi-hop events to North America, such as the one on the 10th. A page is devoted to the 10 of the 16 days when auroral propagation was reported, particularly the extensive event on the 15th - see VHF / UHF in the September *RadCom.*

There is a list of energetic events from data supplied by the Space Environment Center (SEC), plus the usual table of daily solar and geomagnetic data. The reports from observers in other continents enable students of propagation to glean an overall picture of activity.

The *Report* is an activity of the RSGB's Propagation Studies Committee (PSC), and is edited by G0AEV and Prof Martin Harrison, G3USF. Subscription inquiries should be addressed to Steve (QTHR) whose e-mail address is g0aev@explore.force9.co.uk



The incidence of really good troposheric lifts has declined over the past couple of decades. Some experienced VHF / UHF operators suggest this may be due to the sharp increase in atmospheric pollution. This graph shows the dramatic rise in greenhouse gases since 1950. Does this prove the point? Any comments? Source: NASA. (Full story at http://science.nasa.gov/headlines/y2000/ast29aug_1.htm?list)

The August issue of *SunMag* starts with an article on the Perseids / aurora phenomenon covered in the October VHF / UHF column, followed by one about amateur radio in space and ending with a piece about the discovery of comets. Confirmed comet finds are posted daily on a NASA website - see the panel.

The table of daily solar data shows that the 2.8GHz solar flux peaked at 194 units on the 15th, with a minimum of 131 on the 24th. The monthly average works out at 163, which is 18.5% down on the July figure. There are tables of daily geomagnetic and particle data, sunspot group data and a solar flare list. *SunMag* is compiled and distributed by Neil Clarke, G0CAS (QTHR), whose e-mail address is neil@g0cas.demon.co.uk and he has a website - see the panel.

METEOR SCATTER

THE NEXT SIGNIFICANT meteor shower is the Leonids, which should peak on 17 November. Last year the peak occurred around 0205 on the 18th, so this year's peak could be around 0830 on the 17th, taking into account that 2000 is a leap year. Last year the shower was exceptionally good. The zenithal hourly rate (ZHR) was way above the normal and a large number of stations were operational (QRV). It is unlikely that reflections will be anything like as good this year.

The radiant is above a mid-UK horizon between 2230 and 1430, which is most convenient for this year's possible peak. If you need MS software, the very comprehensive OH5IY files can be downloaded from Ilkka's website - see the panel.

MOONBOUNCE

THE SECOND LEG of the ARRL EME Contest begins at 0000 on 18 November and lasts 48 hours. For London latitude stations there will be about 27.5 hours of moon time. The declination varies from +18.09° at the start to + 11.78° at moonset on the 19th.

The 144 / 432MHz sky temperature range is 203 / 15K to 229 / 17K - about as quiet as it gets - and the sun offset at Saturday midnight is -85°. The signal degradation referred to perigee ranges from -0.04dB to -0.21dB.

Stuart Jones, GW3XYW (IO71), is now QRV again on 70cm after 18 months on 23cm and this involved some major equipment changes. On 27 August, 0840 - 1338, he completed 10 CW contacts with YO2IS 339/559, G3LTF 559/559, VE1ALQ 559/559, G4ERG 549/549, DK3WG 549/559, DJ3FI 549/539, DL4KG 559/449, EA3DXU O/O, UA3PTW O/O and OE3JPC 339/439.

When operating on the band he has to move his Ford Fiesta car 100 yards down the road because its super-regen key-fob receiver on 418MHz produces S8 of white noise when near the antenna.

BAND REPORTS

50MHz

Ted Collins', G4UPS (EX), report covers the second half of August following his return to the home QTH. His long running morning tropo skeds on CW with G3CCH (DN) over a 350km path are always successful. John's average signal at G4UPS is S6.5.

On the 20th the band opened up first to Italy from 0925. Later beacons and stations in S5, 4N, 9A, EH5 and CN8 were copied, all with deep QSB, and fading out by 1120. At 1655 he worked SP4AJ (KO14), then DL8DWW (JO70). From 1715 SPs were heard working to ZS6 and at 1745 he copied beacon ZS6TWB at S6. Later, stations in LY, DL, SM7, OH1 and YO were heard,

ANNUAL VHF / UHF TABLE - JAN TO DEC 2000

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Callsign	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Points
G4DEZ	62	62	18	3	42	10	27	6	17	7	256
G3FIJ	41	38	30	4	69	12	30	6	9	2	241
G4APJ	26	29	-	-	89	11	45	5	-	-	205
G7NBE	23	25	14	2	56	9	1	1	-	-	131
G1UGH	3	18	-	-	26	9	4	4	-	-	64
M0CNP	-	-	-	-	3	3	2	1	-	-	9

The District Codes are the 124 listed on page 86 in the 1999 *RSGB Yearbook*. Up to six different GI stations and up to three different GM stations in each Scottish district may be counted. Countries are the current DXCC ones plus IT9. The deadline for the next issue is 10 November.

USEFUL WORLD WIDE WEB SITES

NoV info (RA)	www.open.gov.uk/radiocom/
Contests	www.blacksheep.org/vhfcc
Rochester VHFG	http://vhfgroup.rochesterny.org
NASA Comets info	http://sungrazer.nascom.nasa.com
G0CAS (SunMag)	www.g0cas.demon.co.uk/main.htm
OH5IY (MS s/w)	www.saunalahti.fi/oh5iy

activity thinning out by 1930. From 2104 ZD8KW (II22) peaked to S7 with a huge pile-up of southern G stations and he was last heard at 2141.

On the 22nd from 1955, PY5CC (GG54), was around and Ted worked Peter at 2059. LU8MB (ex-LU8MBL in FF57), LU2FFD (FF97), PP5JD (GG52), PY2VA* and PY2XB* (GG66) were also heard till fade-out at 2140. The morning of the 26th brought more Es to DL and SP among in-band Russian TV. Nothing more was heard after 1110. So far this year Ted has heard / worked 97 countries, six of them new ones.

Jamie Ashford, GW7SMV (NP), was one of those to work ZD8KW on 20 August giving him DXCC number 101. On the 22nd he contacted LU8MB, LU2FFD, PP5JD, PY5CC and PY2XB*. Via transequatorial mode (TEP) on 10 September beacons ZS6TWB and V51VHF were heard along with V51KC.

144MHz

Tropo conditions were well up in the morning of 25 August but Dave Edwards, G7RAU (PO), complained, "I am now blue in the face from calling CQ DX and have sore fingers from keying. All beacons up, but where has everyone gone?" Two beacons in JO90 were S9+. He says he makes an effort to come on when conditions are good so urges others to do the same.

David Dodds, GM4WLL, together with Jim Martin, MM0BQI, and Colin Smith, GM0CLN, operated from Tanera Mor in the Summer Isles (IO78HA) in the Trophy Contest on the 2 / 3 September weekend.

Contest rules meant they couldn't use their GB4XS callsign, so they operated as GM4WLL/P. They completed 43 QSOs, 12 via auroral mode, in 22 grids and eight countries for a claimed score of 19,908 points. Tropo conditions were good on the Sunday and the aurora enabled them to make six to eight QSOs that would have been unlikely via tropo.

QSOs over 900km were SK7MW (JO65) at 1157km, F6IFR (JN09) at 1020km, LA0BY (JO59) at 930km, LA2AB (JO59) at 929km and OZ2TF (JO46) at 907km. All, except F6IFR, were auroral contacts. GW7SMV worked PI4ZVL (JO11) on a lighthouse on 20 August. Tropo conditions were up on 12 September with the PI7CIS beacon (JO22) at S9. In low activity Jamie worked nine PAs in JO11, 22 and 23 but heard nothing from DL.

430MHz UP

Neil Whiting, G4BRK (SN), echoes G7RAU's comments on lack of activity in lift conditions. On 25 August DB0KI (JO50) was S9 on 23cm in the morning and it wasn't until he got on to the packet / converse network and sent a few 'spots' that anyone appeared. He suggests, "Maybe everybody is on the computer instead or maybe tropo is so rare nowadays that people don't expect it to happen at all?" He did manage to work OE5VRL/5 on 70cm at 1192km but his 40W on 23cm was insufficient to raise Rudi.

DEADLINES

THAT'S IT FOR another month. Due to a revision in the *RadCom* schedule the deadline for January is now **11 November** and for February it is **14 December**. My telephone answering and fax machine is on 020 8763 9459 and my CompuServe ID is g3fpk ♦

CONTEST

TIM KIRBY, G4VXE
11a Vansittart Road, Windsor SL4 5BZ.
E-mail: tim@ukgateway.net

The G5BK team for VHF NFD this year. Look at the number plate on the back of the trailer!

AS MOST OF YOU will know, it has been possible, for the last few years, to obtain special short calls for use in certain specific contests (M6T, M2I etc). During the recent 144MHz Trophy, I heard one participant complaining that with all the special calls, he didn't know who anyone was anymore! I confess I find the same thing. I remember the more regularly used calls, such as M6T, but not all of them. I sometimes think that familiarity of contest calls is a great thing, particularly once they has been active for many years – they attract an almost personal following! Short calls might save time, but they could just cause a bit more confusion. If you want to see who holds the calls, you may find the following web page a useful reference: www.g4tsh.demon.co.uk/HFCC/contest.htm

EXCHANGE ETIQUETTE

OVER THE LAST couple of years, I have heard a growing tendency for some stations, when calling in a contest, to reply to a CQ Contest call with a full exchange. In other words you might hear something like the following:

'CQ CONTEST G4VXE'
'G4VXE FROM M0ZZZ YOU'RE 59 100 OVER'

What's wrong with this? Well, first of all, imagine that the contest station can hear more than one caller. The additional information is not going to be useful in the majority of cases, because we can only work one person at a time (normally, at least!). So rather than being useful information it becomes unusable, so we'll call it QRM which, obviously, we don't want to create.

Whilst we are on the subject of exchanges – let's look at a common issue that often trips up beginners to CW contesting. Let's say I'm calling CQ contest and my friend M0ZZZ decides to call me:

'CQ CONTEST DE G4VXE K'
'G4VXE G4VXE DE M0ZZZ M0ZZZ KN'

What's wrong with this? Well, the repetition is probably unnecessary. If I need M0ZZZ to confirm his call, I'll ask him. Also, if there is any sort of pileup going on, the last thing that a contester (or DXpeditioner) wants to hear is *his own* call coming back. Far better then to use something like the following:

'CQ CONTEST DE G4VXE K'
'DE M0ZZZ KN'

Why did I say that this particularly trips up contesters who are starting out? Well, let's assume that the beginner is not sending as fast as some others – and as we have discussed in previous columns there is nothing at all wrong in that. However, imagine that I have a nice little pileup going on and am working two or three stations a minute. Then, our friend M0ZZZ calls at 12 wpm, repeating both calls a couple of times. How long will that take? It might be 15 seconds. Let me tell you, that 15 seconds is a long

AFFILIATED SOCIETIES CONTEST (CW), 2000

Affiliated Societies Section

	Team						Score
1	Lichfield ARS	G3NKC	G3SJJ	GW3YDX	G3VHB	G0MTN	12700
2	de Montfort ARS - A	G3OAY	G3RIR	G3CWI	G3SDC	G4MJS	12129
3	Mid Beds CA - A	G4BJM	G4BWP	G4CXT	G5LP	G3PJT	12073
4	Yorkshire Cluster SG	G3ZEM	G4OBK	G4RCG	G3LZQ	G0LII	11375
5	Addiscombe ARC	G3SJX	G3UFY	G4ALE	G3VYI	G3JJZ	11363
6	Bristol CG	G3SWH	G3TKF	G3XSV	G0JQN	G3YHV	10437
7	de Montfort ARS B	G4ARI	G4EOF	G4CZB	G0WWW	G0TPH	9861
8	Echelford ARS - A	G0OPB	G3KKQ	G4TSH/P	G3NOH	G4ZRR	9731
9	Newbury & DARS - A	G3RVM	G3KLH	G0ORH	G3ZGC	G3NVO	9672
10	Horsham ARC - A	G3LET	G3WZT	G3OGP	G3ZBU	G3TNO	9357
11	Grimsby ARS	G3TBK	G4EBK	G3RSD	G3PDL	M0AJT	9152
12	RNARS Colchester	G3GLL	G3YAJ	G0IBN/P	G3YEC	G0DID	8283
13	Dragon ARC	GW4VEQ	GW0GEI	GW3VVC	GW3HCL	GW3EIZ	8272
14	Cheltenham ARA - A	G4PDQ	G4ENA	G3LVP	G3TA	G3XMM	7974
15	Torbay ARS	G0IVZ	G3LHJ	G4ELZ	G0RDO	M0APB	7197
16	Mimram CG	G3WUX/P	G3ZVW	G4KZD			6522
17	Stratford-u-Avon & DRS	G0OGN	G3MXH	G0MRH	G3XZO		6345
18	Guildford & DRS	G3YXX	G0EFO	G3ZDD	G8GS		6219
19	Stockport RS - A	G4FAS	G3GMM	G0TIP	M0AWV	G3SHF	5782
20	RNARS Rosyth	GM4SID	GM3CFS	GM3HUN	GM3UM	GM4FGD	5673
21	Edgware & DRS	G4IUZ	G0IGP	G0STR	G4KEW	G3ASR	5591
22	Chesham & DARS	G0ODQ	G0WTV	G3MEH	G3VRY	G3XZG	5326
23	Leicester RS	G5UM	G4OOS	G0LZA	G0IFM/P		5281
24	Reading & DARC	G3XTT	G0VQR	G0LHZ	G4ELY		4949
25	Three A's CG	G3WVG	G3SXW	G3TXF			4942
26	Horndean & DARC	G3PSM	G0MBQ	G0DHZ	G0RPX	G0WAQ	4935
27	Yeovil ARC - A	G3GC	G3ICO	G3CQR	G3TSK	G3KSK	4920
28	RAFARS S Yorks	G2AFV	G3IGU	G3SET	G0SWO		4330
29	Taunton & DARC	G4HTD	G0PSE	G3WNI			4264
30	Crawley ARC	G3KXF	G3YSX	G4TTY	G6RC		4258
31	RNARS Birmingham	G3HZL	G4SFO	G4TNI			4248
32	RNARS Barrow	G3IZD	G4USW	G0CHV			4065
33	RNARS Portsmouth	G3LIK	G3KKJ	G0FOD	G3OZY		4030
34	Sutton & Cheam RS	G0KBL	G4CWH/P				4009
35	Southdown ARS	G3SVL	G0THX	G0JHK	M0CHO	G3DQY	3868
36	South Manchester RC	G0LZL	G3HCO	G0NID			3814
37	Wigtownshire ARC	GM3JKS	GM4BES				3774
38	Norfolk ARC	G3PDH	G4DYC	G3DKO			3660
39	RNARS Liverpool	G3HQH	G3RFH	G4RBE			3445
40	Cheltenham ARA - B	G3ZKN	G3LME	G3SZS	G0UPU	G3NKS	3303
41	Echelford ARS - B	G3XTZ	G4GSC	G3EAO	G3HBZ		3296
42	RAFARS Cosford	G8FC	G4CWN	G0EYX	M0BYJ		3132
43	Harwich ARIG	G0DVJ	G4YJQ	G4FTP			3105
44	Telford & DARS	G3UKV	G4EIX				3081
45	Axe Vale ARC	G3DIC	G3FFH	G3MSV			3080
46	Stevenage ARS	G0WAT	G4DDX				3042
47	Horsham ARC - B	G3VQO/2K	G4XHE	G4FQR			3001
48	Isle of Wight RS	G3SKY	G0WVD	G3LWI	G0MWU		2955
49	Maidenhead & DARC	G3LVW	G3RZF	G3TWG			2952
50	RNARS Chatham	G4FRN	G4PTE	M0AEK	G0SCY		2940
51	RAFARS Cottesmore	G4PZQ	G3ZDW/P				2867
52	Worthing & DARC	G3LQI	G4OAY	G4SLE			2866
53	Scunthorpe Steel ARS	G4OGB	G4FUH				2822
54	Chiltern DXC	G3RTE/P					2691
55	Farnborough & DARS	G4BJQ	G0VYR				2605
56	Clifton ARS	G3GHN	G0DCG	G0HUZ			2591
57	Bromsgrove & DARC	G3TQD	G4AFK				2569
58	Cockenzie & PS ARC	GM0CLN	MM0BQI	MM0CCC/P			2410
59	Mid Beds CA - B	G4PIQ					2216
60	West Kent ARS	G3WKS	G3AIO				2200
61	RNARS Newcastle	G3AWR	G3MXZ				2166
62	Strathmore RS	GM4AFF					2101
63	RNARS Yeovil	G4KJD	G0JCY				2025
64	Harwell ARS	G4AZN	G0THY				1910
65	Port Talbot ARC	GW3WWN					1898
66	RNARS Lowestoft	G3OOK					1780
68	Swansea ARS	GW3INW	GW0SGG				1446
69	Southgate ARC	G3GUL	G0FQT				1430
70	Cheshunt & DARC	G4GYP	G3WFM				1400
71	Trowbridge & DARC	G0GKH					1390
72	Newbury & DARS - B	G3WYW					1127
73	Meirion ARS	GW4LZP					1068
74	de Montfort ARS - C	G5MY					940
75	Inverclyde ARG	GM3XGX	GM3YOR				920
76	Wythall RC	G3YCH					721
77	Carmarthen ARS	GW0VEW					610
78	Cheltenham ARA - C	G4ERP	G4RFU				607
79	Blackwood & DARS	GW4BLE					492
80	Colchester RA	G3FIJ					250
81	Stockport RS - B	M0CGF					157
82	Horndean & DARC - B	G0UHM	G0JRN				80
83	Yeovil ARC - B	2E0ATL					10

