Annual HF, VHF, UHF and Microwave Band Plans

0301

www.rsgb.org

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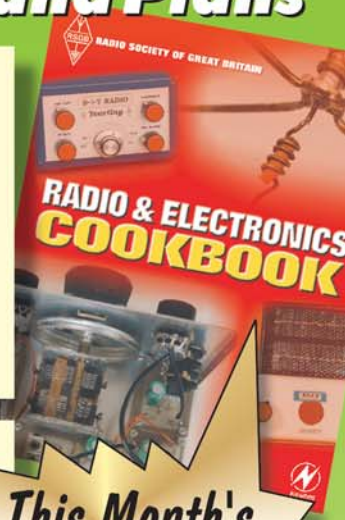

£3.95 Vol 77 No 3 ♦ March 2001 The Radio Society of Great Britain Members' Magazine

This Month's Special Offer See p10

IOTA Contest 2000 - all the results

Build a Peak-Following Power Meter

Peter Hart Reviews Acom HF/6m Amplifiers

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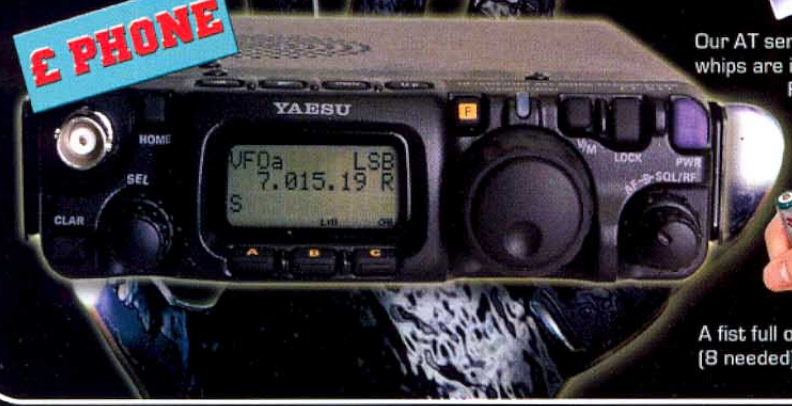
YAESU
Choice of the World's top DX'ers

ANY BAND, ANY MODE, ANYWHERE

FT-817

£ PHONE



AND AWAY

HOME

Our AT series of portable HF whips are ideal for FT-817. From £24.95 each.

A fist full of AA cells (8 needed) lets you operate anywhere.

You're Never Alone with an FT-817!

The FT-817 operates on ham bands from 1.8 to 432MHz, SSB, FM, CW and AM. Use rear mounted SO-239 socket for base operation, or switch through BNC top socket for portable work (6m, 2m and 70cm whip supplied). There's bags of features with a comprehensive programmable menu. You can select the internal electronic keyer, check your VSWR, add a narrow CW filter and even change the colour of the display. But that's not all. There are over fifty other programmable features! This really is the radio you can take anywhere. It's as much at home in your shack as it is in your hand baggage. And with AA cells available almost anywhere in the world, you will never be short of power. Download leaflet from our web site at wsplc.com.

Includes Matching FNB-72 Nicad pack & NC-72C charger

Waters & Stanton PLC open day 13th May !

YAESU **FT-1000MP Mk-V 200W HF All Mode Transceiver**

£2899
Plus £7.50 Carr.

The New Industry Standard ..... Would a Serious DXer accept anything else ?

In choosing the FT-1000MP Mk V, you will be proud to own a rig with an impressive specification, reputation and lineage. Its outstanding performance and attention to detail, makes this the premier HF transciever for the 21st Century. This radio is a class leader.

19.4% APR: Deposit £299 and 36 months at £90.27.

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

£1799
Plus £7.50 Carr.

19.4% APR Available

SAVE

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

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

19.4% APR: Deposit £199 and 36 months at £57.77.

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

£1395
Plus £7.50 Carr.

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

19.4% APR: Deposit £145 and 36 months at £45.13.

ICOM **IC-756PRO 1.8 - 52MHz 100W**

£1895
Plus £7.50 Carr.

Free desk/mic

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

19.4% APR: Deposit £229 and 36 months at £71.13.

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

SAVE

£1099
Plus £7.50 Carr.

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

19.4% APR: Deposit £129 and 36 months at £35.02.

YAESU **FT-847** SAVE
160m - 70cm All Mode

£1199
Plus £7.50 Carr.

SCOOP!

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

19.4% APR: Deposit £129 and 36 months at £38.63.

KENWOOD **TS-570DG**
160 - 10m All Mode

£849
Plus £7.50 Carr.

19.4% APR Available

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

19.4% APR: Deposit £89 and 36 months at £27.43.

WATERS & STANTON @ LOWE

CHESTERFIELD RD
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DERBYSHIRE
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Great news for customers in the Midlands and North of England!

ATX-Walkabout 80-6m (WARC)

Designed for FT-817 it is the ideal portable antenna

£69.95

NORTH
MATLOCK DERBYSHIRE

MON-FRI 9AM-5PM
SAT 10AM-4PM

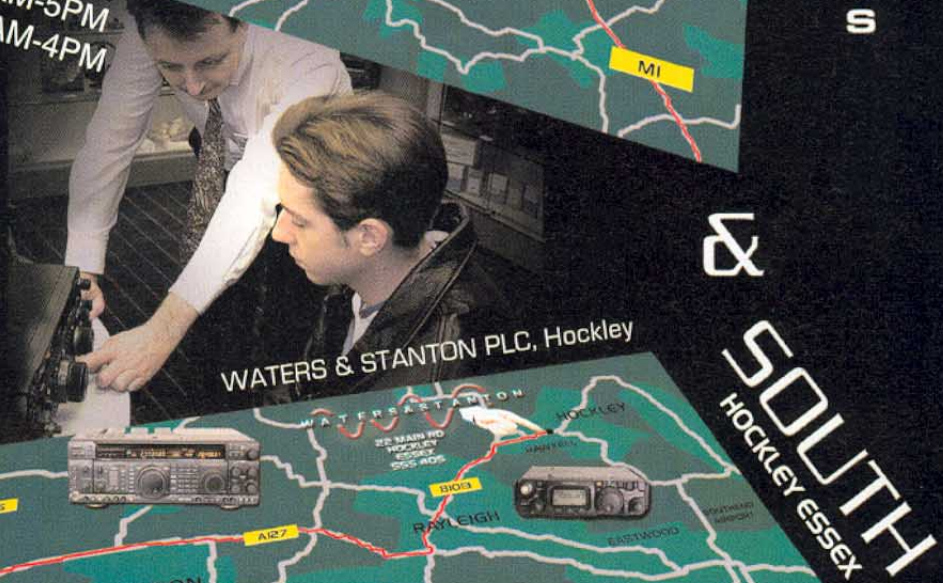
AMAZING VALUE

SPS-8400 Switching Mode Power Supply

AMAZING VALUE

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

£99.95

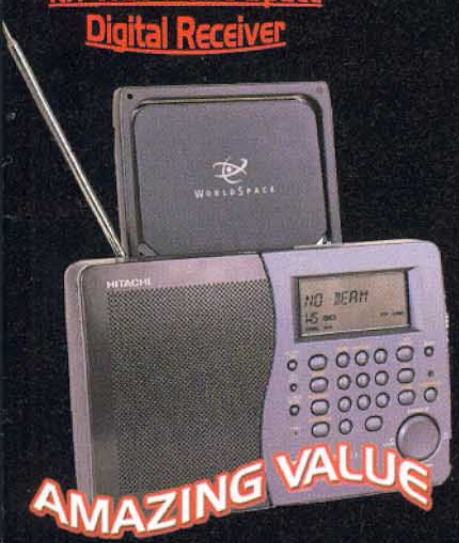


&

SOUTH
HOCKLEY ESSEX

MON-SAT 9AM-5.30PM

KH-WSI World Space Digital Receiver



AMAZING VALUE

This radio has its own mini satellite dish and receives digital WorldSpace broadcast signals via the AfriStar satellite. As well as all the normal VHF FM programmes, you can switch to satellite broadcast signals from CNN, BBC, Bloomberg (multi language), World Radio networks 1 & 2, and lots more. High quality mono via the internal speaker and stereo via the headphone socket. Runs from AC, 4 x D cells (not supplied), or external 6V.

£99.95

SR-214 70cm FM Transceiver

AMAZING VALUE

433.075-434.775MHz
69 channels
25KHz CH spacing
10m W ERP
CTCSS 38 tones
45x128x35mm
130g
Takes 4xAA

£29.95

VISA

WE WILL BE AT;
BLETCHLEY PARK SHOW 7TH AND 8TH APRIL
ALEXANDRA PALACE SHOW 21ST AND 22ND APRIL

ICOM

IC-706IIG 160 - 70cm All Mode

£1099 Plus £7.50 Carr.

SCOOP!

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

19.4% APR: Deposit £129 and 36 months at £35.02.

TS-2000 Multi Band/Mode Transceiver

WEB SITE!

Kenwood promise a top performance 160m - 23cms transceiver. Full details are in our latest catalogue and web site.

£1695 Plus £6.00 Carr.

KENWOOD

TM-D700E 2m / 70cm Data Mobile

£449 Plus £7.50 Carr.

SAVE

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

WMM-3 Data Modes

£69.95 Plus £6.00 Carr.

If you want to receive data, then connect the audio output of your receiver to the WMM-3 and the output of the modem to your PC serial socket. A CD-ROM is provided with lots of software, this will get you started.

£269 Plus £6.00 Carr.

YAESU

VX-5R

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

YAESU

FT-50R

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

£169 Plus £6.00 Carr.

IC-910 VHF/UHF Transceiver - Coming Soon

£1299 Plus £7.50 Carr.

IC-910 VHF/UHF Transceiver - Coming Soon The new IC-910 from Icom will shortly be available. 100W on 2m and 75W on 70cms, plus the option of 1.2GHz. Well placed to take advantage of satellite operation, you can simultaneously operate 2 bands at once. Phone For Details

Optional 23cms + £400

YAESU

FT-11R 2-Metre Handheld

SCOOP!

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

£119 Plus £6.00 Carr.

ICOM

IC-2800H In Full Colour!

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

£419 Plus £7.50 Carr.

Includes FREE Remote head cable.

KENWOOD

TH-D7E

£259 Plus £6.00 Carr.

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

YAESU

FT-90R Can you believe the size?

2m/70cm Dual Band

SAVE £309 Plus £7.50 Carr.

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

ADI AR-147

AM Airband Receive

£199 Plus £6.00 Carr.

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

FT-2600 VHF FM Mobile Transceiver

* 134 - 174MHz Rx * 144 - 148MHz Tx
* 60W Power output, 4 power levels 60/25/10/5W
* Channel steps 5/10/12.5/15/20/25/50kHz
* CTCSS/DCS tone
* Built-in CTCSS/DCS encode/decode
* 175 memories with 8 character alpha numeric display
* Direct keypad frequency entry via optional MH36B6J DTMF mic
* Smart Search™ automatic memory loading
* Tx Time-out timer (TOT)
* Automatic Power off battery saver (APO)
* Automatic repeater shift (ARS)
* Supply 13.8V DC, 10A (60W) Tx, 400mA Rx (squelched)
* Size 160 x 40 x 160mm * Weight 1.3kg

The FT-2600M is one of the toughest mobile VHF transceivers from Yaesu. Built to Mil-Spec, it provides 60W of power along with a "bullet-proof" receiver front end. Designed with packet in mind, has a dual 1200/9600bps port with microphone muting. The FT-2600M has and narrow Tx deviation and 12.5/25kHz spacing. Interactive Menu system allows you to "set and forget" many operating configurations. Options: ADMS-2E Windows PC program software, MH-36B6J direct access microphone.

£139 Plus £7.50 Carr.

ICOM

IC-207H

£279 Plus £7.50 Carr.

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

KENWOOD

TM-G707E

£289 Plus £7.50 Carr.

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

YAESU

FT-8100R

£369 Plus £7.50 Carr.

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

KENWOOD

TM-V7E

£359 Plus £7.50 Carr.

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

Order Details on inside Front Cover

ALL THESE ITEMS IN STOCK AT OUR MATLOCK SHOP AS WELL !!

CARRIAGE CHARGES
A= £2 C= £7.50
B= £6 D= 8.50

WATERS & STANTON

MasterCard

MORSE TUITION & TESTS

Waters & Stanton are now holding Morse classes at their Hockley premises every Saturday morning at 11am.

Sessions are expected to last between 30 minutes to an hour. All equipment will be provided.

Morse tests will be available on the first Saturday of every month at noon.

There is no charge for attending the Morse instruction sessions but anybody wishing to attend will need to book in advance.

For more information or to book a session or test please contact Mark Francis.

MFJ-269 Analyser

160m - 70cm On-site Antenna Analyser.

£299.95 Plus £6.00 Carr.

MFJ-259B 1.8 - 170MHz £229.95

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

KH-WS1
"World Space digital receiver"

KH-ANT external antenna kit in stock £49.95

£99.95 Plus £6.00 Carr.

This radio has its own mini satellite dish and receives digital WorldSpace broadcast signals via the AfriStar satellite. As well as all the normal VHF FM programmes, you can switch to satellite broadcast signals from CNN, BBC, Bloomberg (multi language), World Radio networks 1 & 2, and lots more. High quality mono via the internal speaker and stereo via the headphone socket. Runs from AC, 4 x D cells (not supplied), or external 6V.

NEW MFJ-Cub QRPers

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

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

Heil Audio

Appointed by Heil as UK Distributor

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

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

Avair AV-600

£59.95 Plus £6.00 Carr.

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

Carolina Windoms

CW-80 Special

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

£89.95 Plus £7.50 Carr.

Other Models (all with low angle radiator stub)

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

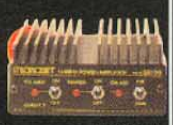
Plus £7.50 Carr.

SGC-230 Smart Tuner

£359.95 Plus £7.50 Carr.

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

Microset Amplifiers



All FM/SSB with GaAsFET preamps and RF switched. 13.8V DC powered.

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

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

Speaker Mics. QS-112

Including Yaesu and Icom 4-way jack.

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

Phone if in doubt about suitable model.

£16.95 Plus £2.00 Carr.

Hands-Free Mobile Mics.

£42.95 Plus £2.20 Carr.

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

The Toughest Japanese Rotators

These are tough rotators that weigh almost twice as much as similar priced units and have great turning capacity. Made by Create of Japn, they will handle 4 element HF yagis with ease. Our own Create model has been on our roof for 12 years turning a 4-element HF beam. We wouldn't use anything else!

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

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

MC-2 Lower mast clamps £49.95 B

80-40-20m Mini Dipole

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

Power Supplies

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

£99.95 Plus £6.00 Carr.

Back In Stock

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

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

LINEAR AMP UK Amplifiers

British made Amplifiers with a Pedigree

Full Range Stocked

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

WATSON

UK's top selling power supplies.

£89.95 Plus £7.50 Carr.

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

W-3A	3 Amp fixed supply.	£22.95 B
W-5A	5 Amp fixed supply	£29.95 B
W-10AM	10 Amp variable supply	£59.95 C
W-25AM	25 Amp variable supply	£89.95 C
W-30AM	30 Amp variable supply	£119.95 C

Cushcraft Ham Radio Antennas

MA5B Mini-Beam

£299 Plus £7.50 Carr.

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

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

Phone for catalogue.

NEW W-40SM 40 Amp Switch Mode

£149.95 Plus £6.00 Carr.

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

Compact 10 Amp Switch Mode PSU

£49.95 Plus £6.00 Carr.

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

Contents

Front Cover:
Members of the UU7J/P and BI4S teams in the 2000 RSGB IOTA Contest. See page 67 for all the results and more. Plus the Acom 1000 HF / 6m linear amplifier; reviewed by Peter Hart on page 28 this month.

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THIS MONTH:
HF, VHF, UHF and Microwave Band Plans - see pages 46 - 55

News and Reports

Technical Features

Down To Earth - Amateur Radio From The Ground Up

Reviews

Regulars

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Log Periodic

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

Mobile HF Whips (with 3/8 base fitting)

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

Dual band mobile antennas

MICRO MAG 2 Metre 70 cms Super Strong 1" Mag Mount (Length 22").....£14.95
MR 700 2 Metre 70 cms (¼ & ⅝ wave) (Length 20") (⅜ fitting).....£6.99
MR 700 2 Metre 70 cms (¼ & ⅝ wave) (Length 20") (SO239 fitting).....£9.99
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (5/8 & 2x5/8 wave) (Length 60") (3/8 fitting).....£16.95
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (5/8 & 2x5/8 wave) (Length 60") (SO239 fitting).....£18.95
MR 750 2 Metre 70 cms 5.5 & 8.0 dBd Gain (⅞ & 3 x ⅝ wave) (Length 60") (SO239 fitting).....£38.95

Single band mobile antennas

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

Tri band mobile antennas

MR 800 2 Metre 70 cms 6 Metres 5.0, 7.9 & 3.0 dBd Gain (¼, ⅛ & 3 x ⅝ wave) (Length 60") (SO239 fitting).....£39.95

½ Wave Vertical Fibre Glass (GRP) Base Antenna 3.5 dBd *(without ground planes)*

70 cms (Length 26").....£24.95
2 metre (Length 52").....£24.95
4 metre (Length 92").....£36.95
6 metre (Length 126").....£46.95

Vertical Fibre Glass (GRP) Base Antennas

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

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

2 metre vertical co-linear base antenna

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

70cms vertical co-linear base antennas

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

Tri-Bander Beam

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

HB9CV 2 Element Beam 3.5 dBd

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

Mini HF dipoles (length 11' approx)

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

Crossed Yagi Beams All fittings Stainless Steel

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

Yagi Beams All fittings Stainless Steel

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

ZL Special Yagi beams All fittings stainless steel

2 metre 5 Element (Boom 38") (Gain 9.5dBd).....£35.95
2 metre 7 Element (Boom 60") (Gain 12dBd).....£45.95
2 metre 12 Element (Boom 126") (Gain 14dBd).....£65.95
70 cms 7 Element (Boom 28") (Gain 11.5dBd).....£24.95
70 cms 12 Element (Boom 48") (Gain 14dBd).....£44.95

Halo Loops

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

Multi purpose antennas

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

Short Wave receiving antenna

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

MWA-H.F. (Receives 0-30Mhz).....£29.95 Adjustable to any length up to 60 metres. Comes complete with 50 mts of enamelled wire, guy rope, dog bones & connecting box.

G5RV Wire Antenna (10-40/80 metre) All fittings Stainless Steel

	FULL	HALF
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Flex Weave	£32.95	£27.95
PVC Coated Flex Weave	£37.95	£32.95

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12" T & K Bracket *(complete with U Bolts)*.....£10.95
18" T & K Bracket *(complete with U Bolts)*.....£14.95
24" T & K Bracket *(complete with U Bolts)*.....£18.95
3-Way Pole Spider for Guy Rope/wire.....£3.95
4-Way Pole Spider for Guy Rope/wire.....£4.95
1¼" Mast Sleeve/Joiner.....£8.95
2" Mast Sleeve/Joiner.....£9.95

Poles H/Duty (Swaged)

1¼"x 5' Heavy Duty Aluminium Swaged Poles *(set of 4)*.....£19.95
1½"x 5' Heavy Duty Aluminium Swaged Poles *(set of 4)*.....£29.95
2" x 5' Heavy Duty Aluminium Swaged Poles *(set of 4)*.....£49.95

Reinforced hardened fibre glass masts (GRP)

1½" Diameter 2 metres long....£16.00
1¾" Diameter 2 metres long....£20.00
2" Diameter 2 metres long.....£24.00

Guy rope 30 metres

MGR-3 3mm (maximum load 15 kgs).....£6.95
MGR-4 4mm (maximum load 50 kgs).....£14.95
MGR-6 6mm (maximum load 140 kgs).....£29.95

Ribbon ladder USA imported

300 Ω Ribbon (20 Metres).....£13.00
450 Ω Ribbon (20 Metres).....£13.00

Coax

RG58 BEST QUALITY STANDARD per mt.....35p
RG58 BEST QUALITY MILITARY SPEC per mt.....60p
BEST QUALITY MILITARY SPEC MINI 8 per mt.....70p
RG213 BEST QUALITY MILITARY SPEC per mt.....85p
H100 Coax Cable per mt.....£1.10
PHONE FOR 100 METRE DISCOUNT PRICE.

10/11 Metre Verticals

G.A.P.12 1/2 wave alumimum (length 18' approx).....£16.95
G.A.P.58 5/8 wave aluminium (length 21' approx).....£19.95

Tri/Duplexer & antenna switches

MD-24 (2 Way Internal Duplexer) (1.3-35 Mhz 500w) (50-225 Mhz 300w) (350-540 Mhz 300w) insert loss 0.2dBd.....£22.95
MD-25 (2 Way external/Internal Duplexer) (1.3-35 Mhz 500w) (50-225 Mhz 300w) (350-540 Mhz 300w) insert loss 0.2dBd.....£24.95
CS201 Two way antenna switch, frequency range 0-1Ghz, 2.5 Kw Power Handling.....£18.95
Tri-plexer 1.6-60Mhz (800w) 110-170Mhz (800w) 300-950Mhz (500w) SO239 fitting.....£49.95
4 way antenna switch 0-500Mhz.....£29.95

Antenna Rotators

AR-300XL Light duty UHF\VHF.....£49.95
YS-130 Medium duty VHF.....£79.95
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Mounts

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TRI-MAG MOUNT (3x5") ⅜ or SO239.....£39.95
Stainless Steel Heavy Duty Hatch Back Mount with 4 mts of coax and pl259 plug (⅜ or SO239 fully adjustable with turn knob).....£29.95
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RSGB Matters

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THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded in 1913 incorporated 1926.
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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, MIMgt, MISM, G0TWW

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R E Piper, G3MEH
R S Atterbury, G4NQI

Details of the Society's volunteer officers can be found in the RSGB Yearbook 2001

HEADQUARTERS AND REGISTERED OFFICE
Lambda House, Cranborne Road,
Potters Bar, Herts EN6 3JE

Tel: 0870 904 7373
Fax: 0870 904 7374

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E-mail addresses:
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GB2RS@rsgb.org.uk (GB2RS and club news items)
RadCom@rsgb.org.uk (news items, feature submissions, etc)
AR.Dept@rsgb.org.uk (Morse tests, beacons, repeaters, GB calls, licensing)
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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.

HISTORIC CHANGES TO THE SOCIETY'S STRUCTURE

FOR THE FIRST TIME in 47 years there has been a significant change in the Society's structure. It was on 18 December 1953 at an Extraordinary General Meeting of the Society that a new constitution was adopted. The most fundamental change at that time was the creation of six geographical zones, each of which could elect a member to serve on Council - an innovation designed to end criticism that the Provinces could not adequately be represented on Council. A further geographical zone was added some time later. Since that time Council has been made up of eight ordinary members and seven zonal representatives. Following last year's AGM in Harrogate, when the membership voted overwhelmingly to accept Council's recommendation for change, the Society's regional representation has been strengthened further.

Council met for the last time under the old regime at the Society's Headquarters in Potters Bar on 20 January. On completion of the meeting the Zonal Council members stepped down and took up the appointments of Regional Managers. The seven zones have now become 12 Regions and the seven currently-elected managers will be joined for the remainder of this year by five co-opted managers to form the Regional Council. The old term 'Council' has been replaced by the new term 'Board of Directors', which will be responsible for the management of the Society. The new Board will be made up of six portfolio-holding members plus two regional managers and the President, who will be the Chairman of the Board. The new Regional Managers will be responsible for all RSGB matters within their respective regions and will be assisted by up to four deputies in each region. The new Deputy Regional Managers will assume the roles formerly carried out by the Regional Liaison Officers. Like the changes made in 1953 the new scheme is designed to increase the Society's representation right across the United Kingdom and to strengthen the management of the Society in all aspects of its work.

The historic final meeting of RSGB Council on 20 January 2001.

national science week
starts 16 march 2001

Is *your* club doing something towards this event, and introducing more young people to our hobby? Amateur radio in Britain needs a much higher profile, and this is an ideal way to achieve it. See p23 for details.

AROS GOES PUBLIC

THE AMATEUR RADIO Observation Service Co-ordinator Barry Scarisbrick, G4ACK, has volunteered to carry out a programme of club talks on the work of this service. This is the first time since the formation of AROS that its work is to be promoted to a wider audience and it is a welcome addition to the Society's lecture programme. Clubs wishing to invite Barry to give a talk should apply in writing to the Amateur Radio Secretary Fiorina Sinapi at HQ or send an e-mail to ARDept@rsgb.org.uk As there is bound to be a great deal of interest, requests will be dealt with on a first-come, first-served basis.

RSGB ON THE ROAD IN 2001

THE SOCIETY HAS taken delivery of a vehicle to be used as an amateur radio demonstration station. The vehicle has been donated to the Society by the RA. The handing over of the keys took place at the Baldock Monitoring Station, where the vehicle was formerly based. The keys were presented to Society General Manager Peter Kirby, G0TWW, by Barry Maxwell the RA's Director of Customer Services. The vehicle is now being converted into a demonstration station. The cost of the conversion is being met by commercial sponsorship. Once the conversion is completed the vehicle will begin a programme of school visits throughout the UK aimed at promoting the use of amateur radio in schools. When not involved with this programme the vehicle will be making appearances at a number of County Shows and some of the larger amateur radio rallies. The programme is expected to get underway in late spring.

Len Crane, G3PED, receiving the Raynet Trophy from President Don Beattie, G3BJ. Len was a founder member of the Radio Amateurs Emergency Network in 1953. 47 years on, he is still an active member of Essex Raynet. Len also has the unique honour of following his late wife 'Taff', who received the trophy some years ago for her work as the Raynet national membership secretary. Len was joined at the ceremony by friends and colleagues from Essex Raynet.

RSGB ON THE MARCH IN MARCH

GENERAL MANAGER Peter Kirby, G0TWW, will be giving a presentation on the work of the RSGB at the Malvern Hills ARC on **Tuesday 13 March**.

SPECIAL OFFER OF THE MONTH

ON THE COVER of this month's *RadCom* you will see that we have introduced a 'Special Offer of the Month' for members only. Each month, a publication will be offered at well below even the usual RSGB member's price. For the calendar month of March *only*, the new RSGB *Radio & Electronics Cookbook* (reviewed on page 39 of the February *RadCom*) is available for just £12.74 instead of the standard price of £16.99 (normal member's price £14.44). Just phone 0870 904 7373 or order on the web at www.rsgb.org/shop during the month of March to take advantage of this superb offer.

NEW MEM, ARTS & BYLAWS NOW AVAILABLE

THE SOCIETY'S new Memorandum and Articles of Association and related Bylaws which came into force on 1 January are now available to members. The documents can be found on the members-only Website (www.rsgb.org/membersonly). If you require a paper version you can write to HQ enclosing an A4 size SASE, quoting 'Mem & Arts'. Postage for these items is 2 x first class stamps. Members are also reminded that the full transcript of the new Mem, Arts and Bylaws appeared in the November 2000 edition of *RadCom*.

BOARD HIGHLIGHTS

THE NEW BOARD met for the first time in January 2001. The following is a summary of the more significant points discussed.

The progress of the implementation of the new Regional structure was reviewed. The Board noted that some Regional Management roles still needed to be filled by co-option. Training plans were being developed for new appointees. The target is to have the full structure operational by July.

A discussion took place on the options to reduce overhead costs, including more effective use of the Society's headquarters. The matter is ongoing.

The structure of Board members' portfolios was discussed and agreed. Actions were agreed to bring the portfolios to life, and to review each portfolio's objectives at the March Board meeting.

The Society's objectives for 2001 were discussed. These covered areas of the new licence structure; the new examination structure; the threat to amateur radio from data transmission systems over unscreened cables; relationships with the RA, Oftel and Ofcom; full implementation of the new governance structure; overhead cost programme; new *RadCom* editorial strategy; initiatives for amateur radio development in the UK; preparation for the IARU Triennial conference in 2002; membership growth and retention.

The Society's finances were reviewed, showing that the Society was on track for its full year target of break-even. Because of the phasing of costs and revenue, there will be a loss at half year, which is expected to be recovered in the second half.

The progress of matters under discussion with the RA was reviewed and the next steps on a number of matters agreed.

A review took place on initiatives to attract young people to amateur radio. Work was authorised to develop a fuller plan in this area.

The Board received a presentation on the threat from data transmission over unscreened lines. The Society will again be deeply involved in various standards bodies in an attempt to ensure sensible standards are agreed for these systems.

WANTED! - MORSE CAMPAIGN INSTRUCTORS

INSTRUCTORS ARE needed to join the teams that run the RSGB 'Morse Campaigns' in Potters Bar and Harrogate. Instructors need to have a friendly attitude and be able to help candidates master Morse code at 5WPM on a one-to-one basis. Most of the time is spent listening to candidates sending, helping them to improve their sending, giving them some tips, and so building their confidence and their will to succeed. 'Morse Camps' run for a weekend, typically from 9.00am to 5.30pm. All instructors find 'Morse Camps' very rewarding personally as their candidates pass their Morse tests as a direct result of instructors' coaching and support. If you are interested in putting something back into amateur radio and joining the teams, please contact Fiorina Sinapi at RSGB HQ on tel: 0870 904 7373.

RSGB MORSE TEST SERVICE 15TH ANNIVERSARY

THE RSGB's Morse Test Service celebrates its 15th anniversary over the weekend of 12 / 13 May 2001. As in previous years, County Morse test teams will be on the air (on CW of course!) using GB0 callsigns, mainly on 80 and 40 metres. A certificate will be made available at a cost of £2.50 for anyone contacting at least 10 of the 27 or more stations active. More details closer to the event.

Lynnette Ranger is the Society's new Website Administrator. The RSGB's website at www.rsgb.org has expanded so much that it now needs a dedicated member of staff to look after it. Lynnette works three days a week and her duties include ensuring that 'WebPlus', the RSGB members-only website, as well as the open Internet site are kept fully up to date. Take a look at the site if you haven't seen it recently - it has changed a lot in the past few weeks! Lynnette has worked at RSGB HQ for nearly 10 years and is well known to many members through her attendance on the RSGB stand at rallies and exhibitions. She moves to website work from her position as Administrator in the Amateur Radio Department.

Welsh Amateurs Raise £655 for British Wireless for the Blind

Port Talbot Club Raises Funds for Transmission 2000

MEMBERS OF the Port Talbot ARS raised £655 for the British Wireless for the Blind Fund when they participated in Transmission 2000. They were very surprised to learn that they raised the most money for the charity in this event. Members of the club would like to thank Tennamast of Scotland for the prize that they donated and they say it will be a great asset to the club.

● A burglary at the Roberts Radio warehouse in Mexborough, Yorkshire, has deprived blind people across the country of much-needed CD cassette radios. The 32 machines, especially adapted for the British Wireless for the Blind Fund for use by blind people, were stolen during the break-in on 16 January. Thieves broke through a skylight and descended approximately 100ft to steal the 'Prelude' machines, worth around £4000.

Members of the Port Talbot ARS after their fund-raising efforts.

Bill Orr, W6SAI, SK

FAMOUS AMATEUR radio author William I 'Bill' Orr, W6SAI, died in his sleep on 24 January at the age of 81. Bill Orr was well known throughout the world for his numerous amateur radio books, many aimed at beginners. His titles include *The Beam Antenna Handbook* and *The Quad Antenna Handbook*. Most recently, Bill Orr wrote a column for *CQ* magazine.

Oscar 40 - Latest

THE LATEST information on Oscar 40 suggests that the satellite might have suffered antenna system damage when it went silent on 13 December. Peter Gülzow, DB2OS, reports that efforts to restart the 2m transmitter continue to be unsuccessful. While the 2m, 70cm and 23cm receivers are all working on the *high-gain* antennas, none of them will work on the omni-directional antennas. He speculated that either the omni-directional antennas, the cabling or antenna relays are damaged. Gülzow said that Oscar 40's attitude control system is fully functional, something that would be critical to keeping the satellite in orbit on a long-term basis. For more on Oscar 40 see 'Space' on page 93.

It's a CRACA!

THE CHRISTIAN Radio and Computer Association (CRACA) has announced a new scheme to open up membership to radio amateurs who are not yet using computers. It is offering its monthly newsletters free of charge on receipt of A5-sized SASEs. Membership of CRACA is entirely free. Normally members receive their monthly newsletter by e-mail or packet radio. For further details contact the Chairman, Charles Elliott, G4UJW, 52 Wellfield Road, Alrewas, Staffs DE13 7EZ; tel: 01283 791213; or e-mail: g4ujw@qsl.net

New Amateur Radio Stars

STELAR - Science and Technology through Educational Links with Amateur Radio - is organising another free residential course for teachers. This one will take place from 17 to 20 April at Harrogate Ladies' College in Yorkshire. There are 20 confirmed delegates and the course is well over-subscribed. The course is being sponsored by the RSGB and the RA and it should take the number of teachers trained by these methods to over 80 RAE passes.

Amateurs Assist in India, El Salvador Earthquake Comms

MEMBERS OF THE National Institute of Amateur Radio (NIAR) in Hyderabad, India, established HF and VHF stations at the end of January in the earthquake-affected areas of Gujarat. According to Jose Jacob, VU2JOS, of the NIAR, VU2LIC, VU2MYH, VU2LFA and VU3RBN as well as other amateurs both local and distant, had been carrying out emergency relief communications work for the Indian government on 14160kHz. Among the lessons learned following the earthquake devastation, it was proposed that a permanent control room equipped with amateur radio stations should be set up in the State secretariat in Hyderabad.

In the aftermath of the El Salvador earthquake on 13 January, the USA Salvation Army Team Emergency Radio Network activated amateur radio nets on 7090 and 14265kHz to respond to health-and-welfare requests and emergency traffic. A team of 22 Turkish rescue personnel led by Serdar Demirel, TA2NO, and equipped with an INMARSAT satellite phone and VHF and UHF amateur equipment, were sent to the disaster area.

A three callsign family. Left to right Alison, G8HPY; Roy, GW4DYY; and Victoria Mander, G8HOS / VP8DAJ.

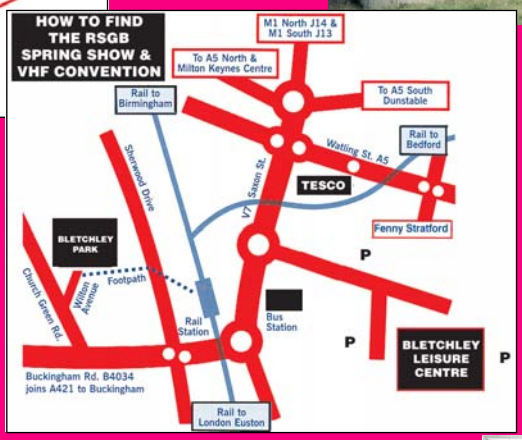
G0AKY Error

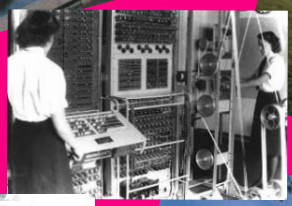
OWING TO circumstances beyond the control of the Society, the entry for G0AKY in the *RSGB Yearbook 2001* is incorrect. It should read: W G Staples, 8 Lesley Close, Bexhill-on-Sea, East Sussex TN40 2RF.

7 & 8 APRIL 2001

PUT THIS DATE IN YOUR DIARY

THE RSGB SPRING SHOW & VHF CONVENTION





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Lifeboat Special Event

SCARBOROUGH Lifeboat Station will celebrate 200 years of lifesaving in March 2001 and the RNLI has announced that it will honour this outstanding achievement by the award of a special bicentenary vellum. Scarborough Lifeboat Station was one of the original three stations established in the United Kingdom between 1800 and 1801. Until then local fishermen risked their lives in their own cobles to save the lives of shipwrecked colleagues. Lifeboats stationed at Scarborough have been launched 1096 times and saved 563 lives, with 17 medals for bravery awarded to crew members.

The Scarborough Special Events Group will be active as GB2SLS from the presentation day on 3 March and a full colour souvenir QSL card of Scarborough Lifeboat will be issued to commemorate the occasion. Activity will be mainly on 40m using SSB and CW. SWL reports are very welcome and QSLs can be sent via the bureau or direct to the club call G0OOO.

Have You Worked Shadow Walker Woman?

FLORENTINE WALLACE, VE1SWW, of Nova Scotia is the first Native Canadian to gain an amateur radio licence. Her Native Metis name is Shadow Walker Woman, which is reflected in her callsign. Florentine is legally blind and confined to a wheelchair following a car accident 12 years ago. She is active on both HF and VHF using voice activated radios. Florentine says that when she discovered she was the first Native in Canada to become an amateur radio operator, it made her feel very proud. She is now encouraging other Native people to take the amateur radio course and get on the air. Florentine says that studying for the radio amateur's examination was particulary difficult due to her sight problems. "I had to study very hard, and it was the most difficult task I have done since my accident," she says.

ON & VE 5WPM Morse

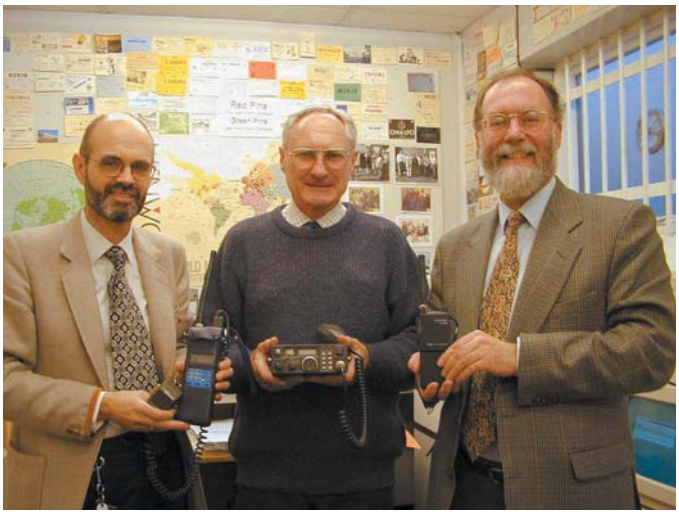
THE BELGIAN Minister of Telecommunications has signed a new decree on amateur radio which has reduced the Morse code test speed required for HF access to 5WPM.

Industry Canada - the Canadian equivalent of the RA - has proposed reducing Canada's Morse code requirement to 5WPM for full HF operating privileges. The Canadian national amateur radio society, Radio Amateurs of Canada sought the action last year.

Donation for New African Amateurs

ON PAGE 33 this month is the story of how Ted Alleyne, 5Z4NU, was able to take a shackful of amateur radio equipment donated to the Starehe Radio Club back to Kenya. The equipment was kindly donated by Eric Popple, G4YOP, who contacted the Harrogate Ladies' College amateur radio club, GB2HC, to say that he needed a good home for his radio equipment. He had heard the girls on the amateur bands and wanted everything to go to young people. Eric was delighted with the idea that some of his equipment would go to Africa. Ted Alleyne collected around 30kg of equipment from the College and made arrangements for it to be transported free of charge, courtesy of Kenya Airways.

Ted writes that, "The Starehe Radio Club was started in 2000 . . . Publicity about the formation of the Club has led to some very generous donations. On behalf of both Starehe and Amateur Radio Society of Kenya I tender our very grateful thanks to all concerned. The Starehe boys are drawn principally from the poorest communities. Selection is stiff and requires dedication and commitment from applicants. This year 33 members of the Starehe Radio Club took and passed the Kenya Novice Exam but a major stumbling block is the cost of radio gear. Equipment generally comes from departing expatriate amateurs leaving their equipment behind. . . This donation will set up Starehe with a full-scale station on HF and 2m which will rival the four or five amateur stations now active in Nairobi. Without your help Starehe would have been in dire straits and could well have foundered."



Richard Horton, G3XWH; Ted Alleyne, 5Z4NU; and David Andrews of Harrogate Ladies' College at the handover of equipment kindly donated by Eric Popple, G4YOP.

Win! A Yaesu FT-817 All-Band (HF / VHF / UHF) All-Mode Transceiver, courtesy of Yaesu (UK)

Second Prize MFJ Cub 15m QRP Transceiver, courtesy of Waters & Stanton PLC

A REMINDER THAT there's still time to enter our competition to win a new Yaesu FT-817 transceiver, with an MFJ Cub 15m transceiver for the runner-up. The closing date is **Friday 30 March**. The competition questions are repeated here, but if you have difficulty with any of them, referring to the announcement of the competition on page 24 of last month's *RadCom* may help!

COMPETITION TIME

Look at the three questions below. Write your answers on **a postcard or the back of a sealed envelope** (no letters accepted) and send them to: QRP Transceivers Competition, RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Don't forget to include your own name and address! The closing date is first post on **Friday 30 March 2001** and the winner will be announced in the May *RadCom*.

Questions

1) Where is the new RSGB Spring Show and VHF Convention to be held in 2001?
a) Sandown Park b) Hatfield House c) Bletchley, Bucks

2) When is the RSGB Spring Show and VHF Convention to be held?
a) Easter weekend b) the weekend before Easter c) The weekend after Easter

3) For an 'Adventure Radio' operation is the most important feature for a transceiver...
a) Its weight? b) Its power output? c) Its receive sensitivity?

Only one entry per reader (multiple entries will be disqualified). No other correspondence can be entered into. All entries will become the property of the RSGB; please state on your entry if you do *not* wish to receive further promotional material or offers from the RSGB. Employees of the RSGB are not eligible to enter. The winner will be the first **correct** entry drawn at random. The draw will take place on 30 March 2001.

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A Precision Peak-Following Power Meter

Here is a power meter requiring no setting up and no adjustment during use. It can even be connected back-to-front and still function!

By Brian Horsfall, G3GKG *

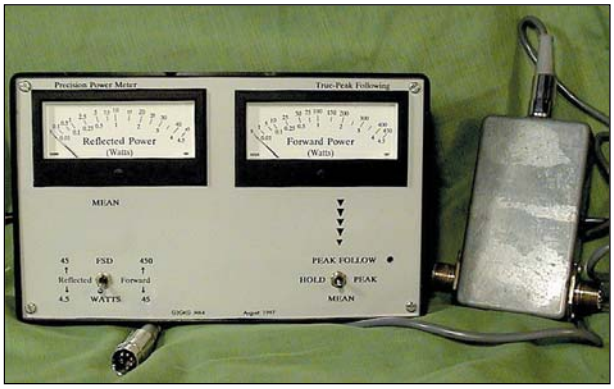
THE HEART of this instrument is the type of coupler known variously as a Tandem Match, a bi-directional coupler, and a 4-port hybrid transformer. It has appeared in many guises, eg [1].

To quote from this reference by G4ZNQ:

"A hybrid is a very simple circuit - just two transformers and four connectors - with some amazing properties. The connectors or ports are best thought of as two pairs. If a signal is fed into one connector and out of the other of a pair, into some unknown impedance load (say an antenna) then, if both the other connectors are terminated in the intended system impedance (say 50Ω), the hybrid feeds a fraction of the power passing *forwards* through the first pair of connectors into one of the terminations.

"It feeds an equal fraction of the reverse power flow into the other termination. Hybrids can be designed to have different sampling fractions, usually quoted in decibels, so that a 20dB hybrid diverts 1% of the flowing power to the appropriate terminated port".

With higher coupling factors, a proportionately lower power is fed to the terminations - eg a 30dB coupler diverts only 0.1%. G4ZNQ, (together with authors of other papers I've read on this subject) then goes on to design his coupler for a specified coupling factor in terms of decibels, and the metering part of the circuit has to deal with whatever voltage is produced at the output ports by a given RF power. By juggling the figures around a little, I derived some simple formulae to produce an essentially standard output *voltage* which can be defined for any particular system.†



The completed instrument, showing the Display Unit and the RF Head Unit

Using the correct type of toroid core (which must be of high permeability ferrite), this is a precision circuit which produces voltages at both the *Forward* and *Reflected* output ports which are strictly and predictably defined by the RF power, the designed load resistance and the number of turns on the secondary winding of the toroid. Used with the amplifier and display units to be described, the calibration is constant throughout (at least) the HF range of the amateur frequency bands and is accomplished completely and accurately just by using the calculated design parameters.

NO ADJUSTMENT OR SETTING UP IS REQUIRED!

IT IS READILY APPARENT from **Fig 1** that the basic circuit is completely symmetrical and this is indeed borne out by its performance. Reversing the transmitter and aerial connections merely causes the *Forward* and *Reflected* output ports to interchange positions, as does reversing the connections to one or other of the toroidal windings.

RF TO DC

THE DISPLAY UNIT uses individual meters for forward and reflected power, so the outputs are brought out from the RF section separately, after rectification and buffering.

The *Forward* metering circuit has been designed to accept a DC voltage range close to an optimum of 10V FSD. To set the power range, it is therefore arranged for the coupler to produce this voltage from the designated maximum forward power (peak), by first finding the required number of turns on the toroids to produce 10V as closely as possible from that power, and then calculating the actual precise voltage for that number of turns. (Fractional turns cannot be wound on a toroid!)

With a 10V range and the employment of Schottky diodes for both RF rectification and for an op-amp linearising circuit [2], the errors are reduced to

† *See note regarding software on p23.*

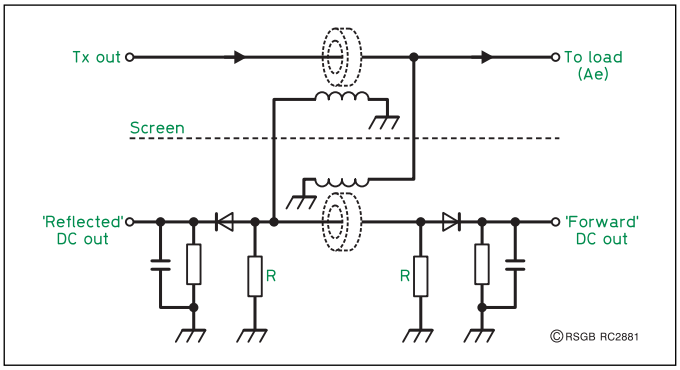


Fig 1: The Tandem Match - symmetrical between input and output.

* *West Mount, 183 Chester Road, Macclesfield SK11 8QA.*

A NOVEL PEAK-FOLLOWING CIRCUIT

THIS CIRCUIT, which may well find application in other areas, will be described in detail, with the help of **Fig 2**, **Fig 3** and **Fig 4**.
The basic internal circuitry of the Sample-and-Hold IC, type LF398N, is shown in Fig 2.

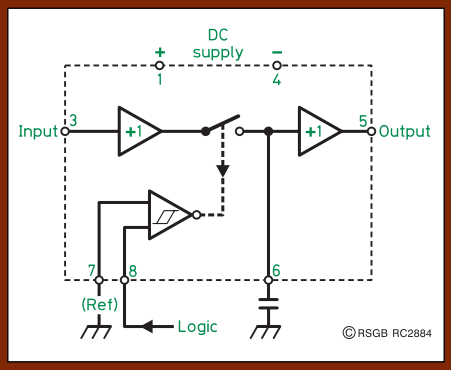


Fig 2: The internal circuitry of the LF398N integrated circuit.

Logic input: differential, up to 7 volts maximum, threshold 1.4 to 2.4 volts.
Logic: 1 (high) = Output follows input
0 (low) = Output holds previous input

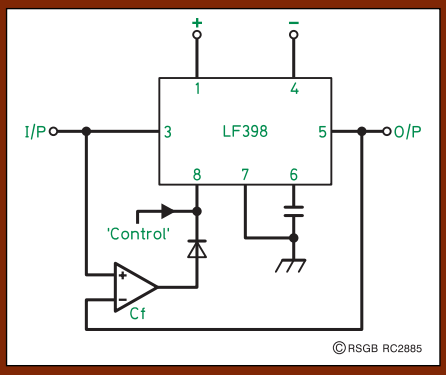


Fig 3: The addition of a comparator allows the detection of positive peaks.

The addition of one op-amp as a comparator (Fig 3) enables the output to collect and hold the positive peak of an input signal as long as 'control' is low. Because of the extremely high input impedance of the second buffer in the LF398, this peak can be held virtually indefinitely.

When the control voltage goes high, the output follows the input exactly.

Fig 4 shows how a second (inverting) op-amp comparator (the other half of an LM358N dual op-amp) allows the circuit to function as above when the input is positive-going. When the input falls, the voltage at this comparator output remains low for a period determined by the preset time constant, thus holding the peak, and then switches to high, again allowing the LF398 output to follow the input until the next positive peak occurs.

By adjustment of the time constant, the output can be made to follow individual peaks at a syllabic rate or to capture the highest peak in each phrase or sentence. Because the input signal to the second op-amp is detected and limited (by the LED) at the lowest practicable level, the peak-following rate remains substantially constant at all input levels.

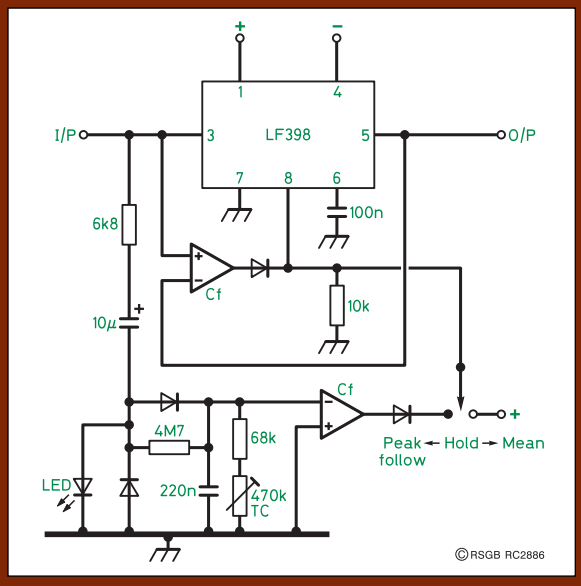


Fig 4: The extra circuitry needed to produce the *Peak-Following*, *Peak Hold* and *Mean* functions.

The Dynamics of Meter Pointers

With an LED display there is no problem with its ability to follow the rapid response of the electronic circuitry, but there is the disadvantage that it can only read in discrete steps (see 'Supplementary Data'). Using an LM3914 LED-driver IC - which uses a chain of 10 comparators responding in equal increments to the *voltage* level of the applied signal - the gap in *power* reading between adjacent LEDs is so large as to negate all the advantages of the precision of this design. If the LED legends indicate dBW rather than power, and if two 3914s driving 20 LEDs are employed, it makes a little more sense. On the other hand, analogue meters do have the fine discrimination required, but can be too slow in their response for best results. With the op-amp voltmeter circuit used in this design there is a simple way of optimising the needle response time.

From my experience with several different types of meter, most are *overdamped* (ie the response to a step change in input is too slow, with the needle creeping over the last few percent of its swing). This response is the easiest sort to improve, but the compensation must be done very carefully and precisely so as to prevent overswing with consequent false readings. It is only required in the peak-following mode and only on the *Forward* power meter, as the *Reflected* meter always reads mean power. The required components form a series combination of resistance and capacitance, switched into circuit in the appropriate mode, across the calibrating resistor of the op-amp (see Fig 9, later). Part of the resistive component is the 'on' resistance of the FET (which, with the associated transistor, performs the necessary part of the switching function from 'peak' to 'mean' reading), whilst the other values are determined for the particular meter, as follows.

Compensation

Leave out these components until the instrument is completed and working. Then, remove the plug coming from the head unit and connect a signal from a rectangular-wave generator to the display unit, (between the *Forward* voltage pin and *Common* of the input socket). Use about 8V positive-going with a mark/space ratio about 1:1 and a repetition rate of about 1Hz. With the switches set to the *High* power range and P*eak* (follow), you will then need to adjust the values of both resistor (Rx) and capacitor (Cx) until the meter follows the amplitude excursions as fast as possible *without overswinging* on either the upward or downward swings - it is easier than it sounds!

My own Mk4 instrument uses 1mA Sifam meters (from a surplus source) and the compensation consists of two 6.8µF capacitors in parallel together with just the 'on' resistance of the FET. Exceptions to my earlier statement, these meters are in fact basically *underdamped* so that the Forward one also had to be shunted to achieve the required *critical* damping, thus altering its sensitivity and requiring changes to the scaling resistors. Whatever the type of meter, these values *must* be critically determined.

negligible proportions, the DC output tracking the RF voltage accurately down to about 30mV (representing a power level of 18µW with a 50Ω load) with little deviation well below that. It is important for this tracking that the pair of diodes in each of the detector/op-amp circuits is initially matched regarding forward voltage drop and also that they remain at the same ambient temperature during use. The same operational amplifier also provides a convenient low-impedance DC output from this part of the circuit to the main Display Unit, allowing the RF unit to be constructed in a separate housing which also caters for the requirement regarding ambient temperature. This RF Head Unit can then be installed in the direct coaxial line between transmitter and aerial matching unit, well away from the main measuring and display instrument, which can therefore be located in the optimum position for viewing.

METERING

EACH METER CIRCUIT incorporates the meter itself in the feedback loop of an op-amp driver - **Fig 5**. The voltage range is determined only by the current range of the individual meter (irrespective of its inherent resistance) and the scaling resistor, R, the value of which is given simply by dividing the actual full scale voltage required, V, by the nominal full-scale deflection (FSD) current sensitivity, I, of the meter. For supreme accuracy, the FSD current can be individually measured and used in the calculation.

As the whole of the Head Unit circuitry is completely symmetrical (as Fig 8 shows), the reflected output voltage of the coupler for the same full-scale power would, of course, be the same, at 10 volts, but we can select a range for that metering circuit

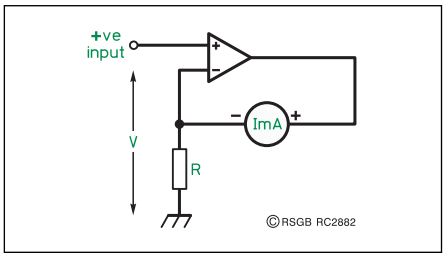


Fig 5: The basic meter circuit, showing the meter in the feedback loop of the op-amp driver.

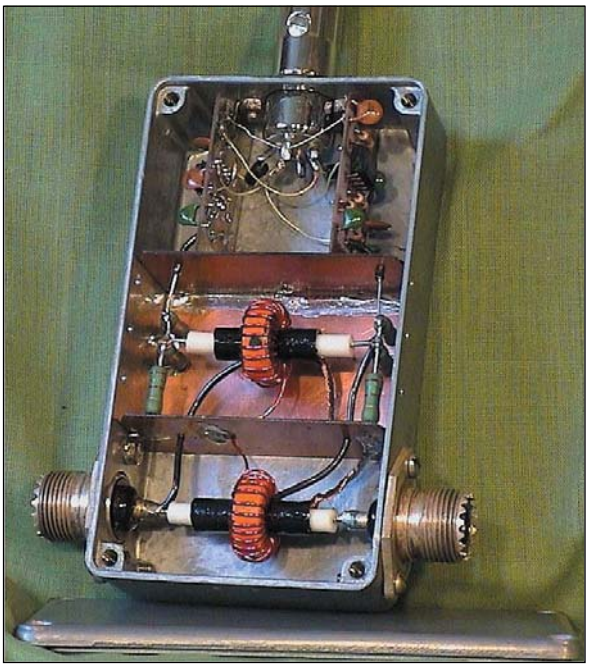
of something less - ie an FSD which is more commensurate with the maximum reflected power likely to be encountered - bearing in mind the square law relationship which dictates that *half* the full scale voltage represents a *quarter* of the power.

