RSGB International HF & IOTA Convention 12-14 October

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LAMBDA TIMES

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Fundamental Changes to UK Licensing Announced

UK Adopts 5WPM Morse Standard

FOR MORE THAN one hundred years radio amateurs have been at the forefront of developments in telecommunication. For many, amateur radio provides a challenging and satisfying pastime, but also one which has great potential for personal development in new technologies, one which provides wonderful career opportunities for young people as well as providing a valuable service to the community at large.

In the current information and communication technology expansion, the Radiocommunications Agency and the RSGB have agreed that it is in the national interest that access to amateur radio is improved so that radio amateurs can continue to play a key role in these technologies.

Amateur radio can offer important benefits to the community:

- ongoing investigation and communication into a technical
- them pursuing cing the

-a contribution to international friendship

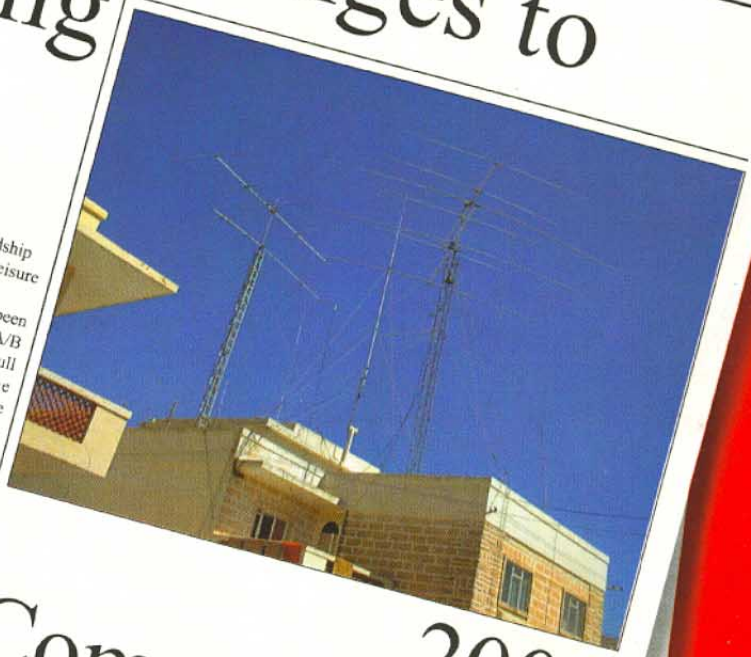
-a rewarding and challenging leisure activity

The current structure of licensing has been based on three levels, the novice, Class A/B and the Full Licence. Both Novice and Full licences have two categories, one providing access to all amateur bands, the other restricted to those at 50 MHz and above. It is hoped that it may be possible to simplify this structure after the World Radio Conference in 2003.

Changes are being made to the structure of amateur radio licensing as follows:

UK CLASS A AND CLASS A/B LICENCES

EARLIER THIS YEAR the European Conference of Postal and Telecommunications (CEPT) recommended that the Morse requirement for their Class 1 licence (equivalent to a UK Class A) be reduced to 5wpm. This has provided us with an opportunity to review our licensing structure. To this end we intend with immediate effect to reduce the Morse requirement for the Class A licence to 5wpm and to incorporate the Class A/B into the Class A licence. Class A/B licence rs will be offered the choice of either their existing M5 callsign or



2001 Commonwealth Contest Results

A SPLENDID entry and few complaints about conditions this year! There were 158 entries in total, a figure which approaches that for the 60th Anniversary contest in 1997. The HF bands (especially 10m) were very good, though 40m and 80m were disappointing, with the latter particularly noisy in most areas. Numerous entrants said that they had achieved a personal best.

Scores were high: the total of points scored by the top 10 in the Open section was 83,281 this year (73,104 in 2000), with 8502 QSOs (8150 last year). Yet the mber of stations participating, as to entering, was not as large as en expected, given the good

ZF2NT, last year's winner. Dave, VE2ZP, is closing up on the leaders and moved up to fourth (sixth last year, seventh in 1999). And a welcome back too to Dave, VE3OI, who came fifth: his first 'BERU' since he won in 1986 and 1974. Bob, G3PJT, operating as ZL4CC this year, gave many a valued bonus, often on several bands, and was sixth. Vladimir, 9H1ZA, and Lee, VE7CC, occupy the same positions (seventh and eighth) as last year, while John, VK4EMM, maintained his reputation of usually being in the to and made ninth. And 9M6AAC,

Digital Radio Tuner Members' Offer

Class A -

ass A/B - 100W

B - 400W VHF

e A - 10W

- 10W VHF

bands

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FT-817

160m - 70cms SW Portable

£799.95 Plus £8.00 Carr.

FT-817 is an incredible design feat by Yaesu, and world reviews agree that there has never been anything like it. It's not expensive either. So why not get out in the fresh air, or put one in the car, and put the fun back into your radio. Check out the exciting AT & ATX portable antennas elsewhere in our add.

Z-11 Auto ATU for FT-817

160m - 10m

£199.95 Plus £6.00 Carr.

OTT-1 One Touch Tune

Plugs into rear of FT-817and gives immediate carrier for adjusting ATU or checking VSWR

£59.95 C

MFJ-Micro Key MFJ-561

FT-817Micro Paddle

This tiny paddle really is a masterful idea. It's simple, yet very effective. Built from phosphorous bronze, it comes with 1m lead and 3.5mm stereo plug.

NEW

£24.95 Plus £2.00 Carr.

HF Whips for FT-817

AT-80 80m telescopic	£24.95
AT-40 40m telescopic	£24.95
AT-20 20m telescopic	£19.95
AT-17 17m telescopic	£19.95
AT-15 15m telescopic	£19.95
AT-12 12m telescopic	£19.95
AT-10 10m telescopic	£19.95

Carriage charge £2 each

NEW 25 Amp Switch-Mode Power Supply. W-25SM

£69

This product available September.

UK Carriage £8

Switched 230 / 115V AC input and fixed 13.8V output at 22 Amps continuous and 25 Amps peak. Over voltage and over current protected and fan cooled. Measures 180mm (W), 75mm (H) and 190mm (D) excluding terminals. Provided with detachable 13 Amp plug and cable.

YAESU FT-1000MP Mk-V

200W HF All Mode Transceiver

FREE 3 YEARS WARRANTY

£2899 Plus £8.00 Carr.

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

FT-1000MP AC 160-10m 100W Transceiver £1699 C

FT-1000 Accessories					
FTV-1000 6m (MKV)	£799	B	YF-114CN CW	£84	B
MD-100ABX Mic	£110	B	YF-110SN SSB	£95	B
SP-8 Speaker	£139	B	YF-110CN CW	£106	B
DVS-2 Vce messge	£199	B	YF-115C Collins	£99	B
YF-114SN Fil SSB	£84	B	TXCO-6 Ref Osc	£128	B
			YH-77STA Phones	£56	B

KENWOOD TS-2000

160m - 70cms Plus 23cms option

FREE 3 YEARS WARRANTY

+FREE HEIL MIC OF YOUR CHOICE

£1695 Plus £8.00 Carr.