AFFILIATED SOCIETIES CONTEST (CW), 2000

Individual Section

	Call	Score	Eqpt
1	G3WUX/P	2700	——
2	G3RTE/P	2691	4C16
3	G3NKC	2675	——
4	G3OAY	2672	4C14
5	G3ZEM	2640	4C19
6	G4BJM	2605	——
7	G4OBK	2591	4C16
8	G3SJJ	2581	——
9	GW3YDX	2564	——
10	G3SJX	2545	4C12
11	G4BWP	2498	——
12	G3VHB	2471	——
13	G3RIR	2461	3C15
14	G3CWI	2440	4C15
15	G0MTN	2409	——
16	G4RCG	2408	4C16
17	G4HTD	2404	4C13
18	G3UFY	2401	4C13
19	G4CXT	2378	4Q18
20	G3TBK	2363	4C16
21	G3SDC	2350	4C1-
22	G4ALE	2349	4C14
23	G5LP	2348	——
24	G0IVZ	2345	——
25	G3RVM	2318	4C14
26	G3SWH	2311	3C16
27	GM3JKS	2307	4C17
28	G3WVG	2288	——
29	G3LET	2265	4W16
30	G3VYI	2261	4G13
31	G3PJT	2244	——
32	G3KLH	2239	4C15
33	G3TKF	2224	4C1-
34	G0KBL	2220	4C1-
35	G4PIQ	2216	
36	G4MJS	2206	3C1-
37	G0OPB	2205	4C14
38	G3LIK	2198	3C13
39	G4ARI	2190	4C14
40	G0ORH	2185	4C16
41	G3YXX	2164	4C14
42	G3XSV	2161	4C1-
43	G0LZL	2138	4C14
44	G3LZQ	2132	3C16
45	G3GLL	2117	4C12
45	G3WZT	2117	-C17
47	G3KKQ	2108	——
48	GM4AFF	2101	4G1-
49	G4CZB	2100	4C12
50	G4EOF	2089	4C1-
51	G4TSH/P	2060	3C14
52	G4PDQ	2057	4C16
52	G3MXH	2057	4C14
54	G5UM	2051	3C1-
55	G0WWW	2049	3C1-
56	G3NOH	2044	4C1-
57	GW0GEI	2029	4C13
58	GM4SID	2024	4C1-
59	G3ZVW	2017	——
60	GW4VEQ	2015	4C11
61	G3UKV	2004	3C15
62	G3PSM	2000	4C14
63	G3OGP	1998	4C1-
64	G4OGB	1992	3C13
65	G0EFO	1985	4C1-
66	G3PDH	1960	3C1-
67	G0JQN	1921	4C12
68	G3XTT	1911	4C1-
69	GW3WWN	1898	3C1-
70	G3IZD	1891	4C13
71	G3RSD	1884	3C13
72	G3YAJ	1868	3C13
73	G4IUZ	1857	4C13
74	G3PDL	1852	4C13
75	G2AFV	1823	4C14
76	G3YHV	1820	4C1-
77	G3JJZ	1807	3W1-
78	G8FC	1805	3C1-
78	G4KZD	1805	——
80	G4CWH/P	1789	4C13
81	G3OOK	1780	4C15
92	G4ENA	1770	3C14
83	G0OGN	1761	3C12
83	G3SHF	1761	3C1-
85	G0WAT	1754	3Q12
86	G3SXW	1750	——
86	GW3VVC	1750	3C1-
88	G6RC	1734	
89	G3HQH	1721	3C1-
90	G3XZG	1720	3C1-
91	G3ASR	1710	3C15
92	G3ZGC	1697	3W13
93	G4AZN	1690	3C1-
94	G0VQR	1664	3C1-
95	G4PZQ	1613	3C1-
96	G0LII	1604	4W1-
97	G3LHJ	1594	3W13
98	G0IBN/P	1581	3C16
99	G4OOS	1577	3C1-
100	G3TQD	1569	3C14
100	G3XZO	1569	4C12
102	G3GC	1560	3C13
103	G3ZBU	1553	3G1-
104	G3GHN	1542	3C13
105	M0AJT	1528	3C12
106	G3HZL	1527	3C14
107	G4EBK	1525	3C13
108	G4BJQ	1500	3C13
108	G3YEC	1500	4C1-
110	G3SVL	1491	4W13
111	G4SFO	1490	4C1-
112	G3IGU	1482	3W14
113	GM4BES	1467	4C1-
114	G3LVP	1448	3G12
115	G3VRY	1444	3C14
116	G0TPH	1433	3C1-
117	G3TA	1429	3C15
118	G3TNO	1424	3—
119	G4ELZ	1419	3C12
120	G0IGP	1400	3C12
121	G0GKH	1380	3C13
122	G3MSV	1370	3C1-
123	G3HCO	1335	3C1-
124	GM0CLN	1331	3C11
125	G3VQO/2K	1327	3W12
126	G0DVJ	1324	3C14
126	G3LWI	1324	3C12
128	G3TWG	1320	3C1-
129	G4ZRR	1314	3G1-
130	G3LQI	1310	3W13
130	G4DYC	1310	3C1-
132	G4USW	1304	3W12
133	GW3HCL	1290	3C1-
134	G4DDX	1288	3C12
135	G3AWR	1284	3W12
136	G3ICO	1280	3C13
137	G3XMM	1270	3C12
138	GM3CFS	1261	3C1-
139	G4FAS	1258	4C1-
140	G3XTZ	1257	4G1-
141	G4FRN	1255	4C1-
142	G3ZDW/P	1254	3C1-
143	G3NVO	1233	——
144	G4TNI	1231	3C1-
145	G3RFH	1224	3C1-
146	G0DID	1217	3C1-
147	G3WKS	1200	3C1-
148	GW3EIZ	1188	3Q12
149	G4XHE	1187	——
150	G3MEH	1178	3C1-
151	G0MBQ	1171	4W1-
152	G3ZDD	1160	4C1-
153	G3WYW	1127	3C1-
154	G0VYR	1105	3C13
155	G3KXF	1090	3W12
156	G4EIX	1077	3W12
157	GW4LZP	1068	3C11
158	G0PSE	1054	3W1-
159	G4KJD	1037	3G15
160	G0RDO	1018	3G13
161	G3GMM	1009	3C1-
162	G3AIO	1000	3G1-
162	G4AFK	1000	3W1-
162	GM3HUN	1000	3W1-
165	G0DHZ	994	3C12
166	G0JCY	988	3C1-
167	G0IFM/P	979	3C1-
168	G3DIC	970	3C12
169	GM3UM	964	3W1-
170	G4YJQ	963	3W12
171	G3YSX	960	3C13
172	G0MRH	958	3C12
173	G3LVW	944	3C1-
174	G0THX	942	3C1-
175	G5MY	940	3G10
176	G3CQR	930	3C13
177	G3ZKN	913	4G16
178	G8GS	910	3C1-
179	G3TXF	904	——
180	G0LHZ	899	3C1-
181	G0TIP	897	3G1-
182	G3KKJ	896	3C1-
183	G3MXZ	882	3C1-
184	G3SET	881	3Q13
185	G4OAY	880	3G1-
186	G0CHV	870	3W13
187	M0AWV	857	3C1-
188	GW3INW	848	4C18
189	G0FQT	840	3—
190	G4FUH	830	3C13
191	M0APB	821	3C1-
192	G4FTP	818	3C14
193	G0ODQ	816	3C1-
194	G4GSC	808	3C1-
195	G3WNI	806	3C1-
196	GM3XGX	800	4C1-
197	G3FFH	740	3C1-
198	G4PTE	727	3G1-
199	G3YCH	721	3C1-
200	G4GYP	720	3C13
201	MM0CCC/P	692	3G1-
202	G0MWU	692	3C12
203	G3RZF	688	3C1-
203	G3SZS	688	3G12
205	G3WFM	680	3C12
206	G4SLE	676	3C1-
207	G0LZA	674	2G1-
208	G3LME	664	3C13
209	G3EAO	660	3C1-
210	G0FOD	648	3C1-
211	G0DCG	634	3W1-
212	G4CWN	633	3C1-
213	GW0VEW	610	3C1-
214	G0JHK	609	3C1-
215	GW0SGG	598	3C1-
216	G3GUL	590	3C1-
216	G3TSK	590	3W1-
218	G0EYX	580	3C1-
219	G3HBZ	571	3C1-
220	G3KSK	560	3W1-
221	G0UPU	538	3C12
222	G4RBE	500	3C1-
222	G0RPX	500	3C1-
222	G3NKS	500	4C13
225	GW4BLE	492	3C1-
226	G3SKY	487	3W17
226	G4FQR	487	2W12
226	G0SCY	487	——
229	G4ELY	475	3C1-
230	G4TTY	474	
231	M0AEK	471	2C14
232	M0CHO	456	3C1-
233	G0WVD	452	3C12
234	GM4FGD	424	3C1-
235	G0HUZ	415	3G10
236	G4ERP	410	3C12
237	G3DKO	390	3C1-
238	MM0BQI	387	3C12
239	G3DQY	370	3W1-
240	G0NID	341	4C13
241	G4KEW	327	3C12
242	G0STR	297	3C12
243	G3OZY	288	3C12
244	G0WAQ	270	3G1-
245	G3FIJ	250	2C1-
246	G0THY	220	3W13
247	G4RFU	197	3Q12
248	G0WTV	168	2C1-
249	M0CGF	157	3C1-
250	G0SWO	144	3C12
251	GM3YOR	120	4G10
252	M0BYJ	114	3G1-
253	G0UHM	50	3C1-
254	G0JRN	30	3C1-
255	2E0ATL	10	2C1-

time when you have a contest pileup going. I won't want to slow the rate and I'll be nervous about losing my frequency. So what will I do? Probably work someone else, even if it is a weaker signal. In fact, I'll do my utmost to keep that rate up! So if you're in this situation, just remember that you don't need to worry about sending more slowly than the contest station, but remember just to drop your call in once. Chances are that when you do that, the contester will slow down for you anyway and the QSO will be nice and comfortable for you.

Of course, there are exceptions to this. Let's say that you can hear two stations operating very close together in frequency and you realise that they are probably unaware of each other. So if you just send your own call, the chances are they will both come back! This could be confusing! So, I'd suggest hear that you include part of their call – not the whole thing, when you call them. For example…
'CQ CONTEST DE G4VXE'
(Just up the band a bit) *'CQ CONTEST DE G4BUO'*
'BUO DE M0ZZZ KN'

This makes it clear that you are calling G4BUO and does the service of letting me know that the frequency may not be as clear as I thought it was. Knowing that Dave is probably going to be a lot louder with my 'target audience', I'm probably going to think about finding a better frequency!

Affiliated Societies Contest (CW), 2000

THIS YEAR the table is headed by a multi-operator entry from G3WUX and G0SAH. As a result of this the Marconi trophy goes to the second-placed entrant, G3RTE, as this award is for the leading single-operator station.

M2000A was active giving many entrants the opportunity to contact the millennium station at Greenwich. Whilst not able to enter as a special event station operator, G4BUO managed to make 227 QSOs whilst running a barefoot transceiver. People who included the equipment codes with their entries made the tabulation easier, whilst for others I have tried to determine the information from the cover sheet – unfortunately some of the entrants gave no information regarding their equipment.

My apologies for the late availability of the results – hopefully things will return to normal for next year.

My particular thanks to G4UOL for his help and for performing his task in a very short time and without whom the results might have been even later than they are.

Comments from the logs:

'Much enjoyed contest – good way to keep Morse alive'.

'My first CW contest and first HF CW contacts after 25 years. Thoroughly enjoyed it. QRS section is a great innovation'.

'EMC problems at home meant a /P entry was required and was it cold on the moors? You bet!

'Called by VQ9QM but failed to hear JA'.

Laurence Mason, G4HTD

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest
10/12 Nov	*2300-2300*	*SSB*	*Japan International DX*
11 Nov	2000-2300	SSB	RSGB Club Calls
11/12 Nov	*0000-2359*	*RTTY*	*WAE RTTY*
18/19 Nov	*1200-1200*	*CW*	*LZ DX Contest*
18/19 Nov	*1400-0800*	*CW*	*IARU Region 1 1.8MHz*
18/19 Nov	2100-0100	CW	RSGB 2nd 1.8MHz
25/26 Nov	*0000-2359*	*CW*	*CQ WW CW*

VHF Contests

Date	Time	Mode	Contest
4/5 Nov	1400-1400	CW	RSGB 144MHz CW
5 Nov	0800-1400	CW	RSGB 144MHz CW 6 hour section
6 Nov	2000-2230	All	RSGB 1.3/2.3GHz Cumulative #3
15 Nov	2000-2230	All	RSGB 432MHz Cumulative #3
21 Nov	2000-2230	All	RSGB 1.3/2.3GHz Cumulative #4

The full rules of RSGB HF and VHF/UHF contests were published in the RSGB Contesting Guide in October 1999 *RadCom*. Brief rules for non-RSGB contests, which are listed in italics above, can often be found in the 'HF' and 'VHF/UHF' columns. The HF and VHF Contest Committees both have web sites from which comprehensive details are available. These are www.g4tsh.demon.co.uk/HFCC/index.htm and www.blacksheep.org/vhfcc

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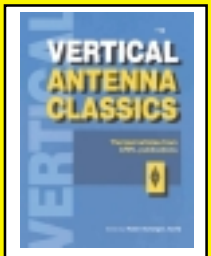

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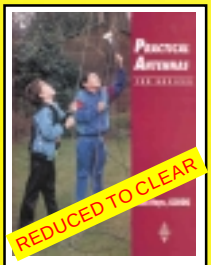

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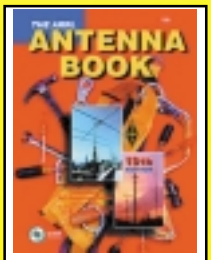

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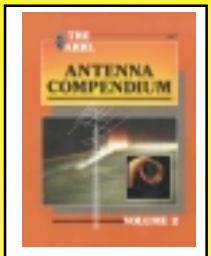

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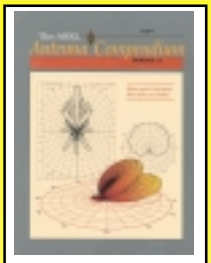

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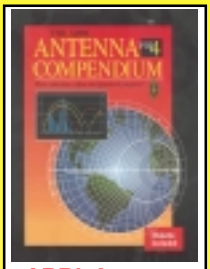

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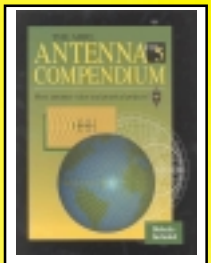

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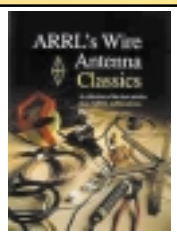

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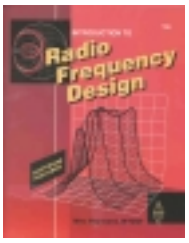

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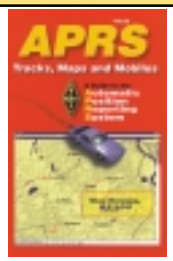

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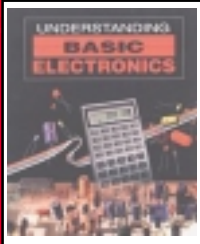

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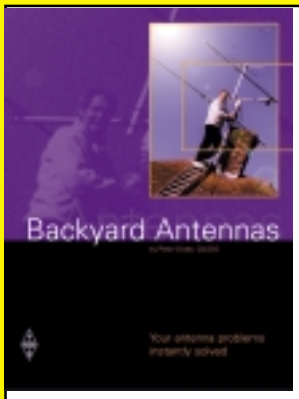

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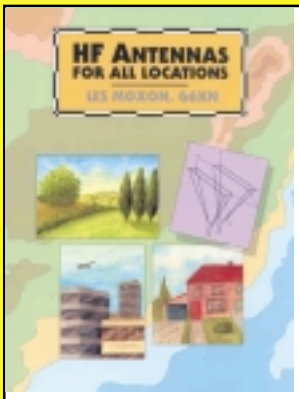

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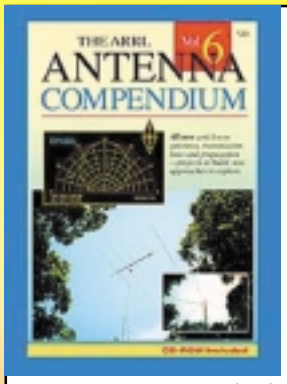

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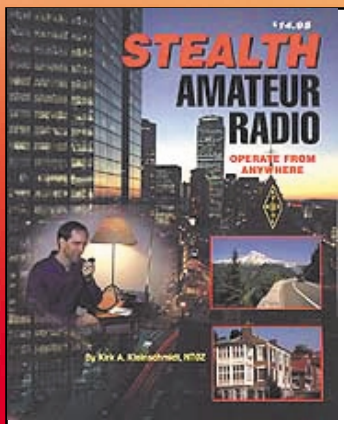

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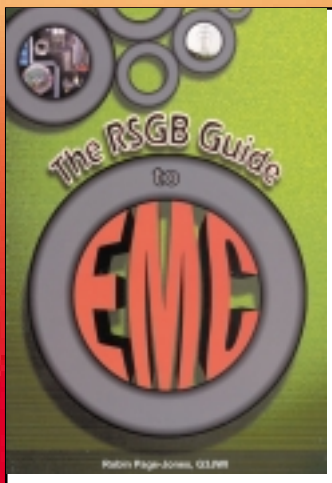

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SWL

BOB TREACHER, BRS32525
93 Elibank Road, Eltham, SE9 1QJ.
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SUMMER holidays took priority over radio for much of August – well, sort of! As Simon, RS177448, is really developing a serious liking for amateur radio, I purchased a Sony ICF-SW7600G compact radio and we took it to that rare country – at least as far as SWLs are concerned – Wales!

HOLIDAY LISTENING

THIS YEAR our main summer holiday was to Pembrokeshire in west Wales. Our /A location was a hotel on the outskirts of Tenby and, after our first trawl around the bands, Simon set himself a target of hearing 200 different stations. I decided it would be something of a challenge to try to hear 100 DXCC entities during our two-week holiday. All our listening in the first week was from our /A location using the radio with either its built-in whip antenna or a 33ft long wire, as the weather was not settled enough to partake in any /P listening. In that first week, Simon logged 105 different stations, while my log shows that 76 DXCC entities were logged. Best DX was V26ET, VP5VAC and YB0DX on 17m, while 40m gave us many Europeans plus EA8ZZ, EA9PB, FM5GU, LU1IV and 5H5A.

The weather showed a vast improvement during the second week, so that some /P listening was possible from Cardigan and Tenby and Amroth beaches. It was pleasing to hear some really good DX, as we were just using the built-in whip antenna. Some of the best DX included BD4ED, DS2BGV, DU8DJ, S92SV, VR2LW, VU2DK, YB7BS, 3B8AD, 9V1WW, and the VK9XY DXpedition! Simon was pleased to have heard a number of new islands for his IOTA claim. They included IS0LYN/IM0 (EU-024), EJ7IQ (EU-121), ES4BG/8 (EU-178), 7S6LGT (EU-043) and SV8/IZ2AEQ (EU-052). He was also pleased to hear M2000Y/MRU79, which brought back memories of M2000A, and GB2LZL operating from the Lizard Lighthouse in Cornwall (which we visited last summer, see the QSL card). Simon achieved his target on the last morning, while I heard 108 DXCC entities – truly amazing in odd listening spells during our two-week break.

I would certainly recommend the radio to listeners who might be contemplating taking a small receiver on their travels and I will be delighted to include details of any future SWL 'DXpeditions' in this column.

PERSEIDS

WHILE I WAS away, the most popular meteor shower of the year came and went. Mick Toms, BRS31976, listened from his QTH (JO01HO) at 62ft ASL, but reported that conditions were not too good. He did hear HA5CW, IW1EZG, IK0BZY, S51MQ, S52EZ, S57EA, S50C, YU7ACO, YU7EW and 9A2KK. Mick was using an FT-847, 10-element ZL-special 10m AGL.

David Whitaker, BRS25429, had converter trouble so concentrated on what the event provided on 6m. Far from hearing signals via meteor scatter, he noted an auroral band which provided several GMs, G8TIC/P in IN79 and EI3IO. His best DX, however, were LA6QBA and LA5QFA.

Away from the meteor shower, David reports hearing ZD8KW (ex-ZD7WRG) on the 'magic band'. Unfortunately, it was not a new country for David, as he heard ZD8LII during the last sunspot maximum.

Simon, RS177448/A, chasing his target of 200 different stations while on holiday in Wales.

Poldhu ARC is pleased to QSL SWL reports to its QSL manager, M0BMX.

RUSSIAN QSLing

HAVE TROUBLE getting replies to direct QSL reports from Russia? Well, my attention has been drawn to this Internet site www.qsl.net/rz1ak/mail.htm which explains how to mail letters to Russia and ensure that your letters get to the recipient.

SWL REPORTS TO D68C

READERS WILL BE aware of the DXpedition to be mounted by the Five Star DX Association in February next year to the Comoros Islands. Advance information for listeners needing D68 - **I will be handling the SWL QSLing**. It will be the fifth time that I have handled the SWL QSLing for a major British operation, the previous being 4S0UK, C56DX, 9M0C, M2000A and now D68C.

I will reply to all accurate reports, so please follow the 'SWLing QSL rules' that formed a large part of my column in the August issue as I'm really looking forward to letting you have a card for this major DXpedition. The team will be in D68 for three weeks, including three weekends. Don, G3OZF, the RSGB President, had just returned from the island as I write this and told me how quiet the bands were – sounds good for the LF bands, even 160m SSB, hopefully.

CQWW SWL CHALLENGE RESULTS

UNFORTUNATELY, the results from 1999 were seriously delayed. However, those who asked for a results booklet should now have one (covering several other contests as well). Everything will be done to provide a quicker report of this year's event – but it should be noted that some transmitting results take an age to appear, too! The rules for the Challenge were in my column last month.

E-MAIL SWL QSLs

I ASKED FOR comments on e-mail SWL QSLing a few months ago. Although I received several replies, it would be good to be able to take account of a few more comments. If you send SWL reports by e-mail, let me know what form your report takes and how successful you've been in getting QSLs in return. Alternatively, if you are an amateur who has received an e-mail SWL report, let me know your impressions of e-mail QSLing and if you replied to the report! E-mail your replies to me at the above address and I'll air the various comments around the turn of the year. ♦

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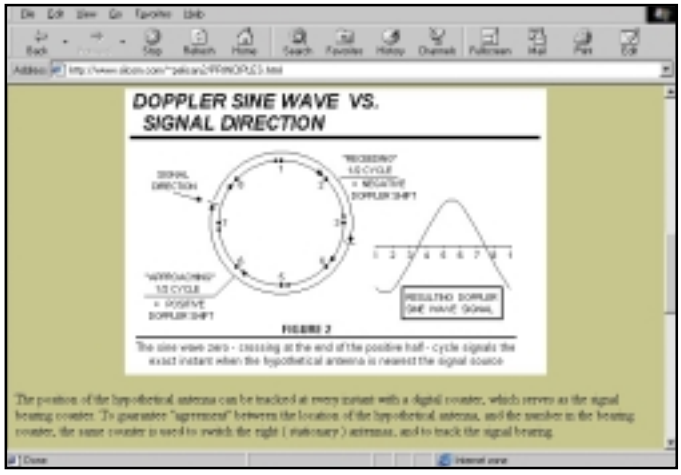
AS WINTER approaches, many amateurs will be thinking about their next serious construction project. For those considering something a little more ambitious for their next society fox hunt, a visit to Bob Simmons's web site [1] may be in order. Here you will find a very professionally-presented Doppler DF unit, that has been designed, built and continually developed by Bob, WB6EYV.

The Doppler unit is suitable for direction-finding strong VHF signals, using an external receiver and a custom antenna array, giving a direction indication via a circular LED display. Despite being a VHF design, the electronics involved are essentially operating at audio frequencies, making the chance of successfully reproducing the unit extremely high, even for the less-experienced constructor. The site does provide a thorough introduction to the principles of Doppler DF, and leaves the potential user in no doubt as to the expected performance and limitations of the unit.

Having decided to proceed with construction, the reader is presented with a comprehensive set of building instructions, circuit diagrams and printed circuit board layouts, together with a full explanation of the installation and testing of the unit. Bob continues to add new features to the unit, with descriptions of a digital readout, RS232 interface and an electronic compass option supplementing the main project. Overall, this is an extremely well-presented web site that is the result of a lot of hard work by the author, and the subject will provide a good stepping-stone to more advanced projects for those with limited electronic construction experience.



A Doppler tutorial from WB6EYV.

REFERENCES
[1] http://www.silcom.com/~pelican2/ (WB6EYV Doppler DF)
[2] http://www.qsl.net/sm7vhs/radio/ (SM7VHS Radio Details)
[3] http://www.recelectronics.demon.co.uk (Vintage Racal)
[4] http://www.nor.com.au/community/sarc/phonetic.htm (Alphabets)

RADIO DATABASE

LOOKING THROUGH the classified advertisements of *RadCom* and elsewhere, we must all ask ourselves at some time "I wonder what that radio looks like?". This is especially true for out-of-production transceivers, but thankfully Martin, SM7VHS, is building a reasonably comprehensive database of amateur radio equipment in his qsl.net web space [2].

Concentrating on the product ranges of Yaesu, Icom and Kenwood, the site contains a straightforward index for HF, VHF+, mobile and handheld equipment, with the index listing known model numbers for each manufacturer. Selecting a model from the index reveals a picture of the transceiver, together with a listing of the specification or features of the equipment. The pictures and specifications are mostly scans of original manufacturer's handbooks or sales literature, but supply enough information to give the reader an idea of the capabilities and appearance of the equipment.

There are several 'holes' in the database, where models have been identified but no information is available, and I'm sure Martin would be pleased to hear from anyone who can assist with filling in the blanks. An obvious improvement to the site would be to include some user's comments against each model, where known problems, quirks or highlights can be passed on to potential users. I have already sent this as a suggestion to Martin, and we shall have to wait and see if it is adopted. Nevertheless, this is a useful resource for anyone who needs a bit of help identifying an amateur radio transceiver in the 'for sale' columns, and deserves to be encouraged and supported wherever possible.