If the *Forward* meter is calibrated so that 10V FSD represents 400W, a companion *Reflected* meter calibrated for 5V FSD will read up to 100W, which would be equivalent to an SWR of 3:1. [Personally, I do not subscribe to the imported habit of relating everything to a purely notional SWR figure. All I'm concerned with is reducing the reflected power to a *minimum*, and can see no point in inventing complicated ways of expressing the outcome. If as much as 10% of my power was being reflected (SWR nearly 2:1), I would know that something was seriously wrong and am not interested in measuring more than that. However, it is perfectly feasible for anyone addicted to such things to calculate SWR, rho, return loss, or any other similar quantity from the readings on these meters.]

It is also convenient and easy with this degree of sensitivity to provide accurate, alternative, very low power ranges, so that the transmitter and aerial system can be tuned and matched with minimum chance of causing interference. This entails incorporating a two-way toggle switch to select different values of scaling resistors which set the scaling of both meters appropriately. For a station using the full legal limit, convenient ranges might be - forward power: 450W or 45W; reflected power: 45W or 4.5W, thus enabling a single set of scale markings to be calculated and used for all ranges, with different figures on the two meters. The scales used on my meters are shown in **Fig 6**.

Consider now the actual scaling resistors. Because the voltage ranges are all calculable, these can be fixed components which, although unlikely to be easily available in the exact values, can be made up from suitable series or parallel combinations of 1% tolerance resistors. Alternatively, by using pre-set variable resistors, the completed instrument could be calibrated using precise values of DC voltage injected at the input socket to the main unit in place of the output from the head unit.

All the calculations for determining the required number of turns on the toroids to suit a given power range, the actual output full-scale voltage, values of scaling resistors for all four chosen ranges with particular meter movement sensitivities (with the facility of calculating series combinations of preferred value resistors to produce the value required) and the meter needle deflections in degrees for the required calibration points, are all available on spreadsheets.† Alternatively, if the required ranges are specified, together with details of the meters to be used, an SAE to the author will result in an individual print-out of all values.



Inside the RF Head unit. My toroids are from a surplus source but are electrically virtually identical to the Electrovalue type. Eagle-eyed readers will also notice that I used three 150Ω resistors instead of two 100Ω!

PEAK READING

MANY COMMERCIALLY-designed power meters include a function labelled 'Peak' or 'PEP'. Occasionally, such a meter will indicate something more or less close to the true peak power, at the expense of a very long decay time. Most of those which are manufactured as separate items, or included in an aerial matching unit, do not and cannot measure or indicate the instantaneous peaks of an SSB speech waveform because they do not include any active circuitry. It is frequently maintained that if the unit requires an external power supply it will most likely contain such a refinement and be capable of capturing these peaks, but this can be a snare and a delusion. The power supply frequently serves only to provide the illumination for the meter(s).

Let's be sure what we are talking about. With a continuous carrier, which is of course just an RF sine wave, the peak power we want to measure is, in fact, what we know as the peak envelope power or PEP. The picture on a monitor scope will show a solid band (the envelope), the vertical width of which varies with the output power of the transmitter and clearly illustrates that, in this sense, the mean and peak powers are the same. Any of the instruments on the market should produce the same reading in either measuring mode. An SSB speech waveform, on the other hand, shows a band of power that is constantly varying at a syllabic rate and further illustrates that, without compression or other processing, the power only reaches local maxima for very brief periods of time. It is these brief peaks that we wish to measure when we refer to 'peak' power - more properly called the *instantaneous* peak power. When we switch to read 'mean' power, we want to know the *average* power output over a period of time, and we need the meters to read in this mode when tuning or adjusting the rig. With a properly-adjusted transmitter in the SSB mode (ie no compression), the mean power will be quite small compared with the peak power.

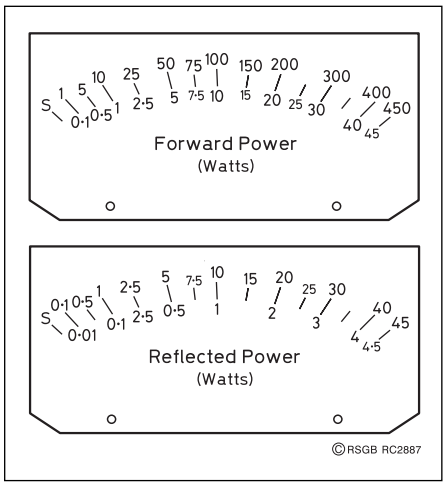


Fig 6: Meter scales, showing the common calibration marks for the two power ranges.

The peak-reading circuits normally encountered all employ the same sort of 'diode-pump-charging-a-capacitor' circuitry, with varying degrees of sophistication designed to overcome the inherent drawbacks of the circuit. In order to capture brief peaks accurately, the diode non-linearity and knee voltage must be overcome, the charging circuit must have a fast attack (implying a very low source impedance) and it must

have a decay time long enough to enable the peak to be read - often accomplished by incorporating a 'peak-hold' feature which removes the normal discharge resistor. In normal SSB use, most of them are inevitably very sluggish in their response.

In order to *follow* the peaks of an SSB signal, either at a syllabic rate or by capturing the peak amplitude in each short phrase of speech and still provide time to read the meter, it is necessary to provide a fast attack, a preset 'hang' period and a rapid decay, in order to capture the next peak. I have tried several approaches to this idea and the most successful is one using a sample-and-hold chip, type LF398 (of which the N version is the best buy in this application). The requirement is for a circuit which performs the function illustrated in **Fig 7**.

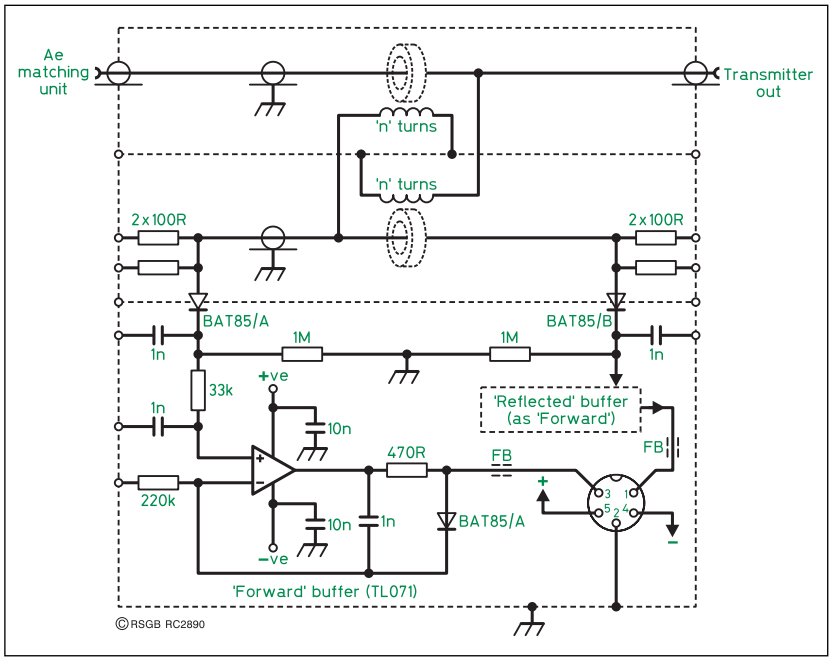


Fig 8: Circuit of the Head Unit. Note that the BAT85s are matched *at the same temperature* in pairs (/A and /B) for forward voltage with a series 1MΩ resistor from a 10V supply.

CONSTRUCTION

IT WAS NOT my intention that this article should provide full constructional details - everyone will have his own requirements and preferences. As can be seen in the photograph, my Head Unit (**Fig 8**) is built into a diecast aluminium box measuring about 115 x 62 x 29mm and is connected to the main display unit (**Fig 9**) by a 5-pin DIN to 5-pin DIN screened lead (readily available from Hi-Fi stores and component suppliers). Thin double-sided copper-clad fibreboard is used in the construction of the screened compartments and for the TL071 linearising buffer amplifiers, with the rectifier diodes passing through holes in the final screen.

The two ends of the second coax-toroid assembly are supported by a pair of orthogonally-mounted 100Ω, 2W metal film resistors (Electrovalue 2W100). The toroids used so far have been generously proportioned with AI ratings in the 1800 to 2000 region (eg Electrovalue type B 64290K 632X27), but I suspect from more recent testing that rather smaller ones (…45X27) would serve equally well. Offset adjustment for the op-amps has not been found necessary but, especially if very low ranges of power are required, could be accomplished by connecting an experimentally-determined, high-value resistor from the negative supply to either pin 1 or pin 5.

Obviously, the size and type of housing required for the main instrument will be dictated largely by the choice of meters used. With the Sifam meters shown in the photograph, mine fits fairly snugly into a plastic Bimbox (Electrovalue stock No.1006) with the whole circuit, apart from the meters and power supply but including the two miniature toggle switches, on a PCB which is mounted to the front panel by means of the switches themselves. In order to keep the off-board wiring to a minimum and the switching as simple as possible, this Mk4 design employs the transistor-FET switch (see the 'Peak-Following Circuit' panel) and omits the additional LED display (see opposite) of my earlier prototypes altogether, experience having already confirmed the feeling that this was an unnecessary complication. The meter indication, as well as being far more discriminating and accurate, can be set to achieve a speed of response which is only fractionally slower than that of the LED display, and is entirely adequate for the purpose.

The power supply is on a separate small board fastened to the back of the box along with the input socket from the Head Unit and the mains lead. A short 5-way ribbon cable connects the box and front panel assembly together. [The design of the power supply has previously been the cause of one or two queries so perhaps I should forestall any future problems with a word here. A negative rail is required by some of the ICs but, because all the actual signals are positive-going, it is not required to be more than a few volts and need not be stabilised. My unconventional use of a negative-type three terminal regulator enables the positive supply to be regulated whilst providing an 'adequate' negative one.]

Quite a few operators have now built copies of either this Mk4 design or the Mk3 version with the additional LED display and all appear to have been well satisfied with the performance.

PERFORMANCE

IT IS WITH SOME considerable trepidation that I present the results of actual measurements on my Mk4 instrument - made with the greatest care and using high-grade test equipment. Calibration, with the larger-size ferrite toroids, appears to be reliable and essentially constant over a frequency range from well below 100kHz to above 50MHz. (This helps to confirm the feeling that smaller ones would be adequate for the amateur bands.)

Using a 4MHz carrier into an accurate 50Ω load and measuring the RF voltage developed across it at various power levels, as indicated on the meter:

- On the higher *Forward* power range (450W FSD), all voltages at powers up to at least 200W were within 1% of the calculated value.
- On the low power range (4.5W FSD), they were within 1% at 1W and above, about 5% high at 100mW and just under 10% high at 10mW, the lowest calibration point on the scale, indicating that the power readings are slightly too low at the bottom of that range.

Of course for really low-power measure-

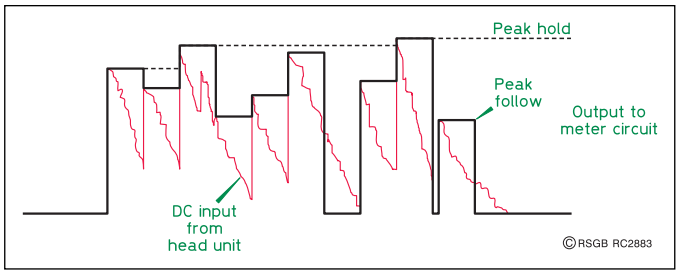


Fig 7: Illustrating the behaviour of the circuit in the Peak Hold and Peak-Follow modes on an SSB-type envelope using 'fast-follow'.

ment, the Head Unit would be re-designed accordingly, with the toroid turns calculated to produce the 10V FSD range from the desired full-scale power (note that fewer turns would be required) - giving similar accuracy at powers several orders lower.

Other tests with a double-beam storage oscilloscope confirm that the meter is accurately registering the true peak value of even very brief signals, in both the *Peak-Following* and *Peak-Hold* modes.

In some cases, at lower output levels with modern 'black box' rigs, this can be confusing as the meter will capture the instantaneous high power on first keying up – *before* the ALC has acted to reduce the output to the set level (the well-known 'stable door' effect). In the *Mean* position, even with the damping compensation switched out, my meters are a little too lively to give a reasonably integrated reading of the mean value of a typical dynamic SSB signal but, as it is only really included to enable tuning and loading operations to be carried out, I have not arranged for a longer time constant in this mode.

Note: It might come as a surprise to anyone using an instrument based on this Head Unit to find that the apparent SWR does *not* get smaller as power is reduced. This is a widespread, mistaken notion based on experience with commercially-available instruments using low voltages derived from some form of Breune circuit [3]. With ordinary silicon diode rectifiers embodying no attempt at linearisation, the combination produces DC outputs which are too low, the error becoming worse as power reduces; this becomes particularly apparent in the *Reflected* mode and on the lower power ranges - where it can sometimes appear, when tuning the aerial, that there is a wide 'dead band' where there is apparently no reflected power!

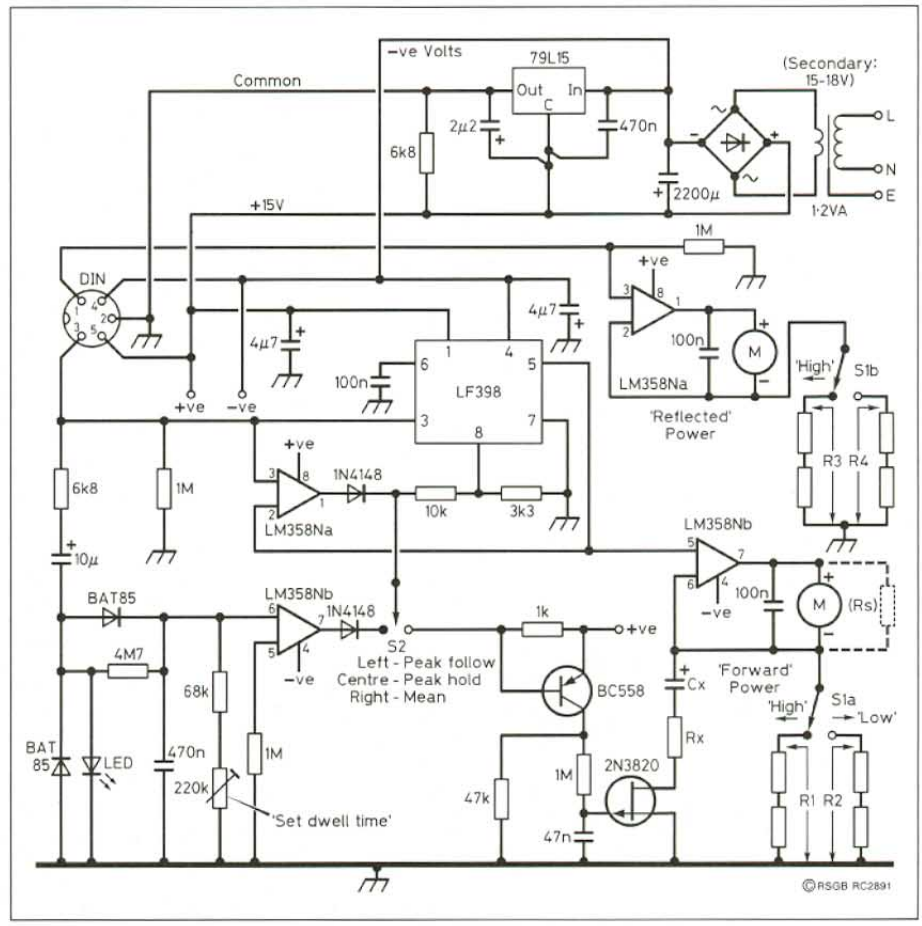


Fig 9: Complete circuit of the main display. Note that the values of R1 to R4 are derived as in the spreadsheet (see box on p23).

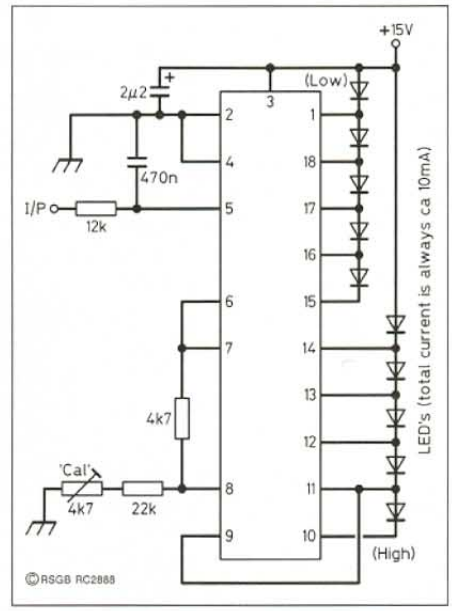


Fig 10: A linear LED bargraph display circuit. When the sixth LED lights, the lower five extinguish. It has the advantage that the total LED current remains that of one diode - here about 10mA.

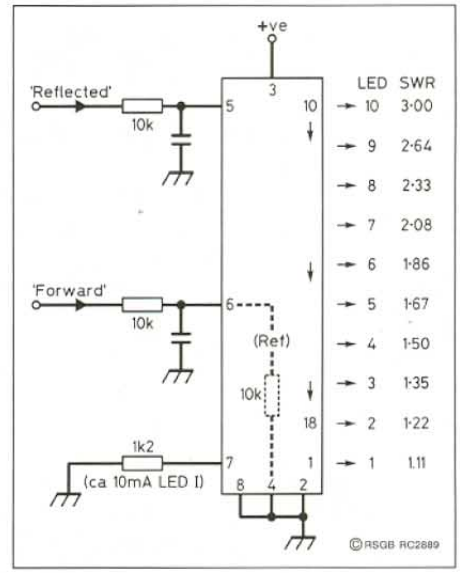


Fig 11: Using another linear bargraph driver to display SWR values directly, irrespective of the *Forward* power level.

SUPPLEMENTARY DATA

THIS SECTION gives details of an alternative type of display, using a line of LEDs as the indicator, as used n the author's Mk3 version.

LED DISPLAYS WITH THE LM3914 DRIVER

(a) **Forward Power**

Fig 10 shows the circuit required to produce an LED display of forward power, either as an extra feature or as an alternative. The input of the LM3914, pin 5, could be connected to the output of the LF398, pin 5, in the main circuit, when it would simply duplicate the indication of the *Forward* meter. More usefully (as in the Mk3 version), it could be arranged to display the peak output from the LF398, even when the meter was displaying mean power, for example. This would necessitate more complicated off-board switching, to transfer the forward metering input to pin 3 of the LF398.

(b) **Automatic SWR Display**

Here is a simple circuit that would automatically calculate and indicate the SWR on a 10-LED display unit, irrespective of the actual forward power level, using just the signals from the Head Unit into an LM3914-based circuit.

Fig 11 shows just how simple the circuit really is. A fraction (say one half) of the Forward voltage is applied across the IC's internal

comparator reference chain of resistors (10kΩ total). The Reflected voltage is applied directly to the normal high-impedance input so that, when it marginally exceeds the value of that fraction of the Forward voltage at the IC input, the uppermost LED illuminates, indicating in this case an SWR of 3:1. Lower values of Reflected voltage will progressively illuminate the lower LEDs in linear one-tenth increments, thus producing the SWR scale shown.

Calculations made during the course of the development of the power meter are provided as spreadsheets on the RSGB Members-Only web site. The spreadsheets may be freely downloaded and used to assist readers to develop their own circuits for use at different powers and with different meter sensitivities.

Acknowledgement

I am indebted to Don, G3ALP, for his encouragement during the design evolution, for providing much generous help and advice to several other constructors and, finally, for the digital photography of the hardware. ♦

REFERENCES

[1] 'Bi-Directional In-Line Wattmeter', G4ZNQ, *Antenna Handbook*, G-QRP Club, pp29-32.

[2] 'The Tandem Match - An Accurate Directional Wattmeter', KA3BLO, *QST*, pp18-26, January 1987. The article is also included, with further notes and design variations from other authors, in the later *ARRL Handbooks*, eg pp34-9 to 34-17 in the 1994 edition; the same chapter also concludes with a further relevant bibliography.

[3] 'An Inside Picture of Directional Wattmeters', W B Bruene, *QST*, pp24-28, April 1959.

RadCom Helplines FOR MEMBERS

● Richard, one of our Polish readers, wishes to exchange **Polish QSL cards for UK QSL cards**. Write to Richard Pilewski, Broniewsk 12, 09-200 Sierpc, Woy Mazowiecke, Poland.

● Brian, G3GDU, is hunting for information on the **FT-DX500**. The handbook or even just the circuit diagram would be appreciated. All costs refunded of course. G3GDU, QTHR. E-mail: brian_kendal @bigfoot.com

● Peter, MW5ARR, is looking for any information (manual, circuit diagram, etc) for a **Philips Service Oscillator type GM2884**, covering 100kHz - 25MHz, late 40s or early 50s vintage. He will reimburse all costs. MW5ARR, QTHR. Tel: 01547 510 211, or e-mail marion@trevland.co.uk

● G3YAA is seeking **QRM5**, a copy of 500kHz CW QRM in the English Channel in the 1970s. Also sought are the results of experiments with a **rotating clothes line** used as an antenna. G3YAA, QTHR. Tel: 01482 866 865.

● Ron, RS8137, is looking for a copy of the handbook for the **Tektronix 2845 150MHz oscilloscope**, and will reimburse any costs incurred. Tel: 01563 850 343.

● Frank, G4WUM, is looking for information or help to convert a **Bosch KF-164** or **KF-163** to 2m operation. He will cover any costs incurred. G4WUM, QTHR. Tel: 0191 489 4960.

THE RSGB IS COORDINATING a series of activities by amateur radio clubs who have volunteered to bring amateur radio to as large a section of the public as possible.

WAB AWARD

THE WORKED ALL BRITAIN Awards Group is offering an award for the month of March entitled "The Man Who Shrunk the World". It is for contact made during the whole month of March or during the 10 days of National Science Week; the requirements are the same for each, although achievement of the latter will be eligible for an additional award. In a nutshell, one point is given for each contact with a WAB area or with a WAB book-holder; a contact with an un-worked WAB book-holder in an un-worked WAB area counts as two points. On HF, 40 points are needed, while on VHF, only 20.

The full rules are available on the WAB Group's web site [http://home.freeuk.net/wab] and a special certificate has been designed to commemorate National Science week.

national science week
starts 16 march 2001

National Science Week takes place over the 10 days from 16 to 25 March inclusive, and not on the dates published in *RadCom* last month.

Many clubs have volunteered their services; they are too numerous to mention individually, but this brief list (which is in no particular order) should serve to illustrate the effort that is being put into advertising our hobby in a positive way.

● Chester & DARS is planning to mount an exhibition of radio equipment past and present and to be operating a station on Saturday 24 March.

● West Bromwich Central RC is running a special event station during the weekend of 17/18 March and/or 24/25 March at a local nature reserve.

● Mid-Cheshire ARS is hoping to run a special event station at a local school or college.

● Newport ARS is planning an open evening on one of its club nights, and will be inviting local schools to attend.

● Sheffield ARC is inviting two local schools to visit the club, where there will be on-air demonstrations of HF and packet operating, together with displays of equipment and a hands-on (but off-air) trial of Morse code.

● Scarborough Special Events Group is running GB2SLS from Scarborough College, assisted by other local clubs. Students and members of the school CCF will also be in attendance.

● Waterside (New Forest) ARS is producing a talk on the history of communications, with emphasis on the origins of amateur radio. There will be displays of HF voice and Morse stations, ATV and a VHF packet station.

● Finningley ARS is having one or two open days, inviting the local ATC, Sea Scouts and CDT students from local secondary schools. Promotion of the events is planned throught the local press and regional tourism committees.

● Warrington ARC is planning a series of demonstrations to local schools, including the use of computing in radio (ie packet, and RTTY), ATV, meteor scatter, propagation and the sun.

● South Derbyshire & Ashby Wolds ARG has been involved in National Science Week for some years, using GB4SET and GB2000SET. This year it is GB4NSW, and members of the Police, Fire Service, TA and Sea Cadets are actively involved.

● Powys ARC is involving the local high school, ATC and youth club.

● Horsham ARC has an Open Novice Night planned for Tuesday 20 March at 7 and 9pm.

If you hear any of these stations, give them a call - yours may be the contact that recruits another member to our ranks!

BOURNEMOUTH RADIO SOCIETY

MARCH 18th 2001

BOURNEMOUTH RADIO SOCIETY'S 14th ANNUAL SALE WILL BE HELD AT KINSON COMMUNITY ASSOCIATION CENTRE, PELHAMS PARK, MILLHAMS ROAD, KINSON, BOURNEMOUTH.

Doors Open at 1000 hours until 1600 hours

Talk In from G1BRS on 2m S22.
Amateur Radio
Computer Traders
Accessory traders
Antenna Suppliers
BRING & BUY STALL etc.
Also Specialist Groups & Clubs
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NEW BOOKS AND REPRINTS

The Communication Handbook by J.D. Gibson. A vast volume of 1598 pages. Published 1997. A perfect balance of essential information. The most recent telecommunications standards from around the world. 100 chapters from 140 expert contributors. Detailed information includes Telephony. Satellite Communicatons. Optical Communications. Radio Communications. Source Compression. Data Recording. Twenty background chapters on analog and digital communications. Published at nearly £80. Illustrated. **Our Price £35.00** Carriage £7.50 (heavy).

Taylor Valve Tester 45A, 45B, 45C and 46A Data Book. 76 pages of valve settings for the above testers. Facsimile reprint. **£9.50** including P&P.
R1155 Receiver Data 47 pages **£11.75** including P&P.
T1154 Series Transmitter Manual 54 pages **£14.75** including P&P.
Wireless Set (Canadian) No.19 Mk3 Technical Manual 62 pages **£13.50** including P&P.

AVO Valve Tester Switch Selector Code and Valve Data and Equivalents Book. Covers AVO testers type CT160, VT160, VCM MkII, VCM MkIII, VCM MkIV, VCM163. Over 240 pages covering all the necessary settings and data for testing 1000's of valves. Facsimile reprint. **£15** P&P £2.25

Janes Military Communications 1991 - 1992. 12th Edition, 814 pages, contains much recently released military wireless equipment. **Now £20.** P&P £7.50.

A.T.Sallis. Government Surplus Radio Sales catalogue circa. 1959. An excellent catalogue contains 200 photos and details of govt. surplus wireless items including,components, receivers, equipment and accessories. 92 pages. Facsimile copy. **£9.50** including P&P.

Power Vacuum Tubes Handbook by J.C. Whittaker. Published 1999. This is a definitive study. Contents include power vacuum tube applications including Designing Circuits. Microwave Power Tubes. R.F. Interconnecting and Switching. The role of power tubes in the generation of high power R.F in the H.F. regions and above. Includes research for power grid tubes, (Triodes, Tetrodes and Pentodes, Klystrons, Magnetrons) etc. 710 pages. Photos and illustrations. Published at nearly £50.00. **Our Price £25.00** Carriage £6.50 (heavy).

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Fluke hand-held digital multimeter model 8024B.
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Acom 1000 and 2000A Linear Amplifiers

by Peter Hart, G3SJX*

ACOM IS A name which is probably new to most readers. Established in 1988 and based in Bulgaria, the company specialises in developing HF power products for commercial, government and amateur markets.

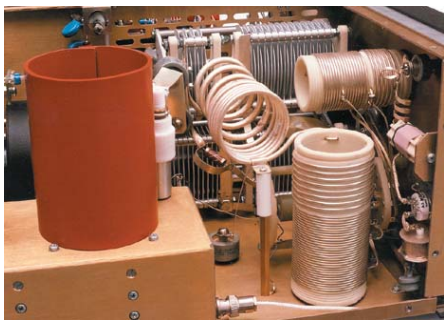
In 1999 Acom launched its 2000A high-power automatically-tuned HF linear. First unveiled at the Dayton Hamvention in May of that year, this 1.5kW amplifier has been acclaimed by many top DXers and contest operators as the best on the market. Similar in many respects to Alpha's top of the range 87A, it has more features, is significantly cheaper and yet an equal to Alpha in terms of quality of design and construction.

Acom 1000 front panel view.

More recently, Acom launched its 1000 amplifier, a manually-tuned linear for 1kW output and covering all HF bands plus 6m. I was particularly pleased to obtain the first production sample for review.

Although Acom amplifiers have been available for only a couple of years, the fruits of its handiwork have been visible for much longer in the Alpha 91β which was entirely developed and manufactured by Acom under contract from Alpha. This amplifier was one of Alpha's most popular and successful [a review of Alpha amplifiers by Peter Hart appears in the February 1997 *RadCom* - *Ed.*]

Both Acom amplifiers are based around the GU74B / 4CX800A Svetlana ceramic-metal tetrode which is available at very low cost compared with the 3CX series of ceramic triodes or the glass 3-500. These tetrodes need very low drive and have excellent distortion characteristics. Both amplifiers are manufactured in Bulgaria from parts sourced from Eastern Europe and this results in a top quality amplifier at a very attractive price.



Close-up of the Acom 1000 RF assembly.

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

ACOM 1000

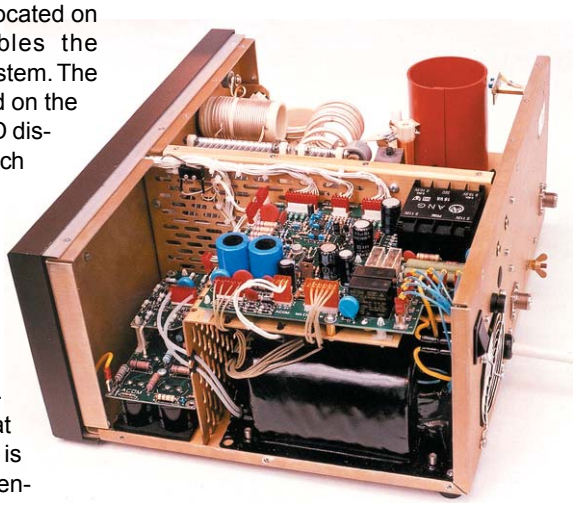
THE ACOM 1000 is a self-contained amplifier with the RF deck and PSU in one box measuring 42.2W x 18.2H x 35.5Dcm and weighing 18kg. It uses a single GU74B / 4CX800A to deliver 1000W output on all modes from 50 - 60W of drive with no time limit on SSB or CW, although for continuous-carrier modes such as RTTY an auxiliary externally-mounted fan is necessary for extended transmissions longer than 15 minutes.

The amplifier uses conventional tune, load and bandswitch controls and these are fitted with large knobs for ease of use. The primary mains power switch is located on the rear panel, which enables the microcontroller-based control system. The amplifier power switch is located on the front panel, together with an LCD display and three other buttons via which a whole host of set-up and monitoring functions are accessible. The amplifier is switched from the transceiver via a 'ground to transmit' line and the linear also provides a 'ground when ready' feedback line to the transceiver to prevent hot switching for radios which support that facility. A vacuum antenna relay is used and fast T/R switching to enable effective QSK operation.

The valve operates in grounded cathode with a cathode resistor to provide some RF negative feedback. The drive power is applied to a 50Ω resistor across the control grid with some additional matching to tune out the valve capacitance. This gives a broadband match without any input bandswitching yielding a low input VSWR across the whole frequency range. The amplifier uses a Pi-L output tuning network for good harmonic rejection and this will match into antenna VSWRs up to 3:1, increasing the usable bandwidth of many antennas and removing the need for an antenna tuner in certain situations. The tuning network is followed by a low pass filter with a cut-off frequency of 55MHz to reduce harmonics in the VHF range further . This is particularly important with the second harmonic of 6m falling inside the FM broadcast band.

The main power supply unit is inrush current protected and provides the 2.8kV anode supply, the screen, control grid and heater supplies, and the supplies for the relays and fans. A separate PSU powers the microcontroller based control system so this is available when the amplifier is turned off.

Extensive circuitry is incorporated to protect the amplifier from a host of potentially damaging conditions. With this auto-protection system, sensors are incorporated to

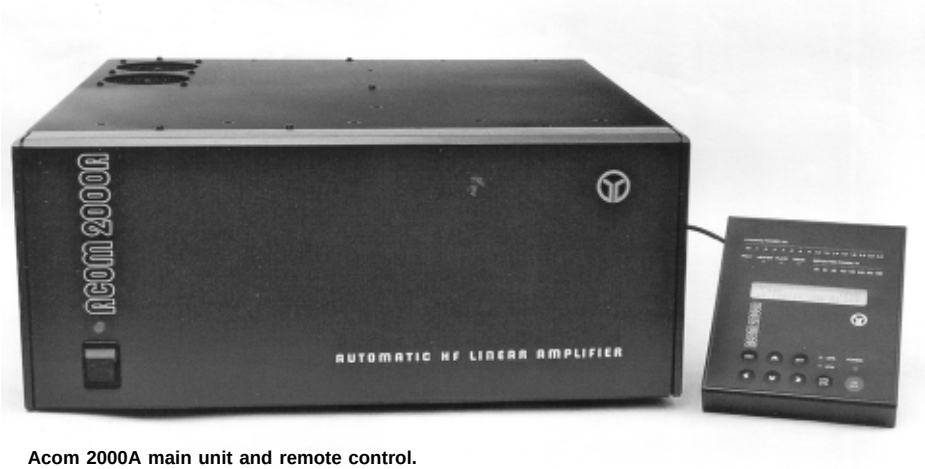


Acom 1000 internals showing PSU and RF sections.

allow the control circuitry to monitor forward and reflected power, drive power, anode DC voltage and current, peak RF anode voltage, screen current, control grid current, control voltages and exhaust air temperature. From these measurements other parameters are computed, for example antenna VSWR, output power, relay closure and a novel arrangement to detect the presence of arcs. The results of all these measurements are available for display, one line at a time, on the LCD. Associated with these measurements are limit levels which, if exceeded, are flagged immediately on to the LCD and may operate trips. The first level of protection reports when limits are getting close, eg "reduce drive". The second level trips the amplifier back to the standby condition in the event of a soft fault, eg high VSWR or excess drive. The third level shuts off the AC power in the event of a hard fault, eg a major problem or a supply failure. The status of these hard faults is stored in non-volatile memory and the last seven conditions may be recalled to the LCD for analysis.

The Acom 1000 incorporates a handy tuning aid to allow simple and rapid tuning of the amplifier. This is called TRI (True Resistance indicator). Tuning Pi networks is usually a two-handed process as the tune and load controls interact. By suitable processing of the sensor signals the correct settings for the tune and load controls are separately identified and displayed on the LCD. A bargraph indicator is used to peak the tune control and on a separate scale a marker shows where the loading control should be correctly set and whether to rotate the knob to the left or to the right. Initial tuning is done at reduced power and a 6dB attenuator is automatically inserted into the drive path when the settings are away from optimum. This is disabled when the tuning is near optimum.

The amplifier is superbly constructed on an anodised aluminium frame with a wrap-around case. Interlocks disconnect the AC power and short the HT to ground when the case is removed. A dividing screen separates the RF deck from the power supply / control circuitry and the RF deck is also separately shielded. The output network components are very substantially rated with much silver plating in evidence on the inductors and connecting straps, and chunky 'door-knob' ceramic capacitors. Full cabinet forced air cooling is provided with the centrifugal blower mounted internally on the side of the grid box. Air is drawn in through the rear panel, past the transformer and PSU circuitry, through the output tuning components and into the grid box. The air is then forced through the valve anode via a rubber chimney, past the temperature sensor and vented out through the top of the case. For high duty cycles or high ambient temperatures an additional fan can be fitted on the rear panel.



Acom 2000A main unit and remote control.

Measurements were made on the amplifier under CW and two-tone SSB conditions. As the linearity of the amplifier is potentially better than most transceivers, care must be taken to use a low distortion two-tone drive source. This was fabricated using two transceivers operating on CW with 5kHz frequency spacing coupled together with a high-power hybrid coupler. This arrangement yielded around 80W PEP drive power with residual intermodulation products at -50dB.

The Acom 1000 delivered 800 to 900 watts output with 60 watts drive power and 1kW output with 70 - 90W drive dependent on frequency; the gain was actually highest at 50MHz. The bargraph power meter was somewhat optimistic reading about 10% high at low frequencies rising to 20% high on the upper bands. The harmonic rejection was well within specification, better than 55dB at low frequencies rising to 75dB on 24MHz and above. The input VSWR was 1.3:1 or better over the frequency range. Two-tone distortion levels measured -34dB worst case for 3rd order products at 1kW PEP output and -50dB for 5th order.

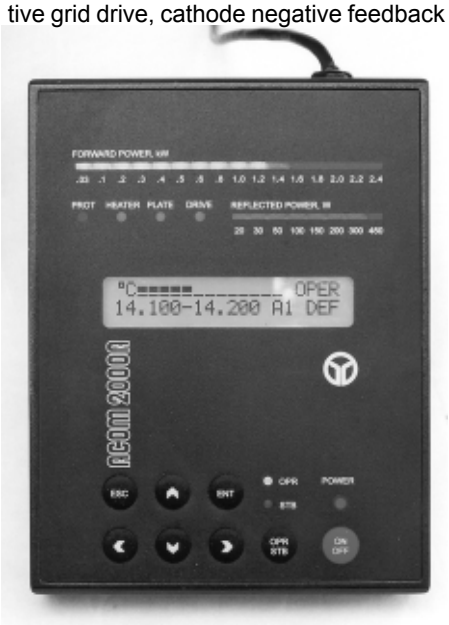
When the mains power is switched on "ACOM1000" is reported initially on the LCD. After switching on the amplifier, it takes 2.5 minutes for the valve to heat up before the amplifier is ready to use, this countdown time being reported on the LCD. This can seem interminable if you are in a hurry. The amplifier performed very well. It was docile and easy to tune, if a little critical on 50MHz, and the TRI tuning aid enabled the correct tuning point to be rapidly and simply set. The blower was very quiet in operation. When the exhaust temperature reaches 90°C, which it can do under hectic contest conditions or RTTY, the blower engages a higher speed but, even in this case, the increase in noise level was not particularly great. The amplifier follows well in QSK operation and the relays are virtually silent in operation due to their special mounting. The amplifier will not allow hot switching, it will not switch to transmit if RF drive is already present but will report this on the LCD.

Overall the Acom 1000 is an excellent performer, and with a price tag of £1495 unbeatable value for a 1kW amplifier which also covers 6m.

ACOM 2000A

THE ACOM 2000A is an automatically-tuned high-power amplifier for the HF bands, delivering 1.5kW output on all modes with 50 - 60W of drive. The amplifier is fully controlled via a small remote control unit which is connected by a cable to the amplifier main unit containing the RF deck and power supply. The main unit measures 44W x 18H x 50Dcm, weighs 36kg and contains no controls or displays other than the primary power switch. It may be mounted remotely, saving space on the operating table. The power transformer is packed separately from the rest of the amplifier for shipment as this makes transportation much easier with each package weighing around 19kg. The transformer is easily bolted in place, with plug-in leads and has a carrying handle to manoeuvre it into position.

The amplifier uses a pair of GU74B / 4CX800A tetrodes in a configuration similar to the 1000 amplifier with broadband resistive grid drive, cathode negative feedback



Acom 2000A remote control unit.

and a Pi-L output tuning network which will match into antenna VSWRs up to 3:1 (2:1 on 160m). The output network tune and load capacitors and bandswitch are stepper motor driven from the auto-tuning control circuitry. As with the 1000, the amplifier is switched from the transceiver via a 'ground to transmit' line and a 'ground when ready' feedback line to the transceiver is also provided. A vacuum antenna relay is used with fast T/R switching and sequencing to enable effective QSK operation. The power supply arrangement is similar to the 1000 but up-rated for the higher powers involved.

A key feature of the 2000A is auto-tuning. The whole frequency range of the amplifier is split into 250 segments ranging in width from 25kHz on 160m and increasing with frequency up to 300kHz on 10m. Associated with each frequency segment are 10 non-volatile memories storing the tuning settings for up to 10 antennas. In operation, the frequency of the incoming drive is sensed and the appropriate tuning settings recalled from the relevant segment memory. It only requires a single Morse dot or speech syllable to achieve this. The amplifier is provided with a default set of factory programmed tuning settings which are applicable if the antenna VSWR is less than 1.5:1. User tuning settings may be optionally stored, particularly where the antenna VSWR is higher than 1.5. Unlike the Alpha 87A, the Acom 2000A determines the correct tuning condition automatically at the push of a button. The amplifier responds very quickly to frequency changes. Segment changes within a band take just 0.2s, band changes 1s and a full retune 3s maximum.

To make full use of the multiple antenna capability of the 2000A, Acom also supplies a 10-way remote antenna switch (2000SW) and automatic antenna selector (2000S). These interface to the 2000A to provide fully-protected automatic antenna switching from the amplifier, the selector or from a PC. Control software is also available which supports the FT-1000MP as a driver.

The remote control unit contains two peak-hold bargraph LED displays permanently monitoring the forward and reflected RF power levels. The control system is very extensive indeed, and structured around a number of menus and sub-menus in conjunction with an LCD panel. Some 20 of the amplifier's operating parameters may be monitored including all the valve electrode voltages and currents. There are menus to assist in the tuning, servicing, trouble-shooting and help routines with many commented displays. The power-on message can be tailored, eg to your callsign, run time in hours can be monitored, the use can be locked by a PIN code and much more. The amplifier is fitted with an RS-232 interface for PC control and monitoring of data and fault conditions. Extensive protection is built-in: the amplifier is virtually indestructible. All protection as listed for the 1000 amplifier is included and more. Some 55 separate fault messages may be reported on the control unit and these can even be sent as RTTY code over the phone line for diagnosis at a service centre.

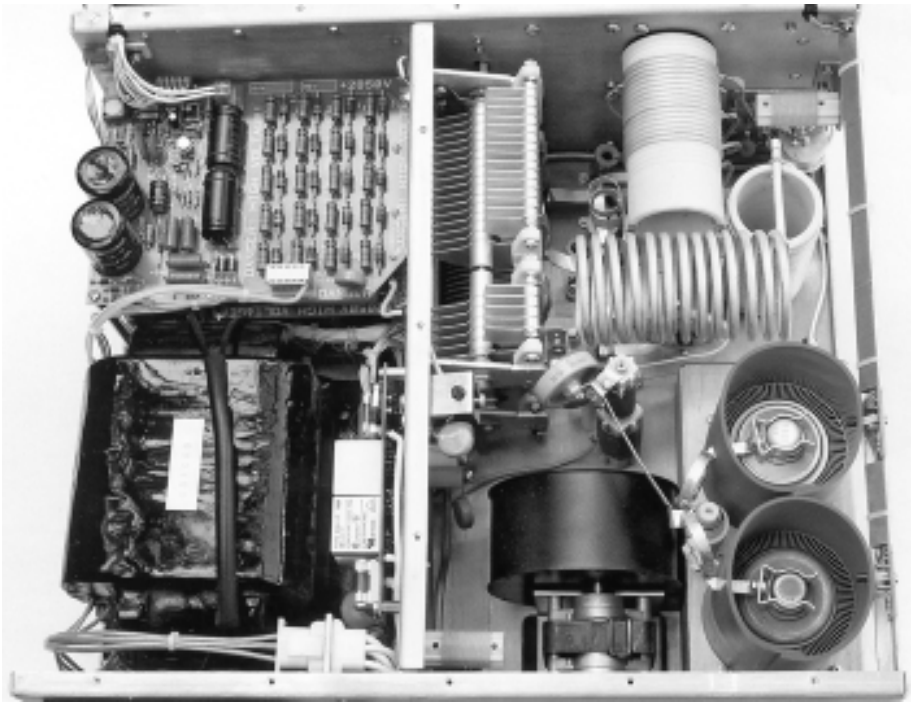
Construction of the amplifier is very similar to the 1000; it is beautifully constructed and engineered. The blower mounting and cooling airflow is also similar and, as with the 1000, an auxiliary fan should be used with continuous-carrier modes for transmissions longer than 15 minutes.

Measurements on the amplifier showed that, dependent on frequency, 1.5kW output could be achieved with 51 - 60W drive and 1kW with about 40W drive. The bargraph power meter was very accurate. The harmonic rejection was better than 52dB at low frequencies rising to 75dB on 24MHz and 28MHz. The input VSWR was 1.2:1 over the frequency range. Two-tone distortion levels measured -34dB worst case for 3rd order products at 1.5kW PEP output and -54dB for 5th order, improving by about 4dB at 1kW output. An excellent overall performance.

". . . the amplifier is . . . beautifully constructed and engineered"

Following switch-on, the initial self test is carried out and an audio confirmation sends 'TEST' in CW. Then commences the 2.5-minute countdown for the valves to reach operating temperature, following which an audio confirmation sends 'R' when ready to use. Then generally there is nothing else to do; the amplifier follows the exciter and delivers the power with just a brief whirring from the tuning motors when the frequency is changed. The fan is fairly quiet but noisier than that of the 1000 amplifier. The amplifier follows well in QSK operation but the relays are really quite noisy. They would benefit from the same mounting method as adopted in the 1000. A 34-page operating manual accompanies the amplifier and is well written and informative. Circuit schematics and full technical data are contained in a separate technical supplement.

The Acom 2000A amplifier is really in a class of its own and at £3695 this is an excellent price for what must be the ultimate linear.



Internal view of the Acom 2000A, showing PSU and RF sections.

CONCLUSIONS

THE TWO ACOM linears reviewed can both be highly recommended as offering excellent performance and quality at a very attractive price. The UK importer, Vine Antenna Products, offers two-year warranty support for both amplifiers and the power valves.

I would like to thank Vine Antenna Products for the loan of both amplifiers. ♦

Acom: www.hfpower.com
Vine: www.csma-netlink.co.uk/users/vine

Whatever Next

STEVE WHITE, G3ZVW
31 Amberley Road, London N13 4BH.
e-mail: steve.white@rsgb.org.uk

IN ITSELF there is nothing new about radio paging, but an innovative system is now being marketed by the American company J-tech. It consists of a 27MHz transmitter, which is intended to be located at a restaurant's front desk, and pagers that are handed out to customers who cannot be seated the moment they arrive. The pagers are designed as drinks coasters, the intention obviously being that they proceed to the bar! Alternatively, if you are one of those who don't want to place a pre-dinner drink on their pager, it can be slipped into the pocket or bag.

When a table becomes available, the head waiter pages the customer, whose drinks coaster proceeds to vibrate, flash, and announce that they should return to the reception desk.

But what happens if someone leaves the restaurant with a pager before being called? In fact these pagers have an out-of-range alarm that causes them to alert the holder, should they not receive a page within a certain time limit (and they don't feature an on-off switch!)

BREAKER PLUG

THERE WAS A time, not that long ago, when appliances were sold in Britain without a mains plug. I'm sure many of us remember recovering a plug from a disused item of equipment or grudgingly having to purchase a plug separately, strip back the insulation, trim the wires, and then fit it. The fact that many people had difficulty with this and made a messy job of it, or got their wires crossed, must have been taken into account when the law was changed to make the fitting of a mains plug compulsory on new appliances.

In Britain that means a fused square-pin plug on your new TV, fridge, etc. But not all countries traditionally use mains plugs with fuses, the USA being a case in point. However, a recent visit there demonstrated that some appliances (notably, hair driers) are now being sold with mains plugs that incorporate a miniature circuit breaker (see photo above).

You can get a circuit breaker in a rocker switch, you can get a circuit breaker in the style of an automotive blade fuse, and now you can get a circuit breaker in a power plug... so long as you use 110V mains.

Whatever Next? Perhaps we will start to see circuit breaker plugs replacing fused plugs fitted to appliances sold in Britain.

EARLY FEEDBACK

JANUARY'S FEATURE on the MFJ-616 brought forth a letter from Alan Smith, GM4IOB. As a result of service in WWII, Alan's hearing "fell over a cliff" above 1kHz. Failing to find any proprietary solution to the problem, Alan purchased two Mono Graphic Equalisers from Maplin Electronics (code VE44X). Connecting them in series and wiring them to boost the higher frequencies by 20dB and cut those below 1kHz by 20dB, Alan describes the result as "a significant improvement of intelligibility over incomprehension".

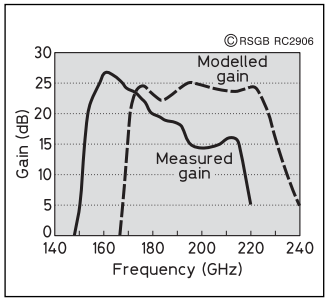


Fig 1: Modelled and measured gain response for a six stage co-planar LNA MMIC. (Source: *Electronic Times*)

HOW HIGH?

CLIVE OUSBEY, G0CHO, brought to my attention news of development taking place in California on microwave devices. As reported in *Electronic Times*, "Already transceivers and imagers are being developed in the 50 to 120GHz band, and researchers at TRW Semiconductors are looking at devices with gate lengths below 1µm to handle the next stage, the G-band, which runs from 140 to 220GHz."

The team has developed a high electron mobility transistor (HEMT) for the first ever G-band amplifier. This is aimed at a new generation of applications, mainly telecommunications and radio astronomy, but also military and radar. This monolithic microwave IC (MMIC) has a cut-off frequency of over 300GHz! Combining the amplifiers into three-stage single-ended, two-stage balanced, and then six-stage single ended (see **Fig 1**) configurations, ultimately enabled the designers to produce an amplifier with a 20dB average gain over the range 160 to 215GHz.

The desire to move to ever higher frequencies is obvious... it permits equipment to be made smaller, it offers the opportunity for higher bandwidth, and beam widths for radar and remote sensing applications can be made smaller.

In due course these devices, and those that follow them, may be of use to amateur radio microwave enthusiasts, as we have 'primary' allocations at 142 - 144GHz and 248 - 250GHz.

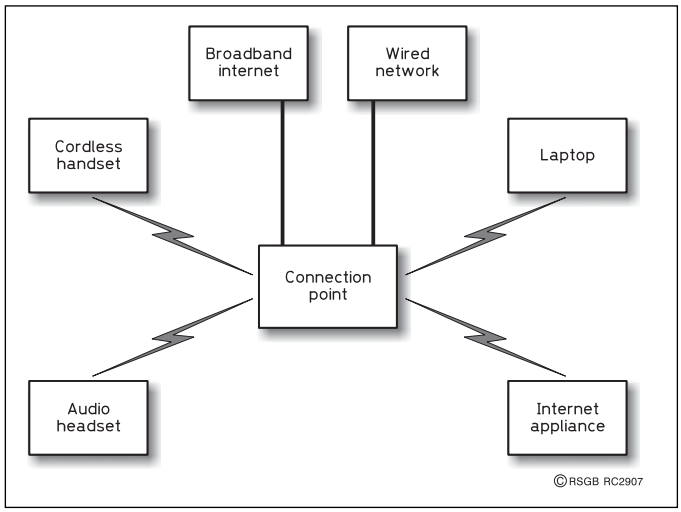


Fig 2: Typical HomeRF network topology.

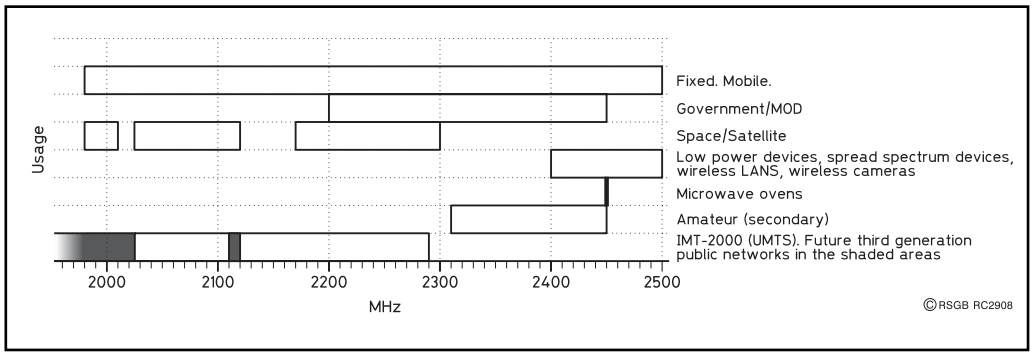


Fig 3: An overview of the allocation of the frequency spectrum between 1.98 and 2.5GHz.

A RIVAL FOR BLUETOOTH

HOME AUTOMATION using wireless devices is set to become big business before too long, and to this end Bluetooth has already been mentioned in *RadCom*. However, this wireless world of the future has a rival in the shape of 'HomeRF'.

Operating in the 2.4GHz ISM band, HomeRF's Shared Wireless Access Protocol (SWAP) is designed to carry voice and data traffic over a short range (quoted in the main system parameters as a typical home and its garden), and to interconnect with the Public Switched Telephone Network (PSTN) and the Internet. The SWAP protocol was derived from existing cordless telephone (Digital Enhanced Cordless Telephone - or 'DECT') and wireless LAN technology, to produce a new class of home cordless services.

Just one of the wireless video cameras available from Maplin. There are four frequencies that these cameras are permitted to operate on, namely 2400, 2427, 2455 and 2482MHz. The range of such systems is often quoted as about 100m for an unobstructed path, but Maplin also stock Yagi antennas to increase this, plus of course a range of suitable receivers.

It supports both Time Division Multiple Access (TDMA) service, to provide delivery of interactive voice and time-critical services, and Carrier Sense Multiple Access / Collision Avoidance (CDMA/CD) service, for the delivery of high-speed packet data.

In a managed network, as shown in **Fig 2** on page 31, it works using a Connection Point which interfaces physically to a broadband Internet connection and the PSTN. The wireless devices that connect via it occupy bandwidth dependant on the data rate they require.

For example, a telephone will occupy a 1MHz-wide 'base channel' and a fast Internet connection will occupy a 5MHz-wide 'superchannel'. The band across which it works is 75MHz wide and the transmission power is 100mW. (An overview of the allocation of the frequency spectrum between 1.98 and 2.5GHz is shown in **Fig 3**.)

However, HomeRF can also work without a Connection Point, an example of this being when data-only devices are to be connected. In this instance, control of the network is distributed between the stations.

HomeRF networks support up to 127 nodes, which can be a mixture of four basic types:

- Connection Point (supports voice and data services)
- Voice Terminal (uses TDMA to communicate with a Connection Point)
- Data Node (uses CSMA/CA to communicate with a Connection Point and other data nodes)
- Voice and Data Node (can use both types of service).

I do not propose to discuss the networking specification in detail, but HomeRF integrates into the standard OSI 7-layer model using modified layers 1 and 2.

Being an adaptive, spread-spectrum system that frequency-hops 50 times per second, HomeRF learns to avoid QRM, so if it gets persistent interference from, say, a microwave cooker, it stays away from that frequency for a while.

MADE FOR EACH OTHER?

THE NEW ICOM IC-R3 is a wideband triple-conversion superhet receiver with a difference, incorporating as it does a 2in TFT colour LCD screen. This screen serves two purposes.

Firstly, it is used as an operating status display. Rather than use a conventional, monochrome LCD display (it's got one of those as well), the IC-R3 uses a 2in TFT display to show the frequency, S-meter reading, tuning step information, memory channel number, a bandscope, etc. There are some nice touches to this display, one example of which is that you can configure it to display how the signal strength of the station you are receiving is changing with time . . . very useful if you are waving an antenna about on a DF hunt!

Icom's new IC-R3 receiver. No longer is a radio just a radio, now it's a TV as well. Could this point the way to similar models from other manufacturers?

Secondly though it doubles as a television, so now you can watch:

- broadcast TV (all VHF and UHF channels)
- amateur TV (70cm, 23cm, and 13cm)
- the video from a wireless camera (see Fig 2 again!)