The amazing TS-2000 offers coverage from HF to UHF. And you can go right up to 23cms with the optional module Monitor the DX cluster whilst working other DX, optimise your satellite contacts, enjoy the benefit of built-in ATU. It's all there in one very compact box.Colour brochures available on request.

YAESU FT-847

160m - 70cm All Mode

£1199 Plus £8.00 Carr.

FREE 3 YEARS WARRANTY

Accessories for FT-847					
FC-20 ATU	£219	B	MD-100ABX Mic	£110	B
SP-8 Speaker	£139	B	YF-115C Collins	£99	B
FVS-1A Vce synth	£38	B	YF-115S Collins	£99	B

ICOM IC-746

160m - 2m All-mode

£1395 Plus £8.00 Carr.

FREE 3 YEARS WARRANTY

Accessories					
FL-100 CW	£59	B	RS-746 Software	£44	A
FL-101 CW	£84	B	SM-8 Mic	£129	B
FL-103 SSB	£59	B	SM-20 Mic	£149	B
FL-223 SSB	£59	B	SP-21 Speaker	£74	B
			UT-102 Vce Synth	£32	B

ICOM IC-756PRO

1.8 - 52MHz 100W

FREE 3 YEARS WARRANTY

£1895 Plus £8.00 Carr.

IC-756PRO Accessories					
CT-17 RS-232	£99	B	SP-20 Speaker	£164	B
SM-8 Base mic	£129	B	SP-21 Speaker	£74	B
SM-20 Base mic	£144	B	UT-102 Voice synth	£32	A
			PS-85 Power supply	£266	B

ICOM IC-775 DSP 200W HF

Last of The Many

£2099 Plus £8.00 Carr.

SAVE £900

YAESU FT- 920AF

HF 160m-6m-100w

SAVE

£1099 Plus £8.00 Carr.

KENWOOD TS-570D8

160 - 10m All Mode

FREE 3 YEARS WARRANTY

£849 Plus £8.00 Carr.

TS-570 Accessories					
VS-3 Voice synth	£45	A	MC-80 Desk mic	£72	B
DRU-3A Recording	£99	B	PS-33 Power supply	£199	C
HS-5 H'phones	£52	B	SP-23 Speaker	£68	B
MC-90 Desk mic	£187	B	CW filters each	£61	B
			SSB 1.8kHz	£61.95	B

YAESU FT-100D

160 - 70cm All Mode

£1249 Plus £6.00 Carr.

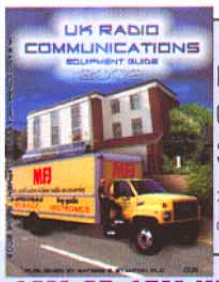
Yaesu's latest version is now available and includes 500Hz CW filter, high stab. osc. and CTCSS decoder.

YAESU MD-200A8X

NEW

£249 Plus £6.00 Carr.

The best microphone Yaesu have ever produced. Featuring Variable Side Pressure Control, you can adjust the audio response precisely. There is also provision for fitting and selecting an additional element, such as Heil.



New 2002 Catalogue 336 pages £2.95 carr. £1.25

10M OR 15M WHIPS

100W 10m Mobile Whip with mag mount Built-in impedance transformer.

£19.95 Plus £2.00 Carr.

Just over 1m long, complete with magnetic base, shock spring, 5m coax cable with PL-259 and built-in impedance transformer for 1:1 VSWR. Centred on 28.5MHz or 21.250MHz, this is anabsolute bargain! Get ready for the Autumn and Winter DX.

ICOM IC-706IIG

160m - 70cm All Mode

FREE 3 YEARS WARRANTY

£999 Plus £8.00 Carr.

New Heil Hands-Free Headset.

This single piece headphone with boom microphone, from Heil USA, allows true hands-free operation using VOX. Wired for IC-706 (all models) it includes PTT switch. Built-in amplifier means no more low audio from older IC-706 models! All this for just £59.95 B

HS-706

IC-706IIG Accessories					
AT-180 Auto ATU	£379	B	FL-223 SSB 1.8kHz	£59	B
FL-100 500Hz CW	£59	B	DC Lead (spare)	£16	A
FL-232 350Hz CW	£59	B	3.5m sep cable	£33	A
FL-103 SSB 2.8KHz	£59	B	5m sep. cable	£49	A
			Others: please phone		

KENWOOD TS-50S HF 100W

SAVE

£599 Plus £8.00 Carr.

Kenwoods TS-50S has stood the test of time. 100W from 160m to 10m makes this a great value rig. Ideal for mobile or portable.

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ICOM IC-910 2m + 70cm All Mode

£1299 Plus £8.00 Carr.

Icom's new dual band all-mode base station radio with 23cms option.

IC-207H 2m + 70cm FM

£279 Plus £8.00 Carr.

A great budget class radio for VHF & UHF use.

IC-2800H 2m + 70cm FM

£419 Plus £8.00 Carr.

Large full colour screen with video input option

IC-2100H 2M FM Mobile

£229 Plus £8.00 Carr.

Rugged design with switched receive filters 12.5/25kHz

KENWOOD TM-D700E 2m + 70cm FM

£449 Plus £8.00 Carr.

Large detached screen and APRS, make this a firm favourite. One of our best selling dual band mobile radios.

KENWOOD TM-G707E 2m + 70cm FM

£289 Plus £8.00 Carr.

If you are looking for simplicity and low cost, here's the answer.

TM-V7E 2m + 70cm FM

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A lovelycool blue display, easy to read and with 50/35W output. A great choice for kenwood fans.

YAESU FT-90R 2m + 70cm FM

They don't get much smaller than this! Dual band and 50/35W with detachable head. A really great performer.

£309 Plus £8.00 Carr.

FT-1500M 2M FM Mobile

£159 Plus £8.00 Carr.

Small, compact yet built like a Battleship! Should last for years. Look at the Price!

YAESU Yaesu Handhelds

VX-1R	2m/70cm handy	£165 B
VX-5R	6m/2m/70cm	£269 B
FT-11R	2m	£119 B
FT-41R	70cm	£119 B
FT-51R	2m/70cms	£315 B

ICOM IC-T81E 6m, 2m, 70cm + 23cm FM

£299 Plus £8.00 Carr.

Four bands in one very compact handheld. This enables you to take advanatge of the UK's complete repeater network right up to 23cms. Also makesan ideal travel companion. AM air receive.

IC-T8E 6m, 2m + 70cm

Very similar in design to the IC-T81E, but without the 23cms band. And again, like its brother, it offers AM airband receive.

£199 Plus £8.00 Carr.

KENWOOD TH-D7E 2m + 70cm

Data Communicator

One of the most successful handhelds over the past few years, it even has a built-in TNC for Packet use. You can also use it for APRS operation in conjunction with an external GPS unit.

£299 Plus £8.00 Carr.

Carriage Charge Codes: A £2, B £6, C £8, D £12, E £14

Prices

Prices are subject to change without notice and are current only until the appearance of next month's advert.