Remember Racal? This site has all the details.

Plenty of radio pictures in the SM7VHS gallery.

VINTAGE ENTHUSIASM

A MORE FOCUSED source of equipment data can be found at 'Keith's Vintage Racal Enthusiasts Site' [3], which concentrates on this popular British marque of radio receiver. Despite an in-depth search of the site I could find no more information as to who Keith actually is, but his enthusiasm for Racal radios is certainly evident.

A brief potted history of the Racal company introduces the subject, which is then accompanied by detailed descriptions of the receivers and key accessories that have become well known to many amateur radio enthusiasts via the surplus market. Keith provides considerably more detail than the type found on the SM7VHS site, especially in the form of internal photographs, though these require a certain amount of patience whilst they download. The 'Things to Look Out For' sections of the receiver description pages will prove invaluable to anyone considering purchasing or restoring this equipment, as will the page entitled 'Repairing an RA17, a Case History', written by Rob Filby, G0HJR.

A 'Notice Board' page completes the site, providing a place for Racal enthusiasts to exchange ideas, seek help, and trade their equipment, though I would suggest adding posting dates against each of the items would make it a lot more user friendly. The site is probably best summed up in Keith's own words: "As far as I know there is no Racal news group and the Racal User Group here in the UK is long dead, so I hope that these pages will help stimulate interest worldwide".

PHONETICS

AND FINALLY, a quirky little archive has been created by J W Alcorn VK2JWA, entitled "Phonetic Alphabets - Historic English and Others" [4]. It presents an eclectic collection of just about every phonetic alphabet you could think of, plus many you've probably never heard of!

Complete alphabets are provided for many European languages, plus versions for Russian, African, Chinese and even Esperanto. Reference sources and dates of use are provided where they are known by the author. ♦

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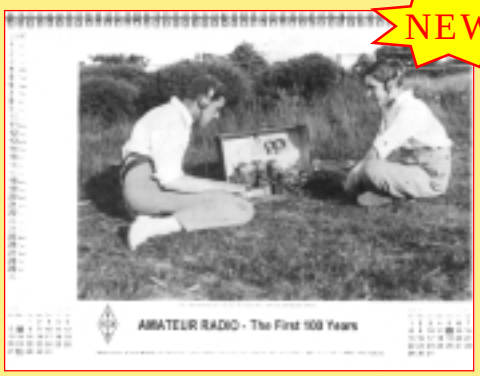

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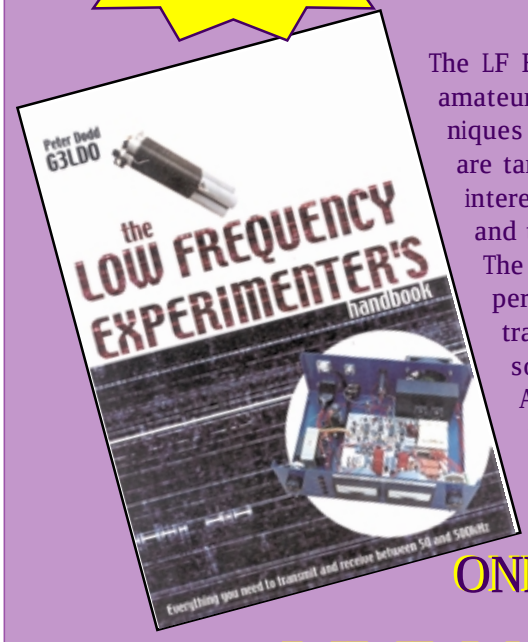

The Low Frequency Experimenter's Handbook

The LF Experimenter's Handbook has been written to meet the needs of amateurs and experimenters who have an interest in low power radio techniques at frequencies below 200kHz. Most of the techniques described are targeted at those using the 136kHz band, but they are also of great interest to readers in New Zealand and Australia with their 183kHz band and the Lowfers in the USA on 180kHz.

The bulk of the material in this book comprises contributions from experimenters world wide and covers antennas, propagation, receivers, transmitters, special modes and test equipment, and also discusses some applications such as communication with caving enthusiasts.

All those interested in exploring the new frontier of the LF bands will welcome this invaluable and unique reference, whether they intend transmitting or are content just to receive.

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LF

DAVE PICK, G3YXM
178 Alcester Road South, Kings Heath, Birmingham B14 6DE.
E-mail: lf.radcom@rsgb.org.uk

Making his way to the coast of Newfoundland any day now should be Larry, VA3LK, setting up for his trans-Atlantic tests on 136kHz. These are due to take place around the middle of November and have been the subject of some debate on the LF e-mail reflector over the past few months. I suggest keeping an eye on the reflector (details on how to join are below) for the latest developments. If Larry manages a QSO it will be a major event, don't miss it!

Just as this column was being put together, David, G0MRF/P worked VE1ZJ cross-band from 136kHz to 20 metres. David was using a semi-vertical wire fed from the 15th floor of a tower block in West London. The QSO took place just after midnight UTC in the early hours of 10 September. David also detected a signal from VE1ZZ on 136kHz. Now we know that a two-way contact really is possible.

To subscribe to the LF reflector, send the message 'subscribe rsgb_lf_group' to majordomo@blacksheep.org (with no subject). To post messages once you are on the list, send them to rsgb_lf_group@blacksheep.org

NEWS FROM SPAIN AND PORTUGAL

TWO SPANISH STATIONS now have special permits to operate in the 136kHz band. EA2HB and EA2BMD are both in the San Sebastián area, (IN93 square) which is in Northern Spain. There should be a good chance of working them from the UK when they get properly set up.

Portugal is represented by Brian, CT1DRP (IN51QD) who also has permits to operate on 136kHz, with the same conditions as most of us, from both his QTHs. Brian has been experimenting with 136kHz for some time, and has copied signals from the UK. He should be well placed to make some QSOs this winter.

FRENCH 136kHz ACTIVITY

FRUSTRATED BY the lack of activity from Northern France, David, G0MRF, and Tony, G4KLF, took a day trip to Calais and set up a portable station near the coast at Wissant. They had 16 QSOs with 14 different stations, mainly southern UK Gs, but also Steve, GW4ALG (CW), ON4ZK (*QRS*), and ON7YD (*DFCW*).

They also heard Wil, PA0BWL, with an excellent signal as they were setting up, but he had gone QRT by the time the transmitter was tuned up. An attempt to work Peter, G3LDO, cross-band to 73kHz failed as they had not planned for this band and could not retune the antenna to the lower frequency.

Meanwhile, in Southwest France Marc, F5MAF, is at the 'exploding FETs' stage. When things are working well he has about 1.5A aerial current and has been copied on *QRS* by G3AQC.

TELFORD RALLY STATION

G3YXM AND G4GVC set up an exhibition station at the Telford rally, which was held at RAF Cosford Aeronautical Museum this year. The site, near the end of a hangar full of vintage planes, had reasonable access to the outside and a 100m long-wire was strung between our hangar and the adjacent one. Rejoicing in a fairly low noise level we had 14 QSOs with 5 countries and generated a lot of interest from passers-by. I was amazed that many amateurs have still not heard about the band and some have severe misconceptions about it. We must do some more exhibition stations to raise awareness!

I would like to thank Telford club's resident LF enthusiasts G0VXG, G0VSJ and G3UKV for making it such a great day.

73kHz CONTINUES

THE REVISED NOTICES of variation for 73kHz have now been issued and it appears that we have the band for another three years. Back in the July column I said it was for one year. We really will have to take advantage of this extension to set some new records! I understand that a couple of European stations are trying to get permits for the band so there may be some new two-way records set. Watch this space.

Flying high: John, G4GVC, operating G2BBC/P at the Telford Rally (see 'Telford Rally Station').

BUZZ, WHISTLE, HUM

WHILST AT MY GM/P location I noticed a nasty buzzing noise all over the (usually beautifully quiet) 136kHz band. Some investigation revealed the newly-installed digital satellite TV box to be the culprit. The noise was present even in standby. I have heard from others about TV sets producing wobbly carriers on the band when in standby. I shall have to adopt my mother's advice in future "always unplug everything when not in use". Keep an eye on the EMC column for more news of this ever-increasing problem. ♦

IOTA

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SOME 40 NEW groups have been activated since June, when the new *Directory* was published, and three quarters of these were newly-created. A further dozen groups have seen activity in the past and are likely to experience a new operation shortly. So, in total, year 2000 can expect to see more than 50 new groups activated, a diet of one a week for the Deserving.

Before celebrating, give a thought to what some of these operations put up with. The VK6BM operation from Browse Island, a hundred miles off the Western Australia coast, saw drama in early September when the catamaran *Tearaway*, having off-loaded its amateurs, was driven on to the beach by gales. All efforts to refloat it failed. The stranded operators were eventually taken off by the Royal Australian Navy and transported back to Darwin. Late news is that the skipper succeeded on his own in getting the yacht afloat on a seasonal high tide and arrived back more than a week after the others. Had the group remained on Browse, they would have run out of food! Count yourself lucky if you are one of the 2100 QSOs in the VK6BM log.

Several other operations, 9G5MD on Abokwa and ZS31ER on Elephant Rock to mention just two, are known to have experienced rough landings involving the loss of some radio equipment and, in at least one case, minor injuries. Despite the best laid plans, DXpeditions often find Murphy travelling with them as a non-paying passenger. The message must be to take care. In some areas of the world there is real risk to life and limb and the existence of an unnumbered island group is not a good enough reason to put yourself in danger.

NEW QSL CARD REQUIREMENTS

THE JULY COLUMN mentioned that IOTA was introducing tighter requirements on QSL cards with effect from 1 January 2001. If, from that date, IOTA DXpeditioners and resident island stations want their operations to count for IOTA, they must include on their QSL card the name of a qualifying island shown in *Directory 2000* or on a list of Additional Qualifying Islands on the IOTA Manager's web-site (www.eo19.dial.pipex.com/index.shtml). This applies equally to British stations who, if they are on the UK mainland, should have 'Britain' or 'Great Britain' added to their cards. 'IOTA EU-005 Britain' seems the neatest way of doing this.

The message to all island stations is that if you are getting new cards printed for contacts made after 1 January, ensure that the island name (of course, one appearing in the *Directory* listing) is printed on them. If, however, you intend to use your current stock of cards and they don't mention the island name, you have the following options - having the cards overprinted with the island name, getting a rubber stamp of the island name and stamping each card individually, or printing the island name on the computerised QSL label. Whichever route you choose, the island name must be reasonably prominent and the card must be totally unambiguous as to the location at the time of contact. Do not try to deal with the problem by adding the island name in manuscript.

The reason for this tightened procedure is to move IOTA to a position where checkpoints can, within seconds, reach a decision on each card submitted on the basis of the information on that card and in the *Directory*. We have to move checkpoints away from constant reference to atlases, maps, personally maintained lists and HQ back-up facilities. The name of a town or village cannot be an acceptable alternative to the island name since, by requiring reference to an atlas, it multiplies processing time many times over. The IOTA reference number, although desirable, is not by itself enough, nor, with few exceptions, is the short IOTA group name taken from the *Directory*. Please bear with us in our endeavours to secure general acceptance of this change. It really is essential.

CONVERSION SHEETS

RECORD CONVERSION has started (see the September column). Current IOTA members with a score credited on the HQ database are asked to complete a Conversion Sheet to facilitate the moving of credits to the correct group. Conversion Sheets are available for downloading from either of the two web-sites (the IOTA Manager's given earlier or the IOTA HQ site (www.rsgbiota.org)). Hard copies are available from Lynnette Ranger, the IOTA Co-ordinator at RSGB HQ. The Committee encourages conversion action to be taken as soon as possible, since this opens the way for applicants to claim credit for the new groups (marked on the list alongside with an asterisk). ♦

The team: Wally, VK6YS; Terry, VK8TM; Dan, VK8AN; Len, VK8DK; Curly and Kevin, the *Tearaway*'s skipper.

The catamaran *Tearaway* aground on the Browse Island beach.

NEW REFERENCES

AF-087	5H	Tanga Region group
AF-088/Pr	C9	Nampula District group
AS-149	*R0F	Sakhalin's Coastal Islands
AS-150/Pr	BY4	Shandong Province South group
AS-151	BY2	Liaoning Province West group
EU-178	*ES0,8	Parnumaa County/Saaremaa County South group
EU-179	UR	Mykolayivs'ka/Khersons'ka Obl: Black Sea Coast group
EU-180	UR	Respublika Krym: Black Sea Coast group
EU-181	LZ	Bulgaria group
EU-182	UR	Odes'ka Obl: Black Sea Coast group
EU-183	YO	Romania group
EU-184	*OH8	Oulu Province group
EU-185	R6A-D	Krasnodarskiy Kray: Black Sea Coast group
EU-186	*TA	Turkey group
EU-187	*SV9	Crete's Coastal Islands
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OC-233	*VK7	Tasmania's Coastal Islands
OC-234	VK	Browse Island, Western Australia Outliers
OC-235/Pr	*DU8-9	Mindanao's Coastal Islands
SA-088/Pr	*PP5	Santa Catarina State South group

Pr = provisional * see text

RSGB IOTA Programme, PO Box 9, Potters Bar, Herts EN6 3RH

QRP

REV GEORGE DOBBS, G3RJV
St Aidan's Vicarage, 498 Manchester Road, Rochdale OL11 3HE.
E-mail: g3rjv@gqrp.com

A NOVICE operator, Bob Macdonald, 2E0ATZ, has recently shown what can be done with QRP. Working from Whitstable on the 10- 15 - and 30-metre bands with 5 watts (Ten Tec Argonaut 515 and Ten Tec Argosy II plus a simple home-brew vertical antenna) he reports DX QSOs as follows: KA1DDB (CW two-way QRP), WP2AIM (CW), K8RNQ (CW), LW2DLL (CW), RV6FF (CW), CU2IJ (CW two-way QRP), LU9FLX (CW), P43E (CW), KG4CNZ (CW), PT7BZ (SSB), 8R1AK (SSB), 4ZJGV (SSB), VE3XN (SSB) and a long list of other stations. Bob works mainly CW on 15m and 10m and SSB on 10m only. I would be pleased to hear of any other successful QRP Novice operation.

THE YEOVIL QRP CONVENTION

THIS POPULAR annual QRP event is now in its 17th Year. The convention is a good place to meet other QRP enthusiasts, buy items from component and QRP traders and enjoy a series of lectures. The date for next year's Convention is Sunday 22nd April 2001, preceded (as usual) by the Convention Dinner on the Saturday evening. The organisers like to issue a Constructional Challenge each year, and are looking for suitable suggestions for next year. If you have any ideas, or would like to issue a challenge and carry out the adjudication at the 2001 Convention, please contact Peter G3CQR, QTHR or via e-mail (petercqr@ukgateway.net).

HIGH TECH QRP KITS

SOMETIMES PEOPLE criticise QRP for being a technical backwater. Enthusiasts making claims for the number of QSOs they have won using a single BFY51 or yet another simple transceiver using the NE602 mixer. Certainly, great enjoyment can be had through the use of simple equipment, but there are QRP constructors building very serious amateur radio equipment. Some of them build their own equipment because they wish to exceed the specification of commercial transceivers. Some of those wishing to build more sophisticated equipment use the kits and modules supplied by Hands Electronics in Wales. Hands have just announced a new high performance HF band transceiver kit, the RTX-109.

The RTX-109 is a amateur-band SSB/CW transceiver with a direct digital synthesis VFO/display to 1Hz resolution. The VFO master uses the new AD9851 DDS clocked at 180MHz, with phase-locked narrow-band voltage-controlled oscillators, covering the 1.8 to 28MHz band allocations. The rig is available in a QRP 6-watt version or in a medium-power 20-watt version. Construction is in modular form to allow budget-building, beginning with a basic receiver and building up to a full transceiver.

Further details can be had from Hands Electronics, Tegryn, Llanfyrnach, SA35 0BL (www.rf-kits.demon.co.uk).

QRP OPERATING EVENTS THIS WINTER

Original QRP Contests

Organised by Hartmut Weber, DJ7ST, the twice-annual 'O QRP Contests' provide an opportunity for a genuine QRP contest.

Participants: Operators of original QRP rigs, commercial or homebrew, including commercial QRP rigs exceeding 5w output like QRP Plus, FT-7 and QRP versions of QRO-transceivers like TS-130V, FT-707S, etc. QRO equipment (>20 watts output) only temporarily turned down to QRP criteria is not allowed.

Date: The last weekend in December each year, Saturday 1500 UTC till Sunday 1500 UTC; rest period of 9 hours minimum in one or two parts.

Frequencies: CW segments of the 80, 40, and 20m bands. Call: CQ OQRP (Original QRP).

Categories: VLP (1W out or 2W in) QRP (5W out or 10W in) MP (20W out or 49W in).

Operation: Single-operator CW. Various transmitters and transceivers may be operated, but only one at any given time.

Exchange: RST, serial no / category eg 559001/VLP. No series reports, please.

QSO-Points: The log checker will count four points for a QSO with another contest station whose log has been submitted. All other QSOs count one point. The exchange of RST is sufficient with stations not in the contest.

Multiplier: The log checker will count two multiplier points for each DXCC country from a QSO with a station whose log has come in. Otherwise each DXCCC country counts one multiplier point per band.

Final score: Sum of QSO points multiplied by the sum of multiplier points (calculated by the log-checker; do not try your own calculation - you cannot foresee who will send logs).

Summary sheet: must show name, address, callsign and the minimum rest periods. Indicate the types of all equipment used with output or input power on each band, according to manufacturer or measured under contest conditions. Homebrew rig descriptions should name the PA-transistor or valve, and possibly a reference.

Logs: List QSOs sorted by band. Add the DXCC prefix if you claim a multiplier for a QSO.

Deadline: 31 January.

Entries to: Dr Hartmut Weber, DJ7ST, Schlesierweg 13, D-38228 Salzgitter.

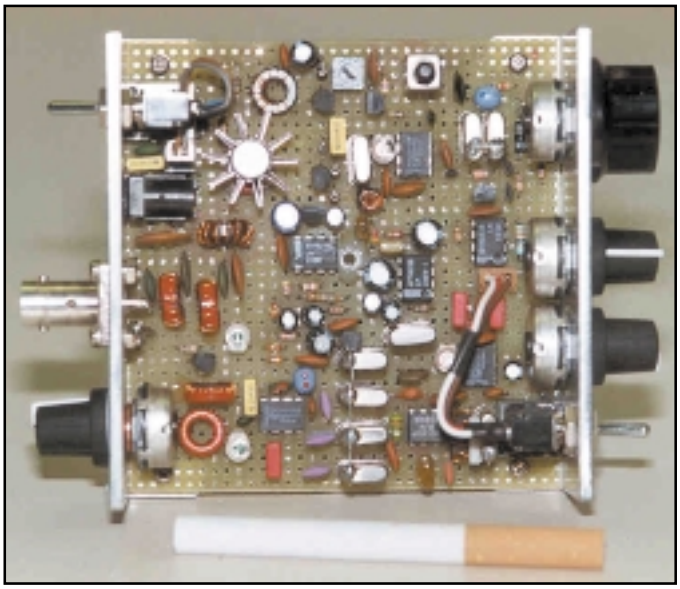
The G QRP Club Winter Sports

The G QRP Club 'Winter Sports' is one of the most popular QRP operating events. Each year between Boxing Day (26 December) and New Year's Day (1 January) the club invites any operators to join in a QRP 'QSO Party' using 5 watts of RF output or less. The operating takes place on and around the international QRP calling frequencies. These are:

CW: 1,843, 3,560, 7,030, 10,106, 14,060, 21,060 and 28060 kHz;
SSB: 3,690, 7,090, 14,285, 21,285 and 28,360 kHz.

The 'Winter Sports' is not a contest, although the G4DQP Trophy is awarded to the operator thought to have made the best overall contribution to the event. Consequently, '5NN BK' exchanges are not heard and participants often linger over interesting QSOs. It is usual for operators to exchange their G QRP Club membership number, if they have one.

The event does provide an opportunity for operators who do not usually use low power, to turn down their power to 5 watts or less and see what can be done. Those taking part are invited to submit logs and comments to the G QRP Club Communications Manager, Peter Barville, G3XJS, 40 Watchet Lane, Holmer Green, High Wycombe, Buckinghamshire HP15 6UG. The G4DQP Trophy is awarded to the station making the best overall contribution, which may not be the station with the most QSOs or working the most DX. So turn down the power and have a try at this popular event. It is one of the few times I have heard QRO stations complaining about QRM from QRP stations! ♦



Inside view of the NAXOS transceiver, a portable 20m CW unit designed and built by Andreas Seereiner, OE6EIF, and described in the autumn issue of the G QRP Club journal *SPRAT*.

SPACE

DENNIS KITCHEN, G0FCL
'Hazelbeech', 13 Lenwood Park, Northam, Bideford, Devon EX39 3PD.
E-mail: space.radcom@rsgb.org.uk

ANNUAL gatherings such as the AMSAT-UK Colloquium 'Space 2000', convened at the end of July, are extremely valuable. Delegates are updated on the latest events, the latest technology, exchange ideas and meet old friends, but above all it enables one to reflect on the philosophy behind future aims and current achievements.

A typical exchange of ideas: delegates at the AMSAT-UK Colloquium.

TOO EXCLUSIVE?