The IC-R3 also features a video output connector, so you can plug it into a larger TV or a video recorder.

Mentioning wireless cameras leads me conveniently on to the range of wireless cameras now available from Maplin. One of these, a colour camera and transmitter that is smaller than a PP3 battery (and runs from one for several hours) weighs just 18g - truly James Bond technology. ♦

FURTHER INFORMATION

Restaurant pager:	www.jtech.com
HomeRF:	www.homerf.org
Frequency allocations:	www.radio.gov.uk
Maplin wireless camera:	www.maplin.co.uk
Icom IC-R3:	www.icomamerica.com

If there is an item of new technology you would like to know more about - or one that you know about and think ought to be mentioned here - drop a line to the author, or e-mail him at the address at the start of the feature.

Newcomers' News

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

AFTER COMPILING this column for a little over a year now I am quite used to seeing my name in print but I have to confess that seeing some of my Novice students in the local paper was a bit of shock, albeit a nice one! The picture has been reproduced here with the kind permission of *The Bath Chronicle*.

For a number of years now Mike Coombs, G3VTO, and I have been running radio classes in Bath sponsored by the Radio Society of Great Britain (RSGB) Bristol Group. This year Graham Thomas, Head of Design and Technology at Beechen Cliff School in Bath, offered to host the classes in return for a donation from the RSGB Group. This took the shape of a bandsaw for the school's woodwork class.

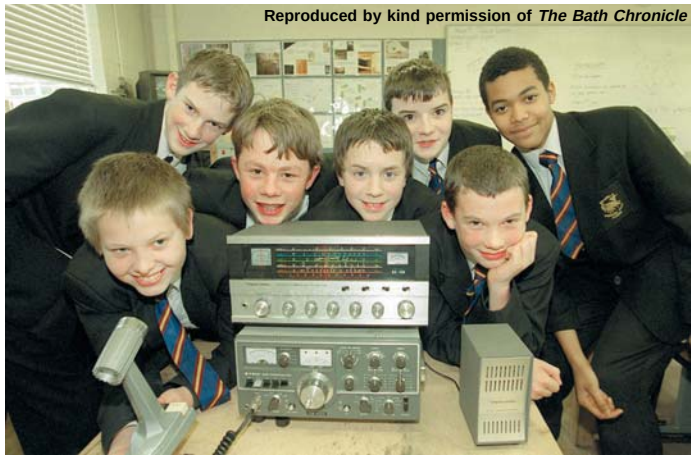
The classes are quite hectic and Mike and I have been most grateful for the assistance given by husband and wife team David, G1KFC, and Dawn, 2E1HVA.

It was great to see amateur radio getting some good press in the local paper. Hopefully they will soon be able to report on another school station being established.

AN OLDER NEWCOMER

NOT ALL NEWCOMERS are still at school as George Davis, G3ICO, is quick to point out. George explained that one of his students, Peter Batchelder, 2E0NPB, learned Morse code during his time in the RAF in the 1950s but waited until last year before taking the plunge with amateur radio!

A 12 words per minute Morse test at the Yeovil QRP (low power) Convention was no problem to Peter but he found the Radio Amateurs' Examination (RAE) classes run by Rob, G3MYM, more of a struggle. Rob suggested that Peter might be better going for the Novice RAE and following a course of one-to-one instruction with George on Wednesday afternoons. Peter sat the exam at Bridgwater College accompanied by 20 curious welders (City & Guilds covers a wide range of exams, you know).



Reproduced by kind permission of *The Bath Chronicle*

Some of the boys from the NRAE classes at Beechen Cliff School in Bath.

The hard work paid off and Peter obtained his Novice callsign in June last year. Within the first three months he had over 250 contacts with more than 50 countries in his logbook. Despite this success Eric, G3GC, the Yeovil Club's Morse instructor, told Peter, "You haven't arrived until New Zealand has been worked". Peter was able to phone Eric in October to say he had arrived! Peter managed to work ZL4SEA on 10MHz with just 10 watts into his dipole antenna. Welcome to amateur radio, Peter!

George and Eric should be equally proud of Peter's achievements, newcomers need all the help and encouragement they can get, keep up the good work guys.

I intend to be at this year's QRP convention on 22 April at the Digby Hall in Sherborne, Dorset. If any readers are there too, please come and say hello.

TED'S TRAVELS

TAKING ADVANTAGE of a privilege ticket and an offer to transport a consignment of radio equipment for free, Ted Alleyne, 5Z4NU, flew from Kenya to London on Kenya Airways in November. After a brief family visit he took the train from Bristol to Harrogate to be warmly greeted by Richard Horton, G3XWH, who put him up for the night.

At the Harrogate Ladies' College Ted was presented with a whole shack full of gear for the Kenyan Novices. Unfortunately, several other kind donations could not be taken up due to weight restrictions on the 'free carriage' offer. It is hoped that further consignments can be arranged in the near future but this first collection of equipment for Starehe is most encouraging and will set them up very well on both HF and VHF. We look forward to hearing from the boys.

GOING LOOPY?

ROBERT SNARY, G4OBE, sent me details of the course he ran at Tolmers Scout Camp. Nineteen candidates took the Novice RAE at the RSGB satellite exam centre following the course which was run over three weekends with another day for extra revision questions etc.

One of the nineteen, Simon Smith, wrote to say that he is planning ahead and is looking to take the Morse test in the not-too-distant future. He is aiming to get a Class A licence so can talk to his father who lives on a boat off Majorca (lucky for some) but, living in a flat, he has been pondering on the choice of HF antennas. Planning permission to fit an antenna to the side of the flats has been declined so Simon has been wondering what sort of results he could expect from a small magnetic loop?

I have had little dealings with such loops but I know that David Berry, G4DDW, in Lutterworth has been using one for some time and, having lost his main antennas in a storm late last year, the loop is now his only antenna. The copper loop is mounted inside an old chicken coop and enables daily contacts to Scandinavia to be maintained. There is some excellent information on magnetic loops on the Internet (see www.alphalink.com.au/~parkerp/nonline.htm#NNCol for example) and in Peter Dodd's book *Backyard Antennas* which is available from the RSGB. Any further information for newcomers from loop users would be most welcome. ♦

The NRAE candidates at the Tolmers Scout Camp photographed by instructor Robert Snary (see Going Loopy?)

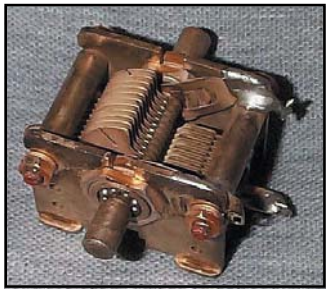
* *5 Sydenham Buildings, Lower Bristol Road, Bath, BA2 3BS.*

Down To Earth

An Introduction to Variable Tuned Circuits

by Stewart Revell, EngTechIIE TMIIE, G3PMJ *

OF FUNDAMENTAL importance to our leisure time either listening or transmitting, is the humble tuned circuit at resonance. Our very existence as radio amateurs, the whole of the RSGB, the vast systems of world-wide radio communications, are totally dependent on the fact that when an inductor and a capacitor have equal and opposite reactances at a certain frequency, that circuit exhibits a phenomenon called *resonance*.



A variable capacitor. The capacitance is changed by varying the area of overlap between the fixed vanes and the rotating vanes.

A capacitor and inductor when used together are called a *tuned circuit.* A fixed value of inductance (L) and a fixed value of capacitance (C) will produce a fixed *resonant frequency*. For obvious reasons, this is called a fixed-tuned circuit. However, there are many cases where we need to make our resonant frequency variable, so that it can be made to 'tune' over a band of frequencies.

This can be achieved in three ways - change the value of C, change the value of L, or both. Although it is possible to change the value of an inductance, it is not as easy as using a variable capacitor, particularly when you are new to the business of circuit construction. The rest of this article will show you how to derive the value of inductance to use with a given variable capacitor, knowing the frequency band you want to cover.

It necessarily involves a little mathematics, but you can ignore the mathematical description and download a spreadsheet from the RSGB Members-Only web site which will do all the hard work for you.

THE MATHS

IT IS RELATIVELY easy to calculate the frequency of resonance given the values of capacitance and inductance of a tuned circuit from the well known formula which you will find in most radio textbooks:

$$f = \frac{1}{2\pi\sqrt{LC}},$$

where π is a constant (3.141…), L is the inductance (in henrys) and C the capacitance (in farads).

From this fundamental formula we can see that the frequency is obviously dependent, in quite a complex way, on L and C, a fact which was mentioned earlier.

Things become more involved when we try to bring in our *variable* capacitor *and* the range of frequencies over which we want to tune. Changing two variables in an equation at the same time is not recommended practice!

First of all, let us make the equation simpler by combining all the constants into one number and, at the same time, make the units of f megahertz, L microhenrys and C picofarads, as these will be the units we use 'on the bench'. Doing this, the equation becomes:

$$f = \frac{159.2}{\sqrt{LC}}.$$

Things are still confused by the square root sign, which we can remove by squaring both sides of the equation, as follows:

$$f^2 = \frac{159.2^2}{\left(\sqrt{LC}\right)^2} = \frac{25330.3}{LC}.$$

We are almost in a position to use our equation specifically for our problem; the only thing left to do is to rearrange it to make LC the subject (ie put LC on the left-hand side). This simply involves swapping over the f^2 and the LC, thus:

$$LC = \frac{25330.3}{f^2}.$$

This gives the LC product for any frequency, f. How this is used to design a tuned circuit is shown in the two examples on the opposite page.

Bear in mind that the calculations can be used with a varactor diode as the tuning element, using the upper and lower limits of its capacitance in the formulae.

A program performing the necessary calculations has been designed by Harry Lythall, SM0VPO/G4VVJ and this is available (with other radio-type calculations) at a small cost. Contact Harry by e-mail to sm0vpo@home.se or the author for details. ♦

Typical small inductors.

*11 Mere Fold, Little Hutton, Worsley, Manchester M28 0SX. E-mail: stewart@revell62.freeserve.co.uk

TWO PRACTICAL EXAMPLES

EXAMPLE 1: A VFO is required to cover 5.0MHz to 5.5MHz using a high-quality variable capacitor of 50pF.

METHOD

We shall make the assumption (which will be discussed later) that at its extremities of motion the capacitor has values of zero and 50pF. First, calculate the *LC* values at each end of the band. At the low-frequency end, we use f = 5.0MHz and at the high-frequency end, f = 5.5MHz. In this case we obtain the following:

$$LC_{(LF)} = \frac{25330.3}{5.0^2} = 1013.2\,, \qquad (1)$$

and

$$LC_{(HF)} = \frac{25330.3}{5.5^2} = 837.6\,. \qquad (2)$$

To give a slight extra margin at each end of the band to be tuned, it is best to round off the figures in the opposite directions; for the LF figure use *LC* =1014, and for the HF figure use *LC* = 837.

As the capacitor is turned from being fully meshed (the *highest* value of *C*, giving the *lowest* frequency), to being fully open (the *lowest* value of *C*, giving the *highest* frequency), the value of *LC* swings from 1014 to 837, a range of 177.

This range of 177 must be produced by our chosen capacitor, which has a 'swing' of 50pF, so we can divide the *LC* range by the swing in order to derive the value of *L* to use in our circuit, thus:

$$L = \frac{LC}{C} = \frac{177}{50} = 3.5\mu\text{H}\,. \qquad (3)$$

At this point, we must think very clearly. Having derived the correct value of inductance, we must examine the two frequency limits and work out the values of capacitance corresponding to these frequencies, which we shall call C_{LF} and C_{HF}.

$$C_{LF} = \frac{LC_{(LF)}}{L} = \frac{1014}{3.5} = 286\text{pF}\,, \qquad (4)$$

and

$$C_{HF} = \frac{LC_{(HF)}}{L} = \frac{837}{3.5} = 236\text{pF}\,. \qquad (5)$$

It can be seen from this that the 'swing' of capacitance is 50pF, which is what we want, but the *actual* values of calculated capacitance are somewhat larger than this.

If you now recall some of the RAE and NRAE theory, you will know that when capacitors are connected *in parallel*, their values *add*. Look at **Fig 1**. This shows the circuit of the components necessary to implement our example. For the moment, ignore C_{stray}.

You will see immediately that there are *two* capacitors in the circuit: C_{tune} and C_{pad}. C_{tune} is our 50pF variable. We can infer the value of C_{pad} from the last equation. The minimum calculated capacitance is 236pF, and this occurs when C_{tune} is zero (see the first sentence of 'Method'). This makes C_{pad} = 236pF. When C_{tune} is fully meshed, its value is 50pF, which adds to the 236pF of C_{pad}, producing 286pF, the calculated value of C_{LF}, as shown above.

When fully open, most capacitors have a residual capacitance of around 5pF. To account for this, subtract 5pF from the 'swing' used in equation (3). This will then produce slightly different values for L, C_{LF}, C_{HF} and C_{pad}, but the frequency swing will be unaltered! The next example will include this.

EXAMPLE 2: The front end of a short-wave radio is required to tune from 12 to 16MHz using a 30pF variable capacitor.

METHOD

As before, we first need to calculate the LC values at each end of the frequency range:

$$LC_{(LF)} = \frac{25330.3}{12^2} = 175.9\,, \quad \text{and} \quad LC_{(HF)} = \frac{25330.3}{16^2} = 98.9\,.$$

To give working margins, we round the two results in opposite directions, thus giving $LC_{(LF)}$ = 176 and $LC_{(HF)}$ = 98.

The range, or 'swing' of *LC* is the difference of these two numbers, 78.

This range of *LC* must be produced by our 30pF capacitor. Most variable capacitors have a residual capacitance of 5pF. This means that, although the maximum capacitance (with the vanes fully meshed) is 30pF, its minimum value is not zero, but 5pF. This gives rise to the figure of 25pF for the 'swing' of the capacitor, which will now be used.

To calculate the inductance for our circuit, the *LC* swing must be divided by the *C* swing, as follows:

$$L = \frac{LC}{C} = \frac{78}{25} = 3.1\mu\text{H}\,.$$

We now need to derive the values of capacitance needed to produce our stated frequency limits using the value of *L* we have just found:

$$C_{LF} = \frac{LC_{(LF)}}{L} = \frac{176}{3.1} = 56\text{pF}, \quad \text{and} \quad C_{HF} = \frac{LC_{(HF)}}{L} = \frac{98}{3.1} = 31\text{pF}.$$

As before, you can see that the swing in capacitance is 25pF, but that an extra capacitor (pad) of 31pF is needed in parallel with the variable, in order to bring the minimum capacitance up to 31pF.

Try as you may, it is never possible to eliminate the effects of 'stray' capacitance. This is capacitance due to the mutual proximity of circuit elements, and can never be accurately predicted.

Unfortunately, you cannot go to a shop or component supplier and ask for a 31pF capacitor; instead, a fixed capacitor plus a very small variable capacitor (called a *trimmer*) are used to make up C_{pad}. Not only can the correct value be set by varying the trimmer, but it will also enable the effects of the strays (unique to *your* construction) to be compensated.

In this particular case, a fixed capacitor of 25pF would be used with a trimmer of 20pF. The setting of the trimmer would be accomplished by using a Dip Meter. Measure the resonant frequency at the upper band edge (with C_{tune} fully un-meshed) and vary the trimmer until the frequency reaches the wanted value of 16MHz. Then confirm with the meter that the LF limit (with C_{tune} fully meshed) is 12MHz.

Not only have you designed a tuned circuit to cover a specific frequency range, but you have calibrated it in practice and have shown that it works to specification!

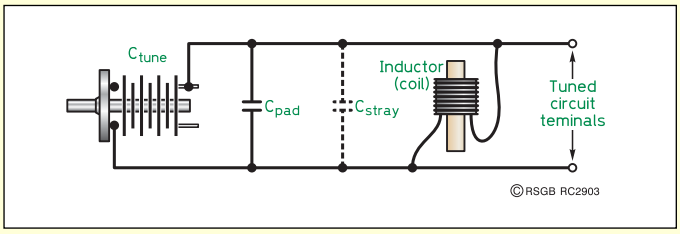


Fig 1: Diagram of the elements of a variable tuned circuit.

Down To Earth

The Voices

Part Nine, by Gordon L Adams, G3LEQ *

THE SO-CALLED 'Numbers Stations' heard on the short-wave bands have always fascinated listeners. Last month, in Part Eight of 'The Voices', I detailed various UK-based semi-covert radio operations. This month I continue with my investigations, but take a look at comparable activities taking place beyond our shores.

The USA has a similar kind of intelligence structure to our own, but employs 10 times as many people, and has a proportionately larger budget and range of communications equipment. However, the work-load is split up in a like manner to our own.

FRIENDS IN THE SOUTH

THE NATIONAL Security Agency (NSA) at Fort Meade, in the State of Maryland, looks after the interception of electronic signals (SIGINT) - as does our own GCHQ in Cheltenham. Their activities are best summed up as electronic monitoring and decoding of international communications, although – believe it or not – there are still some locations dedicated to such basic systems as HF Morse code transmissions. On the other hand, they also have the capability of examining tens of thousands of telephone conversations at a time for such interesting words as "Semtex".

Human counter-intelligence (HUMINT) is largely the responsibility of the Federal Bureau of Investigation (FBI), whilst the UK has its equivalent MI5. External intelligence gathering, or pro-active under-cover work, is the responsibility of the Central Intelligence Agency (CIA) in Langley, Virginia. They have four sites in Virginia. One looks rather like a small college campus and is to be found to the south-west of Warrenton at the intersection of routes 744 and 802. Another is located north-west of Warrenton on route 690, and is designated as the HQ of the Warrenton Training Centre. It has two microwave towers. The third, known as 'Brandy', is a transmitting site, and is a few miles to the south-east of Remington at the intersection of routes 654 and 651. It has various HF antenna systems, including log periodic Yagis, and is the source of many 'Numbers' transmissions. Another site with fewer HF antennas, but including several large radomes, is the associated receiving facility about 10 miles east of Culpeper at the meeting of routes 672 and 669.

The UK parallel to the CIA is the Secret Intelligence Service (SIS) or MI6. With the missile attack reported only recently, most people know that its HQ is at Vauxhall Cross on the South Bank of the River Thames. Somewhat less well-known is their weapons training unit at Fort Monkton near Gosport. Since the collapse of Russian and Eastern European communism heralded the end of the Cold War around 1989, US and UK intelligence interests have become more focused on commercial intelligence, or COMMINT, although this acronym can also mean just communications intelligence. Since the 1970s the radio communications effort has increasingly been using higher and higher frequencies, as a result of new technologies being introduced, and the continuing development of earth satellites handling wide-band data.

NAUGHTY THOUGHTS

WHAT MOST short wave listeners monitoring 'Numbers Stations' have not realised is that the facility responsible for processing messages received from agents does not have to be at the other end of an HF link. For the last 30 years or so it has been possible to receive large chunks of the RF spectrum at given locations throughout the world using wide-band receivers. A portion of spectrum, such as 2 - 30MHz, can then be transported easily via a microwave earth satellite link – back to, say, Cheltenham – where data or voice messages can be examined conveniently and securely. During the process short burst messages can also be received from agents and transported back for analysis. Indeed, an agent in Moscow equipped with a microwave burst transmitter, can now feed data into the American embassy building without the need to visit 'dead letterboxes' or to meet up with his controller. A burst of no more than 2.5 seconds can carry a considerable amount of data, and runs little chance of the source being located. It is not even necessary to use conventional RF.

More recently some people have identified gaps in the carrier frequencies being used by cable TV operators via their fibre optics. It is thus possible to bounce discreet signals through 'wired' systems without alerting the operating company. It is also, by the same technique, possible to 'bug' a person's home remotely. Just what is your satellite box telling 'them' when you hear it make a mysterious click in the middle of the night?

On 23 August 2000 the United Kingdom's Department of Trade and Industry issued Notices of Variation to all classes of amateur radio licence holders stating that unattended operation is not to be permitted in future within a 50 kilometre radius of Harrogate, Lincoln, Cheltenham, Bude and Scarborough.

It would hardly be remarkable if you were to notice some large microwave dishes at these locations, and even more surprising if you did not suspect a link with our Composite Signals Organisation or GCHQ. Nearby amateur radio stations operating on various frequencies might clobber a wideband IF! What has gone through some naughty minds is that if they could catch the propagation just right for a CQ call to Singapore on 14MHz, they might be able to confirm that their signal is making the journey there by tuning in to a returning microwave link.

NON-ATTRIBUTABLE CALLSIGNS

THE CALLSIGNS employed by 'Numbers Stations' are deliberately chosen so that the country of origin may not be determined by listeners who have not been 'indoctrinated'. Generally speaking, single-letter callsigns are employed by the Russian Federation, and in particular the Russian Navy. These single letters are used as channel markers, and listeners who are patient will sometimes hear the signal break into voice, RTTY or data traffic. The locations of the most common markers have been identified as 'C' = Moscow, 'F' = Vladivostok, 'L' = St Petersburg, 'P' = Kaliningrad, 'R' = Ustinov, 'S' = Arkhangelsk, 'V' = Tashkent. The letter 'U' has been used in the past for messages to jammer station controllers. Apart from the naval involvement, some of the markers appear to 'respond' with short bursts of data, and the assumption is that Moscow Centre (SVR) is acknowledging data received from agents using other frequencies. In 1991 the KGB was sub-divided into the FSB or Domestic Security Service, and the SVR - Sluzhba Vneshnie Razvedaki - which is the Russian Foreign Intelligence Service. Currently, Russian President Vladimir Putin is threatening to re-instate the old KGB or Soviet Ministry of State Security. Whatever happens their radio activities will continue.

It would seem that the marker stations may be multi-purpose. Two-character callsigns were reserved by the Soviets primarily for jamming stations (see Part

Markus Wolf, the former head of the GDR's foreign intelligence service.

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

Signboard outside the CIA's Warrenton training centre in Virginia.

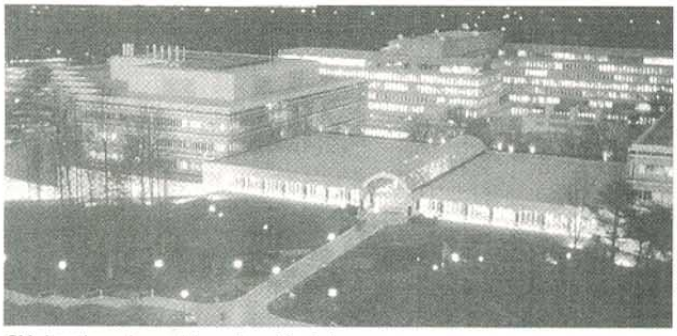
Three of 'The Voices'). Three and four-character non-attributable callsigns are used by many countries, and mostly they try to make them a little different from official ITU callsigns. Nevertheless, a UK amateur contest callsign such as M3Y could easily be mistaken as a spy's identification! Callsigns CP17 and L9CC, which are frequently heard in the amateur 40-metre band around 7039 and 7088kHz, are more likely to be Soviet Military Intelligence (GRU) or SVR stations linking Moscow with Groznyy. They are therefore unlikely to acknowledge calls or send QSL cards!

VALE?

NOW THAT THE Cold War is over, is it farewell to the 'Numbers Stations'? Certainly the greatest spy chief of them all is no longer running any agents. Markus Wolf, or 'Mischa' to his friends, spent 34 years as head of the foreign intelligence service in the Ministry of State Security of the German Democratic Republic. Their Main Intelligence Directorate was known as the HVA (Hauptverwaltung Aufklarung). It was probably the most efficient of all the intelligence services involved in the European Cold War. His HQ was on Normannenstrasse in the Lichtenberg district of East Berlin. It was from here that a vast quantity of coded numbers messages went out to his agents operating in the West. Perhaps the richest pickings could be heard late in the evening in the Fixed and Maritime Services assignment between 3155kHz and 3400kHz. However, most numbers stations throughout the world pick their own frequencies without reference to the International Telecommunications Union or its International Frequency Registration Board.

A few were listed, like the West German callsigns DFD21 and DFC27 (or "Day Eff Say Sieben und Zwanzig" as it was spoken in synthesised German). It was heard regularly during the 1980s on 4010kHz, just above the 75-metre broadcast band. Also registered is the somewhat unusual American State Department station KKN50, which can be heard sending Morse code in numerous Fixed Service short-wave bands. However, once the 1950s had passed it became impractical to train agents in Morse code, and messages were sent to them in five or four-figure coded groups using synthesised voices on AM, SSB and even SSB with reduced carrier. Very often a female voice is employed, as it is considered that the slightly higher pitch can be resolved better. The five-figure code groups are usually spoken in sub-groups of three and two to avoid figure confusion arising, which often occurs when more than four figures are dictated at a time.

More recently additional power output has been achieved by using double sideband with reduced carrier, which is resolved particularly well on short-wave receivers with synchronous AM. Equipped with a Sony SW-55 for reception and a miniature disguised pocket burst transmitter for feeding data back to one's controller; the last of the Cold War agents was a very different character from the WWII spies, or even the 'stay-behind' operatives of the Vietnam era.



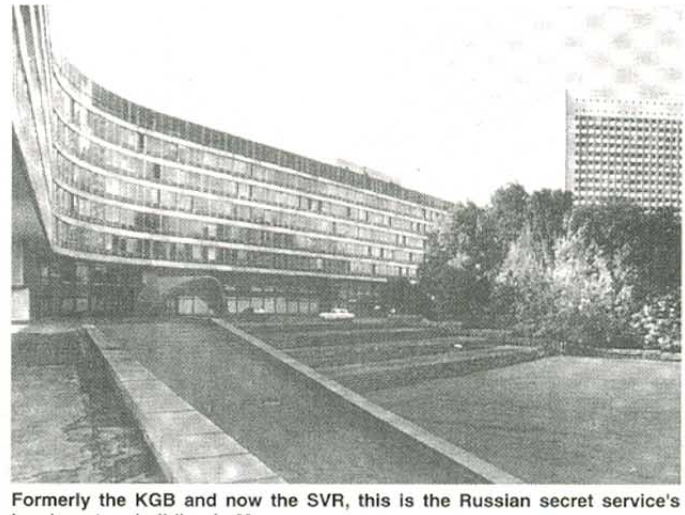
CIA headquarters at Langley, Virginia.

BE SEEING YOU!

OF COURSE, the leaders of totalitarian states fear radio communications. Countries such as North Vietnam, China, Russia and Eastern Germany (GDR) have at certain times employed wired radio distribution systems for this reason. When the allies occupied Berlin at the end of WWII, communications with the people in West Berlin were first established via the telephone network using a broadcast system called DIAS *(Drahtfunk in Americanischen Sektor)*. Towards the end of 1946 the Americans installed their own radio transmitters there, and RIAS came on the air (see 'The Voices' Part One in June 2000 *RadCom*).

Some readers may remember the ITC television series, broadcast in 1967, called *The Prisoner*. This starred Patrick McGoohan as the prisoner, who was dumped by British Intelligence in some strange village. A suggestion was made that it might be located in Lithuania, and jointly operated by Russian intelligence. He was subjected to broadcasting by wired loudspeakers, and thus never had a radio set to find out where he was. The somewhat Italianate architectural style of the film location, Clough Williams-Ellis's North Wales village of Portmeirion, might have suggested another site for the village where the Prisoner found himself. Patrick McGoohan has stated more than once that *The Prisoner* was based upon fact. Well, during the last war a covert SOE operation, called the Inter Services Research Bureau (ISRB) was set up in Baker Street, London, part of Marks & Spencers' headquarters. Norwegian agents were trained by British Intelligence, but a few of the radio operatives appeared to be of dubious allegiance. The ISRB therefore deposited them, and others, in a remote country house called Inverlair at Spean Bridge on the A86 / A82 road to Fort William in the Scottish Highlands. They were accommodated here until the end of the war. It just so happens that George Markstein, the script editor for *The Prisoner*, was a journalist and reporter on intelligence matters during the war, and he wrote about an ISRB village of just this kind. In reality, SIS was engaged in training and inserting agents into the Baltic States throughout the war and during the Russian occupation, right up until 1952. They were spirited into Latvia and Lithuania by fast motorboat from neutral Sweden. The idea was to destabilise the Russian administration there, but the Russians had a mole within MI6. Some of the radio operators kept their radio schedules with the British Poundon and Gawcott stations (see Part Eight of 'The Voices'), but it soon became evident that they had become subject to Russian control. Some of these brave men had been trained at Fort Monkton near Gosport.

Next month Gordon Adams will return to the subject of Radio Free Europe, Radio Liberty and other broadcasting 'Voices', so - as The Prisoner *would say when taking his leave of others in 'The Village' – "Be seeing you!"* ♦



Formerly the KGB and now the SVR, this is the Russian secret service's headquarters building in Moscow.

W.H Westlake

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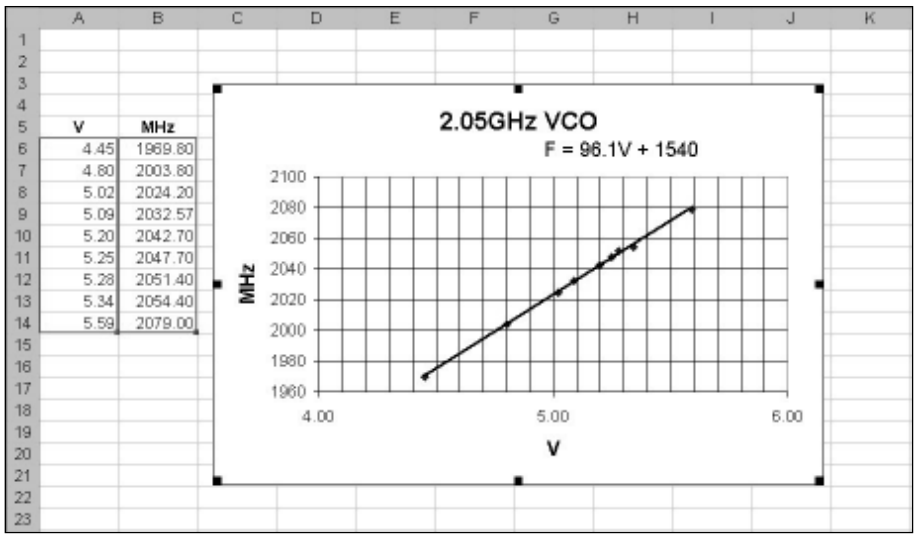

V	MHz
4.45	1969.80
4.80	2003.80
5.02	2024.20
5.09	2032.57
5.20	2042.70
5.25	2047.70
5.28	2051.40
5.34	2054.40
5.59	2079.00

Fig 2: Example of paperless graph-plotting using Microsoft® *Excel* or similar spreadsheet.

DON'T BUY GRAPH PAPER

WHERE CAN I BUY log-log, log-linear or polar graph paper, or Smith chart paper?

THERE'S NO NEED to buy graph paper any more! A gem from the web is *GraphPap*, a Windows program developed by a hospital biologist in France, which will print almost any kind of graph paper - including many other options you've probably never heard of. Philippe Marquis is very responsive to requests for additional styles, so along with music paper and shooting targets, *GraphPap* will print many useful electronic items such as Smith charts, polar diagram paper, stripboard layout paper and graduated dials. **Fig 1** gives a few examples - and remember that all of these are user-configurable. A preview window helps you to configure the size, scales and colours of every printout to look just the way you want, and you can save these as your own personal designs. Pages can also be imported into other Windows applications via the clipboard, and then you can draw your graphs over the original image.

The program is downloadable in about 750KB - follow the link from the 'In Practice' web page. *GraphPap* is shareware which can be registered via a secure web server, and a software key is necessary to remove a copyright notice overprinted on every page. Unfortunately the totally free version which carries an advert is not available at present; they're looking for a sponsor.

For many situations where we'd traditionally use graph paper, we often don't need to do that any more. A more modern approach to graph plotting is to use a spreadsheet program such as Microsoft *Excel* or one of its many competitors. If you type in your values as a table, the spreadsheet will plot the graph for you. Spreadsheet graphs are generally not as configurable as *GraphPap*, but very adequate for most uses. For example, when testing a voltage-controlled oscillator (VCO) recently, I needed to plot the frequency versus tuning voltage in order to check the linearity and work out the frequency sensitivity in MHz/V. All it needed was to type in the DVM and frequency counter readings as a table in *Excel*, and then work my way through the 'Chart Wizard' to plot out the table as a graph. There it is in **Fig 2** - each pair of voltage-frequency numbers is a point on the graph. Obviously the points fall pretty close to a straight line, so a few clicks made *Excel* draw the best straight line through them all. Choosing the option to display the equation on the chart, Excel calculates the frequency sensitivity of the VCO as 96.1MHz/V.

A more advanced type of paperless graph-plotting was used for the complex mixed-sine-wave diagrams for 'In Practice', November 2000. This was an example of a kind of thought-experiment, where you can simulate the effects of adding or multiplying two waveforms with a mathematical certainty that you can't achieve with hardware. Although the plotting of mathematical functions is more the province of specialist programs such as *MathCAD*, you can do it in *Excel* by generating a huge table of 1000 points or more. Fortunately you only need to type the first two rows to get the table started, and then you can generate all the other rows automatically by dragging with the mouse (it's explained in the *Excel* Help file). When you then plot the 1000-point graph, choose the formatting option for a continuous smoothed line with no data point markers, and there's your plotted function. Crude, but effective.

These examples show how graph-plotting by spreadsheet can be a very useful

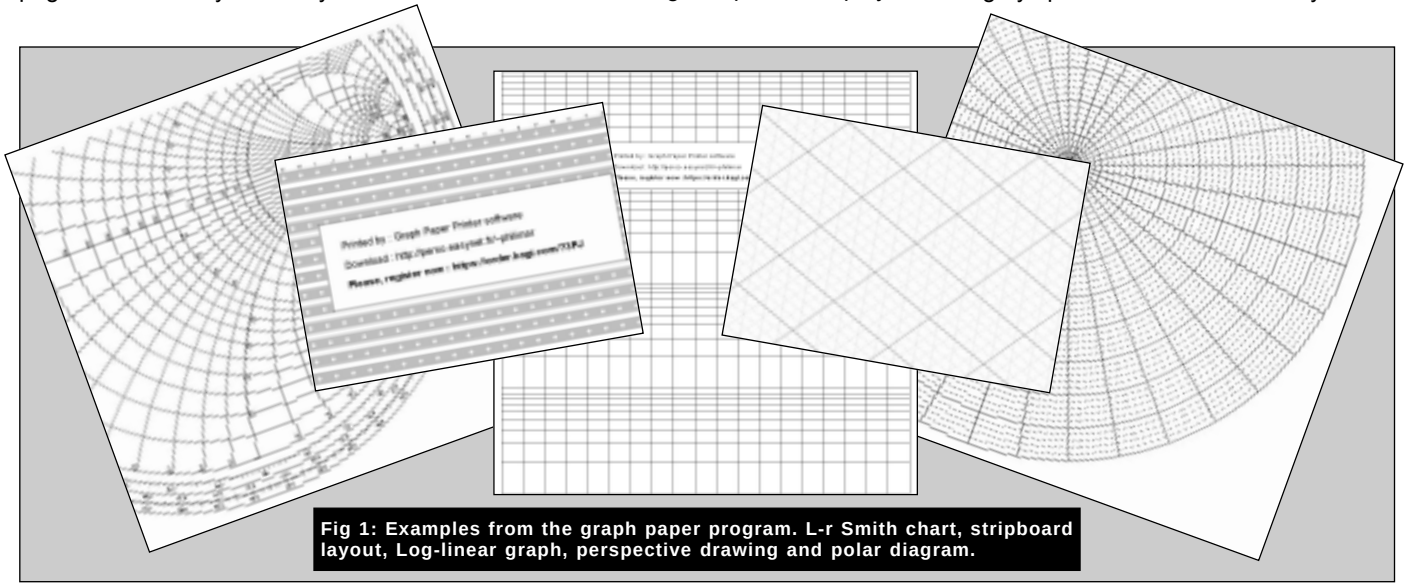

Fig 1: Examples from the graph paper program. L-r Smith chart, stripboard layout, Log-linear graph, perspective drawing and polar diagram.

tool for the practical experimenter. Try it - you'll like it.

MORE DISTRIBUTORS

FOLLOWING ON from 'In Practice', September 2000:

THE PREVIOUS ITEM dealt mainly with buying from the 'Big Three' component distributors: Electromail/RS, Farnell and Maplin. This time it's the turn of selected smaller component dealers and other specialist firms who may not be familiar because they don't advertise in *RadCom* (but perhaps they should). Many are recommended by 'write-in votes' from readers. This is by no means a complete list - I have concentrated mostly on dealers who stock a broad general line of components or have some other specialist strengths. I've also added some useful dealers in tools and workshop equipment.

For help with preparing orders and buying in a businesslike way, see the September 2000 column. Some of the information I gave there about minimum orders, postage etc was already out-of-date by the time it got into print, so I'm not going to attempt that again! Check with the individual companies when you ask for a catalogue, and again when you order. The web and e-mail contact information below is also on the 'In Practice' website, in the form of direct hyperlinks or mailto: links.

Axminster Tools, Chard Street, Axminster EX13 5DZ. Tel: 0800 371 822 (sales), 01297 33656 (enquiries). Fax: 01297 35242. Web: www.axminster.co.uk E-mail: email@ axminster.co.uk Power and hand tools, mostly woodworking but some metalworking.

BEC Distribution, 12 Elder Way, Langley Business Park, Slough SL3 6EP. Tel: 01753 549 502. Fax: 01753 543 812. Web: www.bec.co.uk E-mail: sales@ bec.co.uk Formerly Bonex, and now the main UK importer for TOKO products. Their full TOKO catalogue is on the web site, and BEC also stock a general range of components.

Cirkit, formerly the main source of TOKO products for amateurs, no longer accepts retail orders.

Electrovalue, Unit 5, Beta Way, Thorpe Industrial park, Egham TW20 8RE. Tel: 01784 433 604. Fax: 01784 433 605. Web: www.electrovalue.co.uk E-mail: sales@ electrovalue.co.uk General range of components, and a good UK source for Siemens/Infineon ferrite products and RF semiconductors mentioned in Continental magazines.

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Mainline Electronics, PO Box 235, Leicester LE2 9SH. Tel: 0116 277 7648. Fax 0116 247 7551. General range of components with a bias towards RF/microwaves, and also some surplus.

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THROUGH-HOLE RF BYPASSING

IN RESPONSE TO the January item about RF bypassing on SMD boards:

CHRIS BARTRAM, G4DGU (the original 'Mr muTek'), passes on the interesting option of bypassing using very small SMD ceramic capacitors mounted directly through a drilled hole, and soldered top and bottom (**Fig 3**). Like the other techniques shown in January, you don't find this in commercial equipment because it is not very suitable for automated production, but it looks excellent for amateur one-offs.

The ideal capacitor size for 1.6mm boards is 0603, meaning 0.06 x 0.03in or 1.6 x 0.8mm, because the end metallisation of the chip capacitor is flush with both sides of the board. This requires a hole of about 1.1mm diameter, preferably drilled somewhat under-size and opened up to 0.9mm square with a hard steel broach. (A broach is a tapered tool for opening round pilot holes to a very accurate size. When precision engineers aren't looking, a square broach can also be used for opening-out small square holes in soft materials - if it doesn't snap first.)

If you carefully avoid removing any copper from around the hole on either side, you can easily solder the capacitors with literally zero lead lengths. Clearly this technique can be repeated in several places around a patch of component-side copper to create an area which is bypassed for RF but not grounded for DC. On most practical SMD boards you would use this technique along with other RF grounding and bypassing options, as explained in the January column. ♦

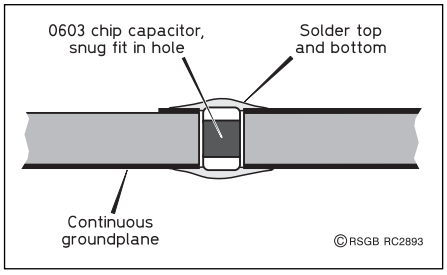

Fig 3: RF bypassing by 0603-size chip capacitors mounted directly through a hole in double-sided 1.6mm PC board.

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

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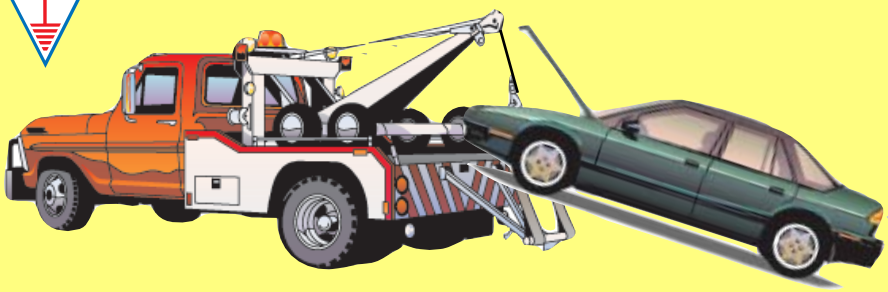

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	Scheme 1	Scheme 2
Insured Items		
Radio and ancillary equipment, masts, antennas and rotators, home computers and peripherals	*	*
All mobile and portable radio equipment	*	only in the home
Location of Insured Items		
In the home or 'radio shack'	*	*
Mobile and Portable cover Worldwide	*	
At or in transit to and from:		
a) rallies, field days, Club meetings	*	*
b) manufacturers or dealers for repair	*	*
On holiday in a building or caravan	*	*
Unattended vehicles	*	
'Get You Home' Cover (subject to satisfactory proof of purchase)		
Cover up to £2.000 immediately on purchase of any additional equipment	*	*
Breakdown Cover		
A limited form of breakdown cover is provided for radio receivers, transceivers and scanners up to 5 years old - a copy of the policy terms and conditions is available on request. **NB this is not a substitute for an extended warranty insurance**	*	*

PREMIUM TABLES

SCHEME I			SCHEME 2		
SUM INSURED		YEARLY PREMIUM	SUM INSURED		YEARLY PREMIUM
From	To		From	To	
£l	£1,000	£30	£l	£2,000	£22
£1,001	£2,750	£44	£2,001	£3,000	£28
£2,751	£3,500	£50	£3,001	£4,000	£33
£3,501	£5,000	£60	£4,001	£5,000	£39
£5,001	£6,500	£72	£5,001	£6,000	£44

Note: £6 for each extra £1,000 and Insurance Tax @ 5% is extra

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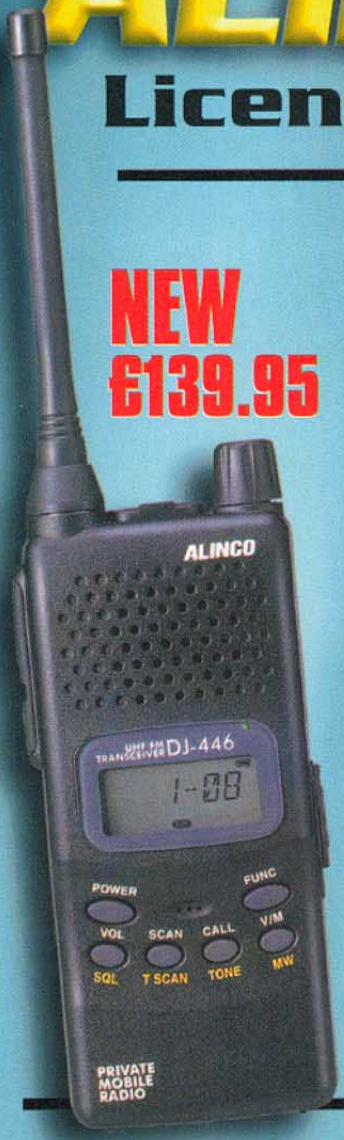

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The Alinco DJ-446 heavy duty handheld radio is packed with features that make it the ideal choice for business, professional and reliable leisure use. High quality design and construction ensure the best possible performance and reliability. Outstanding audio clarity and receiver specifications ensure maximum range. The DJ-446 is factory programmed with all 8 PMR 446 channels. Each channel has 39 CTCSS tones giving an effective 312 usable channel modes.

- 8 frequencies
- 312 channel modes
- 30 memory channels
- Battery level indicator
- Switchable hi-low power
- CTCSS on/off (39 tones per frequency)
- Channel monitor
- Private call channel
- Time out timer
- Bell function
- Memory scan
- Channel scan
- Auto power off
- Power save mode
- Optional desk top quick charger
- Thin type NiMH battery (700mAH, 9.6V)
- Channel finder feature

Ideal for

- Business • Personal • Leisure
- No call charges - no Licence fee
- Japanese high quality construction and design gives maximum possible range with outstanding audio clarity

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- 312 channel modes
- 20 memory channels
- 500mW output power
- Battery level indicator
- Switchable hi-low power
- CTCSS on/off (39 tones per frequency)
- Channel monitor
- Private call channel
- Time out timer
- Bell function
- Memory scan
- Channel scan
- Power save mode
- Weight 190g
- Channel finder feature

Optional extras

- Desk charger • £29.95
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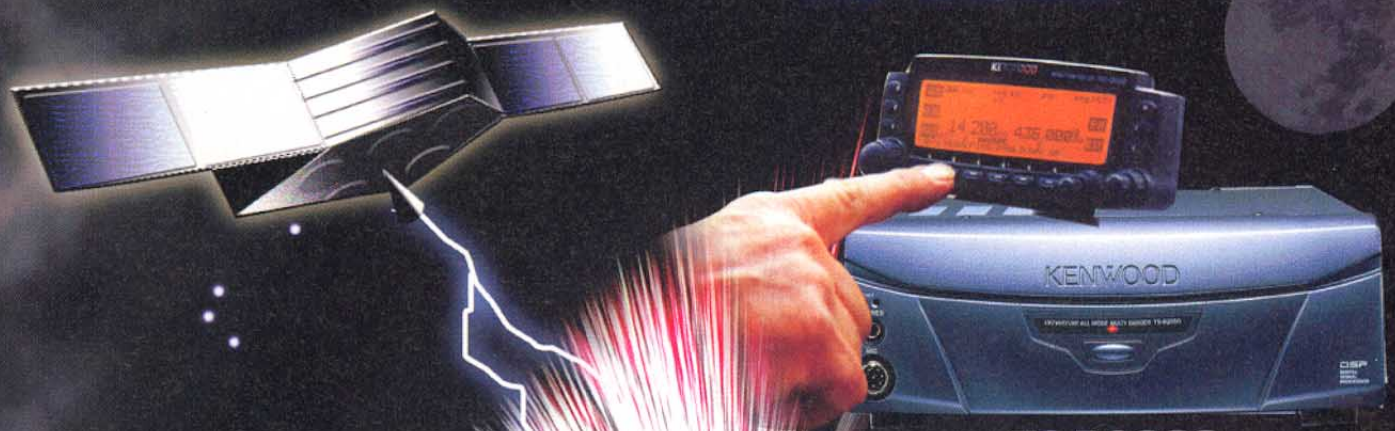
KENWOOD TS-2000



TS-B2000

Breathtaking is the word to describe the TS-2000 specification. Whether you operate, SSB, CW, Data modes, FM or AM, and whether you are an HF operator or VHF/UHF enthusiast, you'll find the TS-2000's performance and flexibility unrivalled. This all-band, all-mode transceiver takes the "station-in-a-box" concept to a new high level whilst offering exceptional value for money. What is more, you will never need to buy another filter; the TS-2000 has its own built-in digital filters. You can easily change the shape and bandwidth to suit mode, preference or band conditions. Add to this the DSP audio filtering that offers Beat cancel, CW auto-tune, Noise reduction and transmit audio shaping, and you have one very serious radio. But there's more. Satellite users have 10 dedicated memories and manual control for Doppler shift. And with the optional UT-20 you can monitor any band and any mode, whilst also monitoring VHF or UHF FM/AM signals - even on the same band. For example, you can keep an ear open on the local repeater or call channel whilst hunting the DX. You can even monitor the VHF DX cluster (using the built-in AX-25 TNC) whilst working HF DX, display the information on the screen and ask the transceiver to automatically QSY to the DX frequency. But to really appreciate all the features the TS-2000 has to offer, you'll need the 10-page colour brochure, available from Waters and Stanton by simply phoning 01702 204965.

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- Electronic keyer system
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- Weight 7.8kg

TS-2000

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UK Amateur Radio Band Plans

CD1900-1

1.8MHz (160m)

Licence Notes: 1.810 - 1.850MHz, Primary. Remainder secondary. *Available on the basis of non-interference to other services (inside or outside the UK)*
Power limit:1.810 - 1.850MHz: 26dBW PEP. Remainder 15dBW
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
1.810					
CW only					
1.838					
Digimodes (and CW but excluding AX25 packet)					*RTTY (Baudot) is the preferred digital mode on this band* *Phone may be used above 1.840*
1.842					
Phone (and CW)	✓			✓	*1.843 QRP* *[1.950 - 2.000 Novice]* *1.960 DF contest beacons (14dBW) 12.5kHz b/w max* *1.970 Provisional Novice calling freq*
2.000					

Note: AX25 packet should not be used on the 1.8MHz band.

CD1901-1

3.5MHz (80m)

Licence Notes: Primary. *Shared with other services.*
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
3.500					
CW only					*3.500 - 3.510 Priority for CW inter-continental working* *3.500 - 3.560 CW contest preferred segment* *3.560 QRP* *[3.550 - 3.580 Novice]*
3.580					
Digimodes (and CW)	✓				*[3.580 - 3.620 Novice]* *3.590 - 3.600 AX25 packet frequencies* *(Phone may be used and has priority above 3.600MHz)*
3.620					
Phone (and CW)					*[3.620 - 3.650 Novice]* *3.600 - 3.650 Phone contest preferred segment* *3.690 QRP* *3.700 - 3.800 Phone contest preferred segment* *3.730 - 3.740 SSTV/fax recommended* *3.775 - 3.800 Reserved for inter-continental phone working*
3.800					

CD1902-1

7MHz (40m)

Licence Notes: Amateur and Amateur Satellite Services: Primary.
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
7.000					
CW only					*7.030 QRP*
7.035					
Digimodes (and CW, SSTV, Fax, but excluding AX25 packet)					*(Phone may be used above 7.040)*
7.045					
Phone (and CW)					
7.100					

Note: AX25 packet should not be used on the 7MHz band.

CD1903-1

10MHz (30m)

Licence Notes: Amateur Service: Secondary.
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
10.100					
CW only	✓				*10.106 QRP* *[10.110 - 10.140 Novice]*
10.140					
Digimodes (and CW, but excluding AX25 packet)					*(Unattended digimode stations should avoid the use of the 10MHz band)*
10.150					

Notes:
1. AX25 packet should not be used on the 10MHz band.
2. The 10MHz bandplan is allocated to the Amateur Service only on a secondary basis. Therefore, IARU has agreed on a worldwide basis that only CW and digimodes, being narrow bandwidth modes, are to be used on this band. Likewise, the band is not to be used for contests and bulletins.

CD1904-1

14MHz (20m)

Licence Notes: Amateur Service: Primary.
Amateur Satellite Service: 14.000 - 14.250MHz Primary
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
14.000					
CW only					*14.000 - 14.060 CW only contest preferred segment* *14.060 QRP*
14.070					
Digimodes (and CW)					*No digimode mailbox or forwarding* *14.089 - 14.099 AX25 packet preferred frequencies*
14.099					
Beacons only					*14.099 - 14.101 Reserved exclusively for beacons*
14.101					
Digimodes (+ phone & CW)					*Digimode mailbox and forwarding* *14.101 - 14.112 AX25 packet preferred frequencies*
14.112					
Phone (and CW)					*14.125 - 14.300 SSB only contest preferred segment* *14.230 SSTV/fax calling frequency* *14.285 QRP*
14.350					

CD1905-1

18MHz (17m)

Licence Notes: Amateur and Amateur Satellite Services: Primary.
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
18.068					
CW only					
18.100					
Digimodes (and CW)					
18.109					
Beacons only					*18.109 - 18.111 Exclusively beacons*
18.111					
Phone (and CW)					
18.168					

CD1906-1

21MHz (15m)

Licence Notes: Amateur and Amateur Satellite Services: Primary.
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
21.000					
CW only					*21.060 QRP* *[21.050 - 21.080 Novice]*
21.080					
Digimodes (and CW)					*21.100 - 21.120 AX25 packet preferred* *[21.080 - 21.149 Novice]*
21.120	✓				
CW only					
21.149					
Beacons only					*21.149 - 21.151 Beacons exclusive*
21.151					
Phone (and CW)					*21.285 QRP* *21.340 SSTV/fax calling frequency*
21.450					

CD1907-1

24MHz (12m)

Licence Notes: Amateur and Amateur Satellite Services: Primary.
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
24.890					
CW only					
24.920					
Digimodes (and CW)					
24.929					
Beacons only					*24.929 - 24.931 Beacons exclusive*
24.931					
Phone (and CW)					
24.990					

CD1908-1

28MHz (10m)

Licence Notes: Amateur and Amateur Satellite Services: Primary.
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV
Unattended beacons: Only for DF contests 14dBWPEP max (not within 50km of NGR SK985640 Waddington)

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
28.000					
CW only					
28.050					*[28.050 - 28.190 Novice]*
Digimodes (and CW)	✓				*28.060 QRP* *28.120 - 28.150 AX25packet preferred*
28.150					
CW only					*28.190 - 28.199 Regional time shared International Beacon Project - Exclusive*
28.199					
Beacons only					*28.199 - 28.201 Worldwide time shared International Beacon Project - Exclusive*
28.201					*28.201 - 28.255 Continuous duty International Beacon Project - Exclusive*
Phone (and CW)	✓			✓	*[28.225 - 28.500 Novice]* *28.360 QRP* *28.680 SSTV/fax calling frequency*
29.200					
AX25 packet (+ phone and CW)					
29.300					
Satellite downlinks					*29.300 - 29.500 Reserved exlusively for satellite downlinks*
29.550					
Phone (and CW)					*Some experimental FM repeaters may be established in IARU Region 1*
29.700					

Unattended (U/A) Operation

Frequencies on which unattended (U/A) operation is permitted by full licensees are shown in these band plans. Novice licensees can also operate their stations unattended but the frequencies and powers are different – please see the Novice licence for the details. Remember that unattended operation requires the prior consent of the local Radio Investigation Service before operation can begin, to enable close down arrangements to be made.

Unattended beacons are limited to 14dBW ERP max. Do not confuse this type of unattended beacon operation with the normal beacon sections of the bands (these are fully site cleared, have special licences and are co-ordinated on an international basis.

Unattended low power remote control is limited to –20dBW ERP and should not radiate outside the boundary of the premises from which you are operating.

Unattended digital operation is limited to 10dBW on the 50MHz band and 14dBW on the other bands where it is permitted.

Notes on the HF Band Plans

1. The word 'phone' includes all permitted forms of telephony.
2. If transmitting very close to a band edge, take care not to radiate outside of the band.
3. Before transmitting, all operators should check that the frequency is not already occupied. The normal advice is to use the question "Is this frequency in use?" on SSB or "QRL?" using Morse.
4. Digimodes are defined as including AmTOR, PacTOR, Clover, ASCII, RTTY (Baudot), PSK31 and AX25 packet.
5. LSB is recommended on bands below 10MHz, and USB on bands above 7MHz.
6. The Region 1 IARU HF band plans are designed to enable the best utilisation of the HF spectrum space available. They achieve this objective because the vast majority of licensed amateurs observe the voluntary recommendations. In some countries (eg the USA), licence regulations require that specific modes be confined to specific sections of each band.
7. The frequencies 14.230, 21.230 and 28.680MHz should be used as calling frequencies for SSTV and fax operators. After having established contact, they should move to another free frequency within the telephony section of the band.