Consumer Protection (Distance Selling) You may return goods within 10 days for a refund. Goods must be in unmarked condition with original packing, handbooks and warranty cards etc. Customers must bear the cost of returning goods unless the goods were faulty on arrival. Please phone prior to sending.

WATERS & STANTON

Order details on inside front cover

VISA MasterCard

MASPRO VHF/UHF YAGIS

These high quality Yagis are made in Japan and superbly engineered. Features folded dipole, balun transformer, waterproof box and SO-239. You won't find anything better on the market.
Take a look at our prices!

144-WH5	2m 5 el. 6.6dBd 0.93m	£26.95 B
144-WH8	2m 8 el. 8.6dBd 1.79m	£37.95 B
144-WH10	2m 10 el 9.7dBd 2.3m	£41.95 B
435-WH8	70cms 8 el. 8.6dBd 0.8m	£29.95 B
435-WH12	70cms 12 el. 12.8dBd 1.51m	£35.95 B
435-WH15	70cms 15 el. 14.2dBd 2.19m	£41.95 B

To compare with dBi figures, add 2.4dB

WMM-3 Data Modem

£69.95
Carr. £6.00

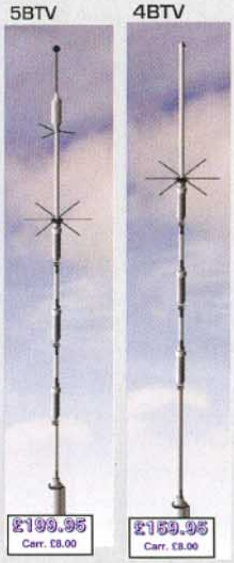
This modem permits a wide range of data to be sent and received. Starterdisc for SSTV, CW, RTTY, Pactor, 1200baud Packet etc.included. The unit is powered from the PC serial socket.

WSA-1 PSK-31 Adaptor

All you need to connect up to your sound card and run PSK-31. Includes CD software.

£39.95
Carr. £6.00

Get in Front with HUSTLER



HUSTLER®

BASE STATION ANTENNAS

Spec	5BTV	4-BTV
Bands	5	4
Coverage	80m-10m	40m-10m
Bandwidth 10-40m	Full	Full
Bandwidth 80m	100kHz	N/A
Resonance	1.15:1	1.15:1
Power	1kW CW	1kW CW
Traps	1" forms	1" forms
Tubing	1.25"	1.25"
Bracket size	1.75"	1.75"
Height	25ft 1" (7.64m)	21ft 5" (6.52m)
Weight	17lbs. (7.7kg)	15lbs (6.8kg)
Wind (112kph)	13kg	-

*"I worked my first ZL while actually on the move using a Hustler whip" - **Peter Waters G3OJV.***
Customers are also telling us how pleased they are with the base verticals. Check the prices!

HF Horizontal Beams + Dipoles

CUSHCRAFT

When you buy an HF Yagi, you want quality and realistic performance. You also want to know you can get spares. We offer a wide choice with guaranteed spares availability. **Count on us!**

MA5B	10-20m (5 band) 3 el 2.7m radius 1.2kW	£299.95 C
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X-740	40m add on kit for X-7	£269.95 C
A4-S	10-20m 4 el. 8.9dBi 2kW 5.49m radius	£529.95 D
A-744	Gives 40m or 30m operation from A-4S	£149.95 C
A3-S	10-20m 3 el. 8dBi 2kW 4.72m radius	£459.95 D
A-743	Gives 40m or 30m operation from A3-S	£149.95 C
A3-WS	12 & 17m 3 el. 8dBi 2kW 4.4m radius	£349.95 D
A-103	Gives 30m operation from A3-WS	£149.95 C
D-3	10-20m dipole element 7.86m 2kW	£219.95 C
D-3W	12, 17, 30m 17m dipole element10.37m 2kW	£219.95 C
D-4	10-40m dipole element 10.92m 2kW	£299.95 C
D-40	40m dipole element 12.88m 2kW	£259.95 C
XM-240	40m 2 el. 6dBi 7.3m radius 2kW	£699.95 C
Ten-3	10m 3 el 8dBi 3m radius 2kW	£189.95 C
ASL-2010	13.5-32MHz 8 el. log periodic6.4dBd 5.86m radius	£749.95 D

Vertical Antennas

CUSHCRAFT

R8 (Illustrated, covers 8 bands from 6m - 40m. Stands 8.7m high and requires no radials. You can feed it with 1.5kW and typical VSWR is around 1.2:1
£469,95 C

R8-GK Optional guy kit for R8
£49.95 B

R-6000 6 band 6m-20m that requires no radials and handles 1.5kW. Stands just 5.8m high and was chosen for the RSGB GB4FUN vehicle antenna. It works!!
£329.95 C

MA5V A new mini vertical 5 bands from 10m-20m and stands just 3.7m. No radials needed and handles 500W. Great for portable use, backyards and patios. **£229.95 C**

The Mini-Beam For Small Gardens

CUSHCRAFT

Here's the best 3 element mini beam you will ever find. It gives 2 element gain on 10, 15 & 20m, and dipole performance on 12m and 17m. Up to 25dB F/B ratio, it accepts 1.2kW yet has a boom length of only 2.2m and a maximum element length of 5.2m Turning radius is just 2.7m. Uses a single feeder, this really works the DX. Get one up before winter!

HUSTLER Mobile Antennas

Model	Band	Bandwidth	Price
RM-10	10m	150-250kHz	£19.95 B
RM-11	11m	150-250kHz	£19.95 B
RM-12	12m	90-120kHz	£19.95 B
RM-15	15m	100-150kHz	£19.95 B
RM-17	17m	120-150kHz	£22.95 B
RM-20	20m	80-100kHz	£22.95 B
RM-30	30m	50-60kHz	£25.95 B
RM-40	40m	40-50kHz	£25.95 B
RM-80	80m	25-30kHz	£29.95 B

Model	Band	Bandwidth	Price
RM-10-S	10m	250-400kHz	£24.95 C
RM-15-S	15m	150-200kHz	£25.95 C
RM-20-S	20m	100-150kHz	£29.95 C
RM-40-S	40m	50-80kHz	£35.95 C
RM-80-S	80m	50-60kHz	£49.95 C

Lower mast sections

MO-1	54" (FOLD @ 22")	£31.95 C
MO-2	54" (FOLD @ 27")	£31.95 C
MO-3	54" (NON FOLD)	£25.95 C
MO-4	27" (NON FOLD)	£21.95 C

Avair VSWR Power Meters

Great value and great performance. There's one just right for you.

AV-200	1.8 - 200MHz 5/20/200/400W	£49.95
AV-400	140 - 525MHz 5/20/200/400W	£49.95
AV-600	1.8 -525MHz 5/20/200/400W	£59.95

All fitted with SO-239, PEP/RMS readings, 3W for FSD approx. AV-600 has dual sensors.

WATSON HF Mobile Whips

All whips are 2-section helical 2.25m.