THERE IS A FEELING that the satellite group is rather elitist with deep pockets and exotic equipment, and definitely not a field for the newcomer to amateur radio! Nothing is further from the truth. Using the AMSAT-UK callsign, G0AUK, during the colloquium, Ray Soifer, W2RS and John Heath, G7HIA, made 17 QSOs, four of them trans-Atlantic, into eight countries whilst giving a demonstration to the beginner's lecture stream. The equipment was a dual-band FM hand-held producing 5 watts into an Arrow antenna - all hand-held, hardly exotic, even if good equipment! Ray Soifer, by the way, is Vice-President, International Affairs, of AMSAT North America, and is well known for his Moonbounce work. (The moon is often called Oscar Zero). Ray obviously likes the two extremes of operation, QRP and QRO. John is a founder member of the Midlands Area AMSAT VHF net and Hon Sec of the fairly-recently-formed National Space Centre Amateur Radio Society in Leicester.

Another area of satellite activity, which gives a great deal of pleasure and doesn't cost the earth is, of course, the world of weather satellites. A receiver kit with a five-star rating can be obtained from the Remote Imaging Group for around £50, add a homebrew antenna such as a quadrifilar helix or crossed-dipoles, and a computer to process the signals, and your station is complete. The receiver scans and locks to a signal so predicting orbits is not essential, though rather convenient. You will find that your geography will improve by leaps and bounds. Also it is great fun to give an alternative, even more accurate, forecast than the weather centre on occasions. Adding false colour to enhance the processed data is yet another aspect of the activity - to be honest a little frustrating until you get more skilful.

PHASE 3-D

THIS SPACECRAFT should be in orbit (if not yet available for general amateur use) by the time this is published. As a best estimate, the launch is scheduled for 31 October and launch preparations should start on 11 September if this proves to be correct. Arianespace has promised to maintain its launch programme in spite of late completion of some commercial satellites causing problems. Phase 3-D, with its good power budget, should improve the ease of access to satellites using simple portable equipment. A far cry from two amateurs in North Devon who worked each other mobile via Oscar 13 even though they were only a mile apart on the ground - they did it, as many others have since. The challenge with the new satellite will be the increased use of microwaves. The continuing pressure on amateur frequency bands means that we migrate to the higher frequencies or lose them for ever. Don't throw away those dishes for analogue satellite television when you go digital. With its elliptical orbit, a minimum of steering should be necessary for accessing the satellite.

As a mark of respect, remembrance and acknowledgment of the sterling work carried out by Werner Haas on the Phase 3-D project, the callsign of DP0WH has been allocated to Phase 3-D. However, it will be rarely used because of the international nature of the whole 3-D programme. It is a very nice gesture, nevertheless.

ISS DEVELOPMENTS

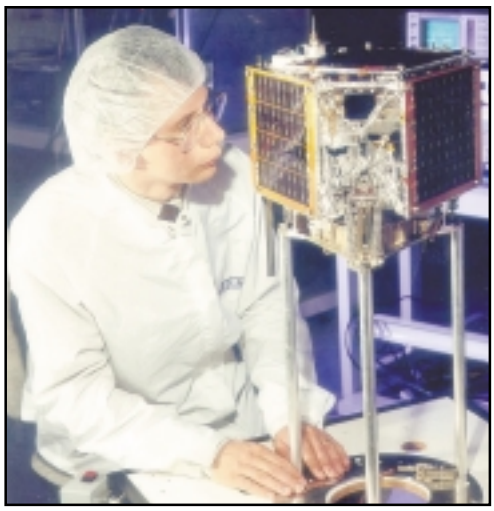
WORK ON the International Space Station carries on in spite of some slippage in the programme. At the time of writing, the space shuttle *Atlantis* is docked with the three modules of the ISS. *Atlantis* carried a seven-man crew and the equipment for the initial amateur radio station. They managed to utilise a very short two-and-a-half minute launch window to have a smooth ride out to the space station. The initial station equipment will be temporarily installed in the cargo-block module and will use a 2-metre antenna (already fitted) to support FM voice and packet operation. It will be moved into the service module to a more permanent home in 2001. VHF and UHF antennas will also be installed, and it is planned to support fast- and slow-scan TV, a digipeater and relay stations. Frequencies and operating schedules will be announced well in advance of use. The first space station crew should arrive in late October 2000. It should be noted that the United States has provided hand-held equipment for 2m and 70cm, Russia has provided ports to enable antennas to be mounted externally to the service module, an Italian team has designed and built the antennas, whilst a German team has provided sophisticated repeater stations.

A mission to the ISS in May should mark the end of the first construction phase. The ISS crew will then be able to carry out space walks to effect any necessary repairs. Until that time, the only way that they can perform space walks is via the airlock of the space shuttle, should that be in position.

A Russian callsign, RZ3DZR, and a German callsign, DL0ISS, have already been issued for the space station, and an application will be made for a United States callsign. More information from www.spacedaily.com/news/iss-00zzb.html and http://ariss.gsfc.nasa.gov

UK ACTIVITIES

THESE ARE certainly exciting times for space-related activities. Although the UK input to the space station appears a little muted at the moment, Surrey Satellite Technology Ltd is carrying the space flag. They have been awarded a £11m contract for the Disaster Monitoring Constellation, (DMC) of earth observation satellites, the Gemini geostationary communications mini-satellite and the Topsat high-resolution micro-satellite for military earth imaging. The news followed the successful launch of Surrey's two latest satellites, Tsinghua-1, a micro-satellite for China and SNAP-1 the world's most advanced 'nano-satellite'. SNAP-1 is designed to demonstrate the feasibility of the remotely-controlled rendezvous of satellites in space, whilst Tsinghua is a demonstrator for the disaster monitoring constellation. ♦



SNAP-1 and Dr Craig Underwood, pictured at SSTL. (Photo: SSTL)

μWAVE

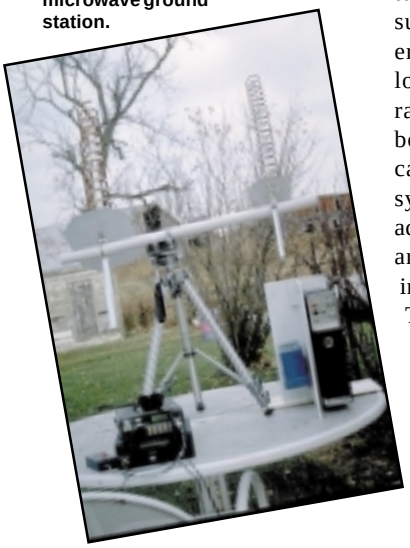
SIMON LEWIS, GM4PLM

Creoch Farm, Ochiltree, Ayrshire KA18 2QH.
E-mail: uwave.radcom@rsgb.org.uk

IT HAS BEEN a busy period at home since the last column, as we are still settling into our new home in Ayrshire (I never want to see another roll of wallpaper!), but things have been set back a little as a period of serious illness knocked me off my feet for a while. This also meant that I have been very late in replying to some people's mail and actioning some requests. If you have not yet received a reply, please e-mail me and remind me.

Winter is fast approaching and this is generally the time the mind starts wandering to the thoughts of winter projects and next year's operations. This year will be no different I am sure, but with Phase 3-D due to be launched by the time you read this, the choice of projects will be a little wider. Phase 3-D will give microwavers the opportunity for the first time to operate microwaves on a global scale. Using small antennas and low power, contacts across the globe will be possible. It's an exciting opportunity for microwavers to make a big impact in amateur radio. Make the most of it, as it will allow us to publicise our activities for the first time on such a large scale. The ground station requirements are very modest and most of us already own the equipment needed. I look forward to hearing plenty of familiar callsigns on the new bird. See you there!

A typical AMSAT Phase 3-D microwave ground station.

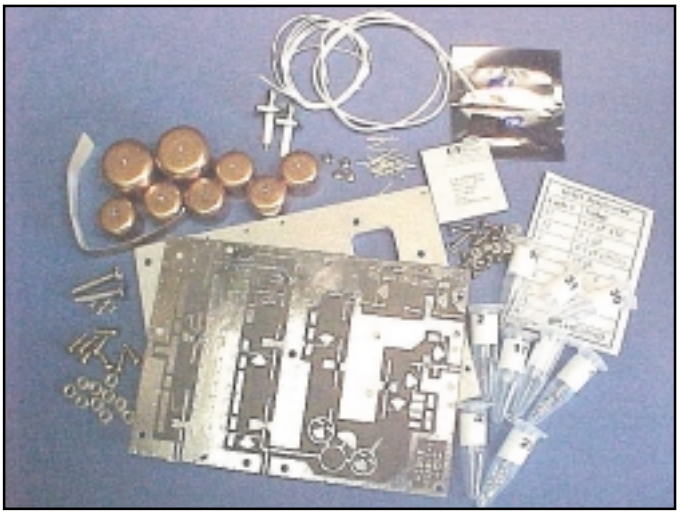


EQUIPMENT REVIEW

STEVE FROM Down East Microwave sent me news of its latest products. The new DEM 10GHz transverter is available as a kit (DEM 10368-144) or as an assembled and tested unit. The assembled unit is a complete transverter ready to be interfaced with a low-power 2m transceiver. The unit was a joint design effort by that well-known US microwaver Paul Wade,W1GHZ (N1BWT), and Steve at DEM. The design work was published in the 1999 NEWS VHF conference proceedings and in the *1999 Microwave Proceedings*. Many new approaches have been taken in the design, starting with the local oscillator (MICROLO), a redesigned version of the 1152 Weak Signal Source board.

The transverter PC board utilises MMICs in every gain stage, including a new GaAs MMIC (Fujitsu FMM5701LG) that is used in the receiver section front end. The DEM Transverter Control (DEM TC) is a new interface that is installed in every DEM transverter from 2.3GHz upwards. It was designed to replace the DEM PIN (or PIN KIT) PIN switch attenuator. This new design now incorporates many new features with the standard functions of the DEM PIN, and is highly suitable for inclusion in any homebrew transverter, and probably many other applications as well.

The board offers all the features of the original interface, such as common- or split-IF operation, with PTT either high or low for keying. It still incorporates adjustable attenuators for both transmit and receive and can be connected to a two-mixer system. It still has options for additional receive gain if required and will perform all DC switching functions for the transverter. The new interface features include a 10-watt attenuator and an RF relay that replaces the PIN diode switch network. The relay offers better IF isolation and is not frequency-sensitive allowing any frequency IF to be used without changing components. Another feature included on the new interface is a 1.5A, 9V regulator and a 24V relay driver for SMA relays. For the latest pricing and ordering information, see www.downeastmicrowave.com and please mention the 'Microwave Column' when ordering. There are also club and bulk discounts available. See the web site for further details.



DEM 3cm transverter kit (see 'Equipment Review').

OPERATING NEWS

AN INTERESTING letter received from Adalbert, DJ3KM, and Dieter, DJ4AM, brings news of a new 3cm world record QSO over 2,079km. It took place at 1651 UTC on 25 June between Lampedusa Island (JM65HM) and Netanya in Israel (KM72KH). Operating as IG9/DJ3KM and 4X/DJ4AM, the pair made a CW QSO for more than an hour over the path, the CW signals peaking at S2. Equipment at both ends comprised DL1RQ transverters, 5W PAs and 60cm dishes. 70cm IFs using FT-790s were used for the QSO. Netanya is located approximately 30km north of Tel Aviv. They broke the previous world record of 30 December 1994, held by VK6KZ and VK5NY who completed a contact across a sea path for a distance of 1,912km. I have asked Dieter for some more information on this DXpedition and hopefully he will have pictures of this fine QSO and equipment. Well done both - an outstanding achievement.

ADASTRAL PARK ROUNDTABLE

THE NEXT Adastral Park Microwave Roundtable is planned for Sunday 12 November. As last year, a Saturday evening get-together is also planned, but details are not yet finalised. The event *may* start on the Saturday afternoon, subject to BT management approval and given enough help from G4MRS club members to run the test facilities.

This year's event will be 'owned' by John, G3XDY, since Sam, G4DDK, will no longer be employed by BT after September. However, John has persuaded Sam to do the Sunday organising again this year. The initial programme is beginning to take shape with the possibility that a familiar North American face may be paying a return visit. If this can be arranged, you are in for a treat when he does his antenna testing talk. The other speakers haven't all said "yes" yet! All the usual facilities will be there, and maybe some new ones; all will be revealed later. We intend to celebrate the new Millennium in style! For further information please contact either John, G3XDY, or Sam, G4DDK – both QTHR.

NEW ADDRESS

PLEASE NOTE that all correspondence should now be sent to me at the addresses given at the beginning of this column. My telephone number is 01290 700 008. An alternative e-mail address is gm4plm@emn.org.uk and my web site is www.emn.org.uk ♦

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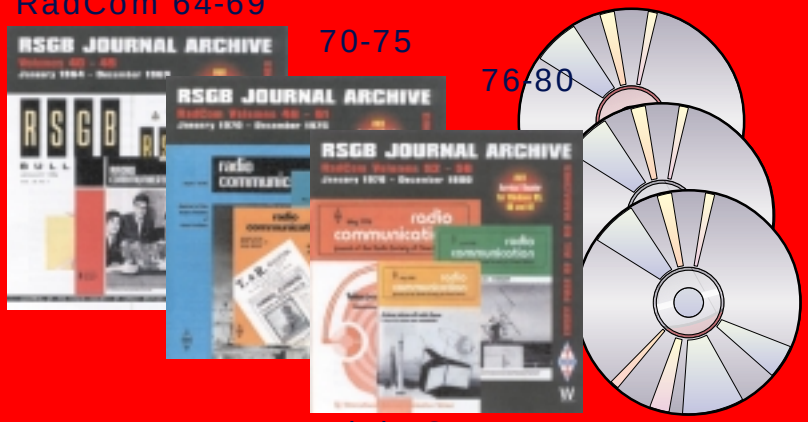

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the last Word

Wanted: Work Abroad

About 25 years ago, before leaving school, I had already passed the RAE and Morse test. I have used more of the knowledge needed to pass the RAE than that of any other course I have attended. I spent almost 10 years as an Electrical Technician doing small-scale electrical installation and maintenance work for a college, so can do all general domestic and small-scale industrial electrician's work. I passed an ONC in Electrical Engineering. My HNC was in Electrical Power Generation and Distribution.

For the next 10 years I worked at the Foreign Office, installing many hundreds of HF SSB and VHF / UHF FM transceivers into vehicles and buildings. I climbed doubtful ladders and went on suspect roofs fitting aerials. Repairs to older sets (where crystals determined the frequency) were generally possible but newer 'cloned' sets were repaired by swapping costly boards. I also worked at the FCO HF transmitting station.

A 'retired' colleague went to a third-world country to maintain the older radio equipment used by their police force. This would be an ideal job for me, especially as my knowledge is now dated and the job is similar to that I have done before.

At the Radiocommunications Agency I allocated microwave frequencies by inputting company applications on to computer. I also used VHF coverage prediction software.

I have been out of paid technical work recently, having completed the first year of a degree in Third World Development, and the first year of a nursing course. Aged 40, I now want to go abroad, possibly with one of the church or humanitarian agencies, but nothing is ruled out. I might go out as an unpaid volunteer even paying my own fare, as I am not too worried about home comforts and money. Work I would enjoy includes fitting solar cells, building windmills, wiring a school or hospital, digging wells, teaching electrics, English or maths, building shelters, providing sanitation, but nothing is ruled out. I can word process and deal with administration.

So if anyone has any ideas that might help, please let me know!

David Ludlow, G4ETX,
30 Lichfield Down, Walnut Tree,
Milton Keynes MK7 7BX.

Plain Language

I have been trying to introduce a colleague of mine to amateur radio. We work together and use radio a lot in our daily routine; everything from MF to satellite, using several modes. To try to help him, we had a long chat, and I lent him a couple of copies of *RadCom*, so he could see what equipment was available, and what the hobby could include. His first remarks, having read the magazines, were that half the material was excellent. The technical information pages were highly relevant and most interesting. He liked the idea that you could design and build your own equipment and use it on air. It also contained propagation predictions and repeater information. Fantastic.

On the other hand, he did remark that half the magazine was written in some sort of code which was most irritating. When I asked what he meant, he quoted a few lines from some of the band reports. For example: "Philip Lancaster, G0ISW, is QRV mobile on 5 August . . ." and "Paulo Gomes, CT1FOH (IN50), made 58 QSOs in the Es event... with stations in DL, F, OK, ON, PA, S5 and 9A."

There must be very few of us who are able to memorise the callsign prefixes for the whole world. This type of shorthand makes it necessary to have a locator map, prefix list and Q-code translator to hand to understand the text. When referring to a country, why not print its name? The same applies to people; I am a person, not just a callsign. I enjoy *RadCom* and find it very absorbing, but couldn't a high quality publication like yours print its content in plain English?

Unfortunately, I do not believe I have convinced my colleague that amateur radio is a worthwhile hobby. It's a shame, really, because he would have been good at it, and has much to offer the hobby, and he has a fabulous property to operate from. He is of the opinion (as now am I) that the strange language is extremely off-putting. Every subject attracts a certain amount of jargon. But in an English speaking country, where an English magazine claims to promote standards in communication, the obsessive use of jargon makes the hobby look rather weird.

When I told him that you still need a Morse code qualification to use any frequency below 30MHz, he began to laugh, muttered something about it being the 21st century, and is probably still laughing now. Oh well, I did my best.

David Earle, G7GOP

Memories of Bhutan

On page 15 of the August *RadCom* there is a minor mistake in the article 'Amateur Radio Comes to the Kingdom of Bhutan', by Jim Smith A52JS/VK9NS. VU2BK was not the station at the time of this particular contact - the station was myself, Zal, VU2DK. VU2BK is Kab, mostly a strict CW operator, and he happens to be my father!

Kab, VU2BK, was one of the DXpedition team for the very first Amateur Radio Society of India sponsored operation to Bhutan, way back in April 1962. The callsign was VU2US/AC5 and the expedition members were VU2US (sadly now a silent key), VU2BK, VU2PS and VU2TN. The expedition took place from Yembola at 4000ft and 20 miles south of Tashigang Dzong. The modes used were AM and CW and all contacts were given a special serial number to avoid bogus QSOs. Approximately 1050 QSOs were made. Kab was the QSL manager and still holds the official log book.

The equipment used was WWII surplus to a triband quad which fell down in storms and had to be reconstructed. The output power was in the region of 75 - 100 watts.

This expedition may not seem much by modern day standards, but in 1962 it certainly was a massive operation. Many old-timer Gs will remember having worked VU2US/AC5 and many were instrumental in helping out in some way or other.

I wonder if Tuji Yonten, A51TY, was around in those years?

Zal Kabraji, VU2DK

Construction Correction

Having just finished constructing the 5 watt 18MHz CW transmitter from the article in the August 2000 *RadCom*, I found that it worked well on keying, but the switch in the 'Tune' position did not activate the VXO.

In my ignorance, it took me a while to find out that the output from IC3a is tag 1 and should be connected to tag 14. This, should, I feel, have by now been picked up and a correction issued in a later *RadCom*.

Eric Gell, G3JTO

Operating Standards

In reply to the letter about disgusting behaviour (*The Last Word* October 2000), I quite often listen to the net on 40m that I think M5SSB is referring to. If he took the time to listen over a long period of time, I'm sure he would change his tune.

If anyone is getting a tongue lashing from anyone on the net, it is usually amongst themselves. If anyone has a problem, they only have to call into the net for good advice (but they don't suffer fools lightly). If M5SSB wants to complain about anyone, he should have a listen to those that continually try to disrupt the net by calling over, playing music and using foul language.

I know a lot of people who would sooner listen to the net than the Archers or any other radio programme.

Bill Jepson, MW0BLU

. . . In response to *The Last Word* October 2000 and M5SSB's letter 'Disgusting Behaviour', I have to say I agree with him.

I can reveal that the Amateur Radio Observation Service (AROS) is monitoring nets on 40m and 80m and I invite infringers of licence conditions to refer to the news story on page 9 of the same issue, 'Essex Man Convicted', and the consequences if caught.

AROS and the RSGB work closely with the RA to rid band occupancy of stations regularly and deliberately operating outside their licence conditions.

Unfortunately, we have no magic wands, although correspondence I receive indicates a feeling that all we have to do is to DF and close down the infringers. I wish!

RSGB AROS Co-ordinator
PO Box 113, Potters Bar, Herts.

. . . As I stand in the pub trying to get the bar-person's attention, someone stands between us and whistles loudly, making conversation impossible, then they start shouting "Olagh", "Ooolaagh" for a few more minutes. This scenario is totally unacceptable in real life, so why do licensed radio amateurs do it just because they cannot see the two people talking 'on air'?

Dave Reeves, G0MVX

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BUSINESS CARD SECTION

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The publishers make no representation, express or implied, that equipment advertised conforms with any legal requirements of the Electro Magnetic Compatiblility Regulations 1992.

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Advertisement Index

Next Advertisement Copy Date:

Display advertisement copy date for December is 22 October

RADIO SOCIETY OF GREAT BRITAIN

(A Company Limited by Guarantee. Registered in England No 216431)

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

Annual Meeting

Annual General Meeting

NOTICE IS HEREBY GIVEN that the 74th Annual General Meeting of the Radio Society of Great Britain will be held at the Harrogate Ladies' College, Harrogate, Yorkshire, on Saturday 2 December 2000 at 11.00am for the transaction of the undermentioned business:

Agenda

1 To receive and, if approved, confirm the minutes of the 73rd Annual Meeting circulated to all members with the December 2000 edition of *RadCom*. (Resolution 1)

2 To receive and consider the accounts for the year ending 30 June 2000 and the reports of the Council and auditors thereon.

3 To announce the names of members to serve on the Council for the year 2001.

4 To call for volunteer scrutineers for the 2001 Council Election.

5 To reappoint the auditors KPMG and to authorise Council to fix their remuneration. (Resolution 2)

Notes

(1) Members are asked to attend no later than 10.45am. Doors will open at 10.00am. Refreshments will be available.

(b) A Society bookstall will be open from 10.00am - 2.30pm.

(c) The Society will make available for sale an audio tape recording of the proceedings. The use of video recording equipment will not be permitted at the meeting.

(d) Members entitled to attend and vote at the meeting may appoint a proxy to attend and, on a poll, vote on his or her behalf. The proxy need not be a member of the Society , but is not allowed to speak at the meeting other than to join in the demand for a poll.