Novice Licence: powers and modes

The power levels shown in these band plans are for the full UK licences. Novice licensees are limited to 12dBW input or 10dBW RF output. Furthermore, the Novice licence schedule makes some restrictions on the modes which are permitted *within* the bands shown in these pages as being available to Novices. Please refer to the Amateur Radio Novice Licence and its schedule for full details.

UK Amateur Radio Band Plans

CD1909-1

50MHz (6m)

Licence Notes: Amateur Service: 50.0 - 51.0MHz Primary, 51.0 - 52.0MHz Secondary. *Available on the basis of non-interference to other services (inside or outside the UK).*
Power limit: 50.0 - 51.0MHz 26dBW PEP, 51.0 - 52.0MHz 20dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
50.000					
CW only					*50.020 - 50.080* Beacons *50.090* CW calling frequency
50.100					
SSB and CW only			✓		*50.100 - 50.130* DX window - Note 1 *50.110* International calling - Note 2 *50.150* SSB Centre of Activity *50.185* Cross-band activity centre *50.200* MS Reference frequency (CW & SSB)
50.500					
All modes	✓				*50.500 - 50.700* Digital communications *50.510* SSTV *50.550* Fax *50.600* RTTY *50.710 - 50-910* FM repeater outputs
51.000					
All modes					*51.210* Emergency comms, priority *51.210 - 51.410* FM repeater inputs
51.410					
All modes					*51.430 - 51.590* FM telephony - Note 3 *51.510* FM calling *51.530* Note 4
51.830					
All modes					*51.940 - 52.000* Emergency comms priority
52.000					

Notes:
1. Only to be used for QSOs between stations in different continents.
2. No QSOs on this frequency. Always QSY when working intercontinental DX.
3. 20kHz channel spacing. Channel centre frequencies start at 51.430MHz.
4. Used by GB2RS news and for slow Morse transmissions.
5. 50.385MHz ± 0.005 designated for PSK31 use in the UK.

CD1910-1

70MHz (4m)

Licence Notes: Amateur Service: Secondary. *Available on the basis of non-interference to other services (inside or outside theUK).*
Power limit: 22dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
70.000					
Beacons					*70.030* Personal beacons
70.030					
SSB and CW only					*70.150* Meteor scatter calling *70.185* Cross-band activity centre *70.200* SSB/CW calling
70.250					
All modes					*70.260* AM/FM calling
70.300					
Channelised operation using 12.5kHz channels		✓		✓	*70.3000* RTTY/fax calling/working *70.3125* Digital modes *70.3250* Digital modes *70.3375* Digital modes *70.3500* Emergency comms priority *70.3625* Digital modes *70.3750* Emergency comms priority *70.3875* Digital modes *70.4000* Emergency comms priority *70.4125* Digital modes *70.4250* FM simplex - used by GB2RS *70.4375* Digital modes *70.4500* FM calling *70.4625* Digital modes *70.4875* Digital modes
70.500					

Notes:
1. 70.085MHz ± 0.005 designated for PSK31 use in the UK.

CD1911-1

144MHz (2m)

Licence Notes: Amateur Service: Primary.
Amateur Satellite Service: Primary
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV
Unattended beacons: Only for DF contests.

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
144.000					
EME (SSB/CW)					*144.000 - 144.035* Moonbounce (only)
144.035					
CW only					*144.050* CW calling frequency *144.100* MS CW ref frequency (Note 1) *144.140 - 144.150* CW FAI/EME working
144.150					
SSB and CW only					*144.150 - 144.160* SSB FAI/EME working *144.175* Microwave talk-back (UK) *144.195 - 144.205* SSB random MS *144.250* GB2RS and slow Morse *144.260* Emergency comms priority *144.300* SSB calling frequency *144.390 - 144.400* SSB random MS
144.400					
Beacons					
144.490					
Guard band					
144.500					
All modes non-channelised					*144.500* SSTV calling frequency *144.525* ATV talkback (SSB) *144.600* RTTY calling frequency *144.600±* RTTY working (FSK) *144.625 - 144.675* Emergency comms priority *144.700* Fax calling frequency *144.750* ATV calling+talk-back *144.775 - 144.800* Emergency comms priority
144.800					
Digital modes					*144.800 - 144.990* Digital Modes (incuding unattended)
144.990					
Guard band	✓		✓	✓	
145.000					
FM Repeater Inputs					*145.000* RV48 *145.025* RV50 *145.050* RV52 *145.075* RV54 *145.100* RV56 *145.125* RV58 *145.150* RV60 *145.175* RV62
145.200					
FM Simplex Channels					*145.200* V16 Emergency comms priority *145.225* V18 Emergency comms priority *145.250* V20 Used for slow Morse transmissions *145.275* V22 *145.300* V24 RTTY AFSK *145.325* V26 *145.350* V28 *145.375* V30 *145.400* V32 *145.425* V34 *145.450* V36 *145.475* V38 *145.500* V40 FM calling channel *145.525* V42 Used for GB2RS *145.550* V44 Recommended channel for rally and exhibition talk-in *145.575* V46
145.600					
FM Repeater Outputs (Note 2)					*145.600* RV48 *145.625* RV50 *145.650* RV52 *145.675* RV54 *145.700* RV56 *145.725* RV58 *145.750* RV60 *145.775* RV62
145.800					
Satellites					
146.000					

Notes:
1. Meteor scatter operation can take place up to 26kHz higher than the reference frequency.
2. 144.085MHz ± 0.005 designated for PSK31 use in the UK.

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- 100W
- All mode
- DSP

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***ML&S £1395** or NOTHING to pay for 6 months INTEREST FREE or 36 x £60.56*

IC-706Gmk II

- HF/6/2/70
- Mobile - 13.8V
- 100/100/50/20
- All mode
- DSP
- Remote Head

RRP £1299
***ML&S £1099** or NOTHING to pay for 6 months INTEREST FREE or 36 x £47.71*

IC-910H NEW

- 2/70/23x
- Base - 13.8V
- 100/75/10
- All mode
- DSP

RRP £1399
***ML&S £1349** or NOTHING to pay for 6 months INTEREST FREE or 36 x £58.56*
Optional 23 module available

- HF/6/2/70/23x
- Base 13.8V
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- All Mode
- DSP

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- 100W
- All Mode
- DSP

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RRP £1999
***ML&S £1399**, or NOTHING to pay for 6 months INTEREST FREE or 36 x £60.36*

- HF
- Mobile/Base 13.8V
- 100W
- All Mode
- DSP

TS-570DGE

RRP £999
***ML&S £849** or NOTHING to pay for 6 months INTEREST FREE or 36 x £36.86*

- 2/70
- Mobile - 13.8V
- FM + APRS + Packet
- Remote Head

TM-D700E

RRP £539
***ML&S £439** or NOTHING to pay for 6 months INTEREST FREE or 36 x £19.05*

- 2/70
- Handie
- FM +APRS + Packet
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RRP £309.95
***ML&S £269** or NOTHING to pay for 6 months INTEREST FREE or 36 x £11.67*

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National Ham Radio Show - Bletchley Park 7/8th April.

No doubt you will have read the excellent news of the RSGB's National Ham Show at the famous Bletchley Park. Spread over a two-day period, this new important event will become the main attraction together with Donington Park (Leicester Show) in the Ham calendar. Admission is only £2.50 (under14's FREE) and offers trade stands from Yaesu, Icom and Kenwood, together with all the important small traders that we all like to see. Come and support this important event run by your national society.
See **http://www.rsgb.org/bletchley** for further details.

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The most advanced antenna analysers

MFJ-259 £229.95 carr. £6.00
MFJ-269 £299.95

Connect it to your antenna and get all the information you need to optimise it for best performance including resonance, VSWR and impedance. Totally portable (using AA cells), you can work right up by the antenna. The MFJ-259 is the basic design covering 1.8 - 170MHz. The MFJ-269 has extended coverage up to 470MHz and gives an extremely wide range of measurements, even indicating where a break is in a coax cable.

MFJ-989C ATU OUR PRICE £329.95

3kW 1.8 - 30MHz "T" Match carr. £7.50

This standard "T" match design has a roller coaster coil for critical adjustment and a 4:1 balun to match balanced line. No matter what your antenna, this will give you a perfect match. Ideal for coax, end fed wires and open wire feeder. Features PEP or RMS power measurement (200 or 2kW max), VSWR, antenna switch, bypass, built-in dummy load (time restricted) 12v dial illumination etc. Size 270 x 375 x 115mm.

MFJ-986 ATU OUR PRICE £299.95

3kW Differential 1.8 - 30MHz carr. £7.50

This differential tuning design does away with one control, making it quick to adjust with just the roller coaster and the tune control. Rugged enough to cope with any amateur radio linear, it can be used with coax, end fed wire or balance line. You get PEP/RMS/VSWR metering, antenna switching, bypass etc. One of our most popular models, it measures 278 x 375 x 115mm.

MFJ-962D ATU OUR PRICE £239.95

1.8 - 30MHz 1.5kW "T" Match carr. £7.50

For use with medium linears. Using the famous "T" Match design, this ATU will cope with any antenna whether it be coax, end fed wire or balanced feed. You can monitor your power (average or PEP 200W or 2kW max))and VSWR. Antenna switch selector is included for two antennas. Size 270 x 375 x 115mm.

MFJ-949E ATU OUR PRICE £139.95

1.8 - 30MHz 300W "T" Match ATU carr. £6.00

Our most popular ATU because it covers all HF bands and matches anything from coax to long wire to balanced feed. Take a look at the price and then consider that it even includes a dummy load plus power and VSWR meter. Measuring 260 x 190 x 83mm, it really is great value.

MFJ-948 ATU OUR PRICE £119.95 carr. £6.00

The same as the MFJ-949 above, but without internal dummy load.

MFJ-969 ATU OUR PRICE £169.95

HF + 6m! 300W "T" Match ATU carr. £6.00

Here's the ATU for those who have an HF transceiver with 6m coverage. Now you can even use your HF antenna on 6m! This "T" Match design has a very accurate PEP meter built-in, though you'll need to install a PP3 battery to get optimum results. There's a built-in VSWR cross needle meter, dummy load and lovely roller coaster for critical adjustment. Size 268 x 242 x 95mm.

MFJ-1786 & 1788 Loops.

MFJ-1786 £349.95
MFJ-1788 £389.95
carr. £7.50

Here's the answer to those who have severe space problems. This loop antenna works as well as a full-size dipole but can be fitted in the smallest of situations. Model MFJ-1786 covers 10MHz - 30MHz and model MFJ-1788 covers 22MHz - 7.1MHz. Each one comers with remote tuning box. box. Maximum power is 100W. Loop diameter is 36 ins and can be mounted horizontal or vertical with the kit provided.

Remote tuning box.

MFJ-934 & MFJ-931 Artificial Grounds

OUR PRICE MFJ-934 £139.95
MFJ-931 £79.95 carr. £6.00

Removes RF hot spots and offers a true ground, even when operating upstairs.

If you operate upstairs or well away from an earth, you will know that trying to use an end fed long wire is a problem!

Now MFJ have solved the problem. With the MFJ-931, you just run out a random length of wire and connect it to the transceiver chassis via the MFJ-931. Then adjust as per instructions and you have guaranteed zero RF potential at the chassis and a good antenna earth. Can also be used with an external counterpoise. The MFJ-934 operates exactly the same but also includes a built-in HF ATU for wire, coax and balanced feed. Maximum power is 300W.

MFJ-941E HF 300W Budget ATU

Matches all types of antennas. OUR PRICE £89.95 carr. £6.00

At this price there is no excuse for not having an ATU and offering your transceiver a perfect match. Covering 1.8 - 30MHz, rated at 300W and having built-in VSWR and power meter. it will match wires, coax systems and balanced feed.

MFJ-418 *The easy way to learn CW*

OUR PRICE £69.95

Unlike other tutors, this one sends true text and full length QSOs, just like the real test. The massive database avoids frequent repeats too! Will also send groups and displays the text.

carr. £2.00

MFJ-392 Mono Padded Communications Earphones

OUR PRICE £21.95
carr. £3.00

These are purpose designed communications padded headphones that are ideal for all the modern transceivers and receivers. Suits 3.5mm and 1/4" jacks - adaptor provided.

MFJ-616 Speech Intelligibility Enhancer

Designed to enhance the audio of your transceiver. MFJ President, Martin Jue suffers with deafness and said that this has put the enjoyment back into radio for him!

OUR PRICE £149.95
carr. £6.00

Hear Signals Better

CD1913-1

Licence Notes:
Amateur Service: Secondary.
Amateur Satellite Service: 435 -438MHz Secondary.
Exclusion: 431-432MHz not available within 100km radius of Charing Cross, London.
Power limit: 430-432MHz 16dBW ERP PEP, 432 - 440MHz 26dBW.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV

430MHz (70cm) IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
430.000					
All modes					*430.000 - 430.810 Digital communications (Notes 6,7)* *430.600 - 430.800 Note 5*
430.810					
Low power repeater i/p Note 1					*430.810 - 430.990 Low power repeaters*
431.000					
All modes Note 1					*430.990 - 431.900 Digital communications (Note 6)*
432.000					
CW only					*432.000 - 432.025 Moonbounce* *432.050 CW centre of activity*
432.150					
SSB and CW only					*432.200 SSB centre of activity* *432.350 Microwave talk-back calling frequency (Europe)*
432.500					
All modes non-channelised		✓	✓		*432.500 - 432.600 IARU Region 1 linear transponder outputs* *432.600 - 432.800 IARU Region 1 linear transponder inputs* *432.500 SSTV activity centre* *432.600 RTTY (fsk) activity centre* *432.625 Digital communications* *432.650 Digital communications* *432.675 Digital communications* *432.700 Fax activity centre*
432.800	✓				
Beacons					*432.800 - 432.990 Beacons*
433.000					
FM repeater outputs in UK only Note 1					*433.000 RU240 (RB0)* *433.025 RU242 (RB1)* *433.050 RU244 (RB2)* *433.075 RU246 (RB3)* *433.100 RU248 (RB4)* *433.125 RU250 (RB5)* *433.150 RU252 (RB6)* *433.175 RU254 (RB7)* *433.200 RU256 (RB8)* *433.225 RU258 (RB9)* *433.250 RU260 (RB10)* *433.275 RU262 (RB11)* *433.300 RU264 (RB12)* *433.325 RU266 (RB13)* *433.350 RU268 (RB14)* *433.375 RU270 (RB15)*
433.400					

Notes on the VHF Band Plans

1. The beacon and satellite services must be kept free of normal communication transmissions to prevent interference with these services.
2. The use of the FM mode within the SSB/CW section and CW and SSB in the FM-only sector is not recommended.
3. Repeater stations are primarily intended as an aid for mobile working and they are not intended to be used for DX communication. FM stations wishing to work DX should use the all-modes section, taking care to avoid frequencies allocated for specific purposes.

CD1914-1

430MHz (cont) IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
433.400					
FM simplex channels			✓		*433.400 U272 (SU16)* *433.425 U274 (SU17)* *433.450 U276 (SU18)* *433.475 U278 (SU19)* *433.500 U280 (SU20) FM calling channel* *433.525 U282 (SU21)* *433.550 U284 (SU22) Recommended channel for rally and exhibition talk-in* *433.575 U286 (SU23)* *433.600 U288 (SU24) RTTY afsk* *433.625 Digital communications* *433.650 Digital communications* *433.675 Digital communications* *433.700 Notes 2, 3 and 5* *433.725 Notes 2 and 5* *433.750 Notes 2 and 5* *433.775 Notes 2 and 5* *433.800 - 434.250 Digital communications (Note 8)*
434.600					
FM repeater inputs (in UK only) - note 1; and fast scan television - note 4	✓				*434.600 RU240 (RB0)* *434.625 RU242 (RB1)* *434.650 RU244 (RB2)* *434.675 RU246 (RB3)* *434.700 RU248 (RB4)* *434.725 RU250 (RB5)* *434.750 RU252 (RB6)* *434.775 RU254 (RB7)* *434.800 RU256 (RB8)* *434.825 RU258 (RB9)* *434.850 RU260 (RB10)* *434.875 RU262 (RB11)* *434.900 RU264 (RB12)* *434.925 RU266 (RB13)* *434.950 RU268 (RB14)* *434.975 RU270 (RB15)*
435.000					
Satellites and fast scan TV - note 4					
438.000					
Fast scan TV					*438.025 - 438.175 Note 5* *438.200 - 439.425 Note 1*
438.425					
Low power repeater o/p + fast scan TV					*438.425 - 438.575 Low power repeaters*
438.575					
Fast scan TV					*438.200 - 439.425 Note 1* *439.600 - 439.750 Digital communications (Note 6)*
439.750					
Packet radio					*439.750 - 440.000 Digital communications (Note 6)*
440.000					

Notes:

1. In Switzerland, Germany and Austria, repeater inputs are 430.600 - 431.825MHz with 25kHz spacing, and outputs are 438.200 - 439.425MHz. In France and the Netherlands repeater outputs are 430.025 - 430.375MHz with 25kHz spacing and inputs at 431.625 - 431.975MHz. In other European countries repeater inputs are 433.000 - 433.375MHz with 25kHz spacing and outputs at 434.600 - 434.975MHz, ie the reverse of the UK allocation.
2. Emergency communications priority.
3. IARU Region 1 fax/AFSK.
4. Fast Scan Television carrier frequencies shall be chosen so as to avoid interference to other users, in particular the satellite service and repeater inputs. IARU Region 1 recommends that video carriers should be in the range 434.000 - 434.500MHz or 438.500 - 440.000MHz.
5. IARU Region 1 packet radio.
6. The DCC will recommend usage of this sub-band at a later date.
7. Users must accept interference from F/PA repeater output channels in 430.025 to 430.375MHz. Users with sites which allow propagation to other countries (notably F and PA) must survey the proposed frequency before use to ensure that they will not cause interference to users of repeaters in those countries.
8. 432.085MHz ± 0.005 designated for PSK31 use in the UK.

UK Amateur Radio Band Plans

CD1915-1

1.3GHz (23cm)

Licence Notes: Amateur Service: Secondary.
Amateur Satellite Service: 1260 - 1270MHz Secondary *Earth to space only.*
Powerlimit:26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV
Unattended operation: Not permitted in Northern Ireland.
In the sub-based 1298 - 1300MHz, unattended operation is not allowed in Nothern Ireland or within 50km of SS206127 (Bude) or SE302577 (Harrogate).

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
1,240.000					
All modes					*1240.150 Packet radio (150kHz b/w)* *1240.300 Packet radio (150kHz b/w)* *1240.450 Packet radio (150kHz b/w)* *1240.600 Packet radio (150kHz b/w)* *1240.750 Packet radio (150kHz b/w)*
1,243.250					
ATV					*1248.000 RT1-3 FM TV repeater input* *1249.000 RT1-2 FM TV repeater input*
1,260.000					
Satellites					
1,270.000					
All modes					
1,272.000					
ATV					*1276.500 RT1-1 AM TV input*
1,291.000					
Repeater inputs					*1291.000 RM0* *(UK) 25kHz spacing* *1291.375 RM15*
1,291.500					
All modes					
1,296.000					
CW only					*1296.000 - 1296.025 Moonbounce*
1,296.150	✓				
SSB and CW					*1296.200 Narrow band centre of activity* *1296.400 - 1296.600 Linear transponder input* *1296.500 SSTV* *1296.600 RTTY* *1296.700 Fax* *1296.600 - 1296.800 Linear transponder output*
1,296.800					
Beacons exclusive					*1296.800 - 1296.990 Beacons*
1,297.000					
Repeater outputs - note 1					*1297.000 RM0* *(UK)25kHz spacing* *1297.375 RM15*
1,297.500					
FM simplex - note 1					*1297.500 SM20* *1297.750 SM30*
1,298.000		✓		✓	
All modes					*Remote control* *Digital communications*
1,299.000					
All modes			✓		*1299.000 Packet radio (25kHz b/w)* *1299.425 Packet radio (150kHz b/w)* *1299.575 Packet radio (150kHz b/w)* *1299.725 Packet radio (150kHz b/w)*
1,300.000					
TV repeater outputs (UK only)					*1308.000 FM TV repeater output* *1310.000 FM TV repeater output* *1311.500 FM TV repeater output* *1312.000 FM TV repeater output* *1316.000 FM TV repeater output*
1,325.000					

Notes:
1. Local traffic using narrow-band modes should operate between 1296.500 - 1296.800MHz during contests and band openings.
2. Stations in countries which do not have access to 1298 - 1300MHz (eg Italy) may also use the FM simplex segment for digital communications.

CD1917-1

2.3GHz (13cm)

Licence Notes: Amateur Service: Secondary. *Users must accept interference from ISM users.*
Amateur Satellite Service: 2400 - 2450MHz Secondary. *Users must accept interference from ISM users.*
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV
NOTE: ISM = Industrial, Scientific and Medical.
In the sub-bands 2310.00 - 2310.4125, 2355 - 2365 and 2392 - 2450MHz, unattended operation is not allowed in Northern Ireland or within 50km of SS206127 (Bude) or SE302577 HHarroghate).

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
2,310.000					
Sub-regional (national band plans)					*2310.000 - 2310.500 Repeater links* *2310.100 Packet radio (200kHz b/w)* *2310.300 Packet radio (200kHz b/w)* *2310.000 - 2310.500 Remote control*
2,320.000					
CW exclusive					*2320.000 - 2320.025 Moonbounce*
2,320.150					
CW and SSB					*2320.200 SSB centre of activity*
2,320.800					
Beacons exclusive					*2320.800 - 2320.990 Beacons*
2,321.000		✓	✓	✓	
Simplex & repeaters (FM) - note 1					
2,322.000					
All modes					*2322.000 - 2355.000 ATV* *2355.100 - 2364.000 Repeater links* *2355.100 Packet radio (200kHz b/w)* *2355.300 Packet radio (200kHz b/w)* *2364.000 Packet radio (1MHz b/w)* *2365.000 - 2370.000 Repeaters* *2370.000 - 2390.000 ATV* *2390.000 - 2392.000 Moonbounce*
2,400.000					
Satellites					
2,450.000					

Notes:
1. Stations in countries which do not have access to the All Modes section (2,322 - 2,390MHz), use the simplex and repeater segment 2,321 - 2,322MHz for data transmission
2. Stations in countries which do not have access to the narrow band segment 2,320 - 2,322 MHz, use alternative narrow band segments: 2,304 - 2,306MHz and 2,308 - 2,310MHz.
3. The segment 2427 - 2443MHz may be used for ATV if no satellite is using the segment.

CD1918-1

3.4GHz (9cm)

Licence Notes: Amateur Service: Secondary.
Power limit: 26dBW PEP.
Permitted mode: Morse, telephony, RTTY, data, fax, SSTV, FSTV
In the sub-bands 3420 - 3430 and 3450 - 3455MHz, unattended operation is not allowed within 50km of SO916223 (Cheltenham), SS206127 (Bude) and SE302577 (Harrogate).

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage
3,400.000					
Narrow band CW/EME/SSB					*3400.100 Centre of activity* *3400.800 - 3401.000 Beacons* *3401.000 - 3402.000 Remote control*
3,402.000					
All modes					
3,456.000		✓	✓	✓	
Narrow band CW/EME/SSB					*3456.000 EME to USA*
3,458.000					
All modes					
3,475.000					

CD1919-1

5.7GHz (6cm)

Licence Notes:
Amateur Service: 5.650 - 5.680GHz Secondary. 5.755 - 5.765GHz & 5820 - 5850GHz Secondary, *users must accept interference from ISM users.*
Amateur Satellite Service: 5.650 - 5.670GHz Secondary *earth to space only*. 5.830 - 5.850GHz Secondary, *users must accept interference from ISM users, space to earth only.*
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV
NOTE: ISM = Industrial, scientific and medical.
In the sub-band 5670 - 5680MHz, unattended operation is not allowed within 50km of SS206127 (Bude) or SE302577 (Harrogate).

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage	
5,650.000						
Satellite uplinks						
5,668.000						
Narrow band CW/EME/SSB		✓	✓	✓	*5668.200*	*Alternative narrow band segment*
5,670.000						
All modes						
5,680.000						
5,755.000						
All modes						
5,760.000						
Narrow band CW/EME/SSB		✓	✓	✓	*5760.100* *5760.800 - 5761.000*	*Current centre of activity* *Beacons*
5,762.000						
All modes						
5,765.000						
5,820.000						
All modes						
5,830.000		✓	✓	✓		
Satellite downlinks						
5,850.000						

Note:
1. IARU aims to move narrow band operation to this segment, but for the time being operation will continue in the 5760 - 5762GHz band.

CD1921-1

24GHz (12mm)

Licence Notes:
Amateur Service: 24,000 - 24,050 Primary. *Users must accept interference from ISM users.* 24,050 - 24-150 Secondary. *May only be used with the written consent of the Secretary of State. Users must accept interference from ISM users. 24,150 - 24,250MHz Secondary. Users must accept interference from ISM users.*
Amateur Satellite Service: 24,000 - 24,050 Primary. *Users must accept interference from ISM users.*
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV
In the sub-band 24,000 - 24,050MHz, unattended operation is not allowed within 50km SK985640 (Waddington) and SE302577 (Harrogate).
NOTE: ISM = Industrial, scientific and medical.

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage	
24,000.000						
Satellites		✓	✓	✓	*24,025* *24,048 - 24,050*	*Preferred operating frequency wideband equipment* *IARU proposed narrowband operating*
24,050.000						
All modes					*24,192 - 24,194*	*Narrowband op*
24,250.000						

Notes:
1. Will eventually be used if and when allocation changes force this.

OTHER AMATEUR BANDS ALLOCATED IN THE UK ARE:

71.6 - 74.4kHz (by NoV only), 135.7 - 137.8kHz (permanent beacons not recommended), and 75.5 - 76, 142.0 - 144.0, 248.0 - 250.0GHz.

The Band Plans printed here have been checked by the relevant spectrum committees, but are subject to change.

CD1920-1

10GHz (3cm)

Licence Notes:
Amateur Service: Secondary.
Amateur Satellite Service: 10,450 - 10,500MHz Secondary
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV
In the sub-band 10,000 - 10,125MHz, unattended operation is not allowed within 50km of SO916223 (Cheltenham), SS206127 (Bude), SK985640 (Waddington) or SE302577 (Harrogate).

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage	
10,000.000						
Digital modes		✓	✓	✓	*10,002.5 - 10,027.5* *10,027.5 - 10,052.5* *10,052.5 - 10,077.5* *10,080 - 10,090* *10,090 - 10,110* *10,110 - 10,120*	*WB transponders 015 OUT* *WB transponders 040 OUT* *WB transponders 065 OUT* *Packet links* *Wideband Beacons & Operating* *Speech repeaters OUT*
10,125.000						
10,225.000						
All modes					*10,227.5 - 10,252.5* *10,252.5 - 10,277.5* *10,277.5 - 10,302.5* *10,302.5 - 10,327.5* *10,327.5 - 10,352.5* *10,352.5 - 10,368*	*WB transponders 425 OUT* *WB Simplex* *WB transponders 015 IN* *WB transponders 040 IN* *WB transponders 065 IN* *Wideband modes*
10,250.000						
Digital modes						
10,350.000						
All modes						
10,368.000						
Narrow band CW/EME/SSB beacons	✓				*10,368 - 10,370* *10,368.1* *10,368.8 - 10,369*	*Narrowband modes* *Centre of activity* *Beacons*
10,370.000						
All modes					*10,370 - 10,390* *10,390 - 10,410* *10,412.5 - 10,437.5* *10,440 - 10,450* *[10,400 - 10,475*	*Wideband modes* *WB beacons and operating* *WB transponders 425 IN* *Speech repeaters IN* *unattended operation]*
10,450.000		✓	✓	✓		
All modes + satellites					*10,450 - 10,452*	*Alternate narrowband CW/EME/SSB - note 3*
10,475.000						
All modes + satellites						*Amateur satellite service only*
10,500.000						

Notes:
1. 10,400 is the preferred frequency for wideband beacons, but 10,100 is still used.
2. Wideband FM is preferred around 10,350 - 10,400 to encourage compatibility with narrowband systems; however, there is still activity around 10,050 - 10,125.
3. The current NB sub-band is at 10,368; however, a sub-band at 10,450 is being considered as a possible future alternative.
4. Simplex TV operation should take place on wideband transponder inputs which are not used by local transponders.
5. Wideband transponder pairs are designated by input/output fequency. The pairings shown are recommended but occasionally variants may be needed to suit local circumstances.
6. Note that 10,475 to 10,500 is allocated ONLY to the Amateur Satellite Service and NOT to the Amateur Service.

CD1922-1

47GHz (6mm)

Licence Notes:
Amateur and Amateur Satellite Service: Primary.
Power limit: 26dBW PEP.
Permitted modes: Morse, telephony, RTTY, data, fax, SSTV, FSTV
Unattended operation is not allowed within 50km of SK985640 (Waddington) and SE302577 (Harrogate).

IARU	Novice	U/A Rem Ctrl	U/A Digital	U/A Beacon	UK Usage	
47,000.000		✓	✓	✓	*47,088*	*Centre of narrowband activity*
47,200.000						

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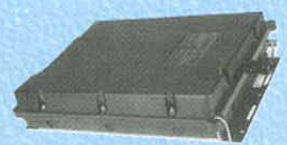

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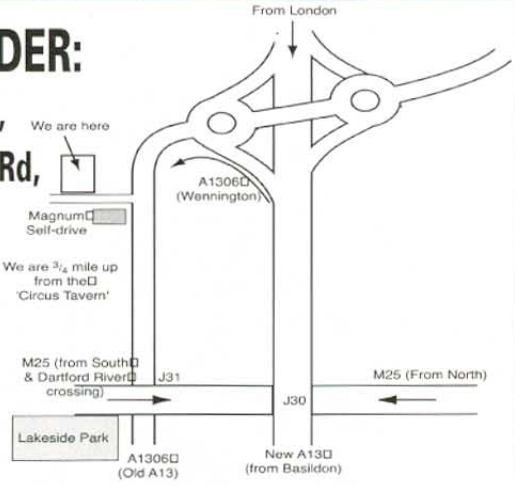

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Technical Topics

PAT HAWKER, G3VA
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DETERMING ELECTRIC FIELD LEVELS

THE FEBRUARY 'TT' item 'Functional Safety and EMC' noted that the European Electromagnetic Compatibility Directive (EMCD) requires manufacturers of most computers and light industrial equipment to ensure that these function adequately in RF fields of up to 3V/m. But it also showed how even mobile phones create 3V/m fields when close to equipment. Furthermore, many complex computer installations, although comprising individual units capable of functioning in 3V/m RF fields, can be adversely affected in fields of only 1V/m.

One result is that some countries are contemplating introducing regulations that would impose on amateur radio operators an obligation to reduce power to such a level that the electric field strength at the site of affected electronic equipment would not exceed a given level. Alan Woodacre, VE3HX, in a letter received *after* the February item was written, but *before* its publication, raises some important questions on RF field levels from amateur transmitters and shows that the answers may be more complex than often supposed. He writes:

"We have the rather alarming prospect here in Canada that an amateur radio operator could, in principle, be obliged to reduce his/her transmitted power to a level such that the electric field strength at the site of the affected electronic equipment (the neighbour's TV set, for example) would not exceed 1.83V/m.

"From a practical point of view, what would this mean for someone living in a residential area? To get some idea of what to expect, I calculated the free-space field strength for the case of a half-wave dipole for the 7MHz band for a power input to the antenna of 100W. The contour plot of **Fig 1** shows the results in V/m. Contours near the antenna element (marked by the thick black line) are omitted for clarity. For a power input of 400W the values should be doubled; for a power input of 25 watts the values halved.

"At VE3HX, the furthest away I can place my 7MHz dipole from my property line is 8m. So, allowing for an antenna height of about 8m and neglecting the effect of the earth, house wiring, etc, it might be necessary to reduce the power to my antenna to something of the order of 5W in order not to exceed a field strength of 1.83V/m beyond the boundaries of my property.

"The excellent *RadCom* article 'Build an E-field Meter' by Dick Rollema, PA0SE, *RadCom*, April 1999, pp28-31, prompted me to build my own E-field meter utilising a rather different configuration of a parallel-plate, capacitor-type sensor and a passive resistor/diode network connected to a high-impedance digital volt-ohm-ammeter. The capacitor consists of two parallel rectangular aluminium plates 53cm long by 33cm wide and spaced 10cm apart with a capacitance of about 15pF. My reason for using a passive network was to avoid the need for an amplifier; however, the time constant of the resistor-capacitor-diode combination must be much longer than the time taken to complete a single RF cycle. I used a series resistance of about 4MΩ.

"It is also necessary to know the relationship between the RF voltage applied to the diode and the rectified output current. For low currents the output is proportional to the square of the input voltage; for higher levels the output tends to be linearly related to the input voltage. Since I wanted to bleed off as little electric charge as possible, I operated the diode in the square-law mode and calibrated the network over a range of input voltages. In doing so I also determined the threshold voltage of the diode. I used a germanium diode with its lower threshold than silicon."

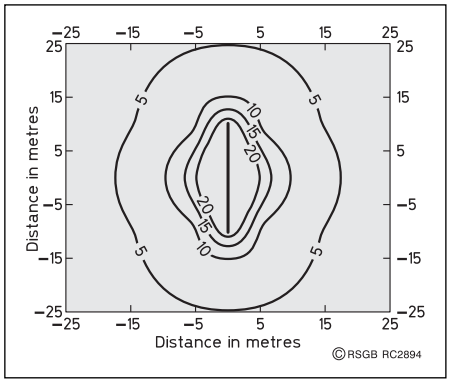

Fig 1: Electric field intensity V/m contours plotted around a 7MHz dipole antenna in free space with 100watts of RF input to the element (solid black line).

VE3HX believes that attention should be given to the two types of electric field produced by a radiating dipole antenna: the radiation field and the induction field. A radiation field is produced by the time-varying electric current flowing back and forth in the dipole. The induction field is produced as a result of the time-varying electric dipole created by the piling-up of electrons alternately at one end or the other of the dipole, with a corresponding deficiency at the opposite end, as the electrons move back and forth in the antenna. He writes:

"Although the induction field falls off more rapidly with distance than the radiation field, close to the antenna the induction field is as large as the radiation field and must be considered. The two fields are best described as vector fields having, at a particular instant at any point in space, direction and magnitude. Mathematically, the radiation field can be derived from a vector potential; the induction field from a scalar potential.

"An electric field derived from a scalar potential cannot cause current to flow round a closed loop of wire whereas, with certain exceptions, one derived from a vector potential can. To measure the total electric field (vector plus scalar) intensity of an RF signal, it is thus insufficient simply to use a closed loop of wire. Instead, some form of open circuit must be employed. Hence my use of a capacitor-type sensor.

"Electric field intensity due to the radiation field is given by the negative time rate-of-change of the magnetic vector potential. With a linear dipole, the magnetic field is zero off the ends of the dipole along the axis, so it is surprising to find that although the magnetic field is zero, the magnetic vector potential is not. As a result, the total electric field intensity is higher off the ends of the dipole than it is broadside (as shown in the contour diagram). This can be taken into account when orientating a dipole antenna.

"Many naturally-occurring electric fields exhibit intensities of several volts per metre. Yet, normally, these do not appear to affect cellular telephones or TV sets. If we consider electric fields as vector (V) fields or scalar (S) fields depending on their type as discussed above, most naturally-occurring electric fields, except those produced by lightning strokes, are probably S-type. So when a neighbour's equipment suffers RFI from your transmitter, what is actually creating the problem? Is it the S-type induction field or the V-type radiation field, or both? Is the frequency important? Until these questions can be answered, it seems premature for any regulator to base a restrictive criterion solely upon the field strength of the transmitted RF signal!"

REGULATING (FERRORESONANT) TRANSFORMERS

OVER A YEAR AGO, I received one of those 'out of the blue' appeals for information on an unusual form of power transformer that rang no personal bells. The original letter gave only a sketchy outline of the component and I have to confess that after an initial attempt to grasp what it was all about, the letter remained buried among the endless heaps of paperwork that accumulate *chez moi* in the course of compiling

'TT'. I usually do my best to answer general queries if they relate to matters covered in the column, though I have to admit that even this is not always possible.

But Dr Peter Lowenstein (RS31144) writing from Mutare was nothing if not persistent. As a keen home-brewer he has a taste for acquiring second-hand or scrap equipment to dismantle for spares, finding Zimbabwe a treasure-trove of old equipment. He wrote: "A component I have come across, that I have not seen described, is a type of mains transformer in which the primary and secondary windings are on completely separate sections some distance apart on a fairly massive laminated iron core. The secondary has an additional (high voltage) winding that is connected only across a capacitor (1 - 20µF 450VAC working). If the transformer is operated with no capacitor connected, all output voltages are low and may drop considerably more on load. With a capacitor connected the transformer hums (sometimes quite loudly), the output voltages are correct and do not drop much on load. If one experiments with the capacitor values, it is possible to find a value at which all output voltages, off load, are almost doubled and a much higher current is drawn by the primary. Care then has to be taken to limit the load to avoid overheating."

When recently yet another reminder came through my letterbox, I again consulted my stock of reference books, but found little relevant information, although one book included a brief note: "A constant-voltage transformer automatically maintains a nearly constant-output voltage in spite of large variations in input-voltage and loading. It usually comprises a series-resonant circuit tuned to the supply frequency, connected across the input terminals, and a saturable inductor connected in shunt with the capacitor. The voltage fed to the load is that developed across the saturable inductor together with a small part of the input voltage, in phase opposition, obtained from an auto-transformer tap on the tuned inductor. Very good voltage compensation can be obtained, but the output voltage waveform is poor."

This description did not fit the Zimbabwe component, but it did suggest that it might be some form of automatically-regulating device. I sought more details of the component in order to make a search at the IEE Library. Dr Lowenstein then provided the information shown in **Figs 2 & 3**.

The standard electrical reference books provided little information although, in a recent book on power transformers, I eventually found some references to 'ferroresonant transformers' which appeared to cover a modern form of self-regulating transformer providing a more or less constant voltage output from a widely varying input voltage. Moreover the book provided a list of references to *IEEE Transactions* papers that seemed relevant. At the Science Museum Library I traced, for example, a paper by Nathan Grossner 'The Geometry of Regulating Transformers' (*IEEE Trans on Magnetics,* March 1978, pp 87-94). This shows that "Ferroresonant, ballast and current-limiting transformers are similar in geometry. In the ferroresonant transformer, the problem of saturation losses, noise and stray flux can be alleviated by altering the geometry to produce a magnetic circuit with non-uniform flux density". An introduction notes that "Transformers can be designed with the specific requirement of regulating output voltage or current when subject to large variations of input voltage or load impedance. We are concerned with three kinds of regulating transformers: ferroresonant, ballast, and high-reactance transformers. Ferroresonant transformers stabilise output voltage. Ballast transformers stabilise output current and power to gas-discharge (fluorescent, metallic-vapour) lamps. High-leakage reactance transformers limit current to nonlinear loads such as the arc-weld and gas-discharge lamp.

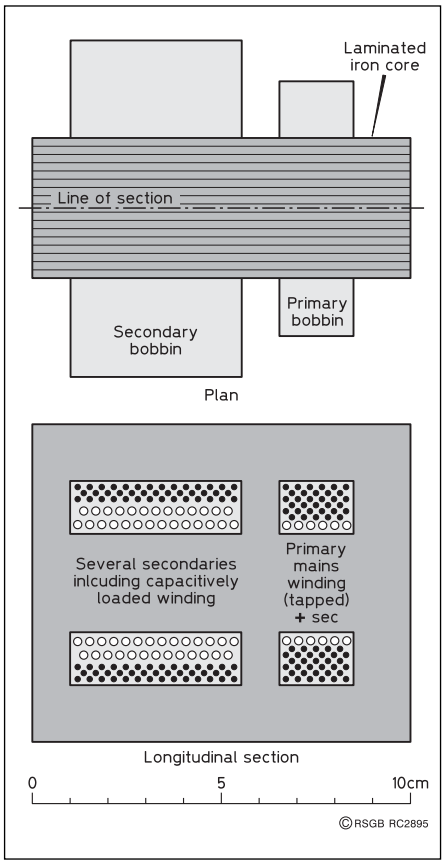

Fig 2: The 'Zimbabwe' transformer as subsequently sketched by Dr Lowenstein.

"Regulating transformers are to be found in a variety of products such as colour television, microwave ovens, electrostatic precipitators, battery chargers, DC power supplies, welders, and lighting fixtures. Because these are high-volume products, the designer is strongly motivated to reduce costs by attempting to optimise materials and geometry… Because many such transformers are characteristically large and lossy, the subjects of size, shunt geometry and saturation losses are prominent in our discussions of optimisation."

It thus became quite clear that the Zimbabwe transformer was a proprietary form of self-regulating ferroresonant transformer designed to cope with the wide variations of mains voltage often found in rural areas. Moreover, the reference to microwave ovens jolted my memory of one of several discussions in 'TT' on the use of ex-microwave oven transformers to provide low-cost EHT supplies for linear valve amplifiers. In January 1998 (*Technical Topics Scrapbook 1995-99*, pp 196-97), John Lawrence, GW3JGA, drew attention to an investigation he had made into oven transformers which showed that "these transformers are designed with a high leakage reactance which gives them special regulating characteristics when used with the correct value of capacitor in a microwave oven power supply." He pointed out the RF output from a magnetron is reasonably proportional to anode current, but very dependent on anode voltage. A small change of 5% in the anode voltage produces a large change of around 50% in anode current and consequently in output power.

"A practical solution which is used in all domestic microwave ovens is to employ a special type of mains transformer which has a high leakage reactance in the secondary circuit. When this operated in a simple form of voltage-doubling circuit (**Fig 4**) with a specific value of series capacitor (C), the effect is to provide a con-

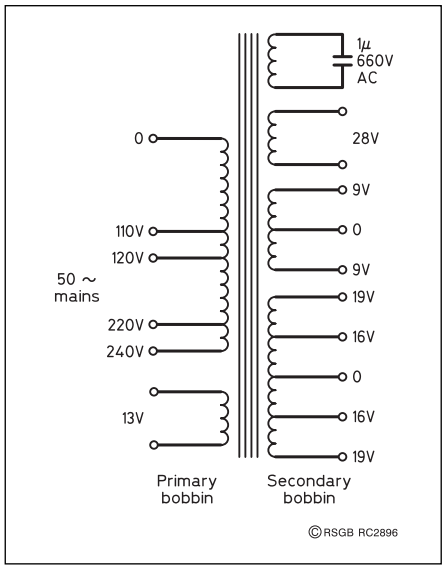

Fig 3: Schematic of the transformer showing the windings of the primary and secondary bobbins. Transformer reference and part number: 1017-5013 REV A MMC 4187.

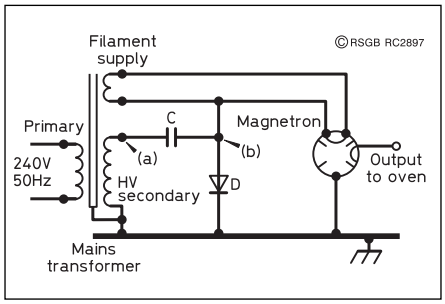

Fig 4: Circuit diagram of a typical microwave oven power supply providing a pulsed negative supply of about –4kV for the magnetron (as described by GW3JGA in 'TT', January 1998).

stant-current feed to the magnetron over the normal range of supply voltage variations.

"The leakage reactance of the secondary winding and the series capacitor are chosen to resonate the at a frequency about 15-20% higher than the incoming supply frequency. At resonance the effective impedance is at its minimum value. Any increase in the supply voltage will cause an increase in the secondary current and a reduction in the leakage inductance due to saturation effects. The resultant increase in resonant frequency raises the series impedance at the mains frequency, thus limiting the rise in current and stabilising the output power."

It is clear from the Zimbabwe transformer made in the USA that this technique of using leakage reactance to provide self-regulation of output current or voltage can be applied not only to high-voltage windings but also to low-voltage outputs by providing an extra higher-voltage secondary winding with a parallel capacitor. It is interesting to note that this form of self-regulating or ferroresonant transformer seems to have been developed only in the 1960s, accounting for the fact that I could find little information in the older standard reference books. In amateur radio practice, it is more common to provide electronic voltage regulation downstream from the transformer, but it is clearly useful to be able to recognise a ferroresonant transformer when you come across one.

W7ACD'S 1.8MHz MEANDER-LINE PROJECT

ONE OF THE 'TT' items that continues to haunt me is the August 1999 report on 'Efficient Short Meander Antennas'. I was unwise enough to accept at face value the claim made by American authors in a professional (IEEE) journal that a 14MHz resonant meandered-line wire dipole antenna built in a cage form with serial wires and with an overall span of only one metre could have a radiation efficiency of 80%. This led me to suggest *inter alia* that a 30ft-high 1.8MHz meander-line monopole for 1.8MHz might prove a rewarding project.

The 14MHz one-metre design led to some furious efforts on both sides of the Atlantic to reproduce the claimed results, but it soon became clear that, despite careful attempts to copy the design exactly as presented in the IEEE paper, the radiation resistance was extremely low and consequently so was the radiation efficiency. The meander antenna built in accordance with the IEEE description worked, but at nothing like 80% efficiency! This was duly reported in 'TT' (October 1999 and January 2000) but apparently too late to deter one former professional engineer from investigating, as a major project, a 30ft 1.8MHz meander-line monopole.

Arch Doty, W7ACD, now living in Oregon, is better known to 'TT' readers as K8CFU of North Carolina. With two other elderly 'professional' amateurs, some twenty years ago his team reported in 'TT' and *QST* a major investigation that led *inter alia* to the revival of the elevated counterpoise as a lower-cost replacement for extensive buried radial systems, such as the 120 used as standard at American MF broadcast stations. He has now furnished an impressive report on his construction and testing of a 1.8MHz meander-line monopole, though making an anguished dig at my initial 'TT' item. In presenting this digest of his letter, my intention is not to encourage others to duplicate his efforts, but rather to show what can be involved in such a carefully-executed antenna project,

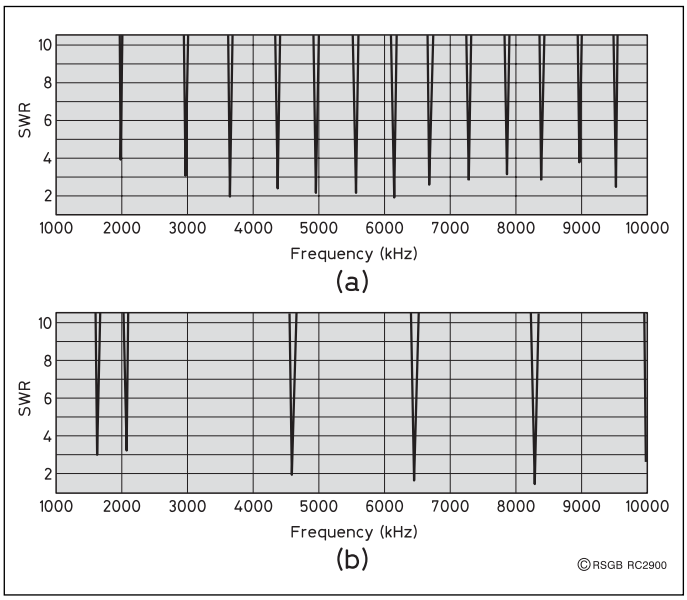

Fig 6: Extracts from (a) VSWR plot of the antenna with 27 lines fed at the bottom of the first meander-line. (b) VSWR plot with nine lines fed at the bottom of the first meander line.

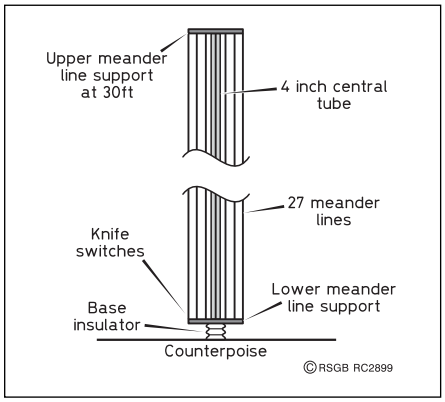

Fig 5: W7ACD's vertical meandered-line antenna as erected in November 1999. For details see text.

and provide some of his practical advice on antenna testing. W7ACD writes:

"You have put me to a great amount of effort (hundreds of hours), anguish (and that is tough when you are 80 years old!) and expense (about $1000)! My basic problem is that, at least in regard to electronics, I have felt for several decades that you could walk on water if you put your mind to it. Thus, when I read your item on Meandered Line Antennas I was intrigued with your surmise that an antenna of this type might be of interest for 1.8MHz

"With our work on counterpoise systems completed some years ago, I had no current construction projects in progress. So, I built a 1.8MHz vertical meandered-line antenna in general conformance with your suggested specifications. The design is based on the paper 'Performance of a Meandered Line as an Electrically-Small Transmitting Antenna' (*IEEE Trans Ant & Prop*, Vol 46 No 12, December 1998) by Thomas J Warnagiris, K3GSY, and Thomas J Minardo of the Southwest Research Institute, San Antonio, Texas on which your item was largely drawn.'

As built at W7ACD: centre tube, 30ft high, 4in diameter aluminium. Length of meander lines, 27ft. Number of meander lines, 27. Spacing between adjacent meander lines 2.75in. Spacing of lines to centre tube, 10.5in. Meander lines, Nr18 AWG copperweld (0.0403in dia). Meander line supports, acrylic plastic 2.5ft diameter. Spacing/wire-diameter ratio 68.2. Antenna reduction factor approx. 4.70. A SPDT knife switch at the base of *each* meander line gives great flexibility in selecting which of the lines are connected. The upper and lower circular RF insulating disks each cost $75! The antenna structure was mounted

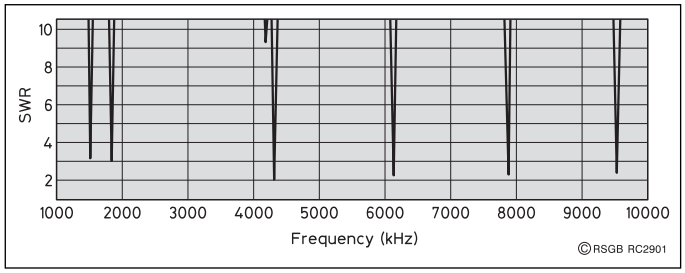

Fig 7: Extract from VSWR plot of antenna with nine lines fed at bottom of first line with 100pF end loading, December 1999.

vertically with the aid of a crane with 100ft boom (another $175) over the buried counterpoise comprising 40 100ft radials of insulated wire six inches below the surface (the RF does not know that it is buried as it 'sees' only *electrical* ground!). [**Fig 5** shows an outline of the antenna, but for more detail see the August 1999 item - G3VA]

"With the antenna installed, the next very real problem was proper test equipment. When I moved here from North Carolina three years ago, I shipped out some seven tonnes of goods, plus my rather large tractor. I thought that all had arrived safely, but when I started unpacking boxes some months later, I found that one case was missing: it was the case containing my two General Radio RF impedance bridges, GR signal generator *et al.*

"Thus, to start testing, I had available only my AEA SWR meter and its associated computer software. **Fig 6** shows what I found: the absurd VSWR performance with the feed to the bottom of the first meander line with **(a)** 27 lines attached and **(b)** with only 9 meander lines connected.

"At this time, I contacted Tom Wanagiris, K3GSY, the principal author of the IEEE paper, and I have subsequently provided him with *all* my results. Tom has been most helpful, and has made a number of excellent suggestions and explanations. [I wonder how he explained the efficiency performance claims made in his paper! - G3VA]

"I also contacted an old friend, Earl Cunningham, K6SE, who is a whiz at using EZNEC (see *QST*, July 2000). He spent a *lot* of time trying to computer-model my antenna, with only modest success - but he persuaded me to buy the new Windows 98® version of EZNEC (another $50 chalked up to the 'Hawker Account'!).

"Before Oregon's 1999 winter rains, I made several hundred tests of the antenna, although I could measure only VSWR. However, I did figure out one very important matter - how to 'tune' the antenna over a modest frequency range.

"The basic fault of the meandered-line antenna (apart from its negative gain) is the near impossibility of designing it to operate on a specific frequency. However, I recalled my work on 'Capacitive Bottom Loading', ie placing a capacitor between the bottom of a vertical antenna and its associated counterpoise [see 'TT' August, 1991 or *Technical Topics Scrapbook 1990-94*, p101 - G3VA]. So I added a remotely-controlled vacuum variable capacitor on the end of the *last* meander line and, son-of-a-gun, I could now move the minimum VSWR points around nicely. **Fig 7** is an example of nine lines with 100pF end-loading.

"Of course, I had to try this antenna on the air. Over a month or so, I managed 1.8MHz contacts from Puerto Rico to Hawaii. But this only demonstrated that the antenna's performance was really quite poor, the contacts resulting more from a few decades of working DX (I have 1.8MHz SSB DXCC) than from good antenna performance.

"During spring 2000, AEA finally came out with computer software for its newer 'Complex Impedance Analyser'. I promptly purchased one ($460 including software) and found this a wonderful means of testing antennas. Set-up the AEA device and a laptop computer at the antenna site, tell it what to do, and then mow the grass while it does your work for you. In 45 minutes, the AEA can make and plot 1000 test points; it can then be reset in a minute or so for the next set of tests. What a contrast with our Counterpoise test program many years ago, where we took over 30,000 individual test measurements *by hand!* During summer 2000, I continued carrying out a comprehensive test programme. **Fig 8** shows the antenna with 27 lines fed at the bottom of the third line.

"To sum up. The Meandered Line Antenna is, basically, pretty useless for 1.8MHz amateur radio usage. Its gain is negative and its performance unpredictable, *but* it is a fascinating antenna, and one that may have promise at other frequencies, or for other applications.

"By the end of August 2000, I figured that I had learned as much as I wanted to know about meandered lines, and took down the experimental antenna. It has now been replaced with a vertical that provides a background noise level some six S-points above that found with the experimental antenna. But, before consigning all my voluminous test results to a dusty filing cabinet, I thought readers might like to know the answer to the question: "What Hath Hawker Wrought?""

HERE & THERE

WITH REFERENCE to 'Power Line Hazards' in the January 'TT', Michael Gale, G3JMG, points out that 'windward' refers to the side *from* which the wind blows. The hazard suggested by Professor Henshaw is *downwind* of the power lines, as made clear in the item. ♦

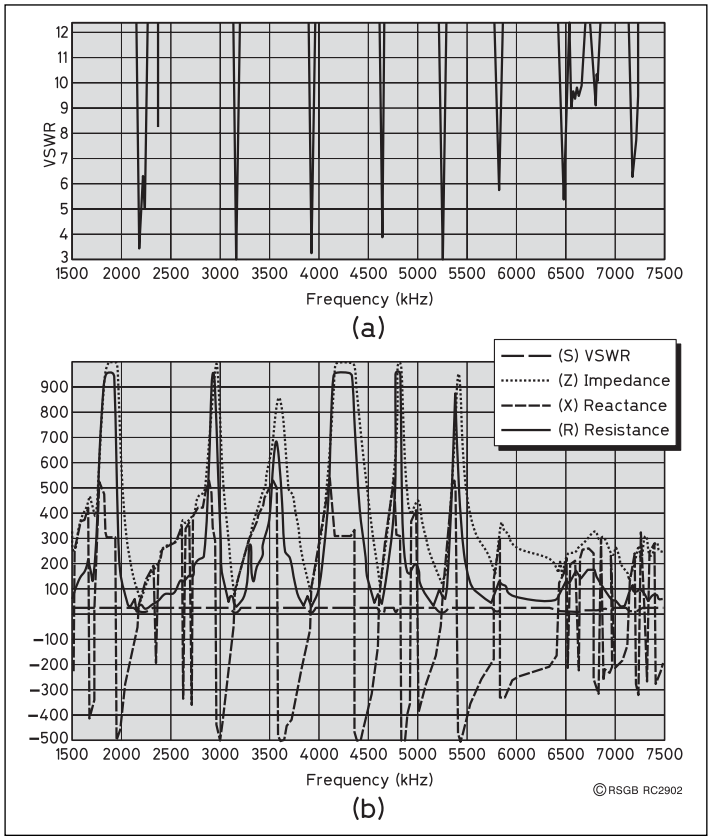

Fig 8: (a) Extract of VSWR plot of antenna with 27 lines fed at the bottom of the third line, June 2000. (b) With the availability of the AEA 'Complex Impedance Analyzer' this plot was made of the antenna as in (a).

