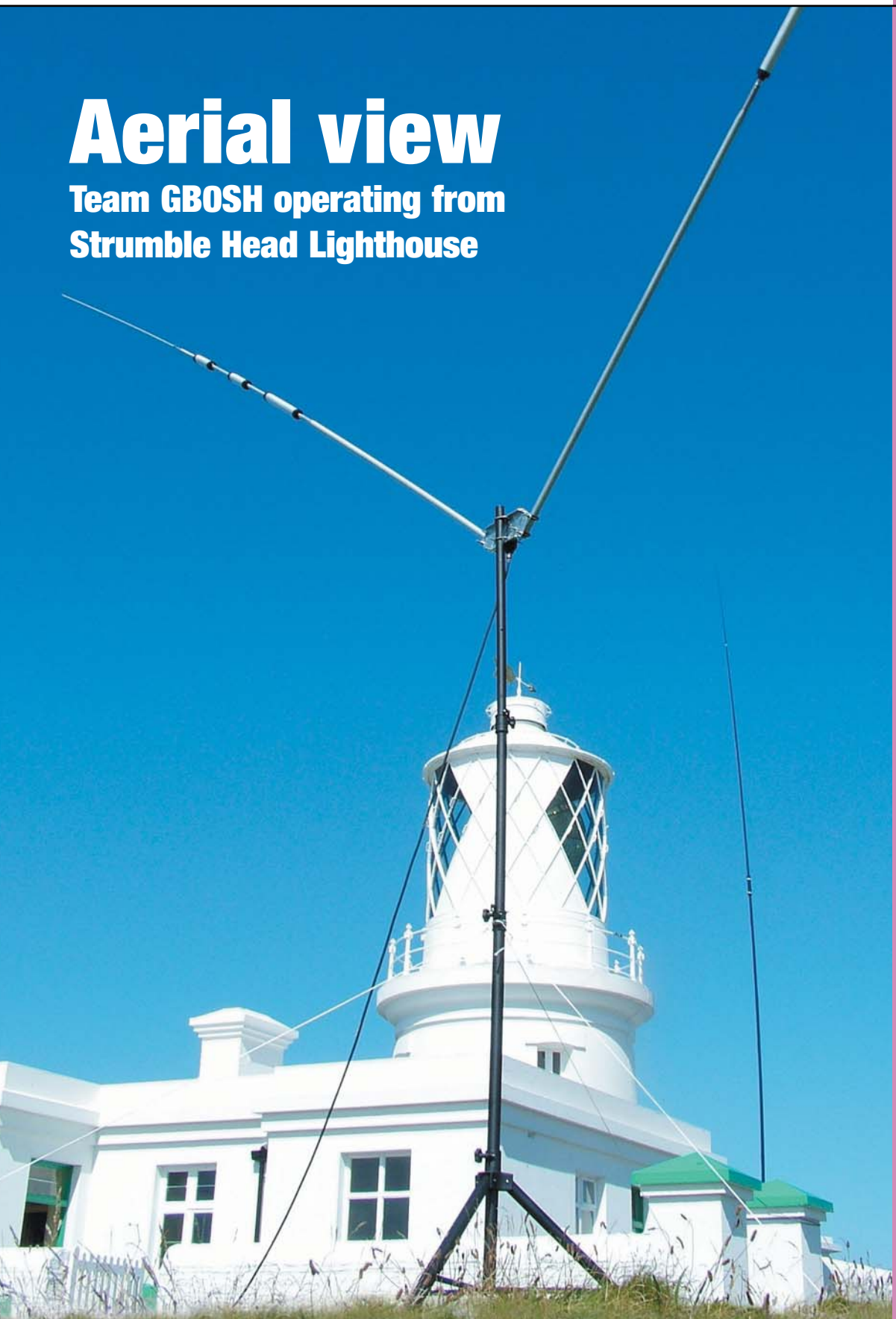
www.rsgb.org

The Radio Society of Great Britain Members' Magazine

RadCom

1005

£3.95 Vol 81 No. 10 October 2005



Aerial view

Team GBOSH operating from Strumble Head Lighthouse

INSIDE

WATERS & STANTON UK'S L

New Matlock Opening Hours: 9am-5pm Tuesday to Friday, 10am-4pm Saturday, Closed Monday

HEAD OFFICE & SOUTHERN STORE • SPA HOUSE, 22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS ENQUIRIES: 01702 206835/204965 FAX: 01702 205843
MIDLANDS STORE • W&S @ LOWE, BENTLEY BRIDGE, CHESTERFIELD RD, MATLOCK, DERBYSHIRE, DE4 5LE ENQUIRIES: 01629 832375 FAX: 01629 580020
SCOTTISH STORE • W&S @ JAYCEE, 20 WOODSIDE WAY, GLENROTHES, FIFE KY7 5DF ENQUIRIES: 01592 756962 FAX: 01592 610451-CLOSED MONDAYS

SPECIAL THIS MONTH

Icom's Fabulous IC-7800 200W Transceiver with *FREE* Delivery and *FREE* Matching SP-20 Speaker worth £165
No Deposit 12 months interest free finance
All this for....
£6400

Garmin C320 GPS

Car Navigation System

3.5" 16-colour screen pre-loaded with UK & Ireland Street maps!

Touch Screen - Speech Prompts - Route in Seconds - ETA and Speed - Built-in antenna - Screen Suction System - Quick Release - Internal Lithium Pack for out-of-car route planning - 12V Cigar Lead - USB cable - Europe Route Maps on CD - 128Mb Card - Auto Zoom - Future Map updates via Garmin

£399.95 B

PRICEMATCH!

We will match or beat any UK advertised price on UK sourced and UK guaranteed stock. Items must be in stock with the competitor and brand new - not B-Stock or old stock clearance.

CALL FREEPHONE SALES 08000 73 73 88

Visit our eBay shop for more bargains!

eBay

Go to www.wsplc.com then click on the link to our eBay shop

PAY NOTHING 'TIL 2006!

BUY NOW PAY LATER AT ALL 3 STORES

AVAILABLE ON ALL SALES OVER £200

You won't find a better deal!

Proof that at W&S you get the best possible deal. On selected items it is now possible to pay nothing for a whole year without incurring any interest charge. Amazing but true. And what's more, you get probably the best prices in the business. Give us a call today or visit one of our branches.

0% APR TYPICAL EXAMPLE OF BUY NOW PAY LATER. CASH PRICE £600. PAY NO DEPOSIT AND PAY THE FULL AMOUNT BY THE DUE DATE. PAY NO INTEREST.

OR

29.8% APR REPAY £31.53 PER MONTH FOR 36 MONTHS, AFTER THE 12 MONTH PERIOD . TOTAL AMOUNT DUE £1135.08. INTEREST IS CALULATED FROM THE DATE OF THE AGREEMENT.

ALL FINANCE SUBJECT TO STATUS WRITTEN QUOTATION ON REQUEST.

The NEW Waters & Stanton 2006

NEW

£3.95 + £1.75P&P

UK Radio Communications Equipment Guide 2006

Available from 1st October!

Order your copy now or come and see us at the Donnington Park Rally on Sept 30th & Oct 1st 2005

• Free Carriage Vouchers • 400 Pages • Full Colour • Articles & Reviews • Detailed Spec on every piece of Ham Gear • Over 4000 Products

FAST SAME-DAY DESPATCH

www.wsplc.com

GREAT AFTER-SALES SERVICE

FREEPHONE ORDER LINE **08000 73 73 88**

NEW HANDS-FREE MOBILE SYSTEM

Available end of September

Supplied with easily detachable lead to match your radio - so you can change radios in the future with ease!

Delivery expected in July

More Great Ideas!

£39.95

Code WM-S

An economical way of staying legal. Flexible boom microphone mounts under sun vizor bolt and PTT box mounts on gear changer. All powered from rig mic socket!

PTT Box

Icom HF Transceivers

ICOM IC-756 PRO MkIII

Top of its range HF transceiver. HF & 50MHz, features large colour LCD with spectrum scope, auto ATU and 32-bit floating point DSP unit.

£2099 C

IC-7800 £6400 C
Flagship HF 200W transceiver. 200W max. The ultimate receiver - the ultimate design! AC psu built in.

IC-7800-PACK £6995 C
The superb transceiver as above plus 17" flat screen, keyboard and SM-20 base microphone.

IC-7400 £1299 C
HF/VHF 160m - 2m transceiver 5 - 100W. SSB CW FM AM. 12V DC. Nice big display. Lovely price.

IC-706 MkIIGDSP £769 C
It's unbeatable. 160m - 70cm (up to 100W HF) yet so small with detachable head. The ultimate mobile.

IC-718 £449 C
This is a budget class radio HF 16 - 10m at a price that belies its performance. Beautiful display.

IC-703 *Free IC-703 Logbook* £539 C
Take an IC-706, reduce power to 10W max and get rid of VHF. 160 - 6m of pure QRP joy!!

NEW IC-7000 £Phone!
The new IC-7000 is **NOT a replacement** for the IC-706 but is a very much up-market design. It is in a box about the same size as the IC-706 but very much like an IC-756 in concept. This will be **THE mobile rig** that others will have to aspire to!!.

Kenwood HF Transceivers

KENWOOD TS-2000

Top-of-the-range Kenwood transceiver. HF/VHF/UHF or up to 23cm with the optional module. Built-in auto ATU, DSP and its unique TNC.

£1389 C

TS-2000
The station in a box. 160m - 70cm with every feature imaginable inc. DX cluster. Kenwood fans dream rig.

TS-2000X £1799 C
Take the TS-2000 and add a superb 23cm module. The best 23cm we know of plus all other bands!

TS-B2000 £1299 C
Designed for the 21st century. You get HF - 70cm with PC software for direct PC control. It works great.

TS-570DG *Low Price* £799 C
The best budget radio at the price. Superb 100W from 160m to 10m. As used by Peter Waters, G3OJV

TS-50S £595 C
A great rugged mobile for 160m to 10m with up to 100W output. Also a great price.

TS-480SAT *Special* £699 C
HF 160m - 6m with remote front panel. Large enough for base use, small enough for mobile. Big display

TS-480HX *Special* £799 C
Take the TS-480SAT, remove the auto ATU and offer a beefy 200W output. That's a really potent package!

Yaesu HF Transceivers

YAESU FT-857D

Our best selling Yaesu HF Rig. Since the price came down from £849 to £579 we can't get enough of them! 160-70cm mobile with up to 100W output. Lovely tuning control from remote head unit .

£579 C

FT-1000 MKV £2099 C
200W HF Transceiver, with EDSP, Collins filter, auto ATU, 220V AC PSU - One of the finest rigs available.

FT-1000 FIELD £1699 C
The HF choice for DXers. With this rigs reputation on DXpeditions what more persuasian do you need?

FTV-1000 £729 C
6m 200W module for the FT-1000 range. Probably the ultimate for 6m DXing.

FT-897D £649 C
160m - 70cm self-contained portable. 100W and up to 20W from optional internal batts.

FT-847 £999 C
Complete station in a box! 160m - 70cm - up to 100W (50W 2m/70cm). Great for satellite work.

FT-840 £399 C
Is there any other radio that comes close to this price? One of our all-time best sellers. 100W 160m - 10m

FT-817ND £Phone C
The ultimate QRP self-contained radio. Up to 5W output 160m - 70cm. New low price. UK warranty.

FT-817DSP £589 C

Warning - as a regular advertiser you can be sure all our stock is genuine UK warranted. Check serial numbers!!

Carriage Charges: A=£3, B=£6, C=£10

OWEST PRICES

ZERO DEPOSIT ZERO INTEREST

Enquiries 01702 206835

Freephone Orderline 08000 73 73 88

Icom VHF/UHF Mobile/Base

ICOM IC-E208

VHF/UHF FM Dual Band Mobile Transceiver
**Freq range 144-146MHz, 430-440MHz Tx*
**55/50W (3 pwr steps each band)*
**Wideband Rx 118-173, 230-549 & 810-999MHz*
£239 C

IC-910H £1099 C
2m / 70cm 100W Base station all - modes with option for 23cm module (**UX-910 £359**)

IC-910HX £1249 C
As above but with 23cm module ready fitted and a big saving as well.

IC-2200H £179 C
2m 55W FM mobile with rugged construction and with digital option.

IC-2725E £269 C
Icom's dual band 2m / 70cm radio. Very easy to operate and install and a lovely detachable head.

Kenwood VHF/UHF Mobile/Base

KENWOOD TMD-700E

2m/70cm dual band mobile transceiver with APRS. Does not need extra high cost boards to function. Only extra if required is a compatible GPS receiver. **£439 C**

TM-G707E £269 C
Dual Band 2m & 70cm with detachable front

TM-V7E £359 C
Dual Band 2m & 70cm with 50/35W output

TM-271E £189 C
Dual Band 2m FM 60W mobile transceiver

Yaesu VHF/UHF Mobile/Base

YAESU FT-7800E

**2m/70cms Dual Band Mobile*
**High power 50W 2m /40W 70cms*
**Wide receive inc. civil & military air-band *CTCSS & DCS with direct keypad mic.*
**Detachable front panel *1000 memories plus five one-touch*
£229 C

FT-2800M £159 C
*2m FM Mobile transceiver * High power 65W * Capable of VHF wideband receiver

FT-8800E £269 C
*2m/70cmDualband FM Mobile transceiver * 50W 2m, 35W 70cm * Wideband receiver

FT-8900R £339 C
*2m, 70cm, 6m & 10m Quadband FM Mobile transceiver * Independent dial for each band

YAESU ADMS Software

Programme all your radio's functions and memories in a fraction of the time using Windows - - - - - and save to disc!

+ FREE PC RADIO DATA LEAD

Versions available for: FT-857/FT-897, FT-817, FT-8800, FT-8900, FT-7800, FT-2800, FT-60E, VX-7 (needs CT-91), VX-6E, VX-2E, VX110/150, VR-500

State model when ordering **£39.95 A**

Icom VHF/UHF Handhelds

IC-E90 Special!

The new E-90 offers triple band coverage of 6m, 2m and 70cms. Up to 5W output and rx cover-age from 495kHz - 999MHz makes this a very attractive rig.
£199 B

NEW IC-V82 Digital Handy NEW
Now in Stock! **£159 B**

Kenwood VHF/UHF Handhelds

KENWOOD TH-F7E

• 144-146MHz Tx/Rx: FM
• 430-440MHz Tx/Rx: FM
Up to 6W out with Li-ion bat-tery and **"scanner" style coverage from 100kHz to 1300MHz** including SSB on receive! This is a great radio to have at all times when you are on your travels. **£239 B**

TH-D7E £299 C
2m/70cm dualband FM handheld transceiver with data communications

TH-G71E £179 C
2m/70cm dualband FM handheld transceiver

TH-K2E £139 C
2m FM 5W portable transceiver c/w Ni-MH battery/charger

TH-K2ET £145 C
2m FM 5W portable transceiver c/w Ni-MH battery/charger

TH-K4E £139 C
70cm FM 5W portable transceiver c/w Ni-MH battery/charger

Yaesu VHF/UHF Handhelds

YAESU VX-6E

NEW

2m / 70cm Handheld Transceiver, Wideband receive including AM Airband. Plus a Built-In Morse Tutor.
In Stock Now! **£199 C**

VX-7R Special Offer £209 C
6m/2m/70cm handheld with huge 132x64 dot matrix display, choose black or silver

VX-2E £119 C
2m/70cm miniature handheld transceiver with LiON battery/charger

VX-110 £94 C
2m handheld transceiver with 8-key keypad NiCd & charger

VX-150 £99 C
2m handheld transceiver with 16-key keypad NiCd & charger

Alinco VHF/UHF Handhelds

DJ-V5E £159 C
2m/70cm FM 5W dualband handheld transceiver

DJ-193E £91 C
2m FM transceiver no keypad, Ni-Cds & charger

DJ-195E £99 C
2m FM transceiver with keypad Ni-Cds & charger

Linear Amp UK HF Linear Amplifiers

RANGER 811H

**1.8 - 29.7MHz*
**800W CW or SSB, 400W RTTY*
**Uses 4 x811A vertically mounted*
**Drive 10 - 100W*
**Toroidial AC Power Transformer*
**6:1 Reduction Drive on Tuning Controls *"Near Silent" Papst Cooling fan *Front-panel ALC Adjust Control *Built-in AC 230V @ 8A Supply*
£945 B

CHALLENGER III £1795 C
HF linear amplifier 10-160m WARC 100W in 1.5kW out

Ameritron HF Linear Amplifiers

NEW LOWER PRICES!

AL-1200XCE £2295.95 C
HF linear amp 10-160m 1.5kW

AL-1500XCE £2595.95 C
HF linear amp 10-160m 1.5kW

AL-800HXCE £2495.95 C
HF linear amp 10-160m 1.5kW

AL-82XCE £2295.95 C
HF linear amp 10-160m 1.5kW

AL-80BXCE £1395.95 C
HF linear amp 10-160m 1.5kW

AL-811HXCE £849.95 C
HF linear amp 10-160m 500W (3x811A)

ALS-500MXCE £819.95 C
HF linear amp 10-160m 500W solid state

ALS-600X £1299.95 C
HF linear amp 10-160m 600W (export only)

SGC HF Linear Amplifiers

SG-500 £1399.95 C
"Power Cube" 1.6-30MHz 500W solid state

Yaesu HF Linear Amplifiers

QUADRA (VL-1000) £3795 C
HF + 6m linear amp. 1kW comes with PSU

Tokyo Hy-Power HF Linear Amplifiers

HL-1KFX £1399.95 C
HF linear amp. 1.8-29.7MHz 500W PEP max, solid state

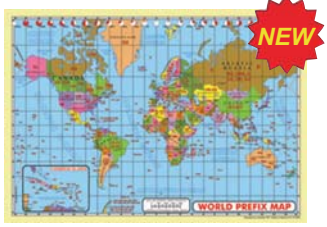
HL-2KFX £2695.95 C
HF +6m linear amp 1.8-29.7MHz + 50MHz 1kW PEP max, solid state

HL-100BDX £429.95 C
HF+ 6m linear amp 3.5-29.7 & 50MHz 1-10W in 100W PEP solid state

WATSON VALUE

NEW STOCK & OFFERS

W&S World Prefix Map



NEW

This attractive full colour map for amateurs and SWL's alike is split into regions, each highlighted in a different colour with the amateur prefixes in red. On the A2 map there are more details regarding islands.. Both sizes are laminated in flexible plastic.

A2 Size (WPMM-MAP) **£4.99 A**
A3 Size (WPMD-MAP) **£2.99 A**

YAESU FT-60E

NEW

**Wide band Reception 108-520MHz & 700-999.990MHz (Cellular blocked)*
**New Emergency Automatic ID System*
**High 5W Power Output*
**Ni-MH Long-Life Battery FNB-83 (7.2V,1400mAh)*
**Programmable Keys for user convenience*
**Split CTCSS/DCS and DCS Encode-Only Capability.*
£179 B

NEW MFJ-935B /936B "Magic Circle" Loop Tuner

This is the most amazing antenna we have seen in years. For optimum results take a wire around 1/5th wave long, bend into square loop (14ft on 20m = 3.5ft square) and attach to MFJ-935. Result: Ultra low indoor noise and VK, ZL & W all on SSB! That's what we achieved in one day's operation! 20m loop works on 15m as well. Now in Stock! Great for QRP and portable as well.

MFJ-935B is portable version with smaller meter internal coil. **£179.95** **MFJ-936B** has larger meter and is ideal for base use. **£229.95**. You use your own wire to make loop (approx 1/5 wave total length for lowest band) or purchase **MFJ-57B** with cross arm and wire for 20/17/15m - approx 2ft per side **£39.95**. **MFJ-58B** has addition of wire for 40/30m **£54.95**

Watson Mobile Antenna's

ANTENNAS

W-2LE	1/4 wave 2m 0.48m 200W	£9.95 B
W-285	5/8th 2m 1.33m long 200W	£14.95 B
W-77LS	2m/70cm 0.42m 50W	14.95 B
W-770HB	2m/70cm 1.1m 200W	24.95 B
W-7900	2m/70cm 2m/70cm 1.58m	£32.95 B
WSM-270	Dual band mini magnetic	£19.95 B

BASES

WM-08	8cm diam magnetic	£9.95 A
WM-14B	14cm diam magnetic	£12.95 A
W-3HM	Hatch mount	£14.95 A
ECH	Cable kit	£10.95 B

NOTE: All antennas have PL-259 ends. Mag mounts have cable attached. Hatch mount needs ECH cable.

Carriage Charges: A=£3, B=£6, C=£10

WATERS & STANTON @ JC Jaycee Present

YAESU
KENWOOD
ICOM
MFJ
DIAMOND
CUSHCRAFT
HEIL

SCOTLAND'S BIG HAM RADIO OPEN DAY

HIGH SIERRA
HYGAIN
KENT
LDG
LINEAR AMP UK
MICROSET
MIZUHO
MIRAGE
OPTOELECTRON
ICS
OREGON
RADIOWORKS
REVEX
SGC
TONNA
WATSON
YUPITERU
ZX

SATURDAY 15TH OCTOBER 2005

Opens 10am

AT OUR SCOTTISH BRANCH
RUN BY BILL & BETTY
JAYCEE ELECTRONICS
20 WOODSIDE WAY,
GLENROTHES, FIFE, KY7 5DF.

* ALL OF OUR POPULAR PRODUCTS
* VERY COMPETITIVE PRICES ON THE DAY
* SPECIAL OFFERS FOR VISITORS
* TRADE STANDS & REFRESHMENTS IN ADJACENT HALL
* KENWOOD, YAESU & ICOM STANDS
* OUR NEW 2006 EQUIPMENT GUIDE WITH MONEY SAVING VOUCHERS

FOR MORE DETAILS :-
tel: 01592 756962
email: jayceecoms@aol.com

BILL, MM0HAY. BETTY, MM3BHG.
SCOTT, 2M0HAY.

RadCom
RADIO COMMUNICATION

Editor
Alexander Kearns

Technical Editor
Dr George Brown, M5ACN

Secretarial
Vicky Keep

Advertising Design
Jodie Escott, M3TPQ

All contributions and correspondence concerning the content of RadCom should be posted to:
The Editor, Radio Communication,
Lambda House, Cranborne Road
Potters Bar, Herts EN6 3JE
Tel: 0870 904 7373
Fax: 0870 904 7374
E-mail: radcom@rsgb.org.uk

ADVERTISING
All display and classified advertising enquiries (excepting Members' Ads) should be sent to:
Chris Danby, G0DWV, Danby Advertising,
299 Reepham Road,
Hellesdon, Norwich NR6 5AD
Tel: 0870 904 7377; **Fax:** 0870 904 7378;
E-mail: adsales@rsgb.org.uk

Notices to readers concerning errors and omissions and advertisements can be found at www.rsgb.org.uk/news/radcom.htm#notices

RadCom is published by the Radio Society of Great Britain as its official journal on the first day of the relevant month and is sent free and post paid to all members of the Society.
Closing date for contributions, unless otherwise notified, is five weeks prior to publication date.

Designed and printed by Space Matters,
60 Borough High Street, London SE1 1XF.

RSGB MEMBERSHIP – Annual Rates

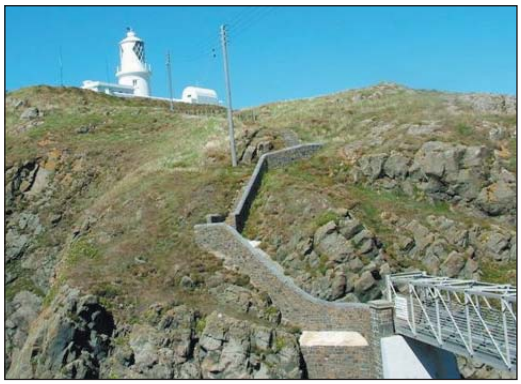
Home Corporate	£42.50
Overseas Corporate	£42.50
Corporate (Senior Citizens)	£33.50
(Applications should provide proof of age at last renewal date)	
Corporate (50 years membership)	50% DISCOUNT
Corporate (60 years membership)	FREE
Family member	£18.50
(Must reside with existing member. Does not include RadCom)	
Student Members	£28.50
(Applications should include evidence of full-time student status)	
HamClub (under 18)	£18.50
Affiliated Societies (UK or Overseas)	£42.50

Subscriptions include VAT where applicable.
Special arrangements exist for blind and disabled persons. Details and membership application forms are available from RSGB HQ.

P&P on RSGB orders: £1.75 for 1 item, £3.30 for 2 or more items. Overseas rates on request.

Contents

October 2005



p42 – Strumble Head Lighthouse on St Michaels Island, from where team GB0SH operated during Lighthouse on the Air Weekend

p45 – The Leicester Amateur Radio Show

RSGB matters

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.

GENERAL MANAGER AND COMPANY SECRETARY:
Peter Kirby, FCMI, MISM, G0TWW

HONORARY TREASURER:
Position vacant

BOARD OF THE SOCIETY
PRESIDENT
J D Smith, MI0AEX
MEMBERS
G L Adams, G3LEQ
R J Constantine, G3UGF
E A Cabban, GW0ETU
D G C Hicks, G6IFA
K A Wilson, M1CNY
C J Thomas, G3PSM
A G Annan, C Eng, MIEE, MM1CCR
D V Wilson, M0OBW

REGIONAL MANAGERS
K A Wilson, M1CNY
G M Darby, G7GJU
E A Cabban, GW0ETU
G Hunter, GM3ULP
K Frankcom, G3OCA.
B Scarisbrick, G4ACK
P Thomson, GM1XEA
G Price, GW3MPP
P Berkeley, M0CJX
I Rosevear, G3GKC
P Lowrie, MI5JYK
P Brooks, G4NZQ
Details of the Society's volunteer officers can be found in the RSGB Yearbook 2005

HEADQUARTERS AND REGISTERED OFFICE
Lambda House, Cranborne Road,
Potters Bar, Herts EN6 3JE
Tel: 0870 904 7373
Fax: 0870 904 7374
All calls to the RSGB are charged at National Rate
QSL Bureau address:
PO Box 1773, Potters Bar, Herts EN6 3EP
E-mail addresses:
sales@rsgb.org.uk
(books, filters, membership & general enquiries)
GB2RS@rsgb.org.uk
(GB2RS and club news items)
RadCom@rsgb.org.uk
(news items, feature submissions, etc)
AR.Dept@rsgb.org.uk
(Examinations, beacons, repeaters, GB calls, licensing)
IOTA.HQ@rsgb.org.uk (Islands On The Air)
GM.Dept@rsgb.org.uk (managerial)

Website: www.rsgb.org
WebPlus: Members-only web site **www.rsgb.org/membersonly** Use your callsign in lower case as the user name, and your membership number (see RadCom address label) as the password.

Amateurs have their say on future of amateur radio licensing

The Radio Society of Great Britain would like to thank all those who submitted their responses to Ofcom's consultation into the future of amateur radio licensing.

This was one of the longest, most comprehensive and significant consultations in the history of amateur radio. Decisions made as a result of the consultation will have an impact on amateur radio in this country for many years to come.

From the outset of the consultation, as the national organisation representing all UK radio amateurs, the RSGB has sought to ensure the maximum number of radio amateurs were able to have their say.

The RSGB undertook a programme of public meetings across the UK, starting in Northern Ireland on 8 June and ending in Swansea on 28 July. These meetings provided RSGB officials with a chance to hear first hand what radio amateurs want from their licence.

Alongside the public meetings, the RSGB's regional teams also carried out over 70 club visits. Amateurs, both members and non-members, have also written and e-mailed the society with their views.

RSGB general manager Peter Kirby said: "It is fair to say we now have a clearer view and understanding of what the amateur radio community would like to see if Ofcom decides to carry out changes to the current licensing regime."

The RSGB's research reveals that radio amateurs are generally comfortable with the concept of an electronic licence but if such a licence were introduced, they want to see adequate security measures built in to ensure that fraudulent applications cannot be made and that the integrity of the licence is maintained.

The majority of radio amateurs, the RSGB believes, are not in favour of a lifetime licence. There is concern that this would lead to degradation of the amateur radio database – an out-of-date listing of radio amateurs could lead to an increase in callsign piracy and more interference on the bands.

The option of a free licence also appears unpopular. Amateurs feel strongly that a free licence would devalue the amateur radio service and weaken the position of amateur radio in any future consultations. There is concern that a free licence would enable Ofcom or any future administration to withdraw the amateur radio spectrum without consultation.

Many amateurs queried why there needed to be any change at all. They were happy with the current licensing arrangements and if there were to be change, then a licence for a longer period of time was the preferred option. The most popular proposal was for a five-year licence.

Proposals to make amateur radio licence exempt were rejected outright. This view was also supported by a number of interested outside agencies. However, payment for NoVs and any licence changes would not raise any objections because amateurs understand that the hobby should be financially self supporting.

Summing up, radio amateurs in general would welcome a five-year licence, retaining the fee. A move to make the delivery of the licence an electronic process would also be welcomed. However, for those amateurs who still want a paper licence, this type of licence should continue to be available without any financial penalties. At no time should any attempt be made to make amateur radio licence exempt.

RSGB and RCF take on examination responsibility

For the first time since the RSGB asked the City and Guilds in 1946 to run a formal radio amateurs examination, the responsibility for licensing examinations in the UK has passed to radio amateurs. On 1 September, Ofcom stood down as the examination body and the task of running the Radio Communications examinations has been given to the Radio Communications Foundation (RCF) and the RSGB.

The RCF will accredit the examinations and, as now, the RSGB will do the day-to-day administration. To ensure that the high standards are maintained, the current examination moderating body will remain in place. Originally set up by City and Guilds and then appointed by Ofcom, this group is independent of both the RCF and the RSGB. It is made up of a mixture of academics, engineers, teachers and experienced radio amateurs, and is responsible for monitoring the question banks and the examinations.

The RSGB is committed to ensuring that all three examinations, Foundation, Intermediate and Advanced, are available at short notice, and that the high standards of instruction and the availability of test centres are maintained. The RSGB will also be introducing more spot checks to ensure that the examination procedures are adhered to. This will give radio amateurs full confidence in their examination scheme.

Congratulations

Below are RSGB members who passed the 15 August Intermediate Examination
Robert Head, M3KFK
Fred Coles, M3KFR
Clive Collins, M3UGC
Maurice Pridmore, M3HJZ
Iain Le Coutour Bisson, M3JFZ
Martin Lee, M3JFY
Mark Train, M3JFT
Andrew Claxton, M3FMF
Paul Green, M3IZF
Leonard Powell, MW3IIZ
Maurice Chell, MW3NRA
Peter Harris, M3HNJ
Jonathan Perry, M3JPE
Robert Gray, M3RFG
Gordon Paterson, MM3JHZ
Zak Jannings
Gareth Jones, M3OPP
Toby Cattrell, M3IOE
Fred Smith, M3HGK
Brian Moorhouse, M3HIF
Trevor Pagden, M3PAG
Colin McDonnell, M3JVQ

Below are RSGB members who passed the 9 July Advanced Examination
David Sharp, 2E0BAN
Daniel Schlieper, 2E0CAX
Dermot Conner, 2E0KDC
Victor Stocker, 2E0VCS
Gary Taylor
Melvyn Torrington, 2E0SDG
Michael Prior-Jones
Michael Capper, 2E0MSC
David Burkin, 2E0ELY

Steven Old upgraded from 2E00LD to M00LD on 17 May

Listen to GB2RS on your iPod

The Radio Society of Great Britain's GB2RS news service is now available as a podcast. To access our podcast, you will need the latest iTunes software from Apple. This software can be downloaded for free from the Apple website (www.apple.com/uk/) and works with both PC and Macintosh computers.

Once you have downloaded and installed iTunes, you will need to set up the software to automatically download the latest GB2RS news in MP3 format. You can do this by clicking on the "Advanced" menu option and then selecting "Subscribe to Podcast". You will then have to enter a special web address into the box that pops up.

The address is: www.rsgb.org.uk/rss/gb2rs_rss.xml

The latest issue of GB2RS should now automatically download when it is available. The GB2RS MP3 file will then be copied to your iPod or other MP3 player when you connect it to your computer.

The GB2RS podcast is made possible thanks to the hard work of Jeremy Boot, G4NJH, who records his GB2RS broadcast onto an MP3 file each week. More details are available on his website (homepage.ntlworld.com/g4njh2/rsgb.html).

Supporters of the Radio Communications Foundation

We asked members when renewing their membership to include a donation to help to continue to support the work of the Radio Communications Foundation. The following is the list of those members who have kindly sent in a donation by the deadline date for this issue. Contributions continue to be wanted: if you would like to help, please send your donation to RCF, c/o RSGB HQ.

Mr R T Whitfield, 2E0RTW
Mr R Macfarlane, 7Q7RM
Mr D J Walsh, EI5CD
Mr R Boitiaux, F9TZ
Mr R Dresser, G0FDA
Mr C James, G0GFY
Mr K L Mills, G0GIN
Mr B W Vanson, G0MBP
Mr A Smith Williams, G0MJV
Mr H Gorman, G0MVG
Mr LCV Duncan, G0OLK
Mr M L Green, G0SGQ
Mr BA Whalley, G0TKH
Mr P D Pugh, G1MLO
Mr P J Brolan, G1MPU
Mr J C Hyde, G1NML
Mr E Parkes, G1PEY
Mr P D Beardshaw, G1UGL
Mr G L Sanderson, G2DBT
Mr A Williams, G2DQW
Mr J H Knowles, G2FXS
Mr R B Miller, G3CJI
Mr J L Salter, G3DQC
Mr R A Lord, G3DSK
Mr E R Tudor, G3INY
Mr A A Blythe, G3LOJ
Mr R P Smith, G3SVW
Mr I D Brown, G3TLH
Mr MH Roach, G3TWJ
Mr M I Vincent, G3UKV
Mr GHS Jones, G3VKV
Mr M R Hall, G3VQQ
Mr KW Hedges, G3XMR
Mr W E Kent, G3YCN
Mr R J Blasdell, G3ZNW
Mr SW Taylor, G4CKX
Mr J E Fletcher, G4EGB
Mr K Middleton, G4EJH
Mr G Mayo, G4EUF
Mr K W Turner, G4GZB
Mr D J Byers, G4IZU
Mr D J Byers, G4IZU
Mr A Rhodes, G4KIJ
Mr W Hughes, G4LVY
Mr R N Byford, G4MKR
Mr A Nevison, G4OSH
Mr K Hall, G4OSK
Mr J Muzyka, G4RCG
Mr DJP Herd, G4SOZ
Mr P Barnett, G4TMC
Mr R Handstock, G4TOY
Mr D Blackwell, G4UFX
Mr B Crow, G4UYJ
Mr C Dawson, G4UZS
Mr A M Palmer, G4VDF
Mr G R Dymond, G4VQL
Mr JNR Wiles, G4WQZ
Mr C S Moore, G4ZOX
Mr J K Woodhouse, G6GPF
Mr M R Law, G6OKU
Mr A Biggin, G7DGE
Mr P S Spencer, G7DUB
Mr D A Barnes, G7EMK
Mr M K Parkyn, G7EYM
Mr B G Whittock, G7IYA
Mr D J McLean, G7IZS
Mr J J Bright, G7OCT
Mr K J Turner, G7RYO
Mr R Elgy, G8EZT
Mr T M Gill, G8IBO
Mr GL Robotham, G8KLH
Mr A J Cox, G8NJF
Mr J M Short, G8OQN
Mr A P Ball, G8PSF
Mr JEH Spencer, G8UMA
Mr H T Tillotson, G8XIZ
Mr G L Clarke, G8XXV
Mr S J Trott, G8ZOE
Mr RT Sherrard, GI3VAW
Mr H R Mesny, GJ3LFJ
Mrs P J Mackenzie, GM0HNV
D J Simpson, GM3LVA
Mr J B Macphee, GM3VNW
Mr R Brown, GM4IKU
Mr A P Hamon, GU4WTN
Mr S P Ward, GW1XVC
Mr M Holland, GW3IWM
Mr AE Gwynne, GW3LNR
Mr C A Long, GW4OJT
Mr L D Connery, GW4ZBN
Mr D Beynon, GW7VGB
Mr G C May, GW8TIX
Mr R Lanfranco, I2RR
Dr R D Johnson, KR4M
Mr T O Bevan, M0ACV
Mr RM Glover, M0BJX
Mr M Fitchett, M0BMX
Mr D E Francis, M0CDV
Mrs L M Taylor, M0CMK
Mr EMB Brendish, M0CMQ
Mr J P Drummond, M0CQW
Mr DAC Tanner, M0DAC
Mr D G Morris, M0DAV
Mr K Dunstan, M0RSJ
Mr M J Sweeney, M0SWE
Mr K Brown, M0TCP
Mr S Knight, M0UNC
Mr D Hart, M1CHN
Mr A Toomer, M1ETX
Mr K J Wright, M1EVH
Mr D R Coombes, M1VPN
Mr P Alce, M3PBA
Mr J S Woods, M5JSW
Mr D Hulin, MM0XPG
Mr R Hyslop, MM3FFR
Mr J Stewart, MM3FWQ
Mr A M Leszczuk, MM3GPF
Mr E W Roberts, MW3EWR
Mr K H Hagemans, PA0JOH
Mr P Norman, RS37046
Mr A W Tideswell, RS48462
Mr RL Dries, RS8137
Mr I Dobnik, S51DI
Mr M Zgadzaj, SP6NIN

The RSGB is also grateful to those many generous members who have sent donations anonymously, or who have asked us not to publish their names.

RSGB books donated by Sheffield ARC

Sheffield Amateur Radio Club is playing an important role in raising the profile of amateur radio among youngsters. The club has donated several RSGB amateur radio books to Wisewood School's library.

The donation of the books – which were supplied by the RSGB – follows further good work at the school. In March, Sheffield ARC gave a demonstration of amateur radio's amazing capabilities to almost 200 of Wisewood's year seven pupils. The youngsters were treated to a live link up with a school in Indiannapolis, USA. Now, the club is planning to help some of the pupils to study to become M3s.

Sheffield ARC meets on Monday evenings at 19:30 at the Sheffield University Staff Club, 197 Brook Hill.
The club's website is www.sheffieldarc.org.uk

Are you an expert in propagation and teaching?

The Radio Society of Great Britain is inviting radio amateurs with expertise in propagation to apply to become members of its Propagation Studies Committee. Applicants should have a lively and informed interest in propagation and an enthusiasm for sharing their knowledge of propagation with others.

Most of the committee's current members undertake personal research projects into propagation but this is not an essential requirement. More important is that applicants have the teaching skills to raise levels of understanding of propagation.

While the committee is particularly interested in new members with HF or microwave expertise, it will also consider applicants with experience in other parts of the spectrum. If you think that you match these criteria, contact the committee's chairman, Martin Harrison, G3USF.
His email is:
psc.chairman@rsgb.org.uk

Call for RSGB members to raise funds for blindness charity

The British Wireless for the Blind Fund is calling on radio amateurs to help it raise money by participating in its annual radio competition called Transmission. The idea is that amateurs ask their friends, family and workmates to sponsor them for contacts made over the 48-hour duration of the tournament.

Trophies are awarded to individuals and groups who make the most contacts or raise the greatest amount of money for the charity. Certificates will also be sent to all individuals and groups who either raise more than £10 or who make a donation of at least £10. In order to qualify for a trophy, amateurs must be a current member of the RSGB and resident in the UK. However, overseas amateurs and non-members of the society are also invited to join in the fun and raise funds for the charity.

This year's Transmission competition is taking place over 24-25 September. A full list of competition rules and sponsorship forms can be downloaded from the British Wireless for the Blind Fund's website – www.blind.org.uk. To ensure you are eligible for the trophies, please register for the competition by emailing transmission@blind.org.uk, making sure to include your postal address. You will then be sent updates about the competition and also free QSL cards as soon as they are available.

HFC2005

Gatwick Worth Hotel
7th - 9th October 2005

The World's Premier Amateur Radio Convention

Win an FT 897

Donated by Yaesu

in the RSGB DXpedition Fund Raffle

2nd Prize: Venus 80 Arno EH Antenna - donated by ML&S
AND MANY OTHER PRIZES

After the success of the 2004 event we return again to the Gatwick Worth Hotel. This year the date is back to our "normal" weekend that is at the end of the first full week in October. For those who did not come last year the Gatwick Worth Hotel is well served by road links, being located just off M23 Junction 23 (look on the HFC2005 website for local directions or put the hotel's post code RH10 4ST into your favourite online route-planner). For those coming by plane or train the hotel runs a shuttle bus to nearby London Gatwick Airport.

The convention is quite different from a rally. Whilst there is a small trade exhibition by our main sponsors, the event aims to be a social event where people meet each other, exchange ideas and share experiences. The weekend is open to all - not just RSGB members! Whilst we have a core of amateurs who regularly attend, the atmosphere is relaxed and friendly which helps to encourage newcomers feel part of the event as well as to help them make new friends and acquaintances. Whilst the focus of the lectures is HF - DXpeditioning, IOTA, contesting, propagation and aerials - over recent years there has been a significant broadening of the scope of the event to cover other topics and technical issues. Thus, for example, the event has become one of the main places to learn about 136kHz techniques, what is happening with our experiments at 5MHz as well as a place to keep up-to-date on policy matters concerning spectrum regulation issues. Again, unlike a rally, this is all carried out in the comfortable environment of a 3 star Best Western Hotel, which we totally take over and who really put themselves out to make us feel at home.

IOTA, Contest, LF & QRP Lectures

HIGHLIGHTS

HIGHLIGHTS

Each year we think that it will be difficult to beat the previous year's programme, but again this year we are amazed at the willingness of our fellow amateurs to give so much in order to come and present at the convention. It would be wrong to single out particular sessions, so just take a look at the programme and see the range of subjects covered, and note the expertise and knowledge of the presenters.

This year we have extended the lecture streams somewhat, by introducing a fourth lecture stream on the Sunday - this allows us to include in the programme some more challenging and advanced topics. As usual the main lecture streams cover DX operating, contesting, general technical matters as well as introductory presentations for beginners, improvers and those wanting to try out a new aspect of the hobby. Please note that in order to bring you the best possible programme over the weekend, the timing and order of events may change after we go to press, so check our website at www.rsgb-hfc.org.uk for the latest programme (copies of the final programme will be available at the event).

In addition to the lectures and the other regular features of the Convention such as the DXCC card checking facility, you will also be able to present your personal registration documents for Logbook of The World, and "drop" your cards for the RSGB QSL Bureau. For the second year we are also offering the full range of UK licence assessments/exams, so if you have the appropriate competences you could move through all three stages, including the operating assessment on the Convention's HF demonstration station. If you wish to take the UK licence examinations at the HF Convention please pre-book with Sylvia Manco at RSGB HQ, tel: 0870 904 7373 or e-mail. sylvia.manco@rsgb.org.uk in good time before-hand.

The HF Convention culminates in a major raffle, the proceeds of which go to the RSGB DXpedition Fund. There will be numerous prizes and our major sponsor Yaesu (UK) is kindly donating an FT 897 HF Base Station Transceiver as the 1st prize.

SOCIALISING

SOCIALISING

The quality and breadth of the lecture programme is only part of the fun of the Convention weekend. As has been mentioned above the other almost equally important aspect of the weekend is for visitors to relax and chat with friends, both old and new.

The Gatwick Worth Hotel provides the right environment for this as the bar, our small exhibition area and the HF demonstration station are all in the same area. Yaesu(UK), one of our main sponsors, are using the event to launch their new top-of-the-range HF Transceiver within the UK, the FT DX 9000, so come along and try and beat the queue to put it through its paces!

A tradition of the convention is the Welcoming Buffet on the Friday evening and the DX Dinner on the Saturday. Both are informal and provide an excellent evening of relaxation with good food and pleasant company. The DX Dinner has the added fun of being coordinated by a Master of Ceremonies, with Bob Beebe, GU4YOX, for the second year agreeing to keep us on course for an enjoyable evening. Both dinners are very popular so make sure that you book early and note that everyone is welcome to attend.

ADMISSION

ADMISSION

Don't miss your opportunity to visit the Convention either by booking an accommodation package or simply by turning up on the day. Taking note of comments from HFC2004 we have been able to keep many of the prices at 2004 levels and for some of the packages we have actually been able to reduce prices! Thus, you can gain admission for £6.50 for the whole day on either Saturday or Sunday, or £10 for a weekend pass. If you are planning to travel as a group you can pre-book five tickets for the price of four, i.e. £26, and remember that under-18 year olds get in free!

To allow people to fine-tune their requirements the booking of day tickets, accommodation, Welcome Buffet and DX Dinner can be done as separate items. Alternatively, to make the booking easier for the more popular options, you could book a "package". Full details are at www.rsgb-hfc.org.uk including the link to on-line booking. Alternatively, contact RSGB Events at 1 The Beeches, Banstead, Surrey SM7 2AZ; tel / fax: 0870 904 7379 or e-mail: rsgbevents@rsgb.org.uk if you have any questions concerning the booking of accommodation packages, special dietary requirements, advance purchase of day tickets, etc.

How to find us?

Gatwick Worth Hotel
Off Turners Hill Rd, Gatwick

HFC Programme

Friday 7th October 2005

TIME	SUSSEX SUITE
18:30	Welcoming of Guests
20:00	Welcoming Buffet

Visitors to the Convention can either pre-book a package that includes accommodation at the Gatwick Worth Hotel, Welcome Buffet, DX Dinner and access to all lectures streams. Alternatively, if you do not need overnight accommodation at the Convention one can turn up on the day and pay an entry fee, for attending the Convention, of £6.50 (£10 for the two days & under-18s free) at the door.
Tickets to the two dinners are also available: Gala Dinner £30 ,Welcome Dinner £6.50
N.B. Places for the Gala Dinner are limited, priority will be given to **delegates booking packages.**

Saturday 8th October 2005

TIME	SUSSEX SUITE	STABLE SUITE	WENTWORTH SUITE
09:15	**Welcome from RSGB President,** Jeff Smith MI0AEX		
09:30 - 10:15	**IOTA Session** Roger Balister G3KMA & Martin Atherton G3ZAY:	**HF Contest Forum,** Justin Snow G4TSH	**Medium Wave DXing using spectrum analysis techniques**, Steve Whitt, G8KDL
10:15	**Programme to include Activation of Mexican IOTAs,** Ramon Santoyo, XE1KK	COFFEE	COFFEE
10:45 - 11:30		**HF Contest Trophy Presentations,** Justin Snow G4TSH	**Current LF Propagation,** Alan Melia G3NYK
11:45 - 12.30	**21st Century DXpeditioning,** Roger Western G3SXW	**VHF Contest Trophy Presentations,**	**136kHz DX,** Laurie Mayhead,G3AQC
12:30	LUNCH	LUNCH	LUNCH
13:45 - 14:30	**FT5XO Kerguelen Islands,** Mark Hayes M0DXR	**Grey Line Propagation,** Steve Nichols G0KYA	**Using GPS to improve amateur data communication,** Andy Talbot, G4JNT
14:45 - 15:30	**Winning Multi-Multi in Africa** Roger Western, G3SXW	**Making DXCC fun with 5W,** Dave Sergeant, G3YMC	**How well do our radios perform,** Peter Hart G3SJX
15:30	TEA	TEA	TEA
16:00 - 16:45	**The FTDX 9000: 'The birth of a new reality',** Paul Bigwood G3WYW		
17:00 - 17:45	**DXCC & Log Book of the World Workshop,** Wayne Mills, N7NG	**Ham Radio Deluxe - rig control Software,** Simon Brown, HB9DRV	**160 & 80m receive aerials,** Bob Whelan, G3PJT

19:30 for 20:00 DX Dinner in the Sussex Suite Master of Ceremonies, Bob Beebe GU4YOX

Sunday 9th October 2005

TIME	SUSSEX SUITE	STABLE SUITE	WENTWORTH SUITE	CRABBET SUITE
09:00 - 09:45	**5T0CW Mauritania,** Phil Whitchurch G3SWH	**Antenna Measurements at RF workshop,** Peter Dodd, G3LDO	**Analysis of 5MHz Experiment data,** John Gould, G3WKL & Richard Cornish	**Understanding CEPT Licensing,** Bob Whelan, G3PJT
10:00 - 10:45	**VU4 DXpedition & Tsunami Relief,** NIAR Team Members (Conference Video)	**Update on a remote operation (HF station) & planning the way forward,** D. Gould,G3UEG		**Laser DX** C. Whitmarsh, GoFDZ & D. Bowman G0MRF
10:45	COFFEE	COFFEE	COFFEE	COFFEE
11:15 - 12:00	**What the recent Tsunami & other disasters have taught us,** Gordon Adams, G3LEQ		**Starting Out in DXpeditioning - the One Man, One Week, One Case Expedition,** Ian Greenshields, G4FSU	
12:15 - 13:00	**Planning for Propagation at 3Y0X,** Eric Scace, K3NA	**5MHz Forum,** John Gould G3WKL	**Building your first HF Transceiver,** Steve Hartley G0FUW	**Precise Frequency Sources and Measurements,** Walter Blanchard G3JKV
13:00	LUNCH	LUNCH	LUNCH	LUNCH
14:00 - 14:45	**6O0CW Somalia,** Andrea Panati, IK1PMR	**Spectrum Forum,** Colin Thomas G3PSM		**CFA aerials,** Mike Underhill G3LHZ
15:00 - 15:45	**The FTDX 9000 - 'The birth of a new reality',** Paul Bigwood G3WYW			
16:00 - 16:30	**Raffle Draw & Farewell** from RSGB President Jeff Smith MI0AEX			

MLS martin lynch & sons

NEW ! LOW PRICES FOR 2005 PACKAGES

Welcome & DX Dinners

DINNERS FROM £25.00

YAESU

DAY TICKETS FOR ALL

CDXC

GREAT RAFFLE PRIZES

YAESU
Major Sponsor

FOR MORE INFORMATION OR TO BOOK
Tel. 0870 904 7379 www.rsgb-hfc.org.uk

MLS martin lynch & sons
Major Sponsor

SOAR calls for law change on airborne radio experiments

A newly formed amateur radio group called SOAR – Space Observation with Amateur Radio – is aiming to get the regulations surrounding airborne experiments changed. The group wants to use meteorological balloons to carry amateur radio experiments to altitudes in excess of 90,000 feet but current licensing restrictions do not allow the use of amateur radio equipment in airborne vehicles. SOAR is currently negotiating with Ofcom and the Civil Aviation Authority to have the rules relaxed to allow experiments of this nature in balloons and other non-commercial craft. Such a change would allow the group to provide payload space for experiments by other amateur radio organisations and schools.

PHOTO: JAY OTTO

The UK is currently the only country in the world where experiments like this are prohibited. But, as a SOAR spokesman pointed out, such projects could help build bridges between the amateur radio community and schools and colleges. "It seems a real shame that old fashioned thinking is restricting such an exciting and important project," he said.

Assuming it succeeds in changing the law, SOAR intends to launch payloads including cross band repeaters, amateur television devices and automatic packet position reporting systems. Each flight will be tracked from the ground and the equipment then recovered on landing.

"If the conditions surrounding airborne vehicles are relaxed, it will enable the group to provide payload space to other groups for experiments," said the spokesman.

"It is envisaged that strong links will be made with schools and educational establishments with the inclusion of SOARSATs – small ping-pong ball sized experiments similar to those already in use in the USA."

SOAR project leader Peter Badham, G0WXJ, is keen to hear from any UK based groups or individuals who are interested in participating in the project. Contact details and further information are available on SOAR's website: www.eham.org.uk.

Space tourist Greg Olsen keen to use amateur radio on the ISS

The next space tourist to visit the International Space Station will once again be an amateur radio licensee. Greg Olsen of Princeton, New Jersey was issued the callsign KC2ONX on 16 August by the Federal Communications Commission. He had passed his Technician radio communications examination a few weeks earlier during a brief gap in his busy pre-flight training schedule. Olsen has indicated that he'd like to use amateur radio to chat with school groups while on the station.

Olsen is currently in Russia undergoing further training in preparation for his ten day stay at the space station. He is scheduled to fly from Baikonur Cosmodrome in Kazakhstan to the ISS aboard a Soyuz spacecraft on 1 October. The crew will include radio amateur Bill McArthur, KC5ACR. Olsen – who cofounded Sensors Unlimited Inc in Princeton – will be only the third paid-up civilian to visit the space station, following in the footsteps of Dennis Tito and Mark Shuttleworth. He is believed to have forked out around $20 million for the trip.

Special event station to mark Battle of Trafalgar anniversary

More details have emerged about the Cray Valley Radio Society's special event station to mark the bi-centenary of the Battle of Trafalgar – the legendary naval skirmish that foiled Napoleon's plot to invade England and established Britain as the world's dominant naval power.

To celebrate the battle, members of Cray Valley Radio Society will be operating from the National Maritime Museum at Greenwich, South East London from Monday 17 to Monday 24 October. A special event callsign – GB200T – has been issued.

The special event station is expected to make at least 10,000 QSOs during the eight-day operation. It will be active on all bands from 3.5MHz to 432MHz from 8am to 10pm daily on SSB, CW and the digital modes using transceivers loaned from Icom UK and an Acom 1010 linear amplifier lent by Vine Antenna Products. There will be an award scheme for those contacting the station. Full details will be available through a specially designed website, and special QSL cards will be available from Cray Valley's QSL manager Owen Cross, G4DFI.

The Royal Naval Amateur Radio Society will also be commemorating the Battle of Trafalgar, operating using the callsign GB200RN. GB2OOV is also participating in the event. This callsign will be QRV from HMS Belfast moored on the River Thames at London Bridge and will be operational on 20/40m CW and SSB from 1 October 2005 for 28 days.

Members of Barry ARS, meanwhile, will be transmitting the official Welsh Trafalgar day station from HMS Cambria, a Royal Navy shore station on the Bristol Channel. This station will use the callsign GB200HNT – Horatio Nelson Trafalgar.

Red Cross in Italy to launch its first amateur radio station

The Italian Red Cross will activate its first ever amateur radio station in October under the callsign IZ4GQA. The pioneering new station is the brainchild of the radio communications department of the Italian Red Cross's Emilia Romagna region. The department had been looking for a communication tool that would provide wider coverage than existing radio networks, incur no fees and be capable of working in crisis and emergency situations.

An amateur radio station appeared to be the perfect solution. But at the time the Italian Red Cross had never before been authorised to operate such a station. Not to be put off, members of the radio communications department obtained a copy of the official Italian amateur radio regulations and submitted a seven-page application for a licence to the Italian ministry of communications.

The application was successful and the Italian Red Cross was given the green light to operate an amateur radio station. An Italian Red Cross spokesman said: "Now we can communicate on all ham bands, being able to connect Red Cross stations not only in our region, not only in Italy, but all over the world."

Rare Worked All Britain square to be activated

Kevin Haworth, M0TNX, and Keith Radford, G3SZU, are planning to activate an extremely rare Worked All Britain square – SD35 – near the village of Knott End On Sea in Lancashire on 10 October this year.

They believe that this will be only the third time that the square has been activated. The reason the square is so rarely activated is that it lies within Morecambe Bay and is therefore under water for much of the year. Kevin and Keith plan to be active from the square from 1400 to 2100UTC on the 20/40/80/160m bands on both phone and CW.

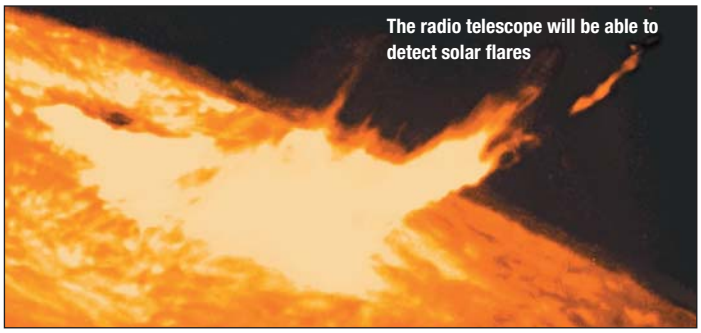
Hungary experiments with 50MHz band

The Hungarian licensing authority issued three amateur radio organisations with licences to broadcast 65 stations on the 50MHz band. This was the first time that amateur radio has been permitted on 50Mhz in Hungary.

The licences – which were valid for 30 days starting August 1 – formed part of an experiment to study whether amateur radio usage of the 50MHz band on a secondary basis causes interference in the reception of broadcasting stations.

The frequency range permitted for the experiment was 50.0500MHz to 50.5000MHz, and the licences were valid for all operating modes, including FM and digital. Maximum effective radiated power however was limited to 5 watts.

A request for a 50MHz licence was originally submitted by Haros Radio Club, HA5HRK, in June 2005. The licensing authority was very cooperative and decided to broaden the circle of stations in the experiment by inviting members of two other amateur radio organisations to participate.



The radio telescope will be able to detect solar flares

Plug and play radio telescope for PCs in development

The British Astronomical Association's Radio Astronomy Group (RAG) is working on an interesting project to develop a "plug and play" radio telescope system that can be connected to any modern PC. The group says that beginners as well as experts will be able to use the system to easily set up their own radio observatory.

The system will have a modular design to allow new functionality to be bolted on as and when it is developed. Modules will initially be available for solar observations at 2.8GHz and sudden ionospheric disturbances (SIDs) at VLF but other modules – including a software-controlled scanning receiver and interferometry, 151MHz and 38MHz receivers – are planned. The group is also keen to hear from anyone interested in developing further modules.

The project has been split into three phases. The first involves the production of a core PIC module to which a variety of receiver designs can be connected. Each receiver will be controlled and monitored from a PC using Java software.

In the second phase, the group aims to develop a simple Ethernet to eight-channel RS485 hub to provide easy connection with modern computers. The final phase is to create an internet-based database of results from individuals' observations.

At present, the group has developed designs for the PIC core module and the VLF receiver. Interestingly, the VLF receiver requires only a simple loop aerial that even a novice radio amateur could make.

For more information about this innovative project, visit the group's website – www.britastro.org/info/radio.html. Radio amateurs might also want to attend the RAG's meeting on 8 October at the Humfrey Rooms, Castilian Terrace, Northampton, NN1 1LD, where a prototype of the plug and play radio telescope will be on display. Among the speakers is RAG project leader Dr Laurence Newell, who will talk about the activities of RAG. Other interesting speeches include "A simple VLF receiver for solar flare monitoring" and "The Schumacher-Levy Jupitor impact at 21MHz and solar observations at 600MHz".

Old Timers get together at Leicester show

The Radio Amateur Old Timers' Association (RAOTA) will be holding its annual general meeting during the Leicester Amateur Radio Show. The AGM will take place at the Tudor Inn in Castle Donington from 1200UTC on Friday 30 September.

RAOTA aims to maintain the pioneering spirit and traditions of amateur radio. Membership is open to anyone (licensed or listener, young or old) who shares this aim. Visit its website to find out more about RAOTA or visit the association's stand at the Leicester Amateur Radio Society.

Third English Mountain Goat award winner

Steve Green, G1INK, from Buxton in Derbyshire has become only the third radio amateur in England to win the coveted Mountain Goat award. This accolade is given to people who achieve 1,000 activator points as part of the Summits on the Air (SOTA) programme.

Steve achieved the award on one of his favourite peaks, Great Gable in the Lake District, on 14 August. At the start of that day, Steve had 980 activator points, but put in a mammoth 24 point expedition as he traversed between three eight-point summits in Cumbria – Pillar, Kirk Fell and finally Great Gable.

Steve began SOTAing in November 2003, and he achieved Mountain Goat status on his 199th summit activation. He is the fifth person in the UK to win the Mountain Goat award, and only the eighth in the world.

Club and regional news

1 Scotland South & Western Isles

COCKENZIE & PORT SETON ARC
21, Video Night. Bob, GM4UYZ, 01875811723
LOTHIANS RS
10, Junk/Surplus Equipment Sale
Toby, MM0TSS, 07739 742 367,
tobysigouin@onetel.net.uk
PAISLEY (YMCA) ARC
5, Aerials for limited space
19, Do you really need an earth?
Jim, GM3UWX

2 Scotland North & Northern Isles

ABERDEEN ARS
6, Club Junk Sale
13, Construction group, and club activity night
20, Computer logging and QSL's Instruction lecture
27, Construction group, Morse and On the air
29, The construction group continue on the assembling of a QRP 80m transmitter, morse for beginners and on air
Ellis, GM4JLZ, 01224 580 594
MORAY FIRTH ARS
8, Autumn Sale
27, Distillery Tour
Geoff, MM5AHO, 07770 726 759,
www.mfars.co.uk

3 North West

CHESTER & DARS
4, Bring and tell night
18, working SOTA by Sam, 2W0UPT
25, Women in the Amateur Radio World – Lisa Mossop – M0LSA
Derrick, M1SUM, 0151 356 1572
SOUTH MANCHESTER RADIO & COMPUTING CLUB
7, Talk on Kit construction by Bill, G3SMM
14, Discussion on members' favourite websites
21, Talk on Early methods of Navigation by Ged, G8RSI
28, Talk on TV Broadcast Satellites by Bill, G4EDM
Ron, 0161 969 3999
STOCKPORT RS
4, Skills Group/Practical evening
18, 6 Metres - the Magic Band - with David, G1JDU, and Peter, G8BCG
David, M1ANT, 0161 456 7832
THORNTON CLEVELEYS ARS
3, Club on air
10, Construction competition
17, AGM
24, The year ahead
31, Auction
Jack, G4BFH,
jack.duddington@btinternet.com
WARRINGTON ARC
4, Measurements – a personal view by Ron, G0WJX
11, A social evening for members and friends
18, FC Judd, G2BCX, a sound man – a talk by Roland, G0RPO
25, Is there life in outer space – a talk by Reg, G3AKX
John, G0RPG, 01925 762 722
WEST MANCHESTER RADIO CLUB
20, Lighthouses & the British Amateur Radio Lighthouse Society by Steve Bryan
Les, G4HZJ, 01942 870 634

4 North East

GREAT LUMLEY AMATEUR RADIO & ELECTRONICS SOCIETY
9, Rally
Nancy, 0191 477 0036, 07990 760 920,
nancybone2001@yahoo.co.uk
HORNSEA ARC
5, Activity Night
12, Rally Preparation
16, Rally at Hornsea Floral Hall
19, Activity Night
26, Talk MS Excel
Richard, G4YTV, 01964 562 498,
g4ytv@aol.com
KEIGHLEY ARS
27, Surplus Equipment Sale
Kath, G0OSA, 01535 656 155
NORTH WAKEFIELD RADIO CLUB
6, GX4NOK on the air
13, Visit by the Mayor of Morley
20, Air Traffic Control @ Heathrow by Rod Metcalfe, 2E0PIW
27, RSGB visit preparation evening, all help would be appreciated
Jim, www.g4nok.org
SHEFFIELD ARC
3, Talk - Nick Totterdell, G4FAL: QSL Cards - How and Why
17, Talk - Andy Burton M0GAV: Ups and Downs of Antenna Erection
24, Operating Evening
Nick, G4FAL, 0114 255 2893
WAKEFIELD & DARS
4, Trivia quiz with Dave, G4CLI
11, Cheese and wine night
18, Committee meeting/On the Air
25, Talk on the Wakefield & District Radio Society Node by Dave, G4CLI
Dave, G4CLI, 07748 221 855,
g4cli@hotmail.com

5 West Midlands

CHELTENHAM AMATEUR RADIO ASSOCIATION
7, Constructional Projects from the past – Mike, G3TSO
Pat, G3IKR, 01386 792 542
COVENTRY ARS
7, AGM
14, Night on the air, novice class, cw practice
28, "Night on the air, Novice class, cw practice"
John, G8SEQ, 024 7627 3190
GLOUCESTER AMATEUR RADIO & ELECTRONICS SOCIETY
3, Club equipment discussion
10, Workshop/on air
17, Workshop/on air
24, Foundation Course Practical Assessments
31, Workshop/on air
Tony, 01452 618 930, Daytime
MALVERN HILLS RAC
11, Bring a rig night
Mike, G3TGD, 01905 830 752
MID-WARWICKSHIRE ARS
11, Programme planning for 2006
25, Technical Topics
Bernard, M1AUK, 01926 420 913
ROYAL AIR FORCE ARS
6, Meeting - anyone interested in radio welcome
Jim, G4PFR, 01296 623 802
SOLIHULL ARS
20, AGM
Paul, G8AYY, 0121 783 2996
STAFFORD & DARS
6, Shack Night
13, Fox Hunt
20, Shack Night
27, Alternative Hobby Night
Graeme, G4NVH, 01785 604 534,
graeme.boull@ntlworld.com
STRATFORD UPON AVON & DRS
10, New look Raynet, G3TZM
24, Broadcast transmitting antennas, LF to UHF, G3TTC
TELFORD & DARS
12, Post Telford Rally debrief – G3UKV et al
19, My favourite radio reference book – bring your well thumbed volume along
25, "Club project – Low voltage Add-on unit, build night"
Mike, G3JKX, 01952 299 677,
mjstreetg3jkx@aol.com

6 North Wales

DRAGON ARC
17, Surplus Equipment Sale
Leslie, 01248 470 606
WREXHAM & DARS
4, Junk Sale
18, UK FM Group (Western visit) - Dave Wilson, M0OBW, and Kath Wilson, M1CNY, will give a talk on repeaters
Mark, MW1MDH,
markmdh@btopenworld.com

7 South Wales

ABERYSTWYTH & DARC
13, Annual General Meeting
Ray, mwmg01@aber.ac.uk
CARMARTHEN ARS
4, video evening Heard Island VK0IR
18, Solving SWR problems by Laurie, GW0CCO
31, Video evening including FSDXA expeditions
Martin, GW3XJQ, 01994 453 495
Swansea ARS
1, Coach trip to Leicester Radio Rally at Donington
Roger, GW4HSH, 01792 404 422.

8 Northern Ireland

No club news details provided.

9 London & Thames Valley

AYLESBURY VALE RS
12, Presentation by Ivan G3KLT, on RF matching and feeders
Roger, G3MEH, 01442 826 651,
roger@g3meh.com
COULSDON AMATEUR TRANSMITTING SOCIETY
10, Alternative Medicine
Steve, G7SYO, 01737 354 271
CRAY VALLEY RS
8, Trophy presentations at HFCC, Gatwick – M3CVN
15, JOTA for the 1st Sidcup Scouts, Sidcup
17, GB Station for Battle of Trafalgar (G4BUO/M3RCV)
20, Meeting at National Maritime Museum – M3RCV
29, M8C in SSB CQWW – M0MYC
Richard, G7GLW, 07831 715 797,
rcains@btinternet.com
CRYSTAL PALACE RADIO & ELECTRONICS CLUB
7, Memorial Lecture – My adventures on top band, Martin G4FKK
Nick, 020 8689 2145
MAIDENHEAD & DARC
6, VHF propagation by Steve Baugh, G4AUC
18, Spacelab by Robin Greenwood
John, G8RYW, 01628 628 463,
g8ryw@tesco.net
READING & DARC
13, Decommissioning of Dounreay by Collin Bayliss, G3WKZ
Pete, G8FRC, 01189 695 697
SHEFFORD & DARS
6, CQWW Planning
13, Autumn Junk Sale
20, What the Big Knobs For Stewart G3RXQ
27, CQWW Event Equipment Check
29, CQWW
David, G8UOD, 01234 742 757
SILVERTHORN RC
7, How to give a talk by G0LWS
14, On the air night
21, Informal evening
28, AGM
Les, G0CIB, 07980 275 081
SOUTHGATE ARC
13, Autumn Junk Sale
Mike, M0ASA, 020 8366 0698
SURREY RADIO CONTACT CLUB
3, Autumn Surplus Equipment Sale
29, 70th Anniversary Dinner
Ray, G4FFY, 020 8644 7589
SUTTON & CHEAM RS
20 Talk on the RSGB by Paul Berkley, M0CJX, RSGB Regional Manager
John, G0BWV, 020 8644 9945,
info@scrs.org.uk

10 South & South East

ANDOVER RAC
4, Interfacing HF Rigs by G4UET
18, Fireworks by John Perry
Nicky, 2E1NAC, 01722 718 457
BASINGSTOKE ARC
3, Club meeting AGM
15, JOTA Baker Hall Odiham
30, Foxhunt
Frank, M0AEU, barc@2lo.info
FAREHAM & DARS
5, Natter night and club station operating with G3VEF/G8KGI
12, The Peltier Effect by Peter, G8TXK
19, Video Night
26, The R311 Soviet Receiver by Steve G7HEP
enquiries@fareham-darc.co.uk
HARWELL ARS
11, IOTA and software logging, Ray, G4FON
Angus, G0UGO, 01235 522 858
HORNDEAN & DARC
4, Social Evening
25, AGM
Stuart, G0FYX, 023 9247 2846
HORSHAM ARC
6, Junk Sale
David, G4JHI, 01403 252 202
ITCHEN VALLEY RC
14, Auction
28, Radio Forum–Your questions answered
Sheila, G0VNI, 023 8081 3827,
sheila.williams@ivarc.org.uk
MID-SUSSEX ARS
7, A lecture on first aid (Basic life support)
14, Radio operating evening
21, AGM with wine and cheese after
28, Surplus Equipment Sale
John, G6XTW, 01273 588 556
SOUTHDOWN ARS
3, Talk, video by Gavin Keegan, G6DGK, on RSGB and deregulation
5, Halisham Shack CW and SSB activity
John, G3DQY, 01424 424 319,
vaughdqy@aol.com
SWINDON & DARC
13, Talk - BBC Monitoring at Caversham, Al, G4VSQ
27, Talk - The promise of fusion power, Neil, G4HLX
Mike, M5CBS, 01793 826 465
TROWBRIDGE & DARC
5, Bristol Contest Group IOTA Contest – Bere Island by Chris Parnell, G0HFX
19, Natter Night
Ian, G0GRI, 01225 864 698, E/W
WORTHING & DARC
5, Wireless Renovation by M0GHO
12, AGM
19, Traps by G1EBA
26, Setting up and running your station
Roy, G4GPX, 01903 753 893

11 South West & Channel Islands

APPLEDORE & DARC
17, Bring and buy auction
Brian, M0BRB, brian.jewell@ic24.net
BRISTOL RSGB GROUP
16, Table top sale held at the Shirehamptom Radio Club
31, Roger Western, G3SXW, 21st Century Dxpeditioning
Martyn, G3RFX, QTHR
CORNISH RADIO AMATEUR CLUB
6, Main Meeting
10, Computer section. Clive on a subject of his choice
John, G4LJY, 01872 863 849
EXETER ARS
9, Rally/table top sale at the Moose Hall
Steven, M3WRS, 01392 498 934, 01392 495 690
EXMOUTH ARC
5, Talk on Auto ATU, Dean, G0UIL
19, Construction and operating Night
Mike, G1GZG, 01395 274 172
HOLSWORTHY ARC
5, SSTV night
David, 01288 353 561, m3eoq@hotmail.com
SALTASH & DARC
6, Talk by Trev, G3ZZY, on Captain Henry Jackson RN
20, Constructors Contest
Brian, M0BHG, 01752 824 321
SOUTH BRISTOL ARC
5, Computer and software clinic
12, Autumn bring and buy
19, Club events and contest planning for 2006
26, On the air evening.
Len, G4RZY, 01275 834 282
SOUTH DORSET RS
11, Regional Manager Peter Clifford will be visiting
Carol, 2E1RBH, 01305 820 400, carolonfraggle@tiscali.co.uk
TAUNTON & DARC
7, AGM
21, Discussion programme of events, 2006
William, G3WNI, 01823 666 234, g3wni@btinternet.com
THORNBURY & SOUTH GLOUCESTERSHIRE ARC
5, Hand held comparisons
12, On air night
19, Video
26, On air night
Stan, G0RYM, stang@talkgas.net
TORBAY ARS
21, Psysio - another visit from one of the Torbay Hospitals
Dave, G6FSP, g6fsp@tars.org.uk
YEOVIL ARC
6, Classic receivers – the Drake R4C, G4JBH
13, Telegraphy, G6LLP
20, The Kilton, G3PCJ
27, Chippenham DARC Mini CxPedition to Lundy, G0GRI
Adrian, G4JBH, 07834 922 858, info@yeovil-arc.com

12 East & East Anglia

CAMBRIDGE & DARC
14, Quiz Night
28, How do computers work? Steve, G4WSZ
Ian, G4AKD, 01954 782 974
CHELMSFORD ARS
4, CARS AGM
Martyn, G1EFL, 01245 469 008,or via club website
DOVER RC
5, Operating and Natter Night
12, Wacky quiz night – David, G0DQI, is question setter and quiz master
19, Result of the DRC Yahoo Group 'poll' talk
26, Half term NET on GB3KS
Brian, G4SAU, g4sau@bcuff.freeserve.co.uk
FELIXSTOWE & DARS
17, Fish and Chip Supper
Paul, G4YQC, paul.whiting@bt.com
HARWICH AMATEUR RADIO INTEREST GROUP
12, Demo and talk - Modern Contest Logging by Jonathan, G0DVJ
Tony, G4EYE, 01255 886 065
LEISTON ARC
4, Video: The Secret Wireless War
Paul, M3MIG, 01728 746 044, m3mig@aol.com
LOUGHTON & EPPING FOREST ARS
14, Bring and buy, table top sale
28, Fish n chips night
Marc, G0TOC, 020 8502 1645, info@lefars.org.uk
MORSE RADIO CLUB OF SWANLEY
20, Autumn Junk Sale at the Five Wents Memorial Hall
Ken, 020 8306 3544
NORFOLK ARC
5, Radio Workshop-Construction
12, Talk on codes and Ciphers by Ed Erbes, M0HDK
19, Special visit by members of Koblenz twinned club (provisional)
26, Members Forum-Programme and Magazine preferences
Reg, G0VDO, 01603 429 269
SOUTH ESSEX ARS
5, Sky at night – Bruce, G1JJS
19, Free evening
Dave, southessex.ars@btinternet.com, www.southessex.ars.btinternet.co.uk

13 East Midlands

EAGLE RADIO GROUP
11, Marblethorpe sea shore trip by local historian Peter Chambers
Terry, G0SWS, 07979 733 640
HUCKNALL ROLLS-ROYCE ARC
7, Night on the air
14, Talk and demo on APRS by Dave Ackrill, G0DJT
21, Forum
28, Visit to Rolls-Royce Heritage Hucknall
Keith, G6NHY, 07929 916 642, hrrarc@ntlworld.com
LEICESTER RADIO SOCIETY & COMPUTER CLUB
1, Help at Donington Park Show
Tom, G1IUT, 0116 286 3949, tomchristmas@ukonline.co.uk
LOUGHBOROUGH & DARC
4, 'Radio Astronomy for Radio Amateurs' talk, Jeff Lashley
11, AGM
18, Talk – 'The Other Man's Shack', Barry Senior G8YGT
26, Night on the air - commity meeting
Chris, G1ETZ, 01509 504 319
MELTON MOWBRAY ARS
14, Visit to Newark Air Museum
Phil, G4LWB, phil@croxtonkerr.fsnet.co.uk

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 between *RadCom* and GB2RS, so information only needs to be sent once.