WHF-160	£49.95 B	WHF-17	£18.95 B
WHF-80	£19.95 B	WHF-15	£18.95 B
WHF-40	£18.95 B	WHF-12	£18.95 B
WHF-30	£18.95 B	WHF-10	£18.95 B
WHF-20	£18.95 B		

Whip Accessories

W-BM1	Ball mount 3/8"	£19.95
MMT-1	Impedance matching xfr.	£19.95
3401	3-way mag mount 3/8"	£39.95
SS-504	Heavy duty spring 3/8"	£6.95

QS-112 Speaker Mic

Models for Yaesu, Kenwood, Icom, Alinco and Motorola.

£16.95
Carr. £2.00

WCT-321 Lapel Talker

Earpiece with combined lapel hanging mic and PTT. Models to suit most radios.

£19.95
Carr. £2.00

Frequency Counters

Each counter is supplied with internal Ni-Cad pack, AC charger and whip antenna.

Hunter	10MHz - 3GHz	£59.95 B
FC-130	1MHz - 3GHz	£79.95 B
S. Hunter	10Hz - 3GHz	£149.95 B
S. Searcher	10MHz - 3GHz	£99.95 B

WM-308 Base Mic

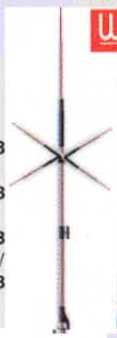
The perfect answer for a high quality base microphone. Built-in pre-amp powered from rig or 2 x AA, electronic PTT and FM/SSB response switch. Includes lead with 8-pin plug.

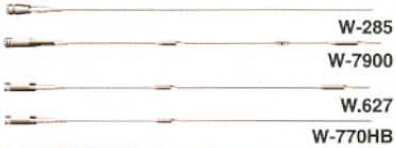
£59.95
Carr. £6.00

WATSON Great value mobile antennas

W-285	2m 5/8th whip with PL-259 base	£14.95 B
W-7900	2m/70cm 5 & 7.5dB length 1.58m	£32.95 B
W-627	6m / 2m / 70cm 2 / 4.5 7.2dB length 1.6m	£34.95 B
W-770HB	2m/70cm whip 3dB / 5.5dB length 1.1m	£24.95 B

All with tiltover bases.





W-GMV Deluxe Key

A high quality Morse key made of brass with wood base. Full set of adjustments

£39.95
Carr. £2.00

SPM-102 Speaker Mic

Incredible value! Has 4-way 3.5mm plug for VX-1, VX-5, FT-50 and IQ-7E

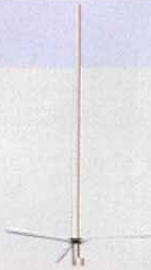
£9.95
Carr. £2.00
Limited stocks.

WATSON PBX-100 Portable HF

80m - 10m 200W

The PBX 100 offers 80m - 10m operation (ma 4-bands at any time) with a height of just 3.6m Supplied with ground spike, it takes seconds to erect, yet collapses down to little more than 1m like all ground mounted verticals, it benefits from radials, and the radial wire is provided. Use it in the garden, in the countryside or abroad. SO-239 connection.
£99.95 C

Base Antennas



2m / 70cm fibre glass colinears with stainless steel fittings, 3 short radials and SO-239 sockets. Pre-tuned and all hardware for mast mounting.

Dual Band 2m/70cms

W-30	3/6dB 1.15m long	£39.95 C
W-50	4.5/7.2dB 1.8m long	£49.95 C
W-300	6.5/9dB 3.1m long	£59.95 C

Triple band 6m/2m/70cms

W-2000	0/6/9dB 2.5m long	£69.95 C

WSMA-450

Extremely low profile antenna with transmit (Tx) capability on three bands as well as useful wideband reception on additional bands. Ideal for use with covert transceivers/scanners.

**4.5 cm long*

£12.95
Plus £2.00 Carr.

RSGB Matters

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded in 1913 incorporated 1926
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G W Dover, BSc, Dip Ed, G4AFJ
R Horton, BSc, PGCE, G3XWH
R M Page-Jones, CEng, MIEE, G3JWI
R C Whelan, BSc, MSc, PhD, G3PJT

REGIONAL MANAGERS
P R Sheppard, DipOS, FInstSMM, G4EJP
S N Lloyd Hughes, GW0NVN
J D Smith, MI0AEX
T W G Menzies, RSSA, GM1GEQ
K A Wilson, M1CNY
R E Piper, G9MEH
R S Atterbury, G4NQI
J H Martindale, GM4VPA
I Rosevear, G3GKC
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
All calls to the RSGB are charged at National Rate

QSL Bureau address:
PO Box 1773, Potters Bar, Herts EN6 3EP
E-mail addresses:
sales@rsgb.org.uk (books, filters, membership & general enquiries)
GB2RS@rsgb.org.uk (GB2RS and club news items)
RadCom@rsgb.org.uk (news items, feature submissions, etc)
AR.Dept@rsgb.org.uk (Morse tests, beacons, repeaters, GB calls, licensing)
IOTA.HQ@rsgb.org.uk (Islands On The Air)
GM.Dept@rsgb.org.uk (managerial)

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

RSGB CONTESTING GUIDE 2002

CONTEST FANS who were expecting to find the 'RSGB Contesting Guide 2002' included as part of this month's magazine should note that this will be published in the January 2002 issue of *RadCom* instead. This is to allow sufficient time for the HF and VHF Contest Committees to revise the rules for the 2002 contests in the light of this year's events. The August submission deadline meant that this was not possible when the Guide was published in October, leading to a year's delay between amendments being suggested and these appearing in the published rules. Note that the rules for contests during the remainder of 2001 appeared in the 'Contesting Guide' published in the October *2000* issue of *RadCom*.

RSGB IOTA CONTEST MANAGER

DON FIELD, G3XTT, has recently been appointed as RSGB IOTA Contest Manager. This position on the RSGB HF Contests Committee (HFCC) was established by Chris Burbanks, G3SJJ, who has coordinated the adjudication of the contest for a number of years, overseeing its growth into one of the major events in the contest calendar. Don, who picks up the role with immediate effect, is an active participant in both the IOTA award programme and the IOTA contest. The HFCC and the RSGB thank Chris for his hard work during the 15 years of service he has given the committee, six of them in the role of chairman. More information about the IOTA Contest and other RSGB HF contests can be found at www.rsgbhfcc.org The IOTA Contest Manager may be e-mailed at iotacontest@rsgbhfcc.org

MORSE EXAMINERS WANTED FOR HERTFORDSHIRE

BECAUSE OF THE increasing popularity of the RSGB Morse Campaigns, two vacancies now exist for Morse examiners in the county of Hertfordshire. If you are interested in joining the Hertfordshire team, please contact Catherine Liston at the Amateur Radio Department at RSGB HQ, tel: 0870 904 7373; e-mail: ar.dept@rsgb.org.uk