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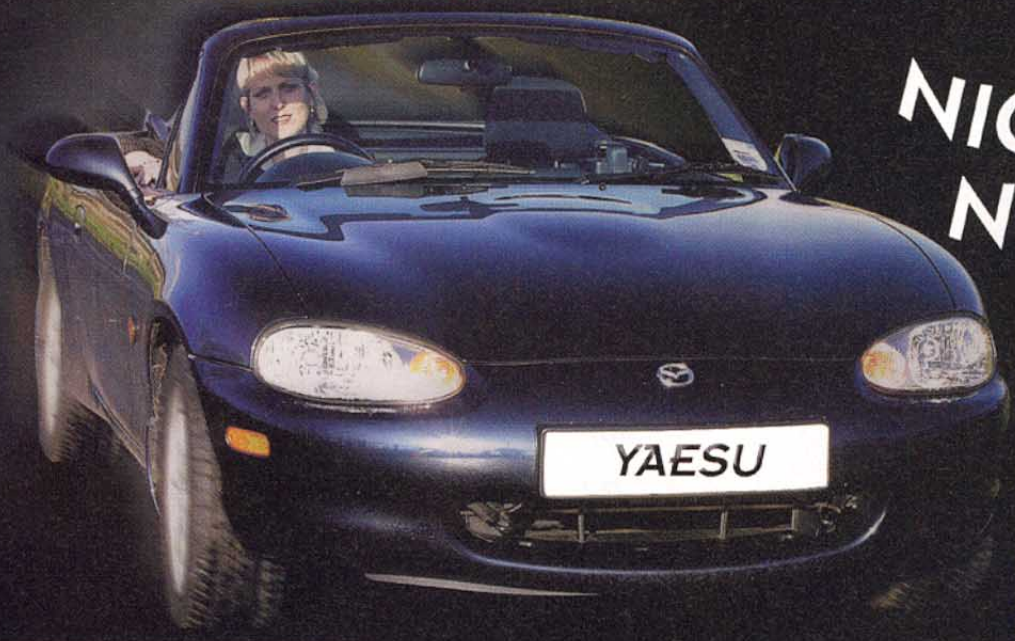

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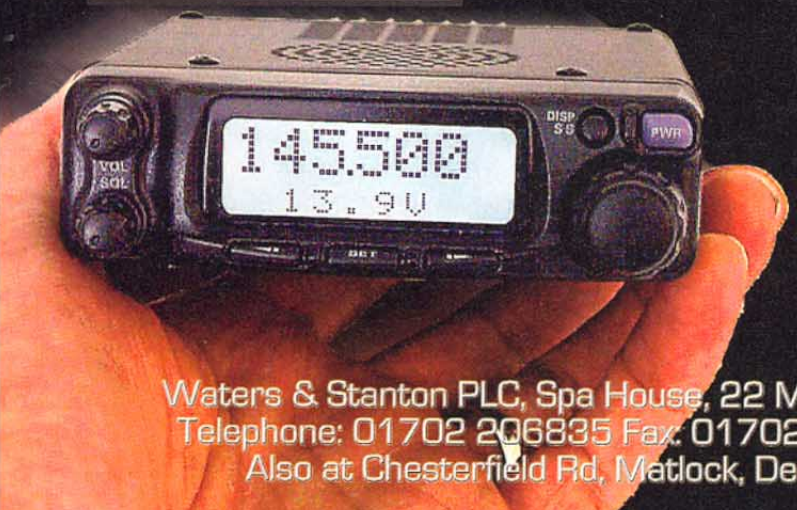

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RSGB IOTA Contest 2000

By Chris Burbanks, G3SJJ*

ONCE AGAIN this event attracted increased participation. Whilst the activity is still predominantly European, it is pleasing to see more entries from Asia, whilst the North American presence continues to grow at a steady pace. A total of 1130 entries were received, an excellent growth record considering that just 300 entries were received in 1993 when the contest had its first outing. In that time, IOTA island activity has increased from 101 to 356 entries and non-island from 145 to 614. The 100W DXpedition section has proved very popular - we just need a few more trophies now!

PROPAGATION

IT IS A shame with such interest that band conditions didn't live up to expectations. It was most noticeable at GU8D on Guernsey; last year we had a good run of JAs on both Saturday and Sunday, at times even having to resort to working by numbers! This time, the bulk of activity in that direction came on 21MHz during late Sunday morning. 28MHz was slightly better than previously with a decent opening to Europe and south east Asia on Saturday evening.

OPERATING STANDARDS

WHILST MANY comments were received on the high operating standards and friendliness shown during the contest, there were a few specific reports of less acceptable behaviour. The rules are quite specific that the IOTA reference should be given with each contact exchange. TF7DX and CQ9K were mentioned several times, whilst GW6J was noted as giving the reference so fast that it was almost indistinguishable. No action has been taken this time, but similar digressions may not be treated so leniently in the future.

RULE CHANGES

IT WAS AGREED that the rules should be reviewed after this year's event. Several comments were received from entrants and input was invited from the IOTA Committee. Six potential changes were discussed: 1. Non-island to non-island contacts; 2. Exchange sent by island stations; 3. Use of DX *PacketCluster* by single operators; 4. Single operator, two radio set-up; 5. Definition of off-hours in the 12-hour section; 6. Format of electronic logs.

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The youngsters at UU7J/P on Kosa Tuzla Island in the Black Sea (EU-180) came in fifth place in the hotly-contested Islands Multi-Operator section.

1. Non-island to non-island contacts

This is a difficult one and has provoked considerable debate. The IOTA Committee feels very strongly that since the contest is linked with the IOTA programme, only contacts with IOTA references should be allowed, furthermore the presence of strong mainland Europe-based contest stations prevents smaller DXpeditions from being heard and making contacts. Every event has its own character and this is very much the case with the IOTA contest over the eight years that it has been running. It is predominantly a contest with IOTA references as the multipliers. A major change such as this would severely affect its character. A non-island station would either need to identify during each CQ that it was not on an IOTA island or it would only search and pounce. The HF Contests Committee decided to leave this rule unchanged.

2. Exchange sent by island stations.

Several people have suggested that since the exchange is lengthy for IOTA entrants, it might be helpful for these to give just RS(T) and IOTA number. Whilst acknowledging that the exchange is long, the HFCC feels that removing the serial number would not enhance the contest in any way; it is part of the character of this event. It was agreed to stress the requirement that the IOTA reference should be given for each contact.

3. Use of DX Packet Cluster by single operators.

Over the last few years there have been increasing requests to allow this. A reasonable proportion of entrants are also IOTA award enthusiasts and use the contest to enhance their scores. On the down side, not all Islands have DX Cluster coverage, although access via the Internet is increasing. On balance, it was perceived that incorporating the use of *PacketCluster* into the rules would be an asset to the contest.

4. Single operator, two radio ('SO2R') setup.

Whilst this is not a major problem, I did receive some comments at the HF Convention suggesting that the use of two radios by some contestants gave an unfair advantage. I felt it necessary to pass this on for discussion but suspected what the response would be. Technology will drive change (or vice versa!); many of us have already mastered the technique of using the sub receiver on modern radios to search for new contacts or multipliers. SO2R is just an advancement of this and most contest logging software will allow for manual or automatic switching between the two radios. No change.

5. Definition of off-hours in the 12-hour section.

Some entrants felt that the off-hours should be re-defined. The HFCC is happy with the current rule although states it is not necessary to mark the log as long as a note is made on the summary sheet.

6. Format of electronic logs.

The wide variety of formats received gives adjudicators a real problem. It is impossible to run all the logs through checking software. We require two files only, the summary sheet file, correctly completed and the main log file. SD, NA, TR and CT all produce the .LOG or ADIF file. Name this callsign.log, eg GU8D.LOG. Files such as Excel, Log EQF, Word etc are of no real value, in that considerable extra effort would be required by adjudicators to convert these into usable data. Another important aspect is to make sure you are using the latest version of your logging software, we are still receiving logs with the old 2, 5 and 15 point scoring system, this changed two years ago to 3 and 15 points. Most programs are updated several times a year.

The rules for the 2001 IOTA contest (which takes place on **28/29 July**) will be published in *RadCom* next month. Now turn to page 68 for the full results from 2000!

IOTA CONTEST 2000 TROPHIES AWARDED

Trophy	Winner	Operators
IOTA	GM5V	GM3NIG GM3UTQ GM4FDM GM4YMA GM0GAV GM0NAI
CDXC Geoff Watts Memorial	GU8D	G3SJJ G3XTT G4DRS G4IIY G4TSH, G0OPB
Roger Balister G3KMA	LZ1KMS	LZ1QV LZ1ZM LZ3GM LZ3YY
David King G3PFS	GW0ARK	
G3DYY Memorial	GM4SID/P	
W9DWQ	AA1IZ	

Islands - Multi-Operator

Callsign	QSOs	Mults	Score	Section	Ref	Name
GM5V	2,606	525	9,673,650	DXped	EU008	Gigha
GU8D	2,967	501	9,365,193	Perm	EU114	Guernsey
OH9A	3,358	433	9,126,774	DXped	EU173	Sandstrom Reef
GX6YB	2,802	476	8,610,840	DXped	EU120	Wight
UU7J/P	2,945	406	7,200,816	DXped	EU180	Kosa Tuzla
F/G0MEU/P	2,355	448	7,159,488	DXped	EU068	Sein
9A1V	2,713	397	7,047,147	DXped	EU016	Korcula
9A0A	2,521	372	6,103,404	DXped	EU170	Vir
GW6J	2,771	358	5,878,718	DXped	EU124	Anglesey
EI1DD	2,312	400	5,715,600	DXped	EU115	Ireland
DH1DX/P	2,209	364	5,552,820	DXped	EU129	Usedom
EJ7M	2,596	325	4,613,700	DXped	EU121	Bere
G3N	2,096	320	3,924,480	DXped	EU120	Wight
SN6F/1	1,808	311	3,858,888	DXped	EU132	Wolin
G9Q	2,018	311	3,531,546	DXped	EU005	UK Mainland
AA1IZ	2,087	265	3,319,125	DXped	NA148	George's
CT3FN/P	2,161	255	3,242,070	DXped	AF014	Porto Santo
LZ1KMS	2,149	265	3,194,045	100W DX	EU181	Sveta Anastasia
CQ9K	2,291	228	3,073,175	DXped	AF014	Madeira
IC8OZM	1,670	257	3,005,358	DXped	EU031	Procida
PA7FM	2,329	233	2,793,903	DXped	EU146	Zeeland
DF4XX/P	1,392	270	2,523,960	DXped	EU128	Fehmarn
ED3IM	1,816	229	2,423,736	DXped	EU078	Medas
SM7M/P	1,621	235	2,332,140	DXped	EU138	Tjurko
EJ4GK/P	1,896	221	2,301,936	DXped	EU006	Inis Mor, Aran
8S7A	1,746	205	2,300,305	Perm	EU037	Oland
GM2T	1,536	219	2,052,468	DXped	EU008	Tiree
9A7T/P	1,293	226	2,015,694	100W DX	EU170	Obonjan
RI1CGO	1,396	225	1,948,725	Perm	EU133	Gogland
DL3KZA	1,466	199	1,863,834	Perm	EU057	Reugen
IL7/IK2XYG	1,732	178	1,760,064	DXped	EU050	San Nicola
R0L/P	1,246	149	1,554,219	100W DX	AS066	Sea of Japan
ED1AE	1,657	179	1,544,949	DXped	EU080	Pontevedra Prov Gp
R1NWS	1,724	170	1,535,610	100W DX	EU147	Nemetskij kuzov
PA6TEX	1,211	211	1,508,439	DXped	EU038	Texel
RZ1AK/P	1,164	186	1,484,280	DXped	EU133	Kotlin
G6I/P	879	232	1,391,304	DXped	EU005	UK Mainland
RI1POM	1,304	174	1,351,284	Perm	EU086	Matveev
RI1CGG	1,453	163	1,348,173	Perm	EU133	Gogland
RI1OSW	1,385	174	1,343,106	100W DX	EU066	Solovetskiye
VE7UF	1,002	191	1,323,630	DXped	NA036	Vancouver
PA7TS	1,511	173	1,311,513	Perm	EU038	Terschelling
GM5C	1,110	187	1,289,178	DXped	EU123	Gt Cumbrae
DL6YFB/P	1,266	160	1,270,080	DXped	EU128	Fehmarn
CU3DX	1,563	150	1,255,950	Perm	EU175	Terceira
GN0ADX/P	1,140	165	1,241,460	DXped	EU122	Rathlin
F5TXM	1,494	145	1,206,690	DXped	EU064	Noirmoutier
9A16D	802	204	1,203,600	100W DX	EU016	Veli Drvenik
GD6IA	1,819	142	1,192,374	Perm	EU116	Man
EJ5J	1,151	165	1,175,625	100W DX	EU121	Clare
SK7DX	1,406	127	1,169,670	DXped	EU138	Hano
ED8OTA	1,456	144	1,124,784	Perm	AF004	Gran Canaria
RK0FWL/P	785	162	1,101,811	100W DX	AS149	Moneron
BI4S	1,075	123	1,038,735	DXped	AS150	Shandong Prov Sth
IK7LMX/P	1,265	148	1,005,660	100W DX	EU091	Gr Pedagna
G0CRW/P	686	203	997,542	DXped	EU005	UK Mainland
G4FOX/P	767	198	994,950	Perm	EU005	UK Mainland
IK7JWX/7	1,180	138	927,360	DXped	EU091	Porto Cesareo
M2H	1,506	141	907,758	Perm	EU005	UK Mainland
TX8ISL	812	115	862,500	100W DX	OC033	Lifou
MM8Y	859	181	859,569	100W DX	EU123	Bute
RI0ZKR	568	144	855,360	DXped	AS095	Krasheninnikova
G3SAD	711	183	822,951	100W DX	EU005	UK Mainland
G5M	610	189	822,150	Perm	EU005	UK Mainland
OZ5BAL	922	129	712,854	DXped	EU125	Fanoe
DL0KHW	618	152	653,904	100W DX	EU057	Rugen
SK7A	688	130	648,960	DXped	EU138	Blekinge
C6DX	1,133	103	638,085	DXped	NA054	Berry
9A1RKV/P	532	157	634,908	DXped	EU170	Dugi otok
M0ACW/P	912	134	603,000	DXped	EU005	UK Mainland
M2G	1,181	108	563,084	Perm	EU005	UK Mainland
VQ9IO	1,093	104	561,600	Perm	AF006	Diego Garcia
W4LVS/P	949	92	486,036	100W DX	NA112	Bogue Banks
SK7IJ/6	730	102	447,372	100W DX	EU043	Tjoern
G3FEC	654	113	415,275	Perm	EU005	UK Mainland
NM8O/4	756	89	380,208	100W DX	NA062	Conch Key
GJ4L	660	88	366,432	100W DX	EU099	Les Minquiers
OH5AD	605	76	264,708	DXped	EU140	Kuorsalo
ED5ICE	819	59	245,499	100W DX	EU069	Columbretes
CO8LY	501	74	214,230	Perm	NA015	Cuba
DX9MI	348	47	177,942	100W DX	OC130	Mindanao
GI3XRQ/P	297	83	173,055	100W DX	EU115	Ireland
SV3/IZ7TAN/P	501	47	114,633	100W DX	EU158	Proti
W5DDX	516	38	87,096	100W DX	NA082	Cat
VE1JS	205	35	37,800	DXped	NA127	Brier Nova Scotia
KL7/NO7F	294	24	31,248	Perm	NA059	Unalaska
ZY7I	239	24	27,288	100W DX	SA046	Itamaraca
K7PAR	93	31	23,157	100W DX	NA065	Whidbey
GM5K	269	21	22,473	100W DX	EU059	St Kilda

Islands - 24 Hour SSB

M6T	2,026	309	3,620,862	Perm	EU005	UK Mainland
F/EA3NY/P	1,766	242	2,449,524	DXped	EU064	Noirmoutier
KP2/AA1BU	1,685	174	2,057,724	100W DX	NA106	St John
GM0F	1,913	217	2,010,939	Perm	EU005	UK Mainland
GM3PPG/P	1,440	213	1,837,764	DXped	EU010	South Uist
P43E	1,041	144	1,140,768	Perm	SA036	Aruba
F5PAC/P	1,370	145	1,088,370	100W DX	EU032	Oleron
MI0BVK	1,438	145	1,010,070	Perm	EU115	Ireland
EI7GL	832	174	983,448	Perm	EU115	Ireland
F5CWU/P	1,038	136	889,032	100W DX	EU032	Oleron
YB8BHC	784	77	614,460	Perm	OC146	Sulawesi
KW1DX	756	120	560,160	100W DX	NA137	Long Island
G0WRE	669	136	529,176	Perm	EU005	UK Mainland
4W6GH	671	77	502,425	Perm	OC148	East Timor
HK3JJH/1	623	99	373,032	100W DX	SA078	Cordoba
CU3A	587	98	336,042	Perm	EU175	Azores
KF9YL	656	83	294,816	DXped	NA076	Cedar Key
F8BDQ/P	654	81	269,730	100W DX	EU032	Oleron
9A/IK0GDG	431	85	247,860	DXped	EU110	Brioni
DU1UGZ	158	124	243,288	Perm	OC042	Luzon
VO1BC	473	69	217,143	Perm	NA027	Newfoundland
EA6TC	534	64	195,072	Perm	EU004	Ibiza
JA7BEW	262	90	194,940	Perm	AS007	Honshu
JA9SCB/1	381	73	176,295	100W DX	AS007	Honshu
YB0LBK	440	60	167,338	Perm	OC021	Java
JA5EO	306	49	126,126	Perm	AS076	Shikoku
G0VBD	134	81	122,958	Perm	EU005	UK Mainland
IT9HLN	301	53	120,840	Perm	EU025	Sicily
CU3AN	355	56	114,016	DXped	EU175	Azores
KE7CU	294	63	109,242	Perm	NA065	Whidbey
DU1BP	177	34	74,461	Perm	OC042	Luzon
IS0/OE5JKL	208	41	68,880	100W DX	EU024	Sardinia
OZ1JVX	207	41	51,045	Perm	EU171	Thy
IT9ESZ	118	31	44,382	Perm	EU025	Sicily
G0PBV	106	38	32,566	Perm	EU005	UK Mainland
SM0FM	42	34	19,788	Perm	EU084	Uppsala
YC8TF	50	16	9,824	Perm	OC146	Sulawesi
JG3DOR	195	12	2,340	Perm	AS007	Honshu

Islands - 24 Hour CW

9H1ZA	1,709	181	1,756,062	Perm	EU023	Malta
OH0TA	1,913	156	1,606,644	Perm	EU002	Aland
GM4SID/P	1,963	159	1,596,519	Perm	EU009	Orkney
RZ1OA/A	1,314	185	1,450,770	DXped	EU153	Lyasomin
DL5XL/P	1,327	187	1,406,427	DXped	EU127	Helgoland
IT9BLB	1,246	158	1,146,132	Perm	EU025	Sicily
J45W	1,394	149	1,082,634	100W DX	EU001	Dodecanese
DL1EFD/P	1,043	166	1,045,302	100W DX	EU047	Langeoog
RW1ZZ/P	1,391	92	618,056	DXped	EU161	Lumbovskiy
G5LP	885	131	587,142	Perm	EU005	UK Mainland
YZ4ED/P	804	103	524,064	100W DX	EU163	Sveti Nikola
TF/G3SQX	1,076	85	515,100	100W DX	EU021	Iceland
OZ8SW	620	105	446,040	Perm	EU029	Sjaelland
OZ3CF	457	124	427,428	100W DX	EU029	Sjaelland
G3GLL	596	119	418,404	Perm	EU005	UK Mainland
JG6URG/6	793	75	367,425	100W DX	AS012	Ikitsuki
G3MXJ	601	88	323,434	Perm	EU005	UK Mainland
DL3NSM/P	293	115	303,945	100W DX	EU057	Rugen
G3PSY	327	97	264,616	Perm	EU005	UK Mainland
JA2KVB	333	100	236,700	Perm	AS007	Honshu
GW3KDB	129	126	234,738	Perm	EU005	UK Mainland
G3YEC	260	106	232,776	Perm	EU005	UK Mainland
OZ/DL5SE	568	54	161,514	100W DX	EU030	Bornholm
M3C	771	53	158,523	Perm	EU005	UK Mainland
G3RSD	280	82	157,440	Perm	EU005	UK Mainland
KP4AH	511	55	143,715	Perm	NA099	Puerto Rico
G3MPB	212	82	116,604	Perm	EU005	UK Mainland
EA6/F6GIN	406	44	109,032	DXped	EU004	Mallorca
IS0SDX	330	50	103,500	Perm	EU024	Sardinia
JE1REU	321	50	100,950	Perm	AS007	Honshu
JH6OPP	308	34	70,584	Perm	AS077	Kyushu
MU0FAL	191	40	44,520	Perm	EU114	Guernsey
JA5APU	356	29	44,196	Perm	AS007	Honshu
G3GMM	111	46	42,090	Perm	EU005	UK Mainland
UR5FEL/P	167	9	7,470	DXped	EU179	Berezan

Islands - 12-hour SSB

PJ2I	1,025	127	751,713	Perm	SA006	Curacao
5B4KH	962	120	732,240	Perm	AS004	Cyprus
IC8WIC	901	111	627,705	DXped	EU031	Capri
EA6AEQ	670	134	602,196	Perm	EU004	Mallorca
GW0ARK	651	122	571,326	Perm	EU005	UK Mainland
DL3BQA/P	500	129	518,580	DXped	EU129	Usedom
DK8OL	605	122	513,864	Perm	EU042	Sylt
9A5V/P	619	101	484,497	DXped	EU016	Sipan
GX4WSM	919	110	478,830	Perm	EU005	UK Mainland

SV1BRL/P	845	95	469,965	100W DX	EU052	Kefalonia
G4JFS	299	141	410,733	Perm	EU005	UK Mainland
DF6QC	492	111	392,940	Perm	EU127	Helgoland
GI0KVQ	634	98	365,148	Perm	EU115	Ireland
OZ1ACB	421	101	359,055	Perm	EU029	Sjaelland
GW0ANA/P	649	102	330,786	Perm	EU005	Sully
AX4EJ	405	82	328,428	Perm	OC001	Australia
VK6NU	378	90	291,060	Perm	OC001	Australia
CT3HF	592	80	249,600	Perm	AF014	Madeira
G3TTC	210	100	196,200	Perm	EU005	UK Mainland
F5TYY/P	443	67	183,734	100W DX	EU064	Noirmoutier
EI4CF	182	95	177,270	Perm	EU115	Ireland
I3BQC/P	332	73	174,324	DXped	EU131	Venice lagoon
OZ8FYN	375	63	169,155	100W DX	EU172	Fyn
G0DIZ	181	89	151,923	Perm	EU005	UK Mainland
IS0LLJ	284	70	151,200	Perm	EU024	Sardinia
EA8AD	450	55	138,270	Perm	AF004	Tenerife
MM5AHO	302	66	137,412	Perm	EU005	UK Mainland
SV8DTP	315	62	125,550	Perm	EU049	Lemnos
EA8IN	359	54	112,266	Perm	AF004	La Palma
G0WAB	231	66	101,970	Perm	EU005	UK Mainland
PP5JD	304	56	99,456	Perm	SA026	Santa Catarina
OZ4PAX	519	42	86,058	Perm	EU171	Vendsyssel
G3YCH	112	66	83,160	Perm	EU005	UK Mainland
SP1MVG/1	140	50	79,800	100W DX	EU132	Wolin
M0BAO/P	239	52	75,972	Perm	EU005	UK Mainland
YB5NOF/P	217	37	73,815	100W DX	OC107	Lingga
M0BTO	135	57	65,493	Perm	EU005	UK Mainland
GM0LUQ/P	165	60	63,000	100W DX	EU008	Skye
9V1RH	83	53	59,625	Perm	AS019	Singapore
CU3CY	221	37	56,242	Perm	EU175	Terceira
MM0BNN/P	325	33	55,935	DXped	EU008	Skye
YB0AZ	191	30	54,990	100W DX	OC021	Java
OY4TN	196	33	46,728	Perm	EU018	Faroe
G4WQI	102	48	44,784	Perm	EU005	UK Mainland
G3OHC	85	48	42,912	Perm	EU005	UK Mainland
OZ1DYI/P	191	33	40,161	100W DX	EU125	Romo
G0ATG	77	46	38,778	Perm	EU005	UK Mainland
JH1UUT	94	41	34,194	Perm	AS007	Honshu
IT9JOF	150	32	32,448	Perm	EU025	Sicily
OH0/SM5TSP	88	35	26,880	100W DX	EU002	Aland
SV9/SV1CID/P	142	28	26,124	100W DX	EU187	Gavdos
CT3KY	68	37	25,752	Perm	AF014	Madeira
VE7XO	69	38	25,498	Perm	NA036	Vancouver Is
JA3TC	48	29	16,356	Perm	AS007	Honshu
GM4ELV	81	28	16,212	Perm	EU005	UK Mainland
DU1LER	111	14	16,126	Perm	OC042	Luzon
JA2GHP	564	40	15,792	Perm	AS007	Honshu
JA3AER	66	27	15,633	Perm	AS007	Honshu
JJ3OOZ	41	28	14,868	Perm	AS007	Honshu
EA8/DL1EJD	184	16	13,824	100W DX	AF004	Lanzarote
JA6QDU	78	18	13,230	Perm	AS077	Kyushu
CU3FT	66	30	13,050	Perm	EU175	Terceira
JG4OOU	62	21	11,718	Perm	AS007	Honshu
OH0/DL3SEM	119	14	8,820	100W DX	EU002	Aland
JH2WHS	36	21	8,568	Perm	AS007	Honshu
JG2REJ	31	22	7,854	Perm	AS007	Honshu
K4RFK	34	20	7,320	DXped	NA069	Pine
CU3ED	75	17	6,681	Perm	EU175	Terceira
JH1MRH	33	33	6,540	Perm	AS007	Honshu
JN3MUC	20	16	3,840	Perm	AS007	Honshu
JA8TEZ	32	14	3,696	Perm	AS078	Hokkaido
JI8GZS	21	14	3,402	Perm	AS078	Hokkaido
JM4UZM	23	12	3,132	Perm	AS007	Honshu
JA2PEI	22	13	2,730	Perm	AS007	Honshu
VK5EMI	17	13	2,516	Perm	OC001	Australia
JG1GCO	13	12	2,340	Perm	AS007	Honshu
CA8VOW	133	1	915	Perm	SA008	Tierra Del Fuego
IS0CLA	14	7	882	Perm	EU024	Sardinia
YC9DBP	239	1	714	Perm	OC022	Bali
EC8ACX	18	5	690	Perm	AF004	Las Palmas
JR2TRC	6	6	540	Perm	AS007	Honshu
JF2FKJ	5	5	375	Perm	AS007	Honshu
VK2CZ	5	4	300	Perm	OC001	Australia
JK8HOS	10	2	132	Perm	AS078	Hokkaido
JK8FRL	8	2	96	Perm	AS078	Hokkaido
PY5VC/P	3	3	27	DXped	SA047	Mel
PY5ZF/P	3	3	27	DXped	SA047	Mel
YC3IZK	215			Perm	OC021	Java

Islands - 12-hour CW

G0IVZ	760	157	735,702	Perm	EU005	UK Mainland
H2G	1,230	100	657,300	Perm	AS004	Cyprus
DL5KUD	517	130	513,630	Perm	EU057	Ruegen
DJ2HW	638	115	441,255	Perm	EU128	Fehmarn
9A/S56A	490	100	377,140	100 DX	EU110	St Nicolas
GM3CFS	280	118	270,456	Perm	EU005	UK Mainland
JH3AIU	681	73	254,259	Perm	AS007	Honshu
G3YEC	260	106	232,776	Perm	EU005	UK Mainland
G3KKQ	611	91	218,309	Perm	EU005	UK Mainland
G0JQN	549	72	193,572	Perm	EU005	UK Mainland
G2HLU	212	93	176,328	Perm	EU005	UK Mainland
G40GB	368	82	173,184	Perm	EU005	UK Mainland
G4BUO	349	78	171,522	Perm	EU005	UK Mainland
G3TJE	380	75	162,000	Perm	EU005	UK Mainland
EI8GP	463	63	147,987	Perm	EU115	Ireland
OZ4FF	462	42	140,700	Perm	EU030	Bornholm
G0UKX	209	77	136,983	Perm	EU005	UK Mainland
PA5TT	422	48	135,888	Perm	EU146	Schouwen
G2AFV	230	65	100,230	Perm	EU005	UK Mainland
G3GMS	182	66	93,060	Perm	EU005	UK Mainland
DF5WA/P	280	51	91,188	100W DX	EU047	Wangerooge
VK4UW	310	43	89,526	Perm	OC001	Australia
G3LHJ	263	59	88,323	Perm	EU005	UK Mainland
LA8LA	103	64	81,984	100W DX	EU036	Hitra
DJ7PT/P	174	53	81,090	100W DX	EU098	Poel
GW3KJN	187	60	80,460	Perm	EU005	UK Mainland
JQ1HIV	139	64	79,680	Perm	AS007	Honshu
EA8DP	302	35	57,750	Perm	AF004	Gran Canaria
KO4PY	264	31	48,267	DXped	NA067	Roanoke
G3VQO	120	48	46,656	Perm	EU005	UK Mainland
OZ/DL2HEB/P	157	37	41,403	100W DX	EU088	Laeso
GW3WWN	261	30	37,170	Perm	EU005	UK Mainland
W4SAA	236	25	33,300	100W DX	NA141	Virginia Key
IS0UWX	191	27	31,644	Perm	EU024	Sardinia
G5G	112	17	28,560	Perm	EU005	UK Mainland
CO8TW	185	27	26,001	Perm	NA015	Cuba
AF4OX	238	22	25,212	100W DX	NA110	St Helena USA
G0MBQ	95	31	21,483	Perm	EU005	UK Mainland
JA1PS	62	34	20,604	Perm	AS007	Honshu
JA2KKA	79	33	20,427	Perm	AS007	Honshu
G4ZME	53	33	20,295	Perm	EU005	UK Mainland
YV7QP	264	18	20,088	Perm	SA012	Margarita
YB4JIM	84	27	18,468	Perm	OC143	Sumatra
LA3BX	65	26	16,302	Perm	EU061	Hidra
DK4CU/P	78	23	14,318	100W DX	EU047	Juist
GW3SB	78	25	13,050	Perm	EU005	UK Mainland
G4OOS	74	25	13,050	Perm	EU005	UK Mainland
7K1EQG	52	26	11,856	Perm	AS007	Honshu
WX3Q	121	10	7,680	100W DX	NA083	Tangier
JA7ARW	40	20	7,200	Perm	AS007	Honshu
JA4BAA	38	12	3,816	Perm	AS007	Honshu
JA3NMV	12	11	1,848	Perm	AS007	Honshu
EI/DL3OCH	100	3	972	100W DX	EU115	Ireland
JA1AAT	5	2	78	Perm	AS007	Honshu

Islands - 12-hour Multi-Mode

9A4W	290	198	823,284	Perm	EU016	Brac
RA0FA	755	122	663,924	Perm	AS018	Sakhalin
G0MTN/P	781	143	621,621	Perm	EU005	UK Mainland
UA0FZ	334	155	585,900	Perm	AS018	Sakhalin
UA0FDX	790	121	507,474	Perm	AS018	Sakhalin
9M2TO	704	70	299,880	Perm	AS015	Penang
EI4DW	540	88	251,328	Perm	EU115	Ireland
G6QQ	240	93	175,212	Perm	EU005	UK Mainland
N2US/P	451	68	173,604	100W DX	NA083	Chincoteague
G4FVK	202	83	143,092	Perm	EU005	UK Mainland
IK1QBT/P	331	25	124,125	DXped	EU083	Bergeggi
G4BJM	531	56	122,808	Perm	EU005	UK Mainland
OZ1IVA	241	55	95,205	Perm	EU029	Sealand
YB5QZ	366	33	87,318	Perm	OC143	Sumatra
JA7IC	212	52	71,760	Perm	AS007	Honshu
JM2RUV	197	46	54,510	Perm	AS007	Honshu
JF2SKV	81	55	52,965	Perm	AS007	Honshu
G3ECS	116	51	43,146	Perm	EU005	UK Mainland
JR1LEV	75	44	37,972	Perm	AS007	Honshu
JI5SKS	150	25	27,450	Perm	AS076	Shikoku
JS3CTQ	45	40	27,000	Perm	AS007	Honshu
JG1OWV	46	41	25,830	Perm	AS007	Honshu
KS4S	124	27	18,792	100W DX	NA112	Sunset Beach
JA1MXY/1	40	25	12,300	100W DX	AS043	Hachijo
G4XPE	51	24	11,736	Perm	EU005	UK Mainland
JF7GDF	25	16	9,272	Perm	AS007	Honshu
JA1XRH	24	21	6,804	Perm	AS007	Honshu
JG3NKP/1	28	18	5,616	Perm	AS007	Honshu
LA9AU	27	17	5,049	Perm	EU033	Hinnoya
K0DI/KH6	432	9	3,888	DXped	OC019	Oahu
JJ1JRH	16	14	3,178	Perm	AS007	Honshu
JK2VOC	52	31	1,798	Perm	AS007	Honshu
JG3WCZ	5	5	375	Perm	AS007	Honshu

Islands - 24-hour Multi-Mode

M5D	2,285	247	2,902,497	Perm	EU005	UK Mainland
9A/S51TA	2,065	215	1,938,870	100W DX	EU110	Istra
CQ9T	1,729	169	1,657,383	Perm	AF014	Madeira
9A/OM3RM/P	1,356	185	1,636,140	DXped	EU136	Krk
9A/OE1EMS	1,313	173	1,481,494	DXped	EU136	Krk
GM4BVJ/P	1,550	168	1,464,624	DXped	EU009	Papa Westray
MM0BQI/P	1,200	171	1,374,840	100W DX	EU010	Benbecula

BO2YA	1,434	98	1,305,948	DXped	AS102	Kin Men
GJ2A	1,563	164	1,247,712	Perm	EU013	Jersey
KH0A	689	101	811,131	100W DX	OC086	Saipan
9A2V	1,139	105	787,290	DXped	EU170	Vrgada
FS/N3OC	1,297	111	712,953	DXped	NA105	French St Martin
DL5CW/P	852	100	481,200	100W DX	EU128	Fehmarn
K1VSJ	552	120	444,960	100W DX	NA046	Martha's Vineyard
IM0/IV3NVN	645	101	367,932	100W DX	EU041	Maddalena

PA2JJB	409	85	238,680	Perm	EU038	Texel
JH5OXF	309	82	180,318	Perm	AS076	Shikoku
IM0/IS0IGV	662	47	141,705	100W DX	EU165	Sardinia
JE1REU	321	50	100,950	Perm	AS007	Honshu
GJ/ON7PC/P	251	49	71,001	100W DX	EU013	Jersey
UA0QBA	297	33	63,657	Perm	AS028	Kotelny
OJ0/SM0NJO	200	24	21,240	100W DX	EU053	Market Reef

World Section

World - 24-hour SSB

Pos	Callsign	Score
1	DL8UD/P	2,809,560
2	UA4LCH	2,574,936
3	YU1JW	2,196,990
4	LY2WJ	1,708,512
5	S51CK	1,348,326
6	UP5P	1,259,670
7	LZ1KSN	1,083,303
8	9A4SS	1,052,352
9	UX7MM	1,005,984
10	RV0AR	969,744
11	SP4GFG	956,412
12	LX1NO	860,640
13	SK0HS/0	857,208
14	SP9X	854,379
15	DE7BME	708,480
16	ON5GQ	680,400
17	YU7QL	555,255
18	YU1RE	546,558
19	UT2IZA/P	484,050
20	OK1VSL	481,596
21	SM0R	427,977
22	IK6UBY	406,575
23	3Z6V	379,476
24	DH4JQ	375,273
25	SP9QMP	365,313
26	UZ4E	361,728
27	RA6DEJ	319,572
28	DL5AUA	298,053
29	SP9KDA	291,183
30	SP3NUN	291,042
31	SP3NUN	291,042
32	RA3QH	254,212
33	SP6TRX	230,496
34	RN3OK	218,280
35	N3FX	196,011
36	S57UYX	192,240
37	IV3AJZ	189,810
38	DH5WB	182,148
39	4N4KP	180,000
40	SP9HQC	174,096
41	S57MTA	171,738
42	UR6MX	166,374
43	OM3YK	149,685
44	UA9ACJ	149,380
45	UR7EM	137,124
46	VE3ZZ	136,809
47	K4GW	128,094
48	UA4NC	127,500
49	PU2PGR	126,976
50	PY5GVC/P	125,235
51	SP3GHK/3	121,472
52	UA1AFZ	110,955
53	SM7BJW	104,448
54	DL2FK	100,521
55	CE6ABC	66,411
56	EA5JC	63,684
57	YO4AAC	62,658
58	IZ4AQL	61,776
59	RX3AJL	57,624
60	DL4NT	48,510
61	HS1CKC	46,452
62	LZ5AZ	40,016
63	UR5KBY	35,100
64	IK0STM	34,560
65	SP2QVU	32,940
66	OK1VHV	29,859
67	PA3DDP	29,070
68	IK2VUC	28,638
69	EA3DZZ	28,272
70	RA4UAT	18,768
71	PY1AFS	2,952

World - 24-hr Multi-Mode

1	UU2JQ	5,103,737
2	HA1AG	4,394,250
3	YU7BW	4,273,044
4	DL4MCF	4,166,274
5	DL5AWI	3,430,716
6	DK3DM	3,084,093
7	UT2FA	2,880,126
8	W1NG	2,760,471
9	ER/UT7ND	2,372,928
10	YZ1SG	2,323,152
11	UA2FB	1,740,222
12	DL6JZ	1,732,776
13	UT5JDS	1,724,220
14	UY5ZZ	1,681,902
15	OK1DOL	1,594,188
16	HA0HW	1,461,424
17	YO7LCB	1,405,392
18	LZ1BJ	1,400,352
19	UA9AM	1,392,930
20	HG8W	1,338,876
21	SP6MLX	1,237,488
22	RA1ZZ	1,164,075
23	RK3EWA	1,101,555
24	RA3NZ	1,067,024
25	UX8IXX	1,005,340
26	EU1SA	829,656
27	OK1FHI	824,976
28	LZ2AU	821,370
29	OK2HBY	798,189
30	DL5JRA	769,656
31	K4BAI	676,800
32	UA3QU	655,560
33	RW3DY	602,316
34	OK2EC	584,160
35	RX3AEX	579,384
36	DL1ARJ	537,294
37	DL3BRA	514,050
38	DL3ZAI	450,240
39	DL1DQY	443,700
40	F5ICC	441,942
41	RA3NC	418,770
42	W5FO	414,936
43	UT5JAP	412,593
44	OK2SGY	389,625
45	OK1AD	385,875
46	HA5JP	376,920
47	DH9SBL/P	349,440
48	RK3DZD	348,079
49	LY2OU	329,943
50	F5RAB	329,724
51	EA7AKJ	320,787
52	VO1SDX	319,986
53	UA3AGS	314,364
54	N6VR	289,416
55	YU1AAV	288,580
56	9A2TN	276,060
57	DL8DXL	260,064
58	RW6BN	251,877
59	SM6WQB	247,968
60	UR3CMA	245,520
62	SP5ICS	235,293
63	SP5LCC	229,500
64	N4MM	227,156
65	VE2AYU	221,850
66	W1JR	198,699
67	US0YA	193,662
68	OM7PA	189,959
69	DL7VSN	185,148
70	HA8LKB	174,560
71	4Z5FW	159,995
72	RU3WR	153,576
73	UA3XAC	151,360
74	YU1PJ	151,032
75	RW3PN	134,685
76	K4IU	132,000
77	PA3HDP	114,678
78	LZ2UZ	109,746
79	OM3CDZ	109,674
80	PY2NY	101,286
81	RV9DC	98,880
82	UR5FCM	94,689
83	UT7CA	67,065
84	UT5HP	56,820
85	KW4JS	55,272
86	PU2NYV	51,168
87	SP5CGN	49,113
88	VE2AWR	45,216
89	OK2SWD/P	44,955
90	UA4LY	37,260
91	OK2BJ	29,400
92	RA9ST	23,130
93	EA5BAO	14,703
94	LY2UF/P	1,998

World - 24-hour CW

1	HA8VK	2,023,120
2	RA1ACJ	1,689,405
3	HA1CW	1,620,830
4	UT7QF	1,481,706
5	DL6KVA	1,449,840
6	EU5A	1,320,774
7	UW5Q	1,287,210
8	DL3KUD	1,111,374
9	UY0ZG	996,072
10	OK1HX	964,800
11	RZ9HT	956,160
12	VE3KZ	953,904
13	YT0A	943,488
14	HA3LN	864,954
15	YL2UZ	821,408
16	UR7IA	744,162
17	SP1NY	627,060
18	HB2DOT	601,776
19	UA9XEN	559,206
20	RN6CF	500,263
21	HB9ARF	483,840
22	DJ1YFK	483,000
23	RN6AL	445,998
24	OK1FCA	423,672
25	LU1DZ	413,295
26	F9KP	402,831
27	UA9AOL	392,700
28	RK0SXF	324,621
29	NT1N	310,272
30	UR3MP	296,238
31	PA0RRS	286,452
32	OK1ZP	269,880
33	OK1XC	265,356
34	4N7N	263,307
35	S53AU	253,590
36	RW6HX	233,142
37	DL1IA	230,160
38	UY5WA	209,520
39	SP8BAB	208,800
40	RZ4AG	205,590
41	OK2BEM	204,750
42	SP3CW	202,582
43	UA0ZDA/6	198,744
44	HP1AC	183,400
45	RW1AI	177,750
46	OK2SJ	175,446
47	LA2HFA	151,320
48	YO4KCC	142,884
49	EA5FID	139,500
50	DM3PKK	137,700
51	KE8M	133,632
52	UR6QS	130,812
53	UR5SBM	126,420
54	OK1LO	124,173
55	UA9AX	106,860
56	S59DDR	102,780
57	UT4NY	102,336
58	PY2NY	101,286
59	4K9W	98,946
60	OH1BOI	98,739
61	OM2TB	91,044
62	UA4AO	68,175
63	HS6NDK	66,456
64	SP5ULV	53,360
65	SP7CKP	50,382
66	UA4RF	49,365
67	OM7VF	46,200
68	SP7FGA	46,056
69	PY3AU	31,473
70	DL5JS	25,092
71	RV1AB/MM	19,899
72	RA9SG/P	18,408
73	RN0A	15,057
74	HL5AP	13,455
75	UA4LU	11,025
76	UT3EK	8,625

World - 12-hour SSB

1	UT5UGR	1,446,009
2	IK2UCK	1,109,328
3	PY2KC	969,984
4	DK7YY	895,284
5	I2AT	671,370
6	SP9W	636,300
7	SP4TKR	604,800
8	EM6M	570,843
9	OM3EA	502,254
10	SP9LJD	497,640
11	UA3BL	467,487
12	ZX2B	399,204
13	CT1ETE	346,491
14	RZ4AL/P	338,328
15	DL3ABL	315,609
16	9A2BD	314,640
17	UN2O	307,552
18	RU3DVR	252,810
19	I7FMN	249,750
20	OK2BJT	247,491
21	IK2RPE	243,492
22	XE1L	228,786
23	SV8DTL	225,996
24	OM7AR	210,758
25	SP6IEQ	200,784
26	EA4EMC	194,628
27	W3TN	194,085
28	IZ8DBJ	190,992
29	OK1JN	190,325
30	UR5XAW	183,762
31	IK4DSP	182,160
32	IZ1DFK	181,545
33	SP9HQC	174,096
34	PR2G	171,684
35	SP4TVO	170,829
36	RV4AM	169,818
37	SP1HTS	167,826
38	EA4ATI/1	166,536
39	PA0RBS	159,528
40	OE7AJT	154,512
41	YO5CRQ	146,286
42	OK1GW	143,565
43	EA1ET	141,600
44	RA3DCT	141,525
45	9A2KO	134,280
46	EA1CS	131,742
47	OK2BHM	131,166
48	DH2SP/P	128,865
49	SP6OPE	127,920
50	DL7NFK	123,876
51	DH2PL	115,884
52	IN3XUG	103,944
53	IZ6CST	103,500
54	UR2E	100,776
55	W6AFA	99,186
56	W1DAD	98,865
57	DH3SWH	95,160
58	SP5BB	90,249
59	I4CSP	78,912
60	SP6FXY	73,416
61	DL0GEO	69,660
62	DL2YED	66,258
63	IZ0CRN	66,165
64	OK1AKF	65,550
65	EA5JC	63,684
66	SP1IXG	63,180
67	PT2TF	61,593
68	EA4YK	59,472
69	F5NDC	56,595
70	EA1AAW	55,125
71	OZ1LGK	54,918
72	ER3DW	54,000
73	TI2DLL	51,600
74	W8TTS	49,833
75	U1BA	48,081
76	SP4SHD	48,000
77	DL3HP	46,920
78	F8AMV	46,856
79	SM4BTF	43,974
80	IK2YSJ	43,214
81	CT1EWA	42,864
82	IZ2BKA	42,372
83	EA3FAJ	41,715
84	K6ACZ	41,310
85	ER5DX	41,280
86	EA3DVJ	39,438
87	SP5DRE	38,025
88	DL1ASF	37,440
89	HB9FBI	37,200
90	SP9LDI	37,023
91	UT7MD	35,376
92	EA1DBC	35,370
93	EZ8CW	33,485
94	EA5VR	33,390
95	SQ9FQY	31,800
96	EA3LS	31,740
97	UA6YEF	31,505
98	LU4DRC	31,185
99	SP8OOB	31,005
100	DJ3XM	29,718
101	OH1HJO	28,680
102	CT2GBK	28,512
103	PY2QA	27,840
104	HA9MDP	27,324
105	PY1SX	26,400
106	IK8IOP	24,687
107	KC8HWV	24,420
108	PY2LED	23,562
109	IK7WPD	21,483
110	RA6YJ	21,000
111	K3GV	20,928
112	WB0YJT	20,352
113	DL1HSR	20,196
114	YL2NS	19,716
115	SM7FTG	19,680
116	EA4APP	19,530
117	VE4RP	19,264
118	N2SQW	19,080
119	YO3BWK	18,042
120	EA5AEN	17,980
121	3Z5NHV	17,856
122	SQ5ABG/7	17,664
123	YO6AVB	16,968
124	PA0JNH	16,896
125	RW9RF	16,524
126	LU4DJC	16,269
127	DL8ULO	14,775
128	LA1VKA	14,700
129	YO9GZU	14,544
130	EA5CGU	14,400
131	YO9IAB	13,824
132	UA9ZBN	13,446
133	OH5PA	13,008
134	ER5OK	12,750
135	US5MHK	12,600
136	W5CTV	10,950
137	ON4CHK	10,950
138	DK5KJ	9,867
139	DL7UGH	9,240
140	EA5DIT	7,260
141	PT2OI	7,140
142	LU7DW	6,966
143	9A2GA	6,834
144	SQ8JLF	6,681
145	EA3GHQ	6,540
146	PY5HSD	6,372
147	EW7BU	6,336
148	UA9LGD	6,270
149	YU7SF	6,144
150	PR7FN	5,502
151	N2LQQ	5,392
152	YU1AAT	5,049
153	PY3AJB	4,720
154	N8WEL	4,032
155	ES5CX	3,888
156	9A6PKT	3,780
157	Z35M	3,682
158	SP3XR	3,510
159	3Z7FBQ	3,360
160	IK8IFW	3,140
161	UA3BLE	2,820
162	PU2TES	2,630
163	SP3NGB	2,409
164	K1MOM	2,112
165	PY2OZF	2,079
166	PY6WO	1,815
167	PV8IG	1,782
168	UR7UL	1,632
169	EA3BJE	1,377
170	PY5TJ	1,160
171	UT4MW	1,104
172	PR7AR	495
173	YO9AHX	442
174	DL0GEL	330
175	PY5BF	176

World - 12-hr Multi-Mode

1	RK3DH	1,182,720
2	ON4CAS	713,502
3	YO6BHN	610,344
4	SP2EWQ	603,570
5	OK2SG	505,395
6	WB2YQH	477,000
7	RA3AUM	471,105
8	S51FB	416,412
9	UT5PW	391,860
10	N4UH	345,576
11	OM7RC	340,380
12	S58MU	338,952
13	K5ZD	317,343
14	LY2FN	316,472
15	RV1CC	314,640
16	US3QQ	309,836
17	UY5TE	284,148
18	OZ6PI	272,802
19	LZ1ZF	245,670
20	DL3JPN	236,340
21	AA4V	217,116
22	UA0QO	189,150
23	VE6JO	176,904
24	DL7FER	171,444
25	OK1ANN	171,360
26	RV3YR	169,389
27	RV3LO	163,308
28	SM3X	153,630
29	F5ROW	135,207
30	UA0ACG	119,470
31	UX5EF	117,300
32	OK1AK	106,215
33	OK1FKV	102,510
34	HB9DCM	101,574
35	UA0SJ	94,024

CONTINUED ON PAGE 80

Members' Advertisements

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

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

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

FOR SALE

ANDREW LD2-50 Heliax 50W, $^3/_8$in cable. Last chance to buy this superb coax at £1.35 per metre. Peter, G4GYI. 01789 763 565 (Alcester).
E-mail: ward.p@virgin.net

COMPLETE 4m setup - RN Electronics 2/4 tvtr, 10W out, MM linear 10W in 100W out, Eagle 4-ele beam, £300 or will split. Kenwood TR-751E immaculate, man, mount, mic, £250. Kenwood TR-851D, £190. Pye A200 4m linear 10W in 50W out, £50. Datong ASP speech processor, £40. 8A PSU, £20. Kenwood SP-820 speaker, £25. Open to reasonable offers on all above. 01204 594 235 (Bolton).
E-mail: neil@g1hsg.freeserve.co.uk

FOR sale Yaesu FT-290R. Trio R-600 with Yaesu FRT-7700 tuner. Icom IC-T8E. Tokyo HL35V 144MHz amp. Daiwa rotator. BNOS 12V PSU. Drae wavemeter. SMC power and SWR meter. Most boxed from well-loved shack. Offers. 07774 466 928 (York).
E-mail: chris@hi-qbroadcast.co.uk

HENRY 2006A amplifier, 1kW out on 50MHz, 18 months old, little used, £1,200. Bob McHenry, G3NSM. 01865 556 321 (Oxford).
E-mail: mchenrymsn@msn.com

ICOM 746 HF/VHF tcvr, gc, boxed with accessories, man and RS-746 remote control software, £875. Siskin multi-cat system, £15. Iomega 250MB computer zip drive, IDE internal mounting with 8 blank discs, £75. Buyer collects or pays carriage. 01986 798 524 (Woodbridge).
E-mail: steve@sbolvic.demon.co.uk

Q-TEK Penetrator 1.8-60MHz vertical, nearly new, £100. TA-33Jr-N-W, 20-10 4-ele mini beam, £200 ono, instruction man, buyer collects. 01903 722 753 (Littlehampton).
E-mail: mervynrw@lineone.net

YAESU 101ZD, needs repair, mains transformer damaged when output valve collapsed. Receiver OK, a real bargain for repair or spares. Complete workshop man and two 12BY7A drivers, £90 plus carriage. Also a popular Trio 430S needing repair, c/w all parts, owners and workshop mans, £90. Worth £400 when repaired, collect or transport (£8 - £10). 01793 814 280 (Swindon, Wilts).