CLUB OF THE MONTH

October's Club of the Month is... the Dover Radio Club (DRC). We decided on Dover because of their great work in transforming a bored class of school children into enthusiastic budding radio hams. DRC was approached by the Dover Grammar School for Boys' head of physics a few months back. He was anxious to find something to occupy his students in the interval between their exams and the end of the Summer.

The club agreed to run a complete Foundation Course over five double lessons in July, culminating in the exam. The course was led by David Harding, G0DQI, assisted by Brian Joyner, G8ZYZ. In all, 18 pupils and physics master Lee Sanders took the course. Interestingly, Lee offered a prize to any student who outscored him in the exam. "The course began with the students regarding us all rather suspiciously," said a club spokesman. "They probably expected us to bore them."

The children were in for a pleasant surprise. Within the first half an hour, they had already found out how amateur radio slotted into the physics they had been studying for their exams, how it made practical use of the electronics they knew already, and how it fitted in with their studies of electromagnetic waves.

The spokesman continues: "It was not long before their enthusiasm was kindled. An early session on Morse Code began to make their pulses race visibly, and many wanted to go on when the bell went. Several of them admitted towards the end that they had 'caught the bug'"

When it came to the test, 13 of the children passed the exam easily, though none were able to match the perfect score of their physics master, who presumably kept the prize. There then followed a Construction Course of five double lessons, where the students were taught how to solder, what radio circuits looked like and how they worked, and how to put them together with the components. Fred Knight, G4GAN, led this course, assisted by Tony Phillpott, G4IMP. By the end of the course, the children were able to make a working medium wave receiver.

It is community work such as this that will ensure that amateur radio remains a popular hobby for years to come. Well done Dover.

Bittern DX to honour Nelson with special event

The Bittern DX Group is operating a special event station in North Walsham, Norfolk on 21-23 October as part of the council's plans to celebrate the 200th anniversary of the death of legendary naval captain Horatio Nelson. The station will be transmitted from the Pavilion on the Memorial Park at North Walsham, Norfolk and will use the special event call-sign GB2NNC – Norfolk Nelson's County.

Nelson was born in Norfolk in 1758 in the village of Burnham Thorpe. He was the son of the village rector Edmund Nelson and his wife Catherine. Horatio Nelson attended schools at Norwich and North Walsham before joining the Royal Navy in January 1771 at the age of just 12. He showed early promise, passing his lieutenant's exam more than a year under the official age in 1777 and being made post-captain at the age of 21. The rest, as they say, is history.

For more information about the celebrations, contact Bittern Group secretary Keith Martin, G0GFQ, at secretary@bittern-dxers.org.uk.

Windmill, windmill for the band

Havering and District Amateur Radio Club successfully ran three windmills during the 2005 Windmills on the Air event, making the single largest contribution by any UK radio club. The club worked a total of 241 HF QSOs and 167 VHF contacts. The pictures are of Upminster Windmill (white) and Mountnessing Windmill. The club also operated from Aythorpe Roding windmill.

Yeovil ARC on the web

Yeovil Amateur Radio Club has launched a new website – www.yeovil-arc.com. It contains a full calendar of events, lots of information about the next Yeovil QRP Convention and a detailed history of the club. Next year is the club's 60th anniversary and the website will be used to publicise a number of celebratory events during the coming year. For further details, contact Adrian Dening, G4JBH, on 07834 922 858 or info@yeovil-arc.com.

Special event station at Fire Brigade open day

The Worthing and District Amateur Radio Club held a special event station to mark Worthing Fire Brigade's open day on Saturday 30 July 2005. The event attracted huge crowds of excited children and interested parents.

Worthing set up a station in the club gazebo calling on 80-40-20m and also 2m. A home brew 40/20m trapped dipole – built by Phil, G4UDU – was hoisted to the top of the station's exercise tower at 100 feet, with the other end launched in the top of a 110 foot tree. The station used the callsign GB2WFB for the event via an Icom 7400 transceiver.

Children queued to practice Morse code using an oscillator and they were all awarded a 'commemorative certificate of achievement' and presented with a goodie bag courtesy of Icom UK.

Brickfield ARS celebrates World War Two anniversary

Members of Brickfields Amateur Radio Society attended an air show at Sandown Airport to celebrate the 60th anniversary of the end of World War Two. They operated the special event station GB6SA. The accompanying picture shows (L to R) Alan Gardner, G0NTH, David Munday, M3FRB, Paul Biggin, M0PBN, Brian Pebody, M0MWU, Jackie (Paul's XYL) M3JIW, David A'Bear, G0VZV, Colin Symons, M0GUN, George Blain, G3JLN and Barry Cant, M0IOW.

West Bromwich Central RC 25th anniversary celebrations

The West Bromwich Central Radio Club, GX4WBC, is celebrating its 25th anniversary on 1 October this year. To celebrate the event, the club is holding a reunion between noon and 6pm on the 1 October at the Horse & Jockey pub on Stoney Lane/St Clements Lane, West Bromwich. The club's founding members Geoff Woodford (now life president) and Pat Skerrit will be attending the event.

Ian Leitch, G0PAI, the club's secretary, is keen to point out that both past and present members are welcome to attend. "If you are a lapsed member, we would like to hear from you to make or re-make your acquaintance and hopefully find out what you have been up to in recent years," he said. "You may have news about other members who have lost touch over the years for a variety of reasons or just be curious to find out more yourself."

Those interested in attending the reunion should contact Ian Leitch as soon as possible via email at info@gx4wbc.co.uk or by telephone: 0121 561 2884.

Chelmsford ARS lays yet another Foundation stone

The Chelmsford Amateur Radio Society is set to embark on its 12th Foundation course in January next year, providing an example for other clubs to follow in bringing newcomers into the hobby.

The Foundation licence was introduced in 2002 with the aim of opening up amateur radio to a wider range of people – and Chelmsford ARS has clearly taken advantage, organising Foundation courses more than twice a year ever since.

Following on from a successful course in Summer this year (see picture), the society's next Foundation course is due to kick off on 12 January. The six week evening course covers the practice and theory of amateur radio and, according to former pupils, "it's not just boring theory but a whole load of fun as well".

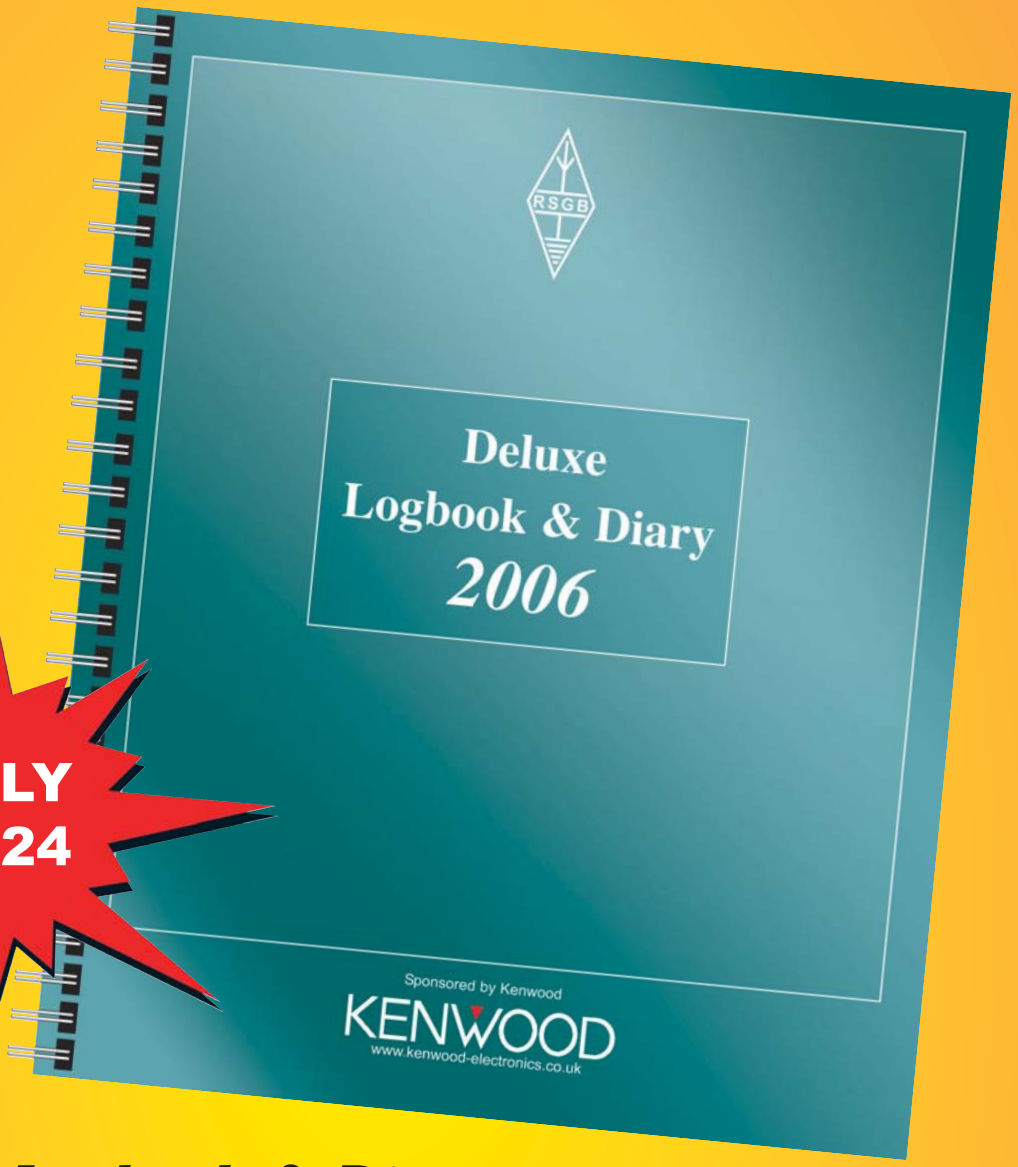
This is because Chelmsford's team of expert trainers know how to back up the theory with hands-on demonstrations of radio equipment in operation. This makes it easier for students to take the informaton in.

To book a place on the next course, contact Clive Ward, M0SIX. Tel: 01245-224577

PICTURE BY TREVOR, M5AKA

Tutors and successful candidates from Chelmsford ARS's Summer Foundation course.

NEW NEW NEW



ONLY £4.24

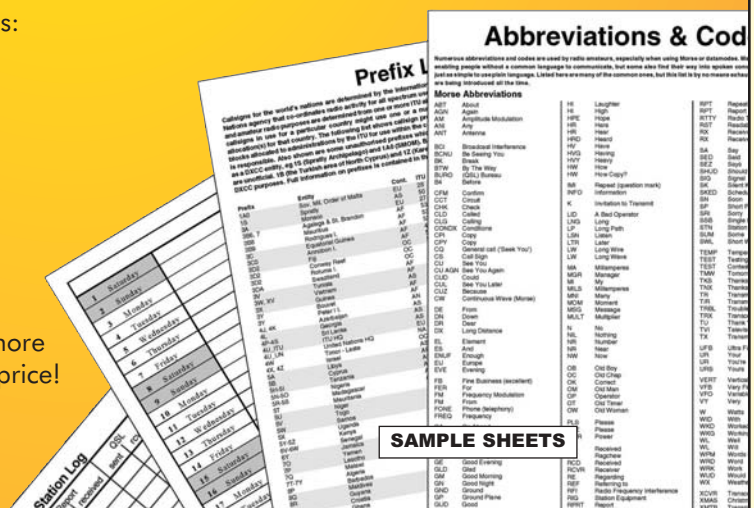
Deluxe Logbook & Diary 2006

Designed for those requiring more from their Logbook, the RSGB have produced the popular Deluxe Logbook & Diary 2006. Containing far more than a standard Log book this edition has been thoroughly revised and updated. Amongst its many features are Band plans, locator maps, lists of abbreviations & codes and a DXCC prefix guide. As usual a 2006 diary section is included along with notes of events and contests through the year. This wire bound book contains generous 255 x 420 log pages yet folds neatly for storage (overall folded size is 255 x 210mm). This book is also the ideal way to neatly record a whole year of activity and store it in attractive way for years to come. This handy reference guide is in the ideal place for every day use - the logbook of the shack!

The Deluxe Log Book & Diary 2006 includes:

- 2006 diary
- 2006 events & contests calendar
- Current UK band plans
- European locator map
- Prefix guide
- Repeater listings
- QSL bureau information
- Handy lists of abbreviations & codes
- And much more

A must for every shack this logbook is far more than a standard logbook yet it is the same price!
Non members price £4.99 plus p&p



RSGB SHOP

RSGB
Lambda House
Cranborne Road
Potters Bar
Herts. EN6 3JE
Tel. 0870 904 7373
Fax. 0870 904 7374

ORDER 24 HOURS A DAY ON OUR WEBSITE
www.rsgb.org/shop

Deluxe Log Book Cover
For those wishing to protect their Deluxe Log Book. The cover is finished in classic black with a RSGB diamond Gold Blocked onto the front. The ideal accessory for anyone purchasing the Deluxe Logbook.
£8.49 member
£9.99 non members

The Rig Guide: The Ultimate Guide to Amateur Radio Equipment
If you are thinking of buying new or used equipment, the fully updated and completely revised RSGB Rig Guide is here to help.
Only £3.99 including postage

Hints and Kinks for the Radio Amateur 17th Edition
Hints & Kinks for the Radio Amateur is the first place hams turn for information about new modes, new projects, and the latest tips. You'll find something on every page to solve problems.
£11.89 members
£13.99 non members

Guide to VHF/UHF Amateur Radio
This hand-sized book contains everything you will need to help you enjoy VHF/UHF amateur radio to the full.
£7.64 members
£8.99 non members

QRP Basics
QRP Basics will enrich your amateur radio. It will inspire you to start building. It may even get you out in the open air. Quite simply, QRP Basics shows just what fun can be had from amateur radio.
£12.74 members
£14.99 non members

All prices plus p&p

E&OE

WATERS & STANTON

WWW.WSPLC.COM
WWW.LOWE.CO.UK
WWW.JAYCEECOMS.COM

NEW LOWER MFJ PRICES!

MFJ

MFJ-259Z *NEW*

The famous antenna analyzer from MFJ has had a revamp. Now you get the analyser plus built-in Ni-MH battery pack and AC charger and also a "dip meter" type coupling coil that can check trap resonances.

MFJ-259Z Turns hours into minutes and Ideas into Antennas!

Brief Specification: ** 1.8 - 170MHz * Built-in Ni-MH pack * AC charger and power supply * Dip Meter coil * DC Voltage display * VSWR digital and analogue * Resistance and Reactance * Coax diagnostics including dB loss * Capacity in from a few pF to several thousand pF * Inductance from 1uH to 60uH * Distance to coax fault * Resonance mode * Velocity factor * RF transformer and balun testing * Frequency counting mode.*

INTRODUCTORY PRICE £199.95 B

AL-811XCE £699.95 C

This amplifier uses three AL-811A tubes to give up to 600W PEP output. Built-in 230V AC supply and dual meters. Quiet cooling and instant by-pass switch. Get your signal heard around the world!

MFJ-948 £119.95 B

Another all-time best seller, this 300W ATU covers 1.8 - 30MHz and handles wire, coax and balanced feed. It is widely used for base station use. Cross-needle meters make adjustment very easy and precise.

MFJ-914 £56.95 A

Not so widely known, but very useful for all HF solid state radios. Place this in series with your coax feed and it allows you to tune antennas that your internal ATU could not manage - like G5RV on some bands. Great idea.

MFJ-910 £22.95 A

If you are interested in mobile operation you will know that the feed impedance of the antenna is very low - you just the VSWR down low! Put this in series and the VSWR comes way down - just switch for best match 3.5 - 30MHz 200W

MFJ-991 *New Auto ATU* £179.95 B

This ATU is very similar to the MFJ-993 but only handles 150W, does not handle balanced feed and has no antenna switch or LCD display. The bare bones at a great price!

MFJ-1026 £149.95 B

A little know product that could transform your listening pleasure. This is designed to remove electrical noise by phasing it out and it really works! Can fit in-line with transceiver. Radio signals remain whilst local eletrical noise is greatly reduced!

MFJ-417 £49.95 B

A budget Morse tutor that is extremely small and convenient to carry. Sends characters, text and can even simulate QSO's from its data base! Runs from 3 - 35 wpm using internal battery (not supplied). Has headphone socket and volume control. Great buy!!

MFJ-704 £42.95 B

Yet another MFJ item that should be in your shack. A low pass filter cleans up the output of your transceiver and reduces the risk of interference to a wide range of domestic products. A small price to pay for peace and quiet. This one handles up to 1kW with bandpass range of 1.8 - 30MHz.

MFJ-969 £169.95 C

This 300W ATU covers 1.8 - 60MHz and matches long wires, coax and balanced feeder. The cross-needle meter makes adjustment easy and it has a great PEP circuit.

MFJ-901B £72.95 B

If you are looking for a 200W ATU from 1.8 - 30MHz with a tight budget, this is the job. 200W rating and handles wire, coax and balanced feed. Needs and external VSWR meter or you can use the one in your rig.

MFJ-902 £65.95 B

We sell these by the bucket load because they are a great design. This ATU is known as the Travel Tuner and measures just 9- x 60 x 80 (mm). 3.5 - 30MHz 150W. It will handle wire or coax systems. MFJ-902H adds balanced feed. **£99.95**

MFJ-974 £159.95 C

If you are using or want to use balanced feeder, then you are best to get a dedicated balanced tuner for best efficiency. This new unit from MFJ will give you just that. Covering 1.8 - 54MHz it will handle 300W and also tune end fed wires. Lovely build quality, smooth tuning and cross-needle metering.

MFJ-16010 £46.95 B

Our Director, Peter Waters, G3OJV, has used this ATU for years. Basically designed for wire use or coax, it covers 1.8 - 30MHz up to 200W. Its an ideal portable unit and measures just 110 x 83 x 55mm

MFJ-382 £39.95 B

MFJ's amplified speaker is a great way of extending the use of your handheld radio or scanner. It will deliver ip to 1W of good quality audio and can be powered from an internal battery (not supplied) or external 12V supply. A mono to mono lead is included.

MFJ-260C £33.95 B

Every station should have a dummy load and this one 1kW for 10 secs befoe cooling or 100W for ten minutes. 50 Ohms 0 - 600MHz. **MFJ-260CN** is similar but with "N" socket. **£44.95**

MFJ-1704 £59.95 B

Antenna switching is an important part of any station and for low loss results you need a coaxial type. This one is a 4-way design with beautifuly positive movement. SO-239 DC-500MHz, 2kW and up to 60dB isolation.

MFJ-949 £135.95 B

One of the all-time best sellers, this 300W ATU covers 1.8 - 30MHz and handles wire, coax and balanced feed. It also features a built-in dummy load. Cross-needle meters make adjustment very easy and precise.

MFJ-971 £89.95 B

Designed for portable work, this ATU can handle 200W from 1.8 - 30MHz and has a power meter that reads FSD 300W 30W or 6W. Cross needle indicators allow you to prescisely match coax, wire or balanced feeder.

MFJ-904H £109.95 B

The complete travel tuner is all you will ever need for portable or mobile use. 3.5 - 30MHz balanced, wire or coax. And the dual meter makes adjustment a breeze.
180 x 60 x 80 (mm).

MFJ-993 *New Auto ATU* £209.95 C

At last, an auto ATU that is low cost, and handles wire, coax and balanced feeder. Covering 1.8 - 30MHz up to 300W and includes and antenna swich. It learns as it goes and remembers previous settings for speedy tuning. You also get digital and analogue readings and an optional audio indicator for those with poor sight.

MFJ-392B £22.95 A

The headphones are of the classical design with padded earpieces and have great sound-proofing properties. The tailored response is ideal for radio communications and are provided with adaptor to fit 3.5 or 1/4" stereo sockets.

MFJ-418 £69.95 B

Morse code is still probably the most effective and simple way to communicate - and great fun. Now you can learn it easily and quickly by using this decoder. Carry it in your pocket and learn anywhere. has headphone socket. **MFJ-461** is similar but instead, reads morse when you hold it near a loudspeaker. **£84.95**

MFJ-267 £129.95 B

This is one piece of test equipment that should be in every operator's shack. Only into a dummy load can you get accurate transmit power capability. This one handles up to 1.5kW with 3 power ranges and accurate PEP mode. It can even be left in circuit as there is a thru switch to the antenna! What a great idea!

MFJ-269 £269.95 B

This analyzer covers 1.8 - 170 / 415-470MHz and has the same basic specifications as the MFJ-259Z but is not supplied with batteries, power supply or dip loop. However, it has a very wide UHF range that extends its usefulness to adjusting helical antennas etc. Just connect to antenna or coax and see the truth. A great idea!

Telephone Enquiries 01702 206835/204965

YAESU
Choice of the World's top DX ers

WIN AN FT-1000MP-MKV!

500:1 or better chance of winning!

Buy any Yaesu Transceiver or Receiver to enter

FT-1000MP-MKV 2005 Competition

We have 500 hundred competition cards to send out to UK & Ireland customers. To enter, simply buy any new Yaesu transceiver or receiver from Waters & Stanton at Hockley, Matlock or Glenrothes. You will receive a competition card with a simple question to answer. Complete the card and post it to the address at Yaesu UK who will make the draw on our behalf. The first card drawn with the correct answer will win an amazing brand new FT-1000MP-MkV transceiver. The draw will take place ten days after the 500th card has been issued to allow time for postage. The result will be announced in the amateur radio press and on our web site. Applies to Mail Order, Counter & Rally Sales.

Only Waters & Stanton can offer you low prices PLUS a chance to win a radio worth £2099!

Yet another reason to buy your Yaesu from Waters & Stanton!

There has never been an offer like this before.
Trust Waters & Stanton to give you that little bit more!

This competition is only open to UK & Ireland customers who purchase new Yaesu transceivers or receivers from Waters & Stanton. It is not open to employees of the company, trade customers or customers of other dealers. Waters and Stanton plc and Yaesu UK Ltd do not accept any responsibility for late or lost entries due to the Post. Proof of sending is not proof of receipt. Draw expected to be made early in 2006.

George Brown, M5ACN

c/o RSGB HQ.

The new Yaesu FT DX 9000D
a preview

The latest from the Yaesu stable, the FT DX 9000D and its anticipated capabilities already appear to be the stuff of legend. Not yet available in the UK, this short article attempts to bring out the more obvious features.

The Yaesu FT DX 9000D, the first of the 9000 series to be launched in the UK later this year.

Well – it's almost here, the most anticipated event in 2005 – the arrival in the UK of the FT DX 9000D, Yaesu's latest top-of-the-range transceiver. Three versions of this 'black box' will eventually be available – the 'D', previewed here, the 'Contest' and the 'MP'. More of these last two later.

The 9000 is big and heavy – is your operating table big enough and butch enough? It is 16.51cm high, 51.82cm wide and 43.94cm deep, weighing in at around 66lb (30kg). It has 37 knobs and 96 buttons, enough for any operator, but the size of the front panel is such that these are all sensibly-spaced, with little possibility that even the most ham-fisted operator will be able to press or turn more than one at once!

The 9000D has two receivers, so that you can listen on one band while transmitting in another – useful for single-operator contest working, I believe. The receivers are the best available to the amateur, being noticeably quieter and more responsive than present receivers. Norm Fusaro, W3IZ, in reviewing the 9000D for *QST* (August 2005, pp53 – 59) under crowded band conditions, says "The FT DX 9000D hears extremely well. In A – B comparisons with my FT-1000MP, the same signals appeared to be much sharper on the 9000... Weak European stations that were somewhat muddy on the MP were crisper and easier to copy... it was nice to be able to isolate a signal so that it appeared as if it were the only one on the band."

The receiver performance figures appear to be much better than those to which we have become accustomed over the past few years assisted, no doubt, by having the choice of roofing filter bandwidths at 3, 6 and 15kHz. Selectivity is a function of the IF DSP, the default values being 9kHz, 2.4kHz and 500Hz, for AM, SSB and CW, respectively. The IF width is variable from 100Hz to 3kHz, and the shift is variable within 1kHz in 20Hz steps. A 'Contour' control is also available for controlling the selectivity slope. Most settings are indicated on the front-panel TFT display, a distinctive feature of the 9000D.

As for the transmitter, the 9000D has a 200W output but, in contrast to its predecessor the FT-1000MP of the same output power, the 9000D has an internal switch-mode power supply. Eagle-eyed readers will have noticed the professional-type XLR microphone socket on the front panel. Don't panic; the usual Yaesu 8-pin connector is to be found on the back panel if you cannot lay your hands on a microphone with a three-wire balanced XLR connector! As might be expected these days, an IF DSP speech processor is provided, together with a built-in keyer. Owners of the FT-1000MP will be familiar with the 'Class-A' switch, enabling a clean 75W signal to be produced. The 9000D goes one step further by having a bias control which is variable between Class-A and Class-AB.

COMPARISONS

So what *is* the difference between the three versions? The information in the box may help as far as the major features are concerned.

Judging by some American amateurs who have already taken the plunge with the FT DX 9000D, the consensus seems to be that it was well worth the wait, and I'm sure this will be the reaction over here too, once the dust has settled!

WHEN CAN I GET IT?

Now you're asking! The present UK estimate is 'later this year', although a demonstration model is thought to be destined for the Leicester Show at Donington Park on 30 September / 1 October.

As far as the price is concerned – £7299, inclusive of VAT – will make quite a hole in your pocket. This is for the FT DX 9000D, which has *everything* included. What more is there to say? ♦

A BRIEF COMPARISON OF THE THREE VERSIONS

FT DX 9000MP	FT DX 9000D	FT DX 9000 Contest
400W special order	200W version	Custom configurable
Two pairs of meters	Large TFT	Two pairs of meters
LCD window	LCD window	LCD window
Main/sub receiver VRF	Main/sub receiver VRF	VRF input preselector
Dual-receive	Dual receive	
50V/24A external PSU with speaker and audio filters	50V/12A internal PSU	50V/12A internal PSU
Modification from 400W to 200W not possible	Modification from 200W to 400W not possible	Modification from 200W to 400W not possible

ALINCO Dual Band Duet

for your car and pocket

DIGITAL

NEW DR-635 mobile brings high power full duplex and convenient controls to your car

Imagine telephone-style full duplex from the car. Rag-chewing on the repeater whilst monitoring a simplex frequency. Or listening to broadcast radio while in a QSO. Alinco's new DR-635 does all this, and more! Featuring a large, easy-to-read LCD and simple clear controls, the DR-635 is one of those radios which just feels right.

Features

- 2m / 70cm operation
- Twin receivers for VHF-UHF, VHF-VHF or UHF-UHF
- FM broadcast receive
- 200 memories
- 50W on 2m, 35W on 70cm
- Large 6 character alphanumeric display
- Selectable display and key illumination (blue, amber or violet)
- Detachable control head - remote kit EDS9 available
- The body can be mounted either way up for optimal speaker placement
- Theft alarm feature
- Full CTCSS and DCS encode / decode
- Optional 1200/9600baud packet (requires EJ-50U) and Digital Voice (requires EJ-47U)
- High stability temperature compensated crystal oscillator
- Ignition key operated on/off

£295

Specifications

Frequency range	87.5-107.995 MHz (Rx)
	144.0-145.995 MHz (Tx/Rx)
	433.0-439.995 MHz (Tx/Rx)
Power output	50/20/5W VHF, 35/20/5W UHF
Channel steps	5, 10, 12.5, 15, 20, 25, 30, 50, 100kHz
Power requirement	13.8V DC +/– 15% negative ground,
	11A max, 500mA (squelched Rx)
Dimensions	140 x 40 x 185mm, 1kg
Rx sensitivity	(12dB SINAD) –14dBu (main),
	–12dBu (sub band)
Audio output	2W (10%THD)

Perfectly complementing the DR-635, Alinco's DJ-C7 gives great dual-band performance in a package you can slip discreetly into a pocket. With strong 2m + 70cm performance and the added benefit of broadcast FM receive, the DJ-C7 is loaded with features. Fitting perfectly into the hand, the DJ-C7 provides 300mW on 2m and 70cm from a package not much larger than a credit card and an incredible 14.5mm thick. Weighing less than four ounces it's the ultimate in portability!

Never be out of touch with the next generation of ultra-slim handheld DJ-C7

Features

- 2m / 70cm operation
- FM broadcast receive
- 200 memories
- 300mW output (500mW on external DC supply)
- Easy to read LCD display
- VFO, Memory and Scan operating modes
- Full CTCSS and DCS encode / decode
- SMA antenna socket, rubber duck dual band antenna supplied
- High sensitivity receiver
- High energy density Li-ion battery EBP-58 included
- Fast charger supplied, world-wide voltage compatible (100-240V)
- Over 24 hours operation on one charge (squelched, battery save mode, 1% Tx)
- Supplied with: Lithium Ion battery pack EBP-58N (3.7V 600mAh), worldwide voltage fast battery charger, flexible antenna.

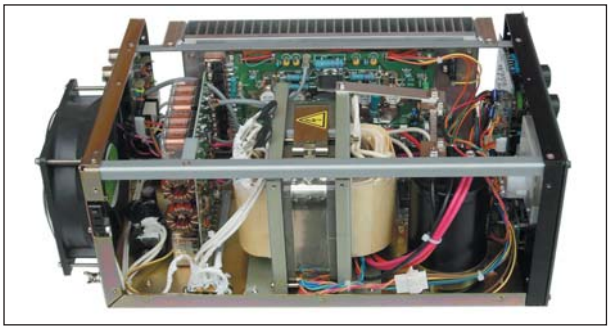
£129

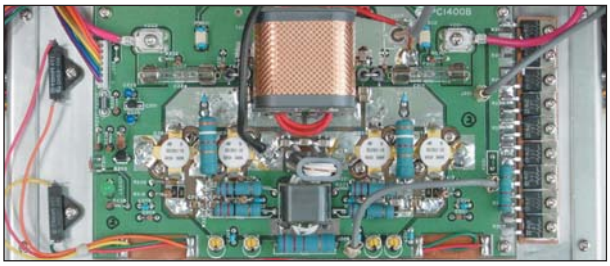
Specifications

Frequency range	87.5-107.995 MHz (Rx),
	144.0-145.995 MHz (Tx/Rx),
	433.0-439.995 MHz (Tx/Rx)
Power output	300mW
	(500mW on external 6V DC input)
Channel steps	5, 10, 12.5, 15, 20, 25, 30, 50, 100kHz
Power requirement	3.7-6V, 320mA (Tx),
	70mA (Rx, typical),
	19mA (Rx, squelched, Battery Save mode)
Dimensions	58 x 96 x 14.5mm, 102g
Rx sensitivity	(12dB SINAD) –15dBu
Audio output	90mW (10%THD)

Japanese company Tokyo Hy-Power Labs specialises in designing and selling high-power semiconductor amplifiers. Peter Hart takes a look at three of the company's HF linear amplifiers.

Tokyo Hy-Power Labs HF linear





HL-1KFX front angled view

HL-1KFX inside view with cover removed

HL-1KFX rear panel view

HL-1KFX 500W RF amplifier module

There are essentially two approaches to providing a high power add-on linear amplifier for the HF bands, the traditional tuned valve amplifier or the broadband semiconductor design. Valve amplifiers need to be retuned by the user when changing bands, although some high-end designs will do this automatically in a few seconds. Some valves require up to three minutes warm-up time before being ready for use but valves are generally fairly robust and tolerant of overdrive or mistuning, and tuning networks allow optimum performance to be achieved with moderate antenna mismatches. Transistor amplifiers use broadband techniques requiring no tuning other than the switching of lowpass filters in the output to keep harmonics within limits. Requiring no warm-up, transistors have totally displaced valves now for well over 20 years at power levels up to a couple of hundred watts. At higher power levels, transistor amplifiers use multiples of lower power units and hence complexity and cost increases in direct proportion to the output power. With valve amplifiers, the cost against power curve increase is not so steep. Hence valve amplifiers still dominate at the higher power levels.

There are a number of manufacturers of high power valve linear amplifiers but relatively few who supply semiconductor units. Both Yaesu and Icom include 1kW broadband amplifiers in their product lines but they are pricey. Tokyo Hy-Power Labs is a Japanese company specialising in designing and selling high power semiconductor amplifiers. The company has an excellent reputation for customer support and its product range is quite extensive with units at a variety of power levels for the HF, VHF and UHF bands. Suppliers in the UK currently stock three models, these being the HL-1KFX, HL-2KFX and HL-100BDX. I am grateful to the UK distributor MLS Martin Lynch and Sons for kindly providing these amplifiers for review.

HL-1KFX

The HL-1KFX is a self-contained and mains-powered amplifier covering the HF bands from 1.8MHz to 30MHz. It is rated at 500W output on SSB and CW modes and 250W output on sustained constant output modes such as RTTY, SSTV, FM etc. The drive requires 50W to 100W and is fully compatible with most HF transceivers.

The RF amplifier section uses four power MOSFET transistors connected in push-pull with ferrite broadband transformers and two parallel connected transistors in each leg of the push-pull pair. These are Motorola devices type MRF150 according to the manual but the review amplifier was fitted with equivalent ST devices type SD2931-10. A low-pass filter follows the amplifier to reduce harmonics to an acceptable level. One of six filters is selected according to band (1.8, 3.5, 7, 10/14, 18/21, 24/28) and these are relay switched from the band switch on the front panel. The RF amplifier operates from a nominal supply voltage of 53V and draws a maximum current of 25A. A conventional unregulated mains power supply is fitted with a chunky transformer and this accounts for much of the weight.

The amplifier is constructed on a sturdy steel frame with a wrap-around steel case and is very well made with good quality components and construction. The case is well shielded but there is no other internal screening. It is quite compact for an amplifier of this power level measuring 23.2W x 15.5H x 40.0D cm overall and weighs about 14kg. The 500W amplifier assembly is constructed as a module on a substantial finned aluminium heatsink. A copper plate is spaced between the power transistor flanges and the heatsink to spread heat more effectively. A large fan dominates the rear panel and blows air through the unit and out the top of the case via the heatsink fins. It seems quite effective at cooling the amplifier and is reasonably quiet, but a little noisier when hot as the fan engages a higher speed mode.

The amplifier is switched from the transceiver via a 'ground to transmit' line at levels suitable for semiconductor switching (14V open, 50mA closed). The antenna relays are quite

Peter Hart, G3SJX

The Willows, Paice Lane, Medstead, Alton, Hants GU34 5PR

E-mail: peter@g3sjx.freeserve.co.uk

amplifiers

small but should be fairly fast in operation and allow QSK with suitable RF sequencing from the transceiver. ALC feedback to the transceiver is provided to prevent overdrive and this is adjustable to accommodate most available radios.

Front panel metering is provided for monitoring forward power, reflected power, PA supply voltage and current and is selected by a front-panel switch. The supply voltage sags noticeably at high power levels but this is normal for unregulated supplies. Protection circuitry is built-in to guard against damage to the expensive power transistors and this includes over-voltage, over-temperature, excessive reflected power and excessive RF drive. If any of these protection limits is exceeded, then the amplifier is placed in the through (standby) state and an LED indicates this condition. An interlock disconnects the mains power when the case is opened.

Measurements were made on the amplifier under CW and two-tone SSB conditions. A low distortion two-tone drive source was fabricated using two transceivers operating on CW with 10kHz frequency spacing coupled with a high power hybrid coupler. This arrangement yielded around 80-100W PEP drive power with residual intermodulation products at -50dB. The measured results for the HL-1KFX at 500W output are shown in Table 1. Full power could only just be achieved at 10MHz and this band also showed the worst harmonic and distortion outputs. The harmonic output was also poor on 1.8MHz and marginal on several other bands. The input VSWR was excellent, 1.1 on the lower bands rising to 1.35 at 28MHz, due in part no doubt to the attenuator in the amplifier input to keep the gain around 7 to 10dB and hence compatible with 100W radios. The front-panel power meter gave good accuracy midscale, becoming a little optimistic at the higher readings.

The amplifier performed well in on-air tests and no problems were experienced. A brief user manual is provided which includes a set of circuit schematics.

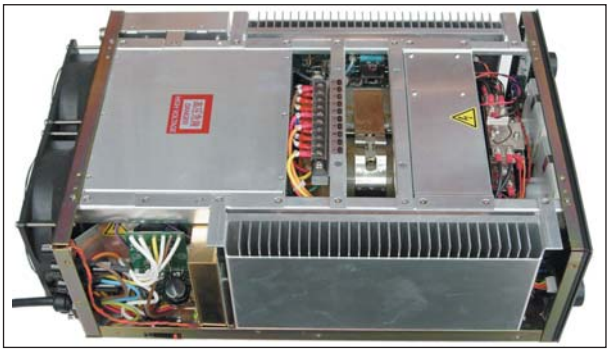
HL-2KFX

The HL-2KFX is the most recent addition to Tokyo Hy-Power's product line and is currently its highest power amplifier. It is self-contained and mains powered covering the HF bands from 1.8 to 30MHz and in addition the 50MHz band. It is rated at 1,000W output on SSB and CW modes on the HF bands and 650W output on 50MHz. For sustained constant output modes such as RTTY, SSTV, FM etc or similar high duty cycle operation, the output power should be restricted to half these levels. The drive power requirement is 70 to 100W.

The RF amplifier section uses two 500W modules coupled together using power splitters and combiners. The 500W modules are essentially the same units as fitted to the HL-1KFX with some small modifications to extend the frequency coverage to 50MHz. M/A COM power MOSFET devices type MRF150 are used with a total of eight to achieve 1000W output power. The low-pass filter unit, which follows the combined amplifier outputs, uses one of seven relay switched filters selected according to band. The same HF band splits are used as with the HL-1KFX but with the addition of 50MHz. Larger components are used in the filter to handle the higher power levels. The HL-2KFX uses a similar 53V power supply arrangement to its smaller brother but with components rated to give a higher current output of 50A.

A similar construction is adopted using a sturdy steel frame and wrap-around case and achieving a very well made quality product. Additional internal screening is provided around the filter units, antenna changeover and other areas and the overall size is 30.2W x 15.5H x 48.0D cm. The weight is 25kg. The unit is cooled by two large fans which virtually cover the rear panel and blow air through the amplifier and out to the top of the case via both finned heatsinks. As with the lower powered unit, the fans are reasonably quiet and engage a faster mode when the amplifier is hot.

Amplifier switching from the transceiver and ALC control are



Top to bottom:
HL-2KFX front angled view

HL-2KFX inside view showing extensively screened units

HL-2KFX rear panel dominated by two large fans

HL-100BDX overall view

HL-100BDX single PCB containing amplifier, filter and control

similar to the smaller amplifier and, according to the Tokyo Hy-Power website, the amplifier is suitable for CW QSK operation. Two antenna sockets are provided on the rear panel and a front-panel switch selects between them. An auto position will automatically select antenna A on HF and antenna B on 50MHz even with the amplifier turned off, providing it is still connected to the mains supply.

Two meters are provided on the front panel. One reads RF power output continuously and the other can be switched between reflected power, PA supply voltage and current. Protection against over-voltage, over-temperature, excess drive, excess reflected power and amplifier unbalance is included and returns the amplifier to the disabled condition. An interlock disconnects the mains power when the case is opened.

The measured performance at 1kW output is shown in Table 2. On 10 and 18MHz, 1kW could not quite be achieved with 100W maximum drive power and on 10MHz in particular the current was noticeably higher than other bands. The input VSWR was again excellent, 1.1 on the lower bands rising to about 1.4 at 28MHz. The front-panel power meter again gave good accuracy midscale, becoming a little optimistic at the higher readings. There were good results generally for intermodulation distortion and reasonable suppression of harmonic outputs. However, some slight instability was occasionally observed at about 1kW output on 1.8MHz.

The amplifier performed well in on-air tests and no problems were experienced. A brief user manual is provided which includes a set of circuit schematics. However, the copying is poor and many labels and values on the schematics are unreadable.

HL-100BDX

The HL-100BDX is a 12V-powered amplifier giving 100W output and covers the bands from 3.5 to 50MHz. It is primarily intended as an add-on amplifier for the Yaesu FT-817 or for other QRP radios. The drive level is switchable between 5W and 10W and a dedicated interface is provided for controlling the amplifier directly from the FT-817 accessory connector. A suitable connecting lead is included with the amplifier.

The amplifier uses a pair of Mitsubishi RD70HVF1 power MOSFET transistors in a broadband push-pull configuration followed by one of six relay-switched low-pass band filters. A band button scrolls sequentially through the bands, but band selection is performed automatically using the FT-817 interface. The amplifier is enabled either by a 'ground to transmit' line or automatically by sensing the transmitter RF power. When using RF sensed switching, the drop back to receive time can be made instant or set to give a half second delay. This prevents switching between Morse characters or brief pauses in speech. A front panel button selects this function and is rather misleadingly labelled SSB/CW, AM/FM. It does not change the amplifier parameters according to mode.

All the circuitry is constructed on a single circuit board mounted on a finned extruded heatsink which also provides the case enclosure. An optional fan may be fitted if needed. The overall size is 17.4W x 5.6H x 23.5D cm and it weighs about 2.4kg. The amplifier is protected against overdrive, overvoltage, incorrect band setting and antenna shorts, deselecting the amplifier and reporting the error audibly in Morse code if a fault occurs. RF power is indicated by a simple LED bar display. A PIC microcontroller is used to carry out all control functions.

Measurements made on the amplifier are shown in Table 3. The higher gain 5W drive setting was used. With the 10W setting, all drive power levels were doubled. On 10MHz, the maximum output that could be obtained was 90W. The input VSWR was about 1.5 on the lower bands, reducing at higher frequencies. Harmonic output is quite reasonable but two-tone distortion levels are very poor.

CONCLUSION

These amplifiers are well made quality units, well protected and generally give a good overall performance. However, the HL-100BDX had a particularly poor distortion performance and all three amplifiers barely reached their rated output on the 10MHz band. Other bands were fine. The amplifiers are currently priced in the UK at £429.95 for the HL-100BDX, £1,399.95 for the HL-1KFX and £2,599.95 for the HL-2KFX. Prices include VAT. ♦

Table 1 Measured performance of HL-1KFX at 500W output power

FREQ	DRIVE POWER FOR 500W O/P	HARMONIC OUTPUT 2nd	HARMONIC OUTPUT 3rd	INTERMODULATION PRODUCTS ref to PEP 3rd order	INTERMODULATION PRODUCTS ref to PEP 5th order
1.8 MHz	54W	-36dB	-54dB	-38dB	-38dB
3.5 MHz	52W	-53dB	-70dB	-38dB	-40dB
7 MHz	84W	-66dB	-77dB	-30dB	-40dB
10 MHz	100W	-34dB	-39dB	-26dB	-40dB
14 MHz	77W	-53dB	-58dB	-30dB	-38dB
18 MHz	56W	-48dB	-63dB	-36dB	-38dB
21 MHz	59W	-55dB	-67dB	-32dB	-38dB
24 MHz	51W	-49dB	-70dB	-38dB	-40dB
28 MHz	46W	-62dB	-67dB	-34dB	-40dB

Table 2 Measured performance of HL-2KFX at 1000W output power

FREQ	DRIVE POWER FOR 500W O/P	HARMONIC OUTPUT 2nd	HARMONIC OUTPUT 3rd	INTERMODULATION PRODUCTS ref to PEP 3rd order	INTERMODULATION PRODUCTS ref to PEP 5th order
1.8 MHz	82W	-64dB	-56dB	-32dB	-41dB
3.5 MHz	61W	-65dB	-58dB	-40dB	-42dB
7 MHz	71W	-68dB	-60dB	-40dB	-50dB
10 MHz	100W (950W)	-54dB	-50dB	-38dB	-50dB
14 MHz	69W	-68dB	<-80dB	-38dB	-44dB
18 MHz	100W (950W)	-55dB	-46dB	-26dB	-42dB
21 MHz	74W	-60dB	-52dB	-30dB	-40dB
24 MHz	87W	-62dB	-52dB	-26dB	-44dB
28 MHz	95W	-65dB	-65dB	-25dB	-42dB
50 MHz	95W (650W)	-65dB	<-80dB	not meas	not meas

Table 3 Measured performance of HL-100BDX 100W output power

FREQ	DRIVE POWER FOR 500W O/P	HARMONIC OUTPUT 2nd	HARMONIC OUTPUT 3rd	INTERMODULATION PRODUCTS ref to PEP 3rd order	INTERMODULATION PRODUCTS ref to PEP 5th order
3.5 MHz	3.2W	-64dB	-66dB	-18dB	-25dB
7 MHz	5.3W	-65dB	-67dB	-20dB	-28dB
10 MHz	5W (90W)	-52dB	-54dB	-20dB	-32dB
14 MHz	5.4W	-78dB	-59dB	-20dB	-28dB
18 MHz	8W	-53dB	-52dB	-20dB	-26dB
21 MHz	2W	-75dB	-57dB	-21dB	-32dB
24 MHz	4W	-52dB	-58dB	-20dB	-30dB
28 MHz	2.9W	-60dB	-53dB	-25dB	-38dB
50MHz	5.3W	-63dB	-61dB	not meas	not meas

WEB SEARCH

Tokyo Hy-Power Labs Inc: www.thp.co.jp

Ultimate Scanning Guide

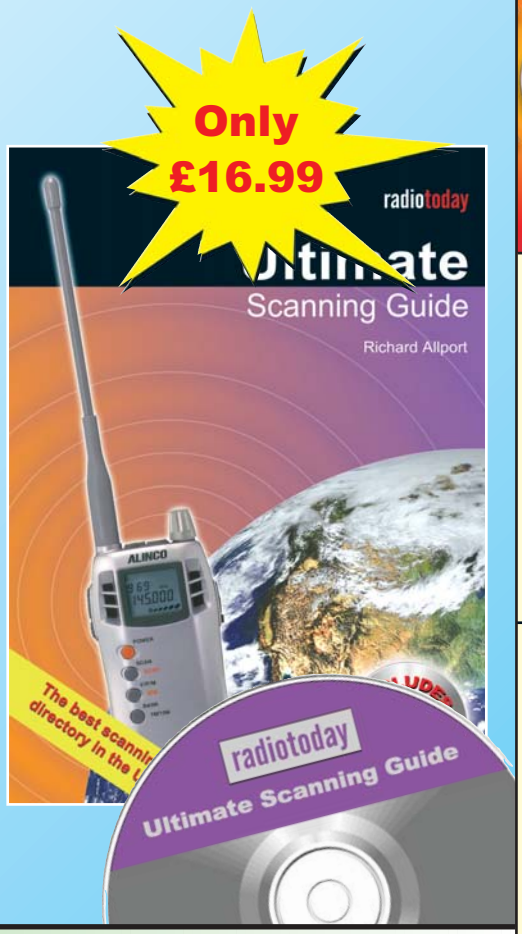
By Richard Allport

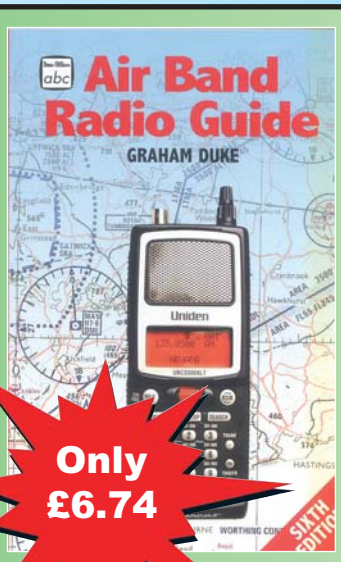
Includes FREE Frequency Search CD

When the first edition of the 'Radio Today Ultimate Scanning Guide' first appeared in 2001 it set new standards in that expected from Scanning books. Not only did the directory claim to have a greater accuracy than other guides it also contained for the first time a searchable CD of the frequencies. Time has moved on and this edition of the book has many new features and touches. For those not familiar with Scanning directories this book provides a simple way to work out exactly who is broadcasting on a given frequency. The reader is provided with clear guidance as to what is available to listen to and what should be avoided. As with the previous edition the listings have been edited to ensure that defunct and duplicated entries have been deleted. This again makes the Radio Today 'Ultimate Scanning Guide' the most accurate and useable directory available. As before this book also contains a free searchable frequency CD. When this first appeared in the Radio Today 'Ultimate Scanning Guide' the CD caused a sensation and the new version is significant step forward. With an improved interface and lightening quick searching this is a boon to any scanning enthusiast. If you are a long standing scanning enthusiast or new to the hobby then you will find this book a "must have" for your book shelf and the yardstick by which every other book in this field is judged.

Size: 240mm x 174mm, paperback, 464 pages

ISBN: 1-905-08606-7. Non members price £19.99 plus p&p





Only £6.74

Air Band Radio Guide

By Graham Duke

For many thousands of aviation enthusiasts part of the fascination of their hobby is the ability to listen in to the radio transmissions made by the Air Traffic Controllers and the aircraft under their control. The book examines in detail the technology involved, the equipment available, airfields, radio frequencies and much else. Individual chapters within the book examine topics such as the legal position, the nature of the transmissions that can be heard, the features of the equipment available and what to look for when seeking to acquire such equipment, antennas and high frequency radio. In addition, the book also includes comprehensive appendices that provide an airfield directory (which lists all the up-to-date frequencies for each of the airfields covered), the ICAO four-letter airfield codes for British and major overseas airports, the ATC reporting points and radio navigation aids, airline call signs and much more.

Size: 184mm x 120mm ISBN: 07110 30758

Non members price £8.99 plus p&p.

RSGB members get 25% OFF !

ABC Air Traffic Control

New Edition

By Graham Duke

9TH EDITION

This new and fully revised ninth edition again gives the reader a comprehensive account of contemporary air traffic control practice. Fully illustrated with both photographs and line drawings, abc Air Traffic Control remains an essential guide for all those interested in the operation of modern civil aviation. Since the eighth edition was published in 2001, the major new ATC centre at Swanwick, a project that had been much delayed, has been commissioned. Also significant has been the demise of Concorde operations at the end of 2003, and the cessation of the special air traffic control regulations that controlled the world's only supersonic airliner. At a time when the level of air traffic flying through UK airspace continues to grow apace and when the incidents of recorded 'near misses' are also on the increase, the subject of air traffic control remains important. Simply put this book is an excellent pocket guide for anyone interested in matters aeronautical.

ISBN: 071103074X, 184mm x 120mm 112 page paperback.

Non-members' price £8.99

RSGB members get 25% OFF !

Only £6.74

RSGB SHOP

RSGB
Lambda House
Cranborne Road
Potters Bar
Herts. EN6 3JE
Tel. 0870 904 7373
Fax. 0870 904 7374

ORDER 24 HOURS A DAY ON OUR WEBSITE
www.rsgb.org/shop

Who's Who? In Amateur Radio
Whatever the level of achievement, Who's Who in Amateur Radio? makes fascinating reading and is an invaluable guide to the personalities of amateur radio
£12.74 members
£14.99 non members

International Antenna Collection
This book is a collection of over 50 of the very best articles published on antennas from around the world. The book is wide ranging and offers solutions to many problems experienced by the antenna enthusiast.
£11.04 members
£12.99 non members

International Antenna Collection 2
This book collects together some of the best articles from around the world on the subject of antennas. It will appeal to radio amateurs in general, whether they be antenna enthusiasts or not. It is a follow-up to the successful The International Antenna Collection, compiled by the same editor.
£11.04 members
£12.99 non members

Backyard Antennas
The book covers end-fed and centre-fed antennas, rotary beams, loops, tuning units, VHF/UHF antennas, antenna and mast construction, transmission lines, and how to estimate and measure the performance of your antenna.
£16.14 members
£18.99 non members

All prices plus p&p

E&OE

AOR ARD9000 digital

AOR's ARD9000 digital voice modem offers "astounding" sound quality at a modest price, writes Chris Lorek

We're increasingly living in a digital world, and this isn't just limited to commercial radio applications such as cellphones, digital TV and radio broadcasting. Amateur radio has been using digital communications from the very earliest days, when CW could be arguably termed as the first ever 'digital' mode. Eventually RTTY came along, then packet radio, followed by a plethora of advanced data modes for keyboard-based communication. Some of these do such a good job in weak signal and interference rejection that you'll achieve 100% copy when modes such as manual CW or analogue SSB wouldn't stand a chance of getting through. Some experimental modes, such as narrowband spread spectrum, are also suitable for digitising signals including speech for weak-signal and interference-laden work. Indeed any digital mode capable of data transfer at a reasonable bit-rate speed could be adapted for digital speech over an SSB bandwidth.

In 1999, Andy, G4JNT, and Charles, G4GUO, published their results with digital speech over HF in RadCom [1], followed by papers later in other publications [2, 3]. There's also an excellent description on G4GUO's website [4]. Last year, AOR took a brave marketing decision and launched a ready-made set-top version of a digital modem, the ARD9800, which was reviewed in the July 2004 issue of RadCom [5]. This offered not only digital speech over an SSB bandwidth, but also file transmission and optional TV-resolution picture transmission by adding a plug-in module. It's fair to say that many amateurs, me included, were greatly excited about this, although I am sure the price tag of just under £500 dissuaded a number of amateurs. However, AOR has now launched the ARD9000 at a typical retail price of around £169.

FEATURES

The ARD9000 is a voice-only modem, although it's fully backward compatible with digital speech with the ARD9800. Like its multimode predecessor, it acts just like a set-top box with no transceiver modifications needed. You just plug it in, possibly adjust a few audio levels using the controls on the unit, and off you go.

For the technically minded, a description of the data mode used is given in the references and the RadCom review detailed earlier. It uses OFDM with a digital vocoder and DQPSK modulation, employing 36 tone carriers spaced at 62.5Hz, giving an overall transmitted audio bandwidth of 312.5Hz to 2,500Hz.

The ARD9000 is quite compact, measuring just 70 x 33 x 98mm making it even smaller than most SWR meters. It operates from an external DC voltage of between 10-16V and draws a current of approximately 100mA at 12V, a plug-in DC cable being provided. AOR recommends this supply be separate from the DC feed to your transceiver, no doubt to prevent earth loops – a small AC wall adapter would be a typical choice here. 3.5mm jack sockets are fitted on the rear panel for receive audio in and out, together with an eight-pin microphone-style socket for connection to your transmitter. This is wired to be compatible with Adonis microphone wiring, and a range of optional ready-made leads are available to suit a variety of transceivers. A ready-made receive audio lead is provided with the unit, together with a matching 8-pin plug which you can wire up to suit your transceiver. But to get you started quickly, a handy speaker-mic, which plugs into the 2.5mm and 3.5mm jack sockets on the front panel, comes with the unit. Four rubber feet are fitted to the bottom panel, and a screw-on circular magnet is also supplied that can also be attached to the bottom panel, to keep the unit in place when it's positioned on top of your transceiver's metal case. This cleverly prevents the modem sliding around, especially if you're using the speaker microphone.

INSTALLATION

Connecting up was very simple, and as I already had an Adonis desk mic I didn't need to make up or obtain a suitable lead from the ARD9000 to my transmitter, although this would have been a simple job taking just a few minutes, providing of course I had a suitable multi-way lead and transceiver mic plug handy. The first thing to do was to set up the receive audio level into the unit for digital reception, which I did by simply

Chris Lorek, G4HCL

PO Box 400, Eastleigh, SO53 4ZF

E-mail: g4hcl@rsgb.org.uk

speech over SSB modem

Left
The ARD9000 is a compact unit

Rear panel connections

Inside the unit

A handy speaker-mic is supplied

adjusting the receiver's volume control until the front panel 'Over' LED remained off; if it's flashing, the level is too low and if it's always on, it means it's too high. It's also possible to adjust the level if needed using a small preset on the underside of the ARD9000's case. The front panel 'PWR/VOL' control is then used to vary the receive audio level in digital reception. The unit doesn't provide sound amplification for ordinary analogue voice - you'll need to use your main receiver's volume control. Next comes the transmit level - the remaining small presets can be used for this although I simply altered my transceiver's mic gain to suit. On transmit, again the front panel 'Over' LED gives you an indication of the correct level of mic audio going into the unit.

IN USE

On the air, the ARD9000 can remain completely 'transparent', automatically switching to digital mode on receive when it detects a digital signal, otherwise passing analogue receive audio straight through. The front panel dual-colour 'STA' (Status) LED let's you know which mode the unit is in at any time. On transmit, you can simply toggle between digital and analogue SSB transmission by quickly pressing and releasing the PTT switch, the second push then opening the microphone and allowing you to transmit. The small front panel 10-position 'Mode' switch lets you choose between various switching options, SSB or FM modes, and the length of the short 'header' which is automatically transmitted before the digital speech on each 'over'.

I've already used the ARD9800 digital speech modem on air, and I must say that the ARD9000 was just as impressive. On HF SSB when receiving a digital voice signal, the background noise you normally associate with high frequency long-distance communication instantly disappears, and perfect telephone-quality speech with absolutely no background noise comes through on your speaker. In fact, during one contact on 20m, my QSO partner commented on one of my cats who was meowing in the background – the cat was in another room and I could only just hear her myself! It really does sound like your QSO partners are sitting in the same room as you, rather than on the other side of the Atlantic.

On SSB, the system operated perfectly as long as signal levels remained reasonably strong, at a level that would normally give at least Q4 copy (readable with practically no difficulty). Once moderate interference was present, communication usually failed, although if this came up mid-way through a digital 'over' and the modem lost synchronisation, I could easily force it to re-sync with a press of the small front-panel 'Sync' button. However, it doesn't have an automatic re-sync facility built in.

To initiate a contact, the usual method is for someone to initially call 'CQ Digital' on analogue SSB, then both parties would switch to digital for the contact. Of course, calling 'CQ Digital' randomly on whichever frequency in the SSB portion of the band is clear will currently usually result in few, if any, digital contacts. Suggested calling frequencies for this mode currently are 14.236MHz, 18.1625MHz and 21.370MHz, all USB. 14.236MHz can sometimes be a noisy frequency over here, and UK and European amateurs also use 14.255MHz USB. There's also a weekly net every Saturday and Sunday at 20.00GMT on 14.236MHz USB plus or minus 3kHz depending upon QRM. As well as on-air contacts, if you'd like to pre-arrange a 'sked' then an independent web site has been set up for amateurs to compare results and arrange schedules (www.rfelectronics.com). On this site, you'll also find a sample of the audio quality you'll typically get on HF with one of these units, taken from a real on-air contact on 18.1625MHz.

As AOR lent me two units, I passed the other onto my colleague Andy, G4MYS. This allowed us to test the modems on VHF FM. Although local FM communication is already high-quality with low background noise, results were equally as impressive as HF SSB. The receive audio sounded far more natural in digital mode due to the wider audio bandwidth being transmitted. This is because narrow-band FM is filtered and clipped to prevent excessive spreading. 12.5kHz channel spacing FM typically starts 'rolling down' at 2.55kHz audio frequency, giving it a nasal effect, whereas the recovered digital audio went well above 3kHz. AOR however doesn't recommend the system to be used for FM mobile work because, in cases of mobile flutter, the digital signal could repeatedly lose synchronisation. But in fixed station use, once again it almost sounds like they're in the same room as you.

On a final note, although I experienced no problems, some amateurs have found that with the ARD9000 in circuit in analogue mode, there has been a slight 50Hz buzz in the background of analogue transmissions. A solution has already been found by AOR, and this involves the removal of an internal surface-mount resistor on the modem's PCB. The only disadvantage here is that the ARD9000 will no longer pass receive audio through when it's switched off. AOR (UK) offers a free, well-documented service bulletin if you wish to do the modification.

CONCLUSIONS

I was very impressed indeed with the quality of audio using the ARD9000 for contacts. It's a major improvement over analogue SSB and the results astonished fellow amateur visitors to my shack when I switched between digital and analogue. The system doesn't offer a 'weak signal' mode. For this you'll typically need to use computer-based digital text modes, but when signals are at a reasonable level, the results are astounding. AOR has launched the unit at an affordable price, and with the open communication protocol it uses (which means it's not just tied in to one manufacturer) the future looks promising. In my opinion, the ARD9000 is an ideal starter product and, as with the ARD9800, AOR is to be commended in leading the way.

The ARD9000 is available either direct from AOR (UK) in Matlock, Tel. 01629 581222, or from a selection of AOR dealers. ♦

REFERENCES

[1] 'Digital Voice Communications' by Andy Talbot, RadCom October and November 1999
[2] 18th ARRL/TAPR Digital Communications Conference proceedings
[3] QEX the Amateur Radio Experimenters Journal, May and June 2000 (ARRL)
[4] www.chbrain.dircon.co.uk/dvhf.html
[5] Digital voice transmission; the ARD9800, RadCom July 2004

Marc Litchman, G0TOC
26 Oak Tree Close, Loughton, Essex IG10 2RE
E-mail: g0toc@lefars.org.uk

John Short, G1DJI
16 Tycehurst Hill, Loughton, Essex IG10 1BU
E-mail: g1dju@lefars.org.uk

Sort it out!

The RSGB's QSL bureau deals with more than one million QSL cards each year. Help the bureau's staff in this Herculean task by ensuring that your cards are sorted correctly

In this edition, we provide some facts and statistics about the bureau. We have also consulted with a few of the sub-managers in order to identify recurring issues that cause problems and have highlighted some of the most common.

So to begin with, here are some facts about the bureau. The RSGB employs four members of staff to run the bureau at Potters Bar. All work part-time, and none are currently licensed radio amateurs. In turn, the bureau employs 85 volunteer sub-managers to look after a series of 108 callsign ranges. According to bureau supervisor Jan Mair, the sub-managers who handle the greatest number of cards are, in no particular order: Steve Bainbridge, M1SWB (the M3 sub-manager), Pat McVey, G3GMC (the G3RAA-TZZ sub-manager) and Mike Evans, MW0CNA (who handles, with the exception of one or two callsigns, cards for all 'GB' special events; and cards for the G0BAA-BZZ series).

In an average week, the bureau can receive up to 500 packages, or envelopes, from RSGB members, containing any number from one to 1,000+ outgoing cards. Thousands of incoming cards from overseas bureaux also arrive regularly at Potters Bar, with by far the highest volume of cards coming from Germany. The Italians provide the next highest quantity followed by the Russians, Ukrainians, Spanish, Dutch, French, Japanese and Americans. Taking into account several factors, we have estimated that well in excess of one million cards, both incoming and outgoing, pass through the bureau annually.

Issues that affect the smooth day-to-day running of the bureau and cause sub-managers difficulties are manifold and diverse. In the first two editions of this column published since its reintroduction, we have informed the readers of some of these issues, and have offered advice accordingly. We are, however, well aware that changes do not happen overnight, and that only by regularly highlighting some of these issues are we ever likely to bring about change.

So, when sending your cards to the bureau for onward delivery, to expedite speedy distribution, it is vital that you sort overseas cards into prefix order and UK cards into callsign order. If you use a computer logging programme to either print labels, or to print directly to your cards, please ensure that they are sorted correctly, and not by QSO date and time. If you are not sure how to sort your cards, please feel free to contact us or the bureau staff for advice. Also, please ensure that your cards all face, and are oriented, the same way and do not use any separators such as paper clips or strips of paper between prefixes.

The cards have to be sorted manually into callsign and prefix order, so it helps if radio amateurs send the cards in already sorted

Another issue concerns the quantity of cards sent in for countries that do not maintain a bureau service. This really just boils down to the senders not listening for QSL instructions on the air, or not researching QSL routes on the internet. These undeliverable cards, and there are a considerable number of them, have a knock-on effect, in as much as currently they are bounced back to the senders, thus giving extra work to the bureau staff and ultimately to the sub-managers.

The issue that gives most concern to sub-managers is a lack of recipients' SASEs, or explicit instructions to dispose of cards. If you have not already done so, please send your sub-manager some envelopes, or simply let him or her know that you are not interested in collecting cards.

From recent correspondence, Steve Bainbridge says that from a typical box of around 8,000 cards, 60% can go unclaimed. According to Steve, this is due to the recipients having no SASEs lodged with him. Certainly, this issue affects all the sub-managers, but we feel that Steve's case is at the extreme end of the scale, and is probably attributable to several factors; the biggest one being that many newcomers to amateur radio are just not aware of how to go about the business of QSLing. Perhaps, a supplement to the Foundation Licence syllabus might help here. Steve has taken steps to address this issue, by publishing details on the internet about how to use the bureau. Details are also available on the RSGB's website and printed annually in the RSGB Yearbook.

On the subject of envelopes, many received by the sub-managers are the wrong type. Commonly, they are either too big, too small or self-sealing variants that stick to each other, and then eventually dry up. Illegible handwriting adds to the confusion, as does a lack of ink, toner and/or callsign.

There are other challenges for the bureau. For example, it appears that many overseas bureaux believe the RSGB is a QSL card clearing-house for every other country in the world – if not every other country, then certainly those overseas territories, realms, kingdoms and domains that were once part of the British Empire or British Commonwealth. We can confirm that this is not the case; the RSGB cannot handle cards from overseas bureaux, or individuals, destined for non-UK callsign holding amateurs. To clarify, we do not provide an incoming service for any callsigns, or via's, that are not for British, G, M, or 2 callsigns.

So that's it for this time, we hope that you now have a better understanding of the scale of operations at the bureau, and that we have provided you with some useful insights. Next time, we will be focusing on some of the internet services maintained by the sub-managers and other internet based resources that provide valuable information for the avid QSLer. ♦

WEB SEARCH

Steve Bainbridge, M1SWB	myweb.tiscali.co.uk/amateur

Tim Kirby, G4VXE

Willowside, Bow Bank, Longworth, OX13 5ER

E-mail: tim@g4vxe.com

Two for one

A tricky but effective technique – single operator two VFO – can give you a vital edge in contests, writes Tim Kirby

Thanks to those of you who have already written in with details of your favourite RSGB contest – your responses are much appreciated. I look forward to hearing from more of you – please take a moment to let me know! So far, the 80m Club Championships are looking very popular!

SO2V

We have, from time to time, covered details of the SO2R (single operator 2 radio) method of contesting. I think it was Lee, G0MTN, who coined the phrase SO2V (single operator 2 VFO). This is a slightly cheaper solution to implement, needing a single radio with two VFOs. So you don't necessarily need an FT1000 type radio, but a radio with 2 VFOs that you can switch between quickly.

How does it work? Well, let's say that you are CQing on one VFO. You call CQ and no-one comes back. Just before you call again, you momentarily switch to the other VFO and listen – perhaps tuning to find another station. There may not be time to see who it is. Back to the first VFO and call again. Hopefully you work someone this time! Either way, when you've finished or are almost ready to call CQ again, listen to the second VFO again. You've worked out who it is there, and this time you notice he's just finishing a QSO and you need him. Drop your call in, work him as quickly as possible and switch back to the first VFO.

Don't necessarily assume that frequency is still clear! Someone may have taken over the frequency in the few seconds that you've been away – so make sure you check. If they have – you left the frequency – you need to find somewhere else! Hopefully, you will find that the frequency is still yours. Call CQ again and in the next pause move the second VFO a little and repeat the process.

It's quite painstaking and can take a while, but remember in high volume contests, particularly like AFS and the Club Championships, an extra QSO or two can make a huge difference so this can be a worthwhile technique. It really comes into its own towards the end of some of the contests where everyone is CQing and the people who are CQing haven't worked each other!

CONTESTS THIS MONTH

The big one this month for phone operators is CQ WW SSB, of course. Don't miss it, whatever your station. You're sure to make some interesting QSOs. Don't forget to support the RSGB 21/28MHz events – even if you don't take part seriously, your QSOs will be much appreciated by foreign entrants, particularly if you are in one of the more unusual postcode districts. The Oceania DX events are well worth a go, surprisingly, even if you have a modest station. With 100w and a vertical, I have worked a number of stations in VK and ZL on 40m during previous events. I'm sure it's possible to do even better. See what you can do.

At UHF, there will be lots of opportunities for unusual QSOs on the higher bands during the 432MHz to light contest and the 1.3GHz and 2.3GHz trophies. ♦

CONTEST CALENDAR

HF Contests

Date	Time	Contest	Mode	Bands	Exchange
01/02-Oct	0800-0800	Oceania DX	SSB	1.8-28	RS+SN
01-Oct	1500-1859	EU Sprint	SSB	3.5/7/14	Your call+other call+SN+Name
02-Oct	0700-1900	RSGB 21/28Mhz SSB	SSB	21/28	RS+SN+District (eg OX)
08/09-Oct	0800-0800	Oceania DX	CW	1.8-28	RST+SN
08-Oct	1500-1859	EU Sprint	CW	3.5/7/14	Your call+other call+SN+Name
15/16-Oct	0000-2359	JARTS WW RTTY	RTTY	3.5-28	RST+Age
16-Oct	0700-1900	RSGB 21/28MHz CW	CW	21/28	RST+SN+District (eg OX)
29/30-Oct	0000-2359	CQ WW SSB	SSB	1.8-28	RS+CQ Zone (eg 14)

VHF Contests

Date	Time	Contest	Mode	Bands	Exchange
01/02-Oct	1400-1400	RSGB 432MHz-248Ghz	ALL	432-248G	RST+SN+Locator
01-Oct	1400-2200	RSGB 1.3GHz/2.3GHz Trophies	ALL	1.3G/2.3G	RST+SN+Locator
04-Oct	2000-2230*	RSGB 144MHz activity & Club Championship	ALL	144	RST+SN+Locator
11-Oct	2000-2230*	RSGB 432MHz activity	ALL	432	RST+SN+Locator
16-Oct	0900-1200	RSGB 2nd 50MHz	ALL	50	RST+SN+Locator+Postcode
18-Oct	2000-2230*	RSGB 1.3GHz/2.3GHz activity	ALL	1.3G/2.3G	RST+SN+Locator
25-Oct	2000-2230*	RSGB 50MHz activity	ALL	50	RST+SN+Locator

* Local

Proving that you can participate in contests whatever your equipment, here's Justin, G4TSH, making QSOs on 28MHz during the IOTA Contest 2005 with an FT817 and magnetic loop.

Affiliated Societies Contest, SSB, 2005

Overall, propagation was good. True to form, the South and Midlands were favoured initially, but later conditions improved to the North and West. From about 1600, the lengthening skip tended to favour all but the South and East, where continental QRM became a problem. The Scots had their usual hard time of it, particularly in the North.

Support was tremendous, with over 230 stations submitting logs (an increase of 19% over the 2004 event) and many others were active just giving away points. This, coupled with the excellent conditions, gave the event every chance of being a record-breaker and there were some massive scores made. Close on 29,000 QSOs were logged in the four hours. No wonder GM3JKS described it as "a cacophony"!

Of course, there has to be a downside and, with so much QRM, it is little wonder that accuracy should suffer. Error rates were higher than usual across the board, with some of the less-experienced operators losing a substantial number of points, mostly through miscopied callsigns.

There were a few complaints of poor-quality and over-loud signals, although no names were mentioned. But it is not necessarily the transmitter which is at fault. When the band is crowded, with a signal pretty much every kHz and every one over S9, even the best receivers can struggle to remain clean - the FT1000MP at G3UFY ran for the whole event with the 18db attenuator in and it still wasn't really enough. Some of the smaller general-purpose radios are just not able to cope with this level of front-end overload. Nor is it right to assume that the strongest signals are using too much power. Of the top 20 individual entries, four (G4TSH/P [7th], G6UW [10th], G8VHI [13th] and G4PIQ[16th]) were using only 100W to a dipole (at 35, 30, 40 and 80 feet respectively). Power helps, it's true, but it's an efficient antenna which gives you a really loud signal.

Congratulations to the Cray Valley RS for achieving what was long thought impossible - taking first place away from the Lichfield ARS. They receive the Flight Refuelling ARS Trophy. Lichfield were a very close second, with De Montfort University ARS in third place.

In the individual competition, G4BUO and G4BWP will have to share the RSGB Lichfield Trophy, as even a re-check could not separate them. The certificate for third place is awarded to G4STV. The certificates for the leading Intermediate and Foundation class entrants go to 2E0ATY (46th) and MJ3JBQ (157th) respectively.

Last, but not least, thanks to G0KYS, G3GUL, G3YSX, GD0EMG and GM0DHZ for their check logs. ***Steve Knowles G3UFY***

Clubs section

Pos	Club/Team	Stn 1	Stn 2	Stn 3	Total
1+	Cray Valley RS 'A'	G4BUO	G3RCV	G4DBL	9400
2c	Lichfield ARS 'A'	G3NLY	G3VHB	G3NKC	9280
3c	De Montfort University ARS 'A'	G3ORY	G8VHI/P	G4EOF	8940
4	Martlesham DX & CG	G4BWP	G4PIQ	G4MRS	8350
5	Sutton & Cheam RS 'A'	G4ERW	G3WHK	G4CWH	7230
6=	Echelford ARS 'A'	G4TSH/P	G0VDZ	G3KKQ	6990
6=	Hadley Wood CG 'A'	G4STV	G4KZD	G6BOX	6990
8	Grimsby ARS 'A'	G3TBK	G0GDU	G4EBK	6800
9	Cambridge University WS	G6UW	M0TDG/P	M0BBB	6560
10	Cray Valley RS 'B'	G0VJG	G3VLX	2E0ATY	6480

Individual listing

Posn	Callsign	Checked			
1=+	G4BUO	3520	6	G3ORY	3260
1=+	G4BWP	3520	7	G4TSH/P	3180
3c	G4STV	3310	8	G4ERW	3130
4=	G3NLY	3290	9	G3VHB	3100
4=	G3RCV	3290	10=	G3NKC	2890

2nd 50MHz Contest, 2004

This contest had it all - poor band conditions including some QSB, low activity and cold weather - mainly reported by the portable stations! Entrants commented on several instances of poor operating practice. The main problem was stations calling 'CQ contest' within the 'DX Window' on 6m.

The standard of logging was extremely variable. Five stations managed to submit perfect logs – congratulations. However, the majority of stations lost an average of 17% of their score due to logging errors.