JAMBOREE ON THE AIR

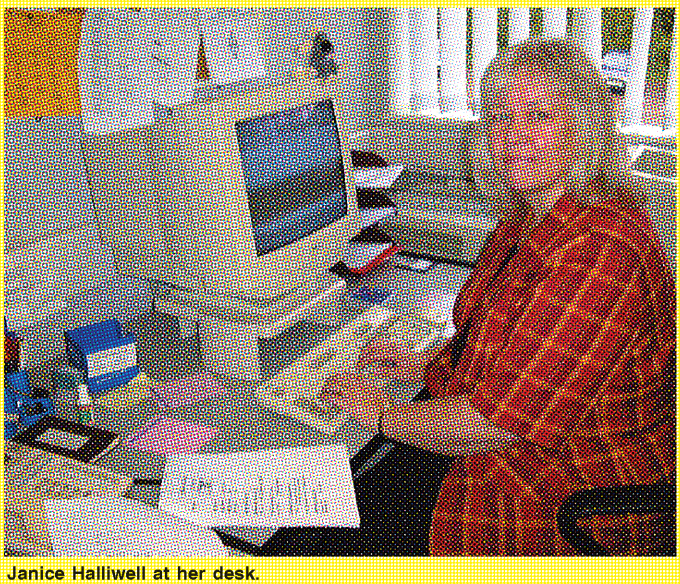
THE ANNUAL Scouts and Guides Jamboree on the Air (JOTA) takes place on **20 / 21 October**. Information packs will be available from RSGB HQ for all participants. Groups using a GX or similar prefix instead of a GB call are asked to inform HQ if they want details of their activity to appear in the information pack.

HQ STAFF CHANGES

FOLLOWING THE departure of the General Manager's Personal Assistant, Fay Huxley, in August, Mrs Janice Halliwell has been appointed to that post. She has also taken on the additional duties of HQ Office Manager.

Suzanne Taylor, from the Marketing and Sales department, is leaving the Society's employment at the end of September in order to take up the unexpected opportunity to travel to the Far East and Australia. The RSGB's receptionist and telephonist, Pauline Reid, is returning to the Marketing and Sales department to replace Suzanne, and Lynn Wortley, who worked as receptionist on a temporary basis earlier this year, is coming back as full-time receptionist.

In the accounts department, Rose Mensah has joined the HQ staff as the Accounts Assistant.



Janice Halliwell at her desk.

BOARD ON THE ROAD

GORDON ADAMS, G3LEQ, a member of the RSGB Board, will be giving presentations about the work of the RSGB and its new Regional Structure at the **Chester and District Amateur Radio Society** on **Wednesday 17 October**, and at the **North Cheshire Radio Club** in Wilmslow on **Monday 29 October**.

AROS SPEAKS

THERE WILL BE presentations on the work of the RSGB Amateur Radio Observation Service (AROS), given by Barry Scarisbrick, G4ACK, the AROS Coordinator, at the **Swindon and District Amateur Radio Society** on **Thursday 18 October**, and at the **Newbury and District Amateur Radio Club** on **Wednesday 24 October**.

EMC WEB SITE

IF YOU HAVE an EMC problem, your first port of call should be the RSGB EMC web site at www.qsl.net/rsgb_emc/ (please note the underline between the b and e). This is an excellent web site with stacks of information on how you can cure virtually any known EMC problem. You can download any of a variety of EMC leaflets. Some of these are specifically designed to be handed to your neighbour and others are for the radio amateur with guidance on the necessary procedures for fixing the problem.

If, after reading through the appropriate EMC leaflets, you still find yourself stuck for a solution to the problem, you will also find on the EMC web pages a list of the volunteer EMC Co-ordinators who can be contacted and who will be glad to give you valuable assistance.

The RSGB EMC Committee is always pleased to receive feedback and information, particularly on suspect equipment, so members are encouraged to visit and use the web site feedback form.

All of the EMC leaflets have recently been updated by David Lauder, G0SNO, who is the author of the regular 'EMC' column in *RadCom*.

ARE YOU AN ACTIVE MEMBER?

Are you an active member, the kind that would be missed?
Or are you just contented that your name is on the list?
Do you attend the meetings and mingle with the flock?
Or do you meet in private and criticise and knock?

Do you take an active part and help the work along?
Or are you satisfied to be the kind to just belong?
Do you work on committees? To this there is no trick,
Or leave the work to just a few, then talk about the clique?

Please go to meetings often, and help with hand and heart.
Don't be just a member, but take an active part.
Think it over, you know what's right from wrong.
Are you an active member or do you just belong?

[*from the Liskeard Royal Naval Association magazine*]

RSGB PORTABLE CONTESTS

AS REPORTED last month, the RSGB HF Contests Committee and VHF Contest Committee announced the resumption of RSGB portable contests with effect from 1 September. The two committee have published a 'code of practice' which is published in full on their web sites (linked from **www.rsgb.org**)

For those without Internet access, here is an edited version of the code of practice, which will remain in force for all RSGB portable contests until further notice:

If you have handled cattle, sheep, goats or pigs in the last seven days please do not go portable. When operating on private land, check that the owner of the land is happy for you to operate from the location in line with standard practice and respect any concerns which they have over F&M prior to turning up to operate. Respect footpaths or rights of way still closed and the 3km controlled areas around infected premises. Do not operate inside the 3km controlled areas. Do not go near, and never touch, handle or feed livestock: if you come across them unexpectedly, move away slowly; if necessary re-trace your route. Do not operate in fields with animals or where animals have been present in the past seven days. Do not take dogs. Do not leave any waste food or litter. Leave all gates as you find them. Use disinfectant where provided. Start your trip with clean equipment, footwear and clothing.

Updated information on the current foot and mouth disease sitation can be found on the web site of the Department for Environment, Food & Rural Affairs (DEFRA) at www.defra.gov.uk/

Finally, if you have any doubts about operating in a certain area, please don't. Try to find an alternative location.

RSGB QSL BUREAU NEWS

ERIC SIMPSON, G3GRX, has recently resigned as Sub-Manager for the G3EAA - HZZ series of callsigns due to ill health. Eric carried out his duties as QSL Bureau Sub-Manager for a period of over 25 years and his exceptional service and dedicated work has been appreciated by thousands of radio amateurs over this time. On behalf of the RSGB, many thanks, Eric, for your tireless efforts.

Several RSGB QSL Bureau sub-managers have recently made pleas that amateurs who wish to collect their QSL cards from the bureau should lodge stamped self-addressed envelopes with them in order to receive the cards. In particular, the following sub-managers are holding large numbers of unclaimed cards:

Eddie Murphy, G0VVT (G6AAA - ZZZ series). If you have a query please phone Eddie on 07881 647434 or e-mail: eddie@g0vvt.freeserve.co.uk

Anthony Nowell, RS94177, 3 Laburnum Grove, Bromsgrove, Worcestershire B61 8NB (G1 and M1AAA - AZZ series).

Mike Evans, MW0CNA (GB* AAA - MZZ series). Mike's web site at www.midglam.cjb.net lists those callsigns which have envelopes lodged, and those where there are no envelopes. Unclaimed QSLs will be returned to the senders in November.