AA&A magnetic loop antennas AMA3, 10-20m, and AMA5 30-80m with controller, power supply and mans. Owned from new and in exc cond. Easy to tune and reliable in use. Sale due to house move, £200 ono. G0TLS. 01691 622 469 (Ellesmere, Salop).
ALBRECHT 485S 10m multimode, boxed with instructions. Used only once, cost £179.99, want only £110. M0COK. 0121 243 3805 (Birmingham).
E-mail: wonderhorseuk@yahoo.co.uk
ALINCO DJ-F1 h/held 2m airband rcvr, spare battery holder charger, £100. MFJ TNC2 packet model 1270C, complete, £100. 01757 700 332 (nr Selby, N Yorks).
E-mail: alan@semark.freeserve.co.uk
AMPLIFIER 160-10m + WARC, Tokyo HL1KGX, boxed, exc cond £450. FT-77 HF 100W out, £150. KR-400 rotator + controller, £120. Target HF2 rcvr, brand new £95. Pro 2006 scanner up to 1300MHz, £80. Yaesu FC-420 ATU, brand new, £75. Heil HM-10 dual h/mic, HC4 + 5 inserts, £70. Complete set traps Cushcraft A3S, brand new, £120. Philips FM1000s for conversion to 4m, just need reprogramming, no retuning needed, £55 each. 45ft marine vertical, £100. Postage at cost. 01953 884 305 or 07970 214 039 (Norfolk).
ANY reasonable offers considered for the following: Advance dual-beam oscilloscope with brand new test prods. Storno ex-PMR rig converted to 2m with W&D synth, full man and spare rig. FT-209 h/held + original packing. W&D 25W 2m linear. BC221AK signal generator. Valve signal generator (circa 1960) . Taylor 85A test meter with man. QRP 80m/40m amp. Crystal marker. Lafayette HA500 amateur band rcvr. Lafayette HA63 broadcast band rcvr (needs attention). All-band ATU – 1 ATU per band, used on HF NFD. 2 x 2in mast joiners. 2m Halo. Record your phone CQ on my Maplin unit. Misc ceramic insulators. ATU (rcvr). Chrome Morse key. Bakelite Morse key. Jackson 6:1 slow motion dial. 4-way ant switch. CW audio filter. KW in-line LPF for transmitter. 10m rcvr preamp. Low power SWR bridges, one commercial, one homebrew. 0.5A RF thermocouple meter. Several variable capacitors up to 50pF. High-power balanced ATU. Altai GDO. Homebrew capacitance meter. 1960s Acos crystal mic. *Sprat* 1990-98. *Morsum Magnificat* 1986-7. *RadCom* 1998 onwards, and many old magazines (*PW*, *Aeromodeller*, *TV*) and old and new radio books, call for a complete list. Geoff, G3YLC, NOT QTHR. 01908 543 643 (nr Milton Keynes).
AT-600 VHF/UHF h/held plus wideband coverage to 999MHz, h/book, holster, desk stand, h/speaker mic, boxed, vgc, £110 plus post. 01256 465 126 (Basingstoke).
BNOS 432MHz 50W linear amp, £140, Navico AMR1000s 2m FM mobile, pristine cond, £90, BNOS 12/20R PSU, £30, R107 WW2 'reception-set' with original h/book, £75. Possible to deliver up to 100 miles. 01763 262 443 (Royston, Herts).
E-mail: alan.florence@tinyonline.co.uk
COMMODORE VIC20 computer with C2N cassette unit record/player, many cartridges eg VIC-1211A super expander, VIC-1212 programmer's aid, VIC-1213 machine language monitor etc, books - beginners to advanced, buyer collects, £25. Data Dynamics printer type ZIP02. Kneehole height over 0.6m and unit 0.65m wide. Also reads/writes punched paper tapes. Interfaces with VIC20 above, £25. Both for £40. 01302 365 472 (Doncaster).
DOWNEAST Microwave 6cm tvtr kit and LO kit, £220 inc preamp. Also 10W solid-state amplifier, tested and relay, £175. G8LMW. 01455 824 780 (Leicester).
E-mail: chris_harri@lmw.co.uk
DRAKE R4B rcvr, exc cond with copy of man, £250. Datong AD-370 balanced active antenna, unused, £60. 01245 381 961 (Chelmsford).
DRAKE TR7 HF tcvr inc CW and AM filters, £200. Heathkit SB-230 1kW linear, £250. Kenwood TR-2300 2m plus 10W amp, £40. GM3WKZ. 01847 802 033 (Thurso).
E-mail: crbayliss@aol.com
EDDYSTONE 1650/2 table-top model USB/LSB, memo, sweep, scan, auto/man tuning, man, first class radio, £750. Racal 1792 backlit, BITE, full filters, man, £750. Eddystone 1837/2, USB/LSB, digital table-top model, £350. 940 vgc, man, £200. Inspect, collect or pay postage. 020 8813 9193 (West London).
FORTOP ATV 23cms transmitter, model NR TVT1300, £95. Brian, G3GSI. 01435 883 248 (Heathfield, Sussex).
E-mail: brian@g3gsi.freeserve.co.uk
FT-101 with fan. SEM Transmatch. Daiwa NS-660P SWR/power meter. DL-1000 dummy load. Diamond, CP5 vertical antenna. £200 (lot). G3XHC, QTHR. 01803 833 621 (Dartmouth).
E-mail: stan@blunderboss1.worldline.co.uk
FT-102 & FV-102DM, CW filter, slight fault, hence £150 ono. KT44 UHF h/held, £35 ono. Buyer pays carriage. 01473 737 320 (Ipswich).
E-mail: dave.powis@planet-interkom.de
FT-2700RH dual-band mobile with mount and mics, £295. Diplexer to one antenna, £20. Marconi sig-gens, £35 & £99. Digital multimeters, £35 & £45. Lab PSU 0-30V, heavy, £20. Lots of cables, air-spaced VCs, components etc on www.zczc.demon.co.uk or ring for list. 01477 533 011 (Holmes Chapel).
E-mail: roger@zczc.demon.co.uk
FT-767GX all mode tcvr 2m 70cm modules auto ATU, vgc, desk mic boxed, man, circuit diagrams matching headphones, £620. KAM all mode TNC, mans, cables for above, £100. Realistic PRO2006 scanner VGC, boxed, man, £100. Realistic analogue multimeter, as new, £20. 01925 821 414 (Warrington).
E-mail: james@sfenpoe.freeserve.co.uk
FT-920 HF rig + 50MHz, FP-1030A power supply, SP8 speaker, MD-100 mic, FM board, CW filter, 2 years' breakdown & accidental damage cover, very limited use hence sale, boxed, mans, mint cond, £1250 ono. Jaybeam Minimax tribander, as new, £150. Daiwa rotator, £50. 813s & bases, £25. GW4VDP. 01407 861 157 (Holyhead).
GEC BRT462E rcvr fair cond, working, case, £60. Inspect, collect. 020 8813 9193 (Middlesex).
HEATHKIT HW7 classic QRP, 7/14/21MHz, original, c/w cct, £35. Marconi T52 rcvr, £40. Murphy A128 B/C rcvr 8-waveband, impressive, £40. Want brass key. 01637 875 848 (Newquay).
E-mail: m0bga@thersgb.net
HEATHKIT SB200 HF linear amplifier, gwo, £210. Not kit construction, immaculate. G4AKG, QTHR. 01444 239 371 (Burgess Hill).
HILO-MAST HD 14m pneumatic, with new seals / spares pack, 12V compressor, purpose-built compact trailer with electrics, unused spare wheel / tyre, outriggers, brakes, large equipment box. Ideal contester group or club. Easy solo operation, vgc, cost £6500, first £1500 secures. 01733 205 333 (Peterborough).
IC-271E 2m base m-mode Mutek complete check by Icom UK, £300. National NC-303 rcvr, ham band good cond with 2m module, h/books, £185. Icom IC-740 HF tcvr, £185. Collins TCS rcvr, £40. Yaesu FC-420 remote-controlled antenna coupler, boxed, new, £45. Ferrograph Series 5 ½-track stereo, good cond, £80 Tannoy Chatsworth speakers, perfect, £500. Call after 12 noon. 01273 454 108 (Shoreham by Sea).
IC-706 Mk1 HF/6m tcvr, almost unused. Matching AT-180 ATU. Sagra 600 2m QRO valve linear, 25W in 600W out. FT-212RH 45W 2m tcvr. FT-47000RH 144/430 FM tcvr inc remote mounting kit. TM-451E 70cm FM tcvr. All above mint cond, boxed, with mans. Yaesu FT-736 VHF/UHF/6m tcvr, well used but exc cond. Handipacket portable TNC. FT-290R Mk1, no batteries or charger. 12V 20A PSU. BNOS 12V 25A PSU. All above in sound working order and for sale due to planning permission problems. Open to all serious offers – buyer collects or pays postage. May also sell Yupiteru MVT-7100 scanner, FT-5100 144/430 FM tcvr with remote mounting kit and TH-79E 144/433 h/held, if offer acceptable. Nick, G7EQM, NOT QTHR. 01952 521 211 day & 01788 811 582 eve (Warwickshire).
E-mail: nick.buckley@ird.eds.com
ICOM 756**,** Icom 706 Mk2**G,** Kenwood TH-7E, Yaesu FL-2100Z, MFJ-984C, Cobwebb antenna, 6250 rotator, Hy-Gain DX-77, Manson 30A PSU, plus many other items. All items in mint cond, please phone or e-mail for full details and prices. 01257 249 185 (Chorley, Lancs).
E-mail: khbrookes@thefreeinternet.co.uk
ICOM IC-706 Mk1, boxed, £450. Icom IC-746, ATU fitted, boxed, £750. MFJ-945 ATU, boxed, £50. Yaesu FT-747, £350. 01952 415 451 (Telford).
E-mail: xtc99@madasafish.com
JAYBEAM DB4-4/6 4-ele Yagi for 4-6m with instruction book £50, carriage extra. M Good, M5ACP, QTHR. 01702 559 099 (Benfleet).
E-mail: mgood@efaman.fsnet.co.uk
KENWOOD TR-751E mint, boxed, mans, quick release mount, £250. Yaesu FT-290 with mobile mount, 25W linear, man, £100. HF linear, homebrew, 813s, separate PSU, £50. Microwave Modules 100W 2m linear. 01608 641 038 (Chipping Norton).
KENWOOD TS-430 with FM plus AT-250 auto ATU, £300. PDL2 quad - reasonable offers, brand new, still boxed. Would exchange or PX for 2m linear or laptop PC. 07958 556 568 (Coventry).
E-mail: g@mackg.freeserve.co.uk
KENWOOD TS-450SAT as new, little used, great performance and cond, £575. Bill, GM3GJB. 01324 623 608 (Falkirk, Scotland).
KENWOOD TS-530SE with Shure 201 mic, gc, £190. G3VNI, NOT QTHR. 01947 895 895 (Whitby).
KENWOOD TS-830, VFO 230, digital remote VFO, YK88C YG455C 500Hz CW filters, spare pair brand new GE 6146B, original owner, non smoker, mint cond, box, man, brilliant CW set up, £375 plus carriage or collect. Steve, G4EDG. 01392 216 579 (Exeter).
E-mail: steve.p.taylor@btinternet.com
KENWOOD TS-850S HF tcvr inc CW filter, exc cond, £650 ono. David, 01977 558 706 after 6pm (Castleford).
MANY bargains. Yaesu FL-50/FR-50, £50, plus lots more. E-mail or phone for list. Liner 2 2m/SSB, £25 - loads more. 01473 314 151 (Ipswich).
E-mail: julian@pjiredale.freeserve.co.uk
MFJ 989C 3kW tuner, original box and man, £200. 01442 824 402 (Tring).
MOSELEY Mini-33 beam £200. Buyer collects. 01842 752 875 (Thetford, Norfolk).
E-mail: billdebass@btinternet.com
PSION Organiser series 5 as new, boxed, man, PC connect kit, £200. Psion series 3A, spec as above, £100. 01386 710 089 (Pershore).
RECEIVERS DIY Eddystone 1837 ex-factory modules, mechanics, man, you provide chassis and time, offers? Kenwood R-5000, standard model, £350 DX-394, £75. Datong 0-30MHz to 144MHz or 28MHz, £75. Eddystone 898 dial, £25. Want Drake R-V75 VFO. Tony. 01905 641 759 (Worcester).
RELUCTANT sale of cherished gear – Collins Racal KW etc plus test gear. Phone for details, G3WDN, QTHR. 01502 715 537 (Beccles, Suffolk).
SGC2020 HF tcvr, superb QRP rig, exc cond, £350. KW Ezeematch. 160m added, £100. Carriage extra. G3EGS, QTHR. 0121 414 0443 (Birmingham).
E-mail: rbobc@btinternet.com
SILENT key sale. Icom IC-R71E HF-comms rcvr, boxed, man, leads, gc, £450. Yaesu FT-480R 144MHz multimode 30W tcvr, boxed, mic, DC lead, mounting bracket, £225. ERA Morse Microreader, £90. Eddystone 990R VHF rcvr, h/book, £100. All ono, carriage to be arranged. Robert, GD4GNH, QTHR. 01624 823 415 (Isle of Man).

CONGRATULATIONS

to the following whom our records show as having reached fifty years' continuous RSGB membership this month:

G3HIA	Mr H C Young
GI3HXH	Mr J J Cosgrove

SILENT key sale. RA17L, RA1217, RA17L for spares. CT501 wobbulator. Daiwa NS-660P SWR/PWR meter. Datong FL3. Datong RF speech processor. Kenwood AT-50. Alinco DX-70. Yaesu FL-DX500. MFJ Versatuner 2. Mihuzo G-QRP board. Microset PT-120 12V/20A PSU. Heathkit Cantenna load. Skyking 2303 rotator. AVO8 (3kV Army version) cased, vgc. Incomplete KW1000E linear. Storno CQM644. Hansen FS711 SWR/PWR meter. Belcom PT205 2m h/held Western DX34 3-ele beam on pump-up mast - buyer dismantles. Pair 4CX250B. Sensible offers invited located Oxford, G3LVW, QTHR. 01628 485 167 (Marlow).
E-mail: g3lvw@amsat.org

SILENT key sale. Yaesu FT-1000MP, PSU FP-1030A, mic MH-31, £1350. Kenwood TS-850SAT, spkr SP-31, mic, PSU P-300, £675. Icom IC-228E, mic HM-I5, Daiwa PSU 120MII, £150. Versatower 40ft crank-up 3-section tower with electric winch and H/D auto-transformer, £295. Buyer dismantles and removes. Antenna DX33, £150. Rotator Emotator 105TSX, £125. Sigmatech DX-peeper, £75. All items gwo, ono. G3GMY, Frank. 020 8449 7203 (Barnet, Herts).

SONY reel-to-reel video recorder CV2100ACE, gc, but not working, some tapes, service and operating mans, £20. Dave, G6KIE. 020 8397 3614 (Chessington).

SPECTRUM analyser HP 8554B (1-12000MHz) complete, working. Best offer secures. Other bargain test equipment (silent key) SAE for details. G3XIZ, QTHR. 01767 314 693 (Biggleswade).
E-mail: chris.osborn@talk21.com

SSB LT23S 1296MHz± tcvr, £200 ono . IC-821 2/70cm tcvr, £700 ono. Alex, GM8BDX, QTHR. 01890 830 294 (Coldstream).

TRIO Kenwood TS-530SP, SP-930, ATU, AT-230, fist mic £500. Kenwood desk mic MC-85, vgc, £80. Datong D70 Morse tutor, £25. Nevada roller coaster ATU 3kW £80. SEM ATU, £45. Solid brass pump key, 1 of only 50, £100 ono. All very good cond. Collect or pay post/package. 01642 273 976 (Middlesborough).
E-mail: g0utp-1@ntlworld.com

TRIO TS-700G 2m multimode tcvr. Datong PC-1 gen coverage converter, SWR-200 SWR/power meter. KW low-pass filter 1-8-30, £100 the lot, buyer collects. G3ZNW, QTHR. 07714 482 414 (Crawley).
E-mail: blasdell@btinternet.com

TS-440S with auto ATU, gc, £430. Also FT-102 with 1.8kHz and 300Hz filters, in exc cond, £300. G4UWS, QTHR. 01202 732 912 (Poole).

TS-950SD top cond, filters AATU, PSU, £1199 ono. AEA PK-232MBX, £199 ono. Going QRT. 020 8309 1295 (Sidcup).
E-mail: g0kpz@yahoo.com

VERSATOWER P60 3-section tilt-over c/w winches etc, £490, buyer dismantles and collects. New unused auto-brake winch, £65. Daiwa MR-750 H/D rotator, £145. TET HB433DX 3-ele 10-40m beam, £90. Sale subject to QTH move. All good cond. Prices negotiable. Dave. 07779 373 216 (West London).
E-mail: g4ged@dshack.demon.co.uk

VERTICAL antenna 10-band MFJ-1798 partially dismantled, man, gc, see *RadCom* Sep 95, cost £300, bargain £100 ono, buyer inspects, collects. 01296 487 983 (Aylesbury).
E-mail: newton.g3yju@cwctv.net

YAESU 480R & slide mount £75. Yaesu 230R, £75. Icom SM-20 mic, £75. 4A PSU, £7.50. 020 8224 6832 (Epsom, Surrey).

YAESU FRG-7700 HF rcvr, FRT-7700 converter, FRT-7700 ATU, £245 inc delivery. Yaesu FRG-8800 HF rcvr plus VHF converter, £265 inc delivery. RS156696. 01994 484 214 (Carmarthen).
E-mail: pelias7372@aol.com

YAESU FT-1000MP, SP-8, MD-100, all mint, boxed. FT-900CAT, Collins filters, FP-800 PSU, mint, boxed, like new all this rig. Ten-Tec Pegasus DSP HF, computer control, 100W all-band, 3 months old, boxed, vgc. Yaesu VHF FT-212RH 25W. Kenwood SP-940, new in box, never used. Drake speaker good for TR4 or other. Paim, G0UUT. 01603 742 733 (Norwich).
E-mail: g0uut@arrl.net

YAESU FT-101Z, £200. Yaesu FT-902 tuner, £120. Yaesu FT-225RD, £175. MFJ-949E tuner, £50. Eddystone 940 rcvr, £120. Marconi signal generator TF559B, £80. Advance signal generator Type Q1, £30. All with mans. Buyer must collect. George. 01556 630 214 (Dalbeattie).

YAESU FT-101ZD Mk3 FM with FTV-901R + 2m, £475. FTV-901R chassis only, £75. TS-830S with TV-502 tvtr, £395. KW1000C linear, part converted, unused, £250. TR-2200, £40. 01788 334 471 (Rugby).

YAESU FT-736R tcvr, 6m 2m 70cm, 1296MHz, includes SP-102 speaker unit, YM-48 DTMF mic, exc cond, £1100. Kenwood TS-50 HF tcvr and matching autotuner, £700 ono. MFJ-1278 data controller with DSP & man, £140 ono. Pakratt 232 PK-232MBX, man, £120 ono. Yaesu FT-290R, man, £120 ono. 25A PSU 13.8V, £40. 0191 388 5936 (Chester-le-Street).
E-mail: barry@g1jdp.freeserve.co.uk

YAESU FT-757GX 100W HF tcvr with FC-757AT auto ATU, gen cov rcvr, CW filter, elect keyer, mic, man, original packing, exc cond, £400. Chris, G0FIJ, QTHR. 0118 969 5440 (Reading).

YAESU FT-757GX HF radio plus FC-757AT, boxed c/w leads, mans, gc, buyer collects, £400. 01409 261 223 (Holsworthy).
E-mail: g0rql@eurobell.co.uk

YAESU FT-76 70cm h/held in original packing plus man, just needs memory, battery replacing, otherwise OK, hence £50 plus postage, insurance. 07944 839 475 eves (Ormskirk).

YAESU FT-790R1 70cm portable tcvr with accessories, £100. Yaesu FRG-8800 HF rcvr, £250. FRA-7700 active antenna, £40. Yaesu FIF-232C CAT interface, £40. RN Electronics 6m tvtr, 2m IF, £120. BNOS 2m 100W linear, £100. BNOS 6m 100W linear, £100. Microset RU20 20W 70cm linear, £60. Microset R50 50W 2m linear, £60. G7NBE, QTHR. 01530 461 660 (Ashby-de-la-Zouch).
E-mail: mikegoodwin@thersgb.net

YAESU FT-8100R 2m/70cm FM mobile, 50/35W, wideband rcvr with removable front, mint cond, c/w h/book and in original packing, £270. Yaesu FT-209RH 2m FM h/held tcvr with MH-12 speaker/mic and NC-15 quick charger, £50. Second FT209RH with NC-18 charger, £25. H/books both sold together, £60. Wanted Create RC-3 rotator. G3UKM, QTHR. 01676 534 079 (Solihull, WM).
E-mail: g3ukm@aol.com

YAESU line-up FT-101ZD tcvr, YH-55 headphones, FV-101Z external VFO, SP-901 external speaker, FC-901 ATU, YO-901 multiscope. Also: Telereader CW/Baudot/ASCII model CWR685E, Moseley Mustang 3-ele beam, CDE HamII rotator, 1kW dummy load and leader in-line SWR/Watt meter. All in mint cond and working order. Including h/books and technical literature. Buyer inspects and collects the lot for £1075 ono. Prefer complete but will split. 023 8047 2929 (Southampton).
E-mail: geoffthomas2@compuserve.com

WANTED

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

SPY/Clandestine/special forces radio sets from any period or origin. Wanted by private collector, your price paid for good examples. 020 8505 0838 (East London).

144MHz 2 x 4CX250 amplifier. Doesn't matter if valves not working. PSU to be included. Also doublet transformer. 1320V outputs, 500mA minimum. 01633 776 753 (Newport).
E-mail: gw7smv@qsl.net

BNOS LPM 144-10-180 linear. Will collect etc. 0121 430 7946 (Birmingham).
E-mail: don@brywood.freeserve.co.uk

CB magazines etc from late 70s early 80s especially *Practical CB* or *CB Citizen Band* books. WHY? Ian, G0YAP. 01379 740 742 (Diss).

CIRCUIT diagram or service information for Goertz Unigor 6e multimeter. Philip Thorns. 01287 634 350 after 6pm (Guisborough).
E-mail: philip@tinkerslane.u-net.com

DISABLED fan of old days seeks QSL cards, log books etc, also can you help complete my magazine archive - *RSGB Bulletin*s pre-1950, *QST* pre-1951 and 1960 to 1975, *CQ* 1945 to 1970 - your price paid. Mike. 8 Windsor Road, Reydon, Southwold, Suffolk, IP18 6PQ.

EDDYSTONE 850/4 LF rcvr in reasonable working cond. Thomas. 01794 514 057, answer phone (Romsey).

FM unit with wiring harness for Trio TS-430S, also CW filter. David. 01902 850 033 (Wolverhampton).

FREQUENCY display module PC1M 177 as supplied by Cirkit in the 1980s. G3WCE, QTHR. 01603 250 910 (Norwich).

HEATHKIT signal tracer with magic eye indicator, old valve type. Circuit diagram FT-101Z all exs paid, QTHR, G7GJZ. 01278 786 621 (Highbridge).
E-mail: chris.brown5@tesco.net

INFORMATION required on Kelvin-Hughes VHF marine tcvr. Legend on it is: 'Husun 60, made in Japan'. 01342 832 389 (nr East Grinstead).

JOYMATCH tcvr ATU with joystick antenna. Original instructions if possible. Antenna to have had indoor use only. Research purposes. 0191 389 2822 (Durham).

OPERATING manual for semi-automatic ATU Daiwa CNA 2002 2.5kW model. Photo copy OK, all expenses reimbursed without question. 01226 361 076 (Barnsley).

QSL cards, including broadcast station verification cards, wanted by collector researcher. Singles to collections wanted. Please phone with details. 01674 676 480 (Montrose).
E-mail: ferryden@btinternet.com

R1155 wanted in gwo with man if possible, for genuine enthusiast not dealer. 0191 456 0689 (Tyneside).

SILENT key clearout, or just not needed. Wanted for research project, QSL accumulations, old call books etc, can collect. 0113 269 3892 (Leeds).
E-mail: g4uzn@qsl.net

SONY AIR7 or AIR8, must be in gc with man and Nicad pack and any accessories. 0121 604 8056 (West Midlands).

STILL required: pair of undrilled standard four-pin plug-in formers. Bernard Litherland, G4IMT. 01225 891 254 (Chippenham).

TH2 Mk3 spare parts wanted please - boom to mast bracket and clamps. M5AAG. 01977 603 096 day or 01937 844 755 (Wetherby).

WANTED FV-101DM for FT-101Z MkIII. G0RRF. 01933 400 662 (Wellingborough).

WANTED HF linear amplifier - prefer Yaesu, Kenwood, Dentron, Ameritron etc. even non-working considered, G3TA. 01285 821 571 (Cirencester).

YAESU power supply for 757GX, not switch mode. Icom HC10, Yaesu FRG-100, working or not. 01302 844 788 (Doncaster).
E-mail: clivethomas@cwcom.net

Rallies & Events

6 MARCH 2001

SOLENT CLUB for Amateur Radio and Television (SCART) Junk Sale - British Legion, Park Gate, Southampton. OT 7.30 for 8pm start. Please the wife - sell it! Contact TBA.

8 MARCH 2001

READING & DARC Annual Junk Sale - The Pavilion, Woodford Park, Woodley, Reading. OT 8pm. Pete, G8FRC, 0118 969 5697,

10 MARCH 2001

LAGAN VALLEY ARS Hamfest & Computer Show - the Lagan Valley Hospital Conference Centre. OT 11.30. TS etc. Ron, GI4NTO, or Victor, GI4LKG, 028 9260 1004 or e-mail gi4lkg@qsl.net
web site www.qsl.net/gi4gty

11 MARCH 2001

WYTHALL RC 16th Annual Radio & Computer Rally - Wythall Park, Silver Street, Wythall. On A435, two miles from jn 3, M42. OT 10am, £1.50. TS, LB, C, B&B, TI on S22, free park & ride. Chris, G0EYO, 0121 246 7267 (e/w) or fax 0121 246 7268 or e-mail chris@g0eyo.freeserve.co.uk

17 MARCH 2001

ABERYSTWYTH & DARS 8th West Wales Amateur Radio & Computer Rally - Penparcau School, Aberystwyth. OT 10am, £1. CP, DF, TS, B&B, SIG, TI on S22, C, on-air demos of HF & VHF packet. Ray, GW7AGG, 01686 628 778, fax 01686 621 880 or e-mail enquiries@mwmg.demon.co.uk

SOUTH NORMANTON, ALFRETON & DARC with G QRP CLUB Junction 28 QRP Convention - Village Hall Community Centre, Market Street, South Normanton, Derbyshire, 5 minutes from M1 jn 28 and A38. OT 10am, £1. TS, SIG, LEC, C, LB, CP free, kits, clubs. 01623 465 443 or www.qsl.net/snadarc

18 MARCH 2001

BOURNEMOUTH RS 14th Annual Sale – Kinson Community Centre, Pelhams Park, Millhams Road, Kinson. OT 10am, £1. C, TI on S22, TS, B&B, SIG. Olive or Frank, 01202 887 721.

BREDHURST R & TS Rainham Radio Rally - Rainham School for Girls, Derwent Way, Rainham, Kent - easy to find from M2 jn 4 (A278) and from A2 at Rainham; follow the RRR arrows. OT 9.30/10am. C, TS, SIG, TI on S22, B&B, CP. www.the-brats.net

NORBRECK Amateur Radio, Electronics & Computing Exhibition – Norbreck Castle Hotel Exhibition Centre, Queen's Promenade, North Shore, Blackpool. MT (two photos required). Peter, G6CGF, 0151 630 5790.

23 MARCH 2001

TORBAY ARS Annual Buffet and Cup Presentation - Highweek Family and Social Club, Newton Abbot. Start 7.30pm, everyone welcome. Anna Coker, 07879 840304.

25 MARCH 2001

BARRY ARS Welsh Amateur Radio Exhibition – Memorial Hall, Barry. Brian, 029 2083 2253.

TIVERTON SW ARC Mid-Devon Rally - Pannier Market, Tiverton. OT 9.45/10am, £1. CP, TS, B&B, LB, C, TI on S22. PO Box 3, Tiverton, Devon or www.g4tsw.freeserve.co.uk

7/8 APRIL 2001

RSGB Spring Radio & Computer Show (incorporating **RSGB National VHF Convention**) - Bletchley Leisure Centre. £2.50, under-14s free. Recruitment fair, LEC, 6m Group AGM, TS, CP free, DF, LB, C. Jan, 0870 904 7377.

14 APRIL 2001

CRYSTAL PALACE & DRC Spring Sale - St John's Hall, Sylvan Road, London SE19. OT 10.30am, £1 (which includes a free drink), children free, C. Bob, G3OOU, 01737 552 170.

21 APRIL 2001

CORNISH RAC INTERNATIONAL MARCONI DAY 2001 - Robin, 01209 820 118 or www.users.globalnet.co.uk/~straff/

GB calls

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.

3 Mar	GB2SLS: Scarborough Lifeboat Station. Scarborough, N. Yorkshire. LH2 (G4SSH)
10 Mar	GB25STD: 25th Anniversary of St.D.ARS. Brighton, East Sussex. LH2 (G3SEJ)
11 Mar	GB1MCG: Manchester Commonwealth Games. Moston, Manchester. (G7JTL) GB2MCG: Manchester Commonwealth Games. Moston, Manchester. (G0TOG) GB60ATC: Air Training Corp. L2 (G0RMM)
16 Mar	GB0DDF: Donaghadee Festival. Donaghadee, Co. Down. (GI0UZG) GB0LOW: Low Power. South Normanton, Derbyshire. L2 (G0OKD) GB2NSW: National Science Week. Grappenhall, Warrington. LH2PS (G3NFB)
18 Mar	GB4RRR: Rainham Radio Rally. Rainham, Kent. 2 (M0AAK)
21 Mar	GB2DIS: Discovery. Dundee, Tayside. LH2 (GM3NHQ)
26 Mar	GB4YOU: Youlbury Scout & Guide Radio. Boars Hill, Oxford. TLH27P (G0RJX) GB4YOU: Youlbury Scout & Guide Radio. Boars Hill, Oxford. TLH27P (G0REL)

Due to space constraints, 'Silent Keys' has been held over until next month.

Regional and Club News

Club NEWS

Scotland West and the Islands Region

PAISLEY (YMCA) ARC
7, Talk '30 Years of Raynet Evolution', by GM4COX; 21, 'Good Operating' or 'Who's a Plonker?'. Jim, GM3UWX, 01505 862 817.

Scotland East and the Highlands Region

ABERDEEN ARS
2, Junk sale; 9, Mini-talks; 16, RSGB video night; 23, CW on-the-air night; 30, Licence further? Robert, 01224 896 142.

COCKENZIE & PORT SETON ARC
2, Normal club night; 16, Talk 'Networks - Past & Present', by Bob, GM4UYZ. Bob, GM4UYZ, 01875 811 723.

LOTHIANS RS
14, Talk 'Thermionics', by David, GM4ZNX; 28, Surplus equipment sale. John, GM7REG.

North West Region

ISLE OF MAN ARS
13, Video of the expedition to Clipperton Island during 2000. David, MD0BXX, 01624 816 308.

MID CHESHIRE ARS
7, Talk by Mark Francis from Waters & Stanton PLC; 14, Norbreck Rally preparation; 21, HF on-the-air and construction night; 28, VHF on-the-air night. Niall, G0VOK, 01606 871 413.

STOCKPORT RADIO SOCIETY
14, Talk 'Britten's War', by John Britten; 28, A visit by Mark Francis, G0GBY, of Waters & Stanton PLC. David, M1ANT, 0161 4567 832.

THORNTON CLEVELEYS ARS
5, Talk 'The Battle of the Somme', by Kevin, G0LRK; 12, Rally preparations; 26, Auction. Jack, G4BFH, e-mail: jack@duddington.fsnet.co.uk

WHITEHAVEN ARC
1, Talk 'Weather Satellites', by Frank, M0FWM; 8, Monthly meeting; 15, Final preparation for 'Pass on the Knowledge' week. Norman, M0CRM, 01946 692 462.

WIDNES & RUNCORN ARC
7, 'Static Electricity' - a shocking talk; 21, Talk 'Microwave Propagation'. Martin, G4LUQ, 01928 714 843 or Dave, G1PIX, 01928 591 401.

North East Region

GOOLE RES
2, Fund-raising night at the *Barnes Wallis Inn*; 9/10, Hobbies exhibition preparation at the *Barnes Wallis Inn* and the *Goole Leisure Centre*, 10am; 16, Contest preparation night at *Lionel Winder* in Selby; 23, Marconi Activity Night at the *Courtyard Centre*, Goole; 30, Junk sale at the Courtyard Centre. Richard, G0GLZ, 07867 862 169.

GRIMSBY ARS
1, Talk 'Antennas', by Joe, G4CFO; 15, Quiz night; 29, RoPoCo. Brian, G4DXB.

HALIFAX & DARS
20, Talk 'Organising Windmills on the Air', by Jasmine, G4KFP. Ray, G0PMU, 01274 600 297.

HAMBLETON ARS
7, Evening on the air; 21, Talk. John, G0VXH, 01845 537 547.

HORNSEA ARS
14, Preparation for science Week Event; 22, Science Week presentation to local youth organisation; 28, 'Optical Illusions', by Dave, G0DMP. John, G0TPS, 01964 562 258.

WAKEFIELD & DARS
6, Video evening; 13, Talk 'Spectrum Analysers', by G0ISJ; 20, OTA; 27, Crystal set competition. John, G7JTH, 01924 251 822.

Midlands Region

BROMSGROVE ARS
13, A free night - any suggestions welcome; 27, Talk - DTI. Angus, G8DEC, 01257 875 573.

COVENTRY ARS
2, Quiz night with Brian, G1AVF; 9, Night on the air, Novice class, Morse practice; 16, Outdoor event - TBA; 16-23, National Science week (possible demo station); 30, Surplus equipment sale. John, G8SEQ, 024 7627 3190.

GLOUCESTER AR & ES
5, Frequency measurement - bring and show; 12, Talk/slide show - Air Ambulance; 19, Open evening - demonstrations; 26, On-the-air evening - 160/80 metres. Tony, 01452 618 930, office hours only.

KIDDERMINSTER & DARS
Meets at Sutton Arms, Sutton Park Road, Kidderminster 6, Night on the air with HF / VHF / UHF, SSTV and data modes. Tony Saunders, G1OZB, 01299 400172.

LINCOLN SHORT WAVE CLUB
7, G5FZ on the air; 16, School demo TBA (visit). John, G1TSL, 01522 793 751.

LOUGHBOROUGH & DARC
6, Amateur radio test gear & how to use it - demo - Art, G3KWY; 1, Annual inter-club quiz - buffet to follow; 20, Video night - subject TBA; 27, On-the-air evening - try 6m or 70cm. Chris, G1ETZ, tel: 01509 504 319.

MAXPAK
5, Open forum prior to the Annual General Meeting. Ron, M0LRD, 01922 684 496.

MELTON MOWBRAY ARS
16, 'The Muck Stops Here' - a guide to pollution and water quality monitoring by Helen Rowley, Ecology Systems Ltd and Steve Proffitt Environment Agency. Mr G A Griffiths, G3STG, 01664 480 733.

MID-WARWICKSHIRE ARS
13, Annual General Meeting; 27, Talk 'Mobile Phones - GSM', by John, G0JUQ. Bernard, M1AUK, 01926 420 913.

SALOP ARS
8, Talk 'Electrical Safety in the Shed', by G7SBD; 22, Quiz at home with the Newtown Club. Di, 01743 341 654.

SHEFFORD AND DARS
1, Talk 'PSK31 & RTTY', by Ken, G4YRF; 8, G8EMJ Challenge - winners' 10 min talks. Mike Carrington, G8BEG, 01438 342 013.

SOUTH NORMANTON, ALFRETON & DARC
5, Annual General Meeting in the hall; 12, CW Night on the air; 19, Junk sale in the hall; 26, Night on the air. Dave, M5RST.

STOURBRIDGE & DRS
12, Talk 'Introduction to digital presentations', by Barry Jones; 19, Annual General Meeting. Tom Edwards, M1ESN, 01384 374 902.

STRATFORD UPON AVON & DRS
12, Talk 'DXing from Bhutan', by Vincent Denecker; 26, Digital modes demonstration. David, G6FEO, 07970 148 204.

TELFORD & DARS
7, On-the-air evening; 14, Main construction competition - no, it doesn't have to be completed; 21, Pre-Annual General Meeting and contest planning evening; 28, Annual General Meeting. Mike, G3JKX, 01952 299 677.

North Wales Region

NORTH WALES RADIO RALLY CLUB
1, Microwaves in medicine, Sid Carfoot, GW4JOT. Contact Ted, GW0DSJ, tel: 01745 336939 or e-mail: edward@shipton.greatxscape.net More information on the club web site at www.nwrrcw.org.uk

South Wales Region

No club details submitted.

Northern Ireland Region

BANGOR & DARS
7, Talk on amateur television by Tony, GI0UZG. Mike, GI4XSF, 028 4277 2383.

London and Central Region

AYLESBURY VALE RS
7, Annual General Meeting. Roger, G3MEH, 01442 826 651.

BRACKNELL ARC
14, Bring and show. Baugh @compuserve.com
CHESHUNT & DARS
7, Talk 'Worked All TVs - SV9!', by Dick, G3URA; 21, Members' forum. John, G3WFM, 01707 651532.
COULSDON ATS
12, TBA. Steve, G7SYO, 01737 354 271.
CRYSTAL PALACE & DRS
7, Building your own GDO. Bob, G3OOU, 01737 552 170.
ECHELFORD ARS
8, Talk 'My Introduction to Radio', by Jean, G0DCU; 22, Annual General Meeting. Robin, G3TDR, 01784 456 513.
EDGWARE & DARS
8, Extraordinary General Meeting - 8pm start. Also Kenwood TS-2000 demonstration; 22, QSL and Awards Round Table discussion - 8pm start. David, G5HY, 01923 655 284 (days), 020 8954 9180 (eves).
HODDESDON RC
13, Guide Dogs for the Blind; 27, Morse practice and open forum; 31, Annual Dinner. Don, G3JNJ, 020 8292 3678.
MAIDENHEAD & DARC
1, Talk 'Shack in a Suitcase', part 22 by Simon, GW0NVN; 2, Annual General Meeting and prize-giving. John, G3TWG, 01628 525 275.
NEWBURY AND DARS
5, Morse test; 28, 'Yaesu', by Paul, G3WYW. Mark Slade, M0CUK, 01635 36444.
SILVERTHORN RC
9, Members' forum; 24, Club quiz evening; 29, On-the-air night. David, G0KHC, 020 8504 2831.
SOUTHGATE ARC
8, Surplus equipment sale. Brian, G0MEE, 01707 257 534.
SURREY RCC
5, Spring surplus equipment sale. Berni, G8TB, 020 8660 7517.
VERULAM ARC
26, Working demonstration of the reproductions by John, G0NVZ, of some of the earliest radio devices. Walter, G3PMF, 01923 262 180.

Region	RSGB Regional Manager
Scotland West & the Islands Region	Vacant
Scotland East & the Highlands Region	Tommy Menzies, GM1GEQ
North West Region	Kath Wilson, M1CNY
North East Region	Peter R Sheppard, G4EJP
Midlands Region	John Layton, G4AAL
North Wales Region	Vacant
South Wales Region	Simon Lloyd Hughes, GW0NVN
Northern Ireland Region	Jeff Smith, MI0AEX
London & Central Region	Roger Piper, G3MEH
South & South East Region	Vacant
South West & Channel Islands Region	Richard Atterbury, G4NQI
East & East Anglia Region	Vacant

RSGB Regional Managers (as of 1 February).

South & South East Region

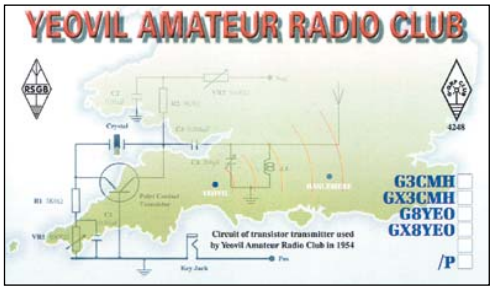
BASINGSTOKE ARC
5, Talk and demo on magnetic loops by John, G3KND; 31, Fox Hunt - find Alan, G8FMH and Pauline, XYL. Bob, M0CJJ, 01256 461 306.
CRAWLEY ARC
21, Talk 'Down to Earth Satellite Broadcasting', by David Miller. Derek Atter, G3GRO, 01293 520 424.
HASTINGS E & RC
21, Gordon Elder Planetary Geology. R C Gornall, G7DME, 01424 444 466.
HORNDEAN & DARC
6, Club social evening; 27, Quiz evening. Stuart, G0FYX, 023 9247 2846.
HORSHAM ARC
1, Junk sale. David, G4JHI, 01403 750 228.
ITCHEN VALLEY ARC
9, Annual General Meeting; 23, Surplus equipment sale. Pete, M0CFQ, 023 8034 5052.
QRZ AMATEUR RADIO GROUP OF SUSSEX
9, Preparations for junk sale on 16 March; 16, Junk sale; 30, Science project meeting. Stuart Constable, M0CHW, tel: 01435 863 020.
SOUTHDOWN ARS
5, Talk 'Is G3XFD Really Accident Prone?', Rob Mannion, editor of *PW* magazine. Glynn, M0CHO, 01323 765 731.
WORTHING & DARC
7, Computers - what to do with them; 14, Discussion evening; 2, 100 years of electricity; 28, Discussion evening. Roy, G4GPX, 01903 753 893.

South West & Channel Islands Region

APPLEDORE AND DISTRICT ARC
19, Annual General Meeting. Brian, 01237 473 251.
BLACKMORE VALE ARS
6, VHF on-the-air evening and Morse class; 13, Interactive talk 'The Sun', with expert John Dawson; 20, HF on-the-air evening - please book; 27, Shack upkeep and Morse classes. Tony, G0GFL, 01258 860 741.
CORNISH RAC
1, Talk 'DXing and Allied Subjects', by Robin; 12, Computer Section - Talk 'Wartime Coding', by Bert, G3VWK. Robin, G0MYR, 01209 820 118.
EXMOUTH ARC
7, Junk sale. Alec, G8GON, 01395 264 872.
POLDHU ARC
15, Visit to Radio Cornwall (Truro). Meet at Phoenix Wharf at 7pm. Keith, G0WYS, 01326 574 441.
POOLE RS
9, Talk by Dr Phil Mason; 16, Construction (shack); 18, Bournemouth rally; 30, Construction (shack). Phil, G0KKL, 01202 700 903.

East & East Anglia Region

BRAINTREE & DARS
5, Sausage supper. Keith, M0CLO, 01376 347 736.
CHELMSFORD ARS
6, HF Awards with Carl, G3PEM and 'Computer Logging', by Alan Jubb, G3PMR. David Bradley, M0BQC, 01245 602 838.
GREAT YARMOUTH RC
9, Operating evening; 23, Web page design. Tony, G3NHU, 01493 721 173.
HARWICH ARIG
14, Visit to Harwich Harbour Control Room. Eugene, G4FTP, 01206 826 633.
IPSWICH RADIO CLUB
6, Quiz night v Leiston RC, hosted by Leiston; 21, Talk 'DF Loops', by John Gee, G4BAV; 28, Morse practice with John Gee, G4BAV. Keith, G7CIY, 01394 420 226.
LEISTON ARC
6, Inter-club Quiz - Leiston v Ipswich. John, G0FSP, 01728 604 621.
MAIDSTONE YMCA ARS
2, Dummy RAE; 9, RAE class - Operating for Beginners (an evening on the air); 17, Peter Pickering on his antennas; 22, Practical evening - wiring plugs; 30, Rally organisation meeting. John, G0RHO, tel: 01622 832 259.
NORFOLK ARC
7, Club visit to Norwich Airport radar control centre, with John, G0VZD; 14, Morse practice; 21, Talk 'Early Computers: From Dinosaurs to Discs', by Peter, G3ASQ; 28, Morse Practice. John Wadman, G0VZD, 01953 604 769.



The QSL from the Yeovil Amateur Radio Club, G3CMH, commemorates the first long-distance radio contact to be made using a transistor transmitter. The contact was made by the club in February 1954.

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 News is a service for clubs and societies affiliated to the RSGB. The announcements are intended to notify non-members and potential members of your club of specific events, therefore 'informal', 'committee meeting', 'natter night' and 'ragchew evening' etc will only be included if space permits. Basic, unchanged details about RSGB-affiliated clubs are published annually in the *RSGB Yearbook*.

HAYDON COMMUNICATIONS

REALISTIC DX-394

The DX-394 is a modern, dual converstion receiver featuring phase locked-loop technology for tuning accuracy and stabilty plus a comprehensive range of memory functions. The frequency coverage provided is 150kHz through to 30MHz with no breaks. This wide range, combined with SSB, CW and AM receive modes, makes this receiver ideal for a wide range of listening styles. Keeping track of all those favourite frequencies is helped by the 160 internal memories. The steps available are 100Hz, 1, 5 and 10kHz, which should suit just about everyone. The internal processor includes some presetting of tuning steps to align with correctly displayed frequency. This is very helpful and greatly speeds up tuning operation. This is the best communications receiver under £350.00. SSP ~~£299.95~~.

OUR PRICE **£149.95**

SANGEAN ATS-909

A superb performance portable/base synthesized world receiver with true SSB and 40Hz tunning for ultra clean reception. The same radio is sold under the Roberts name at nearly twice the price. Other features include RDS facility, 306 memories and FM stereo through headphones. The ATS-909 represents superb value for money.

ONLY **£139.95**

Optional deluxe stereo/mono headphones for short wave portables only £7.99 P&P £2

SONY SW-30

The ideal holiday partner! ★ Fully digital world receiver ★ FM/MW/SW ★ Covers all short wave broadcast/medium wave plus FM stereo (on headphones) ★ Programmable memories ★ Digital local + world clock ★ Sleep timer + alarm function★ 1kHz tuning for short wave ★ Auto scan ★ Short wave guide book included. RRP £79.95.

HALF PRICE **£39.95** P&P £7.00

Once they've gone, they've gone

BEARCAT BC-9000

25-1300MHz wideband desktop scanner with turbo scan (AM/FM/WFM).

SPECIAL OFFER
£249.00
P&P £10.00

YUPITERU MVT-7100EU

Probably the best value for money high end scanner on the market. Covers 500kHz-1650MHz all mode (USB, LSB, CW, AM, FM, WFM). ★ 1000 memories ★ Fast scan speed ★ 500 pass channels ★ 12 tuning steps. Includes nicads/charger/car charger/antenna. Extremely user-friendly hand-held receiver with outstanding performance unmatched by its rivals.

UK's LOWEST PRICE **£199.95**
P&P £10.00

COMMTEL COM-307

Miniature go anywhere airband & VHF scanner. ★ 99 memory channels ★ Selective channel steps ★ Signal strengh indicator ★ Key lock H Beep tone on/off ★ Power saving mode ★ Covers airband 108-1036.975MHz AM VHF band 136-180MHz FM.

SPECIAL OFFER
£69.95

Optional batteries + charger £13.99.

HAYDON COMMUNICATIONS

Unit 1, Thurrock Commercial Park, Purfleet Industrial Estate, London Rd, Nr. Aveley, Essex RM15 4YD

TEL: 01708 862524 FAX: 01708 868441

VHF/UHF

NORMAN FITCH, G3FPK
40 Eskdale Gardens, Purley, Surrey CR8 1EZ.
E-mail: g3fpk@compuserve.com

AFTER THE LONG spell of low-pressure weather that brought gales and floods to much of Britain things changed in the early part of January. As this is being compiled, the barometric pressure has been steady at around 1020mb for over a week. One result was a fine period of tropospheric propagation in the middle of the month.

All times are in UTC, ODX indicates best DX and QTHR signifies that the operator's address is in the current *RSGB Yearbook*. An asterisk (*) after a callsign denotes a CW contact, (SN), (FK) etc refers to the postcode area and (IO93), for example, is the Maidenhead grid.

THE ANNUAL TABLE

IN THE JANUARY column I suggested dropping the Annual Table due to the declining support for it and asked for your ideas. As if to illustrate the lack of interest, only *two* readers bothered to comment, so thanks to Ken Punshon, G4APJ (BL), and Bryn Llewellyn, G4DEZ (SS). Both would like to see the table continue so as to encourage activity. So I will continue to run the Annual Table in its current form for this year and the first appearance will be in the May issue.

The deadline for that month is **20 March** by which time there will have been eleven assorted RSGB contests - see page 54 in the October 2000 *RadCom* for a list. So if you participate in any of these why not use the QSOs to accumulate your score? If you want a copy of the table rules, I can send them via e-mail or by 'snail mail' on receipt of an SASE.

PUBLICATIONS

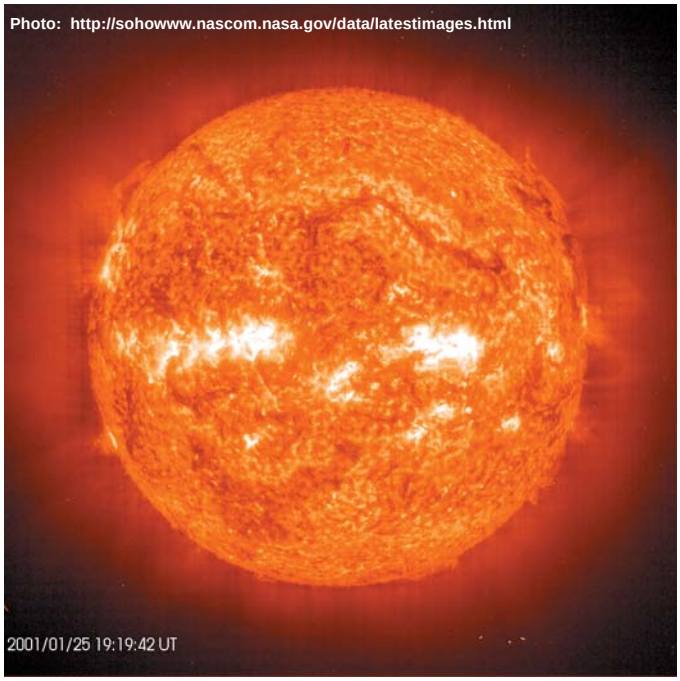
THE WINTER EDITION of *VHF Communications* includes the second part of Gerhard Schmitt's, DJ5AP, article on low pass filters for 2m and 70cm. Wolfgang Schneider, DJ8ES, describes a high precision frequency standard for 10MHz using the Hewlett-Packard HP 10544A quartz oscillator.

Of particular interest is the regular contribution by Gunthard Kraus, DG8GB, 'Internet Treasure Trove', listing useful web sites. For example, anyone looking for Hewlett-Packard's home page won't find it. He explains that, since HP has been split up into smaller parts, it has moved - see the panel.

The front cover of Issue 4/2000 of *DUBUS Magazine* features a stunning picture of the auroral oval taken with the Visible Imaging System / Polar by the University of Iowa at 2058 on 6 November 2000. The main technical article is on low-noise crystal oscillators by the editor, Rainer Bertelsmeier, DJ9BV. This is part 1 and runs to 25 pages. The 'EME News' section includes Ian White's, G3SEK, Lunar Weekend Calendar for this year and the rules for the European Worldwide EME Contest. The other regular columns cover 6m, tropo, Sporadic-E (Es), meteor scatter (MS) and auroral news. The beacon list, which was revised on 15 December 2000, covers from the 50MHz through 430MHz bands. The UK agent for this quarterly magazine is Roger Blackwell, G4PMK (QTHR), and the e-mail address is dubus@marsport.demon.co.uk. There is a website - see the panel.

The November 2000 issue of *Six News*, the quarterly magazine of the UK Six Metre Group, comprises 64 pages. Rod Mackintosh, ZL3NW, describes his monster 10-ele Yagi for 50MHz designed with the aid of Brian Beezley's, K6STI, software program Yagi Optimiser A06. The boom length is 13.2m - over 43ft - and the antenna was hoisted on to his 25m tower by a 50 tonne crane!

Chris Deacon, G4IFX, edits *Six News* and Secretary Iain Philipps, G0RDI (QTHR), deals with membership matters. six@sms.xerox.com is his e-mail address and there is a website - see the panel on page 78.



This is an image of the sun taken by the SOHO spacecraft at 1919UTC on 25 January 2001 and shows just how active the sun is at the maximum of Cycle 23.

PROPAGATION

DAILY SOLAR data downloaded from the Space Environment Center's (SEC) website for the period 18 December to 16 January confirms that the 2.8GHz solar flux was fairly constant. The maximum value was 201 on 20 December and the minimum was 162 units on 16 January. The average over the 30 days was 180.2, a slight rise on the value mentioned in last month's column.

In this 30-day period 34 new sunspot groups were recorded and on 12 days their areas exceeded 1000 millionths of the sun's visible disc. The maximum area was 1490 on 28 December and the minimum 480 on 10 January.

The October 2000 *Six and Ten Report* comprises 40 pages. Steve Reed, G0AEV, compiled the 6m commentary and mentions that over 30 non-European countries in all six continents were heard/worked in the month. He comments on the possibilities of confusion on 6m between Es and F-layer backscatter, as well as difficulties in differentiating between certain Es and MS events and Es and Auroral-E at mid-latitudes. There were auroral events on eight days but very little MS propagation was noted.

In the 44-page November *Report* Steve starts his comments on 6m activity with, "This is more like it! For once I feel able to say there was a 'lot' of 6m DX about in November". This is recorded in several pages of tables further broken down into the various modes.

As there was so much Auroral and Auroral-E propagation he has adopted a different reporting method with the tabula-

THE RSGB VHF CONVENTION

THIS YEAR'S EVENT has a dedicated website - see the panel. UKSMG Vice-chairman Chris Gare, G3WOS, has forwarded details of the group's plans for the Convention over the **7 / 8 April** weekend. There will be lectures by the Greenland DXpedition team who put OX2K on 6m last year and a talk by PY5CC, one of the world's top 6m DXers, with over 200 DXCC countries to his credit.

A 6m DXers' dinner is planned for the night of the 7th at Bletchley Park, the home of the WWII Enigma machine. Space is limited, so hurry up and book. G0RDI is handling bookings and the e-mail address for this is six@xcms.net with payment by Visa or MasterCard. There are websites for the dinner information and for direction and location maps for the venue - see the panel.

Accommodation for UKSMG members can be booked at a special rate through the RSGB. For information call Jan Forde at Headquarters, Monday to Friday 9.15am - 5.15pm, on tel: 0870 904 7377. Be sure to ask for accommodation for the Spring Show, mentioning that you are a UKSMG member and ask for accommodation at Parkside.

tions based on the three-hourly time periods used for recording the K value. Both issues include the daily solar and geomagnetic data and reports from stations world-wide.

The *Report* is an activity of the RSGB's Propagation Studies Committee (PSC), and is edited by G0AEV and Prof Martin Harrison, G3USF. Subscription inquiries should be addressed to Steve (QTHR) whose e-mail address is g0aev@explore.force9.co.uk

The first article in the November issue of *SunMag*, which is published by Neil Clarke, G0CAS (QTHR), is devoted to the Leonids meteor shower of which more later. The second article describes the intense solar radiation storm that started on the 8th and which affected the NASA's Stardust mission.

It was the fourth largest storm since 1976 and the cloud of high-energy particles electrified pixels in its two cameras, causing the spacecraft to go into standby mode. The flight team was able to reset the cameras on the 11th and on the 13th they commanded Stardust to leave safe mode. No damage was sustained from this proton bombardment.

The articles in the December issue deal with the International Space Station, the Geminids and Quadrantids meteor showers and the partial eclipse of the sun visible in parts of North America on Christmas Day. The NASA Galileo spacecraft zipped past Jupiter's satellite Ganymede on the 28th and, since it was in the giant planet's shadow, was able to record auroras in its very tenuous atmosphere of gases. Pictures from the fly-by will be transmitted to earth in coming months.

Both issues include tables of daily solar, geomagnetic, particle and sunspot group data and lists of solar flares. Subscription inquiries about *SunMag* should go to G0CAS. Neil's e-mail address is neil@g0cas.demon.co.uk and he can be reached on packet via g0cas@gb7don.#19.gbr.eu

CONTEST NEWS

WOLFGANG Knobus, DL1EAP, has forwarded details of the 144MHz VHF Activity DX Contest organised by the VHF-DX-Group DL-West with support from the German magazine *Funk-Telegramm.* This is a year-long event in three classes: exclusive CW, exclusive phone (SSB and FM) and mixed. Only stations over 500km count for points and there are grid multipliers. The rules occupy a complete A4 page and if you need a copy, send me an e-mail and I will forward them to you.

For details of RSGB VHF contests in March please refer to Tim Kirby's, G4VXE, 'Contest' column. A full list for 2001 is in the October 2000 *RadCom* and the VHF Contests Committee's web site has comprehensive details - see the panel.

METEOR SCATTER

DURING THE LEONIDS last November Paul Bradbeer, M0CVX, completed a sked with IW2HAJ and 10 random QSOs with stations in DL, HA, I, S5, SP, T9, 9A and LY2SA (ODX) in the period 0256 - 0629 on 2m on the 18th. He runs 400W to a pair of 7-ele Yagis. Bill Harrison, M0BTZ (GU), reports good bursts from EA3TI (JN11) on 24 December in the Ursids when Ramon was working G7RAU.

Clive O'Hennessey, GM4VVX (IV), was QRV (operating) on 2m in the Quadrantids and completed three of his four skeds on 3 January. These were with PA2DWH* (117p, 7b 5s), DL1UU* (36p, 5b, 4s) and OL2O* (few pings, many bursts, best 11s, but weak). The peak of the shower seemed to occur between 1400 and 1530.

Jamie Ashford, GW7SMV (NP), missed the best of the Geminids in December due to work commitments. On 2m on 3 January he completed with OH1XT* for his 39th country. The Quadrantids shower was poor in the morning but really got going in the afternoon with good bursts from I, OE and OH.