Congratulations to the Northern Lights Contest Group (GD0EMG) for winning the Multi-operator section by a massive margin. The runners-up were the Hadley Wood Contest Group (G4STV/P). In the Single Operator (Fixed) section, the winner was Roger Piper, G3MEH. Bryn Llewellyn, G4DEZ was the runner-up. Alan Burnett, G0IFC/P won the Single Operator (Others) section. Trevor Harris, G2KF/P was the runner-up. The Leading Intermediate Station certificate was won by James Beatwell, 2E1GUA. Frank Laanen, PE1EWR, won the Leading Overseas Station certificate. ***Ian Pawson, G0FCT***

Multi-operator

Pos	Group	Call	Locator	Zone	QSOs	Score	Mults	Total	ODX	Kms	Power	Ant	Equipment
1*	The Northern Lights CG	GD0EMG	IO74QD	IM	89	35086	80	2806880	IW4EOQ	1806	400	2x7el	IC756pro2+3cx800a7
2*	Hadley Wood CG	G4STV/P	IO80MS	EX	33	5555	40	222200	G4FVP	428	400	5el	FT736+Amp
3	Otley ARS	G3XNO/P	IO93DV	LS	35	4784	42	200928	G2KF/P	415	100	5el	IC706
4	Newquay & DARS	G4ADV	IO70LK	TR	14	1384	13	17992	GD0EMG	413	100	4el	IC706
5	University of Bristol ARS	G3KAC/P	IO81UN	GL	5	622	8	4976	G3XNO/P	262	50	4el	FT857

Single Operator Fixed

Pos	Call	Locator	Zone	QSOs	Score	Mults	Total	ODX	Kms	Power	Ant	Equipment
1*	G3MEH	IO91QS	HP	67	8634	65	561210	GM4NFC	475	250	2x5el	FT1000+TVVF50a+HLV-650
2*	G4DEZ	JO03AE	PE	43	7946	49	389354	G2KF/P	431	400	7el	IC7400 + GS35b
3	G3TCT	IO91TG	KT	45	6457	48	309936	GM4NFC	532	400	5el	IC575+Acom1000
4	G3YBY	IO91BO	SN	42	5896	49	288904	GM4NFC	453	400	5el	FT1000Mk5+FTV1000+Quadra
5	G0EYX	IO82WT	ST	22	2839	32	90848	GM4NFC	324	100	5el	IC756PRO
6	M5BXB	IO91XR	EN	31	2344	30	70320	GD0EMG	408	200	3el	FT1000MkV+FTV1000
7	G6HOU	IO91PG	GU	18	1498	18	26964	GD0EMG	414	100	5el	IC706
8	G6UBM	JO01CE	TN	7	1156	12	13872	GD0EMG	463	100	4el	FT847
9	M5ADF	IO91TO	HA	12	810	15	12150	GD0EMG	401	100	G5RV	IC746
10*	2E1GUA	JO01FR	CM	5	641	8	5128	G0IFC/P	293	10	HB9CV	IC706
11*	PE1EWR	JO11SL		2	593	5	2965	G4DEZ	304	25	3el	TS680S

Single Operator Others

Pos	Call	Loc	Zone	QSOs	Score	Mults	Total	ODX	Kms	Power	Ant	Equipment
1*	G0IFC/P	IO80FV	EX	56	10900	57	621300	G4FVP	425	400	5el	FT920
2*	G2KF/P	IO70PP	PL	33	6681	33	220473	G4DCJ	444	400	6el	IC7400
3	GW8ZRE/P	IO83JF	CH	21	3081	30	92430	G3TCT	291	100	HB9CV	FT690+BNOS Amp
4	G1KHX/P	IO81MH	BS	23	3117	29	90393	GD0EMG	334	100	5el	FT920
5	G6MXL/P	IO80WP	BH	9	1774	15	26610	GD0EMG	424	50	5el	TS690

50MHz Trophy Contest 2004

Conditions in this contest were far from ideal with only short sporadic-E openings on the Saturday and even less propagation on the Sunday. Consequently, entrants achieved much lower QSO and multiplier totals compared to the excellent conditions in the previous year.

Congratulations to the Northern Lights for their convincing win in the Multi-operator section. They retain the Telford Trophy and Bryn, G4DEZ, retains the Six Meter Cup for his victory in the Single Operator Fixed section.

The winners of both six hour sections benefited from the better conditions on Saturday, congratulations to Dave G1KHX/P who wins the Six Hour Other section and Geoff MM5AHO who wins the Six Hour Single Operator section. ***Matthew Jeffery, M0MAT***

Multi-Operator

Pos	Group	Call	Loc	QSOs	Score	Mult	Total	Best DX	Km	Power	Ant	Equipment
1*	Northern Lights	MD6V	IO74QD	456	356111	144	51279984	5B4FL	3643	400	11el+2x7+2x7+2x6	FT650
2*	Five Bells	G5B	IO92WS	275	128937	105	13538385	5B4FL	3309	400	2x6el + 5el	IC7400
3	Blacksheep CG	M0VHF	JO01KJ	305	119472	96	11469312	9H1TM	2038	400	6el	JST245
4	Bracknell ARC	M4D	IO80ST	173	85208	76	6475808	9H9H	2144	400	8el	FT920
5	Otley ARS	M8Y	IO93DV	154	90286	69	6229734	5B4FL	3456	100	5el	IC706
6	Colchester CG	G0VHF/P	JO01HW	182	65804	69	4540476	IK8YFU	1923	300	7el	FT847
7	Telford & DARS	G3ZME/P	IO82SM	87	71273	51	3634923	UX2KA/P	1915	400	5el	IC756PROII
8		G4HRC/P	JO01DP	139	30896	46	1421216	YR8B	1871	400	6el	IC7400
9	Herstmonceux Megacycles	G3YNN	JO00EU	64	23000	35	805000	9H1TM	2012	100	5el	IC736

Single Operator Fixed - 24 Hour

Pos	Call	Loc	QSOs	Score	Mult	Total	Best DX	Km	Power	Ant	Equipment
1*	G4DEZ	JO03AE	167	102673	79	8111167	CT3FT	2595	400	7el	FT920
2*	G0AEV	IO81WL	136	87481	68	5948708	9H9H	2180	100	7el	IC706
3	G3MEH	IO91QS	194	75308	72	5422176	9H1TM	2135	250	2x5el	FT1000+TVTR
4	MU0FAL	IN89RL	27	24161	32	773152	SP5XMU/P	1653	200	5el	FT1000+TVTR
5*	PE1EWR	JO11SL	26	9642	19	183198	9H1TM	1942	25	3el	TS680S
6	M5ADF	IO91TO	19	7024	14	98336	SP5QWB	1490	25	5el	FT650
7*	2E1GUA	JO01FR	10	1502	10	15020	MD6V	434	20	HB9CV	IC706

6 Hour Other Section

Pos	Group	Call	Loc	QSOs	Score	Mult	Total	Best DX	Km	Power	Ant	Equipment
1*		G1KHX/P	IO81MH	75	68939	52	3584828	YR8B	2094	100	5el	FT920
2*		G6HOU/P	IO91PF	58	28541	31	884771	SP8AWL	1611	80	5el	IC706
3		GW8ZRE/P	IO83JA	64	18975	27	512325	UT7UV	2315	10	HB9CV	FT690R
4	Newquay & DARS	G4ADV	IO70LK	26	3710	13	48230	PA6M	700	100	4el	DX70
5	Cockenzie & Port Seton	GB2MOF	IO85PX	5	479	5	2395	MD6V	238	400	6el	IC756PROII

6 Hour Single Operator Section

Pos	Call	Loc	QSOs	Score	Mult	Total	Best DX	Km	Power	Ant	Equipment
1*	MM5AHO	IO87LN	84	128146	47	6022862	I8MPO	2257	400	6el	FT847
2*	G2KF	IO70PP	52	63660	43	2737380	YU1ARL	2061	50	Vert	IC7400
3	M0DDT	IO91JR	72	50754	42	2131668	TF/G4ODA	1837	100	5el	FT920
4	G4CZB	IO92MF	39	31434	34	1068756	T99C	1704	100	Dipole	FT847
5*	M3TBK	IO93QA	38	30124	32	963968	YP0I	1765	10	5Y	IC706
6	GM8IEM	IO78HF	16	28814	17	489838	II0W	2175	50	4el	IC551E
7	MU3GSY	IN89RL	8	9417	10	94170	SP5QWB	1705	10	G5RV	IC706

SWL

Pos	Call	Loc	QSOs	Score	Mult	Total	Best DX	Km	Ant	Rx
1*	BRS25429	IO93FX	50	47877	49	2345973	YP0I	1854	5el	R-2000

The complete RSGB HF and VHF/UHF 2005 contest calendar was published in the January issue of RadCom. The calendar and rules are also available on the HF Contests Committee and VHF Contest Committee websites. Links to these can be found on the RSGB website (www.rsgb.org.uk). Suitable freeware logging programmes for RSGB HF and VHF contests are available from a variety of sources - see the links section of the contest committee websites.

MOONRAKER

Manufacturers of radio communication antennas and associated products

Log Periodic

MLP32 TX & RX 100-1300MHz one feed, S.W.R. 2:1 and below over whole frequency range professional quality (length 1420mm) **£119.95**

MLP62 same spec as MLP32 but with increased freq. range 50-1300 Length 2000mm..... **£189.95**

Mobile HF Whips (with 3/8 base fitting)

AM-PRO 6 mt *(Length 4.6' approx)*..... **£16.95**
AM-PRO 10 mt *(Length 7' approx)*..... **£16.95**
AM-PRO 17 mt *(Length 7' approx)*..... **£16.95**
AM-PRO 20 mt *(Length 7' approx)*..... **£16.95**
AM-PRO 40 mt *(Length 7' approx)*..... **£16.95**
AM-PRO 80 mt *(Length 7' approx)*..... **£19.95**
AM-PRO 160 mt *(Length 7' approx)*..... **£49.95**
AM-PRO MB5 Multi band 10/15/20/40/80 can use 4 Bands at one time *(Length 100")*..... **£69.95**
SPX-100 'plug n go' multiband 6/10/12/15/17/20/30/40/80mtrs. Band changing is easy via a flylead and socket and adjustable telescopic whip section 1.65m when fully extended..... **£49.95**

Slim Jims

SJ-70 430-430MHz slimline design with SO239 connection. Length 1.00m..... **£19.95**
SJ-2 144-146MHz slimline design with SO239 connection. Length 2.00m..... **£24.95**

VHF/UHF Mobile Antennas

MICRO MAG Dual band 2/70 antenna complete with 1" magnetic mount 5mtrs of mini coax terminated in BNC..... **£14.95**
MR700 2m/70cms, 1/4 wave & 5/8, Gain 2m 0dB/3.0dB 70cms Length 20" 3⁄8 Fitting..... **£7.95**
SO239 Fitting..... **£9.95**
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (5⁄8 & 2x5⁄8 wave) (Length 60") (3⁄8 fitting)..... **£16.95**
(SO239 fitting)..... **£18.95**
MRQ525 2m/70cms, 1/4 wave & 5/8, Gain 2m 0.5dB/3.2dB 70cms Length 17" SO239 fitting commercial quality..... **£19.95**
MRQ500 2m/70cms, 1/2 wave & 2x5/8, Gain 2m 3.2dB/5.8db 70cms Length 38" SO239 fitting commercial quality..... **£24.95**
MRQ750 2m/70cms, 6/8 wave & 3x5/8, Gain 2m 5.5dB/8.0dB 70cms Length 60" SO239 fitting commercial quality..... **£39.95**
MRQ800 6/2/70cms 1/4 6/8 & 3 x 5/8, Gain 6m3.0dBi/2m 5.0dB/70 7.5dB Length 60" SO239 fitting commercial quality..... **£39.95**
GF151 Professional glass mount dual band antenna. Freq: 2/70 Gain: 2.9/4.3dB. Length: 31"..... New low price **£29.95**

Single Band Mobile Antennas

MR 214 2 metre straight stainless 1/4 wave 3⁄8 fitting ..**£4.95**
SO239 type..... **£5.95**
MR 258 2 Metre 5⁄8 wave 3.2 dBd Gain (3⁄8 fitting) (Length 58")..... **£12.95**
MR 268S 2 Metre 5⁄8 wave 3.5dBd gain Length 51" S0239 fitting..... **£19.95**
MR 290 2 Metre (2 x 5/8 Gain: 7.0dBd) (Length: 100"). SO239 fitting, "the best it gets"..... **£39.95**
MR 625 6 Metre base loaded (1/4 wave) (Length: 50") commercial quality..... **£19.95**
MR 614 6 Metre loaded 1/4 wave (Length 56") (3⁄8 fitting)..... **£13.95**
MR 644 6 Metre loaded 1/4 wave (Length 40") (3⁄8 fitting) ..**£12.95**
(SO239 fitting)..... **£15.95**

Single Band End Fed Base Antennas

70 cms 1⁄2 wave (Length 26") (Gain: 2.5dB) (Radial free)..... **£24.95**
2 metre 1⁄2 wave (Length 52") (Gain 2.5dB) (Radial free)..... **£24.95**
4 metre 1⁄2 wave (Length 80") (Gain 2.5dB) (Radial free) **£39.95**
6 metre 1⁄2 wave (Length 120") (Gain 2.5dB) (Radial free)..... **£44.95**
6 metre 5⁄8 wave (Length 150") (Gain 4.5dB) (3 x 28" radials)... **£49.95**

Mini HF Dipoles (Length 11' approx)

MD020 20mt version approx only 11ft **£39.95**
MD040 40mt version approx only 11ft **£44.95**
MDO80 80mt version approx only 11ft **£49.95**
(slimline lightweight aluminium construction)

Vertical Fibreglass Co-Linear Antennas

New co-linear antennas with specially designed tubular vertical coils that now include wide band receive! Remember, all our co-linears come with high quality N-type connections.

SBQBM100 Mk.2 Dual Bander **£39.95**
(2m 3dBd) (70cms 6dBd) (RX:25-2000 MHz) (Length 39")
SQBM110 Mk.2 Dual Bander (Radial FREE!) ... **£49.95**
(2m 3dBd) (70cms 6dBd) (RX:25-2000 MHz) (Length 39")
SQBM200 Mk.2 Dual Bander..... **£49.95**
(2m 4.5dBd) (70cms 7.5dBd) (RX:25-2000 MHz) (Length 62")
SQBM500 Mk.2 Dual Bander Super Gainer..... **£64.95**
(2m 6.8dBd) (70cms 9.2dBd) (RX:25-2000 MHz) (Length 100")
SQBM800 Mk.2 Dual Bander Ultimate Gainer..... **£119.95**
(2m 8.5dBd) (70cms 12.5dBd) (RX:25-2000 MHz) (Length 5.2m)
SQBM1000 MK.2 Tri Bander **£69.95**
(6m 3.0dBd) (2m 6.2dBd) (70cms 8.4dBd) (RX:25-2000 MHz) (Length 100")

Single Band Vertical Co-Linear Base Antenna

BM33 70 cm 2 X 5⁄8 wave Length 39" 7.0 dBd Gain... **£34.95**
BM45 70cm 3 X 5⁄8 wave Length 62" 8.5 dBd Gain.... **£49.95**
BM55 70cm 4 X 5⁄8 wave Length 100" 10 dBd Gain... **£69.95**
BM60 2mtr5⁄8 Wave, Length 62", 5.5dBd Gain..... **£49.95**
BM65 2mtr 2 X 5⁄8 Wave, Length 100", 8.0 dBd Gain..... **£69.95**

MFJ Products

New lower prices on ALL MFJ Tuners. See our website for full details.

Automatic Tuners
MFJ-991 1.8-30MHz 150W SSB/100W CW ATU.... **£179.95**
MFJ-993 1.8-30MHz 300W SSB/150W CW ATU..... **£209.95**
MFJ-994 1.8-30MHz 600W SSB/300W CW ATU..... **£299.95**
Manual Tuners
MFJ-16010 1.8-30MHz 20W random wire tuner **£46.95**
MFJ-902 3.5-30MHz 150W mini travel tuner..... **£65.95**
MFJ-902H 3.5-30MHz 150W mini travel tuner with 4:1 balun..... **£89.95**
MFJ-904 3.5-30MHz 150W mini travel tuner with SWR/PWR..... **£99.95**
MFJ-904H 3.5-30MHz 150W mini travel tuner with SWR/PWR 4:1 balun..... **£109.95**
MFJ-901B 1.8-30MHz 200W Versa tuner..... **£72.95**
MFJ-971 1.8-30MHz 300W portable tuner **£89.95**
MFJ-945E 1.8-54MHz 300W tuner with meter **£99.95**
MFJ-941E 1.8-30MHz 300W Versa tuner 2..... **£109.95**
MFJ-948 1.8-30MHz 300W deluxe Versa tuner..... **£119.95**
MFJ-949E 1.8-30MHz 300W deluxe Versa tuner with DL..... **£135.95**
MFJ-934 1.8-30MHz 300W tuner complete with artificial GND.. **£159.95**
MFJ-974 3.6-54MHz 300W tuner with X-needle SWR/WATT **£159.95**
MFJ-969 1.8-54MHz 300W all band tuner **£169.95**
MFJ-962D 1.8-30MHz 1500W high power tuner..... **£249.95**
MFJ-986 1.8-30MHz 300W high power differential tuner **£299.95**
MFJ-989D 1.8-30MHz 1500W high power roller tuner..... **£329.95**
MFJ-976 1.8-30MHz 1500W alanced line tuner with X-needle SWR/WATT mater..... **£429.95**

HB9CV 2 Element Beam 3.5dBd

70cms	(Boom 12")	**£19.95**
2 metre	(Boom 20")	**£24.95**
4 metre	(Boom 23")	**£34.95**
6 metre	(Boom 33")	**£44.95**
10 metre	(Boom 52")	**£69.95**
6/2/70 Triband	(Boom 45")	**£64.95**

Halo Loops

2 metre (size 12" approx)..... **£14.95**
4 metre (size 20" approx)..... **£24.95**
6 metre (size 30" approx)..... **£29.95**
These very popular antennas square folded di-pole type antennas

Guy Rope 30 metres

MGR-3 3mm (maximum load 250 kgs)..... **£6.95**
MGR-4 4mm (maximum load 380 kgs) **£14.95**
MGR-6 6mm (maximum load 620 kgs) **£29.95**

Crossed Yagi Beams (fittings stainless steel)

2 metre 5 Element
(Boom 64") (Gain 7.5dBd) **£89.95**
2 metre 8 Element
(Boom 126") (Gain 11.5dBd) **£109.95**
70 cms 13 Element
(Boom 83") (Gain 12.5dBd)..... **£79.95**

Yagi Beams (fittings stainless steel)

2 metre 4 Element
(Boom 48") (Gain 7dBd) **£29.95**
2 metre 5 Element
(Boom 63") (Gain 10dBd) **£49.95**
2 metre 8 Element
(Boom 125") (Gain 12dBd) **£69.95**
2 metre 11 Element
(Boom 185") (Gain 13dBd)..... **£99.95**
4 metre 3 Element
(Boom 45") (Gain 8dBd)..... **£59.95**
4 metre 5 Element
(Boom 128") (Gain 10dBd)..... **£69.95**
6 metre 3 Element
(Boom 72") (Gain 7.5dBd)..... **£64.95**
6 metre 5 Element
(Boom 142") (Gain 9.5dBd)..... **£84.95**
70 cms 13 Element
(Boom 76") (Gain 12.5dBd)..... **£49.95**

ZL Special Yagi Beams (Fittings stainless steel)

2 metre 5 Element (Boom 38") (Gain 9.5dBd)... **£39.95**
2 metre 7 Element (Boom 60") (Gain 12dBd).... **£49.95**
2 metre 12 Element (Boom 126") (Gain 14dBd) **£74.95**
70 cms 7 Element (Boom 28") (Gain 11.5dBd).. **£34.95**
70 cms 12 Element (Boom 48") (Gain 14dBd) **£49.95**
The biggest advantage with a ZL-special is that you get massive gain for such a small boom length, making it our most popular beam antenna

G5RV Wire Antenna (10-40/80m) (Fittings stainless steel)

	HALF	FULL
Standard (enamelled)	**£19.95**	**£22.95**
Hard Drawn (pre-stretched)	**£24.95**	**£27.95**
Flex Weave (original high quality)	**£29.95**	**£34.95**
Flexweave PVC (clear coated PVC)	**£34.95**	**£39.95**
Deluxe 450 ohm PVC	**£44.95**	**£49.95**

Double size standard (204ft) **£39.95**
TS1 Stainless Steel Tension Springs (pair) for G5RV **£19.95**

G5RV Inductors

Convert your half size G5RV into a full size with just 8ft either side. Ideal for the small garden..... **£19.95**

Reinforced Hardened Fibreglass Masts (GRP)

GRP-125 1.25" OD length: 2.0m Grade: 2mm **£14.95**
GRP-150 1.5" OD Length: 2.0m Grade: 2mm **£19.95**
GRP-175 1.75" OD Length: 2.0m Grade: 2mm **£24.95**
GRP-200 2.0" OD Length: 2.0m Grade: 2mm **£29.95**

Mobile Speaker

PMR-218 Small extension speaker **£8.95**
PMR-250 Medium extension speaker **£10.95**
PMR-712 Large extension speaker **£14.95**

Portable Telescopic Masts

LMA-S Length 17.6ft open 4ft closed 2-1" diameter **£59.95**
LMA-M Length 26ft open 5.5ft closed 2-1" diameter **£69.95**
LMA-L Length 33ft open 7.2ft closed 2-1" diameter..... **£79.95**
TRIPOD-P Lightweight aluminium tripod for all above **£39.95**

Rotative HF Dipoles

RDP-3B 10/15/20mtrs length 7.40m **£119.95**
RDP-4 12/17/30mtrs length 10.50m **£119.95**
RDP-40M 40mtrs length 11.20m **£169.95**
RDP-6B 10/12/15/17/20/30mtrs boom length 1.00m. **£239.95**

CHECK ON-LINE FOR ALL UPDATES, NEW PRODUCTS & SPECIAL OFFERS

www.amateurantennas.com

★ Postage is a maximum of £7.00 on all orders ★
(UK mainland only)

CALL MAIL ORDER 01908 281705

FAX 01908 281706

Opening times: Mon-Fri 9-6pm sales@moonrakerukltd.com

www.amateurantennas.com

Mounting Hardware (All galvanised)

6" Stand Off Bracket *(complete with U Bolts)* **£6.00**
9" Stand off bracket *(complete with U Bolts)* **£9.00**
12" Stand off bracket *(complete with U Bolts)*.. **£12.00**
12" T & K Bracket *(complete with U Bolts)*..... **£14.95**
18" T & K Bracket *(complete with U Bolts)*..... **£17.95**
24" T & K Bracket *(complete with U Bolts)* **£19.95**
36" T & K Bracket *(complete with U Bolts)* **£29.95**
Chimney lashing kit **£12.95**
Double chimney lashing kit..... **£24.95**
3-Way Pole Spider for Guy Rope/ wire..... **£3.95**
4-Way Pole Spider for Guy Rope/wire..... **£4.95**
1" Mast Sleeve/Joiner **£6.95**
1.25" Mast Sleeve/Joiner **£7.95**
1.5" Mast Sleeve/Joiner..... **£8.95**
2" Mast Sleeve/Joiner **£9.95**
Earth rod including clamp (copper plated) **£9.95**
Earth rod including clamp (solid copper) **£14.95**
Pole to pole clamp 2"-2" **£4.95**
Di-pole centre (for wire) **£4.95**
Di-pole centre (for aluminium rod)..... **£4.95**
Dog bone insulator **£1.00**
Dog bone insulator heavy duty..... **£2.00**

5ft Poles Heavy Duty (Swaged)

20ft Heavy Duty Swaged Pole Set
These heavy duty aluminium (1.8mm wall) have a lovely push fit finish to give a very strong mast set
1.25" set of four 5ft sections..... **£24.95**
1.50" set of four 5ft sections..... **£34.95**
1.75" set of four 5ft sections..... **£39.95**
2.00" set lof four 5ft sections..... **£49.95**

Cable & Coax Cable

RG58 best quality standard per mt..... **35p**
RG58 best quality military spec per mt..... **60p**
RGMini 8 best quality military spec per mt **70p**
RG213 best quality military spec per mt **85p**
H100 best quality military coax cable per mt **£1.10**
3-core rotator cable per mt..... **45p**
7-core rotator cable per mt **£1.00**
10 amp red/black cable 10 amp per mt..... **40p**
20 amp red/black cable 20 amp per mt..... **75p**
30 amp red/black cable 30 amp per mt **£1.25**
Please phone for special 100 metre discounted price

Connectors & Adapters

PL259/9 plug (Large entry)..... **£0.75**
PL259 Reducer (For PL259/9 to conv to PL259/6) **£0.25**
PL259/6 plug (Small entry) **£0.75**
PL259/7 plug (For mini 8 cable)..... **£1.00**
BNC Screw type plug (Small entry) **£1.25**
BNC Solder type plug (Small entry) **£1.25**
BNC Solder type plug (Large entry) **£3.00**
N-Type plug (Small entry)..... **£3.00**
N-Type plug (Large entry)..... **£3.00**
SO239 Chassis socket (Round) **£1.00**
SO239 Chassis socket (Square) **£1.00**
N-Type Chassis scoket (Round)..... **£3.00**
N-Type Chassis scoket (Square)..... **£3.00**
SO239 Double female adapter..... **£1.00**
PL259 Double male adapter..... **£1.00**
N-Type Double female..... **£2.50**
SO239 to BNC adapter **£2.00**
SO239 to N-Type adapter..... **£3.00**
SO239 to PL259 adapter (Right angle)..... **£2.50**
SO239 T-Piece adapter (2xPL 1XSO)..... **£3.00**
N-Type to PL259 adapter (Female to male) **£3.00**
BNC to PL259 adapter (Female to male) **£2.00**
BNC to N-Type adapter (Female to male) **£3.00**
BNC to N-Type adapter (Male to female)..... **£2.50**
SMA to BNC adapter (Male to female)..... **£3.95**
SMA to SO239 adapter (Male to SO239)..... **£3.95**
SO239 to 3/8 adapter (For antennas) **£3.95**
3/8 Whip stud (For 2.5mm whips) **£2.95**
Please add just £2.00 P&P for connector only orders
PLEASE PHONE FOR LARGE CONNECTOR ORDER DISCOUNTS

Baluns

MB-1 1:1 Balun 400 watts power **£24.95**
MB-4 4:1 Balun 400 watts power **£24.95**
MB-6 6:1 Balun 400 watts power **£24.95**
MB-1X 1:1 Balun 1000 watts power **£29.95**
MB-4X 4:1 Balun 1000 watts power **£29.95**
MB-6X 6:1 Balun 1000 watts power..... **£29.95**
MB-Y2 Yagi Balun 1.5 to 50MHz 1kW..... **£24.95**

Tri/Duplex & Antennas Switches

MD-24 HF or VHF/UHF internal duplexer (1.3-225MHz) (350-540MHz) SO239/PL259 fittings **£22.95**
MD-24N same spec as MD-24 but "N-type" fittings. **£24.95**
MX2000 HF/VHF/UHF internal Tri-plexer (1.6-60MHz) (110-170MHz) (300-950MHz)..... **£59.95**
CS201 Two-way di-cast antenna switch. Freq: 0-1000MHz max 2,500 watts SO239 fittings..... **£14.95**
CS201-N Same spec as CS201 but with N-type fittings **£19.95**
CS401 Same spec as CS201 but4-way **£39.95**

Antennas Rotators

AR-31050 Very light duty TV/UHF **£24.95**
AR-300XL Light duty UHF\VHF..... **£49.95**
YS-130 Medium duty VHF..... **£79.95**
RC5-1 Heavy duty HF..... **£349.95**
RG5-3 Heavy Duty HF inc pre set control box..... **£449.95**
AR26 Alignment Bearing for the AR300XL..... **£18.95**
RC26 Alignment Bearing for RC5-1/3 ..... **£49.95**

Complete Mobile Mounts

All mounts come complete with 4m RG58 coax terminated in PL259 (different fittings available on request).
3.5" Pigmy magnetic 3/8 fitting **£7.95**
3.5" Pigmy magnetic SO239 fitting..... **£9.95**
5" Limpet magnetic 3/8 fitting..... **£9.95**
5" Limpet magnetic SO239 fitting **£12.95**
7" Turbo magnetic 3/8 fitting..... **£12.95**
7" Turbo magnetic SO239 fitting..... **£14.95**
Tri-Mag magnetic 3 x 5" 3/8 fitting **£39.95**
Tri-Mag magnetic 3 x 5" SO239 fitting..... **£39.95**
HKITHD-38 Heavy duty adjustable 3/8 hatch back mount **£29.95**
HKITHD-SO Heavy duty adjustable SO hatch back mount **£29.95**
RKIT-38 Aluminium 3/8 rail mount to suit 1" roof bar or pole **£12.95**
RKIT-SO Aluminium SO rail mount to suit 1" roof bar or pole **£14.95**

Antenna Wire & Ribbon

Enamelled copper wire 16 gauge (50mtrs)..... **£11.95**
Hard Drawn copper wire 16 gauge (50mtrs).. **£13.95**
Equipment wire Multi Stranded (50mtrs) **£9.95**
Flexweave high quality (50mtrs)..... **£27.95**
PVC Coated Flexweave high quality (50mtrs) **£37.95**
300Ω Ladder Ribbon heavy duty USA imported (20mtrs)..... **£15.00**
450Ω Ladder Ribbon heavy duty USA imported (20mtrs)..... **£15.00**
(Other lengths available, please phone for details)

Miscellaneous Items

CDX Lightening arrestor 500 watts..... **£19.95**
MDX Lightening arrestor 1000 watts..... **£24.95**
AKD TV1 filter..... **£9.95**
Amalgamating tape (10mtrs) **£7.50**
Desoldering pump **£2.99**
Alignment 5pc kit..... **£1.99**

Telescopic Masts (aluminium/fibreglass opt)

TMA-1 Aluminium mast ★ 4 sections 170cm each ★ 45mm to 30mm ★ Approx 20ft erect 6ft collapsed **£99.95**
TMA-2 Aluminium mast ★ 8 sections 170cm each ★ 65mm to 30mm ★ Approx 40ft erect 6ft collapsed..... **£189.95**
TMF-1 Fibreglass mast ★ 4 sections 160cm each ★ 50mm to 30mm ★ Approx 20ft erect 6ft collapsed **£99.95**
TMF-2 Fibreglass mast ★ 5 sections 240cm each ★ 60mm to 30mm ★Approx 40ft erect 9ft collapsed..... **£189.95**

HF Yagi

HBV-2 2 BAND 2 ELEMENT TRAPPED BEAM FREQ:20-40 Mtrs GAIN:4dBd BOOM:5.00m LONGEST ELEMENT:13.00m POWER:1600 Watts..... **£399.95**

ADEX-3300 3 BAND 3 ELEMENT TRAPPED BEAM
FREQ:10-15-20 Mtrs GAIN:8 dBd
BOOM:4.42m LONGEST ELE:8.46m
POWER:2000 Watts **£329.95**

ADEX-6400 6 BAND 4 ELEMENT TRAPPED BEAM FREQ:10-12-15-17-20-30 Mtrs GAIN:7.5 dBd BOOM:4.27m LONGEST ELE:10.00m
POWER:2000 Watts..... **£599.95**
40 Mtr RADIAL KIT FOR ABOVE..... **£99.00**

HF Verticals

VR3000 3 BAND VERTICAL
FREQ: 10-15-20 Mtrs
GAIN: 3.5dBi HEIGHT: 3.80m POWER: 2000 Watts (without radials)
POWER: 500 Watts (with optional radials) **£99.95**
OPTIONAL 10-15-20mtr radial kit..... **£39.95**

EVX4000 4 BAND VERTICAL FREQ:10-15-20-40 Mtrs GAIN: 3.5dBi HEIGHT: 6.50m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials)..... **£119.95**
OPTIONAL 10-15-20mtr radial kit..... **£39.95**
OPTIONAL 40mtr radial kit **£14.95**

EVX5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 7.30m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials)..... **£169.95**
OPTIONAL 10-15-20mtr radial kit **£39.95**
OPTIONAL 40mtr radial kit..... **£14.95**
OPTIONAL 80mtr radial kit..... **£16.95**

EVX6000 6 BAND VERTICAL FREQ: 10-15-20-30-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 5.00m RADIAL LENGTH: 1.70m(included) POWER: 800 Watts..... **£299.95**

EVX8000 8 BAND VERTICAL FREQ:10-12-15-17-20-30-40 Mtrs (80m optional) GAIN: 3.5dBi HEIGHT: 4.90m RADIAL LENGTH: 1.80m (included)
POWER: 2000 Watts **£319.95**
80 MTR RADIAL KIT FOR ABOVE..... **£89.00**
(All verticals require grounding if optional radials are not purchased to obtain a good VSWR)

Trapped Wire Di-Pole Antennas
(Hi grade heavy duty Commercial Antennas)

MDT-6 FREQ:40 & 160m LENGTH: 28m POWER:1000 Watts..... **£59.95**
MTD-1 (3 BAND) FREQ:10-15-20 Mtrs LENGTH:7.40 Mtrs POWER:1000 Watts.. **£49.95**
MTD-2 (2 BAND) FREQ:40-80 Mtrs LENGTH: 20Mtrs POWER:1000 Watts..... **£59.95**
MTD-3 (3 BAND) FREQ:40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts..... **£99.95**
MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts..... **£44.95**
MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER:1000 Watts..... **£89.95**
(MTD-5 is a crossed di-pole with 4 legs)

Patch Leads

STANDARD LEADS
1mtr RG58 PL259 to PL259 lead..... **£3.95**
10mtr RG58 PL259 to PL259 lead **£7.95**
30mtr RG58 PL259 to PL259 lead..... **£14.95**
MILITARY SPECIFICATION LEADS
1mtr RG58 Mil spec PL259 to PL259 lead **£4.95**
10mtr RG58 Mil spec PL259 to PL259 lead..... **£10.95**
30mtr RG58 Mil spec PL259 to PL259 lead..... **£24.95**
1mtr RG213 Mil spec PL259 to PL259 lead..... **£4.95**
10mtr RG213 Mil spec PL259 to PL259 lead **£14.95**
30mtr RG213 Mil spec PL259 to PL259 lead **£29.95**
(All other leads and lengths available, ie. BNC to N-type, etc. Please phone for details)

ALL PICTURES ARE FOR REFERENCE ONLY

Callers welcome. Opening times: Mon-Fri 9-6pm sales@moonrakerukltd.com

UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD
WOBURN SANDS, BUCKS MH17 8UR

Steve Hartley, G0FUW

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

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

Newcomers' news

Steve Hartley reports on two new amateur radio kits suitable for Intermediate exam students.

The HF Convention is upon us and as well as helping to run all of the Radio Communications Examinations over one weekend I will be giving a talk on building HF transceivers for newcomers. Hope to see you there!

NEW KITS

A couple of new kits have come to my attention that might be suitable projects for Intermediate radio communications exam students. Both are amateur band receiver kits and I must stress that I have not yet tried either.

The first is a 3.5MHz band receiver – the KRC-5 – from the Kit Radio Company. Designed around two well proven chips, the SA602 and LM386, the double balance mixer pulls in the distant signals while keeping broadcast interference at bay.

A low impedance earphone is supplied and speaker output can be obtained by adding an additional KRC kit. The receiver kit is supplied with an engraved front panel, ready for painting in a colour of your choice, and costs £24.99 plus postage and packing.

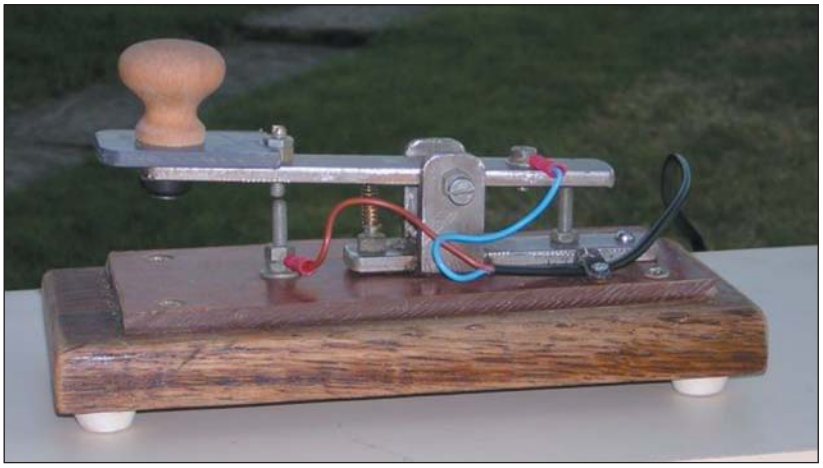
The second is the 'Kilve' receiver from Tim Walford's Somerset range. Again this is a single band direct conversion receiver for those who want a very simple, low cost receiver. The kit comes with a set of parts that allows it to be built for any one of four amateur bands; 3.5, 7, 10 or 14MHz. It is designed to work with Walkman-type headphones. The kit costs £19 plus postage and packing and can be linked to matching transmitter kits for voice or Morse code operation. Tim is currently working on a little double sideband transmitter to match the Kilve.

For more details please contact the suppliers direct (see Websearch below). The Kit Radio Company can be contacted at Unit 11 Marlborough Court, Westerham, TN16 1EU and Walford Electronics can be contacted at Upton Bridge Farm, Long Sutton, Langport, TA10 9NJ.

I am sure that reader reviews of these, or any other kits, would be of interest to others who are looking for suitable projects. Any views?

KEY TO SUCCESS?

Jim Harris, G4DRV, of the Southdown Amateur Radio Society (SARS) wrote about a photograph that he forgot he had on his camera. The way it came about was a bit of a surprise. At the end of one Intermediate training session, one of the students, Paul Medhurst, asked Jim if he had any suggestions for his project. They ran through a few ideas and left it so that Paul would think it over and come back the following week.



Home made Morse key that formed part of Paul Medhurst's Intermediate practical assessment project (see Key to Success)

A week later he returned with a Morse oscillator and a key that he had built in the intervening few days. To quote Jim, "to an old codger like me, the attitude was like a breath of fresh air. With people like this coming into the hobby I feel optimistic for the future".

Paul's original motivation was simply that he wanted to encourage his 16-year-old son, Anthony, who is a fellow student. They now hold the callsigns 2E0WOK and 2E0DRV and, if things have gone to plan, will have started their Advanced training.

Over the past 20 years or so, the SARS membership has fluctuated around the 60 mark. As things stand at present, around a third of the members are either Foundation or Intermediate Licence holders. These figures clearly show the value of the SARS policy of providing a range of frequent classes and exams for the past few years. Details of training and club meetings can be had from the SARS website (see Websearch below) or by contacting Jim Harris, G4DRV on 01323 728479.

All very encouraging!

CORRECTION ON QUESTIONS

David Pratt, G4DMP, has had a long association with *Newcomers' News*. David used to produce excellent exam reports after each of the old City & Guilds (C&G) Radio Amateurs Examinations.

Unfortunately, with the move away from C&G and with more regular examinations, the reports are no longer part of the feedback loop. Nevertheless, David still enjoys reading *Newcomers' news* each month when *RadCom* drops through the letterbox and he spotted a couple of errors with regard to my references to City & Guilds in the August column.

First of all, I said that many of the questions for the Advanced exam have been migrated across from the C&G database. David points out that it would have been more accurate to say "from the C&G *Novice* database". Although RA/Ofcom obtained the Novice question bank from C&G, the same is not true for the top level exam. Questions used or written for the RAE remain the copyright of the C&G, which robustly guards its intellectual property. This was a genuine misunderstanding on my part, apologies for any confusion it may have caused.

Secondly, I implied that *all* RAE questions with diagrams were excluded from the scoring of C&G exams where the candidate was blind. This was not the case, provided the diagrams could be described by the invigilator to the satisfaction of the candidate, the questions were included in the scoring. In either case, the invigilator wrote a comprehensive report describing the circumstances. This was included with the candidate's answer sheet. In this instance, I think I was guilty of overstating the position; there was certainly no intention to mislead readers. I know that disabled candidates enjoy the satisfaction of passing examinations with the minimum of concessions. My experience in teaching a blind candidate certainly taught me not to underestimate his ability to take in visual concepts through words and tactile diagrams.

Thanks for the corrections David. ♦

WEB SEARCH

Kit Radio Company	http://hometown.aol.co.uk/_ht_a/kitradioco/uk.htm
Walford Electronics	http://www.users.globalnet.co.uk/~walfor/
Southdown Amateur Radio Society	http://www.southdown-amateur-radio-society.org.uk/

Quin Collier, G3WRR

E-mail: q.g.collier@btinternet.com

National Field Day 2005

Torrential rain, tent-eating horses and the theft of one team's poles did not prevent the participants of this year's HF National Field Day competition having a lot of fun and making plenty of contacts. Quin Collier reports.

At the time of writing this report, in an environment of half full reservoirs and threatened hosepipe bans, it is hard to remember just how wet the first weekend in June was in many parts of the country. This of course was the weekend of HF National Field Day 2005, bringing comments about "typical Field Day weather". The weather is one of the key factors that affects NFD, influencing both the level of participation and participants' experience of the event. Spending all of Sunday in a leaky tent (although the term "through flow" is preferred) certainly affected the writer. No complaints about variety – sometimes the tent was in pouring rain and sometimes it was inside the cloud from which the rain was pouring. But the end result was the same – two days off work with a nasty cough and sore throat!

Another of the key factors affecting NFD is radio conditions. Despite the fact that we are now well past the peak on the sunspot cycle and on the way down the other side, the leading stations in the Open section nonetheless managed to achieve substantially higher scores than in 2004: the leading four stations in this section all had scores higher than last year's winner, and the winner's score was up by a whopping 19%. Conversely, leading scores in the Restricted section were slightly down. This bears out the view that the more elaborate antenna systems available in the Open section give a greater advantage over a single Restricted section antenna when conditions are flat than when they are more favourable. Scores in the Low Power section were also slightly up on last year, although it is not clear how that fits in with the theory.

ENTRIES

The number of entries this year was 52, five down on 2004. The pattern of registrations suggests that this slightly reduced participation was a result of the weather; 61 groups registered for the event, but eleven of these withdrew and only two unregistered entries were received. This is a significant turnaround from last year when the sunny weather prompted a large number of unregistered stations to appear on the bands.

The distribution of stations between the sections changed slightly from last year, with a small reduction in the Open section and a one third reduction in the Low Power section, partially offset by a slight increase in the Restricted section. Overall, this meant that in 2005 the Restricted section had the greatest number of entrants by some way. Also noticeable was a large increase in the number of check logs received. These are always much appreciated and the HF Contest Committee extends its thanks to those who submitted them: where claimed scores are close, check logs can affect positions in the listings. A total of 26 were received (up from 11 in 2004). Most of these were from the UK and Europe but several submissions were also received from the USA and one from Australia. Interestingly, the check log from VK2BAA/P proved to be from Phil G0HSS, one of the operators from last year's Open section winner GD0EMG/P. Currently resident in Australia and feeling in need of a contest fix, Phil came on 7MHz from a four-wheel drive vehicle with 100W and a vertical, and managed to make several QSOs into Europe – but unfortunately conditions did not favour propagation into the UK and no British stations were contacted. Another /P station submitting a check log, this time from the UK, made enough contacts that if the log had been submitted as a full entry, it would have achieved a position about half way up the listing. Hopefully, the station in question will submit a competing log in 2006.

CONDITIONS

Generally conditions were reported as below average, although a few stations described them as being reasonably good. As might be expected in view of the state of the sunspot cycle, 15 and 10m were patchy for most stations, and with 160 and 80m being open for limited periods, it is not surprising that 20 and 40m carried the bulk of the traffic.

160m as usual was fast and furious for a relatively short period, most of the activity being focused between 2015 and 0230 UTC. A few stations reported top band as being a "pleasure" to operate with very little static whereas others experienced the normal noisy summer conditions. However the contacts were there to be made, and two stations reported their highest ever 160m score. The band leader was a single band entry from G3RIR/P who made 211 QSOs.

80m was busy during the hours of darkness and a rapid QSO rate could be achieved while the band was open. Most entrants found that frequent band changes between 160 and 80m whenever the QSO rate slackened were the way to keep up a good scoring rate. However, as reported elsewhere, the logs did not always keep in step with the radio in terms of which band the station was on! The band leader was G3NKC/P with 265 QSOs.

G3MA operating G4AYM/P in NFD 2005

…and as 2AYP at the very first NFD in 1934

40m was capable of carrying traffic throughout the 24 hours, and provided a steady stream of mostly European contacts, although there were plenty of Russian contacts to be had, along with a sprinkling of USA stations but little real DX. The band leader was a single bander from G3SDC/P with 716 QSOs.

20m was surprisingly lively, with the Open section stations in particular able to make large numbers of QSOs. Again these were mostly European and Russian. The band leader was able to make over 130 North American contacts, and most stations managed to work a few, but only a very small amount of DX was worked. Band leader was the single band entry from G4STV/P with 623 QSOs.

15m is often regarded as the "Cinderella band" of NFD, with entrants finding it difficult to maintain the QSO rate achievable elsewhere. While most stations reported it as poor, a few stations managed a good run on Sunday afternoon. Contacts were almost exclusively with Europe or Russia. Broadly speaking, conditions favoured those in the North and West. Band leader was GD0EMG/P with an impressive 229 QSOs.

Position	Club	Callsign	160m QSOs	160m points	80m QSOs	80m points	40m QSOs	40m points	20m QSOs	20m points	15m QSOs	15m points	10m QSOs	10m points	Total QSOs	Total points	
OPEN																	
1	Manx Kippers	GD0EMG/P	162	1138	224	765	349	1076	561	1595	229	702	116	706	1641	5982	***
2	Bristol CG	G6YB/P	120	864	231	768	499	1500	459	1345	188	586	76	482	1573	5545	*
3	Lichfield ARS	G3NKC/P	193	1334	265	872	408	1243	336	1019	68	246	70	472	1340	5186	**
4	Newbury & District ARS	G5XV/P	173	1206	191	612	323	966	331	1018	136	408	46	318	1200	4528	
5	East Notts CG	G3TBK/P	194	1318	243	772	324	984	329	968	106	334	20	128	1216	4504	
6	North Wakefield RC	G4NOK/P	133	940	165	553	341	1051	305	909	106	334	67	416	1117	4203	
7	Knockycoid CG	GM3JKS/P	138	974	147	530	210	628	327	978	138	433	2	16	962	3559	
8	Oxford & District ARS	G5LO/P	127	912	135	491	176	598	282	900	99	319	47	318	866	3538	
9	Grimsby ARS	G3CNX/P	138	1018	141	494	298	899	243	733	56	183	19	124	895	3451	
10	Stockport RS	M5MDX/P	24	180	116	396	305	894	337	981	58	169	1	6	841	2626	
11	Harwich ARIG	G0RGH/P	74	574	136	453	192	577	174	519	57	176	10	72	643	2371	
12	Edgware & District RS	G3ASR/P	78	576	106	400	173	574	133	402	62	200	22	152	574	2304	
13	Clifton ARS	G3GHN/P	129	948	7	28	150	458	154	457	63	194	22	152	525	2237	
14	De Montfort University ARS A	G3SDC/P	0	0	0	0	716	2042	0	0	0	0	0	0	716	2042	*
15	Hadley Wood CG	G4STV/P	0	0	0	0	0	0	623	1847	0	0	0	0	623	1847	*
16	De Montfort University ARS B	G3RIR/P	211	1434	0	0	0	0	0	0	0	0	0	0	211	1434	*
17	Dundee ARS	GM4AAF/P	28	216	106	326	143	460	98	312	9	32	0	0	384	1346	
RESTRICTED																	
1	Orkney ARC	GM3POI/P	164	1118	165	583	335	1034	421	1246	129	415	23	156	1237	4552	**
2	Flying Pigs CG	G0IVZ/P	168	1218	201	695	252	805	297	951	145	473	60	378	1123	4520	***
3	Gravesend RS	G3GRS/P	174	1224	199	695	304	940	328	1014	115	397	27	190	1147	4460	*
4	Contest Cumbria	G3IZD/P	148	1078	189	640	379	1129	374	1119	94	311	16	112	1200	4389	*
5	Three As CG	GU0AAA/P	168	1166	225	734	317	963	316	944	80	262	27	168	1133	4237	*
6	Sussex Downs CG	G4FNL/P	179	1250	201	672	305	941	287	892	59	203	41	256	1072	4214	
7	Park Air Group	G3KHZ/P	193	1300	196	659	263	821	201	626	53	170	54	360	960	3936	*
8	Addiscombe ARC A	G3WRR/P	148	1028	191	673	259	799	250	779	67	223	31	210	946	3712	
9	West of Scotland ARS	GM4AGG/P	94	706	169	533	258	798	370	1084	70	224	33	224	994	3569	
10	Christchurch ARS	G3KLH/P	144	1028	163	559	279	857	226	692	79	229	30	180	921	3545	
11	Echelford ARS	G3UES/P	143	1062	181	630	157	544	216	717	49	165	43	276	789	3394	
12	Tollesbury CG	G3GLL/P	141	992	147	539	277	873	217	690	82	267	1	8	865	3369	
13	Maidenhead & District ARC	G3WKX/P	151	1118	145	497	142	481	247	722	83	259	26	176	794	3253	
14	Farnborough & District RS	G4FRS/P	155	1082	137	505	143	481	162	509	101	329	37	234	735	3140	
15	Guernsey ARS	GU3HFN/P	102	746	132	470	305	919	154	459	77	245	14	84	784	2923	
16	Addiscombe ARC B	G4ALE/P	105	744	147	498	190	637	169	545	84	267	33	216	728	2907	
17	Windmill CG	G0FBB/P	133	968	164	577	186	604	94	301	60	195	30	204	667	2849	
18	Ilford RSGB Group	G3XRT/P	92	724	139	512	260	842	136	454	44	138	27	176	698	2846	
19	Norfolk ARC A	G4ARN/P	79	600	168	584	253	785	170	517	35	121	11	68	716	2675	
20	Brimham CG	M0IPX/P	86	672	121	458	138	454	215	662	45	146	27	188	632	2580	
21	Scarborough ARS	G4BP/P	115	816	186	611	171	498	150	434	23	78	10	64	655	2501	
22	Gloucester AR&ES	G4AYM/P	99	732	98	362	132	435	159	495	53	169	28	184	569	2377	
23	Medway RCG	G3TRF/P	64	436	150	523	180	590	160	497	49	157	8	56	611	2259	
24	Mid Lanark ARS	GM3PXK/P	50	372	103	345	247	711	157	446	43	139	33	208	633	2221	
25	Royal Air Force ARS	G8FC/P	64	508	96	362	135	474	191	607	33	104	15	112	534	2167	
26	Thornton Cleveleys ARS	G4ATH/P	49	388	81	304	151	524	58	176	12	48	5	28	356	1468	
27	Mid Beds CA	G4BJM/P	39	296	3	10	61	228	18	58	5	18	2	12	128	622	
LOW POWER																	
1	Reading & District ARC A	G3ULT/P	103	752	147	518	110	382	41	162	18	58	20	144	439	2016	****
2	Bracknell ARC	G4BRA/P	104	796	130	484	83	295	49	167	10	32	0	0	376	1774	**
3	Reading & District ARC B	M0EEE/P	71	548	87	314	79	242	66	236	4	16	10	76	317	1432	*
4	Lowestoft District & Pye ARC	G3JRM/P	32	240	34	126	42	158	78	261	20	68	9	60	215	913	**
5	Reading & District ARC C	G0LHZ/P	1	8	34	118	101	350	38	128	16	58	9	72	199	734	
6	Stevenage & District ARS	G3SAD/P	25	200	44	166	51	186	29	114	0	0	0	0	149	666	
7	Finningley CG	M0RHI/P	7	56	43	164	25	84	21	76	1	4	0	0	97	384	
8	Norfolk ARC B	G6NRC/P	0	0	0	0	42	156	28	88	6	18	0	0	76	262	

Check logs are gratefully acknowledged from EI7GY/P, G0MRH, G3AB/P * , G3GMM, G3VQO, G3XMM, G3ZDD, G3ZRJ, G4KNO, G4OGB, GM4FAM, MM3AWD,"GW4BLE, GW4LZP, HA2MN/5, HB9QA, OK1ANP, OZ0F, S51J/P, UT8IM, YL3DX, N1NN, K4PIC, K6III * , VK2BAA/P"

* = certificate winner

10m is in many ways the trickiest band in NFD and most subject to the vagaries of the ionosphere. However, because of the double points, it is important to keep an eye on the band for Sporadic E. Some stations were successful in catching the openings (although being in the right place was important) and reported spells of good conditions at the start, and again on Sunday afternoon, whereas others found the band very hard going. Contacts were almost exclusively with Europe with occasional Russians. Band leader, again, was GD0EMG/P with 116 QSOs.

RESULTS

The winners of the Open section again this year, with a clear lead of over 8% over the runners-up, were the Manx Kippers, GD0EMG/P, operated by G4MJS, G4XUM and M0BEW. Attention to the HF bands was a major factor in their success, in particular 10m with its double points, where their score exceeded that of the next placed contestant by almost 50%. No doubt the use of monobanders on 20, 15 and 10m helped! Runners up were the Bristol Contest Group G6YB/P who are back up from 4th place last year, pushing the Lichfield ARS G3NKC/P down one place to third. Also taking part in the Open section were band winning single band entries from De Montfort University ARC G3RIR/P (160m), De Montfort University ARC G3SDC/P (40m) and Hadley Wood CG G4STV/P (20m).

In the Restricted section, the winners were Orkney ARC GM3POI/P (operated by GM3POI, GM3YTS and F5VHY) who beat runners up the Flying Pigs CG G0IVZ/P by a short head, thus reversing last year's order at the top. Maintaining last year's third place were Gravesend RS G3GRS/P who again restricted Contest Cumbria G3IZD/P to 4th place as a result of more accurate logging.

The Low Power section saw a change at the top, and this year the Reading QRP Trophy "went home" to Reading ARC G3ULT/P (operated by G3XTT and G0VQR) who took the honours from fellow Thames Valley station Bracknell ARC G4BRA/P.

EQUIPMENT AND ANTENNAS

The FT1000 transceiver reinforced its popularity in this tournament, with over half the entrants who provided details of their equipment using one. A wide selection of other transceivers were also reported, the only ones with multiple appearances being the K2, IC756 and TS940. It will be interesting to see whether this trend contin-

ues next year, or whether the new generation of transceivers such as the IC7800, FTDX9000 and Orion will start to make an impact.

In the Open section, the majority of stations used beams for the HF bands, backed up by separate dipoles or inverted Vs for the LF bands. Although tribanders were the most common type of beam, the section leader (and overall winner of NFD) used monobanders for 20, 15 and 10m. The logistics of transporting these and the supporting mastage across the water to the Isle of Man almost defy the imagination.

The Restricted and Low Power sections allow less flexibility in the choice of antenna. Most stations opted for a doublet in either dipole or inverted V configuration: a length of around 265ft was most common, but a range of lengths from 100ft up were in use. Other antennas included Windoms, off centre fed dipoles, delta loops and verticals (the latter being the choice of the section winner).

PROBLEMS AND CAUTIONARY TALES

No NFD passes without at least some stations experiencing and reporting problems. Some of these are old favourites and some have not been reported before. Equally, experiences of different groups vary considerably. Old chestnuts that come back to revisit us year after year are problems resulting from generators, computers and the weather. There is no doubt that the adverse weather in many parts of the country discouraged some stations from participating, including a group who had to withdraw because their site was under eight inches of water. However the pattern across the country was not consistent, with some stations getting really hammered but others reporting that they either missed the rain altogether, or that it visited them at times when it was not too inconvenient.

Several stations reported that they had experienced problems with generators but none seem to have been driven off the air by them. And while some groups reported that their computers had worked flawlessly, others reported the usual crop of problems that seem to go with such devices in an amateur radio environment. Instances were reported of total failure, clock errors, RF from the rig getting into the computer and the reverse problem of RF from the computer getting into the rig. A more unusual case of RFI (a first in NFD) is the group who found they were suffering S9 noise on 15 and 10m from an ultra violet pond filtration lamp. Other firsts include the group who got to site to find that their poles had been stolen, and the group who managed to lock the car with all the gear in it, leaving the keys inside! For the writer's group, this was the Year of the Walking Wounded. Three members had fairly straightforward (albeit incapacitating to various degrees) medical problems, whereas a fourth was suffering from a condition whose details are best left to the pages of the British Medical Journal and certainly not suitable for a family journal like *RadCom*.

Under the heading "the perils of the great outdoors", it seems impossible to outdo the experience of VK2BAA/P who reported that he had suffered predation of his coax feeder after dark by kangaroos. Arguably being outside the UK, this is not relevant to a report on NFD. However the UK was not without animal related problems, as Peter G3SJX had part of his tent eaten by a horse. At least the instance of operators being eaten alive by midges did not recur this year. Perhaps they had decided that radio amateurs were not to their taste: or more likely they had simply drowned.

On a more sombre note, one group reported domestic bereavements affecting several members, which affected their ability to put on more than a token entry. In extending our sympathies to them, it is pleasing to note that they conclude by saying "wait till 2006". And this upbeat stance is reflected by many entrants who clearly do not intend to let problems in 2005 prevent them from participating next year.

TROPHIES

Congratulations to winners of the trophies, which this year are awarded as follows:

The National Field Day Trophy to the Manx Kippers, GD0EMG/P

The Bristol Trophy to Orkney ARC, GM3POI/P

The Reading QRP Trophy to Reading ARC A, G3ULT/P

The Scottish NFD Trophy to Orkney ARC, GM3POI/P

The Gravesend Trophy to Flying Pigs CG, G0IVZ/P

The G6ZR Memorial Trophy to Bristol CG, G6YB/P

The Frank Hoosen G3YF Memorial Trophy to Hadley Wood CG, G4STV/P

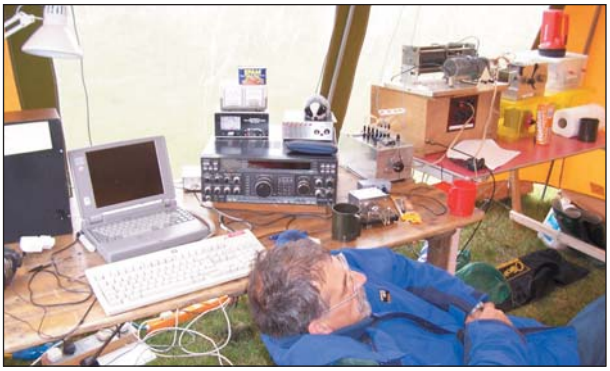
CONTINUITY

One of the main features of NFD is the regular appearance of the same clubs and operators on the bands year after year. Some 43 of the entrants from NFD 2004 were on the bands again this year, displaying a reassuring degree of continuity. Continuity of a completely different order is shown in the case of Pat Perkins, G3MA, who operated for the Gloucester Club as usual this year. Pat has participated in NFD every year that it has taken place since its inception in 1934, and has operated every time since he was licensed in 1938.

NFD in 1934 was very different from today. That year, the Gloucester Club teamed up with the Bristol and Cheltenham groups and went on to win the event. Pat did not hold a full licence in those days (at the time holding the Artificial Aerial license 2AYP) and describes his contribution as helping to erect the aerial and making the tea. The station used a three-valve crystal controlled transmitter powered by a car accumulator and 120V HT batteries. The receiver was a three-valve TRF receiver, again battery powered, and the transmitting antenna is described as an "Act of God" consisting of an unspecified (but long) wire coupled directly into the PA tank circuit. All the gear was transported to site by Austin 7 and housed in a bell tent. Despite the relative lack of sophistication of the gear by today's standards, a contact with a station on the slopes of Mount Kilimanjaro was logged (for 64 points!). By comparison, no contacts with 5Z4 appear in this year's logs. Pictures of Pat in NFD from 1934 and 2005 are included in the report – let's hope that he can continue to participate for many years to come.

BOOK NOW FOR NEXT YEAR....

NFD next year will take place on the weekend of 3-4 June 2006. Please put the date in your diary now – and remember that it's never too early to start planning that killer antenna! ♦



Peter Hart plans his next *RadCom* equipment review as he waits for the start at G3WRR/P

G0IVZ/P's innovative combined solution for tent and mast

GM3PXK/P attempt to win the prize for the most compact NFD station.

RADIOWORLD

www.radioworld.co.uk
42, Brook Lane,
Great Wyrley,
Walsall, WS6 6BQ.
Tel. 01922 414796.
Fax. 01922 417829.

ALINCO - AOR - BHI - CUSHCRAFT - DIAMOND - HEIL - ICOM - KENT - KENWOOD - MFJ - RADIOWORKS - WATSON - WEST MOUNTAIN - YAESU - YUPITERU

KENWOOD TS-2000

HF 6m 2m 70cm 23cms Option. DSP

UT-20 23cms Unit . £369.95
DRU-3A Rec Unit £99.95
VS-3 Voice Synth £45.95
SP-23 Ext Speaker . £68.95
MC-60 Desk Mic £117.95
MC-90 DSP Mic £187.95

1 YEAR WARRANTY **£1,295.00**

KENWOOD TS-480SAT

WITH FREE HEIL MH5 + Cable

New HF+6m. HX-200W - £1099.00

VGS-1 Voice Unit ... £64.95
SP-23 Ext Speaker . £68.95
MC-60 Desk Mic £117.95
PG-4Z Ext Cable £44.95
PS-53T 23A PSU £229.95
SO-3 TCXO £109.95

1 YEAR WARRANTY **£699.00**

KENWOOD TS-870S

100W Base HF. 1.8-30MHz. DSP

VS-2 Voice Unit £45.95
SP-31 Ext Speaker . £82.95
MC-60 Desk Mic £117.95
LF-30A LP Filter £45.95
PS-52T 23A PSU .. £229.95
SO-2 TCXO £122.95

1 YEAR WARRANTY **£1,295.00**

KENWOOD TS-570DGE

100W Base HF. 1.8-30MHz. DSP ATU.

VS-3 Voice Unit ... £45.95
SP-50 Ext Speaker . £27.95
MC-60 Desk Mic £117.95
MB-430 Bracket £44.95
PS-53T 23A PSU .. £229.95
SO-2 TCXO £122.95

1 YEAR WARRANTY **£789.00**

KENWOOD TS-50S

100W Moble HF. 1.8-30MHz.

AT-50 TS-50 ATU . £319.95
SP-23 Ext Speaker . £68.95
MC-60 Desk Mic £117.95
MB-13 Bracket £39.95
HS-5 Del Phones £52.95
SO-2 TCXO £122.95

1 YEAR WARRANTY **£594.00**

KENWOOD TMD700E

2m & 70cms. Dual Band. APRS. TNC

SP-50B Speaker £27.95
PS-33T DC PSU £199.95
MC-58DM DTMF £44.95
PG-4X Ext Cable £61.95
PS-53T 23A PSU .. £229.95
VS-3 Voice Unit £45.95

1 YEAR WARRANTY **£424.00**

KENWOOD TMG707E

2m & 70cms. Dual Band. Det Front

SP-50B Speaker £27.95
DFK-3C Panel kit £34.95
MC-58DM DTMF £44.95
PG-4X Ext Cable £61.95
MB-12 Mount £14.95
MB-201 Mount £14.95

£265.00

KENWOOD Handhelds

TH-F7E 2&70 .... £237.00
TH-D7E 2&70 .... £289.00
TH-22E 2m £135.00
THG-71 2&70 .... £219.00
TH/K2E 2m £139.00
TH/K4E 70cms .. £139.00
Plus much more phone...

www.radioworld.co.uk

YAESU FT-1000MP

HF Base DSP. MkV 200w £2099.00

SP-8 Ext Speaker . £136.95
MD-100 Base Mic . £116.95
TXCO-6 TXCO £124.95
DVS-2 Voice Unit .. £199.95
FH-1 Keypad £33.95
E-DC-20 DC Cable . £11.95

FT1000MP FIELD **£1,699.00**

YAESU FT-847

HF 6m 2m 70cm. DSP. ATU Option

ATAS-120 Act ant . £259.95
ATAS-25 Man ant . £189.00
FC-20 ATU £249.95
FVS-1A Voice Unit £199.95
MH-36D8 DTMF £54.95
MMB-66 Bracket £32.95

2 YEAR WARRANTY **£989.00**

YAESU FT-897D

HF 6m 2m 70cm.100W Transportable

FP-30U AC supply £199.95
FNB-78 Batt pack ... £99.95
FC-30 Ext ATU £249.95

MMB-80 Bracket £15.95

2 YEAR WARRANTY **£649.00**

YAESU FT-857D

HF 6m 2m 70cm.100W. Mobile

ATAS-120 Act ant . £259.95
FC-30 Ext ATU £249.95
MH-36E8J DTMF ... £57.95
CT-39 Packet cab ... £14.95
TCXO-9 TXCO £69.95
YSK-857 Sep kit £45.95

FREE DSP **£579.00**

YAESU FT-817ND

HF 6m 2m 70cm. Portable / Mobile

FP-30U AC supply £199.95
FNB-78 Batt pack ... £99.95
FC-30 Ext ATU £249.95
TCXO-9 TXCO £69.95
MMB-80 Bracket £15.95

FREE BATTERY & CHARGER **£449.00**

YAESU FT-7800E

2m & 70cms. Dual Band Mobile.

CT-39 Packet Cab .. £14.95
MEK-2 Mic ext cab . £29.95
MH-48A6J DTMF ... £39.95
MLS-100 Spkr £29.95
MMB-60 QR Brack . £18.95
MMB-36 Mob Bra .. £6.95

2 YEAR WARRANTY **£237.00**

YAESU FT-8800/8900

FT-8800 Dual Band Mobile. 2/70
£269.00

Quad Band Mobile. 10/6/2/70 **FT-8900**
£329.00

2 YR WARRANTY

YAESU FT-2800M

2m Mobile. 137-174 MHz RX. 65W.
VHF Rugged Mobile TX.

MH-48A6J DTMF £39.95
SP-7 Speaker £34.95
MLS-100 Ext spkr ... £29.95
FP-1030A PSU £199.95
DC Power cord £17.95

2 YEAR WARRANTY **£159.00**

www.radioworld.co.uk

ICOM IC-7800 FLAGSHIP

HF+6m Flagship 200W. 32Bit DSP.
ATU. LCD Scope.

Keboard&Monitor . £469.95
SM-20 Base Mic ... £144.99
SP-20 Ext Spkr £164.99
CT-17 CI-V Conv £99.95

2 YEAR WARRANTY **£6,400.00**

ICOM IC-756 PROIII NEW

HF+6m 100w ATU. 32 Bit DSP.

AH-4 100W ATU ... £359.95
SM-20 Base Mic ... £144.99
SP-20 Ext Spkr £164.99
PS-125 25A PSU .. £295.95
CT-17 CI-V Conv £99.95
UT-102 Voice unit ... £32.99

2 YEAR WARRANTY ~~£2099.00~~
call for the latest price

ICOM IC-7400

HF 6m 2m 100W ATU. 32 Bit DSP.

AH-4 100W ATU ... £359.95
SM-20 Base Mic ... £144.99
SP-20 Ext Spkr £164.99
PS-125 25A PSU .. £295.95
CT-17 CI-V Conv £99.95
CR-338 TXCO £43.48

2 YEAR WARRANTY **£1,279.00**
Inc. SP-21 & SM20

ICOM IC-706 MkII G

HF 6m 2m 70cm 100W DSP Mobile.

AT-180 ATU £329.95
MB-62 Bracket M £17.99
MB-63 Bracket F £9.99
MB-72 Handle £9.95
OPC-581 Sep Cab . £32.99
UT-86 Voice unit £41.13

2 YEAR WARRANTY **£749.00**

ICOM IC-E208

VHF / UHF Dual bander FM Mobile.

CS-208 Cloan SW £329.95
MB-58 Bracket R £25.99
MB-65 Bracket C £25.99
HM-133 Rem mic ... £55.34
OPC-601 Sep Cab . £39.99
SP-10 Mob Spkr £49.99

2 YEAR WARRANTY **£215.00**

ICOM IC-718

HF 100W TX. Dual VFO. Auto Notch.

AH-4 100W ATU ... £359.95
MB-5 Bracket £35.25
MB-23 Carry strap £9.99
UT-102 Voice unit ... £32.99
OPC-599 ACC Cab £32.99
UT-106 AF DSP £84.99

2 YEAR WARRANTY **£439.00**

ICOM IC-910H / X

All mode 2 & 70. 100W. 9600bps op.

AG-25 Preamp £159.95
MB5 Bracket £35.25
CR-293 TXCO £89.99
UT-102 Voice unit ... £32.99
UX-910 23cms unit £349.99
UT-106 AF DSP £84.99

2 YEAR WARRANTY **£1087.00**

ICOM & YEASU Handhelds

IC-T3H 2m FM .. £129.00
IC-E90 6/2/70 .... £199.00
FT-60E 2&70 ..... £169.00
VX-2E 2&70 ..... £119.00
VX-5R 6/2/70 .... £199.00
VX-6R 2&70 ..... £199.95
VX-7R 6/2/70 .... £248.00
VX-110 2m FM £99.95

www.radioworld.co.uk

01922 414796

ORDER HOTLINE

Email: sales@radioworld.co.uk

Mon - Fri - 09:30 - 18:00,
Sat - 09:30 - 1600.

Most Goods are shipped for 24Hr delivery. [UK Mainland] is £10 P&P unless otherwise stated.

Credit Cards Accepted

MasterCard VISA VISA Electron SWITCH SOLO

Order Hotline - 01922 414796
Order Online - www.radioworld.co.uk

MFJ. Tuners

Tuners, Meters, Analysers.

MFJ-989C 3Kw £319.95
MFJ-986C 3Kw £299.95
MFJ-993 Intellituner £209.95
MFJ-971 QRP £89.95
MFJ-969 300w £169.95
MFJ-962D 1.5Kw £249.95
MFJ-949E 300w £135.95
MFJ-948 300w £119.95
MFJ-945E Mobile £99.95
MFJ-941E 300w £109.95
MFJ-934 ATU+AG £159.95
MFJ-921 2m £59.95
MFJ-924 70cms £59.95
MFJ-914 Extender £56.95
MFJ-901 200w £72.95

Reads SWR + Resistance(R) & Reactance(X) or Magnitude(Z) & Phase(degrees). Coax cable loss(dB) Coax cable length and Distance to fault... plus more.

Analysers
MFJ-249 1.8-170 Dig £219.95
MFJ-259B 1.8-170 Rm&Dig . £199.95
MFJ-269 HF/VHF/UHF £269.95

Dummy Loads
MFJ-250 1kw Oil filled £69.95
MFJ-250X 1kw without oil £44.95
MFJ-260C 300w PL259 ..... £33.95
MFJ-260CN 300w N-Type £39.95
MFJ-264 1.5kw PL259 ..... £59.95
MFJ-264N 1.5kw N-Type £69.95

MFJ-418
Morse Decoder / Tutor
£69.95

Learn Morse code anywhere, anytime with this MFJ Pocket Morse Code / CW Tutor! Take it everywhere! enjoy code at home, going to work, on vacation, on a plane or in a hotel. A large LCD display reads out letters, numbers and punctuation in plain English.

Heil. Audio.

Microphones, Headsets, Accessories.

Pro-Set-Plus Headset £155.95
Pro-Set-Plus-IC Headset £169.95
Pro-Set-HC-4/5 Headset £109.95
Pro-Set-HC-IC Headset £119.95
Goldline GM-4 Stick mic £109.95
Goldline GM-5 Stick mic £109.95
Goldline Vintage Stick mic £129.95
HM-10-4 HC4 Reg stick mic ... £69.95
HM-10-5 HC5 Reg stick mic ... £69.95
HM-Dual HC4+5 Stick mic £119.95
HM-10-I Icom Stick mic £89.95
HMM-1C Icom Hand Mic £59.95
HMM-K HC4/5 Ken hand mic . £74.95
HMM-Y HC4/5 Yae hand mic .. £74.95
Traveller-817 Yaesu headset .. £79.95
Traveller-706 Icom headset £79.95

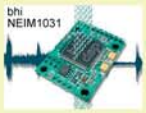
Call for Leads and Accessories

Adonis Microphones

AM-708E
Variable Compression
2 Microphone Outputs
£129.95

Adonis AM-7500E ..... £Phone
Adonis AM-708E £129.95
Adonis AM-508E £79.95
Adonis AM-308E £69.95
Adonis FX-10 ..... £59.95

bhi DSP



Noise Cancelling Solutions for Amateur Radio & SWL

NES10-2 Speaker with dsp £89.95
NES1031 Inline dsp module . £129.95
NES1061 817 dsp module £89.95
NES1061 817 brd inc fitting .. £115.95
NES1062 dsp module £89.95
NES1042 Switch Box £19.95

Watson Supplies

W30-AM

0-15VDC
30/35A Peak
£119.95

W25-XM NEW

13.8VDC
25A Switchmode
£99.95

W-25AM 25A Supply £89.95
W-10AM 10A Supply £59.95
W-5A 5A Supply £29.95
W-3A 3A Supply £22.95
W-25SM 25A Supply £79.95
W-10SM 10A Supply £49.95

Diamond Supplies

GZV4000
5-15 VDC
40A Peak
£154.95

GZV-6000 60A Supply .*NEW.* £299.95
GZV-4000 40A Supply £154.95
GSV-3000 30A Supply £144.95
GZV-2500 25A Supply £114.95

Frequency Counters

Will tune AR-8200, AR8000 & IC-R10
Super Searcher
£99.95

FC130 ..... £79.95
Hunter £59.95
Call for further details

* 10Hz-3GHz
* Imp - 50 Ohms
* LCD readout
* 10-Digit display

Super Hunter
£149.95

Daiwa Accessories

Cross-needle meters

CN101L HF/VHF £59.95
CN103N VHF/UHF £65.95
CN801H HF/VHF £109.95
CN801V VHF/UHF £119.95

Coax Switches 2/4 Way.