Brian Mulleady, GM0KWL (M0B series). He would also be grateful if those amateurs with M0B** callsigns who do *not* want to collect cards would inform him of this, as he will then dispose of these cards to provide more storage space.

Graham Ridgeway, M5AAV, 37 Highfield Gardens, Blackburn, Lancashire BB2 3SN, tel: 01254 522 81; e-mail: m5aav@zetnet.co.uk (M5 series and GB* NAA - ZZZ series). Over 7500 cards are currently being held!

New Sub-Managers

The following new sub-managers have recently been appointed:

D Gilbert, G0NFA, 2 Greenfields Cottages, Bentley, Farnham, Surrey GU10 5HZ (G0TAA - TZZ series).

Andrew Burchell, M1BPN, QTHR (G4BAA - BZZ series).

C Chislett, G0CAM, QTHR (G3UAA - VZZ series).

Andrea Bostock, M0LLW, 34 Lime Tree Crescent, Rossington, Doncaster DN11 0BT (G0CAA - CZZ and G4CAA - CZZ series).

D Phillips, G1JDU, QTHR (G3EAA to G3HZZ series).

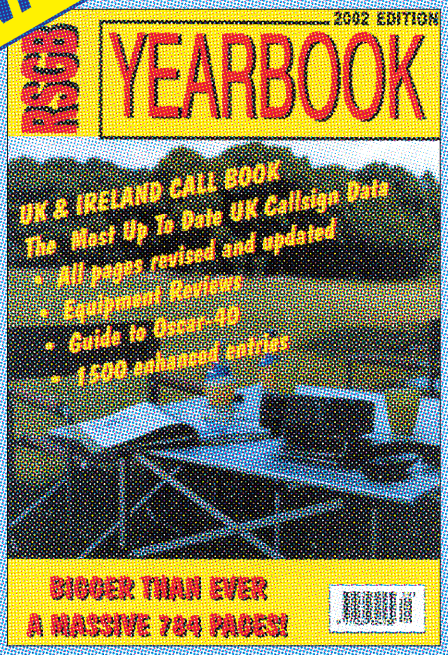
A Horton, G0LKG, QTHR (all Novice licensees).

Thanks to G0RFN, G3GRX, G3UKW, G4FNC, G4YRZ and M0AXO who have recently stood down as QSL Bureau Sub-Managers for these series of callsigns.

Finally, G Pendrick, M5GAC, has sent a plea for all amateurs to QSL more effectively. He says that since 1999 he has sent 421 cards to 80 countries via the bureau but received only 12 QSLs in reply.

AVAILABLE NOW

RSGB YEARBOOK 2002



Your favourite annual has just got even bigger and even better. Colour features include how to get the best out of Oscar-40, and reviews of the FT-1000MP MarkV, the TS-2000 and the FT-817. There are comparitive reviews on logging software, HF linears, VHF/UHF handhelds and kits. Also new are RAE courses, the new RSGB regional structure and repeater maps for 6m and 23cm. Plus the mass of information you have come to expect, and the most accurate and comprehensive UK and Eire callsign listings.

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The complete contents of the RSGB yearbook are available on CD Rom. The callsign directory is accessed by a sophisticated yet easy-to-use search program, whilst all of the information directory section can be viewed using Adobe Acrobat. CALLSEEKER Plus 2002 provides the ideal medium for rapidly searching for all or part of a callsign, post code, name, town, keyword etc.

NOW INCLUDES THE FOLLOWING CALLS:
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All amateur radio information pages are available on screen or via your printer in exactly the same format as the printed yearbook.

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Kenwood TS-50S

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£289.95

All radios on this page are available on various finance packages - call for details

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Kenwood TS-570DGE **£849.00**

An Ideal first radio offering excellent features for CW operators. Also very well suited for blind operators (with optional VS3) 1.8-30MHz with built in ATU at only £849.00 (Requires 25 amp 13.8 volt PSU)

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Front Cover:

The *Lambda Times* may be a figment of our imagination, but the new structure for amateur radio licensing in the UK very definitely isn't! For full details, turn to page 21 now.

Radio Communication

Editor
Steve Telenius-Lowe, G4JVG

Technical Editor
George Brown, M5ACN

Technical Illustrator
Cover Design
Bob Ryan, 2E1EKS

Advertising Design
Annie McVicar

Secretarial
Pauline Reid

All contributions and correspondence concerning the content of *RadCom* should be posted to:

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

Tel: 0870 904 7373

Fax: 0870 904 7374

E-mail: radcom@rsgb.org.uk

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

Janice Forde
Advertising Sales, RSGB
Lambda House, Cranborne Road
Potters Bar, Herts EN6 3JE

Tel: 0870 904 7377
(advertising ONLY)

Fax: 0870 904 7378
(advertising ONLY)

E-mail: adsales@rsgb.org.uk

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

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RSGB MEMBERSHIP - Annual Rates

Home Corporate	£40.50
Overseas Corporate	£40.50
Corporate (Senior Citizens)	£31.50
(Applications should provide proof of age at last renewal date)	
Corporate (50 years membership)	50% DISCOUNT
Corporate (60 years membership)	FREE
Family member	£16.50
(Must reside with existing member. Does not include RadCom)	
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(Applications should include evidence of full-time student status)	
HamClub (under 18)	£16.50
Affiliated Societies (UK or Overseas)	£40.50

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Special arrangements exist for blind and disabled persons.
Details and membership application forms are available from RSGB HQ.

RadCom This Month

News and Reports

October 2001

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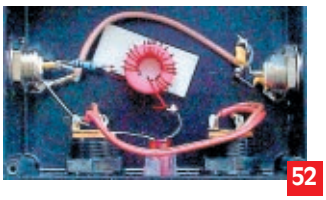
Technical Features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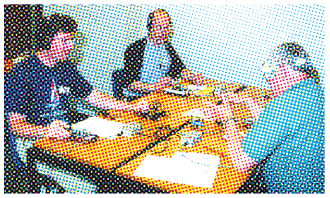
RadCom NEWS

NI Morse Camp a Great Success

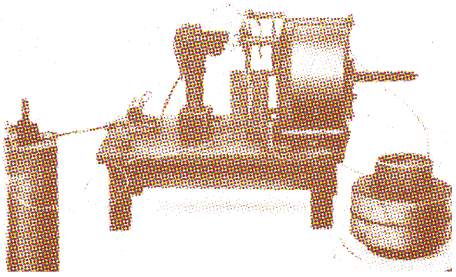
THE UNIVERSITY of Ulster's campus at Jordanstown was the venue for Northern Ireland's first ever Morse camp, held over the weekend of 30 June / 1 July. Eight students attended and under the guidance of Alex, Brian, Eddie, George, Jim and John, all passed their 5WPM Morse tests.



Throughout the weekend, all participants were kept well fed and watered by husband and wife team Jeff and Jane. The camp was a mixture of hard work and good fun and all agreed the effort was well worth while. This was a first attempt for the organisers of the camp and, although a few minor hiccups were experienced, the camp was undoubtedly a great success. The lessons learnt will be valuable in preparing for future similar events.