By Order of Council – P A Kirby, Company Secretary
1 October 2000

Extraordinary General Meeting

NOTICE IS HEREBY GIVEN that at 11.30am (or immediately after the conclusion of the Annual General Meeting) on Saturday 2 December 2000 at the Harrogate Ladies' College, Harrogate, an Extraordinary General Meeting of the above company will be held at the same place when the following will be proposed as special resolutions.

Special Resolution 1

That the Memorandum of Association of the Company be altered in the following manner:

The deletion of the existing clause (11) (c) and the insertion of the new clause (11) (c).

"To Purchase, take on lease, or otherwise acquire, and also let, lease, or to dispose of any premises or other property for the purposes of the Society." (Special Resolution 1)

Special Resolution 2

That the Articles of Association of the company be deleted in their entirety and that new Articles of Association and related Bylaws, as initialled by the Chairman and attached to the notice of the meeting be adopted in place thereof. (Special Resolution 2)

Statement of Council
See page iii of *RadCom*.

On completion of the EGM

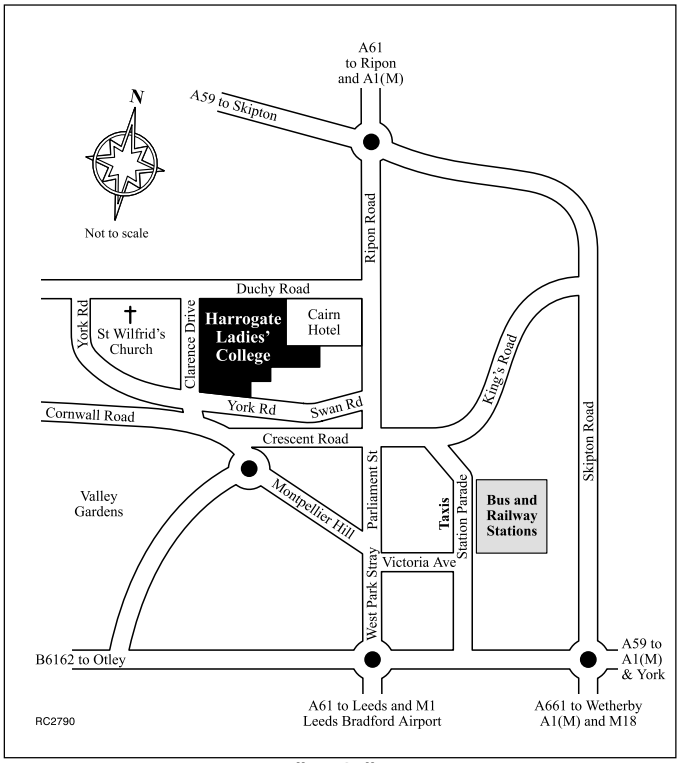
1 Presentation of Awards
2 President's address

A buffet lunch will be available at 1.00pm.

Open Forum

The Open Forum will commence at 2.30pm and end at 4.30pm. Items for discussion at the Forum will include:

1 The New Regional Organisation
2 Amateur Radio licensing in the UK pre- and post-WRC2003.



Harrogate Ladies' College, Harrogate

Radio Society of Great Britain

RADIO SOCIETY
OF GREAT BRITAIN

(A Company Limited by Guarantee. Registered in England No 216431)

LAMBDA HOUSE, CRANBORNE ROAD,
POTTERS BAR, HERTS EN6 3JE

Election of Council for 2001 - 2003

(Only paid-up corporate members are entitled to vote)

The Ballot Paper (printed on page e of this supplement) contains the names of the nominees for the vacancy for the ZONAL MEMBER OF COUNCIL in Zone E. No nominations were received for the vacancy in Zone C.

Election for Council for 2001 – 2003

PATRICK ALLELY, GW3KJW (DOB 07.02.37)

(CANDIDATE FOR ELECTION AS MEMBER FOR ZONE E)

CURRICULUM VITAE: I have been licensed since 1955, and since then, work permitting, I have been active on bands from 160 metres to 70cm. My main interest is, and always has been, chasing DX on the bands, which I have used either on SSB or on my preferred mode of CW. I have been a GB2RS Newsreader for 18 years, teach the RAE at my local night school and am the current RLO for South Gwynedd. I am a member of my local Radio Society and a life member of the Royal Signals Amateur Radio Society.

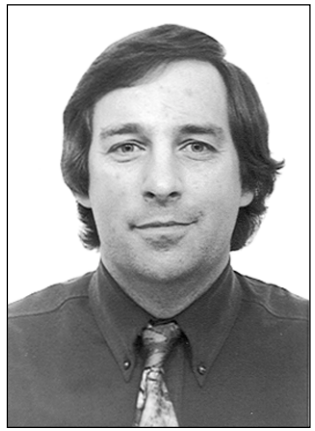
PERSONAL STATEMENT: If elected I will try to improve the perceived old-fashioned image of Amateur Radio, to show the hobby in this digital age as a modern enjoyable way to communicate with fellow enthusiasts around the world. I would not only target the young person, who has many other competing interests, but I would try to involve the more elderly who have the time, finances and often experience to be able to participate in what is one of the more addictive hobbies.

Nominated By	Town	Known for (yrs)	Amateur Radio Positions Held
Max L Heron, MW1KDP	Barmouth	20	Vice Chairman Merion Radio Society.
Roger Johnson, GW4UJT	Trawsfynydd	13	
E LL Jones, MW0AEV	Pwllheli	5	
Endae Buckley, MW1BQO	Penrhyndeudraeth	5	Secretary of the Porthmadog & DARS, Committee member of the Arfon RPT Group.
D E Jones, MW1CWX	Porthmadog	4	Chairman of Porthmadog and District Amateur Radio Society for past two years and committee member for three years.
J F Roberts, GW3RBM	Mold	30	RLO Clwyd 1997 – three years.
Alan J Plumbley, GW0SZB	Nefyn	8	
Ralph C Taylor, GW2HCJ	Penrhydeudraeth	20	Past Chairman Porthmadog and District Radio Club, Past Chairman Merion Amateur Radio Society.
A Ellis, GW2HFR	Pwllheli	20	
Dewi Edward Roberts, GW0ABL	Llanfairpwll	12	Regional Liaison Officer N Gwynedd & Isle of Anglesey. Past senior Novice instructor for Gwynedd (Old County). Past Chairman of Dragon Amateur Radio Club. Corporate member of RSGB (approx 16 years).

Election for Council for 2001 – 2003

SIMON LLOYD HUGHES, GW0NVN (DOB 06.11.58)

(CANDIDATE FOR ELECTION AS MEMBER FOR ZONE E)



CURRICULUM VITAE: Obtained GW8NVN as a teenager. Current callsigns GW0NVN and N1XIH. Life member RSGB, member EMC Committee, Deputy Emergency Radio Liaison Officer. Interested in all aspects of Amateur Radio. I build much of my own equipment and am a Novice instructor for the Polish Scouting Movement. My work allows visits to clubs throughout the UK, giving talks when requested. I make donations to radio groups and pay for magazine subscriptions to public libraries. Founder member SE Wales Raynet, committee member S Glamorgan Raynet, advisor to user services. Professional work is with the contractual, regulatory and customer service side of radio communications.

PERSONAL STATEMENT: I hope to: encourage public and community service by amateurs to justify and protect the radio spectrum allocated to the amateur services; encourage philanthropy to improve the image and promote amateur radio to the wider public; encourage the 'can do, will do' attitude prevalent in other countries to make the licence more relevant to the 21st century; give advice on self-help solutions to funding projects, eg repeaters; encourage use of e-mail to speed response time to members' enquiries and Council / Committee decisions, providing members with a more professional, accountable and inclusive service; continue to visit UK and overseas clubs.

Nominated By	Town	Known for (yrs)	Amateur Radio Positions Held
BCT Neathey, GW0DPM	Vale of Glamorgan	18	Barry ARC, Treasurer, QSL Manager & Committee member. S Glamorgan Raynet Group committee member.
J P Cleak, GW4JBQ	Llantarnam	20	
S Williams, GW4OGO	Caldicot	5	Chairman of Newport ARS
N Halford, GW3UNH	Newport	5	
Chris Plaisher, MW1CTP	Newport	4	
Glyn Jones, GW0ANA	Cowbridge	20+	Chairman Barry ARS, RLO for South Glamorgan.
Jonathan D Eastment, GW4LXO	Rhiwbina	27	Committee member of Barry ARS, Secretary, RSGB Propagation Studies committee. Joint organiser RAL Microwave 'Round Tables'. Member, Sheppy Western Contest Group. Member, Square Bashers Expedition Group. Member, Red Dragon Contest Group. Joint recipient, RSGB Fraser Shepard Prize/Award. Member, ARRL (since 1994) and RSGB (since 1977). Holder of US amateur extra license, AA1RG. Holder of UK licence (GW8NBK, GW4LXO) since 1976. Member, Rutherford Appleton Laboratory ARS.
J Woodland, GW4KHQ	Efail Isaf	20	
E P Essery, GW3KFE	Newtown	4	Council Member Zone E. Member MLC. Chairman of Bishops Stortford ARS.
M J Adcock, GW8CMU	Barry	22	Controller of South Glamorgan Raynet. RLO South Glamorgan. Chairman of Barry ARS. Chairman of RSGB VHF Committee.

RADIO SOCIETY OF GREAT BRITAIN

(A Company Limited by Guarantee. Registered in England No 216431)

LAMBDA HOUSE, CRANBORNE ROAD, POTTERS BAR, HERTS EN6 3JE

Election of Council For 2000-2002

(Only paid-up corporate members are entitled to vote)

The ballot paper below contains the names of the candidates for the vacancy, in **ZONE F**. Note that the candidates for Ordinary Members have been elected unopposed. The candidates are listed in order of receipt of their nomination paper.

Please note:-

a) For the election of the Zonal Member each corporate member shall place a **CROSS** in the space provided against the name of **ONE** candidate. Only corporate members resident in **ZONE F** may vote in the election in this zone.

b) Each corporate member voting must write his/her name and callsign, RS or membership number legibly on the back of the envelope for this ballot paper to be valid.

c) Ballot papers must reach RSGB HQ by 12 noon on Friday **26 NOVEMBER 1999**.

P A Kirby, G0TWW
Company Secretary

ORDINARY MEMBERS

Bob Whelan, G3PJT

Gordon Adams, G3LEQ

Geoff Dover, G4AFJ

have been elected unopposed

Ballot paper

Zonal Member

Zone F

(All of Northern Ireland)

(a) Peter Maile, GI0BME		(b) Jeff Smith, MI0AEX	

Cut along the dotted line

Back of Election Form

RADIO SOCIETY OF GREAT BRITAIN

(A Company Limited by Guarantee. Registered in England No 216431)

Proxy For Use At RSGB Annual and Extraordinary General Meeting

I,* ..... Call/RS .....

of .....

a member of the above named Society hereby appoint

..... Call/RS .....

of .....

or failing him/her ..... Call/RS .....

of .....

*** Full name and address to be inserted in block capitals.**

as my proxy to vote for me on my behalf at the Annual General Meeting and Extraordinary General Meeting of the Society to be held on Saturday 4 December 1999 and at any adjournment thereof as indicated below.

In the event of no proxy being named or of your nominated proxies failing to attend the Annual General Meeting the proxy will automatically revert to the chair of the meeting.

Please indicate with an 'X' how you wish your vote to be cast; otherwise the Proxy will abstain or vote at his or her discretion.

ANNUAL GENERAL MEETING	FOR	AGAINST
RESOLUTION 1 To receive and, if approved, confirm the minutes of the 72nd Annual General Meeting as circulated to all members with the December 1999 *RadCom*.		
RESOLUTION 2 To re-appoint the auditors KPMG and to authorise Council to fix their remuneration.		

EXTRAORDINARY GENERAL MEETING	FOR	AGAINST
SPECIAL RESOLUTION To re-number Article 65 to be Article 65a, and to add new Article 65b, as shown in the accompanying notes.		

Signature ..... Dated 1999

NOTES

1 Members may appoint any member OR non member as their proxy holder. However the following are willing to act as proxies:
The President M H Claytonsmith, G4JKS, 2 Falcon Drive, Hartford, Huntingdon PE18 7LP
The Executive Vice President D F Beattie, G3OZF, Mayerin, Church Way, Stone, Aylesbury, Bucks HP17 8RG
The Company Secretary P A Kirby, G0TWW, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE

2 The proxy form must be signed by either the fully paid up corporate member or by his or her attorney duly authorised in writing.

3 Articles 37 to 49 inclusive refer to proxy votes and the calling of a poll.

4 In order to be valid this form MUST reach the Society's registered office not later than 2.00pm on Thursday 25 November 1999. It may be sent in the envelope provided for the 2000 - 2002 Council Election vote.

Cut along the dotted line

Back of Proxy Form

THE COMPANIES ACT 1985

COMPANY LIMITED BY GUARANTEE

MEMORANDUM OF ASSOCIATION, ARTICLES OF ASSOCIATION AND BYLAWS OF THE RADIO SOCIETY OF GREAT BRITAIN

(name of company altered from “The Incorporated Radio Society of Great Britain” by Special Resolution dated the 18th day of December 1953)

Statement of Council on the EGM Resolutions

The RSGB is a Company limited by guarantee. As such, its affairs are, to a considerable degree, regulated by the UK Companies Acts and the Society's Memorandum & Articles of Association. Council also defines from time to time the more detailed processes for internal management of the Society, and these are set out in the *Green Book* as amended from time to time by Council (which, in Companies Acts terms is the statutory Board of the Society). New members of the Society are sent all these documents on joining.

As members will know from articles earlier this year in *RadCom*, Council is recommending that changes be made to the structure of the Society with the objectives of:

- creating a Regional organisation more able to take an active role to stimulate Society and amateur radio activity in the Regions, and support local radio clubs
- creating a smaller Board, with its members carrying specific responsibilities for coordination and leadership in specific areas of the Society's work.
- providing for the President to serve normally for a two year term (currently normally one, but allowable up to five years)
- introducing a three year break between the maximum six year terms for which a Council (Board) member may serve. Currently this break is one year. Note that if elected President, the total service allowable is increased by the two years of Presidential office.

To give effect to these plans, changes are needed in the Society's Memorandum & Articles of Association and in the *Green Book*. At the same time, the opportunity has been taken to rationalise these by removing unnecessary duplication, and ensuring that the Memorandum & Articles of Association contain only those matters which are so required under the Companies Acts. Other issues relating to the conduct of the Society's affairs have been placed in a new document, replacing the *Green Book*, which will be the "Bylaws" of the Society. The Memorandum & Articles of Association may only be changed in the future with the agreement of Members meeting in General Meeting. The Bylaws may be changed by a decision of the Board, just as the *Green Book* may currently be changed.

The Memorandum, as is normal, is unchanged except for the removal of reference to a now defunct piece of UK legislation.

The Articles of Association and the Bylaws (previously the *Green Book*) have been substantially revised, the main changes being those above, together with the introduction of provisions, should a member so wish, to receive notice of formal meetings electronically, and also to introduce electronic communication as a means of holding Board meetings. This latter is in the interests of both speed and cost. Other changes have been made generally for reasons of clarity or technical accuracy.

The resolutions are therefore:

"To delete the present clause (11) (c) of the Memorandum of Association and insert a new clause (11) (c) therein."

"To adopt the new Articles of Association and Bylaws."

Council strongly believes that the proposals are in the very best interests of the Society, and that they will result in a more effective and efficient governance structure for the Society into the future.

THE COMPANIES ACT 1985

COMPANY LIMITED BY GUARANTEE

MEMORANDUM OF ASSOCIATION OF RADIO SOCIETY OF GREAT BRITAIN

(name of company altered from "The Incorporated Radio Society of Great Britain" by Special Resolution dated the 18th day of December 1953)

1 The name of the Company (hereinafter called "The Society") is "RADIO SOCIETY OF GREAT BRITAIN".

2 The registered office of the Society will be situate in England.

3 The objects for which the Society is established are:

(a) To succeed to and take over such of the property, rights and obligations of the existing Radio Society of Great Britain as may lawfully be acquired and taken over by the Society.

(b) To promote the general advancement of the science and practice of Radio Communication or other subjects allied thereto, and to facilitate the exchange of information and ideas on these subjects among its members and to obtain the maximum liberty of action consistent with safeguarding the interests of all concerned, and for this purpose:

(1) To hold Meetings of the Society for reading and discussing communications bearing upon Radio Science or the application thereof or upon subjects relating thereto;

(2) To hold or promote Exhibitions of instruments, apparatus or other appliances connected with Radio Science or its applications;

(3) To print, publish, sell, lend or distribute the proceedings or reports of the Society or any papers, communications, works, or treatises on the Amateur Service, Radio Science, or its applications, or subjects connected therewith in the English or any foreign tongue or any abstracts or translations thereof or extracts therefrom;

(4) To take charge of the books, pamphlets, publications, manuscripts or instruments at present in the possession of the Radio Society of Great Britain, and to observe and perform the Trusts of any deed affecting the same or any of them, or to form any additional library of books, works, manuscripts on Radio Communication or the application thereof or other subjects allied thereto;

(5) To borrow or raise money as the Society may think fit;

(6) To make grants of money, books, medals, apparatus or otherwise for the purpose of promoting invention and research in Radio Communication or its applications or in subjects connected therewith;

(7) To form Sections of its members united in pursuit of some common interest;

(8) To affiliate with itself British, European and any other societies world-wide, interested in Radio Communication or other subjects allied thereto;

(9) To purchase, for the purpose of resale, components, papers, books, apparatus and other items relating to radio communication and subjects allied thereto;

(10) To act under agreement on behalf of government agencies for the purpose of issuing licences and variations thereto;

(11) To develop and conduct examinations for the purpose of the furtherance of knowledge in the Amateur Service;

(c) To purchase, take on lease, or otherwise acquire, and also let, lease, or to dispose of any premises or other property for the purposes of the Society

(d) Subject to the rules of law affecting champerty and maintenance, to raise and administer funds for the purpose of protecting and indemnifying members of the Society from and against unfounded claims and to take steps to defeat such claims, and for the purpose of affording to its members legal advice and assistance in connection with their wireless experiments;

(e) To consider, originate and support improvements in the law which may seem directly or indirectly conducive to any of the Society's objects, and to resist and oppose alterations therein which may seem to the Society directly or indirectly adverse to the interests of the Society or its members or any section thereof;

(f) The doing all such other lawful things the Society may think fit.

Provided that the Society shall not support with its funds any object or endeavour to impose on or procure to be observed by its members or others any regulation, restriction or condition which if an object of the Society would make it a Trade Union.

Provided also that in case the Society shall take or hold any property subject to the jurisdiction of the Charity Commissioners for England and Wales or Board of Education, the Society shall not sell, mortgage, charge or lease the same without such authority, approval or consent as may be required by law, and as regards any such property the Managers or Trustees of the Society shall be chargeable for such property as may come into their hands, and shall be answerable and accountable for their own acts, receipts, neglects, and defaults, and for the due administration of such property in the same manner and to the same extent as they would as such Managers or Trustees have been if no incorporation had been effected, and the incorporation of the Society shall not diminish or impair any control or authority exercisable by the Chancery Division, the Charity Commissioners or the Board of Education over such Managers or Trustees, but they shall, as regards any such property, be subject jointly and separately to such control or authority as if the Society were not incorporated. In case the Society shall take or hold any such property which may be subject to any trusts, the Society shall only deal with the same in such manner as allowed by law having regard to such trusts.

4 The income and property of the Society shall be applied exclusively in the promotion of the foregoing objects, and no dividend shall be paid to its members or any of them; but these restrictions shall not prevent the payment to any member (including any member of the Council of the Society) of interest on money lent, or rent for premises leased by him or her to the Society, nor the payment of appropriate fees or other remuneration for original literary or other material accepted by the Society for publication or inclusion in any of its publications.

5 The liability of the members is limited.

6 Every member of the Society undertakes to contribute to the assets of the Society, in the event of the same being wound up during the time that he is a member or within one year afterwards, for payment of the debts and liabilities of the Society contracted before the time at which he ceases to be a member, and of the costs, charges

and expenses of winding up the same, and for the adjustment of the rights of the contributories amongst themselves, such amount as may be required not exceeding one UK pound.

7 If upon the winding up or dissolution of the Society there remains, after the satisfaction of all its debts and liabilities, any property whatsoever, the same shall not be paid to or distributed among the members of the Society, but shall be given or transferred to some other institution or institutions, having objects similar to the objects of the Society, and which shall prohibit the distribution of its or their income and property amongst its or their members to an extent at least as great as is imposed on the Society under or by virtue of Clause 4 hereof, such institution or institutions to be determined by the members of the Society at or before the time of dissolution, or in default thereof by such Judge of the High Court of Justice as may have or acquire jurisdiction in the matter, and if and so far as effect cannot be given to the aforesaid provision then to some charitable object.

8 True accounts shall be kept of the sums of money received and expended by the Society, and the matters in respect of which receipts and expenditure take place, and of the property, credits, and liabilities of the Society; and, subject to any reasonable restrictions as to the time and manner of inspecting the same that may be imposed in accordance with the regulations of the Society for the time being, shall be open to the inspection of the members. Once at least in every year the accounts of the Society shall be examined, and the correctness of the balance-sheet ascertained by one or more properly qualified Auditor or Auditors.

We, the several persons whose names and addresses are subscribed, are desirous of being formed into a Company in pursuance of this Memorandum of Association:

H.C.L. HOLDEN. Brig.-Gen., 2 St. John's Park, S.E.2 (Army Retired Pay); MAURICE CHILD, 60 Ashworth Mansions, Maida Vale, W.9 (Director of Company); O.F. BROWN, 13 Hampstead Way, N.W.11 (Civil Servant); J.H. REEVES, 2 Penywem Road, S.W.5 (Tutor); H.R. HALLIWELL, 2 Princes Road, Crumpsall, Manchester (Electrical Engineer); GERALD MARCUSE, Queens Park, Caterham (Merchant); H. BEVAN SWIFT, 49 Kingsmead Road, Tulse Hill, S.W.2 (Electrical Engineer).