CS-201 2-Way £24.95
CX401 4-Way £49.95
CS401N 4-Way NType ..... £Call

Avair Meters

AV-200
HF / VHF PWR SWR meter

AV-201 HF/VHF £49.95
AV-401 VHF/UHF £49.95
AV-601 HF/VHF/UHF £69.95
AV-1000 HF/VHF/UHF £89.95
AV-20 HF/VHF £29.95
AV-40 VHF/UHF £29.95

Palstar Tuners

TThe AT1500CV is an antenna tuner that can handle up to 1500 watts (1500 watt PEP) with low profile construction and bullet proof operation

AT-1500CV **£389.00**

AT-1KD Digital Display £299.95
AT-1KM Regular Display £289.95
AT-1500BAL 1500w Bal £599.95
AT-1500CV 1500w ATU £389.95
BT-1500BAL Dual Bal £569.95

Palstar ZM30 - Antenna Analyser
Micro-controlled SWR antenna analyzer **£289.00**

Watson Antennas

Watson W2000
Bands 6m/2m/70cm
Gain 2.15/6.2/8.4dB
Power 200W (50W 6m)
Type 1/2, 2x5/8, 4x5/8
Length 2.5m
£69.95

W-30 2/70 Base £39.95
W-50 2/70 Base £49.95
W-300 2/70 Base £64.95
W-2000 6/2/70 Base £69.95
WBV-70 4m 1/2 Wave Base ... £39.95

Bencher Antennas

Butternut HF-6V
Bands: 80/40/30/20/15/10
Height (Adj): 26 ft (7.9 m)
Weight: 12 lbs (5.4 kg)
Impedance: Nom 50 ohms
VSWR: 1.5:1 or less
£299.95

Butternut HF-2V 40/80m £229.95
Butternut HF-6V 80-10m £299.95
Butternut HF-9V 80-6m £349.95
Butternut HF-5B 20-10m £319.95

30-MRK 30m ad for HF2V £89.95
A-17-12 17&12 ad for HF6V ... £49.95
A-6 6m ad for HF6V-X £14.95
TBR-160S 160m HF2/6/9V ... £114.95

Hustler Antennas

Hustler 5-BTV
5 Bands - 80-10m
Height 7.64m - Weight 7.7kg
SWR 1.15:1 - Power 1kW
£189.95

Hustler 4-BTV 4 Band Vert ... £159.95
Hustler 6-BTV 6 Band Vert ... £209.95

West Mountain Radio

RIGblaster Pro £209.95
RIGblaster Plus £119.95
RIGblaster M8 ..... £89.95
RIGblaster M4 ..... £89.95
RIGblaster RJ £89.95
Nomic 8P £59.95
Nomic 4P £59.95
Nomic RJ £59.95

Tonna Antennas

Tonna - 20655
23cms (1296 Mhz) 55 element 21.5 dbi gain "N" 4.64m long.

Tonna 20505 6m 5el £89.95
Tonna 20809 2m 9el £54.95
Tonna 20811 2m 11el £79.95
Tonna 20817 2m 17el £99.95
Tonna 20909 70cm 9el £45.95
Tonna 20919 70cm 19el £59.95
Tonna 20921 70cm 21el £74.95
Tonna 20635 23cm 35el £64.95
Tonna 20655 23cm 55el £89.95
Tonna 20745 13cm 25el £69.95

Diamond Antennas

HF10FX 10m Mobile £39.95
HF15FX 15m Mobile £39.95
HF20FX 20m Mobile £39.95
HF40FX 40m Mobile £39.95
HF80FX 80m Mobile £42.95
CR8900 10/6/2/70 ..... £72.95
CP6 Base 6m-80m £239.95
X50 Base 2/70 ..... £54.95
X200 Base 2/70 ..... £84.95
X300 Base 2/70 ..... £99.95
X510 Base 2/70 ..... £124.95
X700 Base 2/70 ..... £249.95

Cushcraft Antennas

X-7 - 20/15/10 7el Yagi £669.95
A3S - 20/15/10 3el Yagi £499.95
A4S - 20/15/10 Yagi £569.95
A3WS - 12/17 3el Yagi £379.95
ASL-2010 13-32MHz Log £749.95
MA5B - Mini Beam £369.95
D3 - 20/15/10 Dipole £249.95
D3W - 30/17/12 Dipole £249.95
D4 - 40m Rotary Dipole £349.95

TGM Antennas Mini Beams

** Call for prices on TGM upgrade kits.*

MQ-24SR 6-20m 2el £329.95
MQ-34SR 6-20m 3el £449.95
MQ-3 6-20m 3el £379.95
MQ-26 6-20m 2el £389.95
MQ-26SR 6-20m 2el + EH £419.95
MQ-36SR 6-20m + Dir £559.95

Radioworks Wire Ants

CW-160 160-10m (252ft) £129.95
CWS-160 160-10m (133ft) £114.95
CW-80 80-10m (133ft) £89.95
CWS-80 80-10m (66ft) £109.95
CW-40 40-10m (66ft) £84.95
CW-20 20-10m (34ft) £89.95
G5RV+ 80-10m £59.95

Radioworld G5RV Fullsize £29.95
Radioworld G5RV Halfsize £27.95

ALINCO - AOR - BHI - CUSHCRAFT - DIAMOND - HEIL - ICOM - KENT - KENWOOD - MFJ - RADIOWORKS - WATSON - WEST MOUNTAIN - YAESU - YUPITERU

RADIOWORLD
If You Don't need it, we won't sell it to you.

price match
Find a lower price? We'll try to match it!*

www.radioworld.co.uk

RADIOWORLD

42, Brook Lane,
Great Wyrley,
Walsall, WS6 6BQ.
Tel. 01922 414796.
Fax. 01922 417829.

ALINCO - AOR - BHI - CUSHCRAFT - DIAMOND - HEIL - ICOM - KENT - KENWOOD - MFJ - RADIOWORKS - WATSON - WEST MOUNTAIN - YAESU - YUPITERU

LDG Electronics

AT-1000

1KW Auto ATU - 1.8-54MHz - 1-8 secs
Tune - Approx SWR Rating of 10:1

£499.95

LDG Z-100

100w Auto ATU - 1.8-54MHz - 0.5 - 6 secs

£129.95 ***BEST SELLER****

LDG TW-1 TALKING WATTMETER *New*

Speaks Fwd - Rev power in Watts & SWR
Continuous tone for amplifier adjustments
Power range: 0 – 2000 watts PEP

£149.95

LDG AT-100Pro *New*

100w Auto ATU - 1.8-54MHz
1-5 seconds Tune - 2 Pos Ant switch

£169.95 ***New****

LDG RBA 1:1 & 4:1

1:1 or 4:1 Balun - Covers 1.8 - 30Mhz
Power rating 200w

£29.95

LDG AT-897

100w Auto ATU for FT-897 - 1.8-54MHz

£199.95

Accessories:

K-OTT Kenwood Interface	£49.95
Y-OTT Yaesu Interface	£54.95
Icom-IC1 Icom Interface	£29.95
Alinco-IC1 Alinco Interface	£29.95
AC-1 Cable	£19.95

W4RT Electronics

One-Plug-Power

One-Plug Power is the internal FT-817 battery solution you have been waiting for until now.

OPP-817 £54.95

NEW! 2300 mAh Large Capacity FT-817 Internal Battery Soluion Still use Internal 817 Charger

OPP-897 £89.95

One Plug Power for the FT-897 4500 mAh; Fully Compatible with the FT-897 and Yaesu Charger.

NEW!

One-Plug Power is the internal FT-817 battery solution you have been waiting for until now. One-Plug Power comprises a 1800 mAh NiMH battery pack, both over-lemperature and over-current protection, connection to the FT-817 Molex connector, and a modified Yaesu battery cover door featuring a power jack that allows connection of a battery charger such as the Maha MH-C777 or MH-C888.

One-Big Punch

One BIG Punch (OBP) is a custom add-on accessory for the Yaesu MH-31 microphone commonly used with many Yaesu amateur radios

OBP £49.95

Speech Compressor for the Yaesu MH-31 mic and FT817, FT857, FT897. Improve the TALK POWER.

MAX PUNCH £165.95

You can also enjoy the "MAX PUNCH" option that features the HC-4 with the OBP and the HC-5 (w/o OBP). The TONE switch is used to select which element is operational.

HAND MIKE £57.95

W4RT Electronics Microphone with One BIG Punch Speech Compressor included.

The One BIG Punch is an AF-based speech compressor specifically configured to provide remarkable increase in talk power while maintaining good audio quality. The OBP is NOT a clipper, but a compressor providing great voice compression, high-level limiting, and noise gating. The unit can be mounted inside the MH-31, requires no additional electrical power, and can be turned on or off by using the MH-31's TONE switch.

One-Board-Filter

The One-Board Filter (OBF) affords you the opportunity to have both the Collins CW and SSB mechanical filters available in your FT-817 together!

OBF £229.95

Replace two filters in the space of one. OBF includes the two optional filters and fitting.

Collins Mechanical Filters
for the Yaesu FT-817, 857 & 897.

500 Hz CW - £94.95 ***2.3kHz SSB - £94.95***

This is the option that many, many FT-817 owners have requested. The OBF utilizes Collins Mechanical Filters that are the same as used in the optional Yaesu filters for the FT-817. The bandwidth of the 7-pole CW filter is 500 Hz and the 10-pole SSB filter is 2.3 kHz. The One-Board Filter is NOT available for installation by FT-817 owners. This is not a "do-it-yourself" option. The One-Board Filter must be installed by RADIOWORLD, or a competent engineer . If in doubt please call for details.

One-Touch-Tune

At the touch of a button, you have the carrier needed for tuning. One-Touch Tune (OTT) is totally transparent to the FT-817 and to any external equipment that you have attached to the rig.

OTT-817 £54.95

It requires no external power and works with both manual and automatic tuners.

W4RT OTT-FT817	£54.95
W4RT OTT-FT100/857/897	£54.95
W4RT OTT-FT847	£54.95
W4RT FT817 One Fast Charger	£Call
W4RT Antenna Boss	£139.95

NEW* FT-817 Stand £19.95

Simply snaps into position. Adjust for desired height. Complete with non slip feet and allen wrench.

Professional-Grade FT-817 Stand

W2IHY Technologies

Available and IN STOCK now*

Finally, professional audio processing technology is applied to the unique requirements of amateur radio operators! The W2IHY 8 Band Audio Equalizer and Noise Gate is an easy-to-use, sophisticated unit loaded with high-performance features.

W2IHY 8 Band Audio EQ Noisegate

£229.95

If You Are Ready for New Adventures in High-End Transmit Audio Then You're Ready for -- *EQplus by W2IHY*

£299.95

iBox is a versatile accessory for amateurs who are serious about their audio.

£Call for information

Adapter cables to fit Icom - Kenwood - Yaesu £22.95

ATX Walkabout

ATX Walk--about PL-259

£47.95

The ATX Walkabout covers all bands (including WARC bands) from 80-6m, 5W guaranteed, 25W max. When fully telescoped it is about 65 inches long. This makes it ideal for the FT-817 or any other portable HF radio.

ATX Walkabout BNC	£47.95
ATX Walkabout PL259	£47.95
ATX Walkabout Universal	£54.95

The Miracle Whip

RX - 0.6 to 460 Mhz
TX - 40,30,20,17,15,12, 10, 6, 2m & 70cm

Power Limits 25W PEP 10W Cont.

£127.95

In Stock*

* The Miracle Whip will transmit on almost any frequency you are licensed to use including WARC, MARS/CAP, Alaska Emergency, Citizens Band, Marine, and most commercial HF SSB and VHF/UHF channels

** The Miracle Whip is optimized for for best receive rather than lowest swr on 80 and 160, as no short antenna will present good transmitting opportunities at these frequencies

Portable Masts

Telescopic Masts Inc Guy Rings

Small 17' 6"	£55.95
Medium 26' 0"	£65.95
Large 33' 0"	£75.95
Tripods to fit masts	£25.95

Mobile Mounts

Solarcon MAGZ-17 TRI-MAG

£39.95

An extremely strong magnet base which actually consists of 3 x 5" chrome magnets that are interconnected with metal strips to form one very large mount. Suitable for very large mobile antennae such as ¼ wave tank whips.

Siro MAG125 3/8	£17.95
Siro MAG125 PL	£17.95
Siro MAG 145 3/8	£22.95
Siro MAG 145 PL	£22.95
Solarcon Magz-17	£39.95

RM Amplifiers

RM HLA-150
HF - 1.5-30MHz
Power Amplifier
150 WATTS

£249.95

RM HLA-300
HF - 1.5-30MHz
Power Amplifier
300 WATTS

£329.95

01922 414796

ORDER HOTLINE

Email: sales@radioworld.co.uk

Mon - Fri - 09:30 - 18:00,
Sat - 09:30 - 1600.

Most Goods are shipped for 24Hr delivery. [UK Mainland] is £10 P&P unless otherwise stated.

Credit Cards Accepted

MasterCard VISA VISA Electron SWITCH SOLO

Do a great deal better @ RADIOWORLD

01922 414796 - www.radioworld.co.uk

price match — Find a lower price? We'll try to match it!*

Linear Amp U.K.

Challenger Mk3 **£1795.95**

Challenger MK3 HF	£1795.95
Ranger811H HF	£945.95
Discovery 2-31 2m 1KW	£1395.95
Discovery 2-35 2m 1.5KW	£1595.95
Discovery 6-31 2m 1KW	£1395.95
Discovery 6-35 2m 1.5KW	£1595.95
Discovery70 70cms 700w	£1495.95
LA-STNM Bal Super Tuner	£345.00
LA-STWM Bal Super Tuner	£395.00

SGC. Smartuners

SGC-230 200Watts **£359.95**

SGC-230 HF	£359.95
SGC-231 HF+6m	£359.95
SGC-235 HF-500w	£749.95
SGC-237 HF+6m	£299.95
SGC-237 Porta	£589.95
SGC-237 PCB	£299.95
SGC-239 HF	£185.95
MAC-200	£339.95

Rotators

YAESU

G-2800SDX Rotator	£999.95
G-450C Rotator	£299.00
G-550C Rotator	£309.00
G-650C Rotator	£379.00
G-1000DXC Rotator	£429.00
G-5500C Rotator	£569.00

Feeders & Wire

Military Spec High grade 50 Ohm coaxial Cable **£69.95** A 100m Drum

RG58U	£0.50 per Metre
RG8 Super	£0.70 per Metre
RG213	£0.90 per Metre
W103 Westflex	£1.30 per Metre
RG-8 75 Metre Drum Special	£39.95
Flexweave 50m Flex	£29.95
Flexweave-PVC-50 50m	£39.95
Enamelled Copper Wire 50m	£12.95
Hard Drawn Copper Wire 50m	£14.95

Rotator Cable: - Color coded Cable

3 core	£0.45 per Metre
7 core	£0.79 per Metre
8 core	£1.09 per Metre

DC Connecting Cable

5A DC Cable	£0.50 per Metre
10A DC Cable	£0.75 per Metre
20A DC Cable	£1.00 per Metre
25A DC Cable	£1.10 per Metre

Wonder Wand *New

Wonder Wand MonoBand Antenna. Mono Band QRP antenna High Quality Mono Band antenna. Available for 3 x Bands.

MB-160 Mono 160m	£49.95
MB-80 Mono 80m	£49.95
MB-60 Mono 60m	£49.95
Wonder Wand 40m-70cm	£89.95
C-POISE Wander-Wand Tunable Counterpoise System	£40.00

The UK's No.1 Used Equipment Trader

Second Hand List.

Quality Used Equipment. 3 Month Warranty. Best prices paid on your used equipment.

432-50 70cms Amp 50w SH MML 432-5 99.00
Adonis AM-708E SH AM-708E 89.00
AEA PK-232MBX-DSP SH PK-232MBX 199.00
AEA PK-900 SH PK-900 199.00
AKD 6001 6m FM Trx SH AKD 6001 135.00
Alan HQ-2000 SWR / Watt Meter SH HQ 2000 25.00
Alinco DJ-580E Dual Band Handy SH DJ-580E 109.00
Alinco DJ-G5EY Dual Band Handheld SH DJ G5EY 199.00
Alinco DJ-V5 Handheld SH DJ V5 99.00
Alinco DJ-X10 Wide Band Rx SH DJ X10 200.00
Alinco DJ-X2000 Intelligent Receiver SH DJ-X2000 275.00
Alinco DR-150 2m Trx SH DR 150 150.00
Alinco DX-77E HF Transceiver SH DX-77E 389.00
AOR AR-1500 Wideband Receiver SH AR-1500 89.00
AOR AR-2002 Receiver SH AR-2002 199.00
AOR AR-7030 SH AR-7030 550.00
AOR AR-8000 SH AR-8000 189.00
AOR AR-8200 2 SH AR-8200 199.00
AOR AR-8200Mk3 SH AR82003 275.00
AOR AR-8600MK1 Wide Band Rx SH AR-8600mk 399.00
AOR AR5000A+3 HF Rx SH AR 5000+ 1599.00
Bearcat UBC-278 XLT Scanner SH UBC 278 99.00
Bearcat UBC-780XLT Scanner SH UBC-780XL 199.00
Bnos 20AMP PSU SH BNOS 20 89.00
BNOS LP50-3-50 6m linear amplifier SH BNOS-50 99.00
Codan 9360 SSB transceiver SH 9360 399.00
Comet CD-270D Meter SH CD 270D 49.00
Commtel Comm-225 Rx SH Comm 225 150.00
Cushcraft MA5B Multiband Beam SH MA5B 249.00
Daiwa CNA-1001 SH CNA-1001 149.00
Daiwa CNA-2002 Auto ATU SH CNA-2002 169.00
Daiwa CNW-419 ATU SH CNW419 99.00
Daiwa CS-201 2 Way Switch SH CS 201 10.00
Datong FL-2 Multimode Filter SH FL-2 69.00
Datong FL-3 Multi-Mode Filter SH FL-3 69.00
Dewsbury Electronics Supa-Tuta SH DE Supa 35.00
Diamond SX-100 Meter SH SX 100 65.00
Diamond SX-200 Meter SH SX 200 69.00
EDC-16B adapter SH EDC-16B 9.99
ERA Microreader CW Decoder SH ERA MR 79.00
FRT-7700 SH FRT-7700 69.00
FT-290R 2m Multi mode SH FT-290R 150.00
FT-817 SH FT-817 375.00
Fujion F-2000A Finder F 2000 A 99.00
GRE PSR-214 FM Base Scanner SH PSR-214 89.00
Heil BM-10-5 Headset SH BM-10-5 50.00
Hi-Mound Manipulator Paddle Key SH HMM 30.00
Hora C-150 2m FM Handheld Transceiver SH C-150 79.00
IC-7400 HF, 6m & 2m transceiver SH IC-7400 899.00
ICE 413 2m Band Pass Filter SH ICE 413 30.00
Icom IC-Δ1E SH IC-Δ 249.00
Icom IC-207H 2 / 70 cm SH IC 207H 199.00
Icom IC-24ET Dual Band Handy SH IC-24ET 139.00
Icom IC-251E SH IC-251E 249.00
Icom IC-2710H Dual Band SH IC 2710H 225.00
Icom IC-703 HF, 6m Portable SH IC703 399.00
Icom IC-706MkIIG DSP SH IC-706M2G 649.00
Icom IC-718 HF Moble Base SH IC 718 375.00
Icom IC-729 HF & 6m Transceiver SH IC-729 399.00
Icom IC-740 HF Transceiver SH IC-740 389.00
Icom IC-7400 HF, 6m & 2m Transceiver SH IC7400 899.00
Icom IC-746 HF / 6 / 2 SH IC 746 875.00
Icom IC-756 PRO HF / 6 Base SH IC 756 PR 1199.00
Icom IC-756Pro SH IC-756Pro 995.00
Icom IC-775 DSP Base SH IC 775 1499.00
Icom IC-821H VHF Base 2&70 SH IC 821 599.00
Icom IC-R5 Hand held Scanner SH IC R5 125.00
Icom IC-R70 HF Rx SH IC R70 299.00
Icom IC-R7000 SH IC-R7000 399.00
Icom IC-R72 Receiver SH IC R72 350.00
Icom IC-R8500 RX SH IC R8500 999.00
Icom IC-T7E Dual Band Handy SH IC-T7E 139.00
Icom IC-T8E SH IC-T8E 159.00
Icom IC-W31E Dual Bander SH IC W31E 160.00
Icom SP-20 Loudspeaker SH SP-20 99.00
Icom SP-21 loudspeaker SH SP-21 54.00
ICS AMT-2 Terminal Unit SH AMT-2 49.00
Jil SWR Meter SH Jil SWR 15.00
JPS NIR-10 Noise Unit SH NIR 10 99.00
JRC NRD-545 DSP Receiver SH NRD-545 899.00
Junker Pump Key SH JP Key 75.00
Kamtronics KAM Multimode TNC SH KAM TNC 140.00
Kent Straight Key SH Kent Key 45.00
Kenwood AT300 Tuner SH AT 300 275.00
Kenwood BO-9 Base Unit SH BO-9 39.00
Kenwood IF232 SH IF232 50.00
Kenwood MB-201 SH MB201 20.00
Kenwood MC-60A Microphone SH MC-60A 80.00
Kenwood PS-31 Power Supply SH PS-31 129.00
Kenwood SO-2 Hi-Stab Oscillator SH SO-2 69.00
Kenwood SP-31 Loudspeaker SH SP-31 59.00
Kenwood TH-G71E Dualband Handie SH TH G71 129.00
Kenwood TH-K2E 2m Handie SH TH K2E 99.00
Kenwood TM-D700E Dual Band Mobile SH TM-D700E 299.00
Kenwood TM-G707E Dual Band Mobile SH TM-G707E 189.00
Kenwood TM-V7E 2 / 70 SH TM V7E 250.00
Kenwood TS-50S SH TS-50S 399.00
Kenwood TS-570 DGE HF Mobile SH TS 570 DG 675.00
Kenwood TS-690S HF -6m Transceiver SH TS-690S 499.00
Kenwood TS-850S /AT SH TS-850SAT 699.00
Kenwood TS-870S HF Transceiver SH TS-870S 849.00
Kenwood TS-950SD HF Transceiver SH TS-950SD 1099.00
Kenwood TSU-8 CTCSS encoder SH TSU-8 30.00
Kenwood VS-2 Voice Synthesizer SH VS-2 30.00
Kenwood YG-455C IF Filter SH YG-455C 65.00
Kenwood YK-88SN-1 SSB Filter SH YK-88SN1 40.00
KP-100 Keypad SH KP-100 29.95
Linear Amp Challenger II amplifier SH CHAL2 1199.00
Linear Amp UK Challenger SH LAUK CHAL 1200.00
M/Mods 144/100 SH MML144/10 119.00
M/Mods 432/50 SH MML432/50 99.00
Magellan GPS 315 Receiver SH GPS 315 129.00
MFJ-1272B TNC / Mic Switch SH MFJ 1272B 20.00
MFJ-1621 Portable Antenna SH MFJ-1621 65.00
MFJ-1701 6 Way Antenna Switch SH MFJ-1701 40.00
MFJ-442 Elec + Memory keyer SH MFJ 442 89.00
MFJ-722 CW / SSB Filter SH MFJ 722 59.00
MFJ-784 DSP Filter SH MFJ 784 149.00
MFJ-9015 15m cw Trx SH MFJ 9015 84.26
MFJ-912 Remote Balun SH MFJ-912 20.00
MFJ-914 SH MFJ-914 39.95
MFJ-921 VHF 200 Watt ATU SH MFJ 921 50.00
MFJ-931 Artificial Ground SH MFJ-931 69.00
MFJ-949E Manual ATU SH MFJ-949E 109.00
MFJ-949E Versa Tuner SH MFJ-949E2 109.00
MFJ-962D Versa Tuner SH MFJ-962D 220.00
Microset PC2S 30 Power Supply SH PC2S 30 99.00
Microset PT 135 PSU SH PT 135 120.00
Microset R50 2m Amp SH R50 79.00
Mizuho ATU SH MIZ ATU 40.00
MML432-30L SH MML432/30 89.00
MML432-50 70cm's Linear Amplifier SH MML432/50 79.00
Nissei RS-402 2/70 SWR Meter SH RS 402 40.00
Palstar PS-30N PSU SH PS 30N 79.00
Pro.Sis.Tel Rotator and Head Unit SH PST 289.00
Proset-Plus SH-PROSET-PL 109.00
Rack for Lowe HF-150 & PR-150 SH ST-150 20.00
Realistic Pro-2006 Scanner SH Pro-2006 129.00
Realistic Pro-2012 SH PRO-2021 79.00
Realistic Pro-26 Scanner SH Pro-26 89.00
Rexon RL-501 Dual Band Handy SH RL-501 89.00
SMC 150PL Dummy Load SH 150-PL 29.00
Snooper S5-R Safety Alert System SH S5-R 119.95
Standard C-156E 2m Handheld SH C-156E 125.00
Standard C-5900 Mobile 6/2/70 SH C-5900 299.00
Target HF3 HF3 RX SH HF3 99.00
Tentec Paragon HF Base Inc. Speaker SH TT PARA 700.00
TenTec RX-350 HF Receiver SH TT RX 350 799.00
Timewave DSP-59+ Filter SH DSP 59+ 129.00
Timewave PK-12 Packet SH PK12 99.00
Tono Theta 777 TNC SH 777 49.00
Trio (Kenwood) YK-88C IF Filter SH YK-88C 40.00
Trio TR-9130 2m multi mode SH TR 9130 220.00
TS-480HX SH TS480HX 799.00
TS-480S / AT TS-480S/AT 649.00
Vibroplex Vibro Keyer Deluxe SH VB-DK 119.00
Vibroplex Vibro Keyer Standard SH VB-SK 89.00
W4RT FT-897 OTT SH OTT-897 29.00
Watson W-25SM 22A Power Supply SH W-25SM 59.00
WELZ DL-600 Dummy Load SH DL-600 49.00
Yaesu FC-20 ATU for FT-847 SH FC-20 175.00
Yaesu FL-2025 25W Linear Amplifier SH FL2025 99.00
Yaesu FL-7000 HF Linear Amplifier SH FL-7000 1299.00
Yaesu FP-707 PSU SH FP-707 110.00
Yaesu FR-101 HF RX SH FR-101 399.00
Yaesu FRG-100 HF Receiver SH FRG-100 299.00
Yaesu FRG-9600 VHF-UHF Receiver SH FRG9600 199.00
Yaesu FRT-7700 SH FRT 7700 70.00
Yaesu FRV-7700 Converter for FRG-7700 SH FRV 7700 60.00
Yaesu FT-1000MK V 200w SH FT-1000Mk 1499.00
Yaesu FT-1000MP AC HF Base SH FT-1000MP 1199.00
Yaesu FT-1000MP Mark -V Field SH FT-1000Mk 1349.00
Yaesu FT-2800M 2m FM transceiver SH FT-2800 119.00
Yaesu FT-290MkII 2m Multi-mode Trx SH FT-290MK2 250.00
Yaesu FT-416 2m Handy SH FT-416 79.00
Yaesu FT-41R Handheld Transceiver SH FT 41R 120.00
Yaesu FT-470R Dual Band Handheld SH FT 470R 129.00
Yaesu FT-51R Dual Band Handy sh FT51R 149.00
Yaesu FT-690Rmk2 6m Multi mode SH FT 690 MK 275.00
Yaesu FT-707 HF Transceiver SH FT-707 220.00
Yaesu FT-7100M 2m / 70cms Mobile Trx SH FT 7100M 220.00
Yaesu FT-736R 23cms Module SH FEX-736 1 399.00
Yaesu FT-736R 2m/70cm Base Multimode SH FT736R5 499.00
Yaesu FT-736R 6-2-70 Base SH FT 736R3 750.00
Yaesu FT-736R Multi Band 6m+23cms SH FT-736R 899.00
Yaesu FT-747 HF Trx SH FT 747 299.00
Yaesu FT-767GX HF, 6m & 2m trx SH FT767GX 599.00
Yaesu FT-76R 70 cms Handheld Transceiver SH FT 76 99.00
Yaesu FT-7800 2/70 mobile SH FT 7800 199.00
Yaesu FT-790 SH FT-790R 159.00
Yaesu FT-817 Portable Transceiver SH Yae 817 375.00
Yaesu FT-847 Multi-Band Transceiver SH FT-847 849.00
Yaesu FT-857D Multi-band Mobile SH FT-857D1 499.00
Yaesu FT-8800E Dual Band Mobile SH FT-8800E 220.00
Yaesu FT-8900 Quad Band Mobile Trx SH FT-8900 279.00
Yaesu FT-897D Multiband Portable Trx SH FT-897D 539.00
Yaesu FT-920AF HF / 6M Base SH FT 920 899.00
Yaesu FT-980 HF Transceiver SH FT-980 399.00
Yaesu MD-100 Desk Microphone SH MD-100 79.00
Yaesu MD-200 Desktop Microphone SH MD-200 175.00
Yaesu MH-29 Speaker Microphone SH MH-29 49.00
Yaesu MMB-31 Mobile Mounting Bracket SH MMB-31 15.00
Yaesu MW-1 Remote Control Mic SH MW1 60.00
Yaesu NC70 Battery Charger SH NC70 60.00
Yaesu PA-11C SH PA-11C 20.00
Yaesu SP-980 Speaker SH SP-980 80.00
Yaesu VL-1000 QUADRA 1kW Amp SH VL-1000 2499.00
Yaesu VR-5000 Receiver SG VR5000 389.00
Yaesu VX-110 2m Handy SH VX-110 79.00
Yaesu VX-1R Handie SH VX1 89.00
Yaesu VX-2E Dual Band Handy SH VX-2E 99.00
Yaesu VX-5R Tri-band handy SH VX-5R 149.00
Yaesu VX-7R (Silver) Tri-Band Handy SH VX-7RS 199.00
Yaesu XF-10.9M-202-01 Filter SH XF109 0.00
Yaesu XF-455K-251-01 CW filter SH XF455 0.00
Yupiteru MVT-225 SH MVT-225 149.00
Yupiteru MVT-3300EU Scanner SH MVT-3300 99.00
Yupiteru MVT-7100 SH MVT 7100 140.00
Yupiteru MVT-7300 Scanner SH MVT-7300 179.00
Yupiteru MVT-9000 Scanner SH MVT-9000 199.00
Yupiteru MVT-9000MK2 Scanner SH MVT-9000MK2 249.00

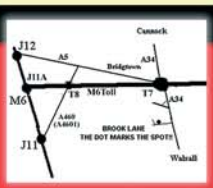
PLUS SO MUCH MORE... CALL FOR DETAILS

ALSO CLICK AND BUY USED ONLINE !

www.radioworld.co.uk

The UK's No.1 Used Equipment Trader - Call 01922 414796

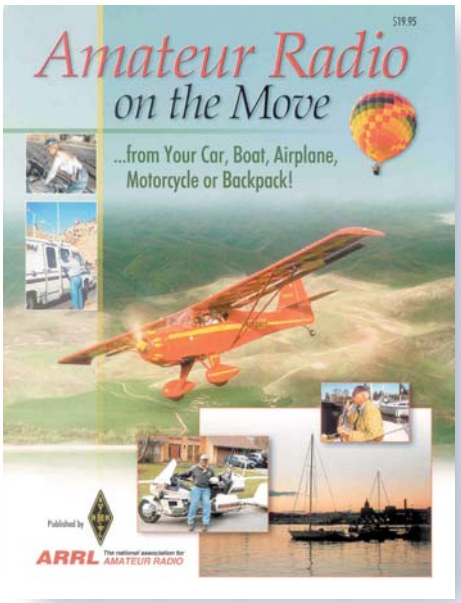
ALINCO · AOR · BHI · CUSHCRAFT · DIAMOND · HEIL · ICOM · KENT · KENWOOD · MFJ · RADIOWORKS · WATSON · WEST MOUNTAIN · YAESU · YUPITERU



42 Brook Lane
Great Wyrley
Walsall WS6 6BQ

We are Premier UK Dealers for ICOM, Kenwood, Yaesu.
Full UK Warranty with full peace of mind. RADIOWORLD

Book review



AMATEUR RADIO ON THE MOVE

Reviewed by RSGB Staff

This is a general book aimed at all forms of amateur radio which do not take place from the comfort of your shack! Subtitled '... from your car, boat, airplane, motorcycle or backpack!', the book brings together contributions from no less than eight authors in the areas of automobile operation, maritime mobile, aeronautical mobile, motorcycle mobile, backpacking, and RV mobile. That seems to cover about everything you might want to do outdoors!

The chapter on automobile operation covers some 41 pages, and covers everything you might want to know on the subject. Bear in mind that, being an American book, the instrumentation tends to be on a much larger scale than here in the UK. The principles are the same, though. When discussing where and when to chase the DX, remember that the book refers to operation from mainland North America.

Maritime mobile gets 29 pages, and covers all the important information about grounding (DC, AC and RF), VHF and HF antennas, and transceiver selection. The world-wide major maritime nets are described. Weather information, radio e-mail, and all the other things you would need on the open sea are discussed. The chapter ends with several pages of tables, giving frequencies and other information on networks dedicated to maritime communication.

The chapter on aeronautical mobile is of mainly academic use to radio amateurs in the UK. It discusses the USA installation regulations and legal issues, together with concerns about interference.

Motorcycle mobile is quite common in the UK, and the information given here is valid. It covers earphones, microphones, PTT switches and antennas (and their mounting). VHF and HF transceivers are discussed. CW operation on the move is described, although I believe it would not be recommended over here!

The next chapter is curiously named 'HF Unplugged'. As far as I can ascertain, 'unplugging' is what you do when you uproot (unplug) most of your equipment from your shack and take it out for field use.

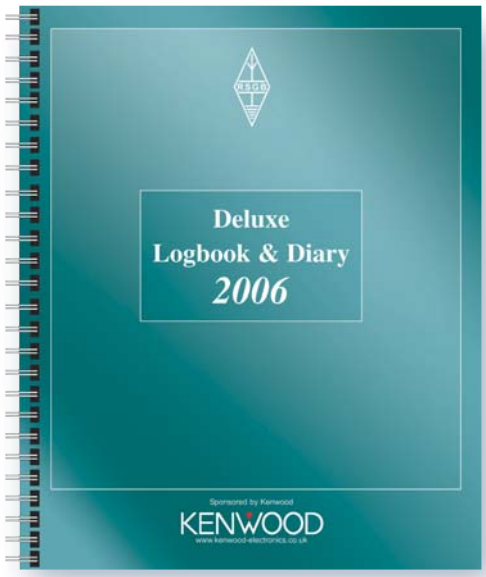
Safety and the use of consistent connectors are important issues. How to make a good demountable antenna and how to rig it up with coax, slingshot and reel are then discussed. A little about propagation and which band(s) to use, rounds off the chapter.

If you are an RV owner and are willing (allowed) to fill it with radio gear, the next chapter is for you! There are lots of useful tips and advice. You will find out all about proper grounding, good RV antennas for mobile use and their mounting. When stationary, of course, the antenna options are almost limitless, and RV operation becomes just like normal shack operation with a different view from the window!

The book ends with an Appendix which covers many different antenna designs, couplers, and mounts, together with a couple of antennas with on-glass mounts for VHF / UHF operators.

In all, from the UK mobile operator's point of view, it still makes interesting reading, provided you are aware of what is applicable in the US and what is applicable over here!

AMATEUR RADIO ON THE MOVE
Published by ARRL, 2005
~161 pages, 275 x 210mm, softback
ISBN: 0-87259-945-0
Members' price £12.74 + p&p
(Non-members' price £14.99 + p&p)
Available form the RSGB Shop,
www.rsgb.org.uk/shop



RSGB DELUXE LOG BOOK 2006

Reviewed by RSGB Staff

The concept of the *annual* log book – whereby contacts for each calendar year are kept in a distinctly-labelled volume – is now well established. One advantage is that in the future, when you wish to look back on your amateur radio contacts over the years, you will appreciate the convenience of being able to go straight to the year required. The other big advantage of the *Deluxe Log Book* is that it contains a wealth of useful operating information which will always be right where you want it – on your operating desk.

The 2006 edition has been updated and includes a prefix list; a locator map of Europe – and how to work out your own locator; information on the RSGB QSL Bureau and a list of QSL Bureau Sub-Managers; the current UK Band Plans, information on GB2RS news and the GB2RS broadcast schedule; repeater lists; and a diary with lists of events such as rallies taking place during 2006 as well as RSGB HF and VHF / UHF contests and the major international contests. There is a guide to Ofcom with useful contact numbers together with information on Morse practice sessions and the Morse Proficiency Programme.

RSGB Deluxe Log Book 2006
RSGB Publications, 2005
Soft covers, 96 pages, 254 x 210mm
Member's price £4.24 + p&p
(Non-members price £4.99 + p&p)
Available form the RSGB Shop,
www.rsgb.org.uk/shop

BRAWN.

BRAIN.

Other tuners fear it.

Smartuners™ are built to last. Rugged construction, superior quality components and state of the art engineering are what keep Smartuners ahead of the competition. You can use them in the most demanding installations. But they're not all brawn. The brain of the Smartuner is the microprocessor, which tunes automatically (in 10ms from memory) with up to half a million precision matches. They work with *any* antenna and *any* radio in ranges from 1.8-60 MHz and 1-500 Watts. The Smartuner is the original and still the number one choice of hams around the globe. Why choose brain or brawn? You can have both!

Stop tuning, start talking.

Visit www.sgcworld.com, call us at +1-425-746-6310,
or contact your dealer for information on all SGC products.
SGC, Inc. 13737 SE 26th St, Bellevue, WA 98005 USA

SGC

HF

Conditions might not be at their best at present but that has not stopped some good activity on the HF bands, writes Don Field in his regular monthly column

Unfortunately KA2HTV (see last month) was unable to operate from North Korea. This appears to have been due to a miscommunication between ministries, with one ministry having agreed his operation, but another refusing it at the last minute. So P5 remains off the air for the foreseeable future. In contrast, and as a result of the way in which amateur radio came into its own after last December's tsunami, Indian amateurs are planning an amateur radio convention in Port Blair, Andamans, one year on. Overseas visitors are being invited and the Indian authorities have indicated that these visitors may well be allowed to operate. Hopefully there will be more news nearer the time.

PROPAGATION

I don't pretend to be an expert on propagation but a couple of news items recently have reported the first stirrings of the next cycle, by way of a region on the sun with the magnetic polarities reversed. This observation suggests a solar minimum sometime between April and October 2006, with the new cycle really starting to get under way after that.

DX NEWS

United Nations High Commissioner for Refugees (UNHCR) worker Jovica Todorovic, T98A (ex-T94FC), is now in **Sudan** for a one year work assignment. He has obtained the call ST0RM and plans to be active mostly on CW with some SSB and digital modes on all bands. QSL cards go via T93Y. Please don't be confused by the ST0 prefix which used to be used from Southern Sudan, no longer a recognised DXCC entity. ST0 is now used for visitors to Sudan.

A team including operators from Egypt and Italy was due to be active as SU8GFT from **Giftun Island** (Red Sea Coast North Group, AF-NEW) for about four days and for at least 18 hours a day during the last week of September. They plan to operate SSB and CW mostly on 20 and 40, with two 100 watt stations, a beam and verticals. Giftun, off the port of Hurghada, is well-known to divers as an uninhabited sandy island surrounded by excellent diving spots, although a developer has recently submitted plans to populate it with a major hotel complex.

4X1VF, 4X6HP, 4Z1UF, 4Z4KX, 4Z5LA and 4Z5LI will be active as 4X7AZ from **Akhziv Island** (AS-100) from 30 September to 1 October. They plan to operate on 10-80 CW and SSB with three stations. QSL via 4Z5LA.

Harvey, ON5SY, will operate as A52SY from **Bhutan** from 3 to 10 October. He plans to concentrate operations during European evenings and the weekend. QSL via ON4ON, direct or bureau.

Alex, HB9FBO, will sign A35BO from **Tonga** over 24 October to 1 December. He will be on 160-10, CW, SSB, and PSK31. A web page is being worked up.

Charlie, W0YG, plans to return to **Christmas Island** from 24 October to 7 November. He will concentrate on the lower bands and RTTY. After Christmas Island, he will go to **Cocos-Keeling** for another two weeks of operating, 8 to 22 November approximately. He still does not know his callsigns.

Rick, G3VZT, his wife Lynda, G0VDR, and their 13-year-old daughter Catherine, M3VZT, will be on from **Montserrat** from 26 October to 4 November with callsigns VP2MRJ, VP2MLJ and VP2MCJ. It's a combined family holiday and business trip. They hope to take time out to do a multi-single entry in the CQWW Phone contest. They're trying to obtain the VP2M callsign of the Montserrat Radio Society. If not, they'll use VP2MRJ. QSL to G4WTD.

W4I will operate from **St George Island** (NA-085) 2 to 9 October. Operators will be WA4RMC, W4KRY, K0MAI, KI4GYS, K4VCM, WA4NFO, K4KWK, AB4GG, W4FOA, AD4F and WA4AA. QSL via WA4AA direct with SASE, or via the bureau. This item prompts me to say a word about these US special event callsigns consisting of a single-letter prefix, number and single-letter suffix. The September K7K (Kure Island) operation was a good example. It is by no means obvious which DXCC entity these calls originate from and some pop up in other guises (K5K was used from Kingman Reef and, later, if I recall correctly, for another event entirely from the 5 call area of mainland USA).

This also leads me to another point I wanted to mention. I am often asked whether I have QSL information for GB special event calls. As often as not, they are difficult if not impossible to track down. Can I encourage those of you who run such operations to ensure, at the very least, that the information is posted on the www.qrz.com web site, which nowadays is the first port of call for most people looking for QSL information.

PHOTO: TIM BEAUMONT, MSSDE

Strumble Head Lighthouse on St Michaels Island, from where team GB0SH operated during Lighthouse on the Air Weekend

CQWW PHONE CONTEST

Apart from operations already mentioned, some of the others expected in the CQWW Phone Contest (not CQWW SSB as some refer to it, it predates that mode!) include 6W1RY (SOAB, by F5VHJ); 8P9LP (M2 by US ops); 8P9R (MM by US ops); 8Q7EA (MM by EA ops); 8R1EA (SOAB by AH8DX); C6A (MS by W2GJ and AA4V); CN2R by W7EJ (40 SB); GD6IA (MS by J1JB and K1EU); HI3CCP (multi-op); HI3TEJ (SOAB); HQ9R (Roatan Island, Honduras, SOAB by WQ7R); IG9R (MS); IH9P (multi-op); J3A (multi-op); JW5E (MS); KG4SB or KG4WW (Guantanamo Bay by KG4WW and N4BAA); NP2B (multi-op); P40A (SOAB by KK9A); P40W (SOAB by W2GD); PJ2T (M2); V31MQ (15 or 20 SB by WQ5C); VK9XD (SOAB by VK2CZ); VP2Exx (various single-band entries by US team); WP2Z (M2 by US ops); ZB2/ON5UR, ZB2/ON5MRT and ZB2/ON6NP; ZD8Z (20 SB by N6TJ) and ZP0R (SOAB by ZP5AZL). SOAB means single-op, all-band, of course, SB is single-band, and the other abbreviations should also be obvious. Remember that many of these operations will also be active, including CW and WARC bands, before and after the contest weekend.

5MHz NEWS

Iceland is now permitting its amateurs to use the following frequencies on USB and CW. The USB dial frequency setting is in parentheses: 5280 (5278.5); 5290 (5288.5); 5332 (5330.5); 5348 (5346.5); 5368 (5366.5); 5373 (5371.5); 5400 (5398.5); 5405 (5403.5). Tom, LA4LN, reports these are the same fre-

By Don Field, G3XTT

105 Shiplake Bottom, Peppard Common, Henley on Thames RG9 5HJ

E-mail: don@g3xtt.com

COUNTRIES WORKED, 2005

(starting 1/1/05, sorted this month by Datamodes totals)

CALL	CW	SSB	DATA	MIXED
G3JFS	163	122	145	191
GU0SUP	0	0	102	102
G3YJQ	94	26	91	126
G3LHJ	147	61	85	158
MM0BQI	51	57	79	108
G4OBK	172	88	78	186
M0CNP	36	62	71	102
2E0TEC	2	38	66	66
MM3AWD	129	137	65	146
G3TBK	188	55	62	191
G6CSY	0	49	60	65
G6HOU	2	39	46	66
M0BKV	91	126	40	156
M0AWX	27	112	24	126
GM4KGK	155	8	9	155
M5LRO	24	78	7	100
G4DDL	66	33	7	70
G4PTJ	187	149	0	223
G0KBL	200	0	0	200
GM0EGI	156	105	0	193
GM4FAM	180	91	0	193
G0RTN	171	83	0	184
G4KFT	177	0	0	177
G4WXZ	113	107	0	154
G3YVH	109	89	0	151
G3HQT	150	0	0	150
M5GUS	0	148	0	148
G3YMC (qrp)	140	0	0	140
MU0FAL	127	94	0	140
G1VDP	0	132	0	132
GM0TGE	63	112	0	132
M0BVE	110	0	0	110
G4FVK	72	81	0	102
M3NCG	0	102	0	102
G0LGJ/M	0	96	0	96
G1UGH	0	96	0	96
G4RQI	94	40	0	94
G3WP	82	0	0	82
G4IDL	80	0	0	80

quencies allowed to Norwegian amateur club stations. Maximum power allowed will be 100 watts. The permission runs through 31 December 2007. Icelandic stations are required to apply for a special licence to use these frequencies.

HF BANDPLANNING

There has recently been a flurry of activity on the UK4C reflector regarding HF bandplanning (the reflector was set up to help prepare papers for the forthcoming IARU conference).

The correspondence reminded me that HF bandplanning needs mentioning from time to time, and can be especially confusing for those who have been used to operating on the VHF bands, particularly those parts which are channelised (repeaters, FM segments). In comparison, the HF bands present a formidable challenge for anyone trying to create a bandplan. Bands

PHOTO: TIM BEAUMONT, M3SDE

Beautiful sunset taken by GB0SH during Lighthouse on the Air Weekend

are much narrower (40m is probably the worst case, just 100kHz wide in IARU Region 1 until recently, compared with, say, 2m where there is twenty times as much bandwidth). And, HF propagation, being what it is, rather than the 50 miles or so range typical on VHF, ranges are in the hundreds or even thousands of miles. So many more amateurs will live in "QRM distance" of each other.

Yet the demands on bandplans are, if anything, even greater than on VHF. CW segments, datamodes segments, phone segments, beacon frequencies, then special interest groups fighting for allocations – QRP, SSTV, etc. The conflicting demands are almost impossible to meet, especially as band activity varies dramatically with time. For example, in a popular SSB contest there will be huge activity on that mode, whereas it will migrate to RTTY or CW when contests are running on those modes. Unattended packet or RTTY mailboxes can also be a menace, starting up on top of your QRP CW contact, for example. We might wonder sometimes why they are still allowed, but they perform a valuable service in parts of the world where the Internet is still something of a pipedream. However, as radio waves are no respecters of international borders, they can be a problem here in the UK.

There continue to be those who call for mandatory bandplanning on HF, as in the USA, presumably so there is some recourse if others stray into a designated area of the band (SSB in a CW segment for example). My personal view is that mandatory bandplanning in Europe is both unrealistic and undesirable. Unrealistic because the problems are as likely to arise from another country as our own and it is highly unlikely that national regulatory agencies would work together to police the matter (think traffic offences committed in another country, for example!). Undesirable because band usage is changing all the time (witness the great increase in datamodes activity in recent years) and I don't believe our mechanisms for debating and modifying bandplans would be reactive enough. Nevertheless I fully realise that many would disagree with me.

What to do? The answer, again in my view, is to stick with what we have, voluntary bandplanning enforced through peer pressure and, hopefully, a strong lead from our national societies and other interested clubs and organisations. With the best will in the world, problems will arise. It may be through carelessness, lack of awareness of certain frequencies (the QRP meeting frequencies, for example) or simply a change in propagation, whereby two QSOs were taking place without mutual interference and then band conditions changed. In such circumstances, the best solution is to be prepared to move. "Band rage" is not the answer! The irony is that, for much of the time nowadays, especially on weekdays, our HF bands are relatively empty and only become busy when there is an expedition or contest in progress.

CORRESPONDENCE AND TABLES

Damian, M0BKV, believes July was a poor month, enlivened on the IOTA Contest weekend when 10m finally opened up. His recent contacts include J68AS (20 RTTY), 5N6EAM and 9Y4HQ (20 SSB), TI3TLI, R1ANF (South Shetland) and OY1CT (20 CW), VP2E (15 CW and SSB). Derrick G3LHJ reports 9N7JO, V73NS, ET3TK, JW/EI6FR and TT8M on CW (mostly 20m) and A6/ON5NT on RTTY. Derrick was also pleased to work six new islands in the IOTA contest. Peter, G3JFS, reports ZL4BR and ZL2AMI (40 RTTY), FG5FR and FR/K9OT (30 CW), 9N7JO, CP6/VE7SV, YI9VCQ, T68G and TU2XZ (20 CW), HS0/IK4MRH and T6X (20 SSB), CY0AA (20 PSK and RTTY), ZD8BG (17 CW) and TI8CBT (17 RTTY). Welcome to Norman, GM4KGK, who runs an IC-746, IC-765 and FT-990 but is restricted by way of antennas to a multiband trap vertical. Pick of a poor bunch were 9M6/G3OOK and 9M2AX (17), 5R8GZ and ET3TK (20), HF0POL and 3V8SM (40) – most of the foregoing on CW.

Mike, G6HOU, reports on his efforts from Burry Port Lighthouse, Wales (WAL-035), using the callsign GB4BPL. He managed 314 QSOs from 66 DXCC entities and 53 lighthouses from 24 DXCC entities. Highlights included a contact with ZL on 40, despite using just 80 watts to a mobile whip, and ZS on 80 using 80 watts to a sloper. This, of course, reminds us again how much better those signals propagate if you are right on the coast. Carl, 2E0TEC, is another welcome newcomer to the column. He gained his Intermediate licence in March and is now working towards his Advanced. He particularly

thanks Don Lamb at the Radio Society of Harrow for his help along the way. Carl runs a Ten Tec Scout 555 and a Yaesu FT817. There is a bent half-size G5RV in the garden and 10 and 15 dipoles in the attic. Carl says: "I have developed a keen interest in digital modes and can often be found on PSK31 and RTTY. I am enjoying RTTY contests for which I use the excellent N1MM software and for more general logging I have found the Logger32 software very good. I am working on improving my CW and have also had a few adventures with SSTV (using MMSSTV) which have been fun."

Recent DX includes CO2ZK and ET3TK (20 RTTY in the SARTG RTTY contest) plus VP2E on 20 CW. Gerry, G0RTN, has been busy with BV9G, C91CW, A61AJ, VP9/NPED, FG5FR, ET3TK, JT1BH (40 CW), 5Z4DZ, P40QX, A61AJ CP6/VE7SV, F5PTM/6W (20 CW), EK6MG/P (17 SSB), VP2E (15 CW) and HK6PSG (15 SSB). Colin, MU0FAL, is back on HF after absconding to 6m over the summer and comments that the variability in band conditions at this stage in the sunspot cycle can actually be advantageous to those like himself with modest stations. If you use your listening skills, you can be in there and working the DX before others realise that there is a band opening. Terry, G1UGH, reports A47RS, 5D6MC (special Moroccan call), R1MVC (Malyj Vysotskij Island), E21EIC and HS0ZED (20 SSB).

Scott, MM3AWD, reports OY1CT (80 CW) during the IOTA contest, ZL1MV for his first ever ZL on 40 CW and also CX7RO on the same band and mode – also XU7TZG (20 SSB), SU9FL and CY0AA (17 SSB), R1MVF, R1ANN and ET3AA (15 SSB), the latter for an all-time new one. Brian, GM0EGI, worked JD1YBJ on Minima Torishima for all time new one number 314. He was also pleased to work Monk Apollo (SV2ASP/A) on Mount Athos on 20 CW through a massive pile up. Apollo hasn't been on CW much in the past, but has recently been trying the mode using some CW software on his PC. Dave, G3TBK, will be back in the Caribbean by the time this appears, starting in J6 then moving to J3. As always, this is a work trip, but he hopes to be active in both legs of the CQWW contest. Dave says: "I will also be visiting VP2M, V2 and J8, but the duration of these visits is not yet finalised. My calls are VP2MDC, V29TBK, J88DR, J6/G3TBK and J3/G3TBK, plus J3G available for contests only".

Peter, G3HQT, says the summer QRN has finally dropped to the point where he can start to hear signals again! New ones include R1MVW (Malyj Vysotskij), ET3TK, FM/JJ2RCJ, CP6/VE7SV (20), 5X1B VP2E, VP5/K4SV (40) and VY2ZM (80). I'm not sure that VY2ZM counts as DX, though; this station (on Prince Edward Island and owned by topband expert Jeff, K1ZM) is absolutely superb, with four-square arrays on both 160 and 80, putting huge signals into Europe! Take a look, for example, at the photo gallery on K5ZD's web page (Randy operated from there in this summer's IARU contest).

Chris, G1VDP, sends an update after a break of a couple of months with family holidays and other commitments. He managed a number of IOTA expeditions and other special event operations such as 4Z17M (Macaibah Games), along with YK1BA, V31UB, 5N4BFD, XU7TZG, ZD7VC and A45WH (all on 20).

THANKS

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 **December** issue by **22 October**. ♦

WEB SEARCH	
K5ZD	www.k5zd.com

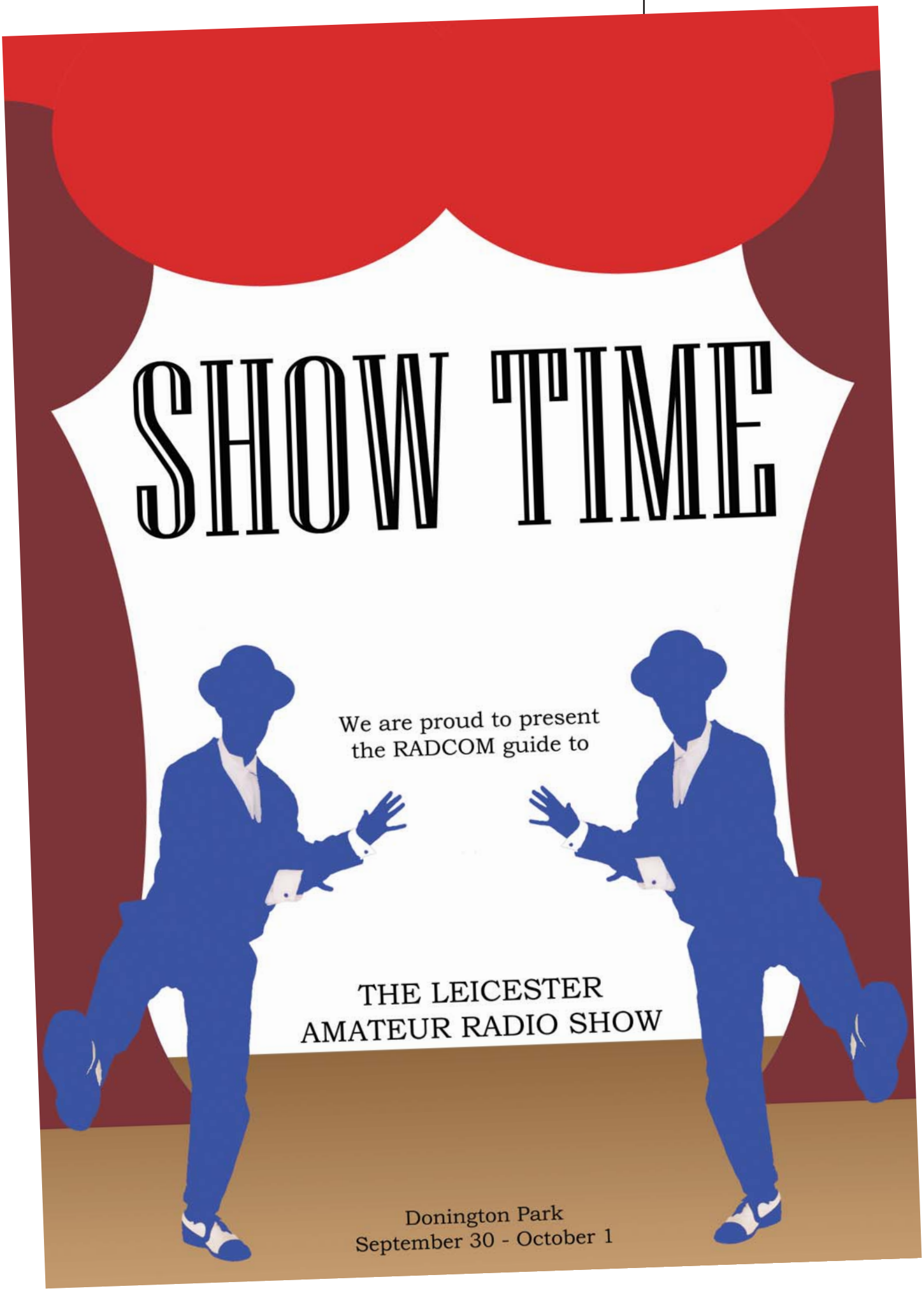
HF F-Layer, Propagation Predictions for October 2005

Compiled by - Gwyn Williams, G4FKH

	3.5MHz	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** EUROPE								
Moscow	991....18889	8874226899 89	..86777886..	..6888886...	...99998....	...8999.....	.....	.....
*** ASIA								
Yakutsk	.....255.	3.....47776	..6545.....	...77.....	...66.....	.....	.....	.....
Tokyo	.....1332.	.....167775.	....457664..	...25443....	...25.....	.....	.....	.....
Singapore	2121	288766	788632	.....4886...	...13687....	...23675....	...2455....	.....3.....
Hyderabad	1222	4.....27777	4.....388875	..2..278....	..67789.....	...7888.....	...8898.....	....77.....
Tel Aviv	883.....8888	8681..179988	..97557997..	...888897...	...67665....	.....	.....	.....
*** OCEANIA								
Wellington	.....23...	...755788...	...888878...	...7887.6...	...3542.....	.....	.....	.....
Well (NZ) (LP)	.....	..6.....	128.....	2.5.....2..	.....	.....	.....	.....
Perth	.....	.....5665.	.....36642.	.....332...	....255.....	...245.....	...66.....	...56.....
Sydney	.....	.....4765..	.....27762..	.....5752...	...2777.....	...3665.....	...57.....	.....
Melbourne (LP)	.....	...5.....	...6.....	...4.....	...5.....	.....	.....	.....
Honolulu	..11.....	..251.....	...655361...	.....2.43...	.....	.....	.....	.....
Honolulu (LP)	.....	.....	.....	.....3...	.....4...	.....3...	.....3...	.....
W. Samoa	.....	...63..2....	...888762...	...5787.3...	....475.....	.....5.....	.....	.....
*** AFRICA								
Mauritius	2.....222	6.....27766	4.....78644	.....872..	.....373...	.....36....	.....23....	.....
Johannesburg	88.....388	99.....8999	782....59988	..731158984.	..3555788...	...566787...	...788897...	...67788....
Ibadan	35.....223	888.....6788	8994...28976	..98756799..	...999999...	...999999...	...999999...	...99999....
Nairobi	2.....1	77.....6666	77.....27777	..62..168733	..7655688...	..6776786...	...77778....	...77686....
Canary Isles	8881....2888	99971..28999	8788523788 87	...8777889..	....7899 6...	.....8999...	.....8786...	.....5.6....
*** S. AMERICA								
Buenos Aires	655.....4	8887.....78	6347.....143	...6.....3..	...7754575..	....76567...	....76566...	....6535....
Rio de Janeiro	212.....2	666.....265	4234.....642	...4.....5..	...7866787..	....87677...	....76677...	....66465...
Lima	1.....	5336.....13	2..4.....11	.....	.....75563..	.....7566...	.....6454...	.....5.3....
Caracas	211.....1	6664.....46	62.61....165	....5...15..	....253352..	.....6555...	.....8665...	.....6.....
*** N. AMERICA								
Guatemala	111.....	5327.....3	2..6.....11	.....	.....	.....	.....	.....
New Orleans	222.....	6665.....6	3..2.....32	.....3...3..	.....878...	.....887...	.....77....	.....
Washington	667.....5	88871.....68	7...6....587	.....65568..	.....87784..	.....5887...	.....44....	.....
Quebec	8882.....38	86683....588	....5...257.	.....54567..	.....8889...	.....7898...	.....78....	.....
Anchorage	.56.....	74862...2246	.....233..	.....5...	.....	.....	.....	.....
Vancouver	.11.....	4142.....	.....	.....	.....6...	.....	.....	.....
San Francisco	.11.....	3223.....	.....	.....	.....45...	.....	.....	.....
San Fran (LP)	.....	.....	.....	.....	.....6....	.....6....	.....6....	.....5....

Key: Each number in the table represents the expected circuit reliability, e.g. '1' represents reliability between 1 and 19% of days, '2' between 20 and 30% of days, etc. No signal is expected when a '.' is shown. **Black** is shown when the signal strength is expected to be low to very low, **blue** when it is expected to be fair and **red** when it is expected to be strong.

The RSGB Propagation Studies Committee provides propagation predictions on the Internet at http://members.aol.com/g4fkhgwyn The page is updated monthly. The provisional mean sunspot number for August 2005 issued by the Sunspot Data Centre, Brussels, was 36.4. The daily maximum / minimum numbers were 69 on 2 August, and 19 on 18 August respectively. The predicted smoothed sunspot numbers for October, November and December are respectively: (SIDC classical method - Waldmeier's standard) 28, 27, 26 (combined method) 26, 24, 22. Longpath predictions are shown with (LP) following the path name. Higher input power and superior aerials have been used for these predictions; less well-equipped stations may find the longpath predictions somewhat inaccurate.


SHOW TIME
We are proud to present
the RADCOM guide to
THE LEICESTER
AMATEUR RADIO SHOW
Donington Park
September 30 - October 1

Show business

If you only visit one amateur radio exhibition this year, make sure it is the Leicester Amateur Radio Show. Nothing else in the UK comes close to it in terms of size, facilities and state-of-the-art amateur radio kit. Here, you can find out how to get there, where to stay and where to visit.

Leicester might not be at the top of most people's itinerary of interesting places to visit but for many amateur radio enthusiasts, the Midlands city is something of a Mecca. Around this time each year, as the gaudy colours of Summer fade into the brown shades of Autumn, hordes of radio hams make their annual pilgrimage to Leicester to attend the eponymous amateur radio exhibition.

The Leicester Amateur Radio Show (Leicester ARS) is the highlight of the UK amateur radio calendar, bringing together radio hams and radio equipment suppliers under the sprawling roof of the Donington Park Exhibition Centre. Donington Park is best known for hosting fast and furious motorbike and car races at its famous track but over one Friday and Saturday in early-Autumn it reverberates to a whole different buzz – the crackle of static, the wooshing of radios being tuned and the rat-a-tat of Morse.

Although Leicester ARS is not strictly-speaking a religious event, one could be forgiven for thinking otherwise, given the looks of wonderment and awe on the faces of hams being treated to demonstrations of the latest state-of-the-art radio kit. This year the Leicester ARS is taking place over Friday 30 September and Saturday 1 October and it looks set to be even bigger and better than ever, with thousands of radio amateurs from across the country expected to attend. The opening times are 9.30am to 5.30pm on Friday and 9.30am to 4.30pm on Saturday.

There will be the usual line-up of leading radio equipment suppliers – including legendary names such as Yaesu, Kenwood and Icom – each keen to show-off their latest gizmos and gadgets to an expectant audience. You might have to fight through crowds to get to Yaesu's stand. The company will be displaying its top of the range new transceiver – the FT DX9000D – for the first time in the UK. The FT DX9000D is the most anticipated new piece of amateur radio kit of the year (see page 18 for a preview of this product). For a selection of some of the best equipment on show at the event, check out our Best of British product showcase on pages 53 and 54.

A number of amateur radio clubs are also expected to take stalls at the show, providing attendees with an opportunity to meet up with like-minded hams after the event. Visitors will also be treated to interesting lectures on amateur issues at the show's convention.

The Radio Society of Great Britain will of course be in attendance. This year we are offering attendees a special offer. Anyone who signs up to become a member of the society at the show will receive a special discount off the standard membership fee. The society will also be offering visitors the chance to get their hands on the latest RSGB publications, including the 2005 Yearbook – the definitive publication for radio amateurs, packed full of useful information including a full list of callsigns and details of hundreds of amateur radio clubs. This year – in a first – the Yearbook comes with a free DVD containing a movie about the RSGB, extensive information about amateur radio clubs and bundles of free amateur radio software.

Leading manufacturers will be showing off their amateur radio kit at the show

Attendees of the show will also be able to buy the RSGB's Callseeker 2006 product containing a searchable database of callsigns, the entire RSGB Yearbook in electronic format and masses of free software – all for less than the print version of the Yearbook. There will also be many other RSGB publications available to buy. Stocks are limited so don't forget to visit the stand early on in the event to guarantee yourself a copy of the Yearbook or the Callseeker CD.

TICKET PRICES

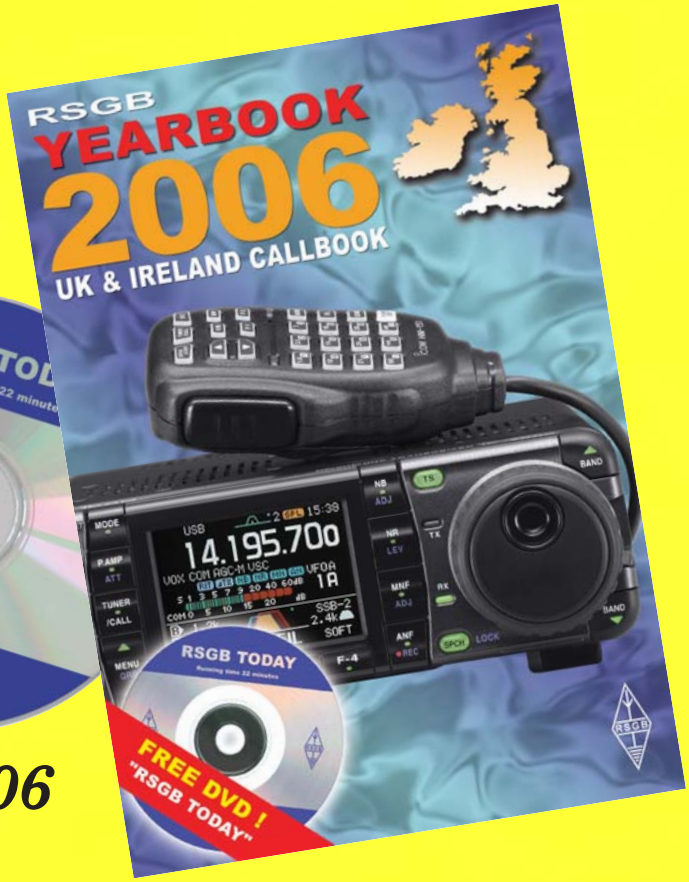
If you haven't already got a ticket for the Leicester Amateur Radio Show, don't fret as you can usually pay at the gate on the day. Prices are reasonable. A one day ticket costs £3.50 (£3.00 for old age pensioners and under-16s) while £6 (£5 concession) gets you two days at the event. If you are going with a group of friends or with your amateur radio club, you can get the tickets even cheaper – £2.50 for one day and £4.00 for two days for each member of a group of at least 12. Under-12s get in free both days, so there is no excuse for not taking your kids to the most important event on the amateur radio calendar.

Disabled visitors are reasonably well catered for at the show. Both the Donington Park International Exhibition Centre and the Motor Museum are all on one level, so are easily accessible by wheelchair users. There are also disabled toilets available throughout the site and a dedicated disabled parking area outside the front entrances to the exhibition hall and the convention hall. Disabled people also benefit from a concessionary rate. This rate also applies to a disabled person's helper.

ACCOMMODATION AND ATTRACTIONS

It has become a tradition for some amateurs to turn the show into an opportunity for a full-blown holiday. There are plenty of interesting places to visit in Leicester (see below) and accommodation can be obtained at reasonable prices. For those on a budget, the cheapest option is to take advantage of the show's on-site camping and caravanning facilities. These are available for free from Thursday to Sunday on the week of the show. However, visitors are warned that space for tents and caravans is limited this year because much of the camping area from previous years is now used for car storage. Another option is

Includes FREE DVD: 'RSGB Today'



ONLY £16.14

RSGB Yearbook 2006

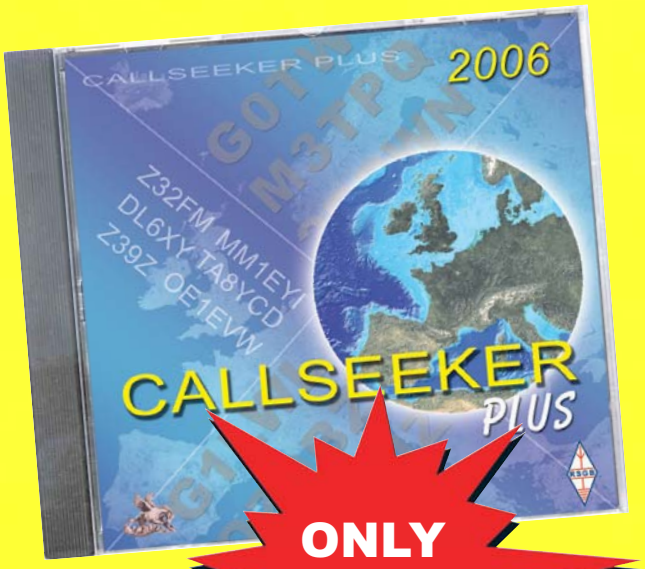
Edited by Steve White, G3ZVW

The RSGB Yearbook is the essential publication for all UK radio amateurs. Not only does it contain the only truly up-to-date database of callsigns, names and addresses in the Callsign Directory, it also contains over 192 pages of information about the Society, clubs, licensing and operating. This year's edition is bigger than ever with over 500 pages of fully updated and revised information. The 2006 Yearbook contains much new material including features on Summits on the Air and International Museums Weekend. Also a huge new section "Featured Clubs" has been added which contains 55 mini features devoted to a local clubs across the country from Scotland to Cornwall.

FREE DVD

For the first time included in the 2006 Yearbook is a free DVD. It contains the movie 'RSGB Today', which has been professionally produced for the Society. In 'RSGB Today' you will meet the people behind RadCom, and the other departments at RSGB HQ. You'll see an M3 licence course in Cheshire and the Annual General Meeting. But there's more than just the movie on the DVD. We were unable everyone's input onto the clubs section mentioned above so we have included all the information supplied to us on the DVD that we received from clubs. There is even more on the DVD with a wide selection of amateur radio software.

© Radio Society of Great Britain, Size: 297 x 210mm, 504 pages ISBN 1-905086-07-5
Non members Price £18.99 plus p&p



ONLY £12.74

Callseeker Plus 2006

Callseeker 2006 is the CD-ROM version of the RSGB Yearbook, but with a lot more besides!
Callseeker uses the highly popular Eurocall interface that is so flexible and easy to use when searching for calls. As well as the most up-to-date listings of United Kingdom and Republic of Ireland amateurs' callsigns, you will also find the callbooks of 18 more European countries: 9A, DL, EA, ES, F, HA, HB9, I, LX, LY, OE, OH, ON, OZ, SM, SP, SV and Z3 across the UK and Europe. You can search by call, name or address and get virtually instant answers to your query, with printing labels for your QSL cards just a step away. Callseeker requires no hard disc installation and runs direct from the CD with no fuss. The 192 pages of the RSGB Yearbook information is supplied in PDF format which means that searches and finding information is easily accomplished. The latest version of Acrobat is supplied along with a wide range of amateur radio software.
Non Members Price £14.99 plus p&p

RSGB SHOP

RSGB
Lambda House
Cranborne Road
Potters Bar
Herts. EN6 3JE
Tel. 0870 904 7373
Fax. 0870 904 7374

ORDER 24 HOURS A DAY ON OUR WEBSITE
www.rsgb.org/shop

The Story of Enigma CD
Interested in Enigma machines? This CD contains over 1400 photographs, Schematics, several Enigma Books, two Enigma Simulator Programs and even a guide to how to build your own simple cipher machine.
£9.34 members
£10.99 non members

Summer 2005 Pegasus Flying Horse Call Book
Using the very latest Europe and US call data, makes this the most up-to-date and very best World Call CD available. In co-operation with the RSGB you also get the latest UK call information on this CD alongside the World Call data.
£33.99 members
£39.99 non members

The Amateur Radio Operating Manual
The RSGB Amateur Radio Operating Manual is a valuable addition to your bookshelf and the must have book for everyone interested in amateur radio.
£16.99 members
£19.99 non members

Technical Topics Scrapbook 2000-2004
This book includes all the words, pictures and line drawings from the most popular column in RadCom.
£12.74 members
£14.99 non members

The DXCC Countries List (ARRL)
The official source of DXCC information! Record the DXCC Entities you've worked and QSLed! This new edition includes a complete listing of DX Century Club rules including the latest changes and clarifications.
£3.39 members
£3.99 non members

All prices plus p&p

E&OE

to use the caravan and camping facilities at nearby Donington Park Farm. There are 65 pitches available on this eight acre site, 40 of which have hook-up. For prices and booking, telephone 01332 862409.

For those who want a little more luxury, there are numerous local hotels (see accompanying box). The show's organisers have done a deal with a hotel reservation company – First Option – to obtain competitive rates for show-goers. Visit www.first-option.co.uk/event/lars/ for details or to book. Once you have sorted out your accommodation, you will probably be looking for local attractions to visit. Visitors will be thrilled to read that there is no shortage of interesting places to visit within easy travelling distance of Donington Park.

THE MOTOR MUSEUM, DONINGTON PARK

You don't even have to leave the show site to visit this attraction as the Motor Museum is based at Donington Park. Better still, show-goers benefit from a special discount admission of £5 on production of their show ticket. The museum provides the world's largest collection of Grand Prix racing cars. There are five halls containing more than 130 exhibits depicting motor sport from the turn of the last century to the present. Highlights of the museum include the most extensive collection of McLaren racing cars on the planet plus former F1 world champion Nigel Mansell's Williams and Brazilian racing legend Ayrton Senna's McLaren. There are also cars from famous marques such as BRM, Lotus and Vanwall and cars driven by racers such as Moss, Nuvolari, Clark and Prost.

THE NATIONAL SPACE CENTRE

Leicester
Tel: 0116 261 0261
A great day out for all the family, the National Space Centre is the UK's largest attraction dedicated to space. From the minute you catch sight of the futuristic 42m Rocket Tower, you'll be treated to hours of breath-taking discovery and interactive fun.

JOHN TAYLOR BELL FOUNDRY MUSEUM

Freehold Street, Loughborough
Tel: 01509 233414
This bell foundry is still in operation and there is a museum and a gift shop.