MOONBOUNCE

THE FIRST MAJOR event in 2001 is the annual European Worldwide EME Contest sponsored jointly by the French national society, the REF, and the *DUBUS* organisation. The first session is on the 31 March / 1 April weekend and is for the 432MHz and the 2.3 - 5.7GHz bands. The second is on the 28 / 29 April weekend and is for the 144MHz, 1.3GHz and 10GHz bands. The full rules occupy two A4 pages and I can forward them to you via e-mail if necessary: they are also in *DUBUS* 4/2000.

Prior to that, the 3 / 4 March weekend is favourable for skeds. The VK3UM program confirms that London latitude stations will have 30.5 hours of moon time when the declination varies from +19.45º to +22.75º. The 144 / 432MHz sky temperature range is 467/35K to 575/44K and the signal degradation, referred to perigee, drops from -0.43dB at the start to -0.12dB at the end. The sun offset at Saturday midnight is +102º.

The only report from the UK in the January issue of the *432 and Above Newsletter* is from Peter Blair, G3LTF (IO91) who has had to replace the damaged hub base plate on his dish antenna. Performance is now back to normal and on 8 December on 23cm he completed with G4CCH, DJ5MN* and K5JL*. Next day on 70cm he worked DL8OBU* and SM3AKW*.

Back to 23cm on the 9th and S59DCD*, DF4PV*, ZS6AXT*, F1PYR* (initial number 167), HA5SHF*, K3AX* and WA1JOF* (#168) were worked. VK4AFL was an excellent signal on 70cm on the 10th and DF3RU*, UA6LGH* and SM3CEW* were also contacted, but very strong winds restricted operation. On the 16th Peter worked W7GBI*, OZ4MM and DL6LAU on 23cm.

BAND REPORTS

50MHz

December started well for Ted Collins, G4UPS (EX), when he worked S92DX* (JJ31) at 1117 on the 1st for his 159th DXCC country. Ws were heard working into GW and IO91 later. VE1s and East Coast Ws were worked from 1341 on the 3rd. At 0928 next morning he worked 5B4AGM* (KM64). In the morning of the 7th the 5B and OD5

ANNUAL VHF/UHF TABLE - JAN TO DEC 2000 - FINAL PLACINGS

	50MHz		70MHz		144MHz		430MHz		1.3GHz		Total
Callsign	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Dist	Ctr	Points
G4DEZ	76	67	18	3	57	13	32	6	25	7	304
G3FIJ	52	39	30	4	74	12	30	6	10	2	259
G4APJ	26	29	-	-	96	11	48	5	-	-	215
G7NBE	23	25	14	2	56	9	1	1	-	-	131
G4OUT	-	-	33	4	26	6	-	-	-	-	69
G1UGH	3	18	-	-	26	9	4	4	-	-	64
M0CNP	-	-	-	-	3	3	2	1	-	-	9

The District Codes were the 124 listed on page 86 in the 1999 *RSGB Yearbook*. Up to six different GI stations and up to three different GM stations in each Scottish district were counted. Countries were the current DXCC ones plus IT9.

USEFUL WORLD WIDE WEB SITES

Dubus Magazine	http://www.dubus.org
UK 6m Group	http://www.uksmg.org
Hewlett-Packard data	http://www.agilent.com
VHF Communications	http://www.vhfcomm.co.uk
RSGB Bletchley	http://www.rsgb.org/bletchley
VHF Contest info	http://www.blacksheep.org/vhfcc
UKSMG Dinner info	http://www.uksmg.org/dinner.htm
UKSMG Bletchley maps	http://www.bletchleypark.org.uk/visit.htm

beacons were copied followed by a QSO with OD5/OK1MU (KM73). 5B4FL* (KM64) was worked at 0827 on the 14th with 4Z5AO (KM72) copied at S9 on CW and SSB. VE2 and 3 districts, plus W1 and 3 were heard in the afternoon of the 17th. In the morning of the 19th there were strong signals from Greece and SV1EN and SV1DH were contacted, Costas being S9+60dB, the strongest signal ever heard from Greece at G4UPS. Lots of Europeans were also copied and subsequent QSOs were with 4Z5AO, OD5/OK1MU again, UT5JCW* (KN64) and UT2IO* (KN88).

Strong in-band Russian TV was heard in the morning of the 23rd and through it Ted contacted 4Z4DX* (KM72), 5B4AGM*, 4Z5AO, 5B4FL* and SU1SK (KM50). Ws and VEs were heard and a few worked in several December afternoons. Morning skeds with G3CCH and SM7AED have been quite successful. Coming to January, the afternoon of the 3rd brought MS QSOs with several OZs in the Quadrantids.

Ted has S92DX's full 6m log for the 24 November to 5 December period, during which Matt made 517 QSOs with 50 countries. He worked 30 Gs, four GWs, a GI and a GM. On 9 January he e-mailed to say he was awaiting his QSL cards from the printer. Tony Selmes, A45ZN, was due back in Oman on 6 January after UK Christmas leave.

Through in-band TV on 7 December GW7SMV contacted YB5QZ* (OJ00RM) at 1035 which gave Jamie his WAC, the YB's first 6m QSO and a GW / YB first. Other notable QSOs in December were with 5B4FL, W1LP* (FN41), 5B4AGM*, 4Z5AO, 4Z4DX, SU1SK and some VEs.

144MHz

M0BTZ was QRV in the AFS Contest on 3 December and lists eight stations worked in DL, F, GW, ON and PA, ODX being DK5DQ (JO31) at 589km. Conditions were poor over the Christmas period and Bill operated from IO91NE with 10W under the call 2E0ARB/P in the Christmas Cumulatives. It was hard going and ODX was G0EHV (IO94) at 415km.

G4APJ was also QRV in the Christmas Cumulatives, ODX being ON1ALJ at 510km on the 28th. GM4VVX often calls to the south from IO78 with 400W but *never* gets an answer on 144.300MHz.

430MHz UP

G4APJ heard MM1CXE on 70cm on 29 December but couldn't raise Andrew. Ken's 70cm skeds are still on-going and on 8 December he had a QSO with M1DRN (IG) at 276km. Jo De Loor, ON1ALJ (JO10), reported some excellent tropo to Scandinavia from 1700 on 14 January on 2m, 70cm and 23cm. From the morning he worked 10 SMs, two OZs and an LA on 23cm, ODX on 23cm and 70cm being SM4DHN (JP60) at 1212km.

Remi Vaicius, LY2MW (KO24), caught his first real tropo opening on 70cm on 16 January and made 17 QSOs, six over 1000km, with stations in DL, LA, OZ, PA, SM and SP: ODX was PA5DD (JO22) at 1390km. He reports low activity, suggesting the opening on the 14th may have left many people tired. Did this opening extend to the UK?

DEADLINES

THAT'S IT FOR the first column compiled in 2001. The May deadline is **20 March** and the June date is **17 April**. These are Tuesdays, so please make sure you send your reports in time. My telephone answerphone and fax is on 020 8763 9457 and the CompuServe ID is g3fpk ♦

CONTEST

TIM KIRBY, G4VXE
11a Vansittart Road,
Windsor SL4 5BZ
E-mail:tim@ukgateway.net

AN INTERESTING letter in the postbag this month was from Reg, G8VHI. Reg explains that he is a contest enthusiast, but describes the CQWW contests as a "farce and a total waste of space". Why? Reg goes on to explain that he feels that the point of a contest is to exchange calls and one other piece of unknown information – which is generally the exchange. Of course, in the CQWW contests, the exchange is the obligatory 59(9) and the CQ zone, which of course is predictable. As Reg says, any decent bit of software will fill in the exchange received field, with the exception of a few USA stations, where you need to be really careful whether they are zone 4 or 5.

So, are the contests a "farce and a total waste of space"? In my opinion, no! But why? I've come to the conclusion recently that there are different sorts of contest which have different requirements and different skills. CQWW is an example of a rate contest – together with the emphasis on zone and country multipliers. In addition, the checking of 'busted' calls in the CQWW contests is second to none. You will not get away with logging an incorrect call in this contest, the degree of cross checking is so intense. Accuracy is therefore paramount. But the exchange – yes, it's certainly pretty redundant – so I can empathise to some extent with Reg's view.

If it's even more intense accuracy you're after then there are different contests to test this. Try the RoPoCo contests organised by the RSGB. In these, you repeat the postcode that was sent to you by your previous contact. These contests have become a little less well supported in recent years. I wonder why? Certainly I am sure that we are all up to the challenge of logging contacts accurately! Am I alone in being put off by the early morning start for these contests? Would you be happier having these contests in the afternoon, *à la* AFS?

Jan Fisher, G0IVZ operates at the 80m position from M6T during CQWW Phone, October 2000.

On the UK-CONTEST Internet reflector recently, there were some interesting comments about the AFS contest on HF. Someone suggested that because of its simple format, single band, no multipliers to be chased, just sheer rate, this was an example of contests being 'dumbed down'. This evoked quite a strong reaction with some correspondents pointing out that AFS is the best supported RSGB contest on HF. Again, I like the contest – it's a great opportunity to work old and new friends – and the fierce competition between people who know each other well and who often contest together makes for a lot of fun.

But if you want a more gentle, more thoughtful contest, you couldn't do better than the Commonwealth Contest. No high rates here! But you do have to know the band openings to the different parts of the world and be ready to exploit them. It's a contest that I think is one of the best and most interesting in the calendar. So look out for this contest on 10 / 11 March. You'll find many familiar calls to work – my usual interest from the UK is to try and work them on as many different bands as possible.

TURN

3rd 144MHz Backpackers Contest, 2000

AFTER THE excellent conditions and low levels of QRM in the second 2m Backpacker contest, entrants had to contend with the high levels of QRM caused by an extensive Sporadic E opening during this contest.

Four stations managed to submit perfect logs for this contest and a further five stations lost less than 2% of their claimed score – congratulations! The average points lost were 7.1% for this contest.

The West Kent Radio Society, G1WKS/P, wins the Single Operator 3W section with M0AFC/P claiming first place in the 10W section. In the Multi-Operator sections, the One Man and His Dog Contest Group, G8NWM/P, claimed first place in the 10W section with GW5NF/PP claiming first place in the 3W section.

Ian Pawson, G0FCT

3rd 144MHz Backpackers Contest, 2000

Multi-Operator 10W

Pos	Group Name	Callsign	Loc	QSO	Multi	Points	Total	Best DX	km	Power	Ant	Equipment
1*	One Man & His Dog CG	G8NWM/P	IO92TR	67	37	30507	1128759	YO8KGA/P	2214	10	2x10Y	FT736R
2*	Barpackers CG	M1BAR/P	IO83XI	34	20	4859	97180	ON7GI	481	10	HB9CV	TR751E

Multi-Operator 3W

Pos	Group Name	Callsign	Loc	QSO	Multi	Points	Total	Best DX	km	Power	Ant	Equipment
1*		GW5NF/P	IO81PR	71	34	20766	706044	YO5TP/P	1976	2.5	9Y	FT290
2*	Malvern Hills RAC "B"	GW4IDF/P	IO81NV	61	38	15808	600704	ER6A/P	2271	3	19Y	IC202S
3		G0HDV/P	IO93UK	52	26	12109	314834	YO8KOA/P	1892	3	13Y	TR751E
4	Oldham RC	G1ORC/P	IO83XN	66	23	7353	169119	EI4IX	484	2.5	2x9Y	FT290
5	Stockport RS	G8SRS/P	IO83XH	54	20	5936	118720	EI4IX	488	2.5	9Y	FT290

Single Operator 10W

Pos	Callsign	Loc	QSO	Multi	Points	Total	Best DX	km	Power	Ant	Equipment
1*	M0AFC/P	IO84SA	113	33	45472	1500576	LZ1KWT	2424	10	13Y	IC706
2*	GW8ZRE/P	IO83JA	101	34	22159	753406	YO5OHY	1984	10	12ZL	TR751E
3	G0PQF/P	JO01AX	50	37	17824	659488	YO3DMU	2095	10	9Y	IC251E
4	M1ACB/P	JO02QC	41	33	11862	391446	YO3DMU	2010	10	9Y	IC821H
5	M0BAO/P	IO80LV	55	27	12813	345951	DL1ELY	664	10	17Y	IC706
6	G8ORG/P	IO83PC	17	12	2244	26928	F5PQV/P	455	10	8Y	IC251E
7	GI0OUM/P	IO74BE	10	11	2203	24233	ON7GI	746	5	5ZL	TR9130

Single Operator 3W

Pos	Callsign	Loc	QSO	Multi	Points	Total	Best DX	km	Power	Ant	Equipment
1*	G1WKS/P	JO01ED	45	30	15580	467400	YO5BLA/P	1748	2.5	13Y	FT290
2*	G4HLX/P	IO82NN	66	28	13195	369460	UT5OH	2044	3	13Y	FT847
3	G0BVW/P	IO92RA	48	28	10150	284200	UT5OH	1882	2.5	9Y	FT290
4	GW0PZO/P	IO83ID	77	22	11909	261998	YO3DMU	2344	2.5	5Q	FT290
5	GM4IGS/P	IO75MB	27	17	5926	100742	G6LX/P	530	2.5	17Y	FT290
6	G0NFO/P	IO82RJ	32	20	4497	89940	ON7GI	464	2.5	7ZL	FT290

*Certificate winner

So, there are different types of contest - with different challenges. In my view, none of them is a "waste of space", though I know many of you might disagree! Consider the different challenges of each contest and decide what suits your style and your interest. Concentrate on those and have fun.

RTTY by WF1B

THOSE OF YOU interested in RTTY contesting will no doubt have come across the excellent program *RTTY*, written by Ray, WF1B. After a number of years of developing and maintaining the program, Ray has decided that he will not charge for the program any longer. Version 5 has just been released, which you can download from his Internet site for free. In addition, Ray has decided to make the program code publicly available in the hope that other amateurs will take up the challenge of modifying and improving the code. Let's hope they will. And in the meantime, thanks to Ray for all his efforts over the year in producing a really superb program.

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest
3 – 4 March	*0000-2359*	*SSB*	*ARRL DX Phone*
10 – 11 March	1200-1200	CW	RSGB Commonwealth Contest
17-19 March	*0200-0200*	*RTTY*	*BARTG WW RTTY*
24-25 March	*0000-2359*	*SSB*	*CQ WPX SSB*

VHF Contests

Date	Time	Mode	Contest
3-4 March	1400-1400	ALL	RSGB 144/432MHz
6 March	2000-2300	ALL	RSGB 144MHz UK Activity Contest
18 March	1000-1200	ALL	RSGB 70MHz Cumulative
27 March	1900-2100	ALL	RSGB 144MHz Cumulative

The full rules of RSGB HF and VHF/UHF contests were published in the RSGB Contesting Guide in October 2000 *RadCom*. Brief rules for non-RSGB contests, which are listed in italics above, can often be found in the 'HF' and 'VHF/UHF' columns. The HF and VHF Contest Committees both have web sites from which comprehensive details are available. These are www.g4tsh.demon.co.uk/HFCC/index.htm and www.blacksheep.org/vhfcc

CQ 160m CONTESTS

RON STONE, GW3YDX, wrote to say that he has been appointed to the committee that runs these contests and will be happy to take up any issues or comments that you have regarding them. ♦

4th 144MHz Backpackers Contest, 2000

LOW ACTIVITY and poor conditions combined for this contest. Several entrants remarked that they packed up early due to the low activity (and the lure of the French F1 Grand Prix on TV). At least the weather was warm and sunny!

Four stations managed to submit perfect logs for this contest and a further two stations lost less than 2% of their claimed score. The average points lost were 9.1% for this contest.

GW0PZO/P wins the Single Operator 3W section with M0AFC/P claiming first place in the 10W section. In the Multi-Operator sections, the One Man and His Dog Contest Group, G8NWM/P, claimed first place in the 10W section with GW5NF/P claiming first place in the 3W section. Finally, thank you to PE1EWR for his very useful checklog.

Ian Pawson, G0FCT

4th 144MHz Backpackers Contest, 2000

10W Multi-Operator

Pos	Group	Callsign	Locator	QSOs	Multiplier	Score	Total	Best DX	km	Power	Ant	Equipment
1*	One Man & His Dog CG	G8NWM/P	IO92TR	51	63	10513	662319	DL6FAW/P	622	10	2x10Y	FT736R
2*	BarpackersCG	M1BAR/P	IO83XH	56	60	7197	431820	PE1OZH	474	10	14Y	TR751E

3W Multi-Operator

Pos	Group	Callsign	Locator	QSOs	Multiplier	Score	Total	Best DX	km	Power	Ant	Equipment
1*		GW5NF/P	IO81PR	51	40	5974	238960	ON1ALJ	448	2.5	9Y	FT290
2*		G0HDV/P	IO93UK	38	38	5148	195624	GI4SNA	395	3	13Y	TR751E
3	Wythall CG	G1WAC/P	IO82XJ	42	40	4003	160120	G3MLO	254	2.5	9Y	FT290
4	Malvern Hills ARC B	GW4IDF/P	IO81NV	41	34	4653	158202	PE1HWO	509	3	19Y	IC202S
5	StockportRS	G8SRS/P	IO93AK	27	30	2807	84210	EI5FK	479	2.5	9Y	FT290

10W Single Operator

Pos	Callsign	Locator	QSOs	Multiplier	Score	Total	Best DX	km	Power	Ant	Equipment
1*	M0AFC/P	IO84SA	86	76	20621	1567196	DL6FAW/P	803	10	13Y	IC706
2*	GW8ZRE/P	IO83JA	80	80	13354	1068320	PE1HWO	540	10	7ZL	TR751E
3	G4ERP/P	IO81XW	65	60	9142	548520	DL6FAW/P	714	10	12Y	FT847
4	M0BAO/P	IO80LV	45	46	7516	345736	PE1HWO	538	10	17Y	IC706
5	G0GRI/P	IO81EE	42	43	7180	308740	PE1HWO	570	10	13Y	TR751E
6	G8ORG/P	IO93AD	42	49	5214	255486	ON1ALJ	460	10	8Y	IC251E
7	G0PQF/P	JO02HV	25	36	5293	190548	GI4SNA	474	10	9Y	IC251E
8	G0WJR/P	IO81PH	22	25	2385	59625	M0AFC/P	302	10	HB9CV	FT290

3W Single Operator

Pos	Callsign	Locator	QSOs	Multiplier	Score	Total	Best DX	km	Power	Ant	Equipment
1*	GW0PZO/P	IO83ID	65	57	8459	482163	ON1ALJ	537	2.5	5Q	FT290
2*	G8JAY/P	IO91AW	46	46	6278	288788	DC9KU	575	3	17Y	IC202S
3	GW1ATZ/P	IO81GV	48	39	6182	241098	ON1ALJ	502	2	10Y	FT290
4	G4HLX/P	IO91FN	37	42	4553	191226	ON1ALJ	365	3	13Y	FT847
5	G0NFO/P	IO82RJ	29	31	3056	94736	ON1ALJ	457	2.5	7ZL	FT290
6	G1WKS/P	JO01ED	23	28	3288	92064	PE1OZH	341	2.5	13Y	FT290
7	G0BVW/P	IO92RA	16	24	2031	48744	M0AFC/P	257	2.5	9Y	FT290
8*	G1GYM/P	IO85WL	25	13	1627	21151	MM1DSD	121	0.5	W30	FT51R

*Certificate winner

CONTINUED FROM PAGE 70

RSGB IOTA Contest 2000 Results

World 12-hr Multi-Mode (continued from page 70.)

36	DL8DZV	75,648
37	PY2YU	71,295
38	N6JM	71,064
39	OK1AOU	67,203
40	DF1ZN	57,876
41	SP9LAS	56,004
42	UY2ZA	51,969
43	OZ9G	49,818
44	VE5SF	48,735
45	VA3UZ	46,953
46	RN4LP	44,100
47	EA5DCL	36,816
48	VO1WET	36,498
49	SN0KYU/P	35,100
50	VE4IM	34,164
51	UA4WNH	31,611
52	UA0YAY	30,360
53	W6FA	29,148
54	IZ1ASP	24,288
55	UA1ANE	22,644
56	YO8DHD	22,572
57	K8KFJ	21,525
58	DL1EV	21,105
59	SP9MDY	19,650
60	9A3ZG	19,344
61	ER1LW	18,954
62	RA3XO	16,875
63	VE6ZT	11,466
64	OK6L	10,833
65	OZ4RT	10,530
66	VE5CPU	9,768
67	PY1KS	9,450
68	S57AW	8,520
69	YU4GQW	7,524
70	LZ2NB	7,020
71	UA3XBB	4,974
72	EW6BI	3,510
73	SP7GAQ	960

World- 12-hour CW

1	HA6NL	569,646
2	OK2ZC	516,100
3	EU6DX	459,225
4	SP2HPD	385,020
5	DJ2QV	379,680
6	YU7AL	322,830
7	OK2QX	321,441
8	UT1FA	320,013
9	RK9AD	312,393
10	SN4JWR	289,722
11	SP6CDP	270,540
12	ER3DX	263,025
13	EU6AA	255,552
14	OM4DN	239,784
15	RW3VZ	220,500
16	RW4NM	202,860
17	UA3RO	198,171
18	UV5U	194,016
19	EA1ABM	168,438
20	UA9APA	167,526
21	LZ1PJ	156,384
22	DL2DRZ	155,976
23	RX3AP	154,629
24	DL5SVB	147,840
25	YL2PM	144,375
26	EA4BSC	137,772
27	ON6TJ	135,135
28	RW4CW	134,064
29	SP6LV	132,525
30	SM7EH	124,640
31	RU9LA	121,440
32	SM4SX	120,120
33	RV3DAK	114,000
34	YU7SF	113,850
35	UA3ABT	112,480
36	UA3WW	110,124
37	SM3AVW	109,983
38	IK5RLS	108,225
39	SP7EXJ/4	93,978
40	RA0CG	90,480
41	DL7VOX	89,856
42	LY2BBF	88,830
43	RU4HH	86,403
44	F8PDR	85,413
45	DL2ANM	83,460
46	RW0IP	82,335
47	UA0LS	79,056
48	UR9MM	76,818
49	OM7PY	76,104
50	SM5PAX	71,335
51	SP6CXH	70,950
52	EW1MN	66,825
53	DF1TJ	65,490
54	DL3BZZ	64,845
55	DL1LAW	64,014
56	RA3UAG	63,360
57	UN8PF	62,208
58	EU1MM	61,620
59	DL8ZAJ	58,599
60	RW1QD	57,069
61	UU2JA	55,620
62	DL3HSC	54,003
63	LZ1IQ	54,000
64	UW0HW	50,760
65	RX9FB	48,870
66	DL5DBH	46,092
67	F2NZ/P	44,697
68	HB2HQX	44,250
69	YV1OB	44,194
70	OK1FVD	42,336
71	YO5DAS	41,067
72	EA4BQ	40,224
73	8S6A	39,900
74	YU7KM	38,418
75	DL2AWW	30,366
76	DJ6TK	30,240
77	YL2BJ	29,760
78	F5IQJ	29,172
79	OK2ZJ	28,024
80	ZV8O	27,552
81	YO4ZF	25,443
82	T92M	22,950
83	N3TG	22,032
84	DL0AKR	20,832
85	RI4M	20,625
86	LZ1QZ	19,662
87	UA9BS	19,500
88	OM8CD	19,488
89	RX6LIX	16,284
90	W9HR	15,912
91	DL7AXM	15,750
92	OM3TKR	15,642
93	UA9XC	13,464
94	DK9EA	12,096
95	F2FX	11,880
96	HA8LLS	11,844
97	UA4QK	10,269
98	ON7SS	10,164
99	PP2JT	9,747
100	RX3ABN	9,420
101	DL5CL	9,120
102	W4NTI	8,400
103	DL3KWF	7,011
104	K8CV	4,995
105	KC2AFK	4,545
106	UT8LO	3,925
107	OK2BHE	3,168
108	SP3GTS	2,700
109	UA9OSV	2,475
110	RV6AB	2,013
111	SP9EMI	2,010
112	UR3PFX	1,782
113	DL3JRA	1,710
114	DL5MY	1,638
115	PP7CW	966
116	OH1UP	945
117	UU4JL	750
118	F5NLX	555
119	EA1FBJ	225
120	K0COP	135
121	W7/JR1NKN	126
122	W5AB	12

SWL - 24-hour SSB

1	NL-4276	1,586,880
2	F-15452	1,302,720
3	SP-3003	1,134,720
4	UA3-147-505	1,121,494
5	ONL-3647	956,223
6	BRS-91529	923,715
7	SP-0142-JG	851,760
8	DE0MLB	358,281
9	ONL-3058	299,625
10	F-17028	276,318
11	F-14846	242,100
12	PA-520-S	22,631

SWL - 24-hour CW

1	UA3-155-28	1,084,974
2	UA1-143-1	830,547
3	JA4-4665/BY4	132,867
4	OH1-688	5,310

SWL - 24-hr Multi-Mode

1	LYR-794	3,705,156
2	OM3-27707	3,305,120
3	UA3-170-847	1,345,050
4	UU-J-1	288,360

SWL - 12-hour SSB

1	ONL-383	887,052
2	UA3-155-776	415,422
3	OH2-836	352,536
4	F-17028	169,632
5	F-17789	165,984
6	NL-290	92,049
7	G6OKU	40,572
8	E21EIC	15,210
9	UA3-155-75	6,048

Check Logs

3Z0OAF, 3Z1KG, 4Z5DW, 4Z5FL/M, 8R1AK, CT1ELF, DF3RED, DH5MM, DJ3XG, DL1JFM, DL2MIH, DL2RTJ, DL2RVD, DL3JON, DL5DXL, DL5KVV, DL5NA, DL7EDH, DL7UEO, EA1OT, EA2BDS, EA4AKH, EC8ABT, G3JTO, G4BRA, HA0DD, HA3GE, HA3GN, HA5AF, HP1ALX, LA7FJA, LT5Y, LU2BA, LW1HCG, LZ2SX, M/DL2KWW, OE6IMD, OK1GS, OK2OP, OM3TU, OZ/DL2JRM/P, OZ/SM7GCZ, OZ5PA, OZ6TL, PA0PIG, PA3AFF, PA3FFM, PA7XG, PP5LL, PY4FQ, R3ZAT, R3ZAU, R3ZAV, R3ZAW, R3ZCA, R3ZCD, RA0ZN, RA3MS, RA6HJR, RK3AY, RN3FT, RN4WA, RU3DG, RX3DOR, RX9AAN, SM0BXT, SM0JHF/5, SM1CXE, SM3MHD, SM4AWC, SM5BTX, SM6AVD, SM6BSK, SM6CZU, SM6Z, SN1A, SN4AAZ, SP0KJU, SP1DMD, SP1JON, SP2MEF, SP3BLT, SP3PFR, SP4BOS, SP4OZ, SP5UAF, SP6TRH, SP7HQ, SP7XK, SP8JUS, SP9CLO, SP9KRT, SV/OK1YM, UA0ZC, UA1CEC, UA1NDX, UA1PBI, UA2FT, UA3XCK, UA3YJU, UA6AF, UR3VJ, UT1WA, UT2IW, UT4FJ, VE7UF, W6ISQ, WA2BMH, WB4DAH, YB0DX, YL2GJZ, YO2ADQ, YO4ATW, YO4CAH, YO5KTK, YO6AUI, YO6DDF, YO7KAJ, YO9HH, YO9KVV, YV5NWG, ZV8Z.

HF HF HF HF

DON FIELD, G3XTT
105 Shiplake Bottom, Peppard Common, Henley on Thames, RG9 5HJ.
e-mail: hf.radcom@rsgb.org.uk

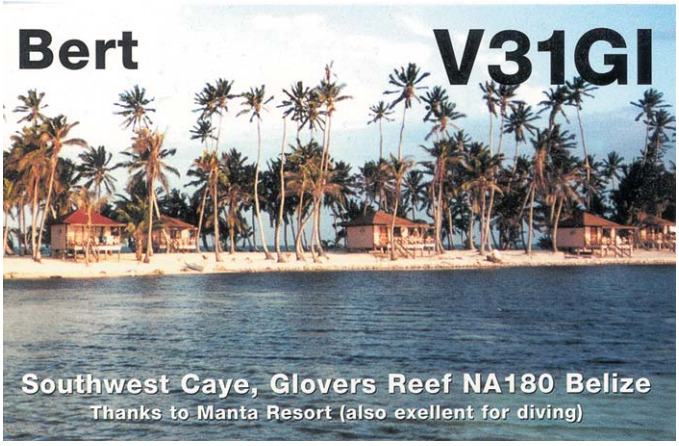
ALL BEING WELL, by the time you read this, you will be satiated from all the DX which was promised for February. I mentioned several operations in this column last month, and others (such as PY0S, St Peter and Paul Rocks) were announced after it went to press. March looks like being somewhat quieter, which is probably just as well! As I write this, Chuck, 3Y0C (see last month), continues to be active as and when he can, but has been plagued by rig and generator problems, along with his antennas being flattened from time to time by the extreme weather conditions on Bouvet Island.

DX NEWS

THE TOSHIBA CORP Fuchuu AMC station, JA1YVT, will be active from Izu Ooshima Island (AS-008) on 17 and 18 March. Activity is planned for CW SSB and RTTY. QSL via the bureau to JA1YVT or direct to JA1CKE.

Dimitri, RA9CO, plans to be in Bhutan from 15 to 21 March and hopes to sign A52CO. He won't be 100% focused on the radio but does plan to be active in the Russian DX Contest, which will run 17 / 18 March from 1200 to 1200UTC. It is interesting to reflect that it is only in May last year that Bhutan finally came back on to the bands in a consistent way, but there now seems to be almost constant activity from there.

Dee, W1HEO, and Paul, W5PF, will operate from Grenada (probably as J3/homecall) from 30 March to 11 April. Operation will be from 40 to 10m, SSB / CW. Special attention will be given to the WARC bands. Two 100-watt transceivers will be used, plus a beam for 10, 15 and 20m and inverted vees for 12, 17 and 40m. QSL with SASE direct to the respective call book addresses or via the bureau.



Bert, PA3GIO, will sign V31GI from Southwest Caye, Glover's Reef, Belize (IOTA NA-180) from 11 to16 March, same call but from the mainland 18 to 25 March and PJ6/PA3GIO/M from Saba (NA-145), Netherlands Antilles, 28 March to 2 April. His web site is at: www.xs4all.nl/~pa3gio/

To commemorate the 500th Anniversary of the discovery of the Isthmus of Panama by Rodrigo Galvan de Bastidas, all Panamanian stations will use the special 3E500 prefix during the month of March and will have special QSL cards available via Radio Club de Panama, PO Box 10745, Panama 4, Republic of Panama.

After their activity from Conway Reef (see January 'HF') the Yugoslav team will operate from Fiji as 3D2AD, 3D2AU and other individual calls from 1 to 6 March.

Bill, W4WX, will be on Wake Island (KH9) from 13 to 20 March and hopes to be active. As transport is dependent on the US military, dates may vary.

Alan, M0BFU, writes that, after reading my column in the November *RadCom*, he sent an e-mail to Bill, T88BA, to arrange a schedule. Unfortunately this didn't come off and, in further correspondence, it transpires that Bill can only put out 20 watts to an R7 vertical. Alan wonders whether any readers might be willing to donate an old rig or perhaps a small tri-band antenna that could be shipped out there to help make T88 more accessible.

Wes, GW3RIH, writes that, although he held the call H44DX from 1974 to 1984, he has been receiving cards for more recent QSOs. H44DX was re-issued for a DXpedition in March / April 1998 and the QSL manager for this operation is OH2BN.

Alan, G4YTY, writes that he will be in Australia until 22 April and will be travelling extensively, operating mobile with an FT-100 and G-Whip. His call will be issued on arrival. On 20 metres he will operate around 14242kHz.

Dan, XQ3ZW, plus two other Chilean and six German amateurs, plan to operate from Easter Island from 3 to 30 March, with special attention to the low bands. Expect to see lots of CW as well as PSK31, RTTY and satellite. The actual call has not been confirmed, although they did request a special event call, which will be used also in the *CQ* WPX SSB Contest.

TABLES

THIS MONTH we have the final scores for the 2000 tables. Competition at the top of 28MHz has been fierce, and congratulations are due to Julian, M0BZQ, for a deserved first place. Julian used an FT-1000MP, Explorer 1200 amplifier and a 5-element monoband Yagi at 45ft. However, I can't help feeling the real trick was the intense enthusiasm and mutual support engendered by the 'Doncaster Waffers Net'!

It's nice to see some relatively recent licensees showing such enthusiasm, and I gather members of the group are already working on their stations for the 2001 tables. Julian singles out two very contrasting highlights for the year. Firstly, working K5K on both SSB and CW but, secondly, working his friend G4YRZ operating portable from indoors in Bosnia using "a tuned up rose bowl and a piece of wire".

John, G4DUW, another 10m specialist, came in second from his excellent south coast location, closely followed by Darren, G0TSM. For part of the year Darren was using a stacked pair of 4-element Yagis, although he's now back to a tribander. The stack worked so well that he was occasionally accused of inventing DX!

Having used stacked

28MHz COUNTRIES TABLE, 2000 (final)

	CW	SSB	Mixed	
M0BZQ	50	259	272	
G4DUW	199	242	263	
G0TSM	175	237	261	
G0VHI	-	255	255	
M0CTQ	4	235	239	
G0CAS	2	210	212	
G3SXW	203	0	203	
5Z4IC	0	194	194	
G0NXX	193	0	193	
G3MDH	0	170	170	
G4MUW	0	155	155	
MM5AJN	0	139	139	
G4UCJ	138	0	138	
G4IDL	136	0	136	
G4OBK	112	19	124	
G3ILO	120	11	120	
G3WGV	116	0	116	
GI4XSF	0	116	116	
G3YJQ	95	51	114	
G3YVH	-	-	108	
G0CGV	96	36	104	
G0KDS/M	0	104	104	
GM4CHX	0	100	100	
GU4YOX	52	82	95	
M0CAL	0	95	95	
MU0FAL	91	0	91	
GU0SUP	-	-	81	(RTTY)
G4FVK	-	-	71	
MM0BQI	23	57	71	
GW0VSW	38	45	67	
G0PHY	0	66	66	
M0CNP	0	66	66	
G3YJQ	-	-	61	(RTTY)
G3WP	60	0	60	
G4ERP/M	0	60	60	
G4YWY/M	-	-	56	
G0NCS	-	-	54	(PSK)
G0URR	-	-	53	(RTTY)
GM0FNE	-	-	53	(RTTY)
M0ASJ	-	-	51	
G3ING	45	0	45	
GM4OBK	34	11	42	
M5AFA	-	-	22	

monobanders myself on various occasions, I can only say that, if you have the ability to erect them, the results are just staggering. Not that gain antennas on 10m need be expensive or unwieldy. My first 'gain' antenna on HF was a 10m quad which I made from garden canes at the massive cost of about £2. On top of 20ft of scaffold pole, hand-rotated, it knocked spots off the multi-band dipole I had been using prior to that.

Of course, many of the entrants have used the tables as a challenge to see what they can achieve with limited stations or time. For example, G3ILO runs just 100 watts to a vertical and a low longwire. Jim, G0CGV, has a job which requires him to work every other weekend, but he still worked nine new ones on the band, including ZK1XXC and XW2A. His antenna is a 2-element tribander. John, G3ING, had a different handicap; as well as being limited to 50 watts and a 25ft end-fed indoor antenna, he also broke his wrist which, as he says, affected his keying!

Owen, G0PHY, agrees with the comment of John, G4EDD, earlier in the year that contests are a good way to work DX, but comments that it is also possible, even as a 'little pistol' to do so at other times. This year he managed ZD9, 3DA, 5H3, YB and VK9 outside contests, with 100 watts and a dipole. He and others complain about problems in getting the QSLs, though. I must also mention the mobile operators who entered. This is a particularly tough challenge but Stuart, G0KDS, for example managed to snag some rare ones including SY2A, VQ9, 3B6 and 5Z4WI.

It's been great to have a few dedicated RTTY entries as well. Phil, GU0SUP, does remarkably well with a (very) low dipole and low power, although no doubt the prefix adds a few dBs to his signal! Tom, GM0FNE, regrets not having more time on the bands, but comments that many people seem to listen on 10m, hear nothing and assume the band is dead. A few CQs, he says, can often produce some surprising contacts. Tom, G4IDL, is another one who would like to spend more time on the bands but says that, a change of job has meant more money but less time for the radio. Tough choice, Tom! He's looking forward to the 2001 challenge as he has just five countries to go (all on 80m) to complete 5-band DXCC. Good luck Tom.

Moving to the WARC bands, Roger, G3SXW, heads the table with a great score. Roger is a highly experienced contest operator, of course, but his home station is very modest in an urban location, and he runs barefoot. Jim, G0NXX, came a creditable second while, I believe, running only wire antennas. Jack, G3WP, reports, as do some of the others, that he finds the WARC bands more interesting than either 14 or 21MHz. Bill, GM3IBU, focused on 12m which, he says, he "discovered" in the autumn of 1998 when realigning his FT-101ZD after a PA valve replacement. He enjoyed the fact that ragchews, as against quickie QSOs, were going on, and has never looked back. The antenna is a 90ft length of wire, with ribbon feeder back to an ATU in the shack. Being way to the north (in Orkney), he finds that propagation is rather different from that enjoyed by the rest of the UK.

All in all, a great year for all the table entrants, and I thank you all for the correspondence and anecdotes which I have enjoyed immensely.

9 BAND TABLES No 37

MIXED MODE

CALL	1.8	3.5	7	10	14	18	21	24	28	TOTAL
G3KMA	245	297	326	311	333	326	332	315	328	2813
G4BWP	235	302	332	316	333	327	332	304	318	2799
G3XTT	228	274	316	277	332	303	327	286	304	2647
G3GIQ	145	243	302	260	333	312	330	286	321	2532
GW3JXN	173	244	287	274	323	306	304	274	283	2468
G3TXF	126	226	286	260	322	274	320	240	293	2347
G4OBK	140	198	257	253	321	285	300	270	275	2299
G3TBK	118	230	265	233	320	276	304	249	274	2269
G3SED	224	245	273	257	288	253	240	230	242	2252
G3YVH	123	152	251	272	315	306	296	261	263	2239
G3WGV	106	183	250	267	295	272	283	249	254	2159
G3IFB	60	219	285	218	323	237	304	226	282	2154
GM3PPE	148	210	246	261	309	243	268	215	224	2124
G3LAS	82	173	214	217	297	278	296	272	270	2099
G3KMQ	59	203	263	199	320	226	277	231	239	2017
G3IGW	129	197	313	233	282	238	249	112	225	1978
G3NOF	5	125	131	0	331	295	330	260	304	1781
G3VKW	43	151	199	83	319	164	311	162	294	1726
G0JHC	1	29	146	194	224	267	285	263	295	1704
G5LP	63	215	277	187	304	101	268	30	219	1664
G4PTJ	26	149	180	77	308	181	308	157	269	1655
G4XRX	7	67	168	143	292	225	296	192	255	1645
G4UCJ	33	87	178	139	221	173	198	161	186	1376
G4NXG/M	24	57	134	0	287	182	269	166	244	1363
M0AWX	43	109	109	0	238	154	200	148	157	1158
GM4OBK	39	95	130	68	161	110	149	110	179	1041
G4FVK	40	76	101	54	181	102	176	62	158	950
G0LRX	1	84	122	0	224	31	242	14	210	928
MM0BQI	39	53	96	41	145	65	126	49	107	721
Average	**93**	**169**	**222**	**176**	**286**	**225**	**273**	**200**	**251**	**1893**

CW ONLY

G3KMA	239	276	322	311	332	319	330	299	315	2743
G3XTT	218	243	302	277	303	275	297	251	273	2439
G4BWP	205	213	283	315	265	291	258	263	218	2311
G3TXF	126	219	284	260	317	272	314	239	278	2309
G0NXX	166	227	271	278	289	278	264	247	255	2275
GW3JXN	168	208	266	263	295	289	284	242	246	2261
G3WGV	108	185	254	271	302	279	295	255	261	2210
G3SXW	93	195	246	238	312	251	293	212	266	2106
G4OBK	127	171	243	253	283	267	261	251	243	2099
G3YVH	122	141	239	266	298	278	264	228	237	2073
G3SED	222	224	269	257	262	226	206	189	189	2044
G3NOH	48	124	204	254	301	284	289	243	248	1995
G3LAS	80	83	189	217	247	234	252	227	231	1760
G5LP	63	209	276	187	287	100	256	29	201	1608
G3VKW	35	74	140	82	211	121	226	116	165	1170
G4PTJ	24	65	119	77	160	110	159	121	168	1003
GM4OBK	31	77	113	68	133	93	128	94	127	864
Average	**122**	**173**	**236**	**228**	**270**	**233**	**257**	**206**	**231**	**1957**

Next deadline 8 April 2001. Prepared by G3GIQ 8 January 2001

CONTESTS

THE MAJOR International contests in March are the ARRL International DX Contest (SSB) on 3 / 4 March, and the *CQ* WPX SSB Contest on 24 / 25 March. Both are 48-hour events, and the rules remain as in previous years. On a smaller scale, the UBA Spring Contest is on 80m CW from 0700 to 1100 on 11 March, and 80m SSB from 0600 to 1000 on 8 April. Work ON stations. Send RS(T) + serial number, receive same plus three letter section abbreviation. I can provide details if required.

Rose, VP9LP, reports that the annual Bermuda contest has been cancelled this year due to lack of participation. The Radio Society of Bermuda thanks all the regular participants and says that a replacement event will be advised in due course.

AWARDS

CQ MAGAZINE IS introducing a special operating award for the year 2001 to mark the start of the new millennium. 'The *CQ* Millennium Award' recognises anyone who meets the minimum requirements for any of *CQ's* four permanent operating awards, minus the QSL cards, during calendar year 2001. Amateurs and SWLs may qualify in one of the following four ways during the calendar year 2001: (1) Work stations in 500 US counties (the basic level for the USA-CA Award), (2) Work 100 countries (the basic criterion for the *CQ* DX Award), (3) Work one station in each of the 40 *CQ* zones (the Worked All Zones basic qualification), (4) Work either 400 prefixes mixed-mode

2000 WARC BANDS TABLE (final)

	10MHz	18MHz	24MHz	Total
G3SXW	191	203	183	577
G0NXX	181	179	187	547
G4UCJ	103	118	106	327
G3WGV	84	119	77	280
G3YVH	73	97	82	252
MU0FAL	109	75	68	252
G3ILO	111	78	61	250
G3ING	61	72	70	203
G4KHM	77	92	27	196
M0BIB	24	51	120	195
G4AFI	28	69	80	177
G4OBK	34	62	58	154
GM4OBK	39	60	55	154
G3WP	58	42	37	137
GM4FAM	26	33	66	125
GW0VSW	33	24	53	110
G4YWY/M	0	51	44	95
GM3IBU	0	0	93	93
G0VLC	24	37	21	82
G0TSM	21	18	32	71
G4ERP/M	0	68	0	68
M0CAL	0	29	37	66
MM0BQI	20	23	20	63
G4FVK	2	20	27	49
M0CNP	5	27	14	46
M5AFA	0	11	16	27

or 300 prefixes single mode (CW or SSB only) (as required for the *CQ* WPX Award).

Applications should include log extracts showing the information required by the standard award rules, in the format required by the standard award rules, plus (outside the US) a $12 processing fee. There will be special recognition for those who qualify on the basis of more than one award program's requirements.

Full details are published on page 15 in the January issue of *CQ* magazine (I should have photocopies available for anyone who requires them). Alternatively, for rules and forms go to the *CQ* web site: http://www.cq-amateur-radio.com/

The ARRL DXCC Desk is now accepting applications for its new '17-Meter Single Band DXCC Award'. The 17m DXCC certificates will be dated but not numbered, and credits will also count towards the DeSoto Cup competition for 2001. To determine prior credits on 17m, contact DXCC for an update to help avoid duplicates and additional costs. Copies of DXCC records are available (in Adobe PDF format) by contacting the DXCC Desk at dxcc@arrl.org

MOST WANTED COUNTRIES

CARL, N4AA, FROM DX Publishing, Inc reports that the results of *The DX Magazine's* 100 Most Wanted survey for the year 2000 (survey taken in September / October) show the top 20 'Most Wanted' to be as follows:

1 P5 (North Korea), 2 VU4 (Andaman), 3 BS7 (Scarborough Reef), 4 3Y/B (Bouvet), 5 VU7 (Lakshadweep), 6 KH5K (Kingman Reef), 7 YA (Afghanistan), 8 VP8/SS (South Sandwich), 9 3Y/P (Peter I), 10 7O (Yemen), 11 KP1 (Navassa), 12 3D2/C (Conway), 13 KP5 (Desecheo), 14 KH1 (Baker & Howland), 15 VP8/G (South Georgia), 16 VK9M (Mellish Reef), 17 FR/J (Juan de Nova), 18 YV0 (Aves Island), 19 VP8/O (South Orkney), 20 SV/A (Mt Athos).

As I write this, Bouvet is active (3Y0C) and, of course, the huge K5K operation will have brought Kingman Reef down the lists. Conway Reef should have been activated by the time this appears in print. Several on the list are rare for the simple reason that permission to operate is difficult, if not impossible, to obtain. This now includes Navassa and Desecheo both of which were once activated on a regular basis. Others are on the list because they are tough to get to, but these are the ones that, sooner or later, will be targeted for a major DXpedition. So I wouldn't be surprised to discover that plans are in hand for another South Sandwich or Peter 1st operation, for example.

The complete *DX Magazine* listing can be found at www.dxpub.com/dx_news.html Breakdowns by different regions of the world can be found in the January / February 2001 issue of *The DX Magazine*.

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 **May** issue by **24 March.** Due to space constraints, QTH Corner has been held over to next month. ♦

HF F-Layer **Propagation Predictions** for **March 2001**

	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe							
Moscow	9988899699	9999999898999	4899999599 87	..9999999 93.	..9999999 8..	..9999999...	..9999999...
*** Asia							
Yakutsk	.....898.	554...188798	64877887888 7	326888865554	..5888643332	..379742....	...6763.....
Tokyo	.....9998.	.....689999.	....8989998.	...8988887..	...8987.....	....8.....	....8.....
Singapore	68886	199987	899975	.....699973.	...1279983..	...367887...	...467885...
Hyderabad	4.....8889	8.....79999	62....699999	3264569999 76	..7788999743	..689999951.	..5899998 2..
Tel Aviv	77.....6677	215....27775	1.2322478522	...44556721.	...3566741..	....22232...	.....112....
*** Oceania							
Wellington	.....27...	.....168...	....23467...	....44445...	....332.2...	....	....
Perth	.....3888.	89981	588872	.....177752.	.....3664...	.....443....	....23.....
Sydney	.....688..	.....5998..	.....58997..	....278883..	....57876...	....56753...	....5553....
Honolulu	....	..22.....	...33.....	....	....	....	....
W. Samoa	....	...2.....	...3445.....	.....34.....	....	....	....
*** Africa							
Mauritius	9.....49999	9.....99999	97.....99999	8.7...899999	..88889999 87	..89999998..	...999999...
Johannesburg	99.....8999	99.....9999	882....29999	3.53..289987	..5644689875	..37778997..	...7778885..
Ibadan	995.....8999	999.....9999	9798..299999	6.9999999 87	..9999999 97.	..8999999 9..	...9999998..
Nairobi	92.....9999	99.....29999	998....99999	9998779999 99	9899999999 98	8.9999999 989	8.9999999 988
Canary Isles	839.....7998	.9.7....992.	99988.599799	989789989.99	8785899..998	....599..98.	.....999998.
*** S. America							
Buenos Aires	9997.....99	9999.....999	99997....999	9999988899 99	8779999999 98	...9999999 9.	...9999999 7.
Rio de Janeiro	999.....999	9999.....999	9999.....999	99999..99999	9..9999999 99	...9999999 9.	....999999..
Lima	9997.....69	9999.....99	87795....298	5..9651137 75	...8475567 6.	....6.8777 7..	....3.7777 6..
Caracas	888.....78	9995.....89	87796....799	6..788..799.	....8988897.	.....9999 9..	.....9999 8..
*** N. America							
Guatemala	9999.....9	99999.....99	999999...999	9..9999999 99	...9.999999.	.....9999 9..	.....9999 9..
New Orleans	888.....8	9888.....18	662862...487	53.5.8878872	.....888885.	.....6989 7..	.....9996..
Washington	887.....69	9992.....98	9778852268 89	6436698998 97	3...5999998 5	.....899996.	.....7999 85.
Quebec	898.....278	8357.....898	1..8744779 61	...5888888 1.	...3888896..	....688873..	....5667 6...
Anchorage	698.....	9998...67418	7667..688898	6.....7876	.....65..	....	....
Vancouver	787.....	8776.....6	3123..444564	2.....6772.	.....575..	.....5...	.....2...
San Francisco	8987.....1	888851...17	6557533225 56	2..3..477642	.....2776..	.....673..	.....55...

Key: Each number in the table represents the expected *circuit reliability*, eg '1' represents reliability between 1 and 19% of days, '2' between 20 and 29% 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 the signal is expected to be strong.

The RSGB Propagation Studies Committee provides propagation predictions on the Internet at www.g4fkh.demon.co.uk The page is updated monthly. The provisional mean sunspot number for January 2001 issued by the Sunspot Data Centre, Brussels, was 95.1. The maximum daily sunspot number was 131 on 7 January and the minimum was 59 on 17 January. The predicted smoothed sunspot numbers for March, April and May 2001 are respectively: (SIDC classical method – Waldmeier's standard) 105, 104, 102 (combined method) 126, 126, 126.

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SWL

LOW BAND conditions this Christmas and New Year period were disappointing. The high spot was hearing quite a few signals from JA on 7MHz SSB at around 0930 - 0945UTC. Nothing of any real note was reported on 3.5MHz, no DX was reported at all on 1.8MHz SSB and my view that 7MHz is a better DX band in February and March seemed to be proved yet again.

Simon, RS177448, and I took part in the CDXC low-band challenge, the idea being to see how many DXCC entities could be heard (or worked) on the low bands in January. At the time of penning this column, I had heard 115, while Simon had managed 102, the difference largely being what I had heard from 2230UTC into the small hours of a number of different mornings. Concentrating on the low bands, especially 7MHz, had paid dividends for Simon as he added 4K, 4L, 5N, 6Y5, 8Q7, 9Y4, C56, JT, VR2 and YS to his All-Time list.

There had been several contests in early January (rules in January's column). I have no reports of activity during the SWL New Year contest, but conditions for the new Cray Valley contest were reasonable although greater DX activity from outside Europe might have provided more interest. Results of this event will be featured in the column at a later date.

While on the subject of contests, it is unfortunate that space could not be found for Franck Parisot's, F-14368, 28MHz SWL contest in December. Conditions were very good, with over 100 DXCC entities and 54 US States and Provinces logged by the RS178500 multi-operator station.

Leslie Vegh, OM3-27707, with his daugther and the Holyland Contest SWL Trophy.

SWL TOP LIST

FOLLOWING ON from last month's news that Yan Barbier, F-11556, had started an Internet DXCC 'Heard and Confirmed' SWL listing, Venca Nemecek, OK-L7, is starting an SWL 'Top List'. This latter list has both heard and confirmed categories and is open to all SWLs, including our licensed colleagues who might spend a lot of their time listening. Deleted countries count in this listing, so don't forget to look back through your logs and include that CR8, KR6 or KZ5 that you heard 20 years ago!

Your scores should be in this order: DXCC Mixed, DXCC SSB, DXCC CW, DXCC RTTY and then a score for each of the HF bands. You can count each DXCC entity only once regardless of mode, so if you hear a G on 20m SSB, a GW on 20m RTTY and a GM on 20m CW that is a mixed DXCC score of 3. If you need further clarification, please write to Venca at Box 10, 190 12 Praha 912, Czech Republic or e-mail him at ok1hrr@wo.cz Please do not be shy! Britain has some very good listeners and some good up-and-coming ones, too. It would really be good to see some of them put an entry into both of these lists.

QSL RATIOS

MAURO BERTOLINO, I1-21171 / IZ1CRR, provides a unique insight into QSLing returns from 1988 to 1999 (see **Table 1**). Does any British SWL keep such detailed records? If so, I will gladly publish the details.

SWL REPORTS - DOs AND DON'TS

ALTHOUGH THIS topic was aired a few months ago, I make no apologies for repeating some of these key points, especially as I shall be dealing with your reports for D68C soon!

- Make sure you copy the callsign of the station you are reporting to correctly
- Make sure your report is clear and legible
- If reporting on QSOs on different bands, make it clear which details relate to which band (perhaps by using different coloured pens)
- Ensure the date, time (UTC or GMT) and frequency are correct
- Be certain that the callsign of the station(s) being worked is correct
- Try to include more than 1 QSO made by the station you are sending the report to
- Make sure that your QSL card has the six main components needed for an acceptable SWL card: date (eg 25 Dec 00), time (UTC), frequency (eg 14195kHz), station(s) worked, mode, honest RS(T)
- If QSLing a DXpedition, QSL managers prefer to have reports listed in chronological (date) order, not in random or ascending / descending band order

If sending your card direct:

- Make sure you send your card to the correct address. If the station has a QSL manager, send your card to him / her
- Include *adequate* return postage, preferably US dollars or IRCs (correctly franked in the left-hand box), or a self-addressed envelope (SAE). Remember that some DXpedition cards are four-sided and if you hear the same station on more than one band, two cards are more expensive to send than one
- Simply enclose your QSL, SAE and return postage
- Put an Air Mail sticker on any SAE intended for anywhere outside the UK, including EI
- Make sure that any SAE that you send is strong enough (postal sorting machinery has a habit of damaging 'flimsy' envelopes
- Do not send British postage stamps when you are QSLing anyone outside the British Isles (our stamps are worthless in, say, Germany). Similarly, SWLs from, say, Italy, should not send Italian postage stamps when they are QSLing a British Isles station or a station with a British QSL Manager

If sending your card via the bureau:

- Make sure you include the station's callsign (or his QSL manager's callsign) in a prominent place

If sending an e-mail request for a QSL card:

- Make sure you follow the appropriate advice from above

These tips will lead to better quality SWL reports and a better QSL return . . . and, finally, I look forward to confirming D68 for you all. ♦

Cont	QSLs sent	QSLs rcvd	%
EU	7547	3539	46.9
AF	1736	922	53.1
NA	4377	1443	32.9
SA	856	410	47.9
AS	2268	909	40.0
OC	1039	534	51.4
AN	59	31	52.5
Total	**17882**	**7788**	**56.4**

Table 1: Mauro Bertolino's QSLing return records.

Certificate received by Simon Treacher RS177448 for his 10th place in the 2000 ARI DX contest.

REPEATERS

ROGER JONES, G3YMK
Millfield House, Alton Lane, Four Marks, Alton, Hants GU34 5AL.
E-mail: G3YMK@aol.com

TWO QUESTIONS specifically relating to repeaters were asked at the very well-attended Radiocommunications Agency Amateur Radio Open Forum held in Edinburgh on 7 December 2000. The first asked, "Why are there no 6m repeaters in Scotland?" Checking with Colin Dalziel, RMC Scotland Manager, the answer given was correct: no full application has ever been produced, although over the years some interest has been apparent. The usual problems are either lack of a suitable site or finance. Any application which might come forward will be processed by the RMC and would be very welcome.

The second queried the letter sent to all keepers by the RMC Chairman, Carlos Eavis, G0AKI, regarding the RA's request to formalise the GB2RS news broadcasts via repeaters. This was because several groups were requesting this privilege and whilst the RA was warm to the extensions, they wished to have on record when, where, and by whom the service was being provided. Nothing more sinister!