Dated the 22nd day of July 1926.

Witness to the above signatures, FEARNLEY OWEN, St. Michael's Alley, Cornhill, E.C.3 (Solicitor).

(Amended by special resolutions dated the 18th day of December 1953, the 8th day of December 1984, the 4th day of December 1993 and the 2nd day of December 2000).

THE COMPANIES ACT 1985

COMPANY LIMITED BY GUARANTEE

ARTICLES OF ASSOCIATION OF RADIO SOCIETY OF GREAT BRITAIN

(As adopted by Special Resolution passed on 2nd December 2000)

INTERPRETATION

1. In these Articles:-

"the Act" means the Companies Act 1985 including any statutory modification or re-enactment thereof for the time being in force.

References to "Section" refer to the relevant sections of the Act.

"the Society" means the Radio Society of Great Britain.

"the Articles" means the articles of the Society.

"the Bylaws" means the bylaws of the Society for the time being in force.

"Member" means any Member of the Society, as defined in Article 3 below.

"the Board" means the board of the Society.

"President" is the President of the Society and normally also the Chairman of the Board (see Article 29).

"Board Member" means any member of the Board of the Society.

"the National Council" means the National Council of the Society whose role is defined by time to time by the Board and recorded in the Bylaws.

"the Regional Council" is the Regional Council of the Society whose role is defined from time to time by the Board and recorded in the Bylaws.

"Council" means the National and Regional Councils of the Society.

"Council Member" means any member of the National or Regional Council of the Society.

"executed" includes any mode of execution.

"Office" means the registered office of the Society.

"the Seal" means the common seal of the Society.

"Secretary" means the secretary of the Society or any other person appointed to perform the duties of the secretary of the Society, including a joint, assistant or deputy secretary.

"the United Kingdom" means Great Britain and Northern Ireland.

"clear days" in relation to the period of a notice means that period excluding the day when the notice is given or deemed to be given and the day for which it is given or on which it is to take effect.

Words importing the singular number only shall include the plural number, and vice versa; words importing the masculine gender only shall include the feminine gender; and words importing persons shall include corporations.

Unless the context otherwise requires, words or expressions contained in these Articles bear the same meaning as in the Act but excluding any statutory modification thereof not in force when these regulations become binding on the Society.

OBJECTS

2. The Society is established for the objects expressed in the Memorandum of Association.

MEMBERS

3. The subscribers to the Memorandum of Association of the Society and such other persons as are admitted to membership in accordance with these Articles shall be Members of the Society. Every person who wishes to become a Member shall deliver to the Society an application for membership in such form as the Board require executed by him. The Society may reject any application for membership without giving a reason therefor.

A Member may at any time withdraw from the Society by giving at least seven clear days notice to the Society. Membership shall not be transferable and shall cease on death.

GENERAL MEETINGS

4. All general meetings other than annual general meetings shall be called extraordinary general meetings.

5. The Board may call general meetings and, on the requisition of Members pursuant to the provisions of the Act, shall forthwith proceed to convene an extraordinary general meeting for a date not later than eight weeks after receipt of the requisition. If there are not within the United Kingdom sufficient Board Members to call a general meeting, any Board Member may call a general meeting.

NOTICE OF GENERAL MEETINGS

6. An annual general meeting and an extraordinary general meeting called for the passing of a special resolution or a resolution appointing a person as a Board Member shall be called by at least twenty-one clear days' notice. All other extraordinary general meetings shall be called by at least fourteen clear days' notice but a general meeting may be called by shorter notice if it is so agreed;

(a) in the case of an annual general meeting, by all the Members entitled to attend and vote thereat; and

(b) in the case of any other meeting by a majority in number of the Members having a right to attend and vote being a majority together holding not less than ninety-five per cent. of the total voting rights at the meeting of all the Members.

The notice shall specify the time and place of the meeting and the general nature of the business to be transacted and, in the case of an annual general meeting, shall specify the meeting as such.

The notice shall be given to all the Members, to the Board Members and to the Auditors.

7. The accidental omission to give notice of a meeting to, or the non-receipt of notice of a meeting by, any person entitled to receive notice shall not invalidate the proceedings at that meeting.

PROCEEDINGS AT GENERAL MEETINGS

8. No business shall be transacted at any meeting unless a quorum is present. Fifty persons entitled to vote upon the business to be transacted, each being a Member or a proxy for a Member or a duly authorised representative of a corporation, shall be a quorum.

9. If such a quorum is not present within half an hour from the time appointed for the meeting, or if during a meeting such a quorum ceases to be present, the meeting shall stand adjourned to the same day in the next week at the same time and place or such time and place as the Board may determine.

10. The Chairman of the Board or in his absence some other Board Member nominated by the Board shall preside as chairman of the meeting, but if neither the chairman nor such other Board Member (if any) be present within fifteen minutes after the time appointed for holding the meeting and willing to act, the Board Members present shall elect one of their number to be chairman and, if there is only one Board Member present and willing to act, he shall be chairman.

11. If no Board Member is willing to act as chairman, or if no Board Member is present within fifteen minutes after the time appointed for holding the meeting, the Members present and entitled to vote shall choose one of their number to be Chairman.

12. The chairman may, with the consent of a meeting at which a quorum is present (and shall if so directed by the meeting), adjourn the meeting from time to time, and from place to place, but no business shall be transacted at an adjourned meeting other than business which might properly have been transacted at the meeting had the adjournment not taken place. When a meeting is adjourned for fourteen days or more, at least seven clear days notice shall be given specifying the time and place of the adjourned meeting and the general nature of the business to be transacted. Otherwise it shall not be necessary to give any such notice.

13. A resolution put to the vote of a meeting shall be decided on a show of hands unless before, or on the declaration of the result of the show of hands, a poll is duly demanded. Subject to the provisions of the Act, a poll may be demanded;

(a) by the chairman; or

(b) by at least five Members having the right to vote at the meeting; or

(c) by a Member or Members representing not less than one-tenth of the total voting rights of all the Members having the right to vote at the meeting; and a demand by a person as proxy for a Member shall be the same as a demand by the Member.

14. Unless a poll is duly demanded a declaration by the chairman that a resolution has been carried or carried unanimously, or by a particular majority, or lost, or not carried by a particular majority and an entry to that effect in the minutes of the meeting shall be conclusive evidence of the fact without proof of the number or proportion of the votes recorded in favour of or against the resolution.

15. The demand for a poll may, before the poll is taken, be withdrawn but only with the consent of the chairman and a demand so withdrawn shall not be taken to have invalidated the result of a show of hands declared before the demand was made.

16. A poll shall be taken as the chairman directs and he may appoint scrutineers (who need not be Members) and fix a time and place for declaring the result of the poll. The result of the poll shall be deemed to be the resolution of the meeting at which the poll was demanded.

17. In the case of an equality of votes, whether on a show of hands or on a poll, the chairman shall be entitled to a casting vote in addition to any other vote he may have.

18. A poll demanded on the election of a chairman or on a question of adjournment shall be taken forthwith. A poll demanded on any other question shall be taken either forthwith or at such time and place as the chairman directs not being more than thirty days after the poll is demanded. The demand for a poll shall not prevent the continuance of a meeting for the transaction of any business other than the question on which the poll was demanded. If a poll is demanded before the declaration of the result of a show of hands and the demand is duly withdrawn, the meeting shall continue as if the demand had not been made.

19. No notice need be given of a poll not taken forthwith if the time and place at which it is to be taken are announced at the meeting at which it is demanded. In any other case at least seven clear days notice shall be given specifying the time and place at which the poll is to be taken.

20. A resolution in writing executed by or on behalf of each Member who would have been entitled to vote upon it if it had been proposed at a general meeting at which he was present shall be as effectual as if it had been passed at a general meeting duly convened and held and may consist of several instruments in the like form each executed by or on behalf of one or more Members.

VOTE OF MEMBERS

21. On a poll every Member present or by proxy shall have one vote.

22. A Member in respect of whom an order has been made by any court having jurisdiction (whether in the United Kingdom or elsewhere) in matters concerning mental disorder may vote, whether on a show of hands or on a poll, by his receiver, curator bonis or other person authorised in that behalf appointed by that court, and any such receiver, curator bonis or other person may, on a poll, vote by proxy. Evidence to the satisfaction of the Board of the authority of the person claiming to exercise the right to vote shall be deposited at the office, or at such other place as is specified in accordance with these Articles

for the deposit of instruments of proxy, not less than 48 hours before the time appointed for holding the meeting or adjourned meeting at which the right to vote is to be exercised and in default the right to vote shall not be exercisable.

23. No objection shall be raised to the qualification of any voter except at the meeting or adjourned meeting at which the vote objected to is tendered, and every vote not disallowed at the meeting shall be valid. Any objection made in due time shall be referred to the chairman whose decision shall be final and conclusive.

24. The appointment of a proxy shall be executed by or on behalf of the appointor and shall be in the following form (or in a form as near thereto as circumstances allow or in any other form which is usual or which the Board may approve)-

"I/We, , of

, being a Member/Members of the above-named Company, hereby appoint

of , or failing him,

of , as my/our proxy to vote in my/our name(s) and on my/our behalf at the annual/extraordinary general meeting of the Company to be held on

20 , and at any adjournment thereof.

Signed on 20 ."

25. Where it is desired to afford Members an opportunity of instructing the proxy how he shall act the appointment of a proxy shall be in the following form (or in a form as near thereto as circumstances allow or in any other form which is usual or which the Board may approve)-

"I/We, , of

,being a Member/Members of the above-named Company, hereby appoint

of , or failing him,

of , as my/our proxy to vote in my/our name(s) and on my/our behalf at the annual/extraordinary general meeting of the Company, to be held on

20 , and at any adjournment thereof.

This form is to be used in respect of the resolutions mentioned below as follows:

Resolution No. 1 *for *against

Resolution No. 2 *for *against.

*Strike out whichever is not desired.

Unless otherwise instructed, the proxy may vote as he thinks fit or abstain from voting.

Signed this day of 20 ."

26. The appointment of a proxy and any authority under which it is executed or a copy of such authority certified notarially or in some other way approved by the Board may;

(a) in the case of an instrument in writing be deposited at the office or at such other place within the United Kingdom as is specified in the notice convening the meeting or in any instrument of proxy sent out by the Society in relation to the meeting not less than 48 hours before the time for holding the meeting or adjourned meeting at which the person named in the instrument proposes to vote; or

(b) in the case of an appointment contained in an electronic communication, be received at an electronic address specified in the notice convening the meeting or in any instrument of proxy sent out, or invitation contained in an electronic communication to appoint a proxy issued by the company in relation to the meeting not less than 48 hours before the time for holding the meeting or adjourned meeting at which the person named in the appointment proposes to vote;

(c) in the case of a poll taken more than 48 hours after it is demanded, be deposited as aforesaid after the poll has been demanded and not less than 24 hours before the time appointed for the taking of the poll; or

(d) where the poll is not taken forthwith but is taken not more than 48 hours after it was demanded, be delivered at the meeting at which the poll was demanded to the chairman or to the Secretary or to any Board Member;

and an appointment of proxy which is not deposited, delivered or received in a manner so permitted shall be invalid.

27. A vote given or poll demanded by proxy or by the duly authorised representative of a corporation shall be valid notwithstanding the previous determination of the authority of the person voting or demanding a poll unless notice of the determination was received by the Society at the office or at such other place at which the instrument of proxy was duly deposited or, where the invitation to appoint a proxy was contained in an electronic communication at the electronic address specified for that purpose before the commencement of the meeting or adjourned meeting at which the vote is given or the poll demanded or (in the case of a poll taken otherwise than on the same day as the meeting or adjourned meeting) the time appointed for taking the poll.

GOVERNANCE OF THE SOCIETY

28. The Society is a company limited by guarantee under the Companies Act 1985. Under the Act, the general governance of the Society is the responsibility of the Board. Members of the Board serve as Directors of the Society

The Regional Council comprises the regionally elected Members who shall be responsible for the representation of members interests and promotion and co-ordination of the Society's activities in the Regions.

The National Council comprises both Regional Council and Board members.

NUMBER OF BOARD MEMBERS

29. Unless otherwise determined by ordinary resolution, the number of Board Members including the President, shall not be less than nine. Six members of the Board will be elected by Members in a national election, and will carry responsibilities in addition to those prescribed by the Companies Acts, as determined from time to time in the Bylaws. The President, appointed by the National Council, shall also normally chair the Board as Chairman, unless the Board by a two-thirds majority of its number determines that an alternative Board Member should be appointed Chairman. Two Members of the Board, together with two alternates, will be elected by the Regional Council from Members elected to that Council.

POWERS OF THE BOARD

30. Subject to the provisions of the Act, the Memorandum and these Articles and to any directions given by special resolution, the business of the Society shall be managed by the Board who may exercise all the powers of the Society. No alteration of the Memorandum or Articles and no such direction shall invalidate any prior act of the Board which would have been valid if that alteration had not been made or that direction had not been given. The powers given by this regulation shall not be limited by any special power given to the Board by these Articles and a meeting of the Board at which a quorum is present may exercise all powers exercisable by the Board.

31. The Board may, by power of attorney or otherwise, appoint any person to be the agent of the Society for such purposes and on such conditions as they determine, including authority for the agent to delegate all or any of his powers.

DELEGATION OF BOARD'S POWERS

32. The Board may delegate any of their powers to any committee consisting of one or more Board Members. They may also delegate to any person holding executive office such of their powers as they consider desirable to be exercised by him. Any such delegation may be made subject to any conditions the Board may impose and either collaterally with or to the exclusion of their own powers and may be revoked or altered. Subject to any such conditions, the proceedings of committees with powers delegated from the Board shall be governed by these Articles regulating the proceedings of the Board so far as they are capable of applying.

APPOINTMENT AND RETIREMENT OF BOARD AND COUNCIL MEMBERS

33. The Board shall consist of a Chairman, together with such number of Board Members as shall satisfy the minimum number for the time being of Board Members expressed in these Articles.

34. Any Board or Council Member shall, unless removed, initially hold office for a term of three years, and shall at the end of his first term of office be eligible for re-election for a second term but shall retire from office after that second term, unless appointed President, when he may serve two years in that office. The Chairman shall hold office for a period of two years unless the Board votes by a two-thirds majority of its number to remove him or unless he ceases to be eligible to continue as a Board Member under any provision of Clause 39 herein. Completion of a term of office as President shall complete the relevant term of office for that person. Where this was the first term, the retiring President may stand for election again as a Board Member for a second three year term. For the avoidance of doubt, he may not then stand for President again during or at the end of the second three year term.

A Board Member may, therefore, complete a maximum of two terms of office of three years plus, during these terms, a maximum of up to two years as President after which he may not be re-appointed for at least three years, when, if appointed he may serve for a similar period as a Board Member or President.

No Member may offer himself for election to the Board or Regional Council to take effect after his 67th birthday, and if appointed after his 64th birthday, may only serve for one term of three years as member of the Board or Regional Council, plus two years if appointed President.

35. Eligibility for appointment as a Board or Regional Council Member and the terms of office of such Members shall be subject to any Bylaw for the time being in force governing the appointment and retirement of such Members.

36. The Board shall send to each Member entitled to attend and vote at general meetings of the Society a list of all Regional Council and Board Members subject to retirement at the next following annual general meeting and of all other Members eligible for nomination as Regional Council Members or Board Members. No person shall be appointed or re-appointed a Regional Council or Board Member at any general meeting unless he is nominated by not less than 10 Members entitled to attend and vote at the meeting.

Notice shall be given to the Society in accordance with the terms of the Bylaws for the time being in force of any person nominated for the Regional Council or the Board stating the particulars which would, if he were so appointed, be required to be included in the Society's register of Board Members together with notice executed by that person of his willingness to be appointed or re-appointed.

37. In the event that the number of valid nominations exceeds the number of vacancies a ballot of the Members shall be held. The ballot shall be conducted in accordance with the relevant Bylaws for the time being in force governing the method and timing of such ballots.

38. The Board may appoint a Member who is willing to act as a Regional Council or a Board Member, either to fill a vacancy or as an additional Regional Council or Board Member, provided that the appointment does not cause the number of Regional Council or Board Members to exceed any number fixed by or in accordance with these Articles or Bylaws as the maximum number of Council or Board Members.

Appointment to fill a casual vacancy shall be disregarded in calculating the period during which the person concerned has held office for the purposes of Article 34. Appointments to the Board under this article shall have effect until the following Annual General Meeting where, unless ratified in that meeting, they shall lapse.

DISQUALIFICATION AND REMOVAL OF BOARD MEMBERS

39. The office of a Board Member shall be vacated if;

(a) he ceases to be a Board Member by virtue of any provision of the Act or he becomes prohibited by law from being a Board Member; or

(b) he shall for more than six consecutive months have been absent without permission of the Board from meetings of the Board held during that period and the Board resolve that his office be vacated or

(c) he becomes bankrupt or makes any arrangement or composition with his creditors generally; or

(d) he is, or may be, suffering from mental disorder and either-

(i) he is admitted to hospital in pursuance of an application for admission for treatment under the Mental Health Act 1983 or, in Scotland, an application for admission under the Mental Health (Scotland) Act 1960, or

(ii) an order is made by a court having jurisdiction (whether in the United Kingdom or elsewhere) in matters concerning mental disorder for his detention or for the appointment of a receiver, curator bonis or other person to exercise powers with respect to his property or affairs; or

(e) he resigns his office by notice to the Society; or

(f) he shall be requested in writing to resign by all other Members of the Board; or

(g) in the case of a Board Member elected from the Regional Council, he no longer resides in the Region for which he is representative, or

(h) he ceases to be a Member of the Society.

REMUNERATION OF REGIONAL COUNCIL AND BOARD MEMBERS

40. Regional Council and Board Members shall not be entitled to any remuneration.

REGIONAL COUNCIL MEMBERS' AND BOARD MEMBERS' EXPENSES

41. Regional Council and Board Members may be reimbursed in accordance with the relevant Bylaws for the time being in force.

BOARD MEMBERS' APPOINTMENTS AND INTERESTS

42. Subject to the provisions of the Act, and provided that he has disclosed to the Board the nature and extent of any material interest of his, a Board Member notwithstanding his office

(a) may be a party to, or otherwise interested in, any transaction or arrangement with the Society or in which the Society is otherwise interested;

(b) may be a director or other officer of, or employed by, or a party to any transaction or arrangement with, or otherwise interested in, any body corporate promoted by the Society or in which the Society is otherwise interested; and

(c) shall not, by reason of his office, be accountable to the Society

for any benefit which he derives from any such office or employment or from any such transaction or arrangement or from any interest in any such body corporate and no such transaction or arrangement shall be liable to be avoided on the ground of any such interest or benefit.

43. For the purposes of Article 42:

(a) a general notice given to the Board that a Board Member is to be regarded as having an interest of the nature and extent specified in the notice in any transaction or arrangement in which a specified person or class of persons is interested shall be deemed to be a disclosure that the Board Member has an interest in any such transaction of the nature and extent so specified; and

(b) an interest of which a Board Member has no knowledge and of which it is unreasonable to expect him to have knowledge shall not be treated as an interest of his.

PROCEEDINGS OF THE BOARD

44. Subject to the provisions of these Articles, the Board may regulate its proceedings as it thinks fit. A Board Member may, and the Secretary at the request of a Board Member shall, call a meeting of the Board. It shall not be necessary to give notice of a meeting to a Board Member who is absent from the United Kingdom. Questions arising at a meeting shall be decided by a majority of votes. In the case of an equality of votes, the Chairman shall have a second or casting vote.

Meetings of the Board shall be held no less than four times each year.

45. The quorum for the transaction of the business of the Board may be fixed by the Board and unless so fixed at any other number shall be five.

46. The continuing Board Members or a sole continuing Board Member may act notwithstanding any vacancies in their number, but, if the number of Board Members is less than the number fixed as the quorum, the continuing Board Members or Board Member may act only for the purpose of filling vacancies or of calling a general meeting.

47. The Chairman shall chair every meeting of the Board at which he is present. But if there is no person holding that office, or if that person is unwilling to preside or is not present within five minutes after the time appointed for the meeting, the Board Members present may appoint one of their number to be chairman of the meeting.

48. All acts done by a meeting of the Board, or of a committee of the Board, or by a person acting as a Board Member shall, notwithstanding that it be afterwards discovered that there was a defect in the appointment of any Board Member or that any of them were disqualified from holding office, or had vacated office, or were not entitled to vote, be as valid as if every such person had been duly appointed and was qualified and had continued to be a Board Member and had been entitled to vote.

49. A resolution in writing signed by all the Board Members entitled to receive notice of a meeting of the Board or of a committee of the Board shall be as valid and effectual as if it had been passed at a meeting of the Board or (as the case may be) a committee of the Board duly convened and held and may consist of several documents in the like form each signed by one or more Board Members.

50. The Board, or a committee of the Board, may agree to hold meetings by electronic means such as by telephone, either by conference telephone connection(s) or by a series of telephone conversations, by the use of video-conferencing facilities or by exchange of facsimile transmissions and addressed to the secretary. The views of the Board, or a committee of the Board, as ascertained by the above means shall be treated as votes in favour of or against a particular resolution. A resolution passed at any meeting held in this manner and signed by the Chairman shall be as valid and effectual as if it had been passed at a meeting of the Board (or, as the case may be, of that committee) duly convened and held.

Any meetings conducted by any of the above means may be deemed to be held in the location either where the majority of the Board Members are physically situated, or where the Chairman is physically situated, or as determined by the Board Members at the meeting itself. The quorum for the transaction of the business of the Board shall be five although in respect of meetings conducted by any of the above means, the Board Members need not be present in the same physical location for the meeting to be quorate.