CAULKE ABBEY

Ticknall, Derbyshire
Tel: 01332 863822
Located ten miles south of Derby on the A514, this National Trust site contains a stately home where time has stood still since 1924, a historic church, orangery, ice house, pheasant aviaries, gardens and 600 acres of parkland. There is a restaurant on site.

HEART OF THE NATIONAL FOREST VISITOR CENTRE

Tel: 01283 216633
A few miles north west of Leicester lies the pristine verdure of the National Forest. At the visitor centre, you will be able to stroll around some of the forest's parkland, visit a range of attractions including the Forest Experience, a garden centre and a lakeside restaurant. The visitor centre also takes in the Once a Tree gift shop selling a variety of timber gifts.

MOIRA FURNACE

Moira, near Ashby-de-la-Zouch
Tel: 01283 224667
Impressive early-19th century blast furnace – one of the best preserved in Europe. Visitors can also enjoy woodland walks, a children's playground and Ashby Canal undergoing restoration.

SUDBURY HALL

Sudbury
Tel: 01283 585305
Another fantastic National Trust property. Located on the A50, this attraction includes the National Trust Museum of Childhood, Queen Adelaide's bedroom, the Long Gallery (as used in the BBC's costume drama Pride & Prejudice) formal gardens and a gift shop.

TWYCROSS ZOO

Twycross, North Leicestershire
Tel: 01827 880250/880440
Close to J11 of M42 on the A444, this zoo is particularly famous for its primates including the Brooke Bond chimps and has all the other attractions of a zoo such as baby elephants. There is also a restaurant, and picnic areas.

FERRERS CRAFT CENTRE

Tel: 01332 865 408
Visitors to this attraction are treated to an impressive collection of contemporary furniture and ceramics. The centre also includes a copper smithy and forge, picture framing and sign studio, aromatherapy studio and textiles, china restoration, stone carving, silver and porcelain jewellery areas.

SNIBSTON DISCOVERY PARK

Ashby Road, Coalville
Tel: 01530 813608
Science discovery park, museum and tourist information. Restaurant.

Other places that might be worth a visit include Kedleston Hall (boasting a fiendish maze), Elvaston Castle & Country Park, Staunton Harold Church, Staunton Harold Reservoir, Mount St Bernards Abbey and the Royal Crown Derby Visitor Centre.

For a full list of local attractions and advice on getting to them, visit a local tourist information centre (see accompanying box).

But for most visitors to the show, the main attraction will be the huge range of ingenious amateur radio equipment for sale. Just remember, as much as you would love to own that top-of-the-range transceiver, the kids still need to be fed and the bills to be paid. Then again, there's always the credit card! Happy shopping. ♦

Tourist information

Tourist information centres can be found in the following locations:

Derby
Assembly Rooms, Market Place
TeL: 01332 255802

Nottingham
County Hall, Loughborough Road
Tel: 0115 977 3558

Ashby-de-la-Zouch,
Tel: 01530 411767

Coalville
Snibston Discovery Park, Ashby Road,
Tel: 01530 813608

Loughborough
John Storer House, Wards End

Hotels

The Paddock Hotel
Tel: 01332 862566
All rooms en-suite with TV, evening meals, English breakfast, licensed bar. Located two miles from East Midlands International Airport - on the outskirts of Melbourne Village

Hilton National
Tel: 01509 674000
En-suite bedrooms and suites. Full leisure facilities. Located at Junction 24, M1.

The Priest House
Tel: 01332 810649
En-suite bedrooms and suites. Located two miles from the circuit.

Yew Tree Lodge
Tel: 01509 672518
En-suite bedrooms. Located Junction 24, M1.

Novotel
Tel: 01159 465111
En-suite bedrooms. Located Junction 25, M1.

Forte Posthouse
Tel: 01159 397800
En-suite bedrooms. Located Junction 25, M1.

The Kegworth Hotel
Tel: 01509 672427
En-suite bedrooms. Located Junction 24, M1.

Melbourne View Hotel
Tel/Fax: 01332 865353
10 en-suite bedrooms. Located half a mile from circuit.

Donington Park Farmhouse Hotel
Tel: 01332 862409
11 en-suite bedrooms. Located adjacent to competitors' entrance.

For a full list of hotels, visit the hotel and accommodation section of the Leicester ARS's website – www.lars.org.uk

ML&S martin lynch & sons
Suppliers of Communications Equipment

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS

TEL: 0845 2300 599 FAX: 0845 2300 339

E-MAIL: sales@hamradio.co.uk WEB: www.hamradio.co.uk

LAST MONTH FOR FREE CDXC MEMBERSHIP FOR ALL NEW YAESU HF PURCHASES

Buy any new Yaesu HF Radio from ML&S this month and receive FREE subscription to the world famous CDXC - Chiltern DX Club.

CDXC
CHILTERN DX CLUB
The UK DX Foundation

CDXC - The world famous Chiltern DX Club.

The aim of the club is to promote HF operating in Amateur Radio and to encourage excellence, particularly in DXing and contest operating. CDXC approach this through mutual assistance, by the support of DXpeditions, by the issuing of achievement awards and by whatever other means are deemed to be appropriate.*

* This is only for UK customers who are not already a CDXC member.

FT-817ND

The smallest All Band Portable available today.

The latest FT-817ND comes complete with HF+6+2+70 and Metal-hydride batteries, charger, mic & antenna.

Call for Best price
(FT-817ND-DSP Version available)

FT-857 + ATAS-120

Nobody can match the flexibility of the FT-857 & ATAS-120 Auto Antenna. Just plug the ATAS into the FT-857 & operate anywhere from 7MHz-432MHz, without having to change or touch the antenna! (Duplexer is required for 2/70).

We can even offer a professional car install service.
Still only £799 for both.
(Rig only £579)

FT-897 + FNB-78 & CD-24 Package

High Power version of the FT-817. 20W output as a transportable, 100W as a base/mobile. This month we are offering the full transportable set-up including the internal battery & charger.

Total package £779. Don't forget the Miracle Antenna!
(Rig Only £649)

FT-847 + MFJ-993 & MP-250A

Still our best selling All Band Base Transceiver. Bundled with the MFJ-993 Auto Tuner (that tunes practically anything) & the excellent MyDEL MP-250 PSU.

Total Package £1299
(Rig only £999)

FT-1000 MkV Field + MD-100 & SP-8

The FT-1k Series has never been such good value.

Offered with the matching Desk filtered Speaker and Base Microphone at an even bigger saving.

Package Price £1859
(Rig only £1699)

FT-1000MP mkV 200W + MD-100 & SP-8

Identical to the FT-1kField but 200 Watts and external PSU. With Desk Mic & Speaker.

FREE Yaesu FH-1 Keypad for all orders placed in September!

Package Price £2249
(Rig only £2099)

FT-DX9000

Hopefully by the time you read this we should be taking deliveries of the first few FT DX9000's. 200 Watts or 400 Watts, TFT Screen or not. You choose. Call now to request a brochure.

Price - TBA

STOP PRESS!

New! FT-2000

A New 100W HF & 6M Base Transceiver.
Available June 2006.
Price TBA.
Check out the news page on our website for up-to-date information.

See us at the Leicester Show

LOG ON NOW
www.hamradio.co.uk
& much more on show at the store

Call us 6 days a week, mon-sat 9.30-5.30
0845 2300 599
local call number

DID YOU KNOW?

You can buy any Yaesu HF Product over £250 from ML&S and not pay a penny for a whole TWELVE MONTHS?

No Catch - pay NOTHING, keep the money in your bank earning interest. In 12 months time settle the amount in full. See main adverts for details, Offer subject to status.

ML&S martin lynch & sons

Suppliers of Communications Equipment

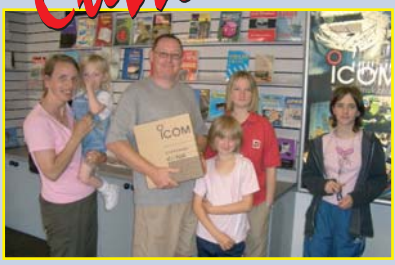
Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS

TEL: 0845 2300 599 FAX: 0845 2300 339

E-MAIL: sales@hamradio.co.uk

WEB: www.hamradio.co.uk

Customer Profile



This family called in yesterday. The "Evans" family headed by Nigel M0NDE, together with his wife baby Colette, Michele M3WAH, Daughters Samantha M3IWX and Anne Marie M3DYP, not forgetting baby Colette & daughter Natalie.

They shopped at ML&S because they liked the free parking right outside the store, the air conditioned showrooms, the competitive prices and friendly welcome. It was worth the 150 mile round trip!

Plus

Congratulations to The Couldson Amateur Transmitting Society on 30 years of club existence. Listen out for their on-air celebration day on Sunday the 9th of October on 20M, callsign G4FUR, using the Arno Eh 20m antenna.

DID YOU KNOW?

You can buy any product over £250 from ML&S and not pay a penny for a whole TWELVE MONTHS?

No Catch - pay NOTHING, keep the money in your bank earning interest. In 12 months time settle the amount in full.

Offer subject to status.

Take Away Now and Pay NOTHING Until This Time Next Year!!

Having many years of experience offering specific finance packages for our customers, we can now offer various options on payment. We have added "Take-Away Now & Pay Later" to all our products over £199. It works like this: 0% APR An example of our Take-Away Now: Discounted price of £300. Pay no interest provided you pay by the date the amount is due, in full. After the 12 months period has expired pay £15.76 for 36 months. TAP £567.43 Please note that interest is calculated from the date of the original agreement. 29.8% APR.

Our Best Sellers!

PLEASE SEE THE PREVIOUS PAGE FOR ML&S SPECIAL PACKAGE DEALS ON YAESU HF PRODUCTS

NEW Yaesu FT-60E
Latest Twin Band 5W Handie from Yaesu. **Only £169**
Or buy the FT-60E with a lapel speaker microphone for only **£189.95!**

Yaesu VX-7R
The U.K's best selling Triple Band Handie. **Only £269**
or with lapel microphone: Only £289

Yaesu VX-150
Built on the commercial VX-400, simple to use rugged 2m Handie, supplied with Nicads & Charger.
RRP: £149, ML&S: £99.95 or 'Twin Pack' only £199

Yaesu FT-7800
Bar make the tea it'll give you 2m/70cm @ 50W/40W.
RRP: £239, ML&S: £239

Yaesu FT-8800
Similar to the FT-7800 but can receive on 2 & 70 simultaneously.
RRP: £289, or 48 x £8.26 p/m

Yaesu FT-2800M
2M brick-built 65W rig.
RRP: £179, ML&S: £159

Yaesu VX-2E
Micro Handie 2/70 with scanner. Complete with Li-ion battery, charger & antenna.
NEW LOWER PRICE
Now only £119

Yaesu FT-8900
with FREE YSK-8900 Remote Kit! One-stop solution to high-power FM on 10m, 6m, 2m &

70cm. When your local repeater is busy, slip onto 10m & work DX!
Only £339

Kenwood TS-2000E
Just superb on all bands 160m-2m with optional 23cm (X-Version).
RRP: £1699, ML&S: £1299

Kenwood TS-2000X
As above but with 23cm fitted.
RRP: £1999, ML&S: £1699

Kenwood TS-480SAT with FREE HEIL MIC! The best selling Kenwood H.F. Can be used mobile or base. Includes ATU.
ML&S: £699.95

Kenwood TS-480HX with FREE HEIL MIC! As TS-480SAT but 200 Watts, no ATU.

ML&S: £799.95

Kenwood TS-570DGE
Still the ideal choice if you are keen on H.F. and want an easy to use radio.
RRP: £999, ML&S: £799 or 48 x £23.64 p/m

Kenwood TMD-700E
The unique 700E is not only a dual-band FM rig but has APRS and TNC built-in.
RRP: £519, ML&S: £439 or 48 x £12.99 p/m

Kenwood TH-F7E
2/70 Handie with Gen Cov RX. If you must have SSB RX on your dual-bander then buy one!

RRP: £289.95, ML&S: £249

Kenwood TH-D7E
A 2/7- Handie with TNC and APRS capability. **RRP: £359, ML&S: £299 or 48 x £8.85 p/m**

Kenwood TS-50S
It's been around 10 years but if you want an HF rig in a compact package with excellent performance then buy one of these. As used by the recent DX-pedition FT5XO to Kerguelen Island. **Only £595**

NEW Icom IC-756Pro mkIII

The latest in the IC-756Pro Series
RRP £2495 ML&S £2099 or 36 x £76.31
Package deal: IC-756ProIII, SM20 Microphone, SP-23 New Base Speaker with filters.
RRP £2768, ML&S £2299
(Rig only: £2099)

Icom IC-7800

The worlds best H.F. Transceiver? Probably.
RRP: £6400.00

Icom IC-7400 + SM-20 + SP-21 + MP-250A
What a package!
New IC-7400 with Matching Desk Mic, Speaker & MyDEL Metered Base PSU.
Only £1349

Icom IC-7000
The replacement for the IC-706 will be arriving with us shortly.
HF/VHF/UHF All-mode Transceiver
IF-DSP technology comes to a new multi-bander.

Icom IC-703

10W Portable/Base HF Transceiver with built-in ATU.
RRP: £703, ML&S: £449

Icom IC-718

Basic ready to go 100W HF Transceiver supplied with Microphone & DC Lead.
RRP: £649, ML&S: £449 or 48 x £13.29 p/m

Icom IC-910X
The best 2/70 & 23cm dedicated all mode base. 23cm included.
RRP: £1675, ML&S: £1239

or 48 x £36.66 p/m
Basic Version (without 23cm). also available **£1089 or 48 x £31.93 p/m**

Icom IC-E208
2/70 mobile 50/55W Transceiver with host of additional features. Remote head leads included.
RRP: £365, ML&S: £239

Brand New IC-E90
Triple Band Handie.
Only £199.95!
(Limited Stocks)

See us at the Leicester Show

LOG ON NOW

www.hamradio.co.uk

ML&S for Ham Radio Top Sellers, Antennas & Accessories - much more on show at the store

Call us 6 days a week, mon-sat 9.30-5.30

0845 2300 599

local call number

"Classic" Finance example: Kenwood TMD-700E. RRP: £519. Payment illustration: Zero deposit and 48 payments of £12.99 per month. Total amount payable: £623.52. APR: 19.9%. ML&S is a licenced credit broker. Finance offered subject to status. Full written details on request. E&OE.

Apply now for your very own ML&S Store Card Conditions Apply

Don't forget! ML&S are approved stockists for the following: AOR, bhi Ltd., Icom, Kenwood, Maldol, MI

Accessories

At last Digital SSB audio has arrived.
(At a sensible price too!)

ARDX9000

Hearing is Believing!

SSB has been around since the fifties. Imagine super low noise-free communication using your existing transceiver on SSB. Just plug-in and go!

Until the "big three" finally install digital voice in their products (its only a matter of time) you can use the system right now. See web for details and ordering info.

- NO transceiver modifications necessary
- Digital voice communications using existing analog transceivers
- Amazing Audio Quality
- Works on Single Side Band (SSB) mode
- Automatic digital receive
- Optional interface cables for most popular transceivers
- Built-in high grade Vocoder (AMBE)
- Built-in FEC error correction
- Compact unit. Easy to operate.
- Utilizes a uniquely designed high performance DSP engine
- Uses the established G4GUO open protocol

AOR ARD9000
Digital Voice Modem
Only £169 incl VAT. P&P £10

Back in Stock

Tom Tom Back in stock at ML&S
Why bother with any other GPS when you can have the easiest and best on the market?

Tom Tom GO 300
The latest GPS, UK maps, car window mount & car charger included. Ready to GO! **£369.99**

Tom Tom GO 500
Identical to 300 plus Hands Free Calling Via BlueTooth & major mapping of Europe. **£469.99**

Tom Tom GO 700
As 500 above plus door to door planning in Europe plus remote control. The ultimate! **£549.99**

ML&S can also program your Tom Tom with the latest Gatso database for only £20.

REMEMBER ALL TOM TOM GO's are available on our Buy Now Pay Later Scheme.

For further details see our website.

TIGERTRONICS

Tigertronics Sound Card - Radio Interface

For all available Digital modes, the SignaLink SL-1+ also supports the latest Voice modes such as Internet Repeater Linking (EchoLink, VOIP, etc.), Remote Base, and Voice Keyer operation. We sell four versions of the enhanced model the SL-1+8R with 8-pin round mic. connector, the SL-1+RJ45 with RJ-45 mic. connector, the SL-1+RJ11 with RJ-11 mic. connector and the SL-1+6PMD with 6-pin mini Din Data Port connector SL-1+8xxx Interface with rig lead (you specify! **£69.95**

Extra leads
£14.95
(8-Pin, RJ-45, RJ-11, 6-pin mini DIN)
£19.95
(SL-CAB-13I 13-Pin Icom), (SL-CAB-13K 13 Pin Kenwood)

DAIWA METERS

Daiwa CN-101L: SWR/PWR Meter 1.8-150Mhz
Power range: 15/150/1.5kW ..... **ML&S only £59.95**

Daiwa CN-103LN: SWR/PWR Meter 140-525MHz
Power range: 20/200W ..... **ML&S only £65.95**

Daiwa CN-801H: SWR/PWR Meter 1.8-200Mhz
Power range: 20/200/2000W ..... **ML&S only £109.95**

Daiwa CN-801:V SWR/PWR Meter 140-525MHz
Power range: 20/200W ..... **ML&S only £119.95**

Daiwa CN-801S SWR/Power Meter 0.9-2.5Ghz
Power rating: 2/20 watts ..... **ML&S only £139.95**

MIRACLE ANTENNAS

Miracle Whip Others try & copy it but never quite get there. £119.95

Miracle Ducker Like the Miracle Whip but has BNC socket in lieu of whip to connect random wire. £119.95

Miracle Ducker IL Latest model! Identical to Ducker but has BNC plug for mounting instead of PL-259. £119.95

QPAK The best QRP ATU money can buy. £149.95

HUSTLER 6-BTV Only £229.95

We have literally sold hundreds of these with fantastic customer reports. At last a vertical that gives you REAL PERFORMANCE on 80m and 40m, as well as the other bands. No radials required. Just mount 18 inches above the ground, connect to a decent earth spike close by and operate.

MyDEL MultiTrap
Forget the G5RV. Install a proper TRAPPED wire dipole MutiTrap for 80-10M. Only 66'. Must be centre supported. **£99.95**

MyDEL MegaTrap
Same as Multitrap but 160m/80/40m, 105' long . **£109.95**

SMALL GARDEN? NO GARDEN?
Install an EH Antenna for HF today.

Introducing a new range of antennas from Arno Electronics. Available for any band 10m-160m, ML&S stock this exciting new product available for immediate despatch.

All antennas are beautifully built and pre-tuned at the factory. Supplied with fixing clamps & clear installation instructions. Easily fine tuned with outer ring sleeve. You will be totally amazed at how well they work. No ATU required. Just plug-in and work!

Cobra 10	28-29.8MHz,	2kW	90cm long	(500W RTTY/AM)	**£105.00**
Cobra 12	24.890-24.990	2kW	90cm Long	(500W RTTY/CW)	**£105.00**
Cobra 15	20.7-21.7MHz	2kW	90cm long	(500W RTTY/AM)	**£105.00**
Cobra 17	18.068-18.168MHz	2kW	90cm long	(500W RTTY/CW)	**£105.00**
Cobra 20	13.8-14.8MHz	2kW	90cm long	(500W RTTY/AM)	**£105.00**
Cobra 30	9.9-10.3MHz	2kW	93cm long	(500W RTTY/AM)	**£105.00**
Cobra 40	7-7.2MHz	2kW	93cm long	(500W RTTY/AM)	**£105.00**
Venus 80	3.5-3.8MHz	2kW	248cm long	(500W RTTY/AM)	**£179.00**
Venus 155	1.913-1.933MHz	2kW	248cm long	(500W RTTY/AM)	**£179.00**
Venus 160	1.830-1.850MHz	2kW	248cm long	(500W RTTY/AM)	**£179.00**

Delivery and Insurance: Cobra £20, Venus £25. (England & Wales, phone for other destinations)

MYDEL POWER SUPPLIES

A new rage of PSU's from MyDEL. The neatest smartest looking desk top power supplies that money can buy. Ideal for powering any main rig or accessory requiring 13.8V DC at up to 25 Amps.

MyDEL MP-250A

25 Amps maximum, 22Amps constant, ideal for most modern HF Transceivers

- Variable Voltage 9-13.8VDC
- 110-234V input
- 2 x outputs: 25A Binding Posts, 7A Cigar Socket
- Fan cooled, speed variable to voltage supplied
- Two huge back-lit meters, Volts/Amps
- Fully protected, supply shut off if more than 25A is drawn, re-setable by switching off for 25 seconds.
- Only 5 3/4"W x 4 1/2" H x 6" D in size
- Less than 35mV peak-to-peak ripple under full 25AMP load
- Full exchange warranty for 2 Years

MyDEL MP-4128

Another new switch mode PSU from MyDEL. Similar in spec to the MP-250A but without meters or cigar lighter o/p. 22-25 AMP output with heavy duty binding posts on the front panel and push on terminals for lower current output on rear. Fully protected. **£69.99**

Yaesu FP-1030A

A power supply for Life? Probably.
25-30 Amp **£179.00**

BUDDIPOLE

W3-BP Buddipole Compact Portable Dipole 40m-2M **£179.95**
W3-BM Buddipole Mast for Buddipole **£44.95**
W3-BPT Tripod for Buddipole **£79.95**

For the full range, please see our website.

PALM KEYS

MP-817 The smallest retractable paddle key - ever! **£59.95**
Code Cube Bolt-on memory keyer for Mini-paddle. **£79.95**

SBS-1 Real-time Virtual Radar

Key Product Features
- Track Mode-S/ADS-B equipped aircraft in real time*
- An invaluable tool for aircraft enthusiasts
- Enhances operational efficiency at airfields
- Easy to install, portable and lightweight
- Real-Time aircraft position and identity data
- Connect to laptop/desktop PC via USB
- Powerful SBS-1 Basestation software included
- Package includes all necessary components to connect to your PC

£499.95 plus £10 P&P

FJ, Miracle Antenna, Hustler, Tokyo-Hypower, Tom Tom, Diamond, Yaesu and many more!

martin lynch & sons
Suppliers of Communications Equipment

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS

TEL: 0845 2300 599 FAX: 0845 2300 339

E-MAIL: sales@hamradio.co.uk WEB: www.hamradio.co.uk

Power Amplifiers from Tokyo-HyPower as reviewed by Peter Hart

NEW! HL-100BDX Latest HF & 6M all-mode amplifier. 5-10W i/p, upto 100W o/p. Ideal for FT-817 & IC-703 .....**SUPER LOW PRICE! £429.95**

HL-1Kfx A sturdy 240 volt powered 500W linear amplifier all mode with protection against over-drive, over heat, high drain voltage, and faulty band setting. ALC out. Remote TX control, all for a very attractive price. **Only £1399.95**

NEW! HL-2KFX Latest HF+6M 1kW version (650W on 6M) of the HL-1K. Full QSK & built-in PSU. **£2599.95**

New models arriving soon, including 2.5kW HF & 1kW auto-tuner for Yaesu, Icom & Kenwood.

MFJ Products at Lower Prices!

MFJ-902 Tiny Travel Tuner.
Tiny 4½ x 2¼ x 3 inch tuner handles full 150 Watts! Covers 80-10 Meters, has tuner bypass switch, tunes nearly anything! **£65.95**

MFJ-904H Tiny Travel Tuner/ SWR/Wattmeter & Balun.
Tiny 7½ x 2¼ x 3 inch tuner handles full 150 Watts! Covers 80-10 Meters, has tuner bypass switch, tunes nearly anything! **£109.95**

MFJ-949E 300 Watt Antenna Tuner. More Hams use MFJ-949's than any other antenna tuner in the world! Why? Because the world's leading antenna tuner has earned a worldwide reputation for being able to match just about anything. **£139.95**

MFJ-974H 160 Thru 6 Meters Balanced Line Antenna Tuner.
The MFJ-974H is a fully balanced true balanced line antenna tuner. It gives you superb current balance throughout its very wide matching and frequency range. **£159.95**

MFJ-993 300 Watt IntelliTuner Automatic Antenna Tuner.
The MFJ-993 IntelliTuner lets you tune any antenna automatically balanced or unbalanced - ultra fast. It's a comprehensive automatic antenna tuning center complete with SWR/Watt-meter, antenna switch for two antennas and 4:1 current balun for balanced lines. **£209.95**

MFJ-969 Roller Inductor Antenna Tuner.
The MFJ-969 Antenna Tuner gives you MFJ's superb AirCore Roller Inductor and full 6 meteres through 160 Meter coverage! 300 Watts PEP SSB full featured antenna tuner, widest matching range, full size lighted Cross-Needle SWR/Wattmeter reads true peak forward power, QRM-Free PreTune, 8 Position antenna switch, built in 50 Ohm dummy load, heavy duty 4:1 balun. **£169.95**

MFJ-259Z Special * With Batteries, Charger & Loop *
Range: 1.8-170MHz. MFJ's favourite Antenna Analyser with HF frequency coverage. It's simple to operate and keeps your antennas in check. MFJ-259B gives you a complete pictures of your antenna's performance. You can read antenna SWR and Complex Impedance 1.8 to 170MHz. **£199.95**

MFJ-269
Range: 1.8-450MHz. MFJ's latest Antenna Analyser with UHF frequency coverage. Based on the successful MFJ-259B it combines all of the features plus more. **£269.95**

If you see it advertised cheaper in this magazine (or on the web) from a UK stockist we will try and BEAT it!

Don't forget! ML&S now stock one of the largest displays of MFJ in the country!

NCS Multi Switcher

New Low Price! £239.95

The NCS Multi-Switcher is a "mini-console" that lets you switch all operator equipment (microphone, headset, keyer, foot-switch, etc) to any of four radios at the push of a button. You can switch between a headset, desk or hand mic, TNC, Phone Patch, Sound Card, etc. The Multi-Switcher matches the impedance, audio level and pin-out of nearly any microphone to virtually any radio including vintage rigs. The Multi-Switcher also switches your foot- or hand-switch and CW keyer to the selected radio.

Connecting cable for any Yaesu, Icom or Kenwood Radio £19.95 each
For more details and the complete range of NCS products see our web site.

NEW!
GDX-50 Wide-Band Discone TX/RX Antenna

RX: 50MHz - 1500MHz
TX: 6/2/70
POWER: 50W
LENGTH: 1360mm
WEIGHT: 910g

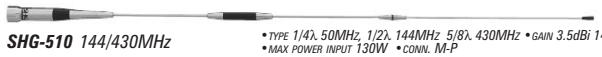
DIAMETER: 530mm
SUITABLE MAST: 60mm
Only £69.95

For the complete range of antennas & mounts call for the 2005 catalogue or see our website

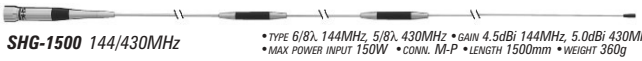
Maldol

Super High Gain Range

SHG-900 144/430MHz — •TYPE 1/2λ, 144MHz, 5/8λ, 430MHz •GAIN 2.15dBi 144MHz 5.5dBi 430MHz •MAX POWER INPUT 130W •CONN. M-P •LENGTH 960mm •WEIGHT 265g — **£27.95**



SHG-510 144/430MHz — •TYPE 1/4λ, 50MHz, 1/2λ, 144MHz 5/8λ, 430MHz •GAIN 3.5dBi 144MHz, 6.0dBi 430MHz, •MAX POWER INPUT 130W •CONN. M-P — **£39.95**



SHG-1500 144/430MHz — •TYPE 6/8λ, 144MHz, 5/8λ, 430MHz •GAIN 4.5dBi 144MHz, 5.0dBi 430MHz, •MAX POWER INPUT 150W •CONN. M-P •LENGTH 1500mm •WEIGHT 360g — **£39.95**

THE BIG ONE!
SHG-2100 144/430MHz — •TYPE 5/8λ, 144MHz, 5/8λ, 430MHz •GAIN 6.0dBi 144MHz, 8.5dBi 430MHz, •MAX POWER INPUT 150W •CONN. M-P •LENGTH 2120mm •WEIGHT 650g — **£69.95**

HMC Range

HMC-6S 7/21/28/50/144/430MHz — •TYPE 1/4λ, 7/21/28/50MHz, 1/2λ, 144MHz, 5/8λ, 430MHz •GAIN 3.5dBi 144MHz, 6.0dBi 430MHz, •MAX POWER INPUT 120W 7/21/28, 150W 50/144/430MHz •CONN. M-P •LENGTH 1800mm •WEIGHT 800g — **£79.95**

HMC-10 & HMC-14 10m & 20m add-ons for the HMC-6 — **£22.95 each**

HFC Range

NEW! HFC-217 7/21MHz. Max power input 120W. Length: 1300mm. Weight: 450g — **£44.96**

HFC-80L 3.5MHz — •TYPE 1/4λ. •MAX POWER INPUT 120W SSB •CONN. M-P •LENGTH 2110mm •WEIGHT 530g — **£44.95**

HFC-80 3.5MHz — •TYPE 1/4λ. •MAX POWER INPUT 120W SSB •CONN. M-P •LENGTH 1540mm •WEIGHT 360g — **£38.95**

HFC-40L 7MHz — •TYPE 1/4λ. •MAX POWER INPUT 200W SSB •CONN. M-P •LENGTH 1870mm •WEIGHT 330g — **£34.95**

HFC-40 7MHz — •TYPE 1/4λ. •MAX POWER INPUT 120W SSB •CONN. M-P •LENGTH 1310mm •WEIGHT 210g — **£29.95**

HFC-20L 7MHz — •TYPE 1/4λ. •MAX POWER INPUT 250W SSB •CONN. M-P •LENGTH 1515mm •WEIGHT 275g — **£34.95**

HFC-20 14MHz — •TYPE 1/4λ. •MAX POWER INPUT 120W SSB •CONN. M-P •LENGTH 1010mm •WEIGHT 190g — **£29.95**

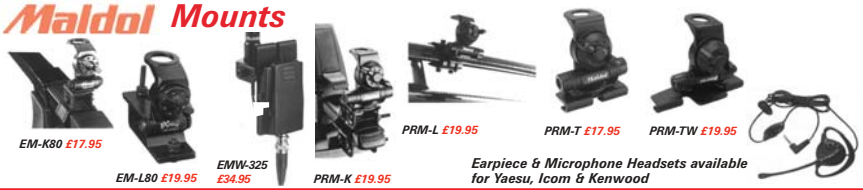
HFC-15L 21MHz — •TYPE 1/4λ. •MAX POWER INPUT 250W SSB •CONN. M-P •LENGTH 1515mm •WEIGHT 250g — **£34.95**

HFC-15 21MHz — •TYPE 1/4λ. •MAX POWER INPUT 120W SSB •CONN. M-P •LENGTH 1010mm •WEIGHT 190g — **£29.95**

HFC-10L 28MHz — •TYPE 1/4λ. •MAX POWER INPUT 250W SSB •CONN. M-P •LENGTH 1515mm •WEIGHT 245g — **£34.95**

HFC-10 28MHz — •TYPE 1/4λ. •MAX POWER INPUT 120W SSB •CONN. M-P •LENGTH 1010mm •WEIGHT 190g — **£29.95**

Maldol Mounts



EM-K80 £17.95 — EM-L80 £19.95 — EMW-325 £34.95 — PRM-K £19.95 — PRM-L £19.95 — PRM-T £17.95 — PRM-TW £19.95

Earpiece & Microphone Headsets available for Yaesu, Icom & Kenwood

Only £199.95

Maldol HVU-8

The Maldol HVU-8 is a unique and ultra-compact HF, VHF, and UHF antenna developed for confined and restricted space installations like apartments and condominiums or for temporary or portable use. Installation is easily accomplished and convenient due the HVU-8 being only the traditional height and weight of HF vertical antennas. The HVU-8 comes with mounting brackets, U-bolts, etc. for easy installation.

HVU-8 Specifications

- Frequency: 80/40/20/15/10/6/2M/70cm bands
- Type: 1/4λ (3.5/7/14/21/28/50MHz)
  1/2λ (144MHz)
  5/8λ x2 (430MHz)
- Gain: 2.15dBi 144MHz. 5.3dBi 430MHz
- 70cm: Two 5/8 waves in phase 5.5 dBi gain
- Power: 200 watts SSB on HF and 150W FM on 6M to 70 CM
- SWR: 1.5:1 at fO frequency
- Connector: UHF (SO-239)
- Mast Diameter: 1.0 - 2.36 inches (25-60 mm)
- Height: 8.5 feet (2.62 m)
- Weight: 5 Lbs. 7 ounces. (2.4 kg)

Maldol VK5-Jnr.

Compact ground plane antenna covering: 3.5/7/14/21/28mHz. It combines low-loss traps, with newly designed coil-bobbin, that can handle up to 500W on SSB. Adjustable solid radials give directional and omni-directional patterns. All traps and elements are adjustable to cover all bands and desired centre frequencies.

Only £219.95

Maldol HMC-4

Type:	Amateur HF/ VHF/UHF mobile antenna
Band(s):	10m - 1/4-wave 6m - 1/4 wave 2m - 1/2-wave 70cm - 2*5/8-wave
Gain:	10 - 0dBi 6m - 0dBi 2m - 2.15dBi 70cm - 5.5dBi
Max power:	120W (10/6 m: 80W)
Impedance:	50 ohms, M-plug/PL-259
Length:	1.19m
Weight:	390gr
Other:	Suitable for Yaesu FT-8900R.

Only £69.95

LOG ON NOW
www.hamradio.co.uk
& much more on show at the store

Call us 6 days a week, mon-sat 9.30-5.30
0845 2300 599
local call number

Visitors to this year's Leicester Amateur Radio Show will be treated to some first class British made products

Best of British

Go back several decades and Britain was admired the world over for the quality of its products and the ingenuity of its engineers and designers. In companies like Marconi, the country was leading the way in pioneering technologies such as radio and telephony. A Made in Britain stamp was a guarantee that a product would be reliable and effective.

Even when the Japanese – and later countries like Taiwan – started flooding the world market with cheaper goods, many people still opted for British made products because they knew they would not be disappointed. In recent years, alas, with competition from around the world growing ever more intense, Britain's manufacturing sector has suffered and the gloss has been taken off its reputation for producing the best products.

Nevertheless, despite the recent problems encountered by companies like Marconi, the country is still manufacturing some world class products and this is true for amateur radio as much as any other sector. Here, we take a look at some of the best British made products for amateur radio enthusiasts.

We kick off with a review – written appropriately by a quintessentially English gentleman – of a pair of masts made by British company Tennamast, before taking a look at a selection of other British amateur radio kit.

Tennamast

Review by G4CXL

For 25 years, I lived in a radio amateur's paradise: a house where a very large mast topped with a 56 element array for 2m could be concealed. This enviable state ended when the XYL, G8HCL, and I sold the house and moved to a modern post and beam house with a lot of glass. Apart from being obtrusive and provoking howls of protests from neighbours, a very large mast would have been at odds with the design of the house. Therefore, a mast had to be found that would blend in with the house and its environment. This led us, after looking at various other masts, to opt for a Tennamast.

The model chosen was the two sectioned 12m Standard Plus Mast. Without a stub mast, this product is 24ft lowered and 40ft raised. Tennamast agreed to paint the mast black to help conceal it against the house, and, in due course, it was delivered. It was wrapped up in one parcel looking rather like a large Egyptian Mummy. On removal of the packaging, the mast was found to be perfectly sound and intact, with various parts well protected by small blocks of wood that were taped and padded.

Starting at the bottom, the parts included the socket; the ground post; the mast itself, which was pre-assembled complete with the cabling and sporting guide rings to keep the feeder and rotator cable tidy; the cage, which was carefully drilled to fit various rotators; and the winch.

A metre square hole was dug in the desired location, into which the socket was concreted. Once the concrete had set, the ground post was inserted; the mast was then lifted onto the ground post, and duly wired into the winch. The winch system was new to me, as my previous mast had two winches; one for lifting or tilting the mast from the horizontal to the vertical, and the other for raising and lowering the sections. However, with Tennamast, one winch does both jobs. The simple bolt system locks the mast into position preventing it from telescoping when being lifted from the horizontal to the vertical, and, once in the vertical position, the bolt is released to extend the mast. I was surprised how easy it was for an elderly gent such as me to operate the winch.

Returning to the basic construction, the socket is a good idea, as the mast can easily be relocated by leaving the original socket behind and obtaining a new socket from the manufacturer. The ground post is a 9cm square tubular construction, as is the lower part of the mast itself. The upper part of the mast is also tubular and around and above this fits the cage, which is simply clamped on.

Having been impressed by this mast, I decided to order another one for my country cottage.

bhi

Sussex-based bhi designs and manufactures DSP noise cancellation products for amateur radio. The noise cancellation technology removes troublesome interference across all bands enabling clear speech.

New for the show is the "Noise Away" amplified DSP noise cancelling module. Housed in a small black ABS box, it has two simple pushbutton controls: Power on/off audio bypass and DSP filter on/off. It connects in-line with your radio requiring 12-15V DC 300mA.

Other bhi products at the show include:

NES10-2 MKII – Connects to the extension speaker socket of your radio. 5W input/2.5W output, with up to 35dB noise cancellation.

NEIM1031 – Noise eliminating in-line module. Fully featured desktop unit. Connects between your radio and speaker.

NEDSP1061-KBD – Noise eliminating DSP PCB module. Integrates directly into most equipment. Generic instructions plus FT817, TS50, DX-77, Icom 706 MK II G, FRG100 and DX394 available.

NEDSP1062-KBD – Amplified DSP PCB module. Retrofits into almost any loudspeaker. Generic instructions plus Kenwood SP31 and Yaesu SP8 available.

Tennamast antenna

One of SOTA's products – a portable yagi – is designed so the components can be packed into a beam just 1m long.

The NES10-2 MKII noise cancellation module from bhi

Right
Walford Electronic's single band superhet transceiver kit aimed at experienced builders

SOTA Beams

www.sotabeams.co.uk

SOTA Beams manufactures and stocks a range of products suitable for lightweight portable radio operating, notably a 2m yagi designed for hilltop portable use. It is quick to assemble and extremely light, having been designed for participants in the Summits on the Air award programme.

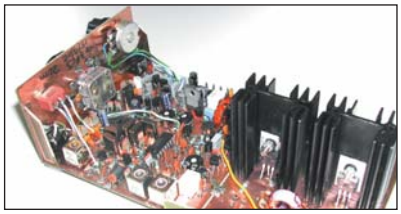
The company also offers a selection of lightweight telescopic poles that are suitable for supporting HF and VHF aerials. The poles can be supplied with guying kits.

SOTA Beams has also designed special lightweight HF dipoles and wire winders to keep HF aerials tangle-free. The Waterlog is another product designed by the company to meet a particular need – that of logging in wet weather. It uses a unique type of waterproof paper that is virtually indestructible.

Walford Electronics

www.users.globalnet.co.uk/~walfor

Walford Electronics has been producing kits for radio enthusiasts for over 20 years. It is the longest running British supplier of such kits. Designed by Tim Walford, G3PCJ, the company's popular



Somerset range of kits are named after places in the historic County of Somerset where Tim lives and runs this mail order business.

The company's kits use novel circuit techniques to concentrate the value in the electronics and minimise hardware costs. All kits are supplied complete with any essential electronics or hardware so that they can be built open style.

They also come with easy to follow instructions including simple tests to be completed before proceeding to the next section. If builders get stuck, advice is available and there is a quarterly newsletter Hot Iron to keep customers informed of new developments and technical topics.

There is a large range of kits available, starting with very simple receivers – such as the direct conversion Kilve. This is intended for novice constructors and those needing a project to support their exams – it can do any band 20 to 80m, is small at only 50 x 80mm and costs £19 + £2 for post and package. For more experienced builders, a popular choice is the Fivehead – a single band phone superhet transceiver. In the accompanying picture, the Fivehead features a linear amplifier attachment from the company's extensive range of accessories. There are other choices up to multiband designs of DC and superhet TCVRs for phone and CW covering all bands 10 to 160m.

Barenco

Barenco was started in 1983 as a manufacturer of brackets specifically for amateur radio. Over the years, the company has expanded its range of products to around 2,000 items, including all the components needed to connect the back of a radio to the aerial as well as a large range of tools and ancillary components.

The company's product range includes brackets, cables, connectors, tools, service aids and tie wraps among others.

Barenco now specialises in the design and manufacture of individual systems to meet the needs of both commercial and private individuals. "As a company we pride ourselves on the quality of the products we sell and service we are able to offer," a spokesman said.

Sandpiper

Sandpiper has been designing and manufacturing aerials for over 25 years and is one of the industry's leaders in this field.

A family run business operating out of Aberdare, South Wales, the company can manufacture aerials on a "one off" basis or mass produce items. The company also provides bespoke headsets and aerials for paragliders and hang-gliders.

Visitors to Leicester ARS will be able to check out the company's new two-element quad (triband) antenna for the 6, 4 and 2m bands (see picture). This product offers 7DBd of gain, has three feed points and features stainless steel and aluminum-centred fibreglass arms.

Moonraker (UK)

Moonraker produces a wide range of different antennas and accessories, many at the specific request of customers. Recent additions to the company's product line include:

MR2-POWER ROD – Ever wanted base performance from a mobile? Well check out the first ever mobile co-linear. Spec – freq: dual band 2&70; gain:3.5/6.5dBdl length: 75cm; fitting: SO239 Type; price: £29.95.

PBKIT-SO – Ever been camping or caravanning and lost performance or just wanted to put your mobile on a pole? Well, we now have the solution with this versatile bracket and cable kit. Spec – right angle stainless steel bracket; mast size up to 1.25"; fitting: SO239; cable: 10m with PL259 fitted; Price: £19.95

MGP-TRISTAR – Ever wanted mobile ground planes? Now you can. Spec – black chromed three-pole Tri-Star; freq: 50-1,300Mhz; fitting: PL259 to SO239; Price £12.95.

Moonraker is offering radio amateurs a special deal if they buy all three of these products at the Leicester Amateur Radio Show.

Linear Amp UK

www.linamp.co.uk

Linear Amp UK is a British manufacturer of high power RF amplifiers. Based near Beverley, Yorkshire, the company was founded by Peter Rodmell, G3ZRS, who is assisted in its running by his wife Gwen, M0GWA. The amplifiers are distributed in the UK and overseas. Linear Amp UK recently won an Export Award for its efforts.

The company's product range includes amplifiers for HF and VHF/UHF. Its top of the range Challenger III is a 1,500W amplifier for HF, soon to be followed by the Mk IV version. The budget end of the HF market is covered by the Ranger 811H, also available in kit form. The Discovery range of VHF and UHF amplifiers produces 1,200W or 1,500W for 6m or 2m and 800W for 70cm. The company's latest product is the Supertuner, available in two models – Balanced Supertuner or SPC Supertuner. Both models have been designed to carry over 1kW and would complement any high power setup.

Sandpiper antenna

Above right
Linear Amp UK's top of the range Challenger III 1,500W amplifier

Above
Moonraker's bracket and cable kit PBKIT-SO

Below
The MGP-Tristar from Moonraker

ML&S

www.hamradio.co.uk

ML&S is an established amateur radio dealer which is always looking for new British-made products. The Mydel range of PSUs and the Megatrap and Multitrap antennas are successful British products the company stocks and which sell well. The new Kinetic SBS-1 virtual Radar system is the latest to hit the market.

Here's a brief overview of some of the British-made products available at ML&S.

MyDEL power supplies
A new range of PSUs from MyDEL are available. They are ideal for powering any main rig or accessory requiring 13.8V DC at up to 25 Amps.

MyDEL MP-250A
25 Amps maximum, 22 Amps constant, ideal for most modern HF Transceivers

MyDEL MP-4128
Similar in spec to the MP-250A but without meters or cigar lighter o/p. 22-25 AMP output with heavy duty binding posts on the front panel and push on terminals for lower current output on rear. Fully protected.

MyDEL MultiTrap
Forget the G5RV. Install a proper TRAPPED wire dipole MutiTrap for 80-10m. Must be centre supported.

MyDEL MegaTrap
Same as Multitrap but 160m/80/40m.

SBS-1 Real-time virtual radar
Combining state-of-the-art electronics and new technological advances, the revolutionary SBS-1 from Kinetic Avionic Products allows for the first time aircraft enthusiasts worldwide to directly monitor the skies in an unprecedented fashion.

The MyDEL MP-250A

KENWOOD

Listen to the Future

Unique concept, brilliant execution. Kenwood's compact TS-480HX/480SAT is tailor-made for DX'ing. But its smartly designed standalone LCD control panel — featuring backlit keys to enhance operating ease — is equally at home on your desk, with the main unit up to 4 metres away. And wherever it is, this HF transceiver delivers an astonishing punch: 200W. Performance is equally impressive. For example, a quad-mixer provides RX dynamic range in the TS-950 class, while AF DSP processing offers many powerful features, including noise reduction, a speech processor, and AF filters. And of course you can enjoy all of the convenience of PC-based control. The TS-480HX/480SAT lets you enjoy the best of both worlds.

l Built-in automatic antenna tuner (100W model) l Terminals for external antenna tuner, linear amp, PC l Electronic memory keyer l AF DSP features: l AF DSP filters l Beat-cancel, noise reduction l TX/RX equalizer l CW auto-tune l Speech processor l Optional 500Hz/270Hz band CW narrow IF filters, 1.8kHz band SSB narrow IF filter l PSK31 compatible l 5W minimum RF output, QRP compatible l Electronic keyer l Plug-in voice recording/synthesis unit available l Packet cluster tune with TM-D700E l Supplied with mobile panel bracket, tabletop panel bracket and carrying brackets

HF/50MHz ALL-MODE TRANSCEIVER

TS-480HX

200W Model

- **200W output (50MHz: 100W) DC 13.8V operation**
- **100W model available with built-in antenna tuner**
- **TX/RX AF DSP**
- **Compact construction for easy carrying**
- **Separate LCD control panel with speaker**
- **Continuous RX: 500kHz (VFO: 30kHz) to 60MHz**
- **TX: covers all Amateur bands 1.8MHz to 50MHz**

TS-480SAT

100W Model with Built-in Antenna Tuner

Available from all official Kenwood amateur radio dealers. For full details of our dealer network and all Kenwood amateur products contact your local dealer or Kenwood Electronics UK Limited. 01923 655284
e-mail comms@kenwood-electronics.co.uk

Kenwood Electronics UK Limited

www.kenwood-electronics.co.uk

Andy Talbot, G4JNT

15 Noble Road, Hedge End, Southampton SO30 0PH.

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

The basic concepts of Software-Defined Radio

Software-Defined Radio (SDR) basics, intended to dispel some of the myths currently surrounding this topic

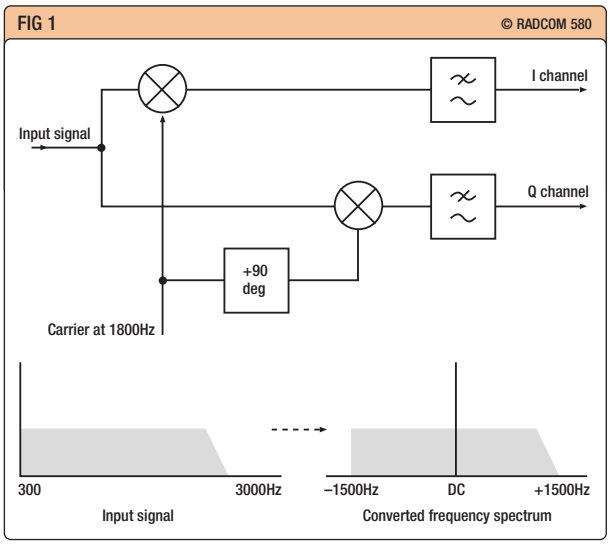
The SDR concept has appeared more and more recently within the pages of this magazine, and the website of Alberto, I2PHD (see 'Web Search'), supports a users' group where there is plenty of lively discussion and debate about SDR techniques, frequency generators and converters, and how to use his sound card-based software as a radio receiver. Alberto's software takes down-converted audio into the sound card for demodulation, filtering and for replaying through the PC speakers, or subsequent datamode decoding. He has designed the software to accept two 90° phase-shifted inputs so that sideband cancellation can give correct signal reception, and it in this area where discussions within the user group reveal there is still a lot of misunderstanding about the frequency conversion technique and its particular value for DSP, so an overview is of value here, even if it is departing briefly from the scope of this column. The idea is easiest to describe when used for a transmitter; for a receiver just mentally invert input and output.

0/90° frequency conversion, (commonly called I/Q for In-phase and Quadrature) is not a new technique and was the first method used for generating SSB, some time before crystal filters took over the task. The technique makes use of a mathematical identity that results when two sinusoidal signals are multiplied together – so-called frequency 'mixing' is actually a multiplication process. If we have two signals of frequencies which here we'll call LO and Audio, the signals are expressed mathematically as sin(LO) and sin(Audio). (Alternatively we could use the cos identity which implies the phase of each is shifted by 90°). If these are multiplied together we get **Equation 1**.

Here we see the classic sum and difference products output from any mixer.

If we look at a similar mixer product generated from the same signals, but with each one now shifted by 90°, we get **Equation 2**.

The first output term at frequency (LO – Audio), is the same in each case, but the second one has opposite polarity, the – and + terms, so if we now add the two signals we end up with 2.cos(LO – Audio) and no sum term – one of the sidebands has been cancelled and we have made an SSB transmitter. There is nothing specifically digital- or DSP-related about this so far. In purely analogue signal processing, achieving perfect balance in 90° phase shifters and mixers is quite difficult, so only limited cancellation can be achieved. But when we move to digital processing, a whole new world is opened up.



Complex or I/Q mixing.

The Numerically-Controlled Oscillator (NCO), described in the August issue, can easily supply two quadrature outputs from two separate look-up tables, so there is one pair of sin/cos signals, and we now only need to supply the phase-shifted audio signals. Generating phase shifts of digitised audio signals in DSP is reasonably straightforward, so a 0/90° pair of audio signals can feed the other mixer inputs. All we now need are a pair of actual physical mixers and any amplification needed to make the transmitter. If we turn the idea around, and swap input and output signals, we can mix a single RF input signal with the two I/Q signals generated from the NCO and generate two outputs from the mixers, which must now be treated as a quadrature pair in the DSP box. This is the idea behind the Software-Defined Radio.

But we now come to an interesting idea that needs a bit of mental agility (or blind faith!) – negative frequency. If we generate our LO frequency at the *centre* of the wanted output bandwidth, we can mix this with a special I/Q waveform that is called a zero frequency signal. It consists of the audio signal of interest (say 300 – 3300Hz voice) but mixed down by (say) 1800Hz. Normally this would create a mess with the high notes folded back onto the low ones; both 300 Hz and 3300 Hz would result in the single frequency, ie 3300 – 1800 = 1500Hz and 1800 – 300 = 1500Hz, and a 1500Hz input itself would exit as DC. Note the order of these subtractions to get the resulting 1500Hz – here is where the concept of negative frequency arises. Negative frequencies overlap positive ones in the real world and we hear them together, but in the mathematical world of DSP, provided the two I and Q channels exist, they can be fully separated to give complete sideband cancellation.

Because the folded audio band now occupies half the bandwidth of the original audio signal, either we can now use half the sampling rate, and *still* meet Nyquist's sampling criteria, or can have double the audio bandwidth. This is the whole idea behind Alberto's SDR software, and the cause of much of the confusion seen in the group's discussion pages recently. By using the soundcard at its maximum sampling rate of 44,100Hz, the typical maximum audio input frequency is normally limited to around 21kHz by Nyquist and anti-alias filtering. But by using I/Q conversion, the SDR can *cover ±21kHz, or 42kHz of bandwidth in one go.* Better sound cards can give even higher bandwidths up to 96kHz.

The I/Q technique is not limited to audio – most GPS receivers and mobile phones also use it to reduce the expensive RF hardware and load most of the design into cheaper silicon (or GaAs) integrated circuits. ♦

Equation 1

$$2.\sin(LO) \times \sin(Audio) = \cos(LO - Audio) - \cos(LO + Audio)$$

Equation 2

$$2.\cos(LO) \times \cos(Audio) = \cos(LO - Audio) + \cos(LO + Audio)$$

WEB SEARCH

Software-defined radio	www.sdradio.org
SDR user group	soft_radio@yahoogroups.com

VHF/UHF

Norman Fitch provides his monthly report on activities taking place on the VHF and UHF bands.

SOLAR AND GEOMAGNETIC DATA

In the 30 days to 9 August there were five consecutive days when no sunspots were observed. These spotless days began on 18 July when the 10.7cm radio flux was in the low 70s. The maximum value was 111 units on 1 August and the average during the period was 89.9, which is 8% down on last month's figure. Only seven new sunspot regions were recorded. Geomagnetic activity was slightly up compared with last month and the mid-latitude A-index at Fredericksburg peaked at 25 on 6 August. The minimum value was 2 on 23 July. The data can be found on the Space Weather website, which contains a vast amount of current and past solar-related information – see Web search.

MOONBOUNCE

ARRL contest branch manager Dan Henderson, N1ND, posted the following message concerning this year's ARRL International EME Competition on the Moon-Net website: "At its July meeting, the program and services committee of the ARRL board of directors approved a change in the rules for the ARRL International EME Competition.

"This new rule separates single operator entries into unassisted or assisted entries and applies to all of the former single operator categories: multiband entries on bands 50MHz through 1296MHz; multiband entries on bands 2304MHz and up; multiband 50MHz and up. Single band: single-band entries on each band.

"These additional categories are in play for the 2005 running of the ARRL International EME Competition starting with the 2304MHz and Up weekend on 24-25 September, and will be eligible for their own awards in the revised contest rules. This change supersedes the categories published in the August issue of *QST*."

This is welcome news since there was a lot of debate on the Moon-Net website after last year's event that there ought to be separate sections for assisted and unassisted contacts. The final weekends are scheduled for 22/23 October and 12/13 November and are for 50-1296MHz. The full rules can be found on the ARRL website – see Web search.

Giorgio Marchi, IK1UWL, posted the following news about a new Italian EME contest on the Moon-Net website: "In our EME meeting in May, the possibility of coexistence of CW and JT65 in the same contest was analysed. The general feeling was that a CW contest is carried out differently from a JT65 contest, so it was decided to keep our traditional autumn contest dedicated only to old modes and institute a new contest for new modes."

Dave Cutts, 2E0EBV, and Greg Bailey, 2E0FMS, operating in the RSGB 2m and 70cm QRP contest on 6 and 7 August. The station was set up at the South Weal Cricket Club ground.

"We say new modes instead of WSJT because hams are very resourceful and we want to leave it open to the digital revolution. In the meantime, we confide in a new version from K1JT with the improvements which will make contesting easier (Thanks Joe, you opened up a new world!). The other point discussed regarded random versus assisted. It was felt that in skeds assistance is proper, but that random QSOs have more merit in a contest. This is reflected in the points assigned for each condition. The modes are those in which decoding is done by a computer, whilst validation and QSO management are effected by the human operator. If, during the contest, no information has been received, specifically regarding frequency and calls, the QSO is considered random, otherwise assisted." Giorgio concludes: "We are open for comments."

This first new modes contest is scheduled for the 48 hours starting at 0000UTC on 1 April 2006 and is for 50MHz-up. The rules are quite extensive, so too long to reproduce here. No doubt Giorgio will send you a copy, or tell you from where they can be downloaded. His e-mail address is marchi.g@libero.it

At a recent Central States VHF Society meeting, Lance Collister, W7GJ, presented a paper about EME DXpeditions. He writes: "I am hopeful that the information will be helpful to stations considering an EME DXpedition. In addition to basic planning and equipment considerations, there also is a discussion of possible operating options, along with links to actual JT65A .wav files. The .wav files of multiple callers can be used to practice the techniques of sequentially decoding random callers using narrow FREEZE filters and quickly replying to them by double clicking on the decoded callsigns. Many thanks to all those who provided photos and suggestions, and also to W1JJ, K7BV and K1SG for calling me last weekend so I could record the .wav files." A complete copy of this excellent paper can be downloaded from the Internet – see Web search.

In the August *432 and Above EME News*, edited by Al Katz, K2UYH, Jean-Jacques Maintoux, F1EHN, reports that his new EME tracking software is now available. Version 6 is much improved and can be downloaded from the Internet – see Web search.

The Moon data for the 22/23 October contest weekend – as derived from the VK3UM program – shows that London latitude stations will have almost 34 hours of Moon time. The declination varies from +28.56° to +27.24° and the 144/432MHz sky temperature range is 575/44K to 391/29K. The signal degradation referred to perigee varies from -1.48dB to -1.76dB over this apogee weekend and the sun offset at Saturday midnight is -113°.

Norman Fitch, G3FPK

40, Eskdale Gardens, Purley, Surrey CR8 1EZ.

E-mail: g3fpk@compuserve.com

BAND REPORTS

50MHZ

Some Hungarian amateurs had special permits to operate on 6m during August and Bryn Llewellyn, G4DEZ (JO03), sent a list of 65 of them, 25 of which he had worked up to 9 August. The list is on the Internet – see Web search. Phil Catterall, G4OBK (IO94), worked HA1YA* at 0840 on the 1st. Tony Read, G0GMS (IO82), has been an avid VHF DXer for 22 years, 15 of them from IO91. He has now taken up an interest in 6m and in a couple of months has worked 200 grids and 61 DXCC entities using 100W to a 3-ele Yagi and hopes to improve the antenna soon.

Ted Collins, G4UPS (IO81), had worked 21 of the HAs up to 10 August, mostly on CW, and mentions the high standard of operating by all those contacted. His report from 12 July runs to six A4 pages and shows little or no activity on 1, 2, 13, 18-21, 23-25 and 28 July and 2, 4 and 7 August. There was good Es propagation on 14 July when there was a significant opening to Scandinavia from 1525 until 2100. QSOs were made with OH0AZ (JP90), 8S5X* (JO99) a special Swedish callsign, OH0JFP (KP00), LY9OE (KO11) and SA0A* (JO97), another special Swedish callsign.

On the 15th there were lots of Italian stations QRV from 1700 till fade-out at 1840. There was an early morning opening to the Balkans on the 17th resulting in QSOs with S5 and 9A stations and in the evening Ted worked TK/F5EMT* (JN42) and TA3KA. In the afternoon of the 22nd, there was Es activity to HB9 and Northern Italy but at 1614, all the Italian stations faded out in just one minute. Four minutes later the S55ZRS beacon was S9 but there was another dramatic fade-out at 1630. In the morning of the 26th, he made QSOs with stations in OM, 9A, LZ, SP9 and UR5.

The last two days in July saw much activity and the morning of the 30th brought QSOs with stations in ES, SM and OZ. From early afternoon, Ted worked stations in SP8, IV3, S5 and 4N, the final contact being with OH3JR* (KP21) at 1600. TA2MW/0 (KN51) was heard at S3 at 0750 on the 31st working 9A stations on 50.110MHz. At 0915 he had a QSO with 5D6MC (IM63) but at 1109 the operator was giving the locator as IM75HN (NB. The 5CA-5GZ series is allocated to Morocco by the ITU). At 1604, he worked TA2MW/0 for a new grid, then heard DL1MAX working K5RLA and W5OZI, neither of whom were audible in IO81

Coming to his August report, on the morning of the 3rd, there was Es propagation to the north resulting in some Scandinavian contacts and QSOs with OY9JD* and OY1CT* (IP62), then later he worked several HA stations till fade-out around 1300. On the 5th, there was an early morning opening to Italy when IM0/I2KQE (JM49) was worked. More HAs were worked next morning and on the 8th. Finally, on the morning of the 10th, Ted contacted IW2OAM/IS0 (JN41) and 9A4A* (JN74) until fade-out at 1325.

Bob Harrison, G8HGN (JO01), worked 5T5SN (IK28) at 1104 on 9 July for country number 70 and grid number 360. During the evening of the 13th, the band was open to I, YU and 9A and at 1937 he contacted 7X0AD (JM16) for another new country and grid. From 1700 next evening, there was the OZ6M contest which coincided with a fine Es opening to Scandinavia resulting in 20 QSOs with stations in 17 grids, five of them all-time new ones, in seven countries: ODX was OH2FR/P (KP31) at 1910km. On the 17th, he worked UR5DDX (KN18) but missed out on TA7KA (KN91) at 1700 who had a monster pile-up calling.

Brian Oughton, G4AEZ, operating club station G8VYK (JO01), lists Es QSOs with SP8FPK/P (KO04), YL2LW (KO26), SP8AWL (KO11) and SP5ENM (KO02). Kevin Jackson, M0XLT (IO83), submitted a long list of Es DX worked in the 13 July through 8 August period in what he describes as a patchy month. To pick out a few July highlights, on the 14th, OH0JFP and OH0AZ; on the 17th T99C (JN93); on the 30th UY9IF (KN88); on the 31st, T77NC (JN63), IM0/I2KQE, EH6CC (JM19) and TA2MW/0. On 3 and 8 August, he worked some of the new HAs.

From his home QTH, Steve Inman, 2E0KBJ (IO93), caught the three hour Es opening on 14 July and worked 16 countries – OH, OH0, SM, ES, SP, HB9, F, OE, I, OK, DL, LA, LY, EH, GD and CT – all of which answered his CQ calls. From his portable location at IO93WV, he worked four new countries, T77NC on 30 July, SV1FKZ (KM18) on the 31st, HB0/PA6TUE (JN47) on 8 August plus lots of the new HAs. Other fine contacts were UT4UO (KO50) on 26 July and UT8AL (KO61) on the 30th. So far this year, he has worked 40 countries as 2E0KBJ/P. Colin Fallaize, MU0FAL (IN89), lists a few choice DX stations worked in July; K1TOL (FN44) and PJ2BVU (FK52) on the 8th and Z36W (KN11), ZA/IK0OKY and TA7KA (KN91) on the 17th.

The Jaybeam 48-ele crossed Yagi antenna used by 2E0EBV and 2E0FMS in the RSGB 70cm QRP contest on 7 August.

70MHZ

There have been reports of Romanian stations being worked on 4m and in my August column, I asked if anyone knew if these stations had operating permits. Derek, G8TOK (JO01), went to considerable lengths to try to get a definitive answer, his first step being to log on to the YO website which has a page showing all the bands allocated to Romanian amateurs. 4m isn't in the list nor was there anything relevant in the news section. Of course, it is possible that some YOs may have been granted special permits so he e-mailed FRR, the national society, but to date has not received any reply. The only other contributor mentioning 4m is MU0FAL who worked 9A6R (JN83) in an Es opening on 7 July.

144MHZ

G8HGN contacted DK5DQ (JO31) and DK5QN (JO42) in the evening of 16 July and later on F4CQY/P (JN28) and in the following afternoon Bob worked DG3XA (JO43) and DG2NBN (JN59). Some DX was around in the afternoon of the 23rd when he worked DK3EE (JO41). He was QRV in the UKAC on 2 August and completed 48 QSOs with stations in 17 grids and six countries for a claimed score of 816 points. ODX was DL0RSH (JO43) at 662km.

Brief periods of Es on 6 and 7 July enabled G8VYK to work CT1HZE (IM57), I0AKP (JN61), 9H5DH (JM75) and IW0GPN (JN62). Operation on MS using FSK441 mode brought a new country, LY2CI (KO14), and the best

of the rest for Brian were YU7EW (KN05), OH6MAZ (KP21), SM3JBO (JP93), SM3RPQ (JP74), SM4/PA3FSA (JP62) and OH6GDX (KP02). G0GMS worked 365 grids from his previous QTH in IO91 using CW and SSB but on moving to IO82 Tony decided not to use SSB, only CW and WSJT. In the past five years, he has worked 290 grids but reckons that without WSJT, the total would only be 98.

Dave Cutts, 2E0EBV, and Greg Bailey, 2E0FMS, members of the Havering and District ARC, were QRV in the RSGB 2m QRP contest on 6 July operating portable from the South Weal Cricket Club's ground. Using minimal equipment – 25W to a 4-ele quad antenna – they amassed 68 QSOs, ODX being F5RMY (JN38) at 547km. MU0FAL contacted I7IWN/7 (JN90) in an Es opening on 15 July.

430MHZ AND UP

Ken Punshon, G4APJ (IO83), was QRV in the 70cm low power contest on 7 August. He completed 28 contacts, ODX being F8BRK (IN99) at 512km which he reckons wasn't bad with low power and average conditions. He also worked GW4DGU (IO71) and wonders how Chris manages to throw such a good signal over the Welsh mountains, let alone hear him.

Brian Pickrell, G8ARM (IO70), keeps the 70cm flag flying from 3km north-east of Penzance and in July lists QSOs with EA1FDI/P (IN52) and PA6NL (JO21) in NFD on the 2nd and with EA1DKV (IN53) on the 13th but a contact with EB1EHO (IN53) was incomplete due to QSB. G8HGN was QRV in the 70cm UKAC on 12 July and made 23 contacts with stations in 14 grids and seven countries for a claimed score of 106,596 points. ODX was SM6CEN/M (JO57) at 1006km. There was some good DX towards Scandinavia but he had to search for it. Then five minutes before the end of the Nordic Activity Contest they all became very strong. At 2249 on the 16th, he worked F4CQY/P. Conditions were up a little towards HB next evening but CQ calls brought no replies.

G8VYK made a few NFD contacts including MM0CSP/P (IO84) and MI0BOT/P (IO74) while running just 30W. 2E0EBV and 2E0FMS operated portable in the RSGB 70cm QRP contest on 7 August and completed 31 QSOs in quiet conditions, ODX being G4APJ (IO83) at 283km.

On 23cm, Dave Powis, G4HUP (JO02), uses an FT847, DB6NT transverter and 200W PA to a 1.2m dish with a 0.6dB noise factor masthead preamp. On 10 July he worked SM6ESG (JO67); on the 12th, when signals were very strong, OZ1CTZ (JO46), SM6EAN (JO57 and SM6AFV (JO67) who was ODX at 948km.

WEB SEARCH	
Space Weather News	www.spaceweather.com
ARRL (EME rules)	www.arrl.org
W7GJ notes	www.bigskyspsces.com/w7gj/DXPEDITIONS.htm
F1EHN tracking s/w	www.f1ehn.org
HA 6m list	http://forum.hasix.org/files/ha_lis_6m.gif

G4ERG, SILENT KEY

On 19 July Howard Ling, G4CCH, took a telephone call from Martyn Gawthorpe, G8FEK, who reported the death of one of his closest friends Peter Etheridge, G4ERG. It seems he was diagnosed with lung cancer about a month earlier, by which time it was too late to treat. This sad news brought many tributes to Peter on the Moon-Net website, typical of which was from Chris Bartram, GW4DGU, who wrote: "That's awful news. Peter and I worked on 432MHz on both tropo and EME many times over the last 30 years. He was a huge signal here on tropo over a >400km path. Our last email exchanges were about 10GHz, a band he was beginning to take an interest in. RIP Peter – I'll remember our QSOs and discussions."

DEADLINES

That's all for another month. The copy deadline for December is **11 October** and for January 2006 it's **8 November**. My telephone answering and fax machine is on 020 8763 9457 and my CompuServe ID is g3fpk ♦

HELPLINES

Respondents to items in the 'Helplines' column are advised not to send original documents, but to copy them and send the copies. This is to protect your (often valuable) property in those very few instances where the originals are not returned.

♦ Nigel, G7URW, is looking for the manual relating to an **OSKER SWR-200**. G7URW, QTHR. E-mail: ursulamt@aol.com

♦ Mike, G3JKX, needs a photocopy of the circuit diagram for the **Sommerkamp / Yaesu FL-2277Z linear amplifier**. G3JKX, QTHR. Tel: 01952 299 677.

♦ Wilf, G3SWP, would welcome any information on re-coding the **Motorola Radius GP300** hand-held to make it usable for the 2m band. G3SWP, QTHR. Tel: 01302 859 481.

♦ Stewart, G3PMJ, is seeking a **89.96kHz Brookes Crystal Unit type G1**, having a B7G glass envelope, as fitted to the **Racal AR98**. G3PMH, QTHR.
E-mail stewart@revell62.freeserve.co.uk

♦ Graham, G7KYX, needs help with the re-wiring of the **steel rope on a three-section Versatower**. Any expense will be repaid. G7KYX, QTHR. Tel: 01205 871 624.

♦ The Swansea Amateur Radio Society needs a photocopy of the operator's manual for the **Yaesu FT-501**. All expenses will be willingly refunded. Contact GW3INW, QTHR. E-mail: 3inw@ukonline.co.uk

Dave Pick, G3YXM

178 Alcester Road, Kings Heath, Birmingham B14 6DE.

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

LF

Dave discusses the problem faced by LF enthusiasts as a result of LORAN-C on 100kHz ♦ Dots and dashes of equal length? Nothing new, they were used on trans-Atlantic cables around 100 years ago!

A few years ago, it seemed that satellites would surely kill off the land-based wide-area navigation systems. The Decca Navigator system closed in 2000 leaving only Loran-C (LOng RAnge Navigation) on 100kHz to make a last stand against satellite delivered systems.

Loran-C was introduced in Europe by the US Coast Guard in the 1950s to meet US naval requirements.

In the early 1980s, the USCG made it known that Loran-C in Europe would no longer be required by the US military after 1994, and the host nations would be offered the option to take over the stations on their own territory.

The stations that cover the UK are at Lessay in North-West France, the German island of Sylt and, since June this year, at Rugby.

The intended site for this station was to be Loop Head on the west coast of Ireland, but the construction of a tall mast was opposed by the local planning authorities. BT stepped in to offer temporary use of the remaining Rugby masts which were available until the end of Rugby's 60kHz MSF contract in March 2007.

The Loran stations each broadcast an accurately-timed pulse train which occupies a different time and frequency slot. Special receivers can identify the relative timing of the received signals from several stations and thus resolve their position to within a few hundred metres.

The Loran spectrum is centred on 100kHz but, being a pulsed signal, it has quite significant sidebands which extend into the 136kHz band where they can actually be useful as calibration markers. Official measurements give the sidebands a level of -40dB at 127kHz relative to the 100kHz level. Although the plot doesn't extend beyond 130kHz, the slope suggests about -50dB on 136kHz.

With Rugby being near the centre of the country, interference levels to many users of the 136kHz band are significant. In Birmingham, my S-meter sits at S8 in a 500Hz bandwidth where it used to be at 1 or 2 on a quiet day. The distinctive 'galloping horses' sound is evident up to 150kHz, where the LW broadcast band starts. In practical terms, it means that aural CW is now impossible with signals of less than S6 which rules out pretty much all signals from outside the UK. QRSS fairs better. The *Argo* screen shows bright lines but, as long as the wanted station is clear of them, copy is only slightly degraded.

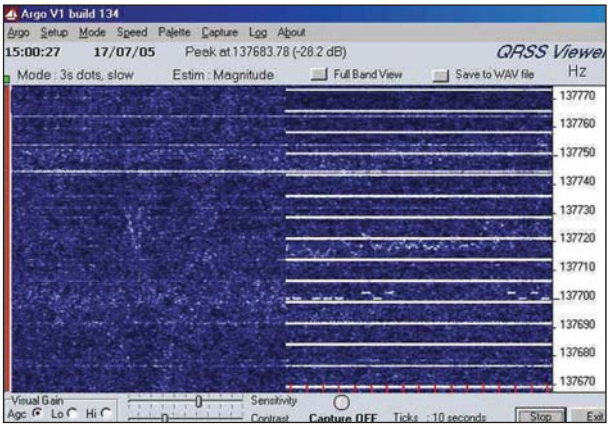
Mike, G3XDV, reports similar findings in Welwyn Garden City, about 120km from Rugby, with an S6 noise level. M0BMU, in Brookmans Park, reports a 15dB increase in a 300Hz bandwidth. Interference levels near the South coast are lower, a 6dB increase is reported by G3GRO, but stations there already have to contend with the noise from Lessay. A loop is very effective at nulling out one interfering signal but can't cope with two on different bearings! Fortunately Jim, M0BMU, has some ideas on how to achieve this:

"To achieve two steerable nulls I used one of the 'band-pass loops' (see 'Web Search') and a vertical. In principle, the transmitter vertical aerial could be used but, at my location, this picks up a lot of mains noise, and it has a narrow bandwidth which would cause the amplitude and phase to vary a lot across the band, so I built a separate 'band-pass vertical', with a double-tuned input similar to the loop, and a bandwidth of about 15kHz. Each aerial has a pre-amp, and the signals are combined using an RC amplitude / phase adjusting network not unlike a 'noise canceller'.

"To set this up, I aligned the loop with its maximum pickup mid-way between the bearings to Lessay and Rugby. Then I adjusted the signal levels from each aerial individually, so that the Loran noise was about the same. Both signals were then added together, and the phase control adjusted for minimum Loran. Amplitude, phase and the position of the antenna were then iteratively tweaked for the best results. It works better than I expected, with audible Loran chatter virtually eliminated. Very slight tweaking is required from one end of the band to the other to maintain the null. During testing, I was able to copy DL1DQZ, DK7SU and F6BWO which, with nulling disabled, were completely inaudible. It proved important to de-tune the transmitter vertical to prevent it affecting the receive aerials."

It does seem that Loran may be in its death throes, especially now that the European Galileo satellite system is set to join the American GPS and the Russian GLONASS systems over the next few years, but we will have to put up with it for a while yet. It's a good job we like a challenge!

Note. The RSGB is to lodge a complaint of interference.



A composite view of the band before and after Loran at G3YXM. Even in the presence of the new bright lines you can see DK1IS on DFCW.

CABLE CODE?

During a summer break in Cornwall, I visited the Telegraph Museum in Porthcurno, where the trans-Atlantic cables came ashore. It was fascinating to see how many of the techniques we now use were invented over 100 years ago. There was for instance, a mechanical phase-locked-loop for synchronising data.

One thing that particularly caught my eye was the use of a double-paddle Morse key for sending 'cable code'. The very high inductance and capacitance of the trans-Atlantic cable meant that it was difficult to send Morse code quickly, as the dots were too short to discern on the galvanometers used for detection. They hit on the idea of sending the dots and dashes at equal length but with separate keys, one applying a positive current and one a negative. Sound familiar? It's the same idea we've used on LF for DFCW, equal length elements for dots and dashes but on different frequencies. There's nothing new is there? ♦

WEB SEARCH

Jim's loops	www.wireless.org.uk/lazy.htm
Porthcurno Telegraph Museum	www.porthcurno.org.uk
RSGB Spectrum Forum	www.rsgb-spectrumforum.org.uk/lf.htm

SHOWROOM & MAIL ORDER:
Unit 1,
Purfleet Industrial Estate,
Off Juliette Way,
Aveley, South Ockendon,
Essex RM15 4YA
TEL: 01708 862524
FAX: 01708 868441
Open: Mon-Fri, 9.00am-4.00pm.