World's First Radio Transmitter?

IT IS GENERALLY accepted that Marconi made the first radio transmitter and that the world's first radio amateur was M J C Dennis, DNX, in 1898. However, Ralph Barrett, G2FQS, is to give a presentation this month that might counter these claims. As long ago as 1879, David Edward Hughes demonstrated apparatus that could be described as a radio transmitter in the street outside his home at 94 Great Portland Street in London. The equipment had a clockwork interrupter that provided impulses of energy supplied from a Daniell cell to make resonance in an inductor coil. Hughes had already invented a type of electric synchronous printing telegraph (which made his fortune in America), the carbon microphone, and an early form of metal detector.



Is this the world's first radio transmitter?

To find out more about the life and inventions of this remarkable man, go to The Institution of Electrical Engineers, Savoy Place, London WC2BR 0BL on **Monday 29 October**, where Ralph Barrett will demonstrate Hughes's radio transmitter and microphone. The lecture starts at 6.30pm and refreshments are served at 6.00pm. Admission is free and no tickets are required.

Cobweb Casts Net Wider

THE COBWEB Foundation is a small charity based in Scotland that works with families nation-wide. Its aim is to provide holidays for sick and disabled children. Adrien Collins, GM0MUN, who is himself disabled, wanted to do something to raise funds for the charity, so is organising special event station GB0TCF in Elgin on **13 October**, the start of the charity's street collection week. GB0TCF should operate on 10 - 80 metres plus 2m and each contact will receive a QSL card. Adrien thanks the local radio club for helping him by loaning a portable tower and providing volunteers to help run the station. As Adrien says, "Amateur radio is a great equaliser, no-one needs to know if the operator is disabled or not; every ham is on equal terms. What better way of passing the word around?"

If anyone would like to sponsor some contacts, or make a donation to the charity, please contact Adrien on 01542 810365. For more information about Cobweb e-mail: info@CobwebFoundation.org or take a look at www.CobwebFoundation.org

RAE etc Courses

DETAILS OF the following courses were received too late for the listings pages in the August and September *RadComs*:

Finningley Amateur Radio Society is holding a **Novice** class each Saturday from 10.30am to noon, followed by a **Morse** class. The venue is the club house at Belton Rd, Sandtoft. Call Eric on tel: 01302 840166 or Harold on tel: 01302 888749 for more details.

The **Maidstone YMCA Amateur Radio Society** will hold an **NRAE** course run by Martin Nash, G0LCH, (tel: 01622 744545) on Wednesdays (subject to sufficient demand). An **RAE** course and **Morse** training will be held on Fridays. Call Keith Maskell, G4YTU, on 01634 831504 for details or look at http://website.lineone.net/~g3trf (correction to information published in September *RadCom*).

North Bristol ARC holds an **RAE** class at their HQ in Filton, Bristol, on Friday evenings. The club also offers **Morse** tuition / practice at the same time and place. Contact Dick, G0XAY, tel: 01454 218362, or e-mail: g0xay@aol.com; or Ken, G3ECS, tel: 01179 622055 for details.

The **Blackwood and District ARS**, GW6GW, is offering **RAE**, **NRAE**, and **Morse** (5 and 12WPM) courses at 7.00pm on Fridays. The courses all started on 7 September. Venue: Oakdale Community College, Oakdale, **nr Blackwood, Gwent.** Further details at www.qsl.net/GW6GW

The **Itchen Valley** ARC in the Chandlers Ford area of Southampton will run a **Novice** course from September to December, and an **RAE** course from January to May followed by on the air **Morse** classes. Details from Sheila Williams, G0VNI, tel: 023 8081 3827.

Pete Pennington, G4EGQ, offers a 'friendly **correspondence course**' for the RAE (postal, e-mail or mixture). This course is aimed at those who, due to disability or other reasons, cannot attend a course run at their local club or college. Commences at any time of year and no time limit. Contact Pete for further details: 6 Highland Close, Folkestone CT20 3SA, tel: 01303 220010 (between 11.00am and 8.00pm), or e-mail: g4egq@thersgb.net

Amateur Radio Promotes Philately

GB5SI WAS operated from the Summer Isles by Jim Martin, MM0BQI, between 27 July and 5 August as part of the celebrations to commemorate a new issue of the islands' unique postage stamps. Tanera Mor in the Summer Isles is the only Scottish offshore island to operate a regular, year-round, private postal service. At least three times per week, sea conditions permitting, *MV Patricia* crosses the sound of Badenterbet carrying mail for onward transmission by the mainland post office at Achiltibuie; the boat returns carrying postal items for island distribution. The Summer Isles' pedigree as a fully-fledged postal authority began on 1 December 1970 by arrangement with the Royal Mail.

Detail of one of the Summer Isles'new stamps.

This is a good example of a radio amateur working with island / land owners to give them something back for allowing amateurs to use their land for expeditions and field day operations. Jim says that judging by the number of questions about the stamps, there are quite a few avid stamp collectors among the ranks of radio amateurs! More information about the stamps and images of the island can be found at www.summer-isles.com

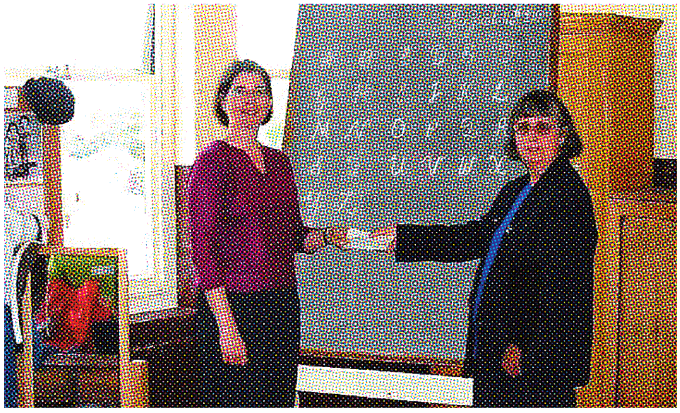
Jim Martin, MM0BQI (left), and Bill Wilder, owner of Tanera Mor, outside the Post Office on the island.

NMW 2001 Raises Funds for Children's Museum Charity

National Museums Event Goes International

THE NATIONAL Museums Weekend was conceived by Harry Bloomfield, M1BYT, assisted by Geoff Steedman, M0BGS, and with considerable help from members of the Denby Dale club. This year was the first such event, which took place over the weekend of 2 / 3 June.

The main aim was to be able to present amateur radio in action to the general public at some of the most popular and well-visited museums around the UK. To add extra interest to those participating, an award scheme was devised with a small fee to cover costs: surplus money would be donated to a UK children's charity museum. The Ragged School Museum at Mile End in London's East End was selected to benefit from this year's event. The Barking Radio and Electronics Society (BRES), the participating club closest to the museum, was asked to hand over the cheque. The amount raised was £85 pounds and a donation of £15 pounds was given by BRES to make it up to £100.



Jennifer Charter, 2E1FZC (right), presents the cheque to Claire Seymore, the curator of the Ragged School Museum.

53 registered museums took part in the weekend. The top awards went to GB2YAM and GB2NAM with 25 other museums worked, and to M0RMW (individual operator) with 32 stations, and BRS47426 with 31 stations. More information can be found on the Internet at www.qsl.net/m1byt/

It is planned to run a similar weekend next year, but expanded to become an international event. The probable date for the *International* Museums Weekend is the third weekend in June. More details at www.imw.f2s.com/

To Catch a Thief

WALTER WILLIAMS, G0XEM, of Helston, Cornwall, says his property has been broken into by an unknown individual on many occasions over a period of 10 years. The thief has made off with personal property including WWII aircraft radio equipment and many non-radio effects. Walter says the police are unable to help. He would like to hear from anyone who has had a similar experience and is prepared to offer a cash reward for information leading to the successful conviction of the individual concerned. Since Walter's address is withheld from the *Yearbook*, if anyone wishes to write to Walter, please send your letter to the *RadCom* office and we will forward it on.

G0FCL SK

IT WAS WITH great sorrow that we learned that Dennis Kitchen, G0FCL, died on 30 August, following a short illness. Dennis had compiled the *RadCom* 'Space' column from November 1998 until the July issue of this year. Our condolences are passed to his widow, Barbara, and his family. John Heath, G7HIA, who compiled 'Space' for last month's *RadCom* at short notice following news of Dennis's illness, has kindly agreed to continue writing the column.

George Johnson, GW3EIR, has been elected mayor of Colwyn Bay. A member of the Conwy Valley ARC, George is an active member of local government circles, and is past President of the Marconi Veterans' Association.

APRS at Land Rover World Show

THE LAND ROVER 101 Forward Control Club and Register ran special event station GB0LRW from the grounds of West Wycombe House during the Land Rover World Show in August. The station was operated by members of the Aylesbury Raynet Group, along with licensed members of the Land Rover club. On VHF, the APRS tracking system was used to record the position of Alasdair Worsley, M1LAN, in a Land Rover anti-tank missile carrier driving on an off-road course. On HF, Ivan, G3KLT, and Ian, G3ZHX, worked stations around Europe and into the USA. Further details can be found at www.users.waitrose.com/~1tonnefc/show.htm

A Stroll in the Woods

TONY WHITAKER, G3RKL, started to walk the length of New Zealand on 10 August. The 1300-mile walk is expected to take 72 days. Tony, who is also licensed as ZL6RTB, is in daily amateur radio contact with the UK via the New Zealand national repeater system and Internet linking, using I-phone and talking over his local repeater GB3US in Sheffield. More information and pictures are on the web site of Ian Abel, G3ZHI, at www.qsl.net/g3zhi/g3rkl.htm

Cray Valley at SciTech 2001

CRAY VALLEY Radio Society will be operating special event station GB8ST from the Crown Woods Festival of Science & Technology (SciTech 2001) in Eltham, south London. on **14 October**. GB8ST will be on the air, with three stations, between 8.00am and 6.00pm. Special QSL cards will be available from Owen, G4DFI, either direct or via the RSGB bureau.

Apart from GB8ST, SciTech 2001 will also feature a car and vehicle show, two lecture streams - including a talk on amateur radio by Richard, G8ITB, plus football skills competitions organised by Charlton Athletic FC, craft exhibits, music, food and family fun. More information is on the SciTech web site at www.crownwoods.fsnet.co.uk/scitech2001.htm

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- TX - all HF + 6mtr
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  150kHz - 30-MHz
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- SSB, CW, AM, FM and digital modes
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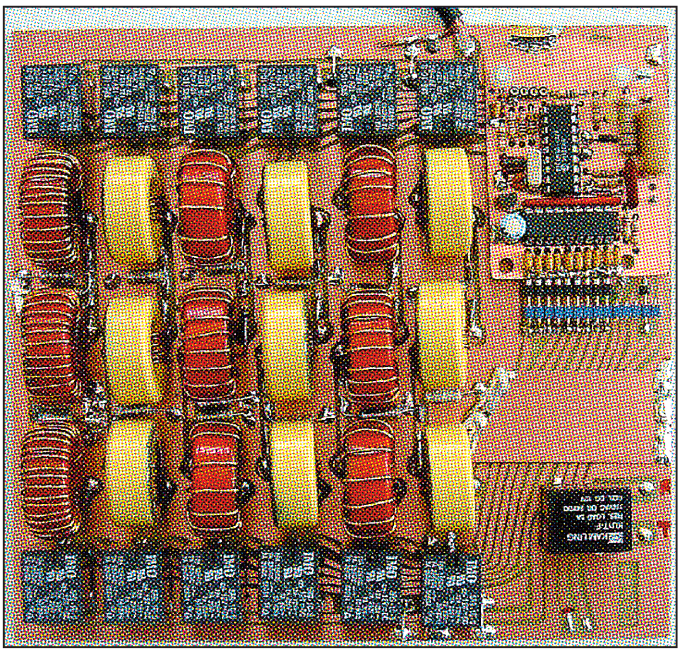
Pic-A-Switch:
a frequency-dependent switch

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

THIS MONTH concentrates on the hardware build. Starting with a handful of components and some PCB material, this can easily be completed in a day. So by next month, you should be ready to concentrate on the software aspects.

To this end, the system design flow-chart is also revisited.



The author's low-pass filter board under development. All components are mounted on the track side, the other side being unetched and forming the base of the complete linear. Pic-A-Switch is fitted as a small daughter board in the top right-hand corner. The T/R relay is bottom right.

CIRCUIT DESCRIPTION

THE CIRCUIT DIAGRAM of a fully-configured Pic-A-Switch is shown in **Fig 8**. Most applications will use some subset of this, as discussed in a moment.

POWER DISTRIBUTION

This is illustrated for 'remote' operation - where the 12VDC power is multiplexed up the coax feed from the shack.

RFC1 splits off the DC component which is used on the board to derive the +5V rail needed by the PIC, and feeds off the board to power your relay coils.

R9 discharges C1 at power-off to give a reasonably short interval to a subsequent power-on reset.

INPUTS

The RF component - with DC blocked by C4 - is passed through to be switched by those same relays. It is also sampled by the PIC, IC1 on RA4 (pin 3) both to detect that you are on transmit - and then to measure the transmit frequency.

D4 and D5 restrict the input to the PIC to a safe level. R12 and R10 bias the PIC input to just below the logic '1' threshold, such that any RF on the line is immediately detectable. See later for a discussion of the values of R4 and C5 versus power sensitivity.

As an alternative to RF detection, if Pic-A-Switch is fitted in the shack it is marginally preferable to sample the PTT line feed from your transceiver. The sense of the PTT line should be 'grounded on transmit' and should be an 'early' indication of the transmit state - and not a derived and delayed output from, for example, some T/R timer. R11 and ZD1 limit the voltage to the PIC to a safe level from what is typically a 12V PTT line. R13 acts a pull-up resistor on RB6.

OUTPUTS

The PIC GENERATES eight switched outputs. Six of them are frequency-dependent and