51. Save as otherwise provided by these Articles, a Board Member shall not vote at a meeting of the Board or of a committee of the Board on any resolution concerning a matter in which he has, directly or indirectly, an interest or duty which is material and which conflicts or may conflict with the interests of the Society unless his interest or duty arises only because the case falls within one or more of the following paragraphs:

(a) the resolution relates to the giving to him of a guarantee, security, or indemnity in respect of money lent to, or an obligation incurred by him for the benefit of, the Society or any of its subsidiaries;

(b) the resolution relates to the giving to a third party of a guarantee, security, or indemnity in respect of an obligation of the Society or any of its subsidiaries for which the Board Member has assumed responsibility in whole or part and whether alone or jointly with others under a guarantee or indemnity or by the giving of security;

(c) his interest arises by virtue of his subscribing or agreeing to subscribe for any debentures of the Society or any of its subsidiaries, or by virtue of his being, or intending to become, a participant in the underwriting or sub-underwriting of an offer of any such debentures by the Society or any of its subsidiaries for subscription, purchase or exchange.

For the purposes of this regulation, an interest of a person who is, for any purpose of the Act (excluding any statutory modification thereof not in force when this regulation becomes binding on the Society), connected with a Board Member shall be treated as an interest of the Board Member.

52. A Board Member shall not be counted in the quorum present at a meeting in relation to a resolution on which he is not entitled to vote.

53. If a question arises at a meeting of the Board or of a committee of the Board as to the right of a Board Member to vote, the question may, before the conclusion of the meeting, be referred to the Chairman of the meeting and his ruling in relation to any Board Member other than himself shall be final and conclusive.

SECRETARY

54. Subject to the provisions of the Act, the Secretary shall be appointed by the Board for such term, at such remuneration and upon such conditions as it may think fit; and any Secretary so appointed may be removed by it. No person who is a Member of the Board shall be appointed to the office as Secretary.

MINUTES

55. The Board shall cause minutes to be kept for the purpose-

(a) of all appointments of officers made by the Board; and

(b) of all proceedings at meetings of the Society and of the Board, and of committees of the Board, including the names of the Board Members present at each such meeting.

THE SEAL

56. The Seal shall only be used by the authority of the Board or of a committee of the Board authorised by the Board. The Board may determine who shall sign any instrument to which the Seal is affixed and unless otherwise so determined it shall be signed by a Board Member and by the Secretary or by a second Board Member.

TREASURER

57. The Treasurer shall be appointed by the Board for such term, at such remuneration and upon such conditions as it may think fit; and any Treasurer so appointed may be removed by it. No person who is a Member of the Board shall be appointed to hold office as Treasurer.

ACCOUNTS

58. No Member shall (as such) have any right of inspecting any accounting records or other book or document of the Society except as conferred by statute or authorised by the Board or by ordinary resolution of the Society.

NOTICES

59. Any notice to be given to or by any person pursuant to these Articles (other than a notice calling a meeting of the Board) shall be in writing or, with the prior agreement of the Member, in electronic form or in accordance with section 369(4A)

60. The Society may give any notice to a Member either personally or by sending it by post in a prepaid envelope addressed to the Member at his registered address or by leaving it at that address, or in electronic form or in accordance with section 369(4A).

61. A Member present, either in person or by proxy, at any meeting of the Society shall be deemed to have received notice of the meeting and, where requisite, of the purposes for which it was called.

62. Proof that an envelope containing a notice was properly addressed, prepaid and posted, or a dated record of electronic mailing, shall be conclusive evidence that the notice was given. A notice shall, unless the contrary is proved, be deemed to be given at the expiration of 48 hours after the envelope containing it was posted or, in the case of a notice contained in an electronic communication, at the expiration of 48 hours after the time it was sent.

DISSOLUTION

63. Clause 7 of the Memorandum of Association relating to the winding up and dissolution of the Society shall have effect as if the provisions thereof were repeated in these Articles.

BYLAWS

64. The Board may from time to time make such Bylaws as it may deem necessary or expedient or convenient for the proper conduct and management of the Society and for the purposes of prescribing classes of and conditions of membership, and in particular but without prejudice to the generality of foregoing, it may by such Bylaws regulate:-

(i) The admission and classification of Members of the Society, and the rights and privileges of such Members, and the conditions of membership and the terms on which Members may resign or have their membership terminated and the entrance fees, subscriptions and other fees or payments to be made by Members.

(ii) The conduct of Members of the Society in relation to one another, and to the Society's servants.

(iii) The setting aside of the whole or part of parts of the Society's premises at any particular time or times or for any particular purpose or purposes.

(iv) The procedure at general meetings and meetings of the National and Regional Councils, and committees of the Society in so far as such procedure is not regulated by these articles.

(v) And generally all such matters as are commonly the subject matter of Society rules.

The Society in general meeting shall have power to alter or repeal the Bylaws and to make additions thereto and the Board shall adopt such means as they deem sufficient to bring to the notice of Members of the Society all such Bylaws, which so long as they shall be in force, shall be binding on all Members of the Society. Provided, nevertheless, that no Bylaw shall be inconsistent with, or shall affect or repeal anything contained in, the Memorandum or Articles of Association of the Society.

INDEMNITY

65. Subject to the provisions of the Act but without prejudice to any indemnity to which a Board Member may otherwise be entitled, every Board Member or other officer or auditor of the Society shall be indemnified out of the assets of the Society against any liability incurred by him in defending any proceedings, whether civil or criminal, in which judgement is given in his favour or in which he is acquitted or in connection with any application in which relief is granted to him by the cost from liability for negligence, default, breach of duty or breach of trust in relation to the affairs of the Society.

BYLAWS OF THE RADIO SOCIETY OF GREAT BRITAIN

1.0 INTERPRETATION

"the Act" means the Companies Act 1985 including any statutory modification or re-enactment thereof for the time being in force.

"the Society" means the Radio Society of Great Britain.

"the Articles" means the articles of the Society.

"the Bylaws" means the bylaws of the Society for the time being in force.

"Member" means any Member of the Society, as defined in Clause 8 below.

"the Board" means the Board of the Society.

"President" is the President of the Society and normally also the Chairman of the Board (see Article 29).

"Board Member" means any member of the Board of the Society.

"the National Council" means the National Council of the Society whose role is defined by time to time by the Board and recorded in the Bylaws.

"the Regional Council" is the Regional Council of the Society whose role is defined from time to time by the Board and recorded in the Bylaws.

"Council" means the National and Regional Councils of the Society.

"Council Member" means any member of the National or Regional Council of the Society.

"executed" includes any mode of execution.

"Office" means the registered office of the Society.

"the Seal" means the common seal of the Society.

"Secretary" means the secretary of the Society or any other person appointed to perform the duties of the secretary of the Society, including a joint, assistant or deputy secretary.

"the United Kingdom" means Great Britain and Northern Ireland.

"clear days" in relation to the period of a notice means that period excluding the day when the notice is given or deemed to be given and the day for which it is given or on which it is to take effect.

Words importing the singular number only shall include the plural number, and vice versa; words importing the masculine gender only shall include the feminine gender; and words importing persons shall include corporations.

Unless the context otherwise requires, words or expressions contained in these Bylaws bear the same meaning as in the Act but excluding any statutory modification thereof not in force when these regulations become binding on the Society.

2.0 OBJECTIVES OF THE SOCIETY

The Radio Society of Great Britain is a Company Limited by Guarantee, registered under the Companies Acts. The objectives of the Society are given in its Memorandum and Articles of Association.

The objectives include:

- To promote the general advancement of the science and practice of amateur radio communication.
- To facilitate the exchange of information and ideas on these subjects amongst its Members.
- To obtain the maximum liberty of action consistent with safeguarding the interests of all concerned.

Services provided by the Society's Headquarters staff and by volunteer effort from Members include:

Essential links with outside bodies such as Radiocommunications Agency; IARU; ITU; City & Guilds; British Standards Institution; IEE;

Organisation of exhibitions, conventions, rallies, round tables, special meetings, special event callsigns and Morse tests.

Provision of technical information through publication of periodicals and books

Organisation of general operating services such as contests; beacons; repeaters; Observation Service; Intruder Watch; RAE / NRAE centres; slow Morse transmissions for beginners.

Provision of news and information through such mediums as may be deemed appropriate, which may include GB2RS news broadcasts; diary of events; information sheets; headline news service; film / tape / slide / video library and Internet based services.

Providing direct services to Members as may be determined from time to time, such as QSL bureau; operating awards; advice on technical matters and electromagnetic compatibility (EMC) problems including TVI / BCI breakthrough; licensing and reciprocal licensing; planning permission; Members' advertisements; specialised insurance schemes.

3.0 STRUCTURE OF THE SOCIETY

3.1 Governance of the Society

The Society is a company limited by guarantee under the Companies Act 1985. Under the Act, the general governance of the Society is the responsibility of the Board acting within the Memorandum and Articles of Association.

The Regional Council (comprising the regionally elected Members as "Regional Managers") shall be responsible for the representation of Members interests and promotion and coordination of the Society's activities in the Regions.

Board

Board Members will be appointed and serve as defined in the Society's Articles of Association.

The Regional Council shall elect two of its members to serve on the Board together with two alternates.

National Council

The National Council shall comprise nationally elected members of the Board, together with Regional Managers, under the chairmanship of the President. The National Council will meet to provide guidance and Member input to the Board in its direction of the Society and to determine a choice of President. Meetings of the National Council shall generally be held twice per year.

Regional Council

Members of the Society in each Region shall elect their Regional Manager (the number and composition of the Regions being as determined by the Board and recorded in the Bylaws of the Society).

Under the chairmanship of the President, Regionally elected Members shall meet as the Regional Council from time to time for the purposes set out in these Bylaws.

Details of the Regional Management structure are given at Appendix 1.

Patron

The President may, from time to time and on the advice of the National Council, invite an appropriate person to be a Patron of the Society.

Voluntary Support

A significant part of the workload of the Society is carried out by the Standing Committees of Council. The Society has Regional Managers and deputies, Honorary Managers, Officers or Organisers and a number of representatives on outside bodies. Appropriate terms of reference are given in the later sections of these Bylaws. Volunteer officers of the Society (including Council members) are expected to have personal e-mail facilities.

3.2 President

The President shall be any member of the Society who, in the view of the National Council, has rendered outstanding service to the Society or who has made acknowledged eminent contribution to radio research, experimentation, communication or a related subject and who can in the opinion of National Council fittingly represent the Society in such office.

The Member appointed to fill the office of President on the following first day of January shall be announced in the Society's Journal in August of each year.

The President shall hold office for a period of two years.

A President may be removed from office by a simple majority decision of the National Council.

The President is an ex-officio member of all committees of the Society.

The President will enjoy the privilege of Life Membership after his period of office.

3.3 Treasurer

The appointment of the Treasurer is defined in the Articles of Association. The Treasurer is a voting member of the Management Committee.

3.4 General Manager

The General Manager shall be appointed by the Board, and administer the Society based on an employment contract for such term, at such remuneration and upon such conditions as the Board may think fit, and any General Manager so appointed may be removed by the Board.

3.5 Company Secretary

The appointment of the Company Secretary is defined in the Articles of Association.

3.6 Responsibilities of Members of the Board and Councils

In addition to the responsibilities defined in the Articles of Association, nationally elected Board Members carry a portfolio responsibility for advice, guidance and co-ordination of the Society's policy in a particular specialist area. These specialist areas will be determined from time to time by the Board, and the Board will agree the allocation of responsibilities between nationally elected members from time to time. Two Board members, appointed by the Regional Council, will hold membership services portfolios.

Members of the Regional Council, have responsibility, acting as Regional Managers, for the representation of Members interests to the Board, promotion of the Society and co-ordination of Society activities in their Regions. In partnership with their Deputy Regional Managers, they arrange and / or attend local gatherings of Members and bring to the notice of National Council or Board as appropriate any matters of general concern in the Regions. (See Appendix 1)

4.0 Nomination and Election of Board and Regional Council Members

The procedure for the nomination and election of members to the Board and Councils is as defined in the Articles of Association.

4.1 Not later than 1st September in each year the Secretary shall send to each Member entitled to vote a list of those Board and Regional Council Members who to the knowledge of the Secretary on the preceding 1st August will retire on the succeeding 31st December, indicating those who are willing to accept nomination and eligible for re-election and whether the vacancies so arising are to be filled by election of a Member to the Board or by the election of a Regional Council Member.

4.2 Upon receipt of the Secretary's notification of vacancies and not later than 1st October following, any ten Corporate Members (as defined in section 8 of these Bylaws) may nominate any qualified Member by delivering in one closed envelope to the Secretary their respective nominations in writing, together with written consent of such Member to accept office if elected, but each such nominator shall be entitled to nominate only one Member on a Regional basis and one on a national basis for election at the subsequent Annual General Meeting each year.

4.3 The nominated Member must enclose:

1. Written, signed consent to accept office if elected.
2. A statement as to whether the nomination is for a Board Member or a Regional Council. Member. If the latter, both the Member nominated and those nominating him must reside in the same Region.
3. A statement declaring any commercial interest in the field of amateur radio.
4. A recent black and white head-and-shoulders photograph which is suitable for publication.
5. A CV or statement of 100 words maximum describing pertinent experience. This CV will be circulated with the ballot forms. Clearly, involvement with decision making in organisations of similar or larger size than the RSGB is relevant and should be mentioned. Experience of RSGB procedures, committee membership, writing for RSGB publications and any duties as a RSGB local representative should be mentioned. Candidates may state in not more than an additional 100 words what they hope to achieve if elected. Extravagant or nonsensical promises will be edited by the Company Secretary as Board and Council members are expected to act as part of a team.

4.4 In the event of insufficient nominations being received to fill all vacancies arising, the Regional Council (or the Board in the case of nationally elected Board members) shall have power to fill any remaining vacancies and all nominations properly made shall thereafter be declared elected unopposed.

4.5 Members nominated for election to the Regional Council must be resident within the Region for which they are nominated and the nominators must be Corporate Members resident in that Region provided that where a vacancy among the Members elected on a Regional basis occurs other than under 4.1 hereof the National Council shall have power to appoint any qualified Member to fill the vacancy within the terms of 4.4 hereof subject to the aforesaid restriction on the residence of the Member appointed.

5.0 BALLOT FOR ELECTION TO THE REGIONAL COUNCIL AND THE BOARD

5.1 In the event that the number of valid nominations under 4.2 exceeds the number of vacancies arising under 4.1 a ballot shall be held.

5.2 If a ballot is required then the Board shall send to each Corporate Member (as defined at 8.0) entitled to vote, not later than 28 days before the date of the Annual General Meeting, a ballot paper containing names of all Members duly nominated and setting out the names of the Members by whom they are nominated.

5.3 The ballot papers for Regional Council and Board elections shall provide a space in line with the name of each candidate thereon and each Corporate Member voting shall place a cross in the space against the name of each candidate for whom he desires to vote but so that the number of names so marked with a cross shall not in any case exceed the number of names to be elected to the respective offices. The ballot papers, marked as determined by the Board from time to time, shall be returned so as to reach the Secretary not later than seven days before the date fixed for the Annual General Meeting. In the ballot for the Regional Council members no Member shall vote for more than one Regional candidate and both voter and the candidate for whom he votes shall be resident in the same Region.

5.4 Each Corporate Member may vote for fewer candidates than there are vacancies to be filled. Any ballot paper which does not comply with all the requirements of this and the preceding Bylaw shall be null and void.

5.5 The Society, at its Annual General Meeting, shall choose a panel of scrutineers for any ballot that may be held for the election of Board and Regional Council members. Scrutineers shall be Corporate Members. No candidate for election shall be a scrutineer. The ballot papers shall be delivered to the scrutineers who shall open them and count the votes and report to the chairman of the Annual General Meeting before the hour fixed for the Annual General Meeting.

5.6 In the event of the scrutineers being unable to report the election of the prescribed number of persons to fill the vacancies in the Board or Regional Council owing to an equality of votes, they shall submit the names of the candidates having the same number of votes to the chairman of the Annual General Meeting who shall determine by his casting vote or votes which candidate or candidates having equality of votes shall be elected.

5.7 The chairman of the Annual General Meeting shall announce the result of the ballot at the Annual General Meeting and declare the new members of the Board and Council duly elected. Until that announcement, the results will be confidential.

6.0 GUIDANCE FOR THE CONDUCT OF BOARD MEETINGS

The Standing Orders are contained in Appendix 2.

7.0 RSGB AFFILIATED SOCIETIES AND CLUBS

7.1 The Society may admit clubs and societies interested in radio research, experimentation, communication or related subjects to such privileges of affiliation to the Society as shall be laid down by the Board from time to time.

7.2 The annual subscriptions to be paid by such societies shall be fixed by the Board.

7.3 After due notification an affiliated society which is two months in arrears with its annual subscription may be dis-affiliated by order of the Board but shall remain liable for the arrears of subscriptions.

Further details are given in Appendix 3.

8.0 MEMBERSHIP

The Society shall consist of Members and Honorary Members (hereinafter together called "Corporate Members") and Associates.

The rights and privileges of every member of any class shall be personal to himself, and shall not be transferable or transmissible by his own act, or by operation of law.

The Society may admit such persons as may be hereinafter qualified as Members, Honorary Members and Associates respectively.

The Society shall maintain a proper Register of Members, where details of Members shall be recorded.

8.1 CORPORATE MEMBERS

Corporate Members must be of the age of consent.

8.2 HONORARY MEMBERS

Honorary Members shall be persons who have rendered outstanding

service to the Society or have made acknowledged eminent contributions to radio research, experimentation or communication or a related subject and shall be elected by the National Council. Honorary Members shall have all rights and duties of Members, except that they shall not pay an annual subscription under 9.0 hereof.

8.3 ASSOCIATES

Associate Members must be under the age of consent. Associates shall have no vote. On attaining the age of consent an Associate must transfer to Corporate Membership in order to remain a Member of the Society.

8.4 LIFE VICE-PRESIDENTS AND HONORARY VICE-PRESIDENTS

Corporate Members who have rendered outstanding services to the Society are eligible to be elected as Life Vice-Presidents. Distinguished persons shall be eligible for election as Honorary Vice-Presidents.

8.5 ADMISSION OF MEMBERS

1. Honorary Members, Life Vice-Presidents and Honorary Vice-Presidents may be proposed, and a ballot held, at a meeting of the National Council. Every such election shall be announced at the next Annual General Meeting of the Society. Not more than two Honorary Members may be elected in any one year.

2. Any person wishing to become a Member of the Society shall apply to the Society on a form which shall be provided for that purpose.

3. The Society may reject any application for membership without giving any reason. No entry other than the name, address and the date on which his or her application was considered by the Society shall be made or kept in the records of the Society relating to any candidate whose application is rejected.

4. An applicant whose application is rejected will not be considered again for membership within twelve calendar months of the rejection.

5. An applicant for membership of the Society shall not become a Member until such time as his subscription payment shall have been received by the Society.

9.0 SUBSCRIPTIONS AND RESIGNATION OF MEMBERS

9.1 The annual subscription for Corporate Members and Associates shall be such as the Board may from time to time decide.

9.2 Where two or more members of a family have the same address registered with the Society, the second and subsequent Members shall be eligible for reduced subscription, which shall entitle them to all privileges of their grade of membership except that of receiving a copy of each issue of the Society's Journal. The annual subscription payable by such second and subsequent Members shall be determined by the Board from time to time.

9.3 Upon the conditions of the preceding paragraph ceasing to apply such Members shall forthwith be required to pay the full subscription appropriate to their category of membership.

9.4 Subscriptions shall be payable in advance and may be paid in one or more instalments as shall be determined by the Board from time to time. The first subscription shall be due (subject to any instalment arrangements) on joining and subsequent annual subscriptions shall be due (subject to any instalment arrangements) either on the first day of the month in which the Member joined in each year or on such common renewal date as shall be determined by the Board from time to time.

9.5 Every Member desiring to resign from membership shall give notice thereof in writing to the Society addressed to the Secretary and shall be liable for all subscriptions due up to the receipt of such notice by the Society.

9.6 No Member whose subscription is in arrears shall be entitled to receive notice of or to attend or take part in the meetings or other activities of the Society, neither shall he be entitled to nominate any person to serve on the Board, Regional Council or in any other capacity, or to propose any candidate for membership, or to vote at any meeting of the Society or upon any ballot.

9.7 Any Member who is two months or more in arrears with his subscription shall be deemed to forfeit his claim to membership and to all the privileges thereof, and it may be recorded in the Register of Members that his membership has been terminated but he shall nevertheless remain liable to pay the arrears of subscription due at the time of such termination. The Board shall have power to reinstate any person whose membership has been terminated.

Notwithstanding anything in these Bylaws, the Board shall have the power to specify from time to time any individual Members or classes of Members, or applicants for membership for whom payment of the full subscription would be in the opinion of the Board be unduly burdensome and to resolve that those so specified shall be liable, either indefinitely, or for such period as the Board may prescribe, to pay only a reduced or no subscription, and from time to time to vary the amount of the reduction in the case of any Member or classes of Members as the Board may think fit.

10.0 EXPULSION

10.1 At a meeting specially convened for the purpose, the Board may expel any Corporate Member or Associate who shall have acted wilfully in contravention of these Bylaws, or who shall in the opinion of the Board have been guilty of such conduct as shall have rendered it undesirable in the interests of the Society that he should continue a Corporate Member or Associate thereof, and the Board may remove from the Register of Members the name of any person who is expelled and any person so expelled shall not be entitled to have returned to him any moneys paid by him as entrance fee, subscriptions or otherwise.

10.2 No motion of expulsion shall be put to a meeting of the Board unless two thirds of the Board Members are present and unless two thirds of such Board Members present vote in favour of expulsion the motion shall be lost. No person shall be expelled unless and until he has been given reasonable notice of the meeting at which his expulsion is to be proposed and is afforded a proper opportunity of being heard at such meeting in his own defence. No motion for expulsion shall be for more than one person but there is no limit to the number of motions for expulsion which can be proposed at any such meeting of the Board.