HAYDON Communications

W. MIDLANDS SHOWROOM
Unit 1, Canal View Ind. Est.,
Brettel Lane, Brierley Hill,
W. Mids. DY5 3LQ
Open: Mon-Thurs, 9.30-4.30pm.
Fri: 9.30-3.30pm. Sat: 9.30-1.00pm
TEL: 01384 481681
E & OE

Mail order: 01708 862524

NEXT DAY DELIVERY TO MOST AREAS, £10.00

FOR MORE INFORMATION OR TO ORDER ON-LINE VISIT
www.haydon.info
FOR OUR ON-LINE CATALOGUE, ETC.

After 25 years in the business, Mike Haydon is partially retiring and both our Thurrock and West Midlands showrooms will close on Friday 30 September.
Our business will continue mail order only by telephone or over the internet.

www.haydon.info

For September:- any customer purchasing on-line can take an extra 5% off any price (including offers – but excluding carriage)

Callers to either of our showrooms in September can expect up to 50% off showroom items and even more off clearance items

Look out for our BIG thank you to our customers in the way of our "2-4-1", ie:- double your purchase for free (additional carriages may apply)

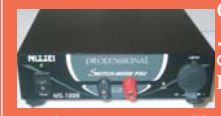
PSUs

DIAMOND GZV-4000

GZV-4000 (40 amp) £119.99
GZV-2500 (25 amp) £89.99

Superb switch mode PSU with built-in speaker

NISSEI MS-1228



OUR PRICE **£69.95**
Del £10.00

Professional compact 28A (12V) PSU (57/174/200mm)

NISSEI PS-300

Features: ★ Over voltage protection ★ Short circuit current limited

TRUE 'LINEAR' PSU

£99.95 Del £10.00

Professionally made 30A (3-15V) PSU (256 x 135 x 280mm)

HF TRANCEIVERS

YAESU FT-817 ND

100kHz-440MHz (with gaps). All mode transportable. Includes NIMH battery/ charger. Latest 2005 spec.

INCLUDES FREE HEADSET **£449.99**

Optional Yaesu carry case £20.00
FT-817 ND + MS-1228 PSU £499.99

YAESU FT-857D DSP

The ultimate HF excitement in a small package. HF + 6m + 2m + 70cm. Incl's digital signal processor unit.

DTMF £59.99

£569.99

Includes free detatch kit

FT-857D + ATAS-120 Package Price £769.99

YAESU FT-897D

HF + 6m + 2m + 70cm all mode. An amazing DSP Tcvr for base/mobile or portable use. Very little has been left out!

INCLUDES FREE HEADSET

PRICE **£639.99**

FT-897 + PS-300 bundle £729.99

YAESU FT-1000MP MkV

200 watts of shear delight from a radio that is without peer when it comes to performance and innovation. Limited stock available. Latest 2005 spec.

Optional extension speaker £119.99

OUR PRICE **£1949.00**

Yaesu FT-1000MP (Field) MkV (100W) £1599.00

KENWOOD TS-570DGE

In our opinion, the best HF transceiver below £1200.

INCLUDES ATU

OUR PRICE **£749.99**

PS-53 matching PSU £199.99

GO LARGE: TS-5700DG + PS-300 .....£849.99

KENWOOD TS-2000

New all mode multibander: HF/50/144/430 optional 1200MHz.

TS-2000 + PS-300 PSU £1379.00

OUR PRICE **£1299.00**

Matching PSU £199.99

VHF/UHF RADIOS

YAESU VX-2E

Tx:- 2m/70cm. Rx:- 0.5-999MHz. Includes battery (Li-/on) + charger.

OUR PRICE **£115.00**

Optional speaker microphone £27.99
Optional plastic case £12.99

YAESU BARGAINS

FT-1000MP MkV (200W)..£1999.99 FT-2800M £149.99
FT-8900 .....£325.00 FT-7800 .....£219.00

ALINCO DJ-596

2m + 70cm Handie. Includes: (NIMH) Battery/Charger. Wide + narrow switchable. High power (4.5W) OP as standard. Alpha Numeric channeling.

Now includes free remote mic **£129.95**

Optional case £16.99
Cigar lead.....£19.99
Optional headset (Boom mic) £24.99

KENWOOD TH-F7E

Transceiver & scanner 2m/70cm Tx (5W). Rx:- 0.1-1300MHz, all mode (incl SSB). Incls:- Lithium ion battery & charger.

Incl's free remote mic

OUR PRICE **£229.99**

Optional case £19.99
Optional cigar lighter lead.....£19.99
Optional headset (Boom mic) £24.99

SUPER-GAINER RH-9090

SMA 40cm flexible whip that is ideal as replacement. Tx:- 2m + 70cm. Rx:- 25MHz-2.9GHz OUR PRICE **£26.95** P&P £1.50

SUPER-GAINER RH-9000

BNC 40cm flexible whip for the ultimate in gain. (Rx:- 25MHz-2.9GHz). Tx:- 2m + 70cm

OUR PRICE **£21.95** P&P £1.50

YAESU FT-7800

Yaesu's latest high spec, low cost mobile. 2m/70cm (50W/40W) Includes DTMF microphone.

Rx:- 108-520/700-1000MHz

BEST BUY **£219.00**

Includes free detatch car kit

NISSEI PWR/SWR METERS

RS-502 1.8-525MHz (200W).....£79.95 P&P £5
RS-102 1.8-150MHz (200W).....£59.95 P&P £5
RS-402 125-525MHz (200W).....£59.95 P&P £5
RS-3000 1.8-60MHz (3kW) Incls mod meter £79.95 P&P £5
RS-40 144/430MHz Pocket PWR/SWR.....£34.95 P&P £2
DL-30 diamond dummy load (100W max) ...£26.99 P&P £3

ACCS

SGC MAC-200

New auto tuner 1.8-54MHz (200W) wire, vertical, dipole. You name it. (5 selectable outputs).

OUR PRICE **£229.95**

SGC-239 Mini tower ATU (1.8-30MHz).....£169.99
SGC-230 (HF-200W) ATU .....Now £299.99
SGC-237 HF+6m Tuner .....Now £249.99
SGC-231 HF+6m (Deluxe) .....Now £299.99

MFJ-993

NEW INTELLITUNER 300W, fully automatic. Will tune wires G5RVS, verticles, trapped dipoles, you name it.

NOW **£199.99**

MFJ-949E

● 1.8-30MHz 300W ATU ● Large cross needle meter ● 30/300W PEP power meter ● VSWR ● 3-way antenna selector ● Internal balun

NOW **£119.99**

MFJ-259B

UK VERSION

HF digital SWR analyser + 1.8-170MHz.

NOW **£189.99** P&P £7.00

Optional case £22.99

MFJ-269 160-70cm analyser .....Now £259.99
MFJ-969 HF + 6m ATU .....Now £159.99
MFJ-260C 300W dummy load (0-600MHz) £39.99
MFJ-901B Superb versitile ATU .....Now £72.99
MFJ-784B DSP filter ~~£249.00~~.....Now £129.99

YAESU G-450C

Heavy duty rotator for HF beams, etc. Supplied with circular display control box and 25m of rotator cable.

OUR PRICE **£299.99**

G-650C .....our price £359.99
G-1000DXC.....our price £449.99
G-5500 (azimuth/elevation) rotator .....our price £499.99
GC-065 thrust bearing.....£48.00
GC-038 lower mast clamps.....£25.00

AR788 *NEW MODEL*

Quality rotator for VHF/UHF. Superb for most VHF-UHF Yagis, 3 core cable required. 3 core cable 50p per mtr.

OUR PRICE **£44.99**

AE-201 thrust bearing £14.99

New station log books (A4) **£2.99** P&P £2.00
5 log books **£12.00** P&P £6.50

D-308B DELUXE DESK MIC

(with up/down). Many amateurs using this mic (over 4000) have expressed extreme pleasure with it's performance. Includes 8-pin round Yaesu mic lead.

£49.95 P&P £6.00

Yaesu 8 pin round to modular adapter (8 pin).....£19.99
Yaesu 8 pin round to 6 pin modular adapter £19.99
A-08 8 pin "Alinco" round.....£9.95
K-08 8 pin "Kenwood" round.....£9.95
I-08 8 pin "Icom" round.....£9.95
IM-08 Modular phone "Icom".....£9.95
KM-08 Kenwood modular lead £9.95

CUSHCRAFT BARGAINS *Delivery £12.00*

MA5B Mini beam 10, 12, 15, 17, 20m.....~~£389.00~~ £315.99
A4S 4 ele beam (10-20m).....~~£599.95~~ £425.00
R-8E Vertical (40-10m) "special".....SPECIAL ~~£499.95~~ £299.99

CAROLINA WINDOM

CW-160S (160-10m) 40m long .....£119.95 P&P £8.50
CW-80 (80-10m) 40m long.....£89.95 P&P £8.50
CW-80S (80-10m) 20m long .....£109.95 P&P £8.50

MFJ-115

24 hour quartz clock. Major cities shown on rim. World map on face. "Know what time it is around the world".

£19.99 P&P £5.00

MFJ-125

12" Dxer's quartz wall clock. give:- 24hr time + 3 smaller dials give 12 hour time/day of week/date.

£24.99 P&P £6.00

TH-887 headset

ADAPTERS FOR MOBILE TCVRS AVAILABLE - PHONE

Superb headset for most handies.
887K (fits Kenwood) £24.95.
887 fits most twin socket-Alinco, Icom, Yaesu, etc.

£24.95 P&P £3

HUNTER

Frequency counter covers 10MHz-3GHz. Incl's nicad, charger, antenna.

OUR PRICE **£39.95** P&P £6

Optional padded case £7.50

BRAND NEW CLEARANCE ITEMS

Icom IC-2725E (2m/70cm mobiles) £219.99
Icom AH-4 HF auto wire tuner.....£199.99
Icom AT-130 commercial HF wire ATU.....£199.99
Icom AT-180 ATU matches 706.....£269.99
Kenwood D-700E 2m/70cm + packet £399.99
Alinco DJ-C7 (micro 2m/70cm handie).....£89.99
HP-4 light weight Icom headphones.....£12.99
Loko PS-1020:- metered 25A switch mode PSU £59.99
Sony SW-30 (broadcast portable radio).....£19.99
Various phasing harnesses @5.00 each..£Phone for details

MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling. (Fits up to 2" mast).

2-4-1 **£8.99** + P&P £3.50

30m pack (4.4mm) nylon guy rope.....£12.50

NEW EASY FIT WALL PULLEY

Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).

2-4-1 **£8.99** + P&P £3.50

Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on

WALL BRACKET **£2.99** P&P £1.00

BARGAIN WINCH

500kg brake winch.
BARGAIN PRICE
£59.95 Del £8.50

Winch wall bracket.....£19.99

COAX BARGAINS

RG-213 Mil spec x 100m.
£69.99 or 2 for £110.00 P&P £10

RG-58 Mil spec x 100m.
£35.00 or 2 for £50.00 P&P £10.00

Coax stripping tool (for RG-58) £4.50

COAX SWITCHES (P&P £4.50)

2 way CX-201 (0-1GHz) SO239.....2-4-1 £19.95
2 way CX-201 'N' (0-1GHz) 'N'.....£24.95
4 way CX-401 (0-500MHz) SO239 .....£69.95
4 way CX-401 'N' (0-500MHz) 'N'.....£79.95

LOW LOSS PATCH LEADS £3.50 P&P

Connectors	Length	Price
PL-259 - PL-259	0.6m	2-4-1 £5.99
PL-259 - PL-259	4m	2-4-1 £9.99
BNC - BNC	1m	2-4-1 £6.99

MOBILE ANTENNAS *P&P £8.50*

DB-770M 2m/70cm (3.5 - 5.8dB) 1m PL-259 ...2-4-1 £24.95
DB-7900 2m/70cm (5.5 - 7.2dB) 1.6m PL-259 2-4-1 £39.95
PL-62M 6m + 2m (1.4m) PL-259 .....2-4-1 £21.99
PLT-20 20m mobile whip (56" long).....£24.95
PLT-40 40m mobile whip (64" long).....£24.95
PLT-80 80m mobile whip (64" long).....£24.95
PLT-259 PL-259 converter for above £5.95

NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc. *Simply close shut over cables and notice the difference!* Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads. 2-4-1

2 for £10.00 or 6 for £25.00 (P&P £3.50)

DOUBLE THICK FERRITE RINGS

A superb quaility ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/OD35mm. 6 for £12.00

2-4-1 12 for £20.00 P&P £3.50
50 for £40.00 P&P 7.00

METAL WORK & BITS *P&P available on request*

2.4m/2" alloy poles £19.99
2" Mast base plate .....£12.95 P&P £5
6" Stand off.....£6.95 P&P £5
9" Stand off.....£8.95 P&P £5
12" T&K Brackets .....£18.00 P&P £8
18" T&K Brackets .....£22.00 P&P £8
24" T&K Brackets .....£26.00 P&P £8
U bolts (1½" or 2").....£1.20 each
8 nut universal clamp (2" - 2") £5.95
2" - 2" cross over plate £10.95
3-way guy ring £3.95
4-way guy ring £4.95
2" 3-way rotary guy ring £29.99
2" mast sleeve.....£9.95
Heavy duty guy kits (with wire) .....£29.95 P&P £6
Ground fixing spikes (3 set) powdered coated £24.00 P&P £8
30m pack nylon guy 4.4mm/B/load 480kg..2-4-1 £12.50 P&P £3
132m roll nylon guy (4.4mm) .....£40.00 P&P £7.50
Self amalgamating tape (roll) 2-4-1 £6.50
'Nylon' dog bone insulators.....£1.00 each
PL-259 plugs (large or small entry).....2-4-1 £1.10
N-type plugs (large or small entry) 2-4-1 £3.95

DIAMOND CP-6

A superb (diamond quality) 6 band trap verticle antenna with trap radials – "rotary" trap system allows "flat wall" mounting. 80m/40m/20m/15m/10m/6m. 200W SSB, HT 4.6m

SEND SAE FOR DATA SHEET

OUR PRICE **£219.99**

Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).

ONLY **£179.95** Del £10.00

SEND SAE FOR LEAFLET

DELUXE G5RV

P&P on either full/half size £6.50

Multi-stranded heavy duty flexweave wire. All parts replaceable. Stainless steel and galvanised fittings.

Double size - 200ft (160-10m).....**£84.95**
Full size - 102ft (80-10m) **£42.95**
Half size 51ft. (40-10m) **£36.95**

Inline (SO-239) line isolator (ideal for G5RV).....£29.99

STANDARD G5RV

Full size 102ft (now includes heavy duty 300Ω ribbon).....£28.95 P&P £6
Half size 51ft (now includes heavy duty 300Ω ribbon).....£24.95 P&P £6

Q-TEK INDUCTORS

80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end).....£25.00 P&P £4.00 (a pair)

G5RV PARTS

Open wire dipole centre £5.99
SO-239 dipole centre £5.99
SO-239 to 300Ω joiner £9.99
300Ω ribbon (Extra heavy duty).....£1/mtr

Q-TEK COLINEARS (VHF/UHF) *P&P £10.00*

X-30 GF 144/70, 3/6dB (1.1m).....2-4-1 £39.95
X-50 GF 144/70, 4.5/7.2dB (1.7m).....2-4-1 £54.95
X-300 GF 144/70,6.5/9dB (3m).....2-4-1 £69.95
X-510H GF 144/70, 8.5/11dB (5.4m).....2-4-1 £120.00
X-627 GF 50/144/70, 2.15/6.2/8.4dBi (2.4m) ..£79.95

BALUNS & TRAPS

1.1 Balun .....£25.00 P&P £4
4.1 Balun .....£25.00 P&P £4
6.1 Balun .....£25.00 P&P £4
40 mtrs Traps .....(a pair) £25.00 P&P £4
80 mtrs Traps .....(a pair) £25.00 P&P £4
20 mtrs Traps .....(a pair) £25.00 P&P £4

1kw Handling

TELESCOPIC MASTS

6 section telescopic masts. Starting at 2 1/2" in diameter and finishing with a top section of 1 1/4" diameter we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 8 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.

8 mtrs **£89.95** 12 mtrs **£129.95** *Carriage £12.00.*

Tripod for telescopic masts £89.95

REPLACEMENT POWER LEADS

DC-1 Standard 6-pin/20A fits most HF £20.00
DC-2 Standard 2-pin/15A fits most VHF/UHF .2-4-1 £10.00

BARGAIN ALUMINIUM POLES

2.4m x 2" aluminium pole. 2-4-1 **£19.99 each** (del £10.00) or **4 for £50** (del £15.00)

BARGAIN MAST SET

5 section 16ft long (1⅛") mast set **£19.95**
Del £10 (2 sets £35.00)

TWO FOR £35

NEW 20' SLEEVED MAST SET

A heavy duty-sleeved, mast set that will tightly slot together. 4 x 5' (2" dia) 16 guage heavy duty aluminium tubes. (Dimensions approx).

£49.99 Del £10.00.

TWO FOR £90.00 DEL £12.50

ALUMINIUM POLE CLEARANCE

We have sets of 4 (2") poles (3 of which are swaged) that slot together to make a (approx) 20' pole. Each section is approx 5' long – some have small dents in – some have been swaged slightly off centre – hence the price.

3 FOR £40.00 DEL £15.00 2-4-1 **£19.95** Del £10.00

Antennas

G3LDO looks at the Gamma Match, and discusses practical examples.

The driven element feed impedance of a multi-element Yagi is usually much lower than that of the coax feed, so some method of matching is required. My favourite beam antenna-to-coax feeder matching method is the gamma match. This is an unbalanced feed system and is well suited to plumber's delight construction, where all the metal parts are electrically and mechanically connected to the boom. The gamma match is popular for amateur arrays, particularly home-made arrangements. However, it is not popular with everyone. G6XN noted in [1] that a large increase in SWR bandwidth can be obtained by going from a gamma match to a balanced system. He went on to say that although no guidelines were available "…the author can do no more than invite the reader to share his misgivings about gamma matches".

I have also read (although not able to find a reference at the time of writing) that the asymmetrical feed causes some distortion of the polar diagram pattern. Perhaps some experimental work is in order. First of all, how does the gamma match work?

As you are aware, the impedance of a half-wave element is low at the centre and increases with distance from the centre. The gamma match comprises a short conductor, which is used to connect the centre of the coax to the correct impedance point along the antenna element. This short conductor has some inductive reactance, which is cancelled by installing a series capacitor, as shown in **Fig 1**.

Because of the many variable factors – driven-element length and diameter, gamma rod length and diameter, spacing between rod and driven element, and value of series capacitors – a number of combinations can provide the desired match. This, in turn, has given the gamma match a bad press regarding ease of adjustment and has resulted in the publication of some convoluted mathematical models and programs.

Taking the variables described above, the following should be considered:

- The feed impedance increases as the gamma rod is made longer and the connection to the element is moved away from the centre.
- The length of the gamma rod can be reduced for a given impedance match as the ratio of antenna element diameter to gamma rod diameter is increased.
- Gamma match adjustment is easier if the element is close to resonance.

It follows that the adjustment is much easier if some method of measuring impedance is to hand. For some years now, the instrument of choice has been the noise bridge. The adjustment has, ideally, to be made with the antenna *in situ*. While noise bridges are small, they require a receiver to detect the null. This problem has been overcome in the past using the receiver in the shack. The noise bridge can be connected to the antenna via the gamma match and the receiver is connected to the noise bridge via the antenna coax feed. The receiver speaker output is fed to the antenna adjustment point via a couple of disconnected leads from the rotator to a small speaker carried aloft for the purpose of listening to the noise null. These days you could use the diminutive FT-817 as a null detector.

There are also these nice little active SWR/impedance meters such as the MFJ-259/269 and the RX Vector Analyst models from Autek Research that make these sorts of measurement much easier.

Most publications recommend that the gamma rod is made from a thin metal tube, the diameter of which is $^1/_3$ to $^1/_6$ of the antenna element diameter. However, it is worth trying what is to hand and it is interesting to see just what you can get away with. For example, the arrangement shown in **Photo 1** uses 14SWG hard-drawn copper wire as the gamma rod to match a 50MHz two-element beam. The connection from the gamma rod to the antenna element is achieved using a hose clamp, which makes it very easy to adjust.

I also made a gamma match for a reference 144MHz dipole, see **Photo 2**, to be used in a series of comparative field strength measurements. The element was made from 14SWG hard-drawn copper wire (my favourite material for making VHF and UHF antennas). In this case, the gamma rod was the same diameter as the element, and a concentric trimmer capacitor was used for gamma rod reactance correction. No difficulties were experienced in obtaining a good match as shown on the MFJ-269 readings in Photo 2.

The traditional method of reactance correction is to use an air-spaced variable capacitor and enclose it in a weatherproof metal box. No matter how weatherproof you make the box,

FIG 1 © RADCOM 584

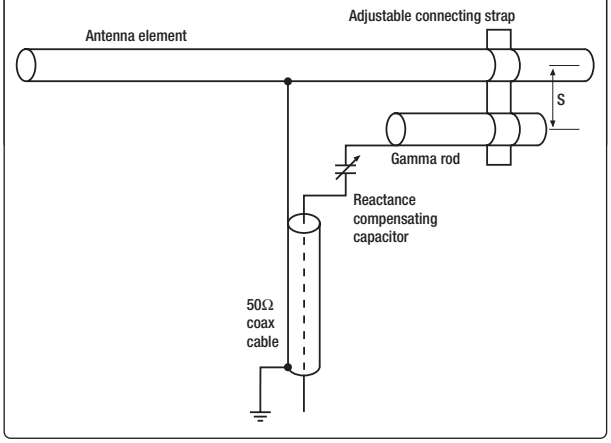


Fig 1
Diagram of the gamma match. With this arrangement, the centre of the driven element does not require an insulator and can be connected directly to a metal boom (plumbers delight construction).

PHOTO 1

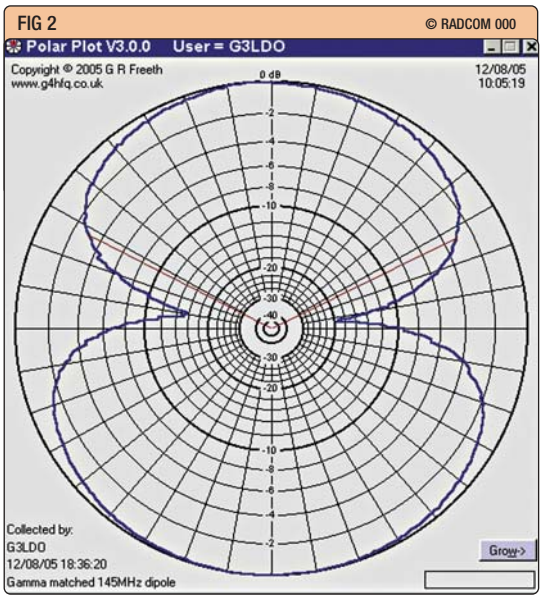
Photo 1
Gamma match on a 50MHz two-element beam using 14SWG copper wire as the gamma rod. Gamma rod reactance is cancelled with a Philips variable trimmer capacitor. Note the low SWR reading on the MFJ.

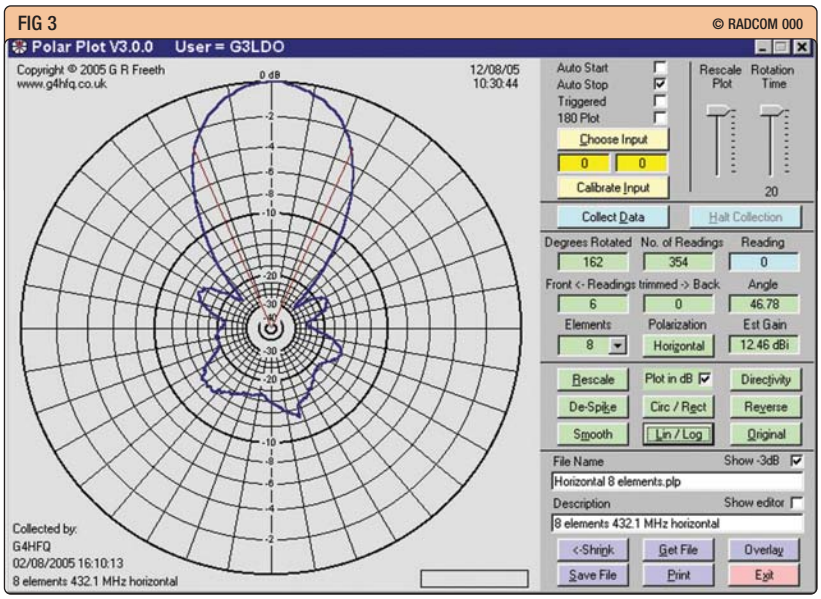
PHOTO 2

Photo 2
144MHz dipole constructed from 14SWG copper wire and using a gamma rod of the same material. The centre of the dipole element is soldered to the copper tube mast. A concentric ('beehive') trimmer capacitor is used for gamma rod reactance correction.

37 The Ridings, East Preston, W Sussex BN16 2TW.

E-mail g3ldo@ukonline.co.uk





corrosion to the capacitor can still occur because of condensation. This problem can be overcome by using a fixed capacitor whose value is determined by experiment with a variable capacitor. The value of the variable capacitor is then measured and a silver mica (or similar) fixed capacitor (or several series/parallel combinations) substituted. This arrangement will handle 100W without breakdown and only requires a smear of grease to achieve weatherproofing.

All experimental evidence so far has not found that the gamma match causes a reduction of SWR bandwidth compared with other feed methods. SWR bandwidth becomes rather narrow when the element is part of a close-spaced Yagi. SWR bandwidth can be increased by using a larger diameter element.

POLAR DIAGRAM SYMMETRY.

In the November 2002 'Antennas', I described a method of plotting a polar diagram of an antenna using a computer and a program called *PolarPlot*, [2] written by Bob Freeth, G4HFQ.

The purpose of this program is to plot the polar diagram of a beam antenna using a signal source, such as a signal generator or QRP transmitter. The variation in signal strength as the antenna is rotated is measured and plotted using a receiver and a computer, using the *PolarPlot* program.

The volume of a beat note, in the SSB or CW mode of a plain un-modulated carrier has good correlation with the RF input level, provided the receiver is operated in a linear manner. The audio output of the receiver is then connected to the line-in socket of the computer's sound card.

In an ideal world measurement of antennas is undertaken using an antenna range, suitably equipped with a full set of laboratory test equipment. For the amateur, though, a more restricted set of equipment must suffice, as described below.

This seemed like a good method of checking to see if the gamma match introduces any asymmetry into a polar diagram. The 2m gamma-matched dipole, shown in Photo 2, was used as the Antenna Under Test (AUT) and energised using a Marconi TF2019A signal generator. The signal was monitored on another dipole located some four wave- lengths distance from the AUT, which in turn was connected to a FT-817.

The result of the plot is shown in **Fig 2**, and shows a degree a symmetry that would be expected using a conventionally-fed dipole.

G4HFQ, aided and abetted by G2HCG, has been experimenting with 430MHz Yagis using what can be best described as a half-folded dipole driven element. The type of feed was described by MW0OPS in [3], based on [4], in a design for a portable 2m VHF Yagi. This rather clever design, which uses a plastic tube as both the boom and element-carrying container, has the most lopsided feed arrangement I have yet to see. However, the polar diagram, shown in **Fig 3**, appears to be as good as any using other feed arrangements.

MORE ABOUT *PolarPlot*

PolarPlot runs on a standard PC that has sound recording capability with a line-in or microphone socket. It has been tested on all flavours of *Windows* running on desktop machines and laptops.

It is now available to radio amateurs free of charge from G4HFQ's website [2].

Fig 2: Polar diagram of the 144MHz dipole antenna shown in Photo 2.

Fig 3: Polar diagram of a multi-element 430MHz Yagi antenna constructed by G4HFQ, using the half-folded dipole driven element described in the text

The *PolarPlot* relies upon the linearity of the receiving audio system for accuracy of plot and the measurement of gain. Whilst the linearity of the average sound card is generally quite good, the linearity of the receiver depends on how it is operated. At a minimum, the receiver must be capable of controlling the RF gain to such an extent as to be able to negate the operation of AGC.

If you can turn AGC off as well as control the RF gain then this is ideal. The AGC on the FT-817 receiver, used as described above, has several settings for the AGC; one of these is OFF. However the 'S' meter bar still works so I am not convinced that the AGC has been switched out. The RF control is very non-linear; however, with a bit of fiddling the receiver could be made to work in a linear manner.

If the sound card's linearity begins to degrade as the peak input level capability is approached (due to overload protection circuitry) the program can be instructed to treat a lower value on the linear part of the curve as peak input.

To measure the transmitting station's polar diagram, the receiving station's antenna remains stationary and the transmitting station's antenna rotates. To measure the receiving station's polar diagram the transmitting station's antenna remains stationary and the receiving station's antenna rotates. The control panel shown in Fig 3 gives some idea of the range of signal processing and scaling arrangements in the program. ♦

REFERENCES

[1] *HF Antennas for all Locations*, L A Moxon, G6XN.
[2] www.g4hfq.co.uk
[3] 'Antennas', *RadCom*, March 2005
[4] www.clarc.org/Articles/uhf.htm

Steve White, G3ZVW

Moorcroft, Crewkerne Road, Raymond's Hill, Axmister, Devon EX13 5SY.

E-mail: g3zvw@talktalk.net

Whatever next

Steve describes a Raytheon device for disabling mobile phones used by terrorists to detonate explosives ♦ The concluding part is presented of the reply by Kenwood's Dave Wilkins, G5HY, to the suggestions raised by delegates at the Stevenage Show, for their ideal 'next generation' transceiver

Cellular telephones provide a simple yet effective way for terrorists to trigger a bomb remotely because all that is required is to send an SMS and trigger the bomb from the beep that the phone emits. But now a portable device from US defence contractor, Raytheon, can quickly identify and disable such weapons. Raytheon's device – which mimics a cellphone base station – includes a 10mW transmitter and a horn antenna to concentrate the signal in a single direction. Scanning suspicious luggage with it tricks a concealed phone into (a) thinking it is in range of a new network base station, and (b) blocks the signal from any genuine base stations in the vicinity. A concealed phone will respond with a handshake signal containing its number. From this a network operator can disconnect it from the real network, preventing it from receiving a detonation call. If the phone in question turns out to be innocent, it can simply be re-enabled.

The Kenwood KDC-W5031, a radio / CD player capable of 4 x 50W output. Would dissipating the heat from a 50W mobile transceiver in the dashboard of a car be more difficult than dissipating the heat from this?

THE NEXT GENERATION – MANUFACTURER FEEDBACK CONTINUES

The first – and at the date of writing only – response to the document I sent to the major equipment manufacturers came from David Wilkins of Kenwood. I presented the first part of it last month and the remainder follows.

"**VHF/UHF transverters** – A very specialist market, perhaps better served by specialist companies? I fully appreciate that those who operate this method are exceptionally enthusiastic about them, but these aren't products that sell in economic volumes. Yes, I'd like to see phantom-powering on HF rigs for masthead gear.

"**Digital Communications** – Yes, the mode of the future (perhaps). Digital input would be a good development for the future.

"**Auxiliary input** – All our current rigs have a proper data connector. The latest rigs also have menu-driven level controls.

"**Modular construction** – 'Modular' equals 'expensive', as far as I'm aware. This is fine, as long as customers are prepared to pay the price of it and accept the inherent lower reliability that all those extra plug-in boards bring.

"**Performance** – Yes indeed! An amateur-bands only receiver – a very interesting concept these days – I appreciate the reasoning and the well thought-out numbers that you've given. A separate plug-in general-coverage receiver would be totally uneconomic and its integration would be a nightmare – far cheaper to just buy a second receiver.

"**IF DSP** – Yes, we do that in our TS-2000 and the AF DSP in the TS-480 is a pretty high standard too. The more filtering the better these days, some might say.

"**User interface** – Pretty well describes the TS-2000/B2000 with an RC-2000 remote head. We have this available now, but the reality is that the optional head is a better seller in the USA where customers often have the 'normal' TS-2000 at home and the B2000 + RC-2000 in their vehicle. An open protocol head would be a nice idea – very good reasoning here. And you can have all the rear-panel plug formats you want as long as you are prepared to pay for them!

"**DIN-sockets** – Interesting comments. We use DIN because, apart from anything else, it has a wide variety of pin configurations (so customers don't put a plug into the wrong socket when the rig has four or five sockets in a row across the back). Did the delegates have any thoughts on an alternative connector style/brand that we can assess?

"**Software** – I think there is a saying along the lines of 'the beauty of a standard is that there are so many of them'. Naturally, we would want ours to be the standard and I'm sure that the other man-ufacturers would feel the same about theirs. Are we talking about firmware here, or (external control) software I wonder?

"**PIN number** – Very interesting again. Probably only of use to a few amateurs, but could be very welcome in the situation you describe. Should be quite easy to implement, I'd have thought.

"**Manuals** – All our current Instruction Manuals are free downloads from the Kenwood USA website. Service manuals are a different matter. Frankly, a modern rig with large numbers of surface-mount components and multi-layer PCBs is simply not user-serviceable. All transceivers will soon be made with lead-free solder, which requires a special soldering iron or workstation anyway, so it will be a well-equipped amateur who is actually in a position to attempt work on his/her rig. A pdf copy of a service manual is around 20 – 30MB, which is OK for broadband download, but not suitable for dial-up.

"**DIN-E slots** – Our present VHF/UHF mobiles run 50 – 60W on 2m. As a matter of principle, I think that putting this right into in the dashboard of your car is asking for trouble (and in a previous point delegates asked for even higher power!)." Here I have to take issue with David, because examination of the Kenwood website shows numerous DIN-E sized car radio/CD players capable of 4 x 50W output. These have got to get hot, so if heat is an issue for an amateur transceiver why isn't it an issue for a radio/CD? Anyway, David continued, "Modern cars are migrating towards multiplexed electrical systems on minimum wiring looms. Add-in all their car control safety features and I would not want to mount my rig in amongst them. And as our car hi-fi division knows only too well, more and more car manufacturers are moving away from DIN slots in their dashboards anyway, for security reasons. Why go to all the trouble of taking out your built-in car broadcast radio when you can use the remote head kit that we all make for our transceivers? You can Velcro the head to any convenient part of the dashboard if you don't want to drill holes in it.

"**Conclusions** – There seemed to be a lot of occasions when delegates wanted modular construction and options. Although I'm not a production engineer I think this is a high-cost form of construction with inherent reliability problems. If customers want such radios, if they accept the cost premium and the (possible) fault rate; manufacturers will answer that demand.

"As I said above, my replies are 'devil's advocate'. They are not in any way intended to seem negative, just realistic. I very much appreciate the time that delegates took to attend the Stevenage Show talk, their consideration of the points raised and their well thought-out conclusions." ♦

NEW NEW NEW

Amateur Radio on the Move

From Your Car, Boat, Aeroplane, Motorcycle or Backpack! - Expert advice for radio operating on the go!

"Amateur Radio on the Move" is a great book filled with advice from people with lots of hands-on, practical experience with the joys, as well as the problems and pitfalls, of mobile radio operating. It covers radios you can use mobile, getting power to run a radio, installation tips, safety, antennas for mobiling, getting rid of the noise, opperating hints and tips and software.

Chapters include:

* Mobile in Your Automobile by Roger Burch, WF4N; Mike Gruber, W1MG; Terry Rybak, W8TR; Mark Steffka, WW8MS
* On the Go with Maritime Mobile by Steve Waterman, K4CJX
* Aeronautical Mobile by Dave Martin, W6KOW
* RV Mobile and Motorcycle Mobile by Al Brogdon, W1AB
* HF Unplugged by John Bartscherer, N1GNV

ISBN: 0-87259-945-0

Non members price £14.99

ONLY £12.74 plus p&p

APRS - Moving Hams on Radio and the Internet

A Guide to the Automatic Position Reporting System:

By Stan Horzepa, WA1LOU

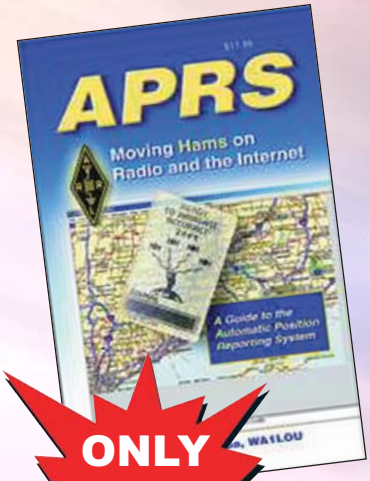
APRS is among the most popular activities using personal computers in ham radio applications. Getting started often requires little more than a VHF radio and computer. With a portable Global Positioning System (GPS) receiver, you have precise position information at your fingertips. Connect the GPS receiver to your APRS station, and you can transmit your location information even as you're moving!

* Track moving objects on maps (other stations, public service vehicles, marathon runners, etc.).
* Display weather statistics and storm warnings.
* Find a hidden transmitter or jammer.
* Access the APRS network on the Internet (even without a radio!)
* The future for APRS applications seems limitless!

In this book, you'll learn how to configure hardware and software to make the best use of your APRS station. Software examples include programs for Windows, Mac and Linux. Follow detailed discussions of APRS operation and technical support. To help you get stated, there's also a complete Glossary of Terms and a summary of APRS software commands.

Size: 212x137mm. 160 pages, ISBN: 0-87259-916-7

Non members price £13.99 plus p&p



ONLY £11.89 plus p&p

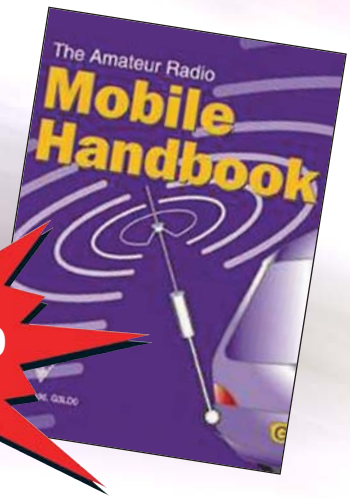
The Amateur Radio Mobile Handbook

This book covers all aspects of this popular part of the hobby. It includes operating techniques, installing equipment in a vehicle and antennas, as well as maritime and even bicycle mobile. This is essential reading if you want to get the most out of your mobile station.Chapters include:

· Going Mobile
· Operating Techniques
· Installing Radio Equipment in Vehicles
· Mobile Antennas
· Fixing an Antenna to a Vehicle
· Kites and Balloons
· Bicycle HF Mobile
· Maritime Mobile
· Experimental Antennas
· Walkabout Mobile

Size: 240 x 175mm, 128 pages, ISBN: 1-872309-77-1

Non members price £13.99



ONLY £11.89 plus p&p

RSGB SHOP

RSGB
Lambda House
Cranborne Road
Potters Bar
Herts. EN6 3JE
Tel. 0870 904 7373
Fax. 0870 904 7374

ORDER 24 HOURS A DAY ON OUR WEBSITE
www.rsgb.org/shop

Radio Propagation - Principles & Practice
Radio propagation is a vital topic for any radio amateur or anyone with an interest in radio communications. This book provides a fascinating description of all the relevant information about radio propagation from HF to VHF, UHF and beyond.
£12.74 members
£14.99 non mmbers

The RSGB Guide to EMC
This timely guide will help you avoid EMC problems by practising good radio housekeeping, and assist you in the diagnosis and cure of any ones which do occur.
£16.99 members
£19.99 non mmbers

VoIP: Internet Linking for Radio Amateurs
This may be the first book ever written about ham radio applications of VoIP! This is a guide to the four primary VoIP systems used by hams: EchoLink, IRLP, eQSO and WIRES-II. The book is designed for beginners who need information on how to set up and use these systems, but it also provides plenty of technical "meat" for those who want to dig deeper and explore how the systems actually work.
£11.89 members
£13.99 non mmbers

CoMmand Computers, Microcontrollers and DSP for the Radio Amateur
This book is for the radio amateur and home experimenter who wants to use modern digital and computer technology to make more use of his/her radio equipment.
£14.44 members
£16.99 non mmbers

All prices plus p&p

E&OE

In practice

Measuring high voltages ♦ Fishing for wires ♦ Superglue tips

MEASURING HIGH VOLTAGES

Q I have a 1mA meter that I want to use to measure a voltage of 1800V DC. How do I calculate the resistor values?

A As I'm sure you know, you basically need a series resistor to convert your 1mA meter into a voltmeter. But when you're working with high voltages, there are several other important safety factors.

If you want the meter to read typically 1800V, a convenient full-scale reading would be 2000V, so that 1800V would read as 0.9 on the meter scale. However, it's easier to do the calculations based on the round numbers of 2000V and 1.0mA. Ohm's law tells us that the total resistance should be 2000V/1mA = 2.0MΩ. The resistance of the meter itself is unlikely to be more than a few hundred ohms, which we can safely ignore because the error involved will be a small fraction of a percent. If you choose a close-tolerance resistor, the main source of inaccuracy in the voltage readings is likely to be the 0 – 1mA meter. A typical commercial meter will have an accuracy of plus-or-minus a few percent.

Fig 1(a) thus shows the basic circuit. But in practice you will never find an off-the-shelf 2MΩ resistor that meets *all* of the necessary requirements:

1. Value = 2.0MΩ, with an accuracy significantly better than that of the meter (2.0MΩ ±1% will be fine).
2. Power dissipation: 2000V x 1mA = 2.0W... but for long life, safety and reliable accuracy you should always avoid operating resistors at their full dissipation rating. In his case, the power rating to aim for should be at least 4 – 5W.
3. Voltage rating: this is what many amateurs forget, with possibly dangerous consequences. Most normal resistors are only rated at about 350V or less. If this rating is exceeded, the resistor may spark over internally. You will either need to use several resistors in series, or special high-voltage resistors. As we shall see, the first option is much more practical.

Since you cannot meet all three of those needs in a single resistor, you have to be creative about combining off-the-shelf resistors in series and parallel. I would base the resistor network on 1.0MΩ 0.5W 1% *metal film* resistors – metal film for reliability and long-term stability. These are available from Farnell at £1.10 + VAT for 50, so you don't need to worry about using several of them [1]. Also, each metal-film resistor only costs a fraction of a penny more than its less reliable carbon-film equivalent.

The voltage rating is the most critical aspect, because it is only 350V per resistor. This immediately tells you that you'll need at least six resistors in series to handle voltages up to 2000V, so your basic building block is 6.0MΩ. The solution is now obvious: three strings of 6.0MΩ in parallel will give the 2.0MΩ you require (**Fig 1(b)**). That is a total of 18 resistors. Since the total power dissipation is 2.0W (see above), each individual resistor is dissipating only 0.111W. Whenever high voltages are involved, the selection of resistors will almost always be dominated by their voltage ratings, not the power ratings.

Could you use resistors with a lower power rating, then? No, because a glance at the catalogue shows that 0.25W resistors have a lower voltage rating; and anyway, 0.25W resistors tend to be no cheaper than the 0.5W components. Of course there are other alternatives for this resistor network, but a further trawl through several catalogues shows that those are less accurate and/or more expensive than the option described here.

Fig 1(c) shows the final practical circuit. You can cross-connect the resistors into paralleled bundles of three, and build the network on a tag-board. Lay the resistors out so that opposite ends of the network are well separated, and use plastic mounting pillars (especially at the high-voltage end). Mount the resistor network somewhere safe, fairly close to the high-voltage line that it is measuring. This ensures that the longer run of wiring to the meter on the front panel is at a low voltage. For additional safety, add a 100kΩ 1W metal-film resistor on the tag-board, across the terminals that connect the resistor chain to the meter. If the meter coil should ever go open-circuit, this resistor will prevent high voltage from appearing on the low-voltage part of the wiring.

Finally, **never believe a zero meter reading when high voltage is involved!** Any meter movement can go open-circuit or stick at zero, while lethal voltages are still present. Before you ever touch a high-voltage circuit, **always** follow these three safety steps:

1. Switch off the power, **and also** unplug from the mains. If you're working on either mains or HV DC circuits, **always** make sure you have to take at least **two** deliberate actions before dangerous voltages

FIG 1 © RADCOM 585

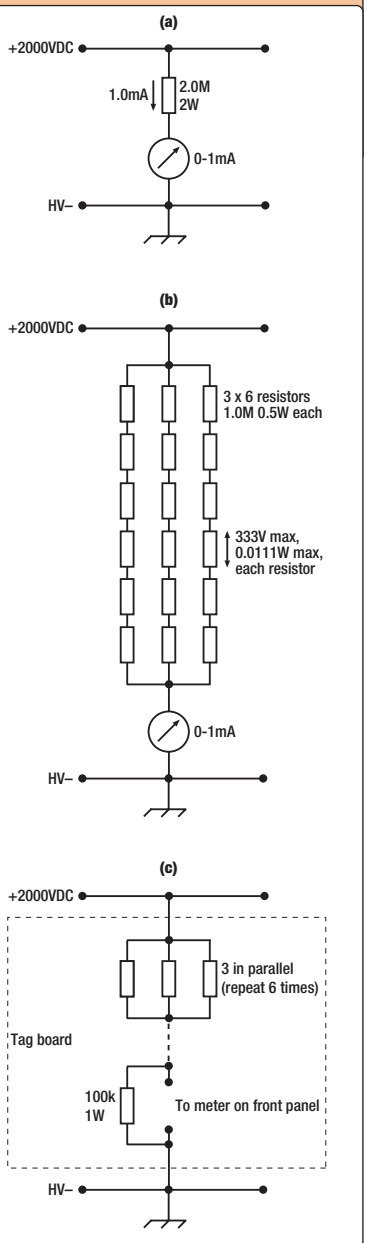


Fig 1: Measuring 2000V with a 0 – 1mA meter. (a) This basic circuit is not practical. (b) Three strings of six resistors meet all requirements. (c) Practical circuit includes a 100kΩ safety resistor.

Ian White, GM3SEK

c/o RSGB HQ.

E-mail: gm3sek@ifwtech.co.uk
Website: www.ifwtech.co.uk/g3sek

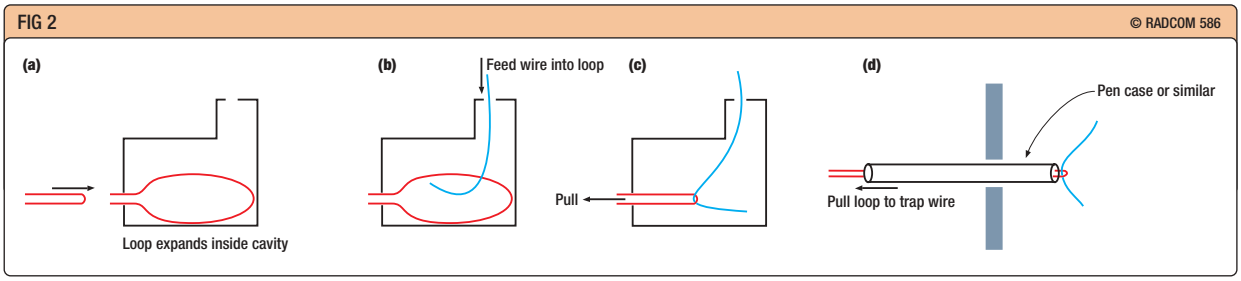


Fig 2: (a) – (c) Use an expanding loop to snare a wire inside a closed cavity. (d) A tube helps to trap the wire more tightly.

can reappear in the equipment. Don't ever put yourself in a situation where just **one** equipment fault – or just **one** error on your part – would injure or kill you.

2. Wait for the HV capacitors to discharge. By all means watch the meter going down, but don't bet your life on what it says!
3. When the HV seems to have disappeared, use an insulated screwdriver to short-circuit each capacitor in turn.

Do **all three** of these things, methodically, **every time**. Working with high voltages is obviously less safe than sorting QSL cards... but it doesn't have to be dangerous.

FISHING WIRES AND CABLES

Q I need to thread a wire through a totally-enclosed cavity, in through one hole and out through another. How can I do it?

A You don't say how large the enclosed cavity is, so here are a few possible solutions. Most of these tricks are well known to electricians, who have to deal with this problem routinely.

The first group of solutions is based on pushing the wire into the cavity, 'snaring' the free end from the exit hole, and then pulling it out. **Fig 2(a) – (c)** shows the basic principle. You're going to need something that can be folded double to be pushed in through the exit hole, but will then spring out into a large open loop. Lawn trimmer line works very well on a small scale, while a flexible steel ruler is good for larger cavities behind a wall, floor or ceiling. Somehow you need to guide the wire from outside the entry hole and make it pass through the loop. Then you can carefully pull both ends of the loop and the wire through the exit hole. Obviously there will be some cases where the wire that you want to thread is either too stiff or too flexible to allow this trick to work. In that case, start with something else that *can* be threaded through successfully, and then use that to pull the wire through as a second stage.

If you need to grip the wire more firmly, feed the loop in through a rigid tube as shown in **Fig 2(d)**, so that you can pull the loop tight and trap the wire against the end of the tube. On a small scale, this can be done using a loop of heavy monofilament fishing line threaded through an empty pen case. For example, a microphone pickup wire can be pulled through the enclosed body of a musical instrument by 'keyhole surgery', working entirely through the 10mm hole for a tubular jack socket. The socket is then soldered on to the cable, pushed back into its hole and glued into place. This makes very neat job, leaving no clues about how it was done.

But what if you can't manage to feed the wire into the waiting loop? You then need some means of pushing or pulling the wire to a location where you *will* be able to grab it and pull it through. For household wiring jobs, I have had good results using the sectional 'fishing rod' kit from Screwfix [1]. The kit consists of ten 1.0m sections of thin plastic rod that screw together to make up any length, or even two or three separate rods. These rods are basically straight, and rigid enough that they can be pushed for several metres without buckling; but they are also flexible enough to be persuaded around bends. The kit includes a screw-on needle eye and a screw-on hook, which you may often have to use with two rods. The rod with the eye pushes the wire into the cavity and guides it into the general region of the exit hole, where you fish it out with the hook on the second rod. As always, the main requirement is to get something – almost *anything* – threaded right through, and then worry about pulling the wire itself. An accessory kit includes a magnetic end, which can be used to grab a steel nut tied to the end of a very light thread, which in turn can be used to pull something stronger. There are several other products available for fishing cables, some cheaper and others more expensive, and each one has its own good features. At £15.29, the 10 x 1.0m rod kit is medium-priced and seems to work well for a lot of jobs. One important warning, though: as with screw-together drain rods, only twist the end *clockwise*, or else you'll be sorry!

SUPERGLUE TIPS

These are follow-ups from the December 2004 column on adhesives, and are specifically about cyanoacrylates or 'superglue'.

From Richard, G3RWL: "When you buy superglue, there is always more than you need, and it tends to go off before you can use it all (typically six months to a year). The solution is to stopper the bottle tightly and keep it in the fridge; it'll remain usable for several years.

"When superglue is getting somewhat old, the setting time is longer, sometimes minutes. To speed it up, put it under water (remember that it works by moisture and the exclusion of air). This isn't always convenient, but if you can hold the joined pieces together, a dip into a washing-up bowl full of water for half a minute usually does the trick."

From Peter, GM8GAX: "If you make a mistake when using superglue, the bond can easily be released by applying a little heat. Heat to approximately 150 – 180°C and you will be able to separate the joint quite easily. Clean off the surfaces and start again. Obviously this tip applies mostly to glued joints between metal components, as many thermoplastic components can't withstand the temperatures involved." ♦

REFERENCE

[1] Follow the links from the 'In Practice' website.

Pat Hawker, G3VA

37 Dovercourt Road, London SE22 8SS.

TT

Oscillators – valve or FET? ♦ VHF oscillators with inverted-mesa quartz resonators ♦ Aluminium - basics & care of ♦ Soldering to aluminium ♦ Lead-free solders

OSCILLATORS – VALVE OR FET?

'Oscillator Stability with Valves and FETs' ('TT' December 1991, see also *TTS, 1990-94,* p122) reported the experiences of Ray Cracknell, G2AHU, who had found that LC oscillators based on valves were less sensitive to changes in local ambient temperature than those using FETs and could provide better long-term stability, I noted then that: "One of the very first widespread application of solid-state technology in amateur radio was to provide an LC oscillator that reached thermal stability from switch-on in a matter of seconds rather than the 20 minutes or so often required for valve oscillators. But this did not – does not – mean that a bipolar or FET oscillator is immune to changes in ambient temperature, either changes in shack temperature or changes resulting from the heat generated within high-power stages whether thermionic or solid-state.

"FETs with their high internal capacitance (Miller effect) and silicon construction can be difficult to compensate effectively over the temperature cycling that occurs in practice. A valve, with its much greater self-generated heat, tends to settle down after its (very long) warm up period and then becomes much more resistant to changes in ambient temperature. FETs have high input capacitances, sensitive to temperature changes; also to the varactor effect."

G2AHU was prompted to investigate a comparison of valve and solid-state oscillator stability when he found that, in practice, there was considerable discrepancy between the stability quoted for FET VFOs and their performance outside laboratories or temperature-controlled buildings. At the time, his shack was in a loft and suffered from wide temperature swings. He investigated temperature effects on FET oscillators by constructing an 11MHz FET test oscillator using a 2N3819 inverted-Hartley oscillator and 2N3819 source follower and buffer (Fig 4 of the December 1991 'TT') in a double-screened enclosure with heat insulation and including a 6V heater and thermostat. He showed that the output frequency swung from plus 3kHz to minus 3kHz when the unit was slowly heated from 20° to 60°C over a period of 140 minutes (including a change of 4kHz in the first 20 minutes).

This could not match the stability of his 18 – 20MHz VFO that used a 6J6 double-triode valve as a Kalitron oscillator, with 6CW4 (Nuvistor) cathode-followers. He wrote: "I found that the long-term stability of the FET oscillators was inferior to the 6J6 oscillator which can also produce a T9 note on considerably higher frequencies than 18 – 20MHz. But then we can't turn back the clock, can we?"

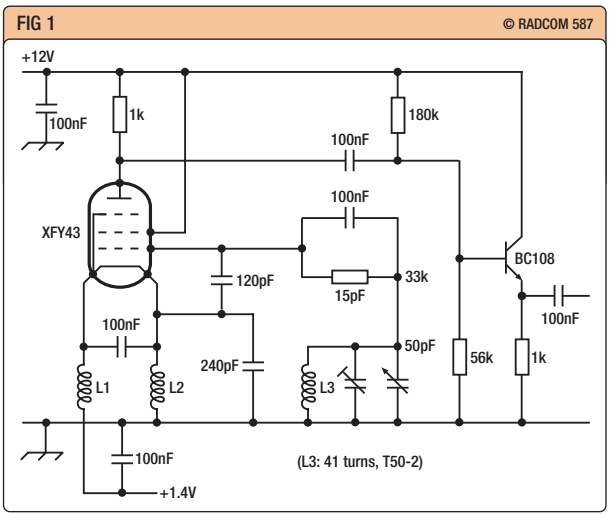
The main source of frequency/temperature drift in a valve VFO is usually the effect of the heat generated by the valves on the inductor and (to a less extent) on the variable and fixed capacitors forming the resonant tank circuit. The effect of heat (internally-generated or otherwise) on the small inter-electrode capacitances of the valve is relatively insignificant and can be made more so by a high-C tank circuit. Temperature compensation of the tuned circuit is reasonably straightforward. An alternative approach, that has been used in the past, was to separate the oscillator tank-circuit entirely, or by effective heat screening, from the oscillator/transmitter enclosure containing the valves, connecting the tuned circuit via short coaxial cables. The valve itself is thus a stable component although the heat it generates will effect adjacent components.

I was reminded of the 15-year-old experiments by G2AHU by an article 'XFY VFO', by Dr Andrew Smith, G4OEP (*Sprat,* No 123, Summer 2005, pp18 – 20). To quote selectively: "Conventional wisdom has it that valves get hot, they heat up other components, they create warm-up drift, they are 'old hat'; FETs and bipolars dissipate only milliwatts and avoid all that; they are 'the way forward'. I have never seen this dogma challenged [but see above – *G3VA*]. So when I made a valve VFO, I was amazed to find that a circuit with an EF95 was no more unstable than an ordinary bipolar design. This set me thinking. Temperature variations in a valve are extreme compared with a transistor – 2 or 3 watts total dissipation, and parts at red heat, as against 20mW or so, and not even barely warm... Valves must be basically much more thermally-stable than semiconductors, in which everything involves exponential functions of temperature. So reduce the heating effect and you must have a winner. Next stop – the junk box; out popped a XFY43 subminiature wire-ended pentode with a 1.4V, 10mA filament and 23V, 0.6mA anode rating, probably intended for hearing-aid applications. It will oscillate on an 'HT' of 8V, 0.4mA giving less than 20mW of total dissipation – no more than an average bipolar.

The result is a very simple VFO with spectacular stability. There is simply no warm-up drift. On a receiver there is an initial 'whoop' followed by an absolutely steady tone, and a frequency counter tells the same story. It reaches a steady condition in less than a second – the nearest thing to a crystal you can hope to find. What surprises me most is that I have never seen the use of miniature low-power valves recommended for VFOs, so perhaps the idea is 'new'. The thermal coefficients of the inductor and capacitors in the tuned circuit have the usual effect if you attack the circuit with a hair-drier, but these can be juggled or a simple compensating capacitor can be made using items found around the house... Don't be tempted to try using varactor tuning unless you want to ruin the VFO, and observe all the usual rules – solid construction, rigid screening, stable variable capacitor with proper bearings, etc. Although relatively insensitive to voltage it is best to stabilise the supply if intended for use in a transmitter. Resist the temptation to derive the heater supply from a pair of forward-biased diodes, use a dry cell for best results.. I was lucky to find the XFY43, other possibilities include the 6088, XFW10, XFW20 and XFW30, the last three having 0.625V filaments. The DF96 and DF97 with 1.4V, 25mA filaments are common B7G types designed for a higher anode voltages but might be worth trying at lower voltages."

G4OEP's 5 – 5.5MHz VFO is shown in **Fig 1**. It comprises an electron-coupled Colpitts oscillator. The directly-heated filament makes it necessary to have two filament chokes (L1, L2) or alternatively a choke with 10 bifilar turns on a 8mm ferrite bobbin. Further details, including the con-

Fig 1
The 5.0 to 5.5MHz VFO using a miniature, wire-ended pentode hearing-aid valve generating very little heat and found by G4OEP to reach thermal stability in a second or two with the VFO offering better stability than when using an FET or bipolar transistor. (Source: *Sprat*, Summer 2005)



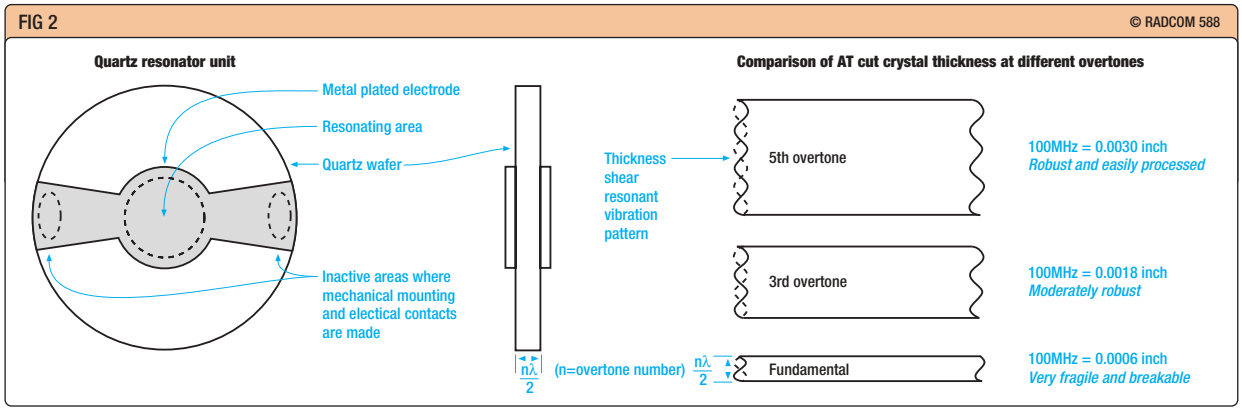


Fig 2
Basic form of conventional AT-cut quartz crystal resonator showing the extreme thinness and hence fragility of a fundamental-mode 100MHz crystal. (Source: *RF Design*, June 2005)

struction of a simple bimetal thermal compensator are given in the *Sprat* article. Just one word of warning (applicable to both low-power valves and solid-state oscillators): higher-power oscillators can result in reduced noise sidebands.

VHF OSCILLATORS WITH INVERTED-MESA QUARTZ RESONATORS

A feature article 'Novel High-Frequency Crystal Oscillator Cuts Jitter and Noise', by Dan Nehring (*RF Design,* June 2005, pp32, 34, 36, 40, 42) carries an editorial note: "The inverted Mesa resonator offers a high-performing alternative to SAW-based oscillators and other bulk resonator types which use a noisy PLL or other such parametric multipliers that also multipliy noise. Oscillators have been developed to demonstrate the effectiveness of this design technique."

To quote from Nehring's introductory notes: "The fast data rates of today's digital systems continue to demand faster and better clock signals with low jitter and phase noise attributes – not to mention small form factors. Crystal oscillators are typically the devices that are providing the originating timing signals for these systems. Oscillators with internal phase-lock loops (PLLs) that generate a high-frequency output from an easily-produced low-frequency crystal are often used. However, the degraded phase jitter of this approach is prohibitive for many new applications. Other techniques, such as the use of surface acoustic wave (SAW) devices, have cost, availability and frequency-stability issues. We take a look at the design process, trade offs and the resultant benefits of oscillators built with pure analogue circuits and no frequency multiplication for providing the clock signals for jitter-intolerant systems."

Fig 2, adapted from a more detailed illustration in Nehring's article, provides an overview of quartz crystal resonators. Basically, the frequency of an AT-cut quartz resonator is determined by the thickness of the quartz wafer, with the frequency increasing as the thickness decreases. This is achieved by mechanically sawing and then lapping the wafer to the desired thickness. This results in fragile resonators, with the processing becoming more and more difficult as the resonant frequency increases. To achieve higher frequencies without reducing thickness, crystals can be resonated at an overtone (approximately odd-harmonic) frequency. Conventional flat wafers cannot be produced economically at fundamental frequencies higher than about 50 or 60MHz, limiting third overtone crystals to 150 to 180MHz at the most. Above this, higher overtones must be used. Nehring points out that fifth, seventh etc overtones are available and can be used in appropriate designs but, as the overtone number goes up, the resistance of the crystal inevitably increases and the number of spurious modes increases. For high performance, the lowest possible overtone available economically should be used.

I recall that pre-WWII, very few amateurs possessed 14MHz crystals, mostly using 7MHz crystals with frequency-doubling stages. The general use of an overtone resonance (in which there is no output in the fundamental mode) seems to have derived largely from US military equipment. Overtone techniques became widely used, post-WWII, by amateurs for VHF equipment.

Over the years, there has been a long struggle to produce higher frequency crystals at an economical cost that can utilise the lowest possible overtone at VHF. Dan Nehring claims that the major solution to this problem has been the development of the inverted Mesa-type resonator. 'Mesa' is derived from the Spanish word for 'table' - thus an inverted-Mesa implies a resonator with a central thin part of the wafer that determines the frequency supported by a thicker outer ring: **Fig 3**. He writes: "This type is effective in driving down the overtone number that can be used to hit any particular frequency. The inverted-Mesa is ideal for creating fundamental mode and third overtone-mode resonators up to 600MHz or higher." His firm, Valpey Fisher Corporation, is producing a tiny VF266 surface-mounted oscillator package (footprint 5mm by 7mm). He concludes, *inter alia,* "The development of better-performing (higher-frequency, lower-noise, smaller package) oscillators continues... The development of the inverted-Mesa resonator has produced a higher-performing alternative to SAW-based oscillators and other bulk resonator types which use a PLL or other such parametric multiplier that also multiplies noise..."

It is shown that the phase noise is generally 20dB lower than for competing PLL clock solutions. While inverted-Mesa resonators may not have an early impact on amateur radio, it is clearly a development worth watching.

ALUMINIUM - BASICS & CARE OF

John Rosindale, G0GUO, noted with interest the recent 'TT' items on cleaning silver-plated variable capacitors by immersing them in a solution of warm baking powder with the plates in contact with some aluminium foil. He writes:

"I can confirm that the reduction of the brown silver sulphide to a shiny silver surface requires an electron flow - so a good electrical contact is needed between the aluminium cooking foil and the object being cleaned. The electrons are provided by the aluminium as it dissolves. It is useful, from time to time, to turn the capacitor around on the foil; this ensures a more even cleaning operation. Current flow is akin to problems of 'throw' in the electroplating of irregular objects

"Aluminium is one of only a few metals to be attacked by both acids and alkalis. Baking soda (sodium bicarbonate) is very slightly alkaline, especially if partly changed into sodium carbonate by very hot water. Washing soda (sodium carbonate) is cheaper than baking soda and quite a bit more alkaline, although still acceptable for this cleaning job. 'Caustic soda' (sodium hydroxide) is too alkaline; the aluminium foil is attacked too quickly and there is a release of hydrogen gas to the detriment of the electrolytic action required to reduce the brown silver sulphide.

"Aluminium is strange in other ways - although plentiful in the earth's crust, it is a relatively reactive metal and is always extracted from bauxite (its oxide) by electrolysis. At the time of its discovery it was a curiosity, more expensive than gold; this was because it was then extracted from bauxite by using even more reactive metals to 'grab the oxygen'.

"Those of us who have spent hours 'chassis bashing' appreciate the soft-

ness of aluminium, even though it can have a bad effect on files, drill bits, etc. This softness presented a 'creep' problem when electricity boards used steel-cored aluminium cables many years ago when there was a world shortage of copper and it was necessary to re-design clamps for such cables.

"Chemically speaking, aluminium is quite reactive once the protective oxide layer is breached. Aluminium dust is used in 'thermite mixture' and reduces iron oxide to molten iron in a very spectacular way. Aluminium powder, with a good oxidising agent, has even been used in bombs!

"This chemical reactivity makes problems for radio amateurs when aluminium antenna elements are fixed with steel hose-clips or when brass or copper bits are used to connect coaxial cables. I live in a coastal region and the salt spray hastens the demise of VHF dipoles and 'Slim Jims'."

The problems encountered in the use of aluminium alloys for antenna elements, masts etc have been discussed on a number of occasions over the years in 'TT', but bear some repetition. In April 1991, Dick Biddulph, (M0CGN, formerly G8DPS) drew attention to the need to avoid contact between copper and aluminium in antenna installations, in addition to other precautions including the application of grease, lanolin or RTV silicone rubber. In June 1991, Steve Henderson, ZL1AOC, drew on a publication of the New Zealand Building Research Association concerned with combatting corrosion in TV receiving arrays. This stressed the effects of marine atmospheres in a country where most populated areas have high concentrations of chloride-containing sea-salt aerosol (which, like the sulphur-dioxide of industrial atmospheres, promotes corrosion). Incidentally, there is nowhere in England more than 72 miles from the sea, and industrial pollution affects most populated areas.

ZL1AOC pointed out: "All unprotected metal surfaces, except the few 'noble metals' such as gold and platinum, corrode or oxidise to some degree. How long this takes before it becomes a problem very much depends on the working environment. All too often one hears of an antenna where the telescopic tubes of an expensive Yagi array can no longer be adjusted or a trap in an antenna has deteriorated... Typical examples include: tinned-copper braided pigtail connections from a balun to a wire dipole completely disintegrated; alloy-aluminium bolts terminating the wire connections to traps in a wire dipole corroded to the extent that some had fractured; telescoping tubes of a Yagi corroded and seized, offering high resistance between sections; element mounting bolts rusted with corrosion to the extent that a VHF element may fall off after only a few months use; two-piece element clamps of diecast metal corroded such that the element sections no longer provide a continuous electrical path."

ZL1AOC continued: "Amateur radio antenna arrays can have a large number of tubular sections, many of them being required to have telescoping adjustable sections. If these are not protected when they are assembled, it will be impossible to dismantle them at some later date. Hardware supplied with some arrays is electro-plated; with others, stainless steel is provided. The preference is always to use stainless steel hardware – a point worth exploring when contemplating the purchase of a new antenna. Rust not only weakens elements but can result in the formation of electrical diodes and their 'rusty bolt' effects. Surplus compound should be cleaned off and the joint wrapped to seal it completely with a self-amalgamating tape

"In assembling an antenna for the first time, or after repairs, care should be taken to prepare all sections to prevent the entry of water. If a telescoping section is involved, all signs of corrosion should be cleaned off the metal. The sections should be liberally coated with grease or better still with one of the anticorrosive preparations. When the position of the sliding joint is finally determined [remember that element resonance lengths will be affected by the operational height above ground – *G3VA*] the surplus compound should be cleaned off and the joint wrapped to seal it completely with a self-amalgamating tape. If you have access to a hot-air gun, the joint could be covered with heat-shrink tubing. In assembling antenna elements to traps or to a boom, all the nuts, bolts, washers and clamps should be completely coated with a suitable compound... Always ensure that drain-holes in traps and other components are clear and face the ground, so that any water that may have penetrated the trap will drain away. Element tubes with open ends should be plugged to prevent water from gaining entry... Corrosion is frequently found on die-cast components, including clamps and die-cast casings of rotators..."

'TT', July 1993, included notes based on a *QST* article by Scot Roleson, KC7CJ, who had experienced a problem with "a trusty Butternut antenna" just six months after installing this in the dry Californian climate. "One day it worked fine; the next it wouldn't load properly. As I dismantled the vertical, I noticed a fine white powder at each joint, corrosion had crept into every connection although, on installation, I had tightened each clamp and bolt securely."

KC7CJ explained how the use of different metals in a situation where an electrolyte is present at the junction results in bi-metallic corrosion, particularly where the metals are well separated in the galvanic series, see **Table 1**. He wrote: "Tin and gold are metals that illustrate how troublesome bimetallic corrosion can be. Both metals are commonly used to coat electrical connectors yet are galvanically remote. Sometimes connectors with these pins coated with these metals are inadvertently attached to each other. If the contact pressure is insufficient to keep out moisture or if in an environment where electrolyte forms easily, the tin surface oxidises. I've seen this happen in PCs, where plug-in cards with gold-plated edge connectors are plugged into tin-plated motherboard connectors. The resulting problems are usually intermittent and difficult to locate. Simply removing a card and reinserting it may remove enough oxide that the problem disappears.

"Aluminium and copper are not very galvanically compatible but connection of copper wires to aluminium antenna elements is often necessary. This problem can be minimised by tinning or solder-plating the copper wire, forming a gas-tight seal between the copper and plating. Then use stainless-steel hardware to secure the connection... use a stainless-steel washer between an aluminium surface and a tinned wire, or lug, connected to it... Another way to form a gas-tight seal with hardware is to use star washers which break through oxides and cut into mating surfaces [although] repeated assembly can damage a surface, possibly providing a path for moisture to

Table 1
Relative galvanic series in sea water

ANODIC END
Magnesium
Zinc
Aluminium
Mild steel
Iron
50 / 50 lead / tin solder
Stainless steel (US type)
Tin
Nickel (active)
Brass
Aluminium bronze
Copper
Nickel (passive)
Silver
Gold
CATHODIC END

FIG 3 © RADCOM 589

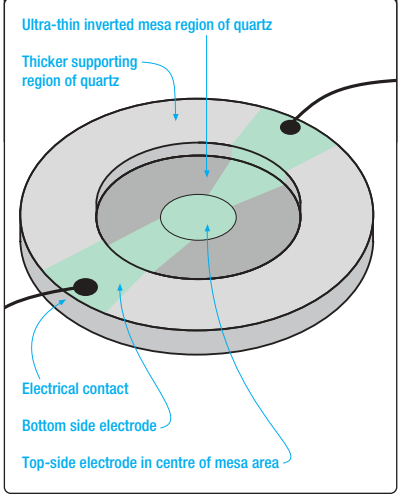


Fig 3
The inverted-Mesa quartz resonator. The central portion is chemically etched to make it thinner than the outer ring. The central part forms a thin VHF resonator , supported and made more robust by the thick outer ring of quartz. The technique provides a method of producing fundamental and low-overtone crystals in the VHF range. (Source: *RF Design*, June 2005)

enter the joint.

"Making and keeping good electrical connections in antennas is really simple – as long as you pay attention to the basics. The best way is to start with galvanically-compatible materials, then clean all connections well before assembly. To make sure these connections stay good, seal all contact points so moisture can't enter the joint. Electrical contacts occur between microscopic bumps and points where the metals meet… A smooth, clean surface ensures that there will be lots of these points and little between them to get in the way. For antennas, I've found it's best to first buff all joining parts with steel wool, emery cloth or a wire brush, then with a nylon scouring pad… For metal tubing, its important not to forget to clean the inside surfaces of telescoping parts. I wrap steel wool around a pencil or form it into a pencil-like shape so I can get to the tubing's inside surface. Finally, I use a clean rag to wipe off any powered metal and oxide. I do my best to refrain from touching the mating surfaces and contaminating them with body oils (use cotton gloves during antenna assembly is a good idea).

"Joint compounds, unfortunately, don't last forever. They harden and crack, or with time and temperature, simply flow away from joints. For this reason some sort of finishing barrier or overcoat is needed, such as plastic tape, paint, or silicon rubber sealant (bathtub caulking). Choose a material that is flexible and resistant to ultraviolet light. Many paints and plastic tapes eventually harden and become brittle from exposure to UV light… This argues for regular maintenance. Plastic tape is easy to remove and replace."

In 1978, Dick Biddulph, in discussing the protection of external metalwork had found that bolts coated with lanolin on his 144MHz array were easy to undo even after some five years in service without maintenance. The lanolin was dissolved in natural turpentine (*not* white spirit) and applied to the threads. After tightening the nuts, further solid lanolin was applied to the exposed threads.

A further tip is shown in **Fig 4** as a means of reducing metal fatigue in tubular sections due to wind flutter.