NEW REPEATERS

THE CLOSING WEEKS of 2000 saw a flurry of new and re-sited repeaters being commissioned. 2m mobile coverage has been restored to much of Cardiff, Newport and the Severn Bridge areas of South Wales with the welcome return of GB3BC (145.750MHz) from its new site. The intermodulation problems suffered on the previous site seem to have disappeared but, as expected, overall coverage is not quite as good. Mark Lewis, GW7KDU, RMC Wales Manager points out that with the introduction of 12.5kHz channel spacing, it might now be possible to accommodate an additional repeater to complement the coverage of GB3BC if a suitable site could be found. Mark would be very happy to advise any interested group and he can be contacted either at the address in the *RSGB Yearbook 2001* or via RMCWEB (1).

Commissioned on the first day of the Picketts Lock exhibition it did not take mobile operators on the M40 very long to recognise the existence of the new GB3AL (145.7375MHz) repeater in Amersham, Bucks. The repeater was very busy for the whole weekend, much of the time being spent by users discovering that it was only accessible via CTCSS. Initial coverage reports are very satisfactory and further reports would be welcomed by keeper Iain Phillips, G0RDI, via the group's web site(2).

GB3BN (433.000MHz) has been resited near Bracknell in Berkshire on a far superior site and is providing excellent coverage of the Thames Valley. It has been taken under the wing of the Thames Valley Repeater Group, which would appreciate reports on the performance of the new unit via their new web site(3) or direct to the keeper, Paul Westwell, G4HLF, QTHR.

Paul Westwell, G4HLF, makes the first QSO via the re-sited GB3BN.

Jon Illsley, M0BQQ, the keeper of GB3SD in Dorset reports the performance of the repeater is much improved following a 'heart and lung transplant' in the form of a new F496 and G3RKL Mk2 logic. The group hopes to replace the ageing aerial system in 2001(4).

North of the border, the Central Scotland FM Repeater Group reports delight with the re-sited GB3CS (145.750MHz) although, as expected, coverage is thin in the Stirling and Dunblane areas. The keeper is working on a solution to the through audio characteristic, but this is not a serious problem.

NEW PROPOSALS

A NEW 2m repeater has been proposed co-sited with the existing 70cm and 23cm units at Corby Power Station. Intended to cover the main A14 trunk road, the provisional callsign allocated to the project is GB3CQ and frequency 145.6125MHz although, as with all new proposals, these are subject to change during the licensing process. GB3CQ is proposed to have CTCSS-only access, at the request of the group.

A proposal to incorporate permanent cross-band linking for GB3NY(433.000MHz) and GB3YC (145.000MHz) has been submitted to the RA.

A request to increase the power of GB3WR (145.600MHz) to 14dBW has been forwarded to the RA. The Mendip Repeater Group hopes this will improve signal levels in the built-up areas around Bristol.

INTERNET GATEWAYS

JULIAN MOSS, G4ILO, writes regarding alternatives to the *iPhone* software used by many gateway operators. He, and several others, have been experimenting with an alternative freeware offering called *Speak Freely*. This will run under Windows and Linux. Some Canadian enthusiasts have apparently adapted the source code quite successfully and it shows great promise. Julian would be delighted to hear from anybody with experience of *Speak Freely* via e-mail: julian@tech-pro.co.uk or his address which is QTHR in the *RSGB Yearbook 2001*.

Frank Pounder, G0GRZ, is trying to compile a website of Internet Gateways operational in the UK. He would be delighted to receive information from any operators regarding location and operating times via e-mail at: frankgrz@ntlworld.com

FINAL SNIPPETS

Dave Burdett, G7MFW, makes a good point in the December 2000 Kent Repeater Group Newsletter. "Before blaming the repeater for poor performance, make discreet enquiries of the keeper to see if others are experiencing similar problems. It might just be your equipment that is at fault. Miscalling the repeater via a recycled coat-hanger antenna is probably not to be recommended; especially if the keeper is listening!" ♦

LATEST CLEARED REPEATERS

No new Voice Repeaters have been cleared by the RA as at 3 January 2001. Outstanding voice repeater proposals submitted for licensing are:

Callsign	Application type	Stage	Keeper
GB3AB	Resited 70cm Repeater Aberdeen	RA	M0GIB
GB3CK	Resited 70cm Repeater Kent	RA	G6ZAA
GB3NA	Resited 2m Repeater Barnsley	RA	G4LUE
GB3PZ	Dedicated 70cm Internet Repeater Cheshire	Primary User	G4ZPZ
GB3UO	New 70cm Repeater Wrexham	Primary User	G4UDE
GB3CQ	New 2m Repeater Corby	RA	G1DIW
GB3WR	Power Increase	RA	G0TJP
GB3YC	Link to GB3NY	RA	G4EEV

As the channel allocated to a proposal is not finalised until the application is approved they has not been included. However, full proposal details including an expected coverage map can be found on RMCWEB (1).

INTERNET ADDRESSES

(1) www.coldal.org.uk/rmc.htm
(2) www.77hz.com
(3) www.tvrg.org.uk
(4) www.sdrg.co.uk

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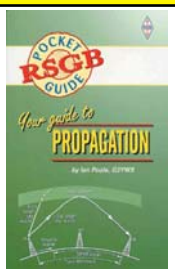

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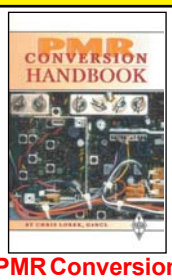

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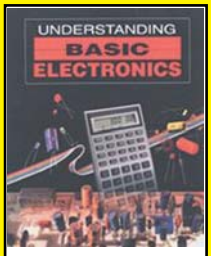

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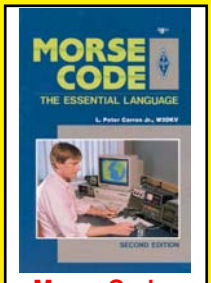

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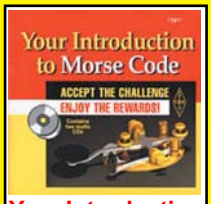

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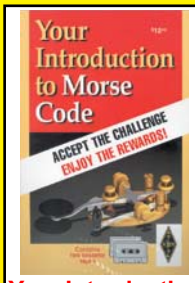

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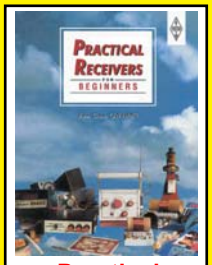

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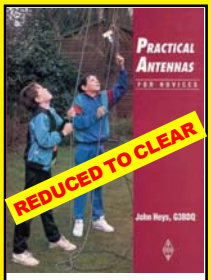

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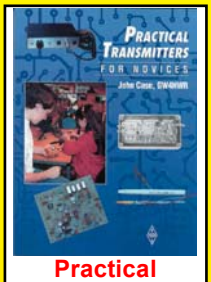

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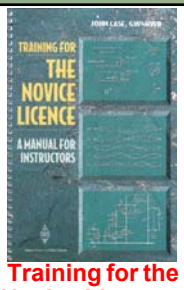

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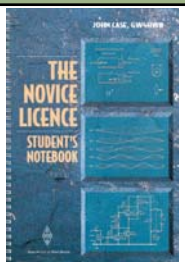

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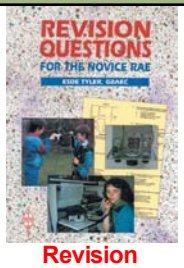

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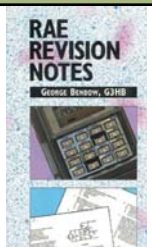

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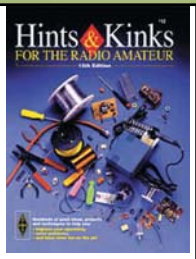

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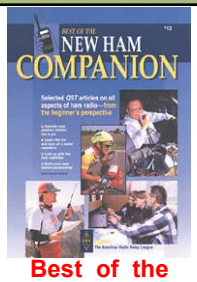

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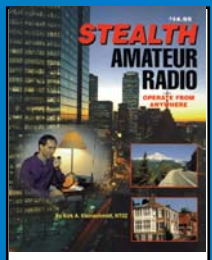

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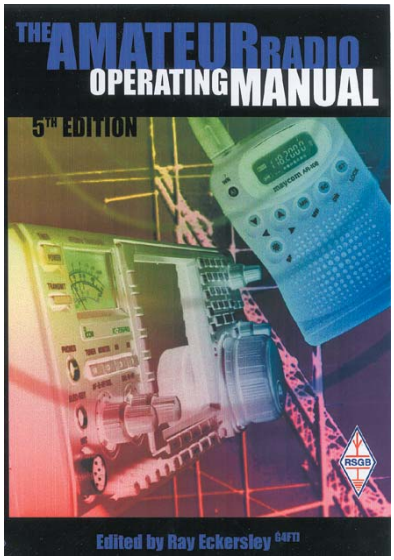

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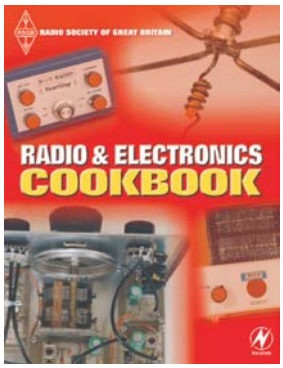

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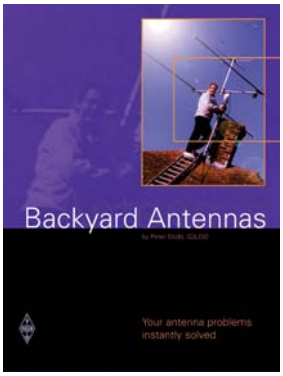

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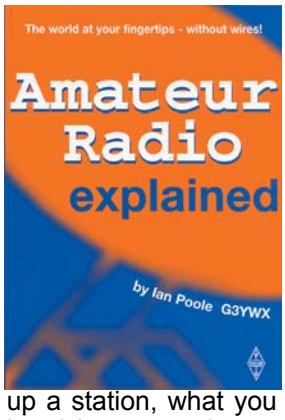

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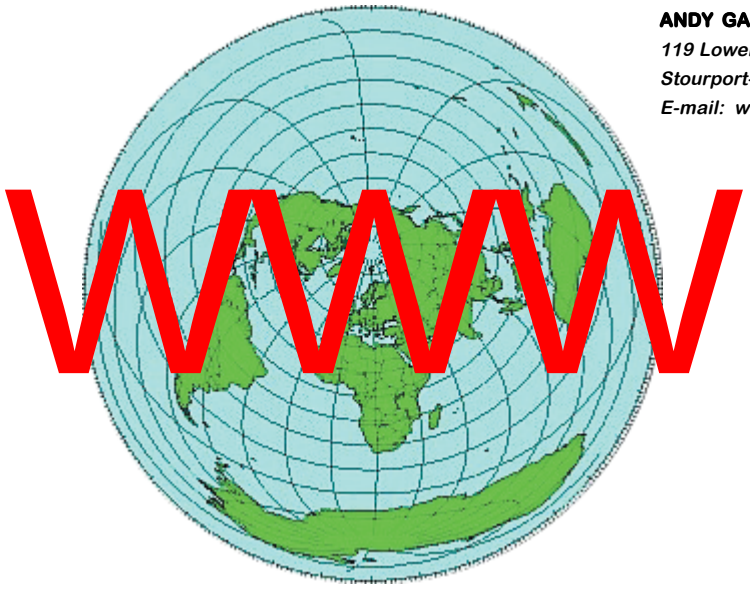

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NOT TOO LONG ago, *RadCom* readers were introduced to a new operating mode by Peter Martinez, G3PLX, in the form of PSK31 [1]. Since then, numerous articles have been written about the subject world-wide, and these have been collated, together with a wealth of other information, at the web site generated and maintained by Eduardo Jacob EA2BAJ, of Bilbao University in northern Spain (1). The site is endorsed by Peter as the Official Homepage for PSK31 information, and it contains everything you will need to understand to start using the mode.

Peter told me some time ago that "the dramatic increase in PSK31 activity on the air worldwide has taken place as a direct result of the influence of Internet technology". Whilst the Official Homepage is not the most attractive site you will ever see, it does demonstrate how the web can be used to great effect for spreading technical information amongst those keen to experiment with it. This has allowed the mode to rise in popularity much more quickly than would be achieved using traditional publishing methods.

Navigation of the site could certainly do with some improvement, with many key pages being found only after following innocuous looking links in the body of other pages. Nevertheless, anyone keen to find out more about the technicalities of this mode would still be wise to spend time exploring the site, as it contains copies of Peter's original *RadCom* articles, additional detailed technical descriptions, plus software downloads for DOS, Windows, Linux and Macintosh operating systems. Links to non-English information pages are liberally referenced throughout the site; an uncommon feature that makes it a truly global resource.

MORE DATA MODES

ONE REGULAR USER of the PSK31 mode is Dave deSouza, G3VFP, who has informed me that an e-mail-based newsgroup (2) is available for enthusiasts to exchange ideas and discuss any problems they may be having. Located on the 'eGroups' web site, you can subscribe to the group by sending a blank e-mail to psk31-subscribe@egroups.com to find out the latest news and chat about this innovative real-time data mode.

Dave also runs a web site that contains regular updates of software for modes that use the PC sound card for encoding and decoding, such as PSK, HELL, THROB, RTTY, SSTV, etc (3). The arrangement of file names on the download page is a little haphazard (Dave freely admits the page needs organising) so the listing needs careful reading to find what you after. Alongside the decoding software for the data modes there are programs for CAT control of various transceivers, Baycom drivers, antenna calculators, and numerous other miscellaneous subjects.

The software archive, when organised, will be a useful resource for anyone interested in new and not-so-new data modes.

CONTEST CALENDAR

ENTHUSIASTS OF HF contesting will find the web site of Jan Almedal, LA9HW (4), to be of interest. Recommended by Stu, MM0BSM, Jan's site is a quick reference for approximately 200 different HF contest events from around the world, listed on a month-by-month basis. A no-frills approach to page design has been used to provide the date, times and modes for all of the named events, along with a link to the rules for each of the contests. Many entries also have listings for previous contest winners, along with links to the contest organiser's home pages where available.

For those who can read Norwegian, Jan provides some dedicated pages for Norway's national contests but, apart from these, the site is completely in English and, as Jan points out, there's an "average of four events per weekend, so there should be something for everyone". A small collection of 'special' listings rounds off the site, with sections for RTTY contests, single-country contests, and State QSO Parties. Jan is at pains to point out that not all the listings on the site come from 'official' sources, so the data should probably not be used as a definitive reference for any one contest. The site is useful, though, as an aid to planning your contest activity for the year ahead, or just finding out 'what's on' before going on air.

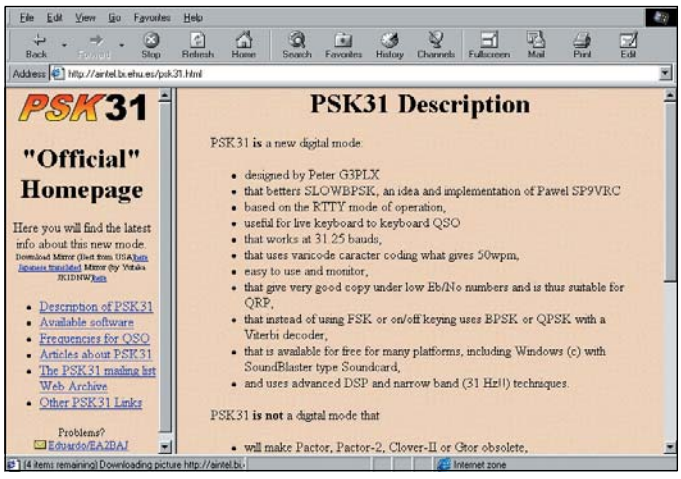
FEEDBACK

AS I WRITE this, I am starting to receive feedback from the comments I made in the January 2001 *RadCom*, regarding the content of 'WWW' and how it should develop. Indications so far are that readers are reasonably happy with the format as-is, and my audience is much wider than I had anticipated. Even 'veteran' users of the web find the reviews useful, so I shall continue to do my best to track down the highest quality amateur radio sites on the web and give you an honest appraisal of their contents. Many thanks to everyone who took the time to respond, but please *do* continue to send me your feedback and web site recommendations. ♦

FURTHER READING AND INTERNET SITES

[1] *RadCom* December 1998 / January 1999

(1) http://aintel.bi.ehu.es/psk31.html
(2) www.egroups.com/group/psk31
(3) www.btinternet.com/~g3vfp/
(4) http//home.sol.no/~janalme/hammain.html



The PSK31 official homepage.

QRP QRP QRP QRP QRP

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E-mail: g3rjv@gqrp.com

FROM TIME to time, little QRP projects capture the imagination, usually simple ideas which can be quickly and cheaply built and bring the constructor a lot of fun. The Doyen of such projects has been George Burt, GM3OXX, from whom the amateur radio world received the *OXO* transmitter and the *ONER* transmitter. The *ONER* is perhaps the most-built amateur radio project – kit sales now number several thousand.

Kanga Kits have just produced a new kit, which is a spin-off of an early GM3OXX design. In *SPRAT*, the G QRP Club Journal for summer 1983, George produced the *FOXX* transceiver. This was a simple 1W CW design, with low component count, the transceiver using the same bipolar device for the power amplifier and the receiver mixer. Although a very basic transceiver, it captured the imagination of many constructors.

I had a small hand in the history of the *FOXX* by modernising the circuit to produce the *FOXX-2* in *SPRAT* for the summer of 1997. Derek Alexander, G4GVM, then went on to improve the circuit further and the *FOXX-3* appeared in *SPRAT* for spring 1999. The Kanga Kit version of the *FOXX-3* first appeared at the Rochdale QRP Convention in October 2000.

The transceiver incorporates a sidetone oscillator, changeover relay and low-pass filter. It fits inside an Altoids™ mint tin, all connections being made via vertical connectors, which are concealed when the lid is closed. The connections are as follows: antenna via 50Ω BNC socket, power via 2.1mm co-axial connector or two-pin 0.1in header, headphones via 3.5mm mono, stereo jack plug or two-pin header, Morse key via 3.5mm jack plug or two-pin header. All you need to add are a 12V DC supply, headphones, an antenna and tuner. An optional push-switch Morse key is fitted. The price is £21.95 for 80, 40, and 20m versions, and £23.95 for 30m. Further information can be had from Kanga Products, Sandford Works, Cobden Street, Long Easton, Nottingham NG10 1BL or at www.kanga.demon.co.uk

G3CWI obviously took to the little transceiver. He writes:

"I was vaguely aware of the original *FOXX* design but hadn't given it much thought. But then came the G QRP Mini Convention at Rochdale, (28 October) and there I saw the rather foxy-looking *FOXX-3*, all ready to go and mounted in a little mint tin. It was love at first sight, and I took my new *FOXX* home. The soldering iron came out and in a couple of hours I had my first QSO (with Adrian, G4GDR, QRP to QRP on 80m CW). It's a simple enough design, but it really works. It's a fun radio and gets you on the air for £20."

Since that time he has taken part in the 'Mint Box Challenge'. With a companion, he climbed Snowdon on 20 January and Scaefell Pike on 21 January, operating the *FOXX-3* for one hour from both peaks with sponsorship for the number of QSOs. The sponsorship is to raise money for two young missionaries working in Siberia. As I write this, the event has yet to take place, but I can only say "well done" to G3CWI.

Foxy: The Kanga kit version of the *FOXX-3* transceiver.

OTHER FORMS OF QRP

IT CAN BE a misconception that most QRP operators are people who use simple CW-only equipment to establish limited contacts. There is a well-established history of QRP operation on a variety of modes with amazing DX results. There is probably more serious DX operation on air than contacts with limited equipment, so here are a few examples.

CW QRP

Some time ago I mentioned Roy Walker, G0TAK, in this column. Roy entered the Arkansas QRP challenge (to work 2000 contacts in a year with 5W or less) and was awarded certificate number two for his efforts. Last year, he entered the G QRP Club challenge to make 2000 two-way QRP contacts (both stations using 5W or less) in the year 2000. Roy writes,

"Well I did it, almost, and this time it was much harder, but I worked slightly less than 1400 two-way QRP contacts in the year, and this time got only 44 DXCC countries in the bag. It was much harder work, but I have a sense of achievement from it. The best contact in the year was ZL2SEA, followed closely by IK2 with 500mW each end."

SSB DX QRP

Ian Keyser, G3ROO, tells an amusing story of SSB QRP DX:

"Some years ago Paul Nicholson, G3VJF, (founder of Icom (UK)) and I were in QSO on 10m along with a VK station. Paul was laughing at the fact that he was running state of the art Icom gear with 100W to a beam. I was running 500mW PEP to a dipole and we were both getting the same report from the VK station. I then realised that we were on 28.5MHz, and I had a CB handheld AM rig on that frequency, so I extended the aerial inside the shack and whistled into the microphone. As my station receiver recovered, I heard the VK say "Was that you whistling, Ian?". Milliwatts to a whip inside a building to VK…!"

Brian Jones, G0UKB, uses a K2 transceiver (a kit rig produced by Elecraft in the USA) for QRP SSB. Brian writes: "I've been too busy to play serious radio, but the K2 log has 274 QSOs spanning 101 countries (all SSB with 10W or less to a 132ft Windom at 25ft or to a multiband vertical). Broke some good pile-ups (especially those working split) to work 1A0, 3A, 4S, 5V, 8Q, A5, A6, CY9, D2, ET, FJ, FR, HH, OX, PJ4, PJ7, PY0, VQ9.

"I worked Gerry, VK2GK, over in Hobart on 17m in August. He kept telling me I was a weak signal. He then switched off his linear, dropping from 200W to 10W (the same as me) and was still perfect copy - my first ever QRP VK contact (and only my second 1000 metres-per-watt buster)."

There are also British QRP kits capable of excellent performance. Sheldon Hands, MW0ELR, of Hands Electronics, writes about testing his company's new all-band RTX109HP transceiver.

"This morning, I hooked into an interesting propagation QSO conducted daily by W1BFA in Maine. From 1200 UTC, Ernest takes calls first on 14.279MHz then moves HF to 18.127, followed by 21.237, 24.937 and 28.239MHz.

"I caught up with Ernest on 18.127MHz and got RS57 with my meagre 10W of SSB. I followed to 21.237 and managed to get in again with RS57. I followed again to 24.937, and found he was down to RS54, so was rather surprised when I again broke the pile to get RS53. I just *had* to try the 28.239MHz spot and got RS55, although by then I guess he was waiting for me."

These examples say nothing of the amazing work being done by QRP stations on PSK31. I will save some of that until the next column. ♦

LF

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In the foreground is the receiving loop. In the background, the kite takes a dive for the sea - again!

THE TRIP to Guernsey by G3XTZ, G3YXM and G0MRF generated some interest on 136 and 73kHz with 34 contacts being made in spite of terrible weather. We suffered heavy showers and gales for the whole weekend which made the anticipated problem of Loran interference seem but a minor irritation! We lost one kite and broke another, got cold and wet but had a good time and met some of the locals. The full story of the trip can be obtained from the web (www.wireless.org.uk/gu2000.htm).

Notable successes were: the first 73kHz QSO from GW, between GW3XDV and GU0MRF (on QRSS), and a new 73kHz CW distance record with M0BMU at 290km. We had two-way LF contacts with G, GW, GI, GM, PA0, DL and ON. Ones that got away were SM6PXJ whom we heard but had no transmitting antenna at the time, OK1FIG whom we saw on *Spectrogram* but he didn't see us, and F6BWO whom we couldn't hear through Loran, but worked cross-band.

There is some interest in LF from a couple of Jersey stations, so maybe we'll soon be able to work GJ. They will have even more trouble overcoming the interference from the Loran station near Lessay - the mast can be seen from Jersey!

THE WELSH END OF THE STORY

G3XDV's TRIP to west Wales to make the 73kHz QSO with GU was eventful in itself. Mike had travelled over to GW4HXO's QTH on the Saturday, through torrential rain and gales, arriving with an hour or so to spare. Then the power went off leaving them in the dark! The telephone still worked though, so he was able to rearrange a later sked with the GU team. Next the wind brought the antenna wire down which had to be found and restored in the howling gale. The QSO was finally made at 2220 UTC.

FIRSTS

AFTER A FAIRLY quiet time for country-to-country firsts on LF a whole lot came along at once! There was the GU trip of course, plus the first GW to OZ QSO between GW4ALG and OZ1KMR with the aid of Steve's balloon-supported vertical. As if that wasn't enough, F6BWO, F6CNI and F5MAF have all been quite active recently, so most countries should now have worked France.

MORE TRANS-ATLANTIC TESTS

JACK, VE1ZZ, is known as a big signal on top band and recently he has been putting his efforts into 136kHz, for which he has a special permit. He has been regularly transmitting QRSS from a 900ft end-fed wire and has been received in the UK, Germany, Sweden and Finland.

On the weekend of 13/14 January John, VE1ZJ, took his computer over to Jack's QTH, near Halifax in Nova Scotia, to see if a two-way LF contact could be made with Europe on QRSS. Luckily, the Canadian Navy transmitter near Halifax (CFH on 137.0kHz) was off the air, so reception conditions were good. The experiment was joined by VA3LK, 1000km further west. On the Friday night, Jack's signals were seen in the UK as early as 2000 UTC, with the best reception after 2300. The signals seemed to peak at different times in different places, with some stations reporting good copy at times when others nearby had none.

Jack and John copied MM0ALM and OK1FIG, who was using a 150m vertical at a disused commercial site, but no QSO was made.

On the Saturday night conditions were bad, possibly due to a solar flare. Noise levels were high on this side, while the Canadians reported poor reception of the usual commercial stations. This was a great pity, as Jack's signals had been received over here every night for the preceding two weeks! Meanwhile, the AMRAD team were out on the beach at Nag's Head, North Carolina, listening for DX LF signals (hardy types!). They reported no European signals but they did receive Jack.

So, once again, signals have been received in both directions; it seems that all we need now is for the receiver and the transmitter to be at the same station! It must happen this season, as there is such a lot of effort being put into it by amateurs on both sides of the pond.

I hope to be able to report a successful trans-Atlantic LF contact next time... ♦

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THE INTRODUCTION last July of a VHF / UHF category of IOTA award application offers VHF enthusiasts and 6-metre operators in particular a new and exciting challenge. Expressions of interest had been received over recent years and the Committee felt that it was time to open up the programme to VHF. By adjusting qualification thresholds, we believe that several of the awards are attainable, albeit in different parts of the world. Full details of award requirements are contained in the RSGB *IOTA Directory 2000* [available from RSGB Sales - *Ed*].

This development offers a real prospect, for the first time, of VHF IOTA expeditions, either running solo or as part of a larger HF group. For island chasers this widens the opportunities because, under another rule change, contacts on VHF / UHF may now count for the normal HF awards.

NEW QSL CARD REQUIREMENTS

A REMINDER that IOTA has introduced tighter requirements on QSL cards with effect from 1 January 2001. If from that date IOTA DXpeditioners and resident island stations want their operations to count for IOTA, they must include, printed on their QSL card, the name of a qualifying island shown in *Directory 2000* or on a list of Additional Qualifying Islands on the IOTA Manager's web-site at http://www.eo19.dial.pipex.com/index.shtml This applies equally to British stations who, if they are on the UK mainland, should have 'Britain' or 'Great Britain' added to their cards. "IOTA EU-005 Britain" seems the neatest way of doing this. For further guidance, see November's IOTA column.

The reason for this tightened procedure is to move IOTA to a position where checkpoints can, within seconds, reach a decision on any card submitted on the basis of the information on that card and in the *Directory*. This will reduce the hours spent referring to atlases, maps, personally-maintained lists and HQ back-up facilities to validate the claimed credit. The IOTA reference number, although desirable, is not by itself sufficient, nor, with few exceptions, is the short IOTA group name taken from the *Directory*. Please bear with us in our efforts to secure general acceptance of this change. It really is essential.

OFFICIAL IOTA NEWS ON INTERNET

MID-MONTH information on the issue of IOTA reference numbers and validation of operations is now available on the IOTA Manager's web-site above. Under IOTA NEWS BULLETINS click the latest bulletin under preparation.

The RSGB IOTA web pages at http://www.rsgbiota.org have now been redesigned and upgraded. Steve, G0UIH, our new web-master, has made it a very attractive site with latest DXpedition activity and QSL information as one of the new features on the opening screen. Well worth a visit. Both sites are worth bookmarking.

NEW CHECKPOINT

THE END OF MARCH will see John Hall, G3TOK, checking his last island cards before retiring as IOTA checkpoint after 11 years' service. As one of 13 checkpoints he reminded me recently that at the end he handled more customers than the total number of members in the programme in 1990! Many thanks, John, for all you have done and happy retirement!

We welcome the return of Philip Marsh, G4WFZ (Columbia, 28 Orcheston Road, Charminster, Bournemouth, Hants BH8 8SR), to handle John's current UK customers from 1 April. Local checkpoint arrangements are being made for Scandinavia and the ex-CIS countries (HQ has details).

Sunset from Sagar Island, in the West Bengal State group, AS-153.

A 2002 DEADLINE

OUR THANKS to the many members who have converted their existing IOTA record scores to the new *Directory* listings. If you are one of those who have not, you have until 1 February 2002 to do so. After the preparation of that year's Honour Roll and Annual Listings, credits that have not been rechecked by means of a completed Conversion Sheet - they could number as many as 16 - will be deleted from all records on the IOTA database.

Members, who intend to claim credit for any of the new references marked with an asterisk in the IOTA *RadCom* columns for September 2000 onwards and have not yet completed a Conversion Sheet, should include one with their update, enclosing appropriate QSLs.

Checkpoints are under instructions not to process cards from asterisked groups where a Conversion Sheet has not yet been submitted.

You can download the Conversion Sheet, from either of the two web sites. ♦

RSGB IOTA Programme, PO Box 9, Potters Bar, Herts EN6 3RH

NEW REFERENCES

AS-150	BY4	Shandong Province South group
AS-153	VU	West Bengal State group
NA-214	KL	Nome County South group*
NA-215	KL	Northwest Arctic County group*
OC-232	4W	East Timor's Coastal Islands*
OC-237	YB0-3	Java's Coastal Islands*
OC-238	FO	Pukarua and Reao Atolls, Tuamotu Islands
OC-239	YB9	Irian Jaya's Coastal Islands West*
OC-240	P2	Papua New Guinea's Coastal Islands East*
OC-241	YB9	Timor Barat's Coastal Islands*
OC-242	YB8	Bonerate and Taka' Bonerate Islands
OC-243/Pr	VK6	WA State (South Coast) West group*

Pr = provisional * see text

Members of the Calcutta VHF Amateur Radio Society on Sagar Island, AS-153.

MICROWAVE

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WELCOME TO the first 'Microwave' column *written* in 2001! I would like to take the opportunity to pass on a belated message of thanks for all those e-mails of support I have received during 2000. Let's hope they continue.

This year starts off with a bang and, as promised, I have a world exclusive from Dieter, DJ4AM, on the world-record 10GHz QSO, and news of the record-breaking contact on the 145GHz band! Space in the column is short, so enough of my ramblings and on with the news!

WORLD RECORD 10GHz QSO REPORT

IN AN EARLIER issue I commented that the world-record-breaking QSO in June 2000 needed further coverage and I hoped that I would have some further information soon from its participants. Well, I have that information from Dieter, DJ4AM. In good amateur fashion he sent me a whole folder's worth of his activities and I would like the opportunity to share some of this with you.

I would like to thank him personally for the time and effort taken to send this to me. Well done, Dieter, and thank you! Dieter's own story is very interesting and I have used this and some additional information to make up the edited version of his texts. It makes for very interesting reading.

Dieter says that he is part of a group of active microwave DXpeditioners and that have been active since 1980 from different locations. The group is made up of himself and Adalbert, DJ3KM (both retired!). Adalbert is an experienced microwaver with a lot of 10GHz experience, having been active since the introduction of 3cm into Europe. Also in the group is Peter, DL1QR, who is a physicist and mathematician; he also accompanies Dieter and Adalbert on their trips. Peter has a fine RF laboratory at his home. All their equipment is home-brewed in Peter's lab.

Most activities have been from the alpine regions of Germany, Austria, Switzerland, France and Italy. In 1995 they changed the DXpedition areas from the Alpine states to the Mediterranean Sea. In 1995, 96 and 98 they visited Italy, Spain and Ceuta but did not make any microwave QSOs'.

The 2000 DXpedition visited Israel and Lampedusa Island in the Mediterranean, off Southern Italy. There are no native active amateurs on the island, but it is often visited by contesters and is often active on other VHF bands. In Israel, many amateurs helped the group which was primarily guided by Joseph, 4X6KJ, Honorary President of the IARC.

No amateurs in Israel are operational on any band higher than 70cm, so Dieter gave some demonstrations and explanations to show how a 10GHz station works. On 10 July he was a guest of the IARC council in Tel Aviv, where he gave a briefing on his activities in the country.

In May, Dieter and his XYL went on a site-seeing tour (yes, 'site'!); his main aim was to find the right location for the test QSOs.

Between 19 June and 25 July, Dieter and Adalbert carried out daily tests culminating in a record-breaking QSO of 2079km between Lampedusa Island (JM65HM) and Netanya in Israel (KM72KH). The QSO took place at 1851 Central European Time and peaked at 52 in QSB. Both stations were running DL1RQ transverters using 70cm IFs (FT-790) and 5W solid-state PAs. The antennas were 60cm parabolic dishes at both ends.

Dieter also has some comments about previous European DX records. He mentions the original 10GHz DX 'record' for Europe, which was set on 8 July 1983 between the Island of Ustica (IE9/I0YLI, JM6NR), and Ceuta (EA9/I0SNY, IM75IV). This record was broken by VK6KZ and VK5NY on 30 Dec 1994 across the Australian Bight.

Taking aim: WA1ZMS aligning the 145GHz dish using a gunsight.

Since then, Dieter says, the Ustica/Ceuta QSO has been marked incorrectly as a European DX record, because Mount Hacho in Ceuta is in Africa, not Europe. Thus, the QSO cannot be marked as a European record. Dieter says that another record QSO should be considered, that of 5 July 1999 between I/DJ3KM (Gizzeria Lido, JM88CW) and EA/DJ4AM (San José, IM86WR), the distance being 1624km. I wonder who is actually responsible for verifying these records?

NEW 145GHz RECORD IN USA

NEWS FROM the US now, with details of an amazing 145GHz QSO. On 1 Jan 2001 at 2322 UTC, W2SZ/4 worked WA4RTS/4 on 145GHz over a distance of 61km. The weather at the time of the QSO was 15ºF and 60% relative humidity at the WA1ZMS end. No weather data was taken for the WA4RTS/4 end, but the temperature was around 25ºF. The atmospheric losses were calculated to be around 0.27dB/km. The equipment used was the same that set the former North American record on 6 November 2000, and produced 5mW output of CW/SSB.

Some changes to the feed system of one dish gave the extra signal margin needed to extend the record to the 61km mark. The addition of Rubidium standards to each station also helped by practically eliminating any frequency error. As with the last North American record, we've reached the 0dB S/N limit of one station, so further DX will require much work on the stations themselves.

That's all for this issue. I am still looking for external contributions, so please send your information to gm4plm@emn.org.uk ♦

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

SPACE

WHAT A magnificent sight the Ariane 5 rocket made as it blasted into space from Kourou carrying Phase 3-D that early morning on 16 November 2000. It was the culmination of some 10 years' work on the biggest, most complex and most ambitious satellite project ever undertaken by the amateur radio community. The launch, flight 135 by Arianespace, was faultless and itself a record breaker with the largest payload ever of some 6313kg. The Ariane 5 rocket is the only commercial launcher capable of lifting that mass into geostationary transfer orbit. The payload was made up of four satellites, PAS 1R, Phase 3-D, (now AO-40 of course) and two British experimental satellites, STRV-1c and STRV 1d.

The launch was shown on Bavarian satellite television channel BR3 and was a broadcast of live video from the European Spaceport in Kourou, French Guiana. It is a very interesting channel to watch as it shows practically all Kourou launches and the commentary is in English. There are other space programmes too, after normal 'close-down'.

Peter Gülzow, DB2OS, the project manager for Phase 3-D was in Launch Control and his facial expressions, very understandably, were a picture to watch. Indeed, it was a pleasure to see him really relaxed when the satellite successfully separated. The Phase 3-D team did a magnificent job and we must pause to remember the late Werner Haas who worked far beyond the call of duty on the project. The spacecraft carries both his name and callsign as a token of respect and remembrance. Peter, of course, is still working hard with the control team to commission the spacecraft for general amateur use. Like the remainder of the command team, he also has a normal job to do to keep body and soul together, not to mention paying the bills. We owe them all a very great debt.

Since launch, AO-40 has understandably dominated the satellite scene. After the faultless launch it was something of a shock to discover that the mode U (70cm) beacon was not working. However, the middle beacon on 2m was tested and found to be serviceable. The telemetry was carried on this beacon and several software decoding programmes were written and made available to all. The most popular method was to use the computer sound card for the purpose. The ready-built Analogue to Digital converter made it unnecessary to use a hardware phase shift demodulator (a stumbling block for many of us who find 'home brew' a little difficult when precision soldering is needed!).

The telemetry proved fascinating and tests continued. It would seem that the intention was to ease the spacecraft into the required orbit over a fairly lengthy period using the Arc Jet motors and make the final orbital adjustments with the 400-Newton thrusters. The 400N motors were fired early and the burn continued longer than it should have. All contact was then lost with the spacecraft.

There was a lot of nail biting before contact was re-established and the long job of recovery and re-commissioning started once again. Software has had to be re-loaded and damage assessment is currently being very carefully carried out. The control teams have a great deal of work yet to do, but they carry on and still find time to keep us in the picture, increasing our debt still further. By the time you read these words, no doubt the full picture will have emerged and hopefully the satellite will be in use, even if slightly restricted compared with the situation originally planned. W4SM calculates that the current orbit will be stable for a very long period. Both the W4SM orbit calculation and the measured AO-40 beacon frequencies (during RF testing in Kourou) have been posted to the AMSAT-DL web site (1).

The AO-40 project leader, Dr Karl Meinzer, DJ4ZC, gave a very upbeat message: "Present data so far indicates that, although we have lost some systems in AO-40, there has been no further deterioration after the second incident. In particular, if ATOS (Arc Jets) and the three-axis stabilisation are still serviceable, AO-40 will still be able to produce a large fraction of the amateur radio service expected from it. Personally, I am optimistic and I believe that the command and engineering teams stand a good chance of turning AO-40 into an extremely useful amateur radio satellite".

Goodbye, old friend: Mir approaches its last orbit. (NASA)

... AND FINALLY

THE INTERNATIONAL Space Station crew has been making a few voice contacts on 2m and are reported to be starting packet transmissions any time now. It will use standard 1200-baud FM packet with an uplink of 145.800MHz and a downlink of 145.990MHz. The station will use the Russian callsign of RZ3DZR. The ISS crew has also been busy talking to schools, an activity which seems to get the youngsters really motivated and keeps a steady flow of new recruits into the ranks of amateur radio.

Mir is finally to be taken out of service, perhaps one should say 'retired'. However, not many people would like to retire as a fiery meteorite which, on 6 March, will plunge into the Pacific Ocean. That is the fate chosen for the 15-year old spacecraft (2). ♦

(1) www.amsat-dl.org/journal/adlj-p3d.htm
(2) www.msnbc.com/news/490797.asp

RADIO SOCIETY OF GREAT BRITAIN

Unaudited Income & Expenditure Account
For the six months ended 31 December 2000

	Six months ended 31/12/00		Six months ended 31/12/99	
Gross Income	£	£	£	£
Subscriptions	419,622		*431,714*	
RadCom Advertising	94,022		*92,346*	
Basic Membership Income		513,644		524,060
Books and Products Sales Income	176,127		*156,819*	
Other Publications including *Radio Today*	28,317		*48,499*	
Other Activities	50,478		*45,451*	
Total Gross Income		768,566		*774,829*
Contribution from Activities (ie Basic Membership Income less Direct Expenses)				
Expenses Charged direct against Basic membership Income				
RadCom Production	(231,555)		*(225,570)*	
Amateur Radio Costs	(21,824)		*(32,466)*	
Council & Committee Expenses	(19,809)		*(19,128)*	
QSL Bureau Running Costs	(14,507)		*(13,749)*	
IARU Payments	(9,597)	(297,292)	*(7,960)*	*(298,873)*
Surplus from Basic Membership Income		216,352		*225,187*
Books and Products Contribution		44,078		*38,322*
Other Publications including *Radio Today*		(4,783)		*(17,726)*
Other Activities		(2,847)		*6,311*
Total Contribution before Overheads		252,800		*252,094*
Less Overheads (ie Cost of General Administration and HQ Operating Costs)				
Finance, Legal & Administration	(149,252)		*(135,686)*	
Office Stationery, Telephone etc	(66,572)		*(77,319)*	
Despatch Costs	(37,632)		*(26,922)*	
HQ property costs, rates, power etc	(20,899)	(274,355)	*(23,628)*	*(263,555)*
Surplus/Deficit of Income & Expenditure before financial & non-recurring items		**(21,555)**		***(11,461)***
Financial and Other Items		15,788		*13,332*
Non-recurring Items		(4,564)		-
Net Income/(Expenditure) for the half Year		**(10,331)**		***1,871***

Commentary on the Income & Expenditure Account for the six months ended 31 December 2000

The Society reports a deficit in the un-audited Income & Expenditure Account for the six months to 31 December 2000, after non-recurring items, of £10,331, (a deficit of £5,767 before non-recurring items). This compares with a surplus of £1,871 in the corresponding prior half year.

Overall, the result is better than budget and the Society is on course to achieve break-even at the year-end.

The Society has seen a decline in subscription income this half of 2.8%, some of which is due to natural shrinkage. At 31 December 2000 the membership of the Society was 25,270, *(1999 26,169)*. The new Regional organisation, the support the Society plans to give to active clubs and new membership benefits are all part of the initiative to reverse this trend. All members have a role to play in encouraging new entrants into amateur radio and membership of the Society.

Delivery has recently been taken of a vehicle, donated by the Radio Communications Agency, which will be used to make promotional visits to schools, clubs and outdoor events. It is important that the Society retains a strong voice to withstand increasing regulatory and commercial pressures.

Book sales have improved over the same period last year. This is partly due to a larger number of new titles being published directly by the Society and also due to better focusing of advertising and sales calls. The Society has recently invested to improve its web site which has become a major marketing tool and information provider. Maintaining and further enhancing the web site to even higher standards will help ensure that members enjoy the maximum benefit.

Efforts continue to contain and control costs. In some areas the Society has been successful (Office and Property costs), but in others the Society is exposed to the same commercial pressures as other companies.

The first six months have been fairly busy operationally with a number of planned changes already completed. Amongst these has been the implementation of the decision to close *Radio Today*. The effect of this action can be seen with a greatly reduced loss under 'Other Publications'. Closure costs are included under non-recurring items.

Another major step forward was taken in the out-sourcing of the publications despatch function to release personnel and space. It is expected that this action will yield cost and efficiency benefits over the next six months.

The reduction in Amateur Radio costs this half year does not reflect decreased investment in this area. A number of projects on-going last half year have now been completed.

The balance sheet continues to be strong, a position which is forecast to be maintained at the year-end.

P A Kirby *General Manager*
Dr R C Whelan

12 February 2001

the last Word

More Satisfied Customers . . .

Recently I have had occasion to contact Icom (UK) concerning one or two little problems I had run into. I would like to thank the staff at Icom (UK) for the help these people afforded me. Nothing was too much trouble and the service they gave was second to none. Many thanks.

David V Morris, MW0DVM

. . . I have purchased a number of items for my company over the last two years from Waters & Stanton in Hockley. As we are based in South Africa, it is sometimes a little risky dealing with an overseas supplier. I would like to offer more than a word of praise for the way in which W&S have handled the enquiries, orders and technical questions we have placed with them. They have been outstanding in the way they have communicated with us and the service they have offered. It is very refreshing to obtain this level of service and I feel that my fellow readers of *RadCom* should know that they are in safe hands if they place their business with W&S.

The format of *RadCom*, I think, has been just the right level for many years. I have been a member for more than 25 years and always find something to interest me in the mag.

I like the new magazine style and hope you go from strength to strength, especially with technical construction articles.

Dave Woodhall, ZS6BNT / G3ZGZ

. . . The January issue of *RadCom* arrived just before the Christmas break and I must say how much I like the new set-up. I must especially mention how much easier it is to read the new 'RSGB Matters' section and the new mast heads on the 'Regular' features like SWL and Space.

Keep up the good work.

Michael Murray, RS30261

. . . Very pleased with 'Whatever Next' and new type propagation chart.

G W Kelley, G5KC

Speech Enhanced

With reference to the article on the MFJ-616 'Speech Intelligibility Enhancer' by Steve White, G3ZVW ('Whatever Next', *RadCom* January 2001), I already have one from Waters & Stanton which has been in use since 20 December.

Being 93 years and having the same hearing trouble, I find the MFJ-616 fulfils all they claim for it. Having a QSO now is a pleasure and not a pain.

Sam Ellis, G3JNY

Try Worldspace

As somebody who has long listened to a lot of radio, but who only recently became interested in it as a hobby, I would like to praise the new Worldspace service. As many people will be aware, this is a new digital radio service, broadcast by satellite. I recently took delivery of a Hitachi KH-WS1 receiver, which combines a digital Worldspace receiver with 'ordinary' MW and FM analogue capabilities.

The MW and FM facilities are of good quality, but it is the Worldspace facilities that are superb. From a 6in square antenna sat on a south-facing inside window sill, it delivers perfect reception. I also listen to radio stations delivered by Sky and other digital and analogue satellite TV services, and the quality of Worldspace is equal to any of these. At the moment there are only around 15 stations that broadcast in English, plus about 20 in other languages, available in the UK, but the potential would appear to be 400. Included in those 15, however, are three of the best international broadcasters; BBC World Service, CNN and Bloomberg, none of which are easy to receive in decent quality using ordinary receivers in the UK.

Much has been made about terrestrial DAB, but the receivers are expensive (the cheapest I have seen is £299, compared with the £99 I paid for my Worldspace plus analogue Hitachi), and the choice of stations limited to the mainstream offerings, 90% of which are available in digital quality through a Sky box.

Worldspace offers much more, with the potential to broadcast a wide variety of international stations and a capacity some 13 times that of DAB. Like DAB, it offers additional information facilities, plus the capability to be linked to a PC for multimedia facilities.

I would encourage readers to take a close look at Worldspace and see what it has to offer. My own view would be that it offers us a view of the future of international broadcast radio. It may not offer the sense of adventure that traditional analogue SWL, but it is certainly easier on the eardrums!

Nick Harriss

Memories of Bhutan, pt 2

An open letter to Zal, VU2DK ('Memories of Bhutan', *The Last Word*, November 2000).

Dear Zal

My apologies for that slip of the typing finger with VU2BK instead of VU2DK. Just maybe it was the fact that way back in the late 40s when I was on Car Nicobar and later in Singapore I also knew Kab, VU2BK. The glitch in phonetics does not detract from the magic of the moment when A51TY made that QSO with you. I can still see the pleasure he felt on making that QSO with you who were one of those amateurs he knew in the old days. When you specifically welcomed him back to the hobby it was as though his absence was a matter of days rather than years.

Some years ago I wrote 'The Background History of Amateur Radio in the Kingdom of Bhutan'. This covered all known amateur radio activity in Bhutan with dates, callsigns, copies of QSL cards etc. The Indian-led DXpedition of April 1962 was covered with full names and ranks of all VU operators given.

Further to your letter, many G stations were quick to send me a copy of their VU2US/AC5 QSL card and other AC5 / A51 QSL cards after an appeal was made for background material. The VU2US/AC5 QSL card used to illustrate my document was donated from the collection of VK3GB. It carries the serial number D09 and is signed by your father Kab, VU2BK.

What makes any A5 operation so special now is that after all these years amateur radio legislation is written into the telecommunication laws of Bhutan. For the first time amateur radio licensing is now a fact, since all previous operations depended on 'permission'. There's a lot of interest among the younger generation in Bhutan and the legislation takes care of them.

Zal, you are absolutely correct. DXpeditioning was a different game altogether in those days and the VU group can certainly claim a first in being a multi-operator DXpedition. Please accept my apologies for that slip of the 'last two', but my copy of Yonten's log shows the entry to be correct as VU2DK, Zal, 27 April 2000, 1248UTC, 20m SSB, 57 both ways.

Jim Smith, VK9NS / A51JS

Morse Speeds

I sympathise with Mr Shaw, M5FRA (*The Last Word*, December 2000), in his difficulty in finding partners to help him improve his Morse speed. It seems that operators these days are only concerned with speed and don't realise that to send signals that the other operator can't read is only creating QRM.

When I was taught Morse telegraphy in the RAF pre-war, accuracy was considered more important than speed. We were told to observe two rules; don't send faster than the other operator is sending, and don't send faster than you can receive. Operators used full break-in and if the receiving operator missed a letter he broke in and requested a repeat. So, if QRM or QSB made reception difficult the receiving operator would send his requests for repeats more slowly. The transmitting operator would slow down in sympathy, and the process went on until the receiving operator needed very few repeats.

The optimum operating speed for that circuit at that time had been achieved. It still works (and the principle is effective for voice communication, too).

R A Parrott, G3HAL

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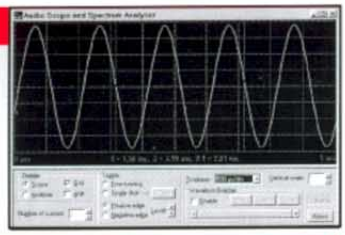

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Tuning resolution	100 Hz (5 Hz BFO)	10 Hz (1Hz for SSB and CW)	10 Hz (1Hz for SSB and CW)
IF bandwidths	6 kHz (AM/SSB), 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)
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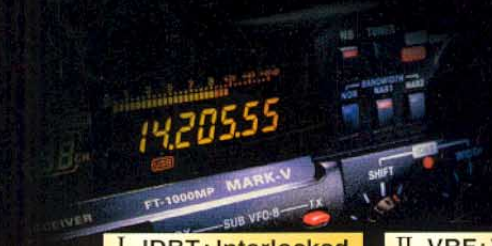
Published software API	yes	yes	yes (also DSP)
Internal ISA cards	£299 inc vat	£369 inc vat	£1169.13 inc
External units	£359 inc vat	£429 inc vat	£1169.13 inc (hardware DSP only internal)

PCMCIA Adapter (external):	£69.00 inc vat when bought with 'e' series unit (otherwise: £99 inc vat)
PPS NiMH 12v Battery Pack & Chrgr:	£99 inc vat when purchased with 'e' series unit (otherwise: £139 inc vat)
The WiNRADiO Digital Suite:	£74.99 inc vat when purchased with a WiNRADiO receiver (otherwise: £81.05 inc vat)

For your free (no obligation) info pack & WiNRADiO demo disk go to: http://www.broadercasting.com. If you don't have access to the internet then by all means feel free to phone/fax us. *Trunked radio transmissions should only be received & decoded with permission of the originator of the transmission.

Please send all your enquiries to: info@broadercasting.com or Telephone: 0800 0746 263 or +44 (0)1245 348000 - Fax: +44 (0)1245 287057
Broadercasting Communication Systems, Unit B, Chelford Court, Robjohns Road, Chelmsford, Essex, CM1 3AG, United Kingdom

"Brick-Wall" Selectivity



Today's Premier class operators demand the best RF weaponry available. Yaesu's exciting new MARK-V FT-1000MP answers the call, with an expanded array of receiver filtering, 200 Watts of power output, and Class-A SSB operation capability for the cleanest signal on the band. Enhanced front-panel ergonomics saves you precious seconds in a DX or contest pile-up. Yaesu HF design and manufacturing know-how ensures that no short-cuts have been taken in our effort to bring you the best HF transceiver money can buy. For more QSOs in your log, and more awards on your wall, there is only one choice: the MARK-V FT-1000MP from Yaesu!

I. IDBT: Interlocked Digital Bandwidth Tracking System

The IDBT feature greatly simplifies operation by matching the bandwidth of the DSP (Digital Signal Processing) system to the net bandwidth of the 8.2 MHz and 455 kHz IF stages. The IDBT system monitors the settings of the SHIFT and WIDTH controls, and automatically sets the DSP bandwidth to match the user settings within the net bandwidth of the Analogue IF Filtering.


IDBT: A Breakthrough in Selectivity!


10-pole Collins® Mechanical SSB Filter

II. VRF: Variable RF Front-End Filter

Protecting the MARK-V's receiver components from strong out-of-band signals, the VRF system acts as a high-Q "Preselector," located between the antenna and the main bandpass filter networks, providing additional RF selectivity on the 160-20 meter Amateur bands for multi-operator contest teams, DX-peditions, or for operation near MW/SW broadcast stations.


VRF Features Large, High-Q Coils and High-Quality Relays


VRF Typical Bandpass Response (3.5 MHz)

III. 200 Watts of Transmitter Power Output

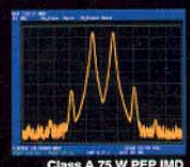
Utilising two Philips® BLF 147 Power MOSFETs in a 30 V push-pull configuration the MARK-V's Transmitter generates up to 200 Watts of the cleanest RF Power output available thanks to the conservative design of the PA Section.


Philips Power MOSFETs


High-Speed Automatic Antenna Tuner

IV. Class-A SSB Operation

Exclusively available on the MARK-V FT-1000MP , a press of a front-panel button engages Class-A SSB operation of the transmitter, at a power output level of 75 Watts. Class-A operation produces incredibly clean signal quality, with 3rd- order IMD suppressed 50 dB or more, and 5th- and higher-order products typically down 80 dB or more!


Class A 75 W PEP IMD

V. Multi-Function Shuttle Jog Tuning/ Control Ring

The immensely-popular Shuttle Jog tuning ring, which is concentric with the Main Tuning Knob, has a new look in the MARK-V: it now includes the activation switches for the VRF (left side) and IDBT (right side) features, so you don't have to move your hand position to activate these important circuits during contest or pile-up situations!

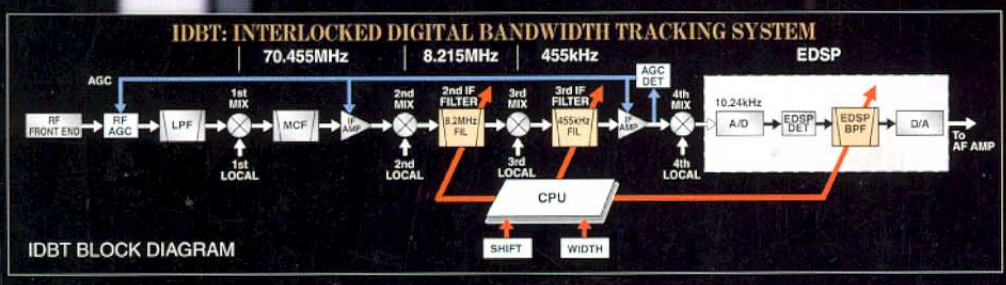

Access VRF and IDBT Features via Shuttle Jog Dial

DC 30 V / 13.8 V Power Supply FP-29

Photo shows optional MD-100A8X Deluxe Desk Microphone

HF 200 W All-Mode Transceiver

MARK-V FT-1000MP



IDBT BLOCK DIAGRAM

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