11.0 COMMITTEES

a) The Chairman of each Committee shall be appointed by the Board.

b) A Committee Chairman may be removed from office at any time following an opportunity to address the Board, by a vote exceeding two-thirds of the Board Members present.

c) Where a change of Committee Chairman is involved, the Board will consult with the existing Committee Chairman and members of the Committee concerned and will arrange for suitable candidates for appointment to be interviewed. The Board will consider the CV of the candidate(s) and a report of the interviewer(s) before making a decision to appoint a Committee Chairman.

d) Each Committee Chairman will be responsible for the appointment of Committee members other than ex-officio members, and for terminating their membership. The appointed members and the ex-officio members are conveniently referred to as Full Members of the Committee. The size of the Committee must not exceed the number specified by its terms of reference without the permission of the Board.

e) Unless otherwise agreed by the Board, all Full Members of the Committee must be Members of the Society. The President or a Council member designated by the President to represent him may

attend meetings of all Committees and Working Groups. They may not be part of its quorum, nor vote.

f) Following a Committee Chairman's invitation and at the discretion of the General Manager, members of the Society's staff may attend Committee meetings. They may not vote, hold office or form part of the quorum.

g) If thought more efficient, a committee may be wholly corresponding (ie have no meetings except by mail, e-mail etc) and will report to the Board by means of a regular news letter.

h) A Board Member will be appointed as a Liaison Member of each Committee. The specific portfolios held by nationally elected Board members will guide the appointment of liaison members.

i) A Committee Chairman may appoint Corresponding Members who are Committee members who do not attend meetings except at the specific invitation of the Committee Chairman. In addition, there may be Liaison Members who provide links with outside bodies and may attend meetings with the permission of the Committee Chairman but at the expense of the bodies that they represent. Visitors may attend meetings at the specific invitation of a Committee Chairman at their own expense. Corresponding Members, Liaison Members and visitors have no vote nor form part of the quorum.

j) Each Committee Chairman is responsible for the administrative arrangements leading up to the appointment of the Committee members and for notifying the General Manager of the full composition of the Committee according to status.

k) When seeking to fill vacancies with other than ex-officio members, the Committee Chairman is required to advertise the vacancy in the Society's Journal , giving details of the qualifications required and the conditions under which the Committee meets. This requirement does not apply to the Management Committee.

l) The committee shall serve from 1 July of each year to 30 June of the following year - the "RSGB Year". Committee members may be available for re-appointment on the invitation of the Committee Chairman.

m) At the beginning of each committee year, the Committee shall elect a Vice-Chairman and appoint a Minutes Secretary. Minutes should reach Society Headquarters within two weeks of the Committee meeting concerned.

n) Meetings shall be called by the Committee Chairman, the Board, National Council, General Manager, or by a quorum of the Committee.

o) The quorum shall be that specified by the terms of reference of the Committee. If a quorum is not reached, the Committee Chairman at his discretion may conduct the meeting as though a quorum were present with the proviso that any decisions recorded have to be ratified by the next meeting at which a quorum is present.

p) Committee procedures shall generally follow the principles laid down in the Articles of Association and Appendix 2 to these Bylaws.

q) It is the responsibility of the Committee Chairman to deal with all matters within the competence of the Committee and to decide which matters are sufficiently important to require and seek the prior authority of the Board.

r) Each Committee Chairman shall be responsible for ensuring adequate liaison with other Committees and relevant outside bodies.

s) A Committee Chairman shall attend a Board meeting on request in order to answer any questions concerning the work of his Committee.

t) A Committee Chairman may ask to attend the Board personally when decisions affecting the work of his committee are likely to be made; to seek guidance; a decision on any problem concerning his committee's work which the committee is unable to resolve. Requests by the Board or committee Chairmen must be made in writing to the Society Secretary at least 14 days prior to a Board meeting, accompanied by sufficient information to enable an adequate response to be made.

u) In preparing committee minutes, the progress with the agreed programme for the year should be clearly distinguished from routine committee work.

v) Committees may form working parties for special purposes. No restrictions are placed on whom they may co-opt to aid in their work. The proceedings of such parties or groups shall be fully reported and given the same circulation as minutes of the parent committee.

w) Towards the end of each committee year, each Committee Chairman shall produce and present to the National Council a written report concerning the work of the committee, with particular emphasis on the objectives agreed by the Board at the beginning of that year. The Committee Chairman will explain any failure in achieving agreed objectives. The report will include the proposed programme and new objectives for the following year, for approval by the National Council. The report will form the basis of the Annual Report to Members.

x) Each Committee Chairman will prepare an annual budget for submission to the Management Committee keeping expenditure within the limit authorised. The budget will include travelling, subsistence and out-of-pocket expenses for Full Members, Liaison Members and Corresponding Members, visitors and working parties.

y) All claims for reasonable out-of-pocket expenses incurred by volunteers or invited visitors shall be submitted in accordance with the Society's expense reimbursement procedures.

Appendix 1 - Regional Management

In order that the Society may keep effective contact with its Members throughout the United Kingdom, it maintains a system of national and local representation. The country is divided into 12 Regions, each of which is supervised by a Regional Manager (more formally the "RSGB Regional Manager" or "RRM"), elected by the Members resident in that Region. Additionally, there are Deputy Regional Managers ("Deputy RSGB Regional Managers" or "DRRM"), each being responsible for an area defined by the Regional Manager. Their terms of reference are shown elsewhere later in this Appendix.

The Regional management structure ensures that those Members who live in the remoter parts of the country have an opportunity to make their views known and to learn of the services which are available.

The Regional boundaries shall be determined from time to time by the Board.

RSGB Regional Manager and Deputy Regional Managers

The terms of reference for the Regional Manager and Deputy Regional Manager are as below.

DRRMs support their Regional Manager in promoting:

- the growth of amateur radio and the Society's activities at local level

- a link between the membership and the Society's central organisation.

DRRMs are usually responsible for at least a county-sized area. They are appointed by the relevant Regional Manager, and serve for three years, from 1st January. They may be removed from office at any time by the relevant Regional Manager.

Regional Meetings

Official Regional Meetings (ORMs) are intended to give members an opportunity of discussing amateur radio matters with Society representatives. The procedures for these meetings are:

- Official Regional Meetings may be held as considered necessary.

- Requests by DRRM's for an Official Regional Meeting must be made to the Board via the RRM, for approval of the meeting itself and of the expenses involved.

- The RRM will be responsible for chairing the meeting and determining the main business.

- Approval of the Board is necessary should the RRM desire the attendance of the President, other Council Member, Regional Managers or General Manager (who may appoint a deputy).

- Resolutions of the meeting must be formally tabled and voted on.

- Non-members may be admitted to the meeting at the discretion of the Regional Council and may speak at the invitation of the Chairman. They may not vote.

- By request of the Regional Manager, meetings may be closed to non-RSGB members either in part or totally.

Roles and Responsibilities

RSGB Regional Manager (RRM)

Job Title: RSGB Regional Manager (RRM)

Reporting to: RSGB National Council / Vice President Membership Services

Responsible for:

- Managing amateur radio activities in a Region whose geographical area and boundaries are defined in General Instructions.

- Managing, supporting and advising the DRRMs, located within his Region.

- Supporting Members within the Region.

- Submitting important regional issues requiring clarification at National or Regional Council as agenda items for discussion in a timely manner.

- Attending RSGB meetings as / if required.

- Submitting a quarterly activity and financial report to the Regional Council.

- Confirming and organising DRRM appointments.

- Controlling DRRM and personal expenditure within the Region which he represents including timely authorisation and submission of expenses.

- Chairing ORMs and other meetings within his specific region.

- Supporting other RSGB officers, managers, committee chairman and members of committees within his region.

- Giving RSGB presentations to clubs and groups as appropriate.

Term of Office: Initially 3 years, or as defined in the Bylaws.

Deputy RSGB Regional Manager (DRRM)

Job Title: Deputy RSGB Regional Manager (DRRM)

Reporting to: RSGB Regional Manager

Responsible for:

- A link between the Membership and the National Council.

- Advice and Support to RSGB Affiliated Societies

- Support to Members within his area.

- Submitting important area issues requiring clarification to the RRM for discussion.

- Attending Regional Council meetings as required

- Submitting a monthly activity and financial report to the RRM including expense claims for authorisation in a timely manner.

- Gaining authority for expenditure and club visits from the RRM.

- Attending ORMs and other meetings within his specific area.

- Supporting Affiliated Society contacts or club secretaries within his area.

- Giving RSGB presentations to clubs and groups as appropriate and as agreed with RRM.

- Maintaining an area directory of all RSGB and amateur radio resources within his area.

Term of Office: Initially 3 years, a DRRM may be appointment for subsequent terms as required by the RRM.

Appointment to office as a DRRM

Suitable candidates who are Corporate Members can be nominated by members within their area or invited to apply to represent Members resident in their area.

Candidate's Qualifications:

The candidate must be:

- A Member

- A resident within the area he wishes to represent.

The candidate must submit the following:

- Written application to represent the area where he resides

- Consent to accept office, if appointed.

- A declaration that he / she is a Member.

- That he / she agrees to his / her e-mail address, address and telephone number being published if he / she is elected.

- These declarations, together with nominations, may conveniently be made using the Candidate's Form for the Nomination of a Deputy RSGB Regional Manager available on request from the candidate's RSGB Regional Manager or: The General Manager, RSGB Headquarters, Lambda House, Cranborne Road, Potters Bar, Herts. EN6 3JE.

Confirmation of DRRM Appointments

- The Regional Meeting, chaired by the RRM, will confirm appointments of DRRMs.

- Where vacancies occur due to resignations or other circumstances new DRRM's will be appointed pro tem by the RRM and then confirmed at a Regional Meeting.

- A Regional Meeting may also remove DRRMs from office where they no longer serve the best interests of the areas they represent.

Appendix 2 - Standing Orders for Board Meetings

Note: these standing orders are also intended to apply wherever practicable to meetings of committees and councils

Board

1. The place and time of routine Board meetings shall be fixed by the Board in session. Non-routine meetings may be called by the Company Secretary under the direction of the President or not less than three Board members. At least 21 days notice must be given.

2. The Chair shall be taken by the President, or in his / her absence by another Board member nominated by the members present at the meeting.

3. The quorum for the Board shall be five.

4. The routine business of the Board may consist of:
   a) Apologies for absence.
   b) Approval of the minutes of the previous meeting.
   c) Matters arising not covered by agenda items: information only.
   d) Agenda items for decision.
   e) Other business, as defined in (5).
   f) Treasurer's Report.
   g) Management Committee Report.

   Items 4b, 4d, 4e, 4f and 4g require documentation to be circulated in advance. The remaining items may be omitted from the agenda when appropriate.

   Suggested amendments to the previous meeting's minutes must be

notified in writing to the Minutes Secretary, at least 21 days prior to the following meeting.

5. The item "Other Business" should be taken as item 4e. It covers urgent matters of which it has not been possible to give formal notice, as defined in 6, but which has received the Chairman's permission to be raised at some point during the meeting.

6. Proposed agenda items apart from "Other Business" as defined in 4 and 5 above, shall be submitted to the Secretary as formal proposals which he must receive at least 21 days before the Board meeting, for circulation to the Board. The documentation should be self-contained, provide a complete briefing and include details of any financial implications. The Chairman will decide whether such items will be placed on the agenda of the following or subsequent meetings - or referred directly to appropriate bodies for comment.

7. Any Board Member who is personally concerned in any matter under consideration shall declare his interest and retire during the discussion, not voting thereon.

8. At the request of any Board Member, voting shall be by ballot.

9. Questions normally shall be determined by a simple majority of the votes of those present. In the case of an equality of votes, the Chairman shall have a second or casting vote.

10. If at any meeting business be introduced of which notice has not been given as a formal resolution at either the previous meeting or in the notice calling the meeting, any Board Member present shall be entitled to require that no vote or decision shall be taken on such business until the next Board meeting. When necessary for reasons of timing a postal or electronic vote may be substituted for a show of hands at a Board Meeting.

11. The ruling of the Chairman on any question under the Standing Orders, or on points of order or explanation, shall be final unless challenged by not less than five Members, or a majority of the Members present vote to the contrary.

12. Notwithstanding the above, the Board may meet together for the despatch of business, adjourn and otherwise regulate its meetings as it thinks fit.

13. With the agreement of a majority of the Members present, observers may be invited to attend all or any part of a Board meeting.

14. Proper minutes shall be taken of all business transacted at each meeting. Minutes are prepared by the Company Secretary, and circulated on the understanding that they are strictly confidential to recipients, and may not be disclosed to any other party. An agreed summary of the proceedings of the Board will be made public though the RSGB Web site, The UK Packet Network, the UK Amateur Radio Internet Newsgroups, as well as to Committee Chairmen and Members through the Society's Journal.

15. The Board operates on the principle of collective responsibility. Board Members and former Board Members are expected to support the views and decisions of the Board on which they serve or have served, whether or not they personally agree with them.

16. Board Members likely to incur abnormal expenditure on Society business are required to obtain prior authorisation from the Chairman of the Board.

17. Board procedures shall be based on the Bylaws, Memorandum and Articles of Association and the relevant parts of the Companies Acts.

18. Whilst acknowledging that Board Members are Directors of the Company with every legal right to visit RSGB HQ, it is not only courteous, but also assists in practical arrangements, this should only take place after prior liaison / notification with the General Manager or his nominated deputy to whom the purpose of the visit should be indicated. Board Members visiting HQ for any purpose are required to sign the visitors' book, observe any security measures in force, observe all Health and Safety regulations and comply with all current rules relating to conduct whilst in the building.

19. A Board member can be disqualified from service under Article 39.

Note 1: A resolution in writing signed by all Members of the Board shall be as valid and effectual as if it had been passed at a meeting of the Board.

Appendix 3 - RSGB Affiliated Societies, Groups and Clubs

Note: In this Appendix, the term "Society" refers to the Affiliated Society or Club, and not to the Radio Society of Great Britain, which is referred to as the RSGB.

RSGB Groups

RSGB Groups consist of ten or more RSGB Members organised to hold regular meetings and other events to promote the interests of the RSGB in a community. Appropriate officers should be properly elected. RSGB Groups are afforded the same facilities as Affiliated Societies, except receipt of the RSGB's Journal, provided that:

(a) Appropriate officers are properly elected.

(b) All Members are fully paid-up Members of the RSGB, a full list of Members to be provided on application.

Registration forms are available from RSGB Headquarters and on completion should be sent to the appropriate Regional Council Member for approval, as listed in the RSGB's Journal.

Affiliated Societies and Clubs

Many local societies or clubs interested in amateur radio and related subjects become affiliated to the RSGB. The benefits of affiliation include:

1. Publicity for club activities through "Club News" each month in the RSGB's Journal.

2. Full facilities of the RSGB QSL Bureau for cards bearing the club station callsign.

3. Book purchases at a discount via a club account with RSGB.

4. Freedom to borrow RSGB films, tapes and display materials. (This facility is also available to certain non-affiliated groups such as schools.)

5. Insurance facilities for club-owned equipment under the terms of the Amateur Radio Insurance Scheme.

6. Freedom to participate in the RSGB Affiliated Societies Contests.

7. Receipt of the RSGB's Journal.

Application Procedure

Societies which wish to become affiliated to the RSGB should make a formal application to the Society's General Manager, using the standard membership application form, signed by their Chairman or Honorary Secretary, which should include:

a) A copy of the constitution of the society or club. Guidance on a suitable constitution is given below.

b) A list of officers.

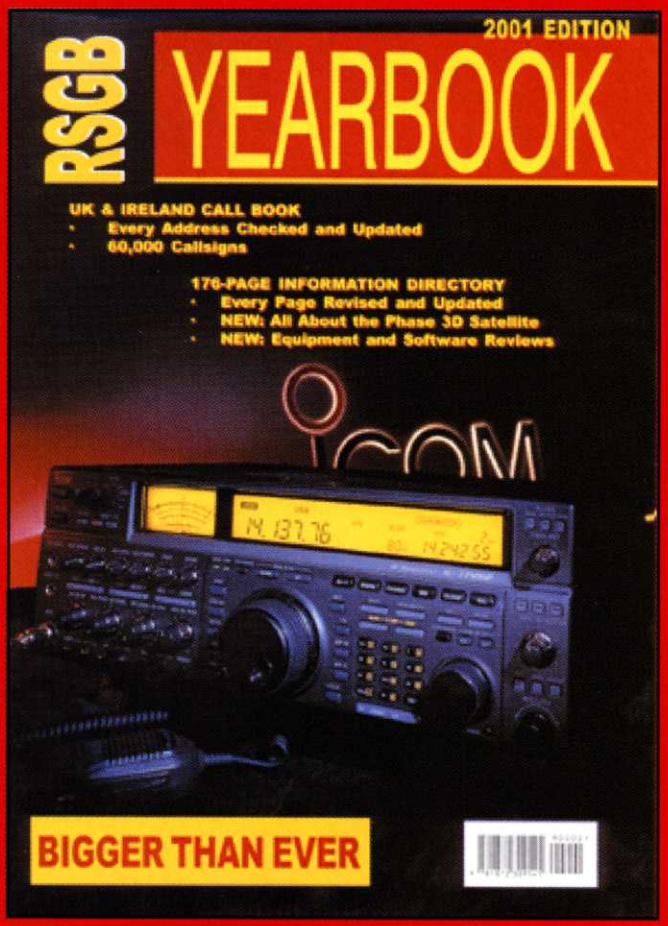
c) A statement of the number of members and the proportion who are Members of the RSGB.

The relevant paperwork should be sent to the appropriate Regional Council member, as given in each issue of the RSGB's Journal.

Constitution for RSGB Affiliated Societies

A model constitution for an Affiliated Society is available on application to the Society's headquarters.

YEARBOOK 2001



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"Brick-Wall" Selectivity

Today's Premier class operators demand the best RF weaponry available. Yaesu's exciting new MARK-V FT-1000MP answers the call, with an expanded array of receiver filtering, 200 Watts of power output, and Class-A SSB operation capability for the cleanest signal on the band. Enhanced front-panel ergonomics saves you precious seconds in a DX or contest pile-up. Yaesu HF design and manufacturing know-how ensures that no short-cuts have been taken in our effort to bring you the best HF transceiver money can buy. For more QSOs in your log, and more awards on your wall, there is only one choice: the MARK-V FT-1000MP from Yaesu!

I. IDBT: Interlocked Digital Bandwidth Tracking System

The IDBT feature greatly simplifies operation by matching the bandwidth of the DSP (Digital Signal Processing) system to the net bandwidth of the 8.2 MHz and 455 kHz IF stages. The IDBT system monitors the settings of the SHIFT and WIDTH controls, and automatically sets the DSP bandwidth to match the user settings within the net bandwidth of the Analogue IF Filtering.

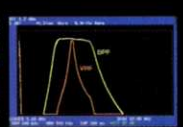
IDBT: A Breakthrough in Selectivity!

II. VRF: Variable RF Front-End Filter

Protecting the MARK-V's receiver components from strong out-of-band signals, the VRF system acts as a high-Q "Preselector," located between the antenna and the main bandpass filter networks, providing additional RF selectivity on the 160-20 meter Amateur bands for multi-operator contest teams, DX-peditions, or for operation near MW/SW broadcast stations.

10-pole Collins® Mechanical SSB Filter

VRF Features Large, High-Q Coils and High-Quality Relays



VRF Typical Bandpass Response (3.5 MHz)

III. 200 Watts of Transmitter Power Output

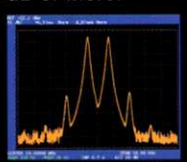
Utilising two Philips® BLF 147 Power MOSFETs in a 30 V push-pull configuration the MARK-V's Transmitter generates up to 200 Watts of the cleanest RF Power output available thanks to the conservative design of the PA Section.

Philips Power MOSFETs

High-Speed Automatic Antenna Tuner

IV. Class-A SSB Operation

Exclusively available on the MARK-V FT-1000MP , a press of a front-panel button engages Class-A SSB operation of the transmitter, at a power output level of 75 Watts. Class-A operation produces incredibly clean signal quality, with 3rd- order IMD suppressed 50 dB or more, and 5th- and higher-order products typically down 80 dB or more!



Class A 75 W PEP IMD

V. Multi-Function Shuttle Jog Tuning/ Control Ring

The immensely-popular Shuttle Jog tuning ring, which is concentric with the Main Tuning Knob, has a new look in the MARK-V: it now includes the activation switches for the VRF (left side) and IDBT (right side) features, so you don't have to move your hand position to activate these important circuits during contest or pile-up situations!

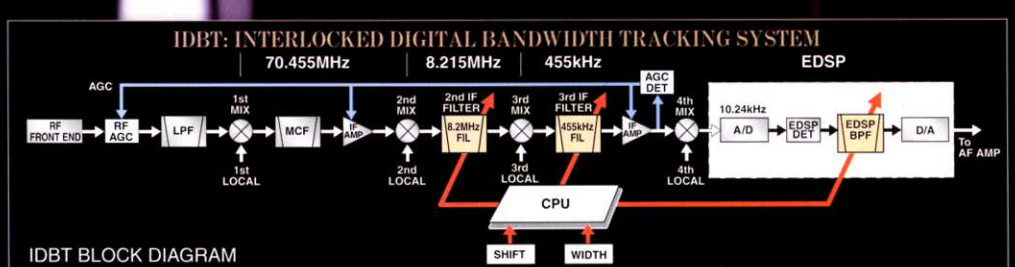
Access VRF and IDBT Features via Shuttle Jog Dial

DC 30 V / 13.8 V Power Supply FP-29

Photo shows optional MD-100A8X Deluxe Desk Microphone

HF 200 W All-Mode Transceiver

MARK-V FT-1000MP



IDBT BLOCK DIAGRAM

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