SOLDERING TO ALUMINIUM

Back in 1978, a series of items in 'TT' noted the problems that are encountered when trying to make soldered connections to aluminium. For example, I reported a *QST* a tip by K0JFN: "An old trick for soldering to aluminium is to place a drop of oil on the aluminium and then scratch the metal with a knife or other sharp instrument until the area to be soldered is shiny. Apply a soldering iron and resin-cored solder. After the solder has taken, wipe the oil from the surface. A very neat solder base should then appear."

FIG 4 © RADCOM 590

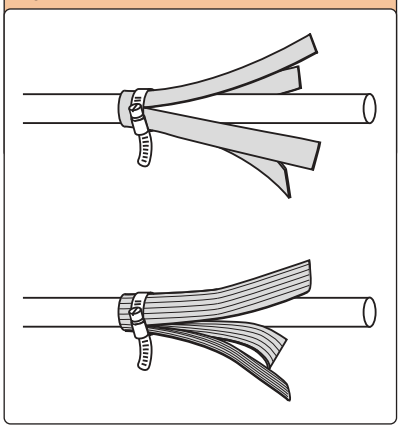


Fig 4
A method of reducing metal fatigue in tubular beam elements caused by flutter-type oscillation brought about by vortex shedding at specific, relatively-low windspeeds. Energy absorbers can be made from split rubber hose pipes or flat rubber or pliable plastic material. An alternative technique is to fill the inside of the tubes with the type of foam intended for sealing and insulating cracks and holes in buildings. Metal fatigue can cause the elements to fracture if the oscillation continues over months or years. (Further information in 'TT' December 1993)

However, in July, I warned that Harold J Reed, a professor in metallurgy, had pointed out in *QST* that the real problem is not that of making a good bond to aluminium but of making one that will last: "There are dozens of ways of making a good bond to aluminium, but no inventor has solved the corrosion problem that causes failure of the bond. Aluminium is an extremely active metal and, were it not for a self-repairing, protective oxide coating the metal and its alloys, could not be used for any commercial purpose. When aluminium is bonded to a metal or alloy (eg a solder) of considerably lower activity, the protective oxide film either cannot form or is imperfect. The aluminium becomes strongly anodic to the solder and is converted at the interface to corrosion products having little or no strength, and the bond fails. This may take a few hours, weeks or months, depending on the system and environment, You can be sure failure will occur sooner or later." What was required, he suggested, was a solder whose activity is the same, or nearly the same, as that in aluminium or its commerciql alloys.

Dick Biddulph (September 1978) agreed that an exposed soldered joint made to aluminium is subject to corrosion that will eventually weaken the bond, nevertheless such soldered joints are used widely in the electrical power industry. He commented: "The corrosion can be slowed up if, after soldering and cleaning off the flux, the joint is covered with adherent grease such as anhydrous lanolin and applied to the warm metal. An alternative, better for indoors, would be to heat the joint (again after cleaning) and coat with an epoxy resin such as Araldite."

LEAD-FREE SOLDERS

Meanwhile, the date is coming ever closer (July 1, 2006) when the use of lead-free solder will become compulsory throughout the European Union – a directive that fills many electronics service engineers as well as amateurs with considerable foreboding It was noted in 'TT' October 2003 (see also *Technical Topics Scrapbook 2000-2004)* that, in most solders, the lead will be replaced by copper (or silver) with its appreciably higher melting point of tin-copper solders typically some 40 – 50°C higher than tin-lead solders, depending on the percentage of copper with its melting point of over 1000°C. Some television manufacturers including Sony and Panasonic are already using lead-free solders.

Adrian Gardiner in 'Bench Notes' (*Television,* June 2005, p490) notes that the removal of lead from solder has introduced a number of complications mainly arising from the increase in melting point. This can result in quality and stability problems, but also reduces processability, because of lower wetting and changes in flow behaviour.

He writes: "The new lead-free alloys are more temperature-sensitive than conventional solder. It's important therefore to avoid increasing the process temperature as the longer cooling time can cause microcracks. In addition, higher soldering temperatures can result in black layers on the soldering tip. This makes it unwettable, causing early fallout (charred flux, oxidised tin, tin-copper-iron fusion)."

A problem with using very high bit temperatures is that the flux burns off immediately and cannot work effectively. Flux is essential to soldering to deoxidise the metal surfaces and it facilitates diffusion of the metals into each other. Gardiner adds: "The way to overcome this is to be able to transfer increased amounts of thermal energy rapidly at lower temperatures. And this calls for hand-held soldering tools that are more efficient technically". He uses a Weller WSD81 soldering station, a more expensive tool than the conventional hand soldering iron.

In the August 2005 issue, a letter from Geoff Darby, a respected *Television* contributor, expresses his concern at the change to lead-free solders: "It has yet to be explained to me satisfactorily exactly what the issue is with leaded solder, particularly if a proper and responsible approach to the recycling of end-of-life electronic equipment is adopted. I fail to see how the lead in solder could have an appreciable effect on the public. He asked a friendly plumber of his experiences only to receive an unprintable reply (plumbers have for some time been banned from using leaded solder with open pipework systems for hot and cold water). He claimed that lead-free solder is a much more difficult material to work with even with a blowtorch. He said that it has completely different flow and resetting characteristics and that it is much more difficult to make a completely watertight join. The solder tends to melt very suddenly and rolls around in a less-controllable fashion. For electronics servicing there are warnings against mixing leaded and unleaded solders, and this would seem to include using leaded solder to repair a PCB where the manufacturer has used lead-free solder see Fig 4 of July 'TT'. I cannot help feeling that, for radio amateurs, lead-free solder is bad news. ♦

Now available for 2mtrs or 4mtrs

TETRA COMMUNICATIONS LTD

PHILIPS/SIMOCO

FM 1000 2mtr or 4mtr MOBILE

Now available fully converted to cover the entire 2mtr or 4mtr band with this top of the range model. Frequency selection via numeric keypad as well as selection via up/down buttons in 12.5KHz steps Variable power in 5w 10w 15w 20w 25w. Variable squelch via up/down buttons, squelch defeat button. Complete with original mic, speaker, power lead and mounting bracket. Six months service exchange warranty (However you break it, you pay for the repair)

£65.00 - £7.50 p&p

EXTRAS
2m, 4m, 6m Base station Aerials £29.95
2m, 4m Mobile Mag mount Aerials £19.95
FM1000 Powerleads £10.00
FM1000 Microphones (copy) £15.00

See us at the **Leicester Show** Stand W10B

NewsFlash!

General Electric Rangr 6Mtr

The GE Rangr was designed jointly between the General Electric Company (USA) and the Japanese Radio Company (Japan). The main radio unit was manufactured by JRC to the highest standard as the majority of the radios we destined for the internal security forces of the USA. The radio is available in three bands Lowband 50Mhz Midband 150Mhz and UHF 440Mhz. The Rangr is available in two models (The Rangr and the Rangr 89) with two versions in each band (60w and 110w) Radios with 50 within the serial number are earlier than those with 51 within the serial number (Rangr and Rangr 89 respectfully). P7 denotes 60w P8 denotes 110w.

All of the units that we are supplying are the following type P19C852051P8 110w model with 32ch (The radios will be set at 50w ONLY) The radio is in fact a 64ch however the control head has only the facility for 32ch. I am sure that before very long some brainy person will find a modification to throw a switch to give the extra 32ch (We will keep you informed) These radios are ALL USED with only one owner and have been removed fully operational from New York Police Department Vehicles mainly Police Cars (95%). FYI They have gone to 800Mhz (!!!)

We have learnt our lesson on the supply of the FM1200 4Mtr radios, so the price of the Rangr on any 32ch of your choice with in the 6Mtr band is £75.00 plus £7.50P & P you send us a cheque or ring with your card details (you may visit and we will accept cash) we will then select your radio give it a number and by means of a post card or E-Mail send you a confirmation. We will also keep your name and address & call sign (Data Protection Thingy) with your permission so that we may update you on delivery and also any modifications that the brainy person comes up with.

CASH / CHEQUE / DOLLARS / EURO's / VISA / MASTERCARD / AMEX

If you have any questions regarding the above then you are welcome to give me a ring on
01604 234333 or 07836 600700 Gary G6NYH
TETRA Communications Ltd, Victoria Chambers, 1 Victoria Road, Northampton, NN1 5EB
Or by the written word to G6NYH@AOL.COM www.tetra.tv

David Gould, G3UEG

2 Mayfield Close, Old Harlow CM17 0LH.

E-mail: david.gould@btinternet.com

There's a remote possibility...

This final part covers a few additional aspects of the second system, other miscellaneous details which I have discovered along the way, and plans for the future. It also discusses some of the alternative methods of implementing a link between the two sites and covers the pros and cons of each. Finally, I have to produce a report to the RSGB and Ofcom by the end of 2006; however, before I start on this, I would like to undertake a wider consultation with others who are interested in remote operation, and so I would like to use this article as the starting point for this discussion.

I am not a CW operator, but I have spent some time proving that remote CW is a feasible option using TRX-Manager and the TS-480; in fact, there are three possible ways of generating CW remotely.

- CW can be generated by CAT commands within the TS-480 itself, which is the approach I took. *TRX-Manager* has a CW tool which is a essentially a text-entry box, but also has some memories from which standard information can be recalled easily. This text is sent as CAT commands to the rig which then generates the CW at the remote site. This approach worked very well, but is obviously very specific to the TS-480. (If only it did CW receive as well!)
- Using *TRX-Manager* in its standard remote configuration with a remote PC, gives an additional option to generate the CW on a serial port on the slave computer from the text entry box running on the master computer. I do not know whether this approach would work with a remote serial port derived from a serial server. All *Windows*-based CW generators can have problems with erratic CW timing and *TRX-Manager* is no exception to this, though I understand faster computers tend to reduce the problem.
- The best and most generally-applicable approach would be to use *Winkey* by K1EL (see 'Web Search'), which would overcome the timing problem. Again *TRX-Manager* has an option to interface directly to *Winkey*.

HOME RIG AUTO-TRACKING THE REMOTE RIG

I mentioned previously that (where frequency allowed) I wanted to monitor the remote signal from home. For simple testing it was not a problem to tune the home rig manually but, once into everyday operating, I wanted the home rig to track the remote rig automatically. Again *TRX-Manager* had the solution, with a small additional application called *TRX-Synchro*. This application, obtains the frequency from *TRX-Manager* and generates CAT commands for any other rig that can be connected to another serial port on the home computer; in my case, this was a Yaesu FT-1000MP. I then feed the audio from both the remote rig and the local rig into an external speaker unit that has two selectable input sources and a headphone jack. When transmitting remotely I can listen to the actual transmitted signal, and when receiving I can switch between listening remotely or locally. There have been many occasions when I could hear stations remotely that I could not detect at all from home, which proves the value of the system.

The Griffin PowerMate, a USB-interfaced rotary control. Photo: Griffin Technology

GRIFFIN POWERMATE AS A TUNING KNOB

As I have said before, having to tune the rig from a keyboard is one of my major dislikes, and although *TRX-Manager* has more options and flexibility than the Kachina did, I have spent some time looking for better options. The Griffin PowerMate (see 'Web Search' and the photograph) is a USB-interfaced rotary knob that that can be used to generate the keystrokes used for tuning in a more convenient way. The anti-clockwise rotation of the knob can be equated to the '-' (minus) key to tune down, and clockwise rotation can be equated to the '+' (plus) key to tune up. The knob can be pressed and released to activate or deactivate a function and different keystrokes can be assigned when the knob is held depressed and then rotated: I use this last option to give a faster QSY rate across the band. I have found this a useful accessory which normally sits on the bench horizontally; I want to try mounting it vertically to see how it feels orientated this way.

RS-232

When is a standard not a standard? RS-232 is in widespread use but, because there are so many options as to how it can be implemented, it is not as standard as you might think. During my experimentation I have used rigs from Yaesu, Icom and Kenwood, and their 'CAT' capabilities vary between the different manufacturers.

- **Icom** uses an efficient RS-232 implementation that lends itself to remote control applications, and works well using the serial server approach.
- **Kenwood** older rigs, such as TS-850, also have an efficient RS-232 implementation and they also work well using the serial server approach.
- **Kenwood** newer rigs, such as the TS-2000 and TS-480, are also well-suited to remote operation and work well with the serial server approach. These rigs have a greater CAT capability than most other rigs and use a more 'talkative' RS-232 implementation, there-

Part Three, conclusion

Remote HF operation made practical

fore needing a slightly greater bandwidth to operate effectively.

- **Yaesu**'s CAT capability works well when attached direct to a real COM port on a PC. However, there is something unusual about the Yaesu implementation of RS-232 which I have not been able to identify precisely, but is probably a timing problem. The consequence of this is that I have not been able to get my FT-1000MP to work with the serial server approach, even when connected to a hard-wired LAN at home. Unless a solution is found to this, any remote operation of a Yaesu rig would have to use a PC at the remote site.

SITE LINK ALTERNATIVES

The second system established the idea of using a LAN as the main framework component, which I chose to implement using an ISDN line. There are several other ways that a LAN link can be implemented.

- **Leased Phone Line**. This is an expensive option, but would remove the delays caused by the switching within the telephone exchanges, and would increase the security. It is possible to lease lines with bandwidths from 64Kb/s up to 1Mb/s and way beyond.
- **Wireless Network** (Wi-Fi). This is a technology that has grown considerably over the last few years and products are readily available and affordable. It can provide abundant bandwidth (typically up to 10Mb/s) but the distance it can cover is limited. It would be a good option where it was required to extend a LAN within the boundary of your own property. Longer distances are achievable as long as there is an unobstructed line-of-sight path between the two sites, and it might be necessary to use directional antennas and optimise the gain of the Wi-Fi system carefully to stay within the Wi-Fi regulations.

PHOTO: G3TXF

G3UEG at the operating position of his remote station. The Powermate control knob can be seen in the bottom left-hand corner.

Table 1

Ping results (average, in ms) for 50 transits of a 32-byte packet.

Link Mechanism	Average Time	Max Time
Dial-up	168	238
ISDN	49	79
Broadband	32	35

- **Broadband**. This is also becoming widely-available at bandwidths of 500Kb/s or greater and has the advantage that distance is no object.

With Wi-Fi or broadband there are a couple of additional points to consider. I have not investigated these to any great depth and the unknowns were another reason why I kept to dial-up lines for both my systems. It would require some further research to understand fully the problems and any solutions. First, there would be a need to tighten up on the security, as we are all aware of how insecure the Internet is, unless specific precautions are taken. Second, there is the possibility, when packets are flying round the Internet, that some packets will go a different route from others, take longer to travel, arrive out of sequence, and this may affect the performance.

Various timing tests (using the ping function) were done during the experimentation. Table 1 shows some of the results in milliseconds for a 32-byte packet averaged over 50 tries and gives an idea of the speed differences between the different systems.

There is a further, slightly different way of exercising control over a LAN, and that is to use remote desktop software. This approach would have the control program running on a PC at the remote site, but the remote PC would be controlled from home using remote desktop software. The disad-

Table 2

The combination of options that could be used. The choice is wholly subjective.

Control Data	Audio	Comments
Packet over a radio link	Use an analogue dial-up line	See Note
Modems over a dial-up line	Share the single dial-up line	The Kachina approach
Modems over a dial-up line	Use a 2nd dial-up line	
1 channel of ISDN	2nd channel of ISDN as analogue	My second system
1 channel of ISDN	Digital voice over ISDN 2nd channel	
Broadband	VoIP using broadband	
Broadband	Use an analogue dial-up line	
Wireless network	VoIP using wireless network	
Wireless network	Use an analogue dial-up line	
Leased line	VoIP using leased line	

Note: The packet radio control link could possibly be used for a receive-only remote operation, but is probably not viable for transmitting because of security and regulatory reasons.

vantage of this approach is that it requires a large amount of screen graphic data to be sent over the network link, which would require a lot of bandwidth, and is very inefficient. Several people have reported trying this approach, but then have reverted to other methods.

Finally, as a technical option, TRX-Manager can provide an alternative way of linking the two sites that does not require a phone line at all, but uses conventional packet radio technology using suitable VHF or UHF equipment. This method can provide basic control facilities which would be limited by the slowness of the link but, most importantly, the legality of using this approach in the UK would need to be examined in detail. It might be feasible for a receive-only remote system.

AUDIO TRANSMISSION ALTERNATIVES

Use of a wide-bandwidth link such as Wi-Fi or broadband would allow the audio to be sent over the single LAN connection using Voice over IP (VoIP), which has developed significantly over recent years. Microsoft Netmeeting has been around for a while but, more recently, a product called Skype (see 'Web Search') has been growing in popularity. These systems offer high quality audio, but they do include audio processing, which will inevitably introduce some additional delays into the system.

MATRIX OF OPTIONS

Table 2 shows the main combinations of options that could be used. Which option is chosen will depend on availability, distance between the two sites, and the balance between cost and performance.

REASONS FOR USING A REMOTE PC

I have given my reasons for going down the serial server route but, as I said, there are several valid reasons for opting for a PC at the remote site.

- No need for special products such as port re-director software and serial servers, and probably cheaper if an old PC can be put into service.
- Would enable any rig with RS-232 capability to be controlled remotely without having to worry about compatibility with serial servers.
- Would allow any parallel port applications to be used (eg band decoders).
- If broadband or Wi-Fi were being used, a PC would be one option to implement the tighter security and also the decoding of the VoIP audio.

ISDN IN ANALOGUE MODE

The digital side of the ISDN line has worked exactly as expected; however, I did have a number of problems when using it in analogue mode. It appears that some of the line voltages used for signalling are significantly different on an ISDN (Home Highway) line from those on a conventional analogue line. I found that the audio hybrid I used would auto-answer perfectly on an analogue line but not on the ISDN line. (This was eventually overcome with help from the manufacturers.) Also, originally I tried to have the two analogue devices, the DTMF unit and the audio hybrid, connected in parallel on the same line where, according to their respective specifications, they should be able to co-exist. I never resolved this, but found a work-around by putting the analogue DTMF unit in parallel with the digital control line, which worked because they never needed to be used simultaneously.

NEXT STEPS

Some of my plans for the future are:-

- Tuning knobs again I am afraid, but this has just leapt to the top of my priority list. Gus, SM3SGP, has recently posted to the TS-480 reflector that, as part of the development of the SK3W contest site, they have discovered the protocol that is used on the cable that joins the rig body to the remote head and have successfully extended this cable over a broadband link. (see 'Web Search'). This would mean that the rig's own remote head could be used for control purposes and gives the normal tuning mechanism that I have been striving for. The protocol is straightforward serial TTL, and I have identified some serial TTL-to-Ethernet converters which should do the job without needing any PCs. So I just need the time to do the further investigation work on this. (They have also discovered the protocol for the IC-706 remote head as well.)
- Try the digital modes.
- Revisit the option of using a remote PC, in particular how to boot it remotely.
- Try some newer serial servers that claim lower delays.
- Investigate remote-controlling a linear amplifier.
- Controlling a 'Preset ATU', which would take the frequency from *TRX-Manager* and, depending on which band segment the frequency was in, switch coil taps and capacitors in a matching unit at the base of my vertical which have been 'preset'. This would be necessary if using a remote linear amplifier.

Looking further forward, Dave, G8KKB, has suggested that in the future, as rigs become USB-enabled (as many ancillary products already are), it will be relatively straightforward to build USB-extenders to replace the serial port interfaces we use today which will have better performances and be able to handle the audio as well as the control data.

THE WAY FORWARD

When my NoV was updated to allow me to use the second system, there was a requirement that I produce a report to be submitted to the RSGB and Ofcom by the end of 2006. I have not yet had any terms of reference for the report, but my guess is that the purpose of the report will be to help inform any decisions that will be made as to how remote operation might be regulated in the future. I have my own views on this, but I would also like to involve other people who are seriously interested in remote operation and/or have knowledge in areas such as broadband, secure networking and VoIP. So I would like to invite people to contact me, so that the report produced can take into account the views and expertise of a wider population.

I will be presenting a lecture/workshop session at this year's HF convention in October, and this will be an additional opportunity for anyone interested to contribute to the preparation of the report.♦

ACKNOWLEDGEMENTS

I don't think I could have completed the development of the second system without some considerable help from a number of people. As well as general encouragement, they have given me significant technical help in solving some of the problems, and a lot of time testing. Chris, G3SVL, has helped throughout, Steve, G7TAJ, and my son, Andy, have helped with the networking and software development for the watchdog timer. Laurent, F6DEX, and Larry, N8LP, have both implemented several enhancements to their programs that have helped my approach. Dave, G8KKB, and John, G8JMB, for their technical review of the article prior to publication. I should also mention Peter, G3RZP, and Julian, G3YGF, who, as members of the original LAC, helped me get the NoV in the first place. Finally, I would like to thank my wife, Gill, who not only put up with the time I have spent on this project, but has helped with the manuscript, turning my technical writing into something more readable.

WEB SEARCH

Griffin Powermate	www.griffintechnology.com/products/powermate
Microsoft Netmeeting	www.microsoft.com/windows/netmeeting
Skype	www.skype.com
Winkey	http://k1el.tripod.com/wkinfo.html
SK3W	http://sk3w.shacknet.nu/remote/

PEAK
electronic design ltd

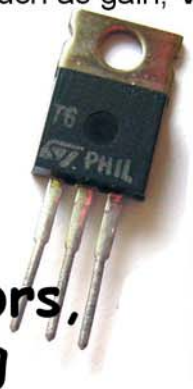
not just intelligent
but smart

Peak Electronic Design Ltd
Atlas House, Kiln Lane
Harpur Industrial Estate
Buxton, SK17 9JL, UK
Tel. 01298 70012

the *Atlas DCA55*

- Automatically analyse most 2 and 3 leaded semiconductors.
- Automatically identify all leads, just connect any way round!
- Measures lots of parameters too such as gain, V_{BE}, V_{GS}, etc...

DCA55 £49



LCR40 £69.00

DCA55 £49.00

SCR100 £99.00

Passive components, semiconductors, power devices, network cabling

Choose your perfect analyser

New Low Prices!

limited time only

"Star Pack"
LCR and DCA in carry case
£118.00

Carry cases
£15.00

SMD Tweezer Probes for LCR
£19.00

Spare Battery
£1.75

the *Atlas LCR40*

- Automatically identify Inductors, Capacitors and Resistors.
- Inductors from 1µH to 10H.
- Capacitors from 1pF to 10,000µF.
- Resistors from 1Ω to 2MΩ
- 1% Basic accuracy.
- Automatic frequency selection.

LCR40 £69

accessories & carry cases

ESR Measurement

model ESR60 £79

Triac and Thyristor Testing

£99

Cat5 Cable Testing

£79

www.peakelec.co.uk

all prices include UK Delivery and VAT

Don't just test it...
...Analyse it!

Dave Roberts, G8KBB

32 Woodbridge Close, Appleton, Warrington, Cheshire WA4 5RD.

E-mail: dave.roberts@btinternet.com

USB interfacing

If you've ever wondered what was the difference between the USB ports and the RS-232 ports on your computer, here is the explanation. Dave continues the discussion to include a USB interface design for the N2PK vector network analyser as an example. The reader may then wish to begin interfacing other shack equipment to his USB ports

You may be reading this under false pretences. This is not about Upper Side Band, but rather about the Universal Serial Bus (USB). This article will explore aspects of USB interfacing and how it may be applied to amateur radio. It does this by showing application to the N2PK VNA (Vector Network Analyser) [1], but the principles, hardware and software are easily applicable to other projects.

All hardware design details and software are available for download from the web [2], and if you do not want to build your own hardware, there are several commercial modules that will do just as well.

The aim is to paint a broad enough picture to allow experimenters to consider using USB to interface equipment in the shack to a PC.

WHAT IS USB?

USB is a serial computer bus. It is, however, quite different from RS-232/V.24 serial interfaces. In fact, the only thing in common is the term 'serial'. USB is specified in detail in the published standards [3] in an attempt to make sure that any USB peripheral will work with any USB cable and any USB interface on any computer. There are at least five versions of USB, but only two will concern us here. USB 1.1 provides speeds at 1.5Mb/s (Megabits per second) and 12Mb/s (Low and Full speeds). USB 2.0 extends that to 480Mb/s (High speed).

USB is characterised by the following;

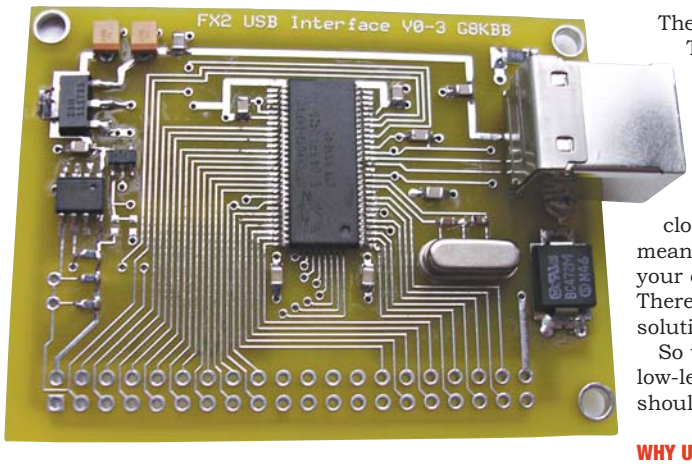
- standardised 4-pin connectors carrying power and bi-directional data;
- protocol specifications for communication that allow interoperability;
- short cable lengths.

This obviously differs from the 9- or 25-pin RS-232 connectors and cables. The speed is also much higher. In RS-232, there is a long tradition of problems in setting up an RS-232 link as the various permutations of handshaking are tried. In USB, one end is always in control and the other end is the peripheral. Connectors (ignoring here USB 'on the go') are defined differently for controllers and peripherals so that the type of connection issues that plague RS-232 are avoided (This is a little harsh on what is a comprehensive standard, but incompatibilities still exist). Also, USB carries power to the peripherals so that they may avoid having their own power supplies as long as their needs are moderate. Handshaking and status lines are avoided by the use of protocols.

There are therefore two main types of USB connector – Type A and Type B – as shown in the illustration. Type A is the one used at the computer and Type B is used at the peripheral unless the cable is hardwired into the peripheral, for example as is done with a USB mouse. In addition, there is a 'small' Type B connector used on devices such as digital cameras.

There are four wires – power, ground and two data lines. A USB port can deliver 5V at up to 0.5A to a peripheral.

This brings us to another point – hubs. Suffice it to say that a hub can be plugged into a port to allow more devices to be connected. For example, you might have four USB ports on your computer. If you plug a 7-port hub into each, you would have 28 USB ports available. In fact, a USB interface can support up to 127 devices. **Fig 1** shows a typical topology. Unpowered hubs limit the current that a device may draw.



Above:
My homebrew card.

USB connectors.
Above:
Series A plug.

Below: Series B plug.

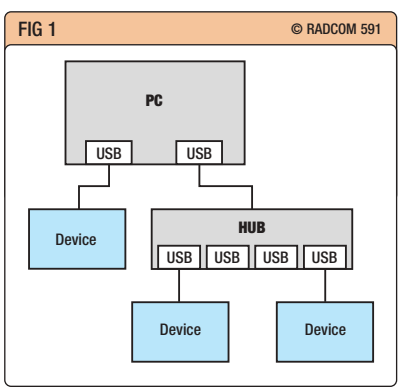


Fig 1
USB hub topology.
(Source:
www.cypress.com)

The data lines are bi-directional.

The fact that they may be passing data at 480MHz means that transmission quality is very important. For this reason do not use USB extender cables.

The implication of these bi-directional transmission lines clocking at these high speeds means that you cannot easily build your own hardware drivers for USB. There are many cheap single-chip solutions that will do it all for you.

So we will not try to discuss the low-level data transmission – you should never need to go looking at it.

WHY USE USB?

In short, parallel and simple serial ports are a dying breed on computers, especially laptops. In addition, Operating system providers such as Microsoft feel that we should not be driving the hardware directly – we ought to ask the operating system to do it for us through its interfaces, which is not always easy. In the shack, we frequently use the serial and parallel ports to connect rigs and peripherals or to control simple peripherals by toggling port lines. With operating systems like *Windows 2000* and *XP*, we resort to programs that try to bypass these controls. USB provides an alternative allowing a program to control a remote device over the USB bus and modern implementations mean we do not need to worry about the low-level details. Finally, with speeds as high as 480Mb/s with USB 2.0, you could, with one connector, carry bi-directional audio from the PC to a rig, control the rig, transport real-time spectrum analysis data for display on the PC and hardly scratch the available bandwidth!

HOW DO I USE USB?

There are two basic approaches. If you want to use USB to interface to a legacy device with an RS-232 or parallel port, there are several off-the-shelf devices that can be used; these are widely available on the high street. What we will consider here are custom USB interfaces – for example if you wanted to build a USB radio interface or, in the example here, build a USB Vector Network Analyser interface.

USB INTERFACE CHIPS

There are many single-chip USB interface devices available. Here, however, we will concentrate on some of those available from Cypress [4] (as that's what I used). Specifically, Cypress produce a range known as EZ-USB and, more specifically, two of interest are the EZ-USB FX and the FX2. The FX is a 'full' speed device which runs at up to 12Mb/s and the FX2 is a 'high' speed device that implements USB 2.0 and runs at 480Mb/s.

Each of these contains:

- a serial interface engine;
- a set of buffers to hold data to be transmitted to the PC or for holding data from the PC;
- an enhanced 8051-type microcontroller (CPU) complete with RAM to hold program and data;
- high-speed interfaces to devices.

The cost of the chips is almost the same for FX and FX2, so I used the FX2 and will describe this from now on.

THE CYPRESS EZ-USB FX2

The photograph shows my homebrew module. There is one main chip on the PCB – the FX2 (its part number being CY7C68013). It connects directly to the data lines from the USB bus. It is a 3.3V device so a 5V to 3.3V regulator powers the chip. It needs a small memory chip to configure it – in this case a serial EEPROM. The circuit diagram of the homebrew board is shown in **Fig 2**. The other chip is a reset controller.

The FX2 is available in four versions – two different 56-, a 100- and a 128-pin package. The simplest one, the 56-pin, is used here. The others are completely compatible, but add more I/O ports, serial interfaces, buses and interface options.

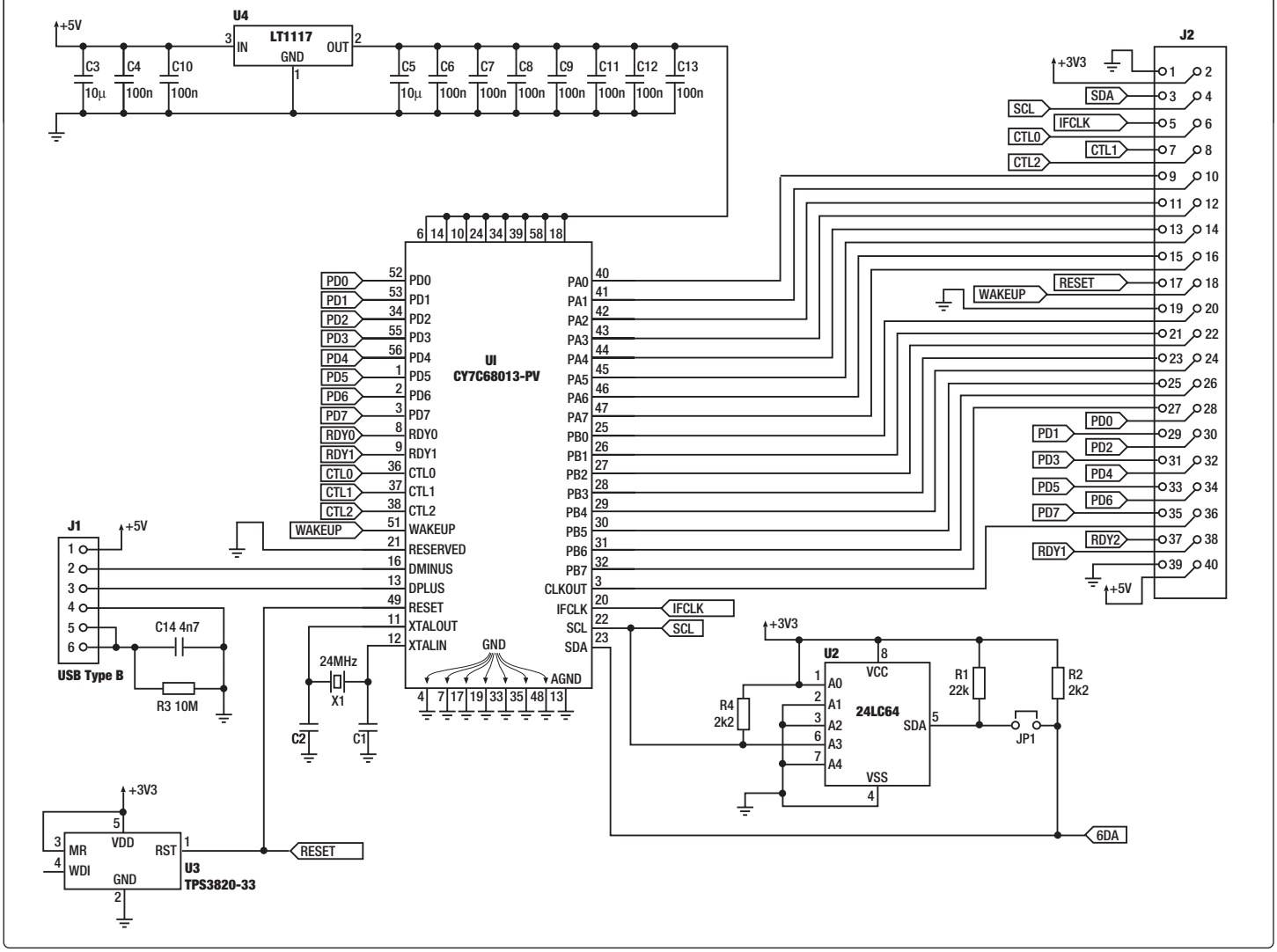
In this design, there are three 8-bit bi-directional ports and a number of other control lines. I'm not going to describe them here – read the datasheet [4]. These are 3.3V, but are 5V tolerant and will interface to 5V TTL or CMOS chips.

BUS ENUMERATION

So what happens when you plus a USB interface into the USB connector of a hub or controller? The device powers up and signals to the controller that it is there and wants a piece of the action. The controller sends out a request for the device to identify itself and allocates it an address. The peripheral identifies itself with a Vendor ID (VID) and a Product ID (PID). These are unique (or should be) so that the controller can unambiguously locate a driver program. This is where the EZ-USB FX2 is neat. If the EEPROM on the interface does not contain a complete executable program, but just a VID and PID, the FX2 will expect a program to be downloaded from the controller. This program will be used by the FX2 to configure its operation and as code & data for the on-chip microprocessor. It will then identify itself again and the application driver will be located by the PC and executed. In this way, the need to store a program on the FX2 is eliminated.

Fig 2
Circuit diagram.

FIG 2 © RADCOM 592



BUILDING AN INTERFACE

The PCB layout is shown in **Figs 3** and **4** with component placement in **Fig 5**. Note that the tracking is fine with 10-thou lines and spaces. The PCB is double-sided. While you could make your own PCB, there is an easier way, provided you have some friends to share the cost. The PCB designs are available on the web [2] and are in a file format of a free software package from a company called expressPCB. You can download the program from their website [5]. This PCB file may be sent to the company from within the program as an order, specifying your credit card number and delivery address. They will produce three PCBs for $51 at today's prices, but will charge carriage – find an amateur in the US to collaborate with if you want to minimise this. The three PCBs will each provide two USB interfaces, so you get six boards in all.

Construction is simple. All parts other than the 24MHz crystal and USB connector are surface-mount. The sequence of construction is not important and is described in the documentation that accompanies the PCB layouts on the web.

SOFTWARE

Now the tricky part. Do not be under the illusion that you can connect an FX2 chip to the serial port of your rig, ATU etc, and magically drive it from the PC – you will need a suitable set of programs to do that.

Available on the web are the programs used for the VNA [2]. There are several parts to it as follows:

- a program that is loaded into the USB chip on start-up;
- a driver that contains the above code that automatically loads it at start-up;
- a set of library files (DLLs) that provide a simple way to talk to the VNA;
- configuration files to tell windows which driver to use on start-up.

The web-downloadable code also contains examples and other programs.

Using the software as-is to drive the VNA, you need only whatever compiler you use for your application. To rebuild the FX2 code, you need the free software from the Cypress website. To build the DLL or example applications you need *Microsoft Visual C++* V5 or later. In addition to the full version of *Visual C++*, you need the *Windows 2000 Device Driver Kit* (DDK) from Microsoft if you want to rebuild the device drivers.

APPLICATION PROGRAMMING INTERFACE (API)

The complexity of USB interfacing is, in general, hidden from us. *Windows* itself provides the basic communications routines and low-level drivers. On top of this there needs to be a specific vendor-provided driver. The easiest solution is to use the one provided by Cypress for the EZ-USB series of products – *ezusb.sys* – as provided in the development tools. This driver provides an interface to your program, through a *Windows* API function: DeviceIOControl(). Opening and closing communications is done using CreateFile(), GetHandle() and ReleaseHandle(). The code for the VNA from the web [2] shows how to do it.

FIG 3

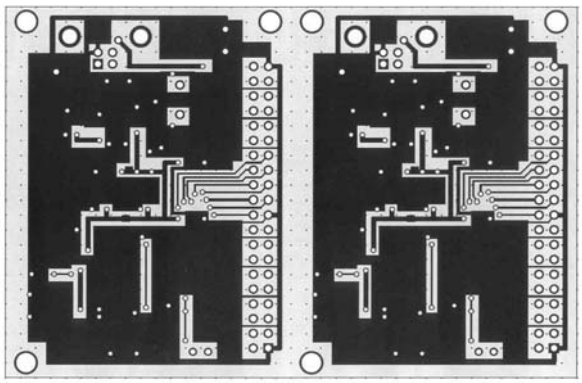


FIG 4

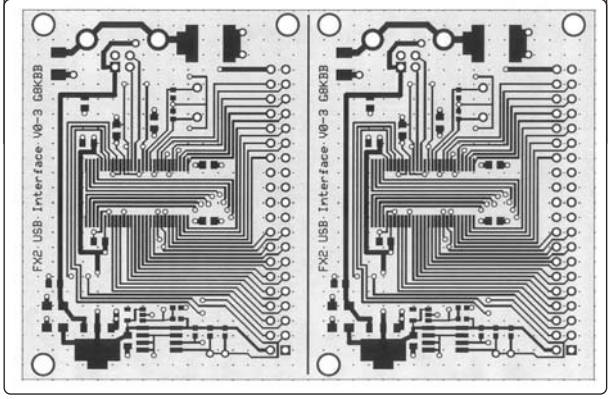


FIG 5

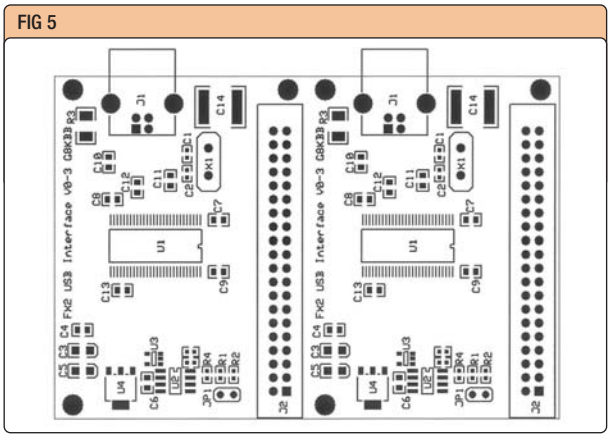


Fig 3
PCB bottom. Note: Each PCB makes two modules. This fact is illustrated also in Fig 4 and Fig 5.

Fig 4
PCB top.

Fig 5
Component layout.

FX2 CHIP PROGRAM

The FX2 microprocessor runs an 8051 program. This is written either in *C* or assembler and built using the free Cypress tools. In this, a generic framework is provided by Cypress with clearly-defined 'hooks' where you may add your own code. This is the approach followed for the VNA.

What the VNA program does is this. When it receives a message from the PC (in this case a string of bytes of a defined structure) it checks what type of message it is and processes it. Currently there are two message types defined, a RAW command and a SET command.

The RAW command contains a set of bytes used to change the state of the 8-bit port output lines. This provides a simple means for an applications program to send a message to the chip instructing it to set the output ports to a particular state and read the state of output and input lines – so here is an example of how to build a simple PC interface to arbitrary peripheral logic.

The SET command is more complex and shows some of the power of the FX2. The PC sends a string of bytes to the PC that contains a set of instructions. The N2PK VNA contains two Direct Digital Synthesis (DDS) chips that can generate arbitrary frequencies at up to 60MHz and one or two 24-bit Analogue-to-Digital Converters (ADCs) that are used to read a demodulated signal. The data string instructs the 8051 to do some or all of the following in one command:

- reset the DDS chips;
- set the DDS chips to specific frequencies and phase relationships;
- delay a specified time before starting the ADC conversions;
- perform between 1 and 30 ADC conversions on one or both ADCs;
- return the result of all ADC conversions in one message to the PC.

The FX2 interfaces to the control lines of the N2PK VNA to do this. It is a simple matter to reuse these structures for other projects. The FX2 will do more than this – it has a flexible programmable hardware interface that can input or output data without CPU involvement but, for low speeds such as this, it is unnecessary.

Happy interfacing! ♦

GLOSSARY

A number of terms in this article may not be familiar to some readers. Here are some of them:

Term	Meaning
VNA	Vector Network Analyser
PC	Personal Computer
USB	Universal Serial Bus
DLL	Dynamic Linked Library
CPU	Central Processing Unit
DDK	Device Development Kit
RAM	Random-Access Memory
EEPROM	Electrically-Erasable Programmable Read-Only Memory
VID	Vendor Identity
PID	Product Identity
DDS	Direct Digital Synthesis
ADC	Analogue-to-Digital Converter

WEB SEARCH

[1] **N2PK Vector Network Analyser** http://n2pk.com
[2] **N2PK USB interface** http://uk.geocities.com/g8kbb@btinternet.com/
[3] **USB Specifications** www.usb.org/
[4] **FX2 datasheet, application notes & development tools** www.cypress.com/
[5] **PCB software and pricing** www.expresspcb.com/

Donington Park 30th September & 1st October 2005

The Leicester Amateur Radio Show Committee is proud to present

The 34th LEICESTER AMATEUR RADIO SHOW & CONVENTION

COMPUTERS, RADIOS and ELECTRONICS at
THE CASTLE DONINGTON INTERNATIONAL EXHIBITION CENTRE
DONINGTON PARK NW LEICESTERSHIRE
less than 5 minutes from J23A & J24 M1 Motorway

On Friday 30th September & Saturday 1st OCTOBER 2005
OPENING TIMES 9.30am to 5.30pm Friday, 9.30am to 4.30pm Saturday

ALL MAJOR DEALERS, AOR, ICOM, KENWOOD, YAESU

FLEA MARKET, BRING and BUY, Large RSGB stand, LOCAL & NATIONAL CLUBS & SOCIETIES
Morse Proficiency tests, demonstration amateur radio station, OFCOM stand,
camping and caravanning on site

CONVENTION

Including Rob Mannion (PW Editor), Radio Astronomy for the Radio Amateur, RSGB Forum
and RAIBC AGM, BRING YOUR CARD FOR THE QSL BOARD SO YOUR FRIENDS CAN LOOK OUT FOR YOU
Drop and Swap Table for data books and catalogues
TALK IN 145.550 & 433.550MHz by GB0LS

ADMISSION PRICES

1 day ticket £3.50, OAPs & under 16 £3, 2 DAY TICKET £6, OAPs & Under 16 £5
Under 12 free when accompanied by an adult
DISCOUNT ADMISSION to The Donington Racing Car Collection

FOR FURTHER DETAILS AND THE MOST UP-TO-DATE INFORMATION SEE OUR INTERNET SITE at http://www.lars.org.uk
STAND BOOKINGS contact John Theodorson, G4MTP tel 01604 790966, fax 0870 762 0840, E-mail g4mtp@lars.org.uk
FLEA MARKET BOOKINGS contact John Senior, G7RXS on 0116 284 1517, E-mail SENIORJA@aol.com
All other enquiries to Geoff Dover, G4AFJ, tel: 01455 823344, fax: 01455 828273,
mob 0779 649 2146, E-mail: geoffg4afj@aol.com

HIGHLANDER

MOBILE HF TAPPED WHIP

THE HIGHLANDER SERIES

For a highly durable mobile whip, look no further than the Highlander series. Performance proven in harsh conditions all over the globe, extensively including the climatic extremes of the Australian outback, the Highlander series boasts a fibreglass core with a wall 4 times thicker than the average mobile whip on today's market and our specially developed resilient coating.

Manually Tuned Antenna - NO TUNER REQUIRED

SPECIFICATIONS

Frequencies:
80m, 40m, 30m, 20m, 17m, 15m, 12m, 10m
Length: 1.5m (H) **OR** 1.2m (HII)
Power Input: up to 500W

For More Information:
www.bushcomm.com.au

LEFT: Highlander (1.2m length) shown

We are currently seeking new UK/European dealers...special prices apply!

For More Information
Email: bushcomm@bigpond.com

Bushcomm
HF ANTENNA MANUFACTURER

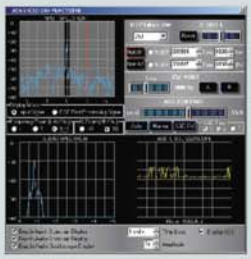
PH: + 61 8 9296 0496 **FAX:** + 61 8 9296 0495
www.bushcomm.com.au **bushcomm@bigpond.com**

FDM77

HF RECEIVER

The FDM77 is conceived as a SDR (Software Defined Radio). This approach means that the receiving set is composed of a Hardware RF front-end and a PC with an ELAD Software Radio. The Software Radio is the operator's main interface (GUI) for the control of the radio (Input RF, Tuning, Setup, Mode, Display, Scan and AF) and is also used to decode and reproduce the audio through the PC soundcard.

High Performances continuous coverage (10KHz ~ 65 MHz) all modes SDR Receiver



SOFTWARE

Advanced window with:
±10 KHz bandwith Spectrum Analyzer with the mask of the selected filter
AGC control: Auto, Manual, Software
Two different notch filters with tuning and Bw selected by the operator
Selectable Bw DSP filters down to 250 Hz

MAIN FEATURES

- Multimode: CW, LSB, USB, AM, FM, DRM continuous coverage (LW, MW, HF + 6m) RX
- High dynamic range Front-end with 7 bands preselector filters and preamplifier
- 2 RF inputs (External antenna with SO-239 and indoor active antenna with BNC)
- Clean and low phase noise VFO and OL generated through DDS technology
- Triple conversion superetherodyne with IF of 70 MHz, 455 KHz and 12 KHz
- 10 KHz and 4 KHz Bw crystal and ceramic filters on 70 MHz and 455 KHz IF
- Variable bandwith down to 500 Hz DSP filters on 12 KHz IF
- Spectrum analyzer display of the received channel and two notch filters tunable on the desired frequency by the mouse directly on the channel spectrum
- DSP demodulators for all traditional and DRM modes
- FDM77 software is shipped complete with channel and sound decoder for the DRM mode
- FDM77 software is shipped complete a driver (ELAD virtual Sound Card) to feed the detected AF signal to external application as recorder or programmes for SSTV, PSK, CW, RTTY, HAMDREAM decoder
- MEMORY and user's programmable range SCAN with spectrum analyzer
- TCP/IP protocol for RX remote control through internet (option)
- Options: Mute control by separated TX, USB tuning wheel, Whip antenna
- Free upgrade to future releases of the software with download from ELAD web site

ELAD

ELAD S.r.l.
via Col de Rust, 11
I-33070 Sarone di Caneva (PN) Italy
Tel. +39 0434 77248 r.a. - Fax +39 0434 77231
email:eladit@eladit.com
www.eladit.net www.drmradio.it

Dealer for UK and Ireland: ML&S Martin Lynch & Sons

David Lauder, G0SNO

20 Sutherland Close, Barnet, EN5 2JL.

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

EMC

This month's 'EMC' includes more information on using ADSL 'microfilters' to tackle RF breakthrough on telephones, improving the immunity of ADSL to amateur radio transmissions and noisy switch-mode power supplies.

Bill, G2HCG, was interested in the articles in February and April 'EMC' on the use of ADSL 'microfilters' for improving RF immunity of telephones to amateur radio transmissions. This uses the filters well above the frequencies that they are designed to reject and there are large differences in the performance of different filters in the HF bands. Bill has tested three types of filter from 2 - 15MHz. His test setup used an RF signal generator with a 50Ω output feeding the filter via a 1:4 balun. The output of the filter was fed via a 4:1 balun to a 50Ω load and an oscilloscope for measurement. This means that the filters were tested in a 200Ω balanced circuit. The results are shown in **Fig 1**.

Bill found that unbranded plug-in ADSL microfilters that were supplied free with an ADSL modem provided poor rejection of amateur radio signals. He found that the Alcatel 'Speedtouch' 413UK was the best on 14MHz and the BT MF50 was the best on 3.5MHz and 7MHz. Actual use confirmed the measured results. Bill considers that his telephone breakthrough problems were caused by differential-mode signals, because common-mode suppression with ferrite rings had no effect. The ADSL filters provide both differential- and common-mode filtering, although Bill only tested differential-mode.

FIG 1 © RADCOM 581

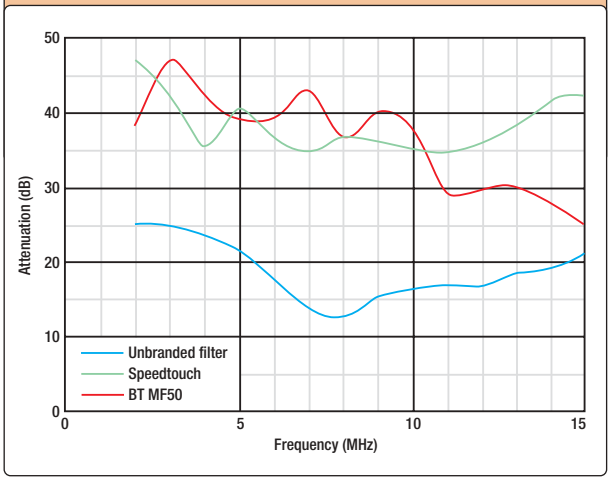


Fig 1
Results of tests of ADSL 'microfilters' by G2HCG (measured in a 200Ω balanced test circuit).

ADSL IMMUNITY - BT INVESTIGATES

The RSGB EMC Committee is aware of couple of cases where members' 512Kbit/s ADSL broadband service stopped working when they transmitted on the 1.8MHz or 3.5MHz amateur bands. Although it was the radio amateurs' own ADSL services that were affected, the members concerned were keen to find a solution so that other family members could 'surf the Net' while they were on the air. The EMC Committee informed BT Exact of these cases and asked for technical advice. BT Exact is BT's research, technology and IT operations business at Adastral Park, Martlesham Heath near Ipswich.

BT staff visited the home of RSGB member Andy, in Newbury, Berkshire. This was a 'one off' engineering visit in response to the request for specific advice from the RSGB EMC Committee. BT provided the EMC Committee with a copy of its technical report on the visit. This contains information that should be useful in dealing with other cases. Two broadband DSL specialists from BT Exact attended the visit – Kevin Foster, M1CGM, and Trevor Morsman from the Network Engineering Department.

Andy has a 512Kbit/s broadband ADSL service with the host computer in his radio shack. This PC has a PCI internal ADSL modem card which is connected to telephone extension wiring via an ADSL 'microfilter'. The BT engineers measured the line characteristics using ADSL test equipment and found that in the 'downstream' direction (from the exchange to the customer), the attenuation was 56.5dB and the noise margin was 8dB. The line balance was measured at 198kHz by measuring signal levels from the Radio 4 Long-Wave carrier. The common-mode signal (both sides of the pair relative to earth) and the differential-mode signal (between the two halves of the pair) were both measured at the extension socket and the ratio of these signal levels indicated that the line balance was only about 10dB, which is not as good as expected.

ADSL uses frequencies from 25kHz up to 1104kHz but, when Andy transmitted a 100W unmodulated carrier on 3.7MHz, the ADSL service lost synchronisation. The measured level of the common-mode 3.7MHz RF signal level on the line to the ADSL modem was +23.6dBm (229mW) and the differential-mode 3.7MHz signal was -3.4dBm (0.46mW). This indicates a line balance of about 27dB at 3.7MHz. The BT engineers then fitted a new type of front plate to the master telephone socket. This was a prototype that has an inductor in series with the third 'ringer' wire, in order to improve the RF balance of the indoor telephone extension wiring. This made a substantial 21.8dB improvement in the measured RF balance of the wiring at -3.7MHz so that the 3.7MHz differential signal on the line was reduced to -25.2dBm. It also improved the performance of the ADSL link, which now had a 19.5dB noise margin instead of 8dB. Nevertheless, the ADSL modem was still affected by the amateur transmission at 3.7MHz, possibly due to the large common-mode RF signal on the line, which was 3.4V RMS. This was measured without the modem being present (but into an impedance of 150Ω) so it should be comparable with the 3V test level required by harmonised EMC standards. This obviously highlights a potential deficiency in the immunity of the PCI modem against the requirements of harmonised EMC standards. An ADSL modem should be immune to a 3V common-mode carrier with 80% amplitude modulation, or 5.4V RMS at the peaks of the modulation (peak envelope voltage).

The BT engineers fitted a common-mode filter between the ADSL modem and the microfilter. The common-mode filter used a common-mode choke with two windings, a T60405-N4021-X076 made by VAC. This has a common-mode inductance of 70mH. When this filter was fitted, Andy could transmit on the 1.8MHz or 3.5MHz amateur bands at 100W without affecting his ADSL service.

ADSL IMMUNITY ADVICE

If you have a problem with an ADSL service that does not operate when you transmit on the 1.8MHz, 3.5MHz band or above, then RF picked up on indoor telephone extension wiring is likely to be a significant factor. **Fig 2** shows a typical 'splitterless' ADSL installation with a 'microfilter' for each telephone. The third 'ringer' wire that is used in UK telephone extension wiring is connected to one side of the line via a capacitor in the master telephone socket. This 'three wire pair' introduces unbalance at RF and if any mains-powered telephone equipment such as answering machines or fax machines is used without a microfilter, this may also introduce unbalance at RF.

The new type of front plate for the BT master socket mentioned above is

currently being trialled by BT so, until it becomes available, an alternative arrangement is shown in **Fig 3**. This involves running a new wire from the ADSL modem to the master socket. One pair in a length of standard four pair CAT5 or CAT6 UTP computer network cable could be used. Now, only one ADSL 'microfilter' is required at the master socket. There are large differences between different types of ADSL microfilters, so it is advisable to use a good-quality type such as BT MF50 or Speedtouch 413UK. The new UTP cable to the ADSL modem is connected to the ADSL socket on the microfilter at the master telephone socket. All the telephone extension wiring in the house is connected via the telephone socket on the microfilter. This extension wiring may not be well balanced at RF but any RF pick-up is attenuated by the microfilter. The main source of common-mode RF signal to the ADSL modem is now the signal picked up in the new UTP cable. This UTP cable should be kept as short as possible by locating the ADSL modem close to the master socket, if possible. There will also be some RF pickup on the BT line before the master socket, particularly if this fed from an overhead wire but this should be well-balanced at RF compared to indoor telephone wiring.

If the arrangement in Fig 3 does not provide enough improvement in RF immunity, a common-mode filter can be added in the cable to the ADSL modem as shown. The VAC range of chokes mentioned above is manufactured by the German company Vacuumschmelze. The T60405-N4021-X075 type with an inductance of 50mH would give the best performance on the 3.5MHz amateur band, because the winding has a slightly lower stray capacitance than the 70mH version mentioned above. These VAC common-mode chokes may not be easily available in small quantities to non-trade customers, however. Two separate chokes are *not* a suitable alternative because the two windings must be on the same core and tightly coupled with low leakage inductance to avoid any significant loss for the ADSL signals. Nevertheless, it is not advisable for radio amateurs to construct telephone filters for reasons of type-approval. A suitable alternative is to wind the cable to the ADSL modem 12 or more turns through an RSGB ferrite ring. Although it will not be possible to achieve an inductance anywhere near 50mH, it should be possible to achieve a useful common-mode impedance of 3kΩ or more at 3.5MHz.

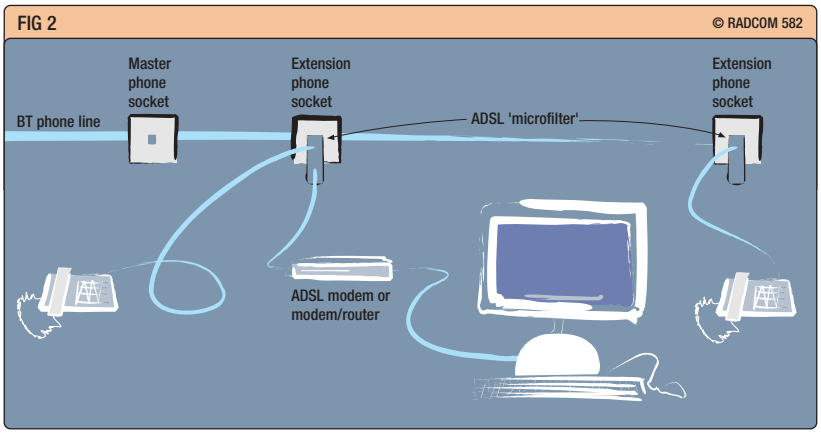


Fig 2
A typical 'splitterless' ADSL installation with microfilters.

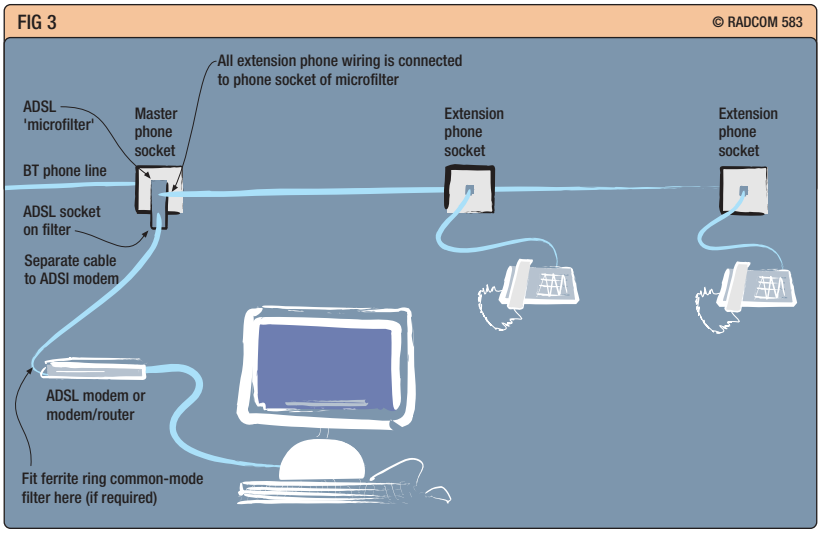


Fig 3
An alternative ADSL arrangement for improved RF immunity to HF amateur radio transmissions.

13.8V SWITCH-MODE POWER SUPPLIES

George, G0LIU, wrote to report that, for a long time, he was suffering from noise all over the 3.5MHz band which caused him difficulties when operating on nets. He eventually traced the source to the switch-mode power supply (SMPS) for his IC-706 HF transceiver. The power supply is a 13.8V, 23A type SEC 1223 made by Samlex Europe.

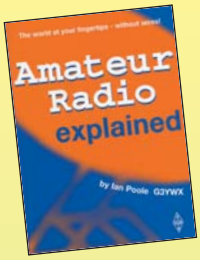
Frank, M1FRH, e-mailed to thank the 'EMC' column for alerting him to SMPS interference, otherwise he would still be scratching his head trying to locate the source of S9 noise on the 28MHz band. After reading an item in 'EMC' about switch-mode power supplies, Frank disconnected his Lowe 40A SMPS and tried his FT-920 on battery only. The noise totally disappeared. He considers that the power supply is very good indeed, apart from the RF noise level.

Switch-mode power supplies supplying 13.8V at 22A or more are becoming increasingly popular for powering amateur radio transceivers as they can be smaller, lighter and cheaper than the traditional linear type. There is no reason to believe that either of the SMPSs mentioned above fails to meet the relevant EMC standards, but an SMPS may not be popular with radio amateurs unless it is much quieter than the relevant EMC standards require. It is sometimes said that designing a switch-mode power supply is easy compared to designing the RF interference filtering to go with it!

PC POWER SUPPLIES

Kris, G0OQI, recently experienced a problem with his PC interfering with HF right across the 1.8, 3.5, 7 and 14MHz bands. No amount of ferrite rings, mains filters etc would remove the problem. Using a battery to operate the rig resulted in complete loss of the interference, suggesting mains-borne problems. The source of the problem was found to be the 'E BOX' ATX-350 power supply in the PC. Kris went back to the shop and changed the power supply to an 'XPro 460' which eliminated the problem completely.

The EMC Committee receives reports of noisy PC power supplies from time to time. There is a suspicion that some types may not be intended for the European market, may not comply with the EN55022 EMC standard and may have inadequate mains filtering. If anyone has such a PC power supply or definite information on where they are being sold, the EMC Committee would like to test one. ♦



AMATEUR RADIO EXPLAINED

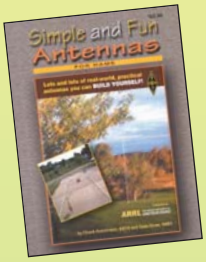
Building on the success of Amateur Radio for Beginners this new volume covers setting up a station, what you are likely to hear on each band, how to receive and transmit, what's involved in getting a licence, codes, propagation, equipment, construction and much more. In short an ideal introduction to the diverse world of amateur radio. Size: 210 x 146 mm, 146 pages. ISBN 1872309-704
Non members price £9.99 plus p&p

Only £8.49 plus p&p

THE AMATEUR RADIO OPERATING MANUAL

If you are interested in amateur radio the RSGB Amateur Radio Operating Manual is the book you should not be without. This book provides a comprehensive guide to operating across the amateur radio spectrum. Packed with information and tips this book has long been a standard reference work found on the bookshelf of radio amateurs.The RSGB Amateur Radio Operating Manual is a valuable addition to your bookshelf and the must have book for everyone interested in amateur radio.
Non members price £19.99 plus p&p

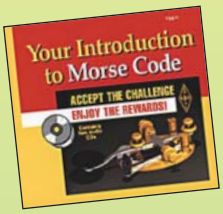
Only £16.99 plus p&p



SIMPLE AND FUN ANTENNAS

Simple & Fun Antennas for Hams is designed not only for newcomers to amateur radio, but also for anyone overwhelmed with the theory and technical details in most antenna "textbooks". This book contains 70 well tested and entirely useful projects - which work! Hundreds of photos and illustrations make sure you can actually build working antennas yourself. The designs include dipoles, verticals & wire antennas across both the VHF and HF bands.
ISBN: 0-87259-862-4 Non members price £16.99 plus p&p

Only £14.44 plus p&p



LEARNING MORSE CODE TAPE / CD

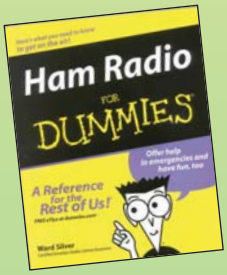
With ARRL code practice tapes, you'll not only learn the code--you'll master it! Each set includes two cassette tapes with nearly 2-1/2 hours of practice. With ARRL's new audio tapes you can easily find and repeat practice on separate audio "tracks", all audio material was created using digital recording techniques for improved sound quality and integrity. CD's available for same price.
Non members price £9.99 plus p&p

Only £8.49 plus p&p

THE BEST OF THE NEW HAM COMPANION

Here's a book that's chock-full of the ham information you need and want. Beginners, less-experienced hams and, yes, even old-timers will find articles that are enjoyable to read and easy to understand. These articles come from one of the most read sections in QST, the New Ham Companion, and even includes popular excerpts from "The Doctor Is IN" column. The Best of The New Ham Companion will become your companion as you navigate the ham bands in search of adventure, fun and new friends.
Non members price £9.99 plus p&p

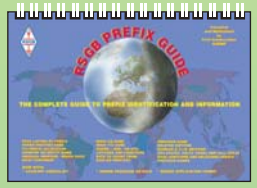
Only £8.49 plus p&p



HAM RADIO FOR DUMMIES

Starting with simple explanations of amateur radio this book progresses through making contacts, setting up the station, keeping logs, maintenance, EMC and much more. Ham Radio for Dummies contains hundreds of tips for both new and experienced amateurs alike. Simply this is a must have book for anyone starting in amateur radio, setting up new station. Note: The licence information in this book refers to the USA only. Size 233 x 190mm 380 pages. Non members price £14.99 plus p&p

Only £12.74 plus p&p



THE RSGB PREFIX GUIDE

Ever wondered what that "unusual" callsign was? The fully updated "RSGB Prefix Guide" answers the question.This book is an excellent tool for the beginner and the experienced hand alike. Designed with a "lay flat" wire binding for ease of use the new "Prefix Guide" is a must for every shack. 48 pages.
Size: 210 x 297mm, Non members price £8.99 plus p&p

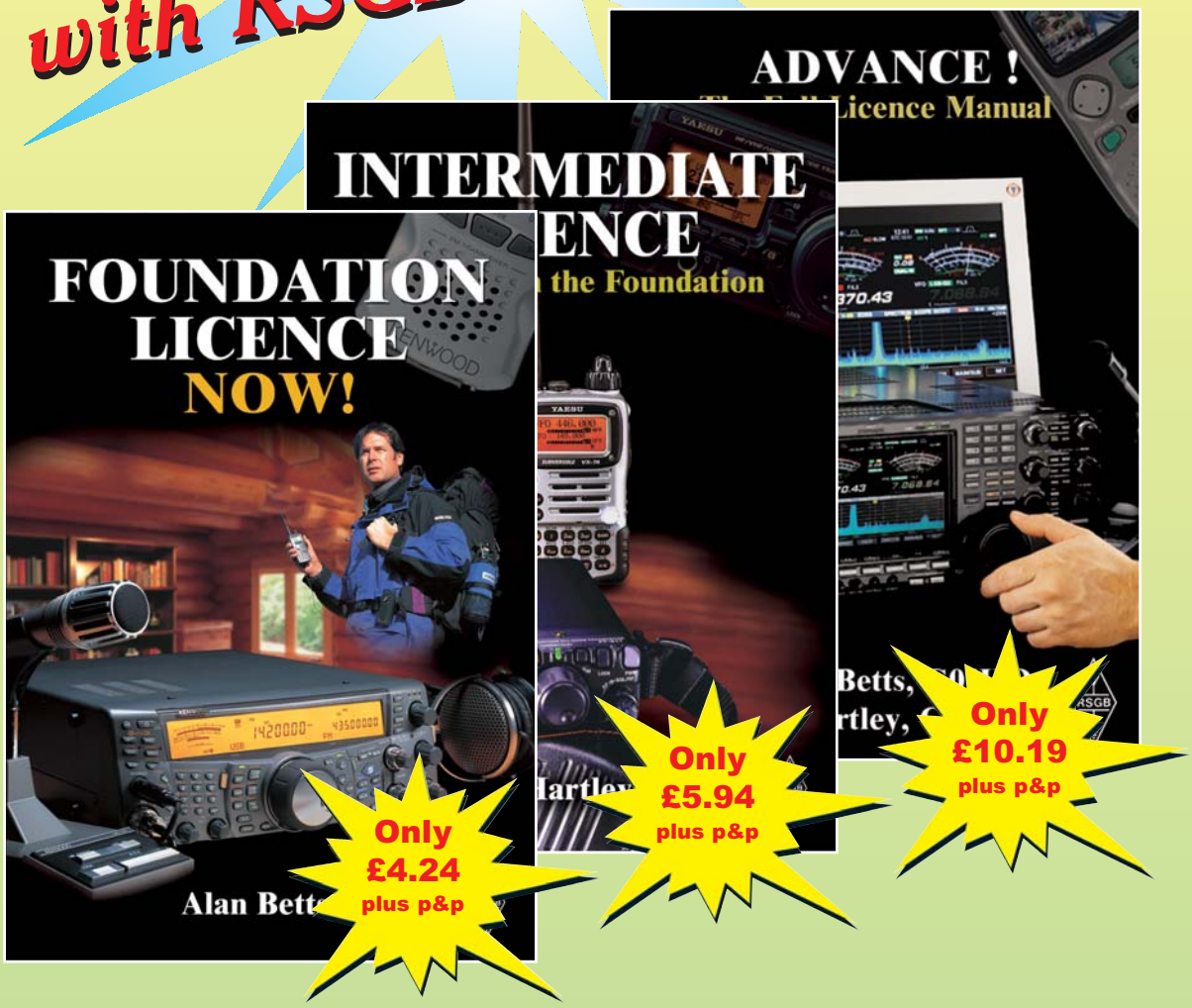
Only £7.64 plus p&p

RSGB SHOP

TO ORDER YOUR BOOKS Tel. 0870 904 7373
OR ORDER 24 HOURS A DAY ON OUR WEBSITE
www.rsgb.org/shop

RSGB Books are available at all good book shops, just ask for Gardeners Wholesale

TRAIN NOW !
with RSGB Training Books



FOUNDATION LICENCE NOW !

For those wanting to know more about the new Foundation Licence the RSGB has produced "Foundation Licence - Now". The book contains all that is required to obtain that first step into Amateur Radio hobby - gaining the Foundation Licence - Now!
Size: 297mm x 210mm, 36 pages, ISBN: 1-872309-80-1
Non members price £4.99, plus p&p

INTERMEDIATE LICENCE - Building on the Foundation

This book is broken down into manageable half-hour worksheets and contains practical exercises along with plenty of helpful advice and safety tips. This is the course workbook for the Intermediate Licence, and as such contains all the information covered during the 20 hours recommended for the course. This is the ideal book for every Intermediate Licence student. Size: 210mm x 297mm, 80 pages. ISBN: 1-872309-81-X
Non members price £6.99, plus p&p

ADVANCE ! The Full Licence Manual

This book is the third course-book in the RSGB series for those interested in obtaining an amateur radio licence. Advance! the Full Licence Manual is a "must have" for everyone progressing to the Full licence and is the best route to success in the examination.
Size: 210mm x 297mm, 104 pages, ISBN 1-872309-95-X.
Non members price £11.99, plus p&p

RSGB SHOP

RSGB
Lambda House
Cranborne Road
Potters Bar
Herts. EN6 3JE
Tel. 0870 904 7373
Fax. 0870 904 7374

ORDER 24 HOURS A DAY ON OUR WEBSITE
www.rsgb.org/shop

Practical Wire Antennas 2
provides a collection of antenna designs and ideas that will help capture the enjoyment of experimenting in the true spirit of amateur radio. This book will help improve any station and is a must have book for anyone interested in antenna construction.
£10.19 members
£11.99 non members

The Antenna Experimenter's Guide
This book describes how to build and use simple RF measuring equipment, and for the keen designer and experimenter how to construct fold-over masts, how to construct your own antenna test range, and how to use your computer to model antennas and to analyse experimental test results.
£15.29 members
£17.99 non members

Value Log Book - Transmitting
Spiral-bound transmitting log book which complies with UK licensing requirements for the correct format for logging all your contacts.
£4.24 members
£4.99 non members

Log Book - Receiving
This spiral-bound log book enables you to keep a complete record of all stations heard - invaluable for keeping accurate information for award chasing!
£4.24 members
£4.99 non members

Shortwave DX Handbook
This indispensable book is a goldmine for anyone interested in DXing or operating on the HF Bands.
£16.14 members
£18.99 non members

All prices plus p&p
E&OE

Rev George Dobbs, G3RJV

St Aidan's Vicarage, 498 Manchester Road, Rochdale, Lancs, OL11 3HE.

E-mail : g3rjv@gqrp.co.uk

QRP

Sad news for amateur radio ♦ QRP transceiver comparisons ♦ G QRP Club Mini-Convention this month!

Unfortunately, I begin this column with three items of sad news. The first is to record the death Peter Halpin, PH1PH. Peter has been around in QRP circles for more than 20 years. He always showed an interest in QRP operating and gained a reputation of being a 6m DXer, gaining the first-ever QRP ARCI DXCC for single-band operation. The first 50 contacts were made on homebrew equipment and a Meon Transverter with either 2.75W or 4W out. It took Peter 13 years to work all the countries required and receive enough QSL cards to claim the award. He also received ARRL DXCC for 6m, the G-QRP Club 6m DXCC and was G QRP QRP Club Master number 74. He was the Dutch representative for the G QRP Club since 1991.

Perhaps Peter was best known in the amateur radio community for assisting Simon Brown, HB9DRV, in the development of *Ham Radio Deluxe*. *Ham Radio Deluxe* (*HRD*) is a suite of free *Windows* programs providing CAT control for commonly-used transceivers and receivers including mapping and PSK31 software. Simon Brown said, "I estimate Peter devoted 3,000 hours free time to *Ham Radio Deluxe* and very probably the same amount of time to the predecessor *FT-817 Commander*. He was very enthusiastic, buying radios neither of us had and driving across Holland to borrow radios for just a few days. We spent four solid years working on ham software; I would never have got as far as I did without his help."

In 2002, Peter was diagnosed with cancer and given six months to live. He came to the Rochdale QRP Convention that year to say goodbye to his friends but with great determination managed to return the following two years. He died on 8 June, but was in touch with his amateur radio friends right up until his final hours. PH1PH will be missed by the QRP world.

The UK QRP fraternity was also saddened by the death of John Leak, G0BXO. John had been the Membership Secretary of the G QRP Club for many years. A quiet worker in the background of the club, John did the 'nuts and bolts' of enrolling and maintaining membership. G0BXO died suddenly of a brain haemorrhage at the age of 63. Many QRPers had come to know John through his kindly dealing of their membership queries.

Above
The late Peter Halpin, PH1PH.

Another sad loss for the G QRP Club in June was the premature death of René Anrijs, ON4KAR, at the age of 57. René was the Belgium representative of the G QRP Club for many years. He was an excellent telegraphist and an avid QRP operator. His friend Guy Marchal, ON5FM, wrote, "René's passion for radio, and particularly telegraphy, was testified by the groove in his finger tips caused by pressing his Morse key!"

He attended many Benelux radio events on behalf of the G QRP Club and was well known through his visits to amateur radio events in the UK.

QRP TRANSCEIVER COMPARISON

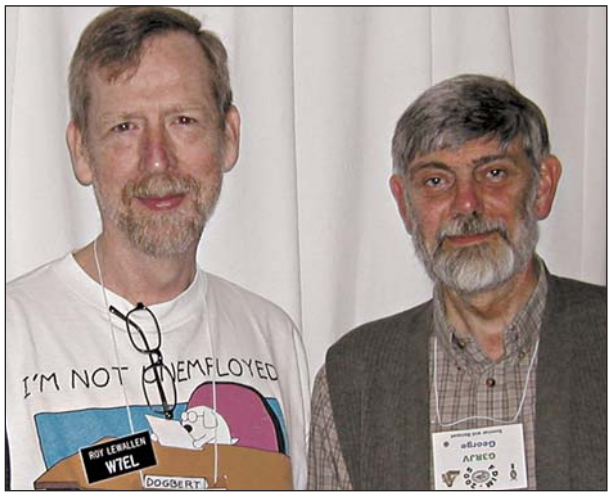
Those who wish to buy a commercial QRP transceiver, and are not sure of the respective merits of radios currently available, might like to look at a chart prepared by Anthony Luscre, K8ZT. Anthony is QRP Contributing Editor for *QST* magazine. His article called 'A Look at Four Popular Multimode/Multi-band Low-Power Radios - Comparing Features, Look and Feel, Operating Impressions and Special Features', see 'Web Search'.

In addition to the chart on the site, an on-line spreadsheet version is available that allows buyers to weigh the importance of each feature based on their individual needs. The spreadsheet will then calculate a numerical value for each radio to assist readers in the selection process. There is also a link to Anthony's own website which is full of good QRP-related material.

THE G QRP CLUB MINI-CONVENTION 2005

As usual, the G QRP Club will be holding its Mini-Convention in Rochdale. The date this year is Saturday 8 October and the venue is St Aidan's Church Hall, Manchester Road, Rochdale. The event begins at 10am with an admission charge of £1. As in previous years, the event is an 'old style' radio rally with component, junk and kit vendors. No expensive new equipment will be on sale and there will be a notable absence of computer equipment. The convention will also include a full programme of lectures throughout the day plus the tradition Pie and Peas lunch. Details can be had by sending me a stamped addressed envelope to the address above or by sending an email request.

The lectures this year draw on some international speakers. The keynote speaker is Roy Lewallen, W7EL, well-known for his *EZNEC* antenna software. Peter Zenker, DL2FI, will speak about QRP equipment and kits available in Europe. Henning Mikkelsen, OZ4XF, is to introduce a new kit for 80 and 20m SSB, digimodes, and CW, built almost entirely with SMD components. The fourth presentation will be on the QRP2004 All-band QRP Transceiver – a talk by Jan Verduyn, G0BBL, with Alan, M0PUB, and John, G8BTR. This year's convention offers a fine collection of presentations for the QRP enthusiast. ♦



Below
Roy Lewallen, W7EL, (left) with G3RJV at the Dayton Hamvention, 2005.

WEB SEARCH

Radio comparisons	www.arrl.org/news/features/2002/03/11/1/
Adventure Radio Society	www.arsqrp.com/
EZNEC software	www.eznec.com/

Members' ads

FOR SALE

3-ELEMENT tribander, Jaybeam with Yaesu G-1000SDX rotator, £150 ono. GW0LTH, QTHR, 01495 221 655 (Blackwood, Gwent).

AKAI 4-track tape deck, stereo with service man. GX-265D, new cond, £50. Buyer collect. G3HRF, 01621 784 931 (Burnham on Crouch).

AMERITRON AL-80B 1kW linear, £900. Amp super tuner, £290. Yaesu mic MD-200 ABX, £150. Oil-filled dummy load, £35. Yaesu boom balun, £30. All above unused and boxed. G-Whip all-band. 5kV wide-spaced variable capacitor 320pF, £40. Revex 520 SWR meter, £40. 8-way parallel feeder switch, £50. 1kW parallel ATU 15/20 MHz, £30. 1kW parallel ATU 20/40 MHz, £30. Multi 10.20kW ATU, £30. 01279 731 070 (Harlow).

AMERITRON AL-82 linear 2x3-500Z, spare valve, £600 ono. GW3KDB, QTHR, 01545 560 451 (Llandysul).

BIRD with 9 elements and case, £250. MFJ-258B, £100. Marconi 2002AS sig gen, £45. Marconi TF-2015A sig gen, £95. Rohde & Schwarz BN-4242/2 sweep sig gen, £35. Fluke 8810A multimeter, £55. Hameg HM 205-3, 20MHz storage scope, £75. Postage extra. Pascal, GI0SFT, 028 7135 2804 after 5pm (Londonderry).
E-mail: pascalmcd@aol.com

SILENT KEYS

We regret to record the passing of the following radio amateurs:

G0FPS	Mr R Watson	24/07/05
G0TGF	Mr J McGoff	07/07/05
G1LUM	Mr M S White	31/07/05
G2PT	Mr J Piggott	20/06/05
G3AYZ	Mr J F Turner	24/08/05
G3MYN	Mr R J Smith	05/08/05
G3OBD	Mr P Dutfield	16/02/05
G3THX	Mr C Collins	06/08/05
G4DLQ	Mr J Milligan	01/05
G4EDP	Mr P J Powell	20/06/05
G4ISC	Mr A R Rickus	12/04
G4WYG	Mr B Rowe	05/08/05
GM3UU	Mr A S McNicol	11/08/05
RS43049	Mr D W Benjamin	06/05/05
RS48401	Mr J G Van Went	14/07/05

CUSHCRAFT R8 8-band vertical 40-6m with guying kit. 'The Rolls Royce' in unopened boxes, £320. Navico AMR-1000S 2m FM 25W, £30. KAM, £25. Sinadder S-101E for aligning FM radios, £50. G3RCE, QTHR, 01908 231 904 (Milton Keynes).
E-mail: rob@robg3rce.plus.com

ELECRAFT K2 tcvr with all bands, SSB and internal auto ATU, £480. 01634 891 017 (Medway).

FOUR 813 valves, used but OK, £5 each plus postage. Les, G2FQP, QTHR, 0117 957 0929 (Bristol).

IC-706 MkI, very little used, £395 ono. Thurlby-Thandar 1906 computing multimeter, 200,000 counts (5.5 digit) – RS-232 interface – as new. Bargain at £270. Tektronix 454A analytical oscilloscope, dual trace (alt or chop), 150MHz/2mV, delayed sweep etc, £180 ono. Airmec Wave Analyser type 248, wide-band measuring rcvr (5 to 300 MHz), £150. 9 off ITT starphones, two on 432MHz, others 460MHz, plus full service man, £95 ono. Dave, G3PLR, 01582 766 410 (Harpenden).
E-mail: daveskye1@hotmail.com

ICOM 765 Hf tcvr, £400. SP-20 matching spkr unit, £50. MFJ-784B tunable DSP filter, £75. AEA inc MM-3 Morse Machine, £40. Entire station, £525. All items one owner and mint condition. Buyer collects. Don, G3HVA, 01256 780 482 any time (Basingstoke).
E-mail: donpinnock@onetel.com

ICOM HF tcvr IC-740, h/book, service man, mic, works well on all bands including WARC. Buyer to inspect and collect and witness working, £250 ono. 01865 821 503 (Abingdon).
E-mail: robin@campionhouse.co.uk

ICOM IC-706 tcvr, HF 6m 2m, man, mic & leads, no box. Exc cond, £250. Terry, G7BHU, 01773 776 025.

ICOM IC-756PROII, exc cond, handbook, boxed c/w accessories and Icom SM-8 desk mic, £1150. Radio Works Carolina Windom 80 Special, 80-10m, 4 months' use, man, £50. Will deliver tcvr locally or carriage at cost. Stephen, 01986 798 524 (Diss).
E-mail: steve@sboldvic.demon.co.uk

INTERFACE bargain. Signalink model SL-1+ by Tigertronics. Does not require com port and is suitable for pretty well all rigs. Complete with all cables and instructions. Cost over £100 last May. Surplus to requirements, £70 post paid. Ken, G3RDG, 020 8455 8831 (London).

KENWOOD MC-90 mic in as new cond, wired for TS-2000 (8-pin). Unwanted gift, £120. G4PFR, QTHR, 01296 623 802 (Aylesbury).

KENWOOD TH-77E 2m/70cm h/h. Many extras, £75 + carriage. Yupiteru MVT-7100 wide band scanner, £95 + carriage. Both in exc cond in orig packaging with mans. Roger, G4WOI, QTHR, 01637 878 133 (Newquay).
E-mail: rogerallennr@btopenworld.com

KENWOOD TL-922 Linear amplifier with man. Perfect cond, £759 ovno. Due to heavy weight, buyer must collect from Lindfield West Sussex. Yeasu FT-290R (mic and man) + Mirage B-34G 30W linear (with man) + Watson 10AM power supply. Full working order. Sell as package, £220 ono. Eric, 01444 484 535.

KENWOOD TS-570DS vgc auto ATU 100W, DSP, as new, £570 + carriage. G6WWM, 01606 599 280 (Northwich).
E-mail: hslade@btinternet.co.uk

KENWOOD TS-950S, 150W o/p with narrow SSB filter 1.8kHz, MC-60 mic, man, vgc, £900. Kenwood AT-230, £90. Carriage extra. G3SPU, QTHR, 01225 703 696 (Melksham).
E-mail: g3spu@tiscali.co.uk

KW08 monitorscope by DECA, instruction man, £40. G4ZJE, 01524 770 538 (Lancaster).

MFJ magnetic loop antenna model 1786 brand new, never erected never used, £280. 01664 562 044 (Melton Mowbray).
E-mail: terence.murphy4@ntlworld.com

MFJ-969 tuner, boxed, £85 + post. Icom SM-20 desk mic, boxed, £75 + post. 01722 502 877 (Salisbury).

RELUCTANT sale QTH neat Norwich. Barn conversion in Bunwell village, well served by local shops, church and garage. Some seven miles from market towns of Wymondham and Attleborough, both providing a wide selection shopping leisure/recreational facilities and schooling for all age groups. Norwich is 11 miles to the North. Major roads A11, A140 and A47 are all within 10 miles. Entrance hall, downstairs bedroom with adjoining bathroom. Open plan lounge and dining area divided by central chimney and fireplace. Conservatory off dining area. Large well-fitted kitchen and pantry. Study and storeroom. Garden room accessed through further work area. Utility room with shower and WC. First floor landing overlooks lounge area leading to two further bedrooms and bathroom. Courtyard annexe with kitchen sink and WC, ideal as fourth bedroom, office or radio shack. G5RV aerial and masts included in sale. Large garage, rear garden, workshop, sheds and greenhouse also included, £495,000. Enquiries only through Moneyproperties. Tel +44 (0) 1953 423 006

RETIRED TV engineer has classic and modern instruments for sale. For list please contact John, G8BXO, 3 West Park, South Molton, Devon, EX36 4HJ. 01769 573 382.

SILENT key, Ten-Tec Jupiter + extras tcvr, Drake 2B rcvr, Tennamast, Altai rotator, ant analyser MFJ-259, dip meter, test gear & books. 01258 453 432

CONGRATULATIONS

to the following, whom our records show as having reached 60 or 50 years' continuous RSGB membership:

70 years

G3WP	Mr J H Brazzill
G8QM	Mr V J Flowers

60 years

G2A0Z	Mr G W F Ashford
G3CSC	Mr S J Roddan
G3DWQ	Mr G Lancefield
G4AQ	Mr E G Filby

50 years

G3KLH	Mr D G Alexander
W1JR	Mr J H Reisert

We apologise to Mr K G Thompson, G3AMF, who was omitted from the September list of those with 60 years' membership.

(Blandford Forum).
E-mail: bvars@bvars.org.uk

SILENT key. New IC-703 + CW filter. AH-703 HF/50MHz ant. Watson 5A PSU. Also FT-480R. IC-240. FT-901DM. SRX-30 rx. Offers? G4VWI, QTHR or Peter, 0116 235 0009 (Leics).

STRUMECH BP-40 Versatower with autobrake winches, head unit, bearing. Also HD KR-600RC rotator and Cushcraft A4WS tribander. Must sell due to move, £600 together. Buyer collects and preferably dismantles. G0KGD, QTHR, 01948 770 302 (Malpas).
E-mail: vz@first3.freeserve.co.uk

STRUMECH HD BP-80 tower exc cond, all winches and base post incl, £2,500 ono. Force 12 5-band Yagi, £500 ono. Both in exc cond and can be seen. Pete, G4XNR, 07971 678 623 (Pontefract).
E-mail: p.morris@koomail.co.uk

TELEX High Gain Tribander 20, 15 & 10m c/w ferrite balun for maximum legal power. Colour coded for reassembly. Manufacturer's assembly instructions. Buyer to collect. Boom length 14ft 2in in one piece. Best offer. Ivan William King, G3VVU, 0115 911 2265 (Nottingham)

TS-530SP exc cond, £200. M M tvtr 28/144, £50. TR-751, no memories, hence £150. MFJ-945E mobile tuner, one month old, £75. 01438 369 128 (Stevenage).

VIBROPLEX single-paddle delux key, £90. Bird Termaline dummy load, £50. Brown Bros iambic key, £45. Datong FL3 filter, £45. Colyn, GD4EIP, 01624 801 592 (Isle of Man). E-mail: gd4eip@yahoo.com

YAESU 847 plus PSU in mint cond, boxed, can be seen working, £620. Terry, 0161 211 9047 (Manchester).
E-mail: sidney.kay@ntlworld.com

YAESU FT-726, 6/2/70/sat boxed with power leads mic, man and circuit. Non-smoker, £385 ono. G6MDU, 0115 849 7482 (Long Eaton).
E-mail: gordygreytop@yahoo.co.uk

WANTED

APPRENTICE/BOY entrant brass wheel. Not filed or centre tapped. Your price paid. 1932082, Dick, G0DIC (Boston).
E-mail: rafixter@lineone.net

CUSHCRAFT A3S or similar. Must be in good cond. G3FEV, QTHR, 01706 211 339 (Rossendale).

GRUNDIG Yacht Boy radio, must be model 210 from between 1970-1974. Must be in absolutely mint cond, will pay very good money for a set in mint cond. Peter Tankard, 0114 231 6321 between 9am and 10pm. No time wasters please (Sheffield).

HEATHKIT counter IM-4100 (not necessarily in working order) for spares. Instruction leaflet on Cirkit Electronics FC-177 frequency counter. G3MEA, QTHR, 01670 503 525 (Morpeth).
E-mail: stan@g3mea.fsnet.co.uk

HUNTER 6 50MHz linear amp in good cond for next cycle – good price paid. Dave, G4GLT, 01858 565 443.
E-mail: newmandildav@aol.com

MORSE keys wanted please. Early brass keys, especially by Marconi, GPO etc, but all considered. John, G0RDO, an avid collector, 01626 206 090 (Newton).
E-mail: john@morsemad.com

SILENT key clearout or just not needed. I collect QSL cards for their historic interest, preferably from periods before 1970. Please don't throw them away. I can collect or arrange collection. Tony, G4UZN, 01132 693892 (Leeds). E-mail: g4uzn@qsl.net

TS-130V your price paid for a nice one. 01634 891 017 (Medway).

RALLIES

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; **MA** - Foundation Morse Assessments; **LB** - Licensed Bar; **C** - Catering; **DF** - Disabled Facilities; **WIN** - prize draw, raffle; **LEC** - LECtures/ seminars; **FAM** - FAMily attractions; **CS** - Camp Site.

2 OCTOBER 2005

BELGIUM Amateur Radio & Computer Rally – Hall 'La Louvière Expo', La Louvière, access direct from motorway 50km S of Brussels. OT 9am. FM, TS from UK, Holland, Germany & France. Michel, ON7FI, 0032 64 849 596, michel.dewyngaert@skynet.be [www.qsl.net/on6ll/]

7 – 9 OCTOBER 2005

RSGB HFC2005 – Gatwick Worth Hotel, Sussex. 0870 904 7373. hfc@rsgb.org.uk [www.rsgb-hfc.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; 7 = 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. The only QSL Bureau sub-manager for special event station callsigns is as follows: Mike Evans, 322 Heol Gwyrosydd, Penlan, Swansea SA5 7BR, e-mail mw0cna@ntlworld.com. Will organisers of special event stations please ensure that they lodge plenty of envelopes with their sub-manager?

1 Oct	GB200RN: 200 Royal Navy. Fareham, Hampshire. LHV27 (G4ZMP)
	GB200V: Two Hundred Victory. Upper Pool, London. LH27 (G0TBD)
3 Oct	GB0LTM: Leeds Talking Magazine. Horsworth, Leeds. LHV27 (G0WRT)
5 Oct	GB0NPD: National Poetry Day. Bradford, West Yorkshire. LHV2 (G0PFH)
7 Oct	GB1CCC: Cardiff Centenary Celebrations. Cardiff. LHV27 (GW0WHT)
	MB2HFC: H F Convention. nr Gatwick Airport,West Sussex. TLH (G3LAS)
8 Oct	GB0I0I: Airship R101. Cardington, Beds. LHV2P (M1TLK)
	GB0PWE: Papa Whiskey Echo. Morpeth, Northumberland. TLH27 (M0VKX)
14 Oct	GB2TNC: Trafalgar Nelson Collingwood. TLH2 (G3BRA)
	GB5WVR: Worth Valley Railway. Keighley, West Yorkshire. LH (G0FQN)
21 Oct	GB200HNT: Horatio Nelson Trafalgar. Sully, South Wales. LH2 (GW0ANA)
	GB200RN: 200 Royal Navy. Portsmouth, Hants. LHV2 (G4ZMP)
	GB2NNC: Norfolk Nelsons' County. North Walsham, Norfolk. LH27 (M0NBG)
	GB4BOT: Battle of Trafalgar. Penzance, Cornwall. LHV2 (G3UUZ)
22 Oct	GB200: Golf Bravo 2 Oscar Oscar (200). LH2 (G4SSH)
23 Oct	GB2LSM: Long Shop Museum. Leiston, Suffolk. LH (G4XVE)
	GB50RS: Radio Society. Wilmslow, Cheshire. TLHV27 (G3LEQ)

9 OCTOBER 2005

BLACKWOOD & DARS Rally – Newport Centre, Newport, 1 mile from jn 25A of the M4 (jn 26 travelling W – E. OT 10.30 / 10.45am, £1.50. CP free, B&B, TI, TS, SIG, LB, C, DF, WIN. George, 2W1JLK, 01495 724 942, or Dave, GW4HBK, 01495 228 516.

EXETER ARS Radio Rally / Table-Top Sale – Moose Hall, Spinning Path Lane, Blackboy Road, Exeter. OT 10.30am, £1. C, CP nearby. Steve, M3WRS, 01392 498 934.

GREAT LUMLEY AMATEUR RADIO & ELECTRONICS SOCIETY Rally – Great Lumley Community Centre, Front Street, Great Lumley. OT 10.30, £2, accompanied under-14s free. B&B, CP, C, model club, radio, hobbies, electronics, computer, satellite and component stalls. Nancy, G7UUR, 0191 477 0036, 07990 760 920, nancybone2001@yahoo.co.uk

15 OCTOBER 2005

W&S @ Jaycee Open Day – Glenrothes Shop, 01592 756 962.

15 / 16 OCTOBER 2005

JAMBOREE ON THE AIR (JOTA)

16 OCTOBER 2005

HORNSEA ARC Annual Rally – Floral Hall, Hornsea. G4YTV, 01964 562 498.

Northern Ireland Morse Proficiency Tests – Carrick Rally. Advanced booking (>10 days prior to test) necessary. John, GI3YRL, 028 9336 7208, jbranagh@supanet.com or Jim, GI0DVU, 028 9266 2270, jim.henry@ntlworld.com

19 OCTOBER 2005

HASTINGS ELECTRONICS & RADIO CLUB Autumn Auction of Used & Surplus Equipment – William Parker School, Parkstone Road, Hastings, at 7pm. Gordon, 01424 431 909.

22 / 23 OCTOBER 2005

HAMEXPO 27ème Salon International Radioamateur – Auxerre. [www.ref-union.org]

23 OCTOBER 2005

GALASHIELS & DARS Annual Open Day & Rally – The Volunteer Hall, St John's Street, Galashiels. 10.45 / 11am. TS, B&B, C. Jim, GM7LUN, 01896 850 245, mail@gm7lun.co.uk

29 OCTOBER 2005

ROCHDALE & DARS Traditional Radio Rally – St Vincent de Paul Catholic Church Hall, Caldershaw Road, off the A680 Edenfield Road, approx 2 miles W of Rochdale. Follow the orange arrows from M62 jn20. OT 10.15 / 10.30, £1. CP free, TS, B&B, C, TI on 145.550MHz. Please note that this is a Saturday Rally! John, G7OAI, 01706 376

204 (eve), radars@radars.me.uk [www.radars.me.uk]

30 OCTOBER 2005

RUSTY RADIOS CONTEST GROUP Rally – Cottered Village Hall, Herts (on the A507 between Baldock and Buntingford). OT 10.30, £1 + conc. C, CP, no computers! Sean, 01462 459 724 (eve). [www.rustyradios.com]

5 / 6 NOVEMBER 2005

NORTH WALES RS 19th North Wales Radio, Electronics & Computer Show – North Wales Conference Centre, Llandudno. OT 10am both days; £3 per day, or £5 for two-day ticket. Under 14s free if holding a callsign or if accompanied. B&B, DF, TI on 145.550MHz from 8.45am. Jenny, MW0BET, 01492 549 413. [www.nwrs.org.uk]

13 NOVEMBER 2005

West London Radio & Electronics Show – Kempton Park racecourse, Sunbury-on-Thames, Middx. Paul, M0CJX, 01737 279 108, m0cjx@radiofairs.co.uk [www.radiofairs.co.uk]

20 NOVEMBER 2005

MIDLAND AMATEUR RADIO SOCIETY Birmingham 16th Radio & Computer Rally – New venue – Alderbrook School, Blossomfield Road, Solihull, approx 3 miles from M42 jns 4 or 5. OT 10am, £1, TS, clubs, SIG, CP free, FM, TI. Peter, G6DRN, 0121 443 1189.

26 NOVEMBER 2005

Reddish Rally – St Mary's Parish Hall, Reddish Road & Broadstone Hall Road South, Reddish. OT 10am, £1. C, TI. John, G4ILA, 0161 477 6702, john@mckae.freeserve.co.uk

3 DECEMBER 2005

Martin Lynch & Sons' Christmas Hog Roast & Boot Fair – Guildford Street, Chertsey. sales@hamradio.co.uk [www.hamradio.co.uk]

Northern Ireland Morse Proficiency Tests – Greystoke Community Centre, Antrim. Advanced booking (>10days prior to test) necessary. John, GI3YRL, 028 9336 7208, jbranagh@supanet.com or Jim, GI0DVU, 028 9266 2270, jim.henry@ntlworld.com

4 DECEMBER 2005

BISHOP AUCKLAND RAC Rally – Spennymoor Leisure Centre. OT 10 / 10.30am, £1.50, accompanied under-14s free. B&B, C, LB, DF, FAM, TI on 144.550MHz. Mark, G0GFG, 01388 745 353, or Brian, G7OCK, 01388 762 678.

5 FEBRUARY 2006

SOUTH ESSEX ARS Mobile Radio Rally – Ken G0BBN, 01842 861 089, hendryken@aol.com [www.southessex.ars.btinternet.co.uk]

12 FEBRUARY 2006

WAKEFIELD & DRS Northern Cross Mobile Rally 2006 – John, G7JTH, 01924 251 822.

18 / 19 FEBRUARY 2006

World Thinking Day on the Air – Liz, 023 8025 4599, liz@guides-on-the-air.co.uk

26 FEBRUARY 2006

SWANSEA ARS Amateur Radio & Computer Show – Roger, GW4HSH, 01792 404 422.

5 MARCH 2006

CAMBRIDGE & DARC Rally – John, G0GKP, 01954 200 072, j.bonner@ntlworld.com

12 MARCH 2006

BOURNEMOUTH RS 18th Annual Sale – John, G0HAT, 07719 700 771, johncbales@yahoo.co.uk [www.brswebsite.freeserve.co.uk]

1 APRIL 2006

GMDX Convention 2006 – Robert, GM3YTS, gm3yts@btinternet.com

19 – 21 MAY 2006

55th Hamvention – Dayton, Ohio. [www.hamvention.com]

18 JUNE 2006

NEWBURY DARS Car Boot Sale – Kevin, G6FOP, g5xv@ntlworld.com [www.nadars.org.uk]

23 – 25 JUNE 2006

Hamtronic Friedrichshafen – [www.messe-friedrichshafen.de]

25 JUNE 2006

West of England Radio Rally – Shaun, G8VPG, 01225 873 098, rallymanager@westrally.org.uk [www.westrally.org.uk]

13 AUGUST 2006

FLIGHT REFUELLING ARS Hamfest – Mike, M0MJS, 01202 883 479, hamfest@frars.org.uk [www.frars.org.uk]

RSGB MEMBERS' ADVERTISEMENTS

RSGB members wishing to place an advertisement in this section should use the official form printed in *RadCom* each month and send it to 'Memads', *RadCom*, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. No acknowledgement 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*. **The RSGB believes that it is inappropriate for members trading in whatever way in radio equipment to place members' advertisements. We therefore regret that we are unable to take such advertisements, although we do welcome these in the 'Classified' advertising section of *RadCom*.** The editor reserves the right to refuse any advertisement for any reason. In such matters, the editor's decision is final.

The RSGB 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. Members may submit *one* photograph of equipment being sold / wanted at an additional cost of £5.00. This *must* be a .jpg or .gif file and the file name *must* be included on the Order Form. The photograph may be e-mailed to radcom@rsgb.org.uk or sent on a floppy disk or CD.

Licensed members are asked to use their callsigns and QTHR, provided their addresses in the current edition of the *RSGB Yearbook* are correct. RS members will have to provide their names and addresses or telephone numbers. Please include your town and phone number in the free boxes provided to assist readers. Advertisements will be placed in the first available edition. Please do not send Members' Advertisements to Danby Advertising (advertising agents). The closing date for copy is the first day of the month prior to publication, e.g. the deadline for the May issue is 1 April.

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. Members' Ads also appear on the members-only website: www.rsgb.org/membersonly/membersads*

The Members' Ads order form is published below. If members do not wish to cut the form out of the magazine, photocopies will be accepted, as will recent copies of the form from previous months. As a last resort, members may also send in their advertisements on separate sheets of paper, but if you choose to do this, you must supply an accurate word count and, of course the correct fee in the normal way.

RSGB MEMBERS' ADS ORDER FORM

Application form for one For Sale, Exchange or Wanted advertisement. Do not mix classifications on this form; separate applications must be made.

Please ensure you read and understand the conditions of acceptance of these subsidised Members' Advertisements, printed at the top of the Members' Ads page of *Radcom*

☐ I enclose a cheque/PO for £ ☐☐.☐☐ p

☐ Please charge to my credit card

Number ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Expiry date ☐☐☐☐ Issue number (Switch only) ☐☐

Signed _____ Date _____

Section: ☐ FOR SALE ☐ EXCHANGE ☐ WANTED

_____

_____

_____

_____

_____

_____

_____

_____

_____

RATES: UP TO 20 WORDS £5.50; 21-40, £6.50; 41-60, £7.50.
PHOTO (jpg or gif only) ADD £5.00

Free entries

Photo file name (if applicable) _____.jpg/gif

Town _____

E-mail _____

Phone _____

CLASSIFIED

Classified advertisements 58p per word (VAT inc.) minimum 14 words £8.12. All classified advertisements must be prepaid. Please write clearly. No responsibility accepted for errors. Latest date for acceptance is 1st of the month prior to publication.

Copy to: Chris Danby G0DWV, Danby Advertising, 299 Reepham Road, Hellesdon, Norwich, NR6 5AD
Tel: 0870 904 7377 Fax: 0870 904 7378 E-mail: adsales@rsgb.org.uk

Payment to: RSGB, Lambda House, Cranbourne Road, Potters Bar, Herts, EN6 3EP

FOR SALE

ISOLATED INTERFACES For PSK-SSTV-RTTY-WSJT-CW. Suitable for SOUNDBOARD PROGRAMS. INTERCHANGEABLE LEAD MODELS AVAILABLE. Also NEW CW model. Registered with PAYPAL. See www.g3liv.co.uk johnny@melvin.com
Tel 0191 2843028

FIBREGLASS TUBE High strength tube, square box, rod, and other sections all from stock in 6m lengths. Engineered Compositions, Chester. Tel: 01244 676000 e. barbara@engineered-composites.co.uk www.engineered-composites.co.uk

*****NEW*** TELESCOPIC FIBREGLASS** Poles.Light and strong. 6.9m (23ft) £17.95, 9.1m (29.8ft) £25.95. Prices include p&p. Cheques to: SOTABeams 89 Victoria Road, Macclesfield, Cheshire, SK10 3JA. More at www.sotabeams.co.uk

Qtz X-tals 455.2 kHz — 28.060 MHz £1-95/unit Incl.call freq. Mtchd 9MHz, 10MHz £12/8, 4MHz £2/8, 10.7MHz £8/8 1.4MHz usb/lsb fltr £14,10.7 MHz 10kHz fltr £8 p&p £1-50 + VAT IQ ELECTRO 0208 391 0545 vincent@jakomin.fsnet.co.uk

UNIVERSAL PORTABLE 12V4500MAH Li-ion intelligent battery. Ideal for FT-817, K2, handhelds and other QRP.See http://myweb.tiscali.co.uk/the817shop Please note no www in address.

ICOM 737 INC AUTO-TUNER, Immaculate condition.£500
Tel: 01843 292600 Mr Steele G0RBC

EQUIPMENT

VHF/UHF ACCESSORIES AND AERIALS, PMR equipment and spares, Garex Electronics, P O Box 52 Exeter EX4 8WX www.garex.co.uk Phone 07714 198374

G2DYM ANTI-TVI, ANTI INTERFERENCE AERIALS outperform any other commercial wire aerial. Information, testimonials, Large S.A.S.A.E:- G2DYM, Uplowman, Devon, EX16 7PH. 01398 361215 Anytime.

REPAIRS to all amateur and vintage RX/TX cost effective service phone or call in for details. Medway Aerials rear of 14 Luton Road, Chatham, Kent, ME4 5AA 01634 845073

SILENT KEY ESTATES - sympathetic advise, valuations and purchase by retired Solicitor / Licenced Ham. Midlands area. Tel: 07866 077249

COMPUTER SOFTWARE

MEMORY MANAGEMENT SOFTWARE for YAESU rigs. FT-817/ND, FT-847 FT-857/D, FT-897/D,FT-7800, FT-8800, FT-8900, VR-5000. 9 South Avenue, New Milton, Hants H25 6EY. Website: www.g4hfq.co.uk Email: bob.freeth@g4hfq.co.uk Phone: 01425 618092

CARDS & DESIGN

QSL FACTORY - quality full colour QSL cards. Single and double sided, ready-made and custom. From £24. Fast turn-round. www.qslfactory.com Large SAE for samples: 13 Lumley Flats, Pimlico Road, London SW1W 8NQ

G4TJB QSL CARDS. Large SSAE for samples. Unit 6, Worle Industrial Centre, Coker Road, Worle, Weston-Super-Mare BS22 6BX.

LZ1YE QSL PRINT SERVICE, prices from £20 per thousand inc. p&p.
One, two, or full colour glossy cards, the choice is yours. More information via: qsl@qslprint.com or m0mja@aol.com. Samples at www.qslprint.com

QSL'ERS For all your QSL needs, FREE samples with your callsign. Stock cards with overprinting, Shirts/Caps available. Free quotes Contact Chris MØDOL, PO Box 184, Northampton, NN3 9JH, England

CARTOONIST's QSLS - Your Idea (or GW3COI's) £10 inc p&p. 01694 731661 Bank Cottage, Kenley, Salop. SY5 6NW

MISCELLANEOUS

ROYAL NAVAL AMATEUR RADIO SOCIETY seeks your support and membership. Qualify? Join today! www.RNARS.org.uk

BUSINESS CARDS

RCQ COMMUNICATIONS POSSIBLY

9am - 5pm Monday to Saturday

THE UK'S LEADING USED EQUIPMENT DEALER

ICOM IC-728 HF TRANSCEIV	£325.00	KENWOOD TS-140S HF TCVR	£275.00	YAESU FT-2600M 2M FM	£135.00	KENWOOD LF30A LPFILTER	£35.00
BATTERY FNB-85 FOR FT-817	£35.00	K/WOOD TS-440SAT INC ATU	£350.00	KENWOOD TM-221ES 2M FM	£75.00	DAIWA CROSSED CN-101	£45.00
YAESU FT-1000MP	£895.00	TRIO/KENWOOD TS-440S HF	£225.00	YAESU FT-8000 TRANSCEIVE	£165.00	BOOM H/SET TH-887A NISSEI	£15.00
KENWOOD TS-870 HF TRCVR	£695.00	KENWOOD TS-50	£295.00	KENROTATOR KR-250 NEW	£50.00	K/WOOD MC-80 BASE MIC	£50.00
YAESU FT-980 HF SOLID STA	£375.00	YAESU FIF-232C CAT SYSTE	£45.00	MFJ DIFFERENTIAL T 3KW	£95.00	ADDONIS AM-308 OK YAESU	£35.00
ALINCO DX-70 TH	£350.00	YAESU FT-757GX MK2 MAN,	£325.00	MFJ-989C 3KW ATU	£125.00	NISSEI SJDC308 FOR ICOM	£35.00
ICOM IC-706 MK2 BOXED	£375.00	ICOM IC-2700H DUAL BAND	£185.00	MFJ 945 ATU BOXED	£65.00	ASTATIC TEARDROP MIC	£35.00
FT-ONE TECHNICAL MANUAL	£25.00	ALINCO DJ-596 2/70 HANDIE	£90.00	YAESU FC-902 ATU AS NEW	£195.00	YAESU YD-148 DUAL z BASE	£35.00
KENWOOD TS-50 HF TCVR	£250.00	KENWOOD TR-751E 2M MUL	£275.00	LDG AT-11MP AUTO ATU	£95.00	KENWOOD MC-60 DUAL z	£65.00
KENWOOD 950SDX	£1,295.00	K/WOOD TH-78E + SPK MIC	£95.00	MFJ 989C AS NEW BOXED	£225.00	TIMEWAVE DSP59+ DSP	£95.00
YAESU FT-7B HF TCVR	£195.00	ICOM IC-32E + BASE CHG +	£115.00	SGC-239 HF SMARTUNER	£150.00	SCOPEX 4S-6 SINGLE BEAM +	£50.00
ICOM IC-745 BOXED	£325.00	ICOM IC-240 VHF 2M FM 10W	£35.00	MFJ-986 3KW DIFFERTIAL T	£175.00	LOWE FX-1 DIP METER	£40.00
TS-440S + PSU 430	£395.00	YAESU FT-290R + MUTEK V/	£150.00	KENWOOD AT-440 ATU	£95.00	CAMBRIDGE NOISE BRIDGE	£5.00
YAESU FT-840 + FM BOXED	£325.00	ALINCO DJ-G1 HANDIE	£75.00	YAESU FRG-100 EXCELLENT	£250.00	TELEQUIPMENT D1010 SCOP	£50.00
YAESU FT-847 BOXED	£725.00	ALINCO DR-130E VHF FM	£95.00	SGC POWER CLEAR DSP	£195.00		
YAESU FV-101Z VFO	£85.00	KENWOOD TM-271E BOXED	£150.00	TRIO R-2000 RECEIVER	£185.00		
YAESU FT-757GX HF TCVR	£250.00	KENWOOD TM-702 2/70 FM	£165.00	YAESU FRG-7 **DIGITAL**	£165.00		
TEN-TEC ARGOSY 525 + MAN	£225.00	YAESU FT-4700 FM 2/70 MINT	£165.00	W9GR DSP2 AUDIO FILTER	£85.00		
YAESU FT-101ZD MK3 MINT	£325.00	ICOM IC-490E 70CMS MULTI	£150.00	DATONG FL-3 AUTO NOTCH	£55.00		
KENWOOD 950SD SUPERB	£625.00	ALINCO DR-140 VHF MOBILE	£95.00	REVEX DUMMY LOAD	£10.00		
HEIL HEADSET - PROSET 4	£75.00	FDK MULTI 11 2M FM TCVR	£35.00	MFJ 815B 1.8-60MHZ SWR +	£65.00		
YAESU FT-920 EXCELLENT	£795.00	LINER 2 SSB TCVR FOR 2M	£45.00	MFJ 815B USED CONDITION	£25.00		
TRIO-TS130S 3.5-28 WARC	£275.00	ALINCO DR-605 2/70 BOXED	£125.00	OSKER SWR-200	£35.00		
INDEX QRP PLUS HF TRVR	£295.00	KENWOOD TM-441E 70CMS	£85.00	WELTZ SP-400	£45.00		

WANTED FOR CASH

A personal message from Dave G3RCQ - I always try to pay the best price for your Equipment. I also buy for CASH. You do not To buy another rig - simply sell to me for £££. Then go to your new equipment dealer without a trade in and negotiate a discount.

LEICESTER SHOW

Because we only sell quality used equipment - we have found that most of our sales are made on the 1st day of the show.
THIS YEAR WE WILL ONLY BE AT THE SHOW ON

FRIDAY 30th.SEPT.05

E-mail g3rcq@supanet.com | **Sales Hotline 079 408 37 408** | **Latest list www.g3rcq.co.uk**

QSL COMMUNICATIONS

UNIT 6 WORLE INDUSTRIAL CENTRE, COKER ROAD, WORLE, WESTON-SUPER-MARE, BS22 6BX.

www.qsl-comms.co.uk

Email: jayne@qslcomms.f9.co.uk

TEL: 01934 512757

YAESU

NEW VX-6E Waterproof 2m/70cms Transceiver

£199

YAESU

FT60E 2m/70cms Transceiver

£169

MOBILE BOOM MICROPHONES

Suitable for the FT-857, IC-706 **£39.95**
When ordering please indicate for which radio.
Complete with Switchbox & Radio connection leads
also VHF/UHF radio
Kenwood **£39.95,** Icom **£39.95**

ICOM

IC-718	£449
IC-706 MK2G	£769
IC-703	£539
IC-2725E	£265
IC-E90	£269
IC-R5	£169
IC-R20	£349

YAESU

FT-847	£999
FT-857D	£599
FT-817ND	£469
FT-8900	£349
FT-8800	£289
FT-7800	£249
VX-7R	£249
VX-2E	£129
VR-5000	£539
VR-500	£199

KENWOOD

TS-2000	£1299
TS-570DGE	£789
TS-480 SAT	£699
TM-D700E	£439
TM-G707E	£279
TH-F7E	£239

QAP SPEAKER

£12-99
P&P £3

500 QSL CARDS

YOUR CALLSIGN HERE
YOUR ADDRESS HERE

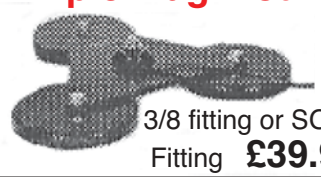
To Radio.....
Confirming our.....MHz QSO
On.....At.....GMT
Ur SSB/FM/AM/CW Sigs were RST.....
Transceiver.....Pwr.....W
Antenna.....
PSE/TNX QSL

Card size 140mm x 88mm

YOUR NAME HERE

£38-60 + £8 P&P INCLUDING ARTWORK & VAT

Triple mag mount



3/8 fitting or SO239 Fitting **£39.95**

AVAIR

POWER/SWR METERS

AV201	1.8-160 MHz	£49-95
AV400	140-525 MHz	£49-95
AV600	1.8-525 MHz	£69-95
AV1000	1.8-160 MHz 430-1300 MHz	£79-95

FERRITE RINGS

£10
INC P&P
PACK OF 10

The last word

Letters published in 'The Last Word' do not necessarily reflect RSGB policy. 'Last Word' letters may be e-mailed to radcom@rsgb.org.uk Please note that letters submitted for 'The Last Word' may not be acknowledged. The RSGB reserves the right to not publish any letter, with no reason being given. It is a condition of publication that all letters may be edited for grammar, length and / or clarity. Due to the limited space available, please keep letters as short as possible. Additional letters may be published on the RSGB members-only website at www.rsgb.org/membersonly/lastword

Testing my patience

FROM: Richard Hankins, G7RVI

Approximately half of the new 40m band segment, 7.1-7.2MHz, has been occupied every day during August (between 1100 and 1700BST) by a single signal in the UK. Everyone I have spoken to reports it as "very strong", though the exact report depends on the S-meter and their location. No, this is not an amateur transmitter gone wild – this is a DRM (Digital Radio Mondiale) test transmission being beamed at the UK from Juelich in West Germany. Details can be found at www.drm.org/livebroadcast/livebroadcast.php, where the transmitter power is given as 40kW and frequency as 7,145kHz.

Amateurs are secondary users in the band until 2009, so do we have any grounds for complaint? Well, in fact, it appears that we do (and I have already complained to the DRM governing body). Firstly, the ITU requires all signals to conform to the appropriate standard, where the sideband energy limit will be defined by a so-called "spectrum mask". Careful measurement of this signal with a lab-quality spectrum analyser shows that its sidebands exceed the ITU spectrum mask by around 10-12dB at both 10 and 20kHz from the centre frequency. Just listening on the band shows that while this signal is present, a great swathe of the band from about 7,120 to 7,170kHz is a "no-go area" for anyone else. While signals outside those points can be found (both amateur and broadcast) it is apparent that the noise floor for the entire 100kHz segment has been raised by this one DRM signal.

I haven't done a detailed study of other DRM signals, but just tuning through the various SW broadcast bands reveals more of them, and some of these do have analogue AM transmissions next to them. Even on a high-grade communications receiver, it is quite obvious that some analogue signals are suffering adjacent channel interference from the DRM transmissions.

It's almost certainly too late to complain about the ITU standards that govern DRM (which might well be claimed to be overly optimistic when it comes to analogue and digital transmissions co-existing side by side). However I do wonder if the RSGB is keeping tabs on what is going on in this field, with its potential threat to polluting our bands?

Testing my patience - response

FROM: RSGB general manager Peter Kirby, G0TWW

The Society became aware of the interference to the 40m band through the monitoring efforts of RSGB Intruder Watch coordinator Chris Cummins, G4BOH, and his team. The RSGB made initial enquiries as to the source of the interference through Ofcom and the Baldock Monitoring Station. Once it was established that it was a Digital Radio Mondial (DRM) signal centred on 7,145KHz, we made direct contact with the DRM trial coordinator. We subsequently received the following reply from T-Systems which was conducting the trial from Juelich.

"T-Systems monitors the DRM spectrum screen during the transmission. Following your enquiry regarding interference, we have noticed a temporary fault in the transmitter for the frequency 7,145KHz. This fault is causing the transmitter to radiate outside of the assigned frequency envelope. We are making every effort to repair the fault. We are sorry for the inconvenience you have experienced."

The RSGB is aware of the standards set for DRM transmissions and we will continue to liaise with all parties to ensure that the amateur bands are not affected. The RSGB Intruder Watch team will continue to monitor all the amateur bands to ensure that they remain clean of interference from unauthorised signals wherever possible.

Getting worked up

FROM: Steve Nicholls, EA5FJF

The concept of Worked All Breweries certainly has a certain charm (Last Word, G3HEE). It was back in the 1990s that, while waiting for my wife to complete her shopping, I suggested to a friend that we could have a new WATCP award (Worked all Tesco Car Parks). More recently, I've had discussions with Bill, M0BNN, who has been activating umpteen lighthouses (and issuing beautiful QSL cards) that maybe a WANB (Worked All Nudist Beaches) might find more willing operators.

Eulogy to Eugene

FROM: Nick Lansley, G1KZI

May I pass on my congratulations to amateur radio enthusiast Eugene Sully, G0VIQ, on being a superb and entertaining housemate in the Big Brother house this year.

Eugene's enthusiasm for our pastime spilled out frequently in conversation and many friends and colleagues who know that I am a radio ham have been chatting to me about the hobby as a result. I've enjoyed elaborating on Eugene's summaries from people who remembered them right through to the next day in order to ask me about some aspect of the hobby or another in more depth.

Eugene has probably done more to lift awareness of amateur radio than any other person in recent times, and I hope that the four million viewers who regularly tuned into the Big Brother house every night have taken away greater knowledge of the hobby and the enthusiasm of its participants. I hope to hear Eugene on the air very soon, perhaps with a shiny new radio and antenna purchased with his winnings!

Software radios

FROM: John Crux, G3JAG

Congratulations on the *RadCom* approach to reviewing the above. It was fair, objective and thoroughly professionally done, because like so much modern equipment, home servicing of SMD equipment is quite impossible for 99.9% of us. Returning it to base (strictly at your own expense!) for replacement of parts, boards etc is an expensive chore which must be factored into the purchase price.

Technical performance issues are another matter; most of us want a radio that we can simply switch on and that will work with no need for anything extra to be set up. But add in the undeniable complexity of anything that relies on software that is apparently updated almost daily and a domestic computer with its unpredictable idiosyncrasies, and what chance does the average amateur have?

Software radio is indeed a work in

progress on both hardware and software fronts, as its authors freely admit. You are right to highlight this along with the potential for problems that require an expensive "fix" beyond normal capabilities. Buy one to play with, but be prepared for what might go wrong...

At least with DIY construction projects like the Elecraft K2 there are discrete components, a very detailed manual and a large body of other users/constructors able to help troubleshoot. And the upgrade route to the latest version is not all that important – I still use Elecraft K2 serial number 609 and its not all that far behind current serial numbers in the 3000s. Keep up the good work.

Too much of a good thing

FROM: Brian Clowes, GW4HBZ

I was delighted to see the letter from Peter Chadwick, G3RZP, responding to my August *RadCom* letter regarding low noise oscillators and high intercept point mixers. We seem to agree that there are limits. It is a matter of quantifying how far you need to go. I was amused by two articles in the September issue, one from a keen 40m operator (G0GSF) who uses a TS120 and the other in Technical Topics on valve diode mixers. I used a TS120 and it WAS poor. I even fitted an attenuator to stop it being overloaded by the nearby broadcast band. G0GSF seems happy with the TS120.

How many are actually going to bother with the complication, heat, size and power requirements of valves when plenty of perfectly adequate solid state designs are available? A happy medium is required, somewhat better than the TS120 but not going to the extremes that some deem necessary.

I now use an IC735 which is fine. If the mixer were poor, switching in the RF stage would make a difference, not that an RF stage is needed on 40m. It doesn't seem to make any difference. I am still using a 30-year-old FT225 on 2m and have no complaints regarding receiver overload. It has been well used on hilltops during contests and openings with many big signals around. It just uses a single dual gate MOSFET mixer. It might benefit from a hot carrier diode ring mixer but that would be 20+ year old technology. Anything better (on paper) than that would seem to be a waste of time. The old IC202 is still highly regarded by keen VHF operators again with a single MOSFET mixer. Maybe it benefits from simple low noise crystal oscillators? I have had two other responses to my letter, one agreeing, and one disagreeing. Audio is a good comparison as are cars. There is poor, adequate, good and very good performance. Beyond those, there is silly and very silly. A friend was conned into buying a SCART lead at nearly £30. The shop convinced her it would make a difference.

Ideas exchange

FROM: Colin, G3SBI

I thought I ought to respond to the letter from Brian Clowes, GW4HBZ, in the July edition of RadCom. In this letter, Brian said that he was getting fed up of reading about bomb-proof mixers and low-noise oscillators in Technical Topics. He believed that the noise on 40m meant that high-performance mixers and low-noise oscillators were a waste of time.

At one time, I had a Yaesu 757 and an Icom 735. The Yaesu had a poor IP3 and poor phase noise compared with the Icom. If you listened on the band with the Yaesu, it was noisy but with the 735 it was quiet.

When I learnt how to make short top-loaded verticals, I started to really enjoy working CW DX on the 40m and 80m bands. Some of the best DX such as VK was worked about 11am on winter mornings when loads of stuff were coming in from Europe. There was also a working to W6 about 3pm in the afternoon. To work these stations, the RX had to be bomb proof. If you are a CW DX hunter, you need the best RX performance.

The point I would like to make is that the really important developments in receiver design, particularly for the amateur bands, have come from the amateur radio fraternity and have been published in Technical Topics – a very important column for the exchange of ideas for both amateurs and professional engineers.

To illustrate the importance of Technical Topics, some years ago Pat published something I did using an EPLD to make an Iambic keyer. The day after the article was published in *RadCom* I received 20 calls from professional engineers interested in what I had done. Don't knock Technical Topics.

HF remote operation

FROM: David Gould, G3UEG

I refer to the letter in the September issue from Phil Mayer, G0KKL. His cautionary warning may be entirely correct, however, I would like to point out that nowhere in Part 1 of the article did I make any suggestion or recommendation about using any low-power device for control within the boundary of one's own property. I think this must have been purely an assumption on Phil's part. All I stated was that this option would not need to use the public telephone system with its inherent bandwidth restrictions. The approach I would take in such circumstances would be to use a LAN (as described in Part 2).

Bi-directional propagation

FROM: Chris Saunders, G4ZCS

Having enjoyed operating during the recent IARU contest, a particular phenomenon has come to my attention – bi-directional propagation (or the lack of it). I was fortunate to have a free Saturday evening; with the XYL out visiting family until the small hours, I had a bash to see how many of the many headquarters stations I could work. I was amazed to find that by the following morning I had worked nearly 50 countries. However, several stations were having problems, or so it seemed to me. In spite of appeals to amateurs to work their local HQ, the HQ stations appeared to have ideas to the contrary.

For example, I spent some time trying to work a (very) local HQ on 20m who called "CQ contest" with a very short pause continuously for over half an hour with no takers but me, it seemed. Returning to the same frequency later I heard others trying in vain to work the same station, so I am not alone. Now I know this station was limited to 400W, unlike some who I did manage to work who were using considerably more power!

I would not have minded, but he was a 60dB+ signal even with an attenuator in my RX. I was amazed how regular the CQ call was, just like a tape recording. Now surely the operator had not gone to sleep leaving the transmitter unattended? Or perhaps the station was running maximum power with lots of attenuation in the receiver so he could only work the other high power stations. Another possibility is that there IS such a thing as unidirectional propagation! Naah, I don't think so.

When we, at my local club, teach

the Foundationers we are at pains to instil in them the need to LISTEN before transmitting. Perhaps this might be suggested to the stations representing their country as good practice; they might then score some more points – mine would have been one of them!

Lucky escape?

Bob Harry, G3NRT

I recently had the opportunity to take a holiday in my friend's house in France. At the last minute I packed my FT817, atu, various connectors and pieces of wire. I did wonder if I would have any problems with security at the airport, but I flew out of Stansted Airport without difficulty.

On checking in my luggage at Bergerac Airport (nothing like the size of Stansted) for the return flight I was horrified to see my suitcase pass through the X-Ray machine and pulled off the line.

I approached the operator, and was asked to open my case. I explained I was an amateur (well it is a French word) and showed the equipment. My case was passed on.

However, it transpires that I should have prepared a Customs Declaration. This is a list of all the radio kit I was taking abroad identified by serial number or other unique identifier with a statement that it was for personal use and would be returned to the UK. This statement should be presented to the Customs & Excise office at the departure airport. This is what I think I should have done. What is the experience of members? Maybe I was just lucky.

Don't try this at home

FROM: Trevor Bunce

The item in Helplines from Chas, AE4TP, about Joystick antennas jogged my memory. I am not a radio amateur operator, only a listener, but a friend who is a registered operator lent me the latest edition of *RadCom* magazine. Some years ago I had one of these Joystick antennas coupled up to a Revco AP2 masthead amplifier (pre-amp) and an Eddystone short wave receiver. After selling this equipment, I bought an Archer all band scanner antenna model 20-9005 VHF/UHF base aerial. My receiver is a Realistic PRO 2005 400 channel programmable scanner.

I have always been interested in electricity and radio. As a boy I used to go to the local government surplus shop in Middlesbrough. Here I bought a carbon microphone. By running a wire to my friend's house next door, we used to read the news from the local newspaper to one another. Later, after the end of World War II, we had a new radio at home which had shortwave. I listened for hours, to various stations and amateurs, using a pair of ex-government headphones. I remember that the actual wiring in these was similar to silk thread and to make a good connection it required a piece of wire winding around the fragile leads.

I suppose that I am fortunate in being able to relay this to you, because at about the tender age of six, I pushed two pieces of wire into the mains socket and blew myself across the living room floor with a big bang and blue flash!

Source of annoyance

FROM: Anonymous

I wonder if anyone has managed to trace the source of wide-band noise interference that has been heard on shortwave over very widespread MHz. It usually starts around midday and continues through the afternoon until darkness and can be heard over a spread from about 7MHz to 22MHz. It has no distinct centre frequency but is a weak tac-tac-tac type pulse of around five pulses a second.

I was told that it originates as an OTH radar from military in Cyprus but surely they could not be allowed to pollute up to 20MHz of HF continually for hours on end. Depending on propagation, it is often much stronger on frequencies around 14-18MHz. It must be a powerful transmitter to cover 7-24MHz with pulse power at one time.

Other sources of interference closer to home are those cheap mini-florescent lamps. Some of them produce vicious noise all over the HF frequencies, electronic switching being the culprit. The latest source to arise is an LED hand torch from LIDL. I kid you not! How can white LEDs produce RF oscillations? 136KHz enthusiasts beware.

Say that again

FROM: Ray Howes, G4OWY

I realise that the following request might be greeted with a bit of mystified query and maybe a touch of cynicism but might it be possible that when stations are calling CQ – be it VHF, UHF or HF – they issue their callsigns s-l-o-w-l-y.

Why is it that so many stations garble their callsigns or say them so quickly? Do they think everyone out there immediately recognises their voice and therefore knows their callsign or are they so habitually used to doing so that they are totally unaware of the consequences.

Please gentlemen – and ladies – s-l-o-w not fast. And, before you mention it, QRZ doesn't always work. Nor QRS.

Fearing for the future

FROM: Malcolm Drummond, G0RGO

I run the Deanery Church of England High School's radio club, G0TWD, and when we operate on HF, the rig we use is the trusty Yaesu FT 990. I have always considered this to be an excellent rig offering simplicity of use and freedom from unnecessary "bells and whistles" that might confuse both the children and me.

During the school summer holidays, I have been making plans for next year and thought it might be a good idea to download the instruction manual for the rig to print out and then laminate every sheet to create a virtually indestructible instruction book. The original would then not get dog-eared.

While I was doing this, I was interested to find out what others thought about the rig and looked for on-line reviews. The vast majority of reviewers thought it was an excellent rig and I was feeling pleased with myself for making this choice rather than similarly priced alternatives. Then I came across a review by KB3KV (www.eham.net/reviews/detail/402). He gave the rig an excellent review before dropping his bombshell. He claimed that the firm that made the microprocessor for the Yaesu FT 990 was no longer in existence. Therefore, the rigs were irreparable in certain circumstances and because of this they were no longer being accepted in part exchange by dealers.

Our own rig soldiers on well but I dread to think what will happen if it gives out and cannot be repaired, because in the present circumstances in schools, any extra money is very hard to come by.

Thank you

FROM: RJ Langdon, G8GZR

A big thank you to all those amateurs who replied to my request for information on the Ts830S. I am always amazed by the amount of help offered by amateurs. ♦

WATERS & STANTON

UK'S L

WWW.WSPLC.COM WWW.LOWE.C

Panasonic Digital Camera's

FREE 128MB SD CARD & CASE WORTH £35.98 WITH ALL THESE CAMERA'S!

Part Exchange welcome (Hockley only)

PANASONIC DMC-LS1

4 MegaPixel Digital Still Camera.
Optical Image Stabilizer
3x Optical Zoom

~~£184.95~~ £149.95 C

PANASONIC DMC-LZ1

4 MegaPixel Digital Still Camera.
Optical Image Stabilizer
6x Optical Zoom

~~£234.95~~ £199.95 C

PANASONIC DMC-LZ2

5 MegaPixel Digital Still Camera.
Optical Image Stabilizer
6x Optical Zoom
Black or Silver

~~£265.95~~ £229.95 C

PANASONIC DMC-FZ5

5 MegaPixel Digital Still Camera.
Optical Image Stabilizer
12x Optical Zoom
Black or Silver

~~£384.95~~ £329.95 C

PANASONIC DMC-FX8

5 MegaPixel Digital Still Camera.
Optical Image Stabiliser
3x Optical Zoom
Black or Silver

~~£314.95~~ £279.95 C

Watson Headset

NEW

WATSON WEP-601

Adjustable Headset with Boom Mic.
*Heavy Duty
*Swivel Boom Adjustment
*Earbud type earpiece
*Adjusts for left or right ear
*PTT in-line switch with clip
*Choice of Connectors
*32 Ohm earpiece
*1k Ohm electret mic capsule

£24.95 B

Fujikon Noise Cancelling Headphones

NEW

FUJIKON NC-2 FUJIKON NC-4

These Active Noise Cancelling Headphones, from Fujikon, blockout annoying ambient background noise. Powered by an AAA battery noise cancelling is controlled by an on/off switch. NC-4 has a folding design for easy storage.

£18.95 B £19.95 B

Adonis Desk Microphones

ADONIS AM-708

*Electret condenser mic.
*FM/SSB quality selection
*2 transceiver operation
*Electronic PTT & latch
*Analogue level meter
*Up/Down Buttons
*500 - 100k Ohm match
*2 x AA cells or ext. 5-9V

£129.95 C

AM-308 £69.95 C
Electret Condenser Mic with built-in preamp

AM-508 £79.95 C
Electret Condenser Mic with compressor amp

Kenwood Desk Microphones

MC-60A £117.95 C
Moving Coil Cardoid Mic with built-in preamp

MC-90 £187.95 C
Wired Dynamic Mic for DSP radios

Yaesu Desk Microphones

MD-100A8X £116.95 C
Base Mic suitable for SSB & FM transceivers

MD-200A8X £254.95 C
Desk Mic for high fidelity SSB operation

Icom Desk Microphones

SM-6 £69.95 C
Desk Mic for all Icom base stations

SM-20 £144.95 C
600 Ohm 8-pin deluxe base station desk mic

Heil Desk Microphones

HEIL CLASSIC MIC

The Heil Classic mic, an exact replica of the 30's RCA 74B broadcast mic. Inside it has modern technology, two inserts are provided, one for broadcast studio quality and a choice of one other Heil insert (HCL-4, HCL-5 or HCLiC).

£199.95 B

GM-4 £109.95 B
Goldline Hand Mic with HC-4 insert

GM-5 £109.95 B
Goldline Hand Mic with HC-5 insert

ICM £74.95 B
Hand Mic with studio insert for Icom users

HHSM £129.95 B
Heritage Professional Studio Mic, 50's style

HCLP £209.00 B
Heil Classic Pro Mic RCA design

PR-20 £109.95 B
High Quality Professional Hand Mic

Condenser Desk Microphones

B-1 £109.95 C
Professional Large Diaphragm Condenser Mic

Watson Headsets

WATSON HP-100

Excellent lightweight communication headphones with tailored response ideal for the modern transceiver or receiver.
*8 Ohms 200-9,000Hz
*Adjustable headband
*3.5mm stereo plug *1/4" stereo adaptor.

£19.95 B

HP-200 £22.95 B
Superb headphones with padded earpieces

WEP-501(K,M,Y) £24.95 A
Versatile Earpiece with boom mic

WCT-321(K,M,Y) £19.95 B
Clip over earpiece & clip on lapel mic

SAFE-2-WAY £89.95 B
Mobile mic system for the car

Heil Headsets

HEIL PROSET PLUS

Top quality headphones with boom microphones. Choice of mic. elements, HC-5 ideal for "rag chewing" or HC-4 for DX communications. Icom models fitted with IC element. Choice of AD-1 (£16.95) interface leads for most makes of rigs.

£155.95 B

PRO-SET-PLUS-IC £169.95 B

PRO-SET £109.95 B
Headset with boom mic, choice of HC-4 or HC-5 insert, please state when ordering

PRO-SET-IC £119.95 A
Headset with boom mic with IC insert

HST £79.95 B
Heil Traveler for mobile use, single earpiece with mic, available for IC-706, Icom 8pin, Kenwood 8pin, Kenwood mod, FT-817.

HSTD NEW £99.95 B

Heil Traveler Dual Sided Headset Boom Mic. Available for Icom, Kenwood & Handhelds.

PRO-SET QUIET PHONES

Latest from Heil, boom mic headset with acoustic noise cancelling headphones to exclude outside noises & improve received sound. Choice of HC-4, HC-5 or Icom elements, Icom el. at addtional cost.

£189.95 B

PSQP-IC £199.95 B

QUIET PHONES (Q-PHONE)

Ambient noise reduction headphones, all external noise below 400Hz is gone! 1/8" headphone connector allows use with minidisc, cd or mp3 and 1/4" adaptor allows use with amateur radio transceivers. In-line battery holder uses 1xAA cell.

£89.95 B

bhi DSP Equipment

bhi NES10-2 MkII

NES10-2 Combined speaker and programmable DSP unit. Offers dramatic noise reduction, even reduces annoying hetrodynes. Power On/Off switch with audio bypass, 8 Ohms, 8 filter settings, 3.5mm plug, 12-24V DC.

£89.95 B

NES-5 £79.95 B
DSP Speaker Basic Plug & Go model

NEIM-1031 £129.95 B
Noise Eliminating In-Line Module with DSP

1042 £19.95 A
Switch box allowing up to 6 items to connect to one bhi speaker/module.

NEDSP-1061 £89.95 B
Small DSP PCB modulefor retrofitting into rigs

NEDSP-1062-KBD £99.95 A
As NEDSP-1062 but with small keyboard

NCH £34.95 B
ANR Noise Cancelling headphones

SGC DSP Equipment

SGC ADSP-2-EXT

Speaker with built-in ADSP noise filters. 3 modes selectable.
1)no reduction
2)original ADSP
3)New ADSP2 noise reduction.

£69.95 B

ADSP-2-LLK £89.95 C
ADSP2 Low Level (70-11) Audio Power Kit

ADSP-2-HLK £89.95 C
ADSP2 High Level (70-12) Audio Power Kit

Graphic Equalisers

BEHRINGER UB-802A

Dual Mic graphic equaliser with dual **variable 60dB pre-amps** plus 2 x mon/stereo line inputs.Configure to adjust both tx & rx audio and monitor both through phones. Professional quality features low-mid-hi, tape in/out, 1/4" jack and XLR sockets, 48V for condenser mics etc. **Plus FREE AC adaptor.**
In/out adaptor sets for 8-pin mics: K-802, Y-802, I802 £19.95

£54.95 B

W2IHY W2-EDGE

The W2IHY is an 8-band graphic equaliser, plus noise gate specifically designed with radio communications in mind. The graphic equaliser covers 8-bands between 50Hz and 3200Hz - the typical range for SSB. This enables you to finely adjust the audio response to improve your mic and match your radio.

£229.95 B

Carriage Charges: A=£3, B=£6, C=£10

OWEST PRICES

CO.UK WWW.JAYCEECOMS.COM

Freephone Orderline 08000 73 73 88

Watson Power Supplies

WATSON W-25XM

*9.7 - 17V DC (13.8v notch) *Input 230V DC or 115V AC *25 Amps peak, 22 Amps cont. *Fan cooled *Dual output terminals *Dual metering volts & current *Over voltage & current protect *Removable AC lead *Illuminated metering *Protection warning light *1.65kg *170w x 180d x 65h mm

£99.95 C

W-3A £22.95 B
Output 3A, 13.8V DC, supply 230V AC

W-5A £29.95 B
Output 5A, 13.8V DC, supply 230V AC

W-10AM £59.95 C
Output 10A, 0-15V DC, supply 230V AC

W-25AM £89.95 C
Output 25A, 0-15V DC, Dual meters

W-30AM £119.95 C
Output 30A, 0-15V DC, Dual meters

W-25SM £79.95 B
Output 22A (25peak), 13.8V DC, supply 230V / 115V AC

PS-122 £21.95 B
Output 2.2A, 13.8V DC, supply 230V AC

Manson Power Supplies

MANSON EP-925

A general purpose 3-15V DC, 25A (30A peak) power supply able to provide the needs of the modern 100W HF transceiver. *Dual analogue meters *Over current protection *Large power terminals for rigs *Quick snap connectors for ancillaries

£99.95 C

Diamond Power Supplies

DIAMOND GSV-3000

*Output voltage: 1 - 15V DC *Output current 30A continuous *Built-in cooling fan *Supply 230V AC 50Hz *Size 250 x 150 x 240mm *Weight 9kg

£149.95 C

GZV-2500 £119.95 C
Output 25A, 5-15V DC, supply 230V AC Switch mode over volts protected. 21 x 11 x 22cm

GZV-4000 £159.95 C
Output 40A, 5-15V DC, supply 230V AC Switch mode over volts protected. 21 x 11 x 30cm

GZV-6000 £299.95 C
Output 60A, 1-15V DC, supply 230V AC Switch mode over volts protected. 21 x 11 x 36cm

Ni-MH Batteries

NXC-4AA £5.95 B
4xAA Rechargeable Nickel Metal Hydride Cells

NXC-4AAA £5.95 B
4xAAA Rechargeable Nickel Metal Hydride Cells

NXC-CHG £5.95 B
Ni-Cd/Ni-MH Battery Charger charge 2/4 cells

West Mountain DC Distribution

RIGRUNNER 4008

The *RIGrunner* 8-way 13.8V DC distribution system with Over voltage, Normal and Under voltage indicators. Nine pairs of outputs in four groups - 25A, 10A, 5A and 1A all individually fused. Requires 13.8V DC power source either from battery or mains power supply with current rating up to 40A.

£79.95 B

RR/4012/C £99.95 B
12-way 13.8V DC (25A,10A,5A,1A)

RR/4010/SG £109.95 B
10-way 13.8V DC (25A,10A,5A,1A)

RR/4005/C £51.95 B
5-way 13.8V DC (25A,10A,5A,1A)

Spare Power Pole Connectors

C15/PK/12 NEW £11.95 B
15A Pack of 12 pairs

C30/PK/12 £11.95 B
30A Pack of 12 Pairs

C45/PK/12 NEW £13.95 B
45A Pack of 12 Pairs

Watson Power Meters

WATSON W-220

*1.6 - 200MHz *0-5W / 0-20W / 0-200W (max power 200W) *SO-239 *50 Ohms *Size 190 x 85 x135mm *Weight 790g *Accessories: DC lead for 12V illumination

£49.95 B

W-420 £49.95 B
118-530MHz, 0-5, 0-20, 0-200W, SO-239

W-620 £89.95 B
1.6-530MHz, 0-5, 0-20, 0-200W, SO-239

Avair Power Meters

AVAIR AV-201

Ideal for HF and VHF operation. It features high power handling up to 1kW * 1.8-160MHz * 5W, 20W, 200W, 1kW * Av or PEP

£49.95 B

AV-400 £49.95 B
140-525MHz, 5W, 20W, 200W, 400W

AV-601 £69.95 B
1.8-160MHz(S1), 140-525MHz(S2)

AV-1000 £79.95 B
1.8-160MHz, 430-450MHz, 800-930MHz, 1240-1300MHz. 5W, 20W, 200W, 400W

AVAIR AV-20

*3.5-150MHz **(AV-20)** *Impedance 50 Ohms *Power 0 - 15W / 0 - 150W switched *Measures forward / reflected power + VSWR *Sensitivity 3W for full scale deflection *Accuracy 10% at full scale *Sockets SO-239 *Size 85 x 87 x 95mm *Weight 280g

£29.95 B

AV-40 £29.95 B
144-470MHz, power 0-15W/0-150W switched

Watson Frequency Counters

WATSON HUNTER

*10MHz-3GHz *Impedance 50 Ohms *LCD readout *8- digit display *BNC Whip Antenna *Black anodised case *Internal Ni-Cads *AC charger *9V DC 300mA *68 x 80 x 31mm *210g

£49.95 B

FC-130 £59.95 B
1MHz-3GHz, 10 digit readout

SUPER SEARCHER £99.95 B
10MHz-3GHz, 7 digit readout

SUPER HUNTER £149.95 B
10Hz-3GHz, 10 digit readout

Optoelectronics Frequency Counters

OPTOELECTRONICS SCOUT

The Scout automatically stores frequencies as it locks onto them, and logs the number of hits for any one channel. It incorporates both digital filter and auto capture. The Scout can also Reaction Tune various receivers with a suitable optional cable. RT-8200 for AR8200 Series-2 and SAC-8000 for AR8000.

£299.95 B

CUB £129.95 B
Mini Counter 1MHz-2.8GHz, 9 digit readout

MFJ Coax Switches

MFJ-1702C

*2-way *Connectors SO-239 * < 0.2dB loss *SWR < 1.2:1 *Isolation 60dB at 300MHz 50dB at 450MHz

£28.95 A

MFJ-1704 £59.95 B
4-way, Connectors SO-239 or 'N'

MFJ-1700C £89.95 B
6-position antenna swirtch, SO-239

MFJ-1701 £52.95 B
6-way, range 1.8-30MHz, SO-239

Watson Coax Switches

WATSON CX-201

*2-way *Connectors SO-239 *Power 2.5kW *Range DC - 600MHz *Impedance 50 Ohms *Loss 0.1dB

£18.95 A

CS-600 £12.95 A
2-way, Connectors SO-239, Power 2.5kW

DL-300M 300W Dummy Load

Every station needs one!

A convenient way of testing your rig and measuring power etc. DC - 150MHz, 300W. Requires 50 Ohm patch lead. **DL-300MN** "N" socket **£48.95B**

£46.95 B

Duplexers

DIAMOND MX-72

*1.6MHz - 150MHz 400W PEP *400MHz - 460MHz 250W PEP *Max loss 0.3dB *SO-239 to 2 x PL-259 *Cable length 200mm to plug *45 x 42 x 25mm approx.

£32.95 B

NEW

DIAMOND MX-72A £39.95 B
Duplexer "N" Type, 1x 'N' Plug + PL-259

DIAMOND MX-62M £49.95 B
Port1: HF + 6m Port 2: 2m + 70cm

DIAMOND MX-610 £54.95 B
Port 1: HF Port 2: 6m + 2m + 70cm

WATSON WD-25 £24.95 A
Port1:HF+6m+2m Port2:70cm, SO-239 sockets

WATSON WD-24 £22.95 A
As WD-25, SO-239 and dual PL-259

WATSON WD-24N £24.95 A
As WD-25, SO-239, PL-259, N-type

Diamond Triplexers

DIAMOND MX-2000

*1.6 - 60MHz 800W PEP Loss 0.15dB *110 - 170MHz 800W PEP Low 0.2dB *300 - 950MHz 500W PEP Low 0.25dB *SO-239 socket & 3 x PL-259 plugs *Cable length 300mm to plug. *65 x 85 x 23mm approx.

£59.95 B

MX-3000 £56.95 B
Port1:HF+6m+2m Port2:70cm Port3:23cm

Superb DCI Band Pass Filters

Razor Sharp Professional Filtering

DCI-145-2H £119.95 B
144 - 146MHz 68dB @ 136MHz / 55dB @ 155MHz. Less than 1dB loss. 200W. 30 x 8 x 13cm SO-239

DCI-145-2HN £129.95 B
144 - 146MHz 68dB @ 136MHz / 55dB @ 155MHz. Less than 1dB loss. 200W. 30 x 8 x 13cm N socket

DCI-435-10C £139.95 B
430 - 440MHz 47dB @ 415MHz / 50dB @ 455MHz. Less than 1dB loss. 200W. 30 x 8 x 19cm N socket

DCI-145/435-DB £199.95 B
This has similar performance to above 2m and 70cm individual filters. 200W Duplexer inside. N socket. Designed for single coax dual band operation.

Kuranishi Antenna Analysers NEW

KURANISHI LA-310

This is a professional grade frequency counter and field strength meter and matches the BR-210 and BR-510 series of analysers. *10MHz - 2500MHz (3 ranges) *New Pre-Amp increases sensitivity by 20dB

£399.95 C

BR-210 £359.95 C
Antenna Analyser 1.8-170MHz in 6 bands

BR-400 £399.95 C
Antenna Analyser 100-170MHz, 300-500MHz

BR-510A £439.95 C
Antenna Analyser 1.8-170MHz, 300-500MHz

BR-510D £479.95 C
As BR-510A, covers improved ranges

Carriage Charges: A=£3, B=£6, C=£10

THE PINNACLE OF PERFORMANCE...

FT DX 9000D

The Ultimate, "All Options Installed" Version.

Three μ-Tuning Modules Factory Installed

The D version is equipped, at the factory, with all three μ-Tuning modules, covering the 160, 80/40. and 30/20 meter Amateur bands. These Hi-Q RF Tuning modules provide a degree of RF selectivity not normally found on other Amateur transceivers, and make operating the FTDX9000D a truly special experience.

Large, Easy-to-Read TFT Display

The wide-screen 6.5" TFT screen (800 x 400dpi) is standard on the FTDX9000 and supports the following functions, World Clock, Spectrum Scope, Transceiver status page, band swept SWR, Audio scope showing waveform and waterfall display, Rotator control page with Great Circle map, memory channel list and menu list. An external VGA monitor can be connected to the rear panel VGA connector to replicate the internal display.

Other features include:

- WORLDS FIRST HRDDS LOCAL OSCILLATOR USING 400MHZ REFERENCE SIGNAL.
- 3 USER SELECTABLE ROOFING FILTERS AT 15KHZ, 6KHZ AND 3KHZ FOR OUTSTANDING CLOSE-IN DYNAMIC RANGE.
- 32 BIT IF DSP FOR DSP SIGNAL PERFORMANCE WITH INTERNAL DSP AGC FOR THAT 'ANALOGUE SOUND'.
- FAST ACTING AUTOMATIC DSP NOTCH FILTER TO REMOVE ANY INTERFERING CARRIER.
- 3 BAND PARAMETRIC EQUALISATION MICROPHONE AMPLIFIER WITH XLR AND 8 PIN MIC CONNECTORS.
- 200W RF OUTPUT WITH 75 CLASS A MODE FOR ULTRA LOW DISTORTION TX SIGNAL.
- SMART CARD FOR STORING USER CONFIGURATION AND LOGBOOK DATA.

...The radio

YAESU

Choice of the World's top DX'ers

Yaesu UK Ltd Unit 12 Sun Valley Business Park Winnall Close Winchester Hampshire SO23 0LB UK

www.yaesu.co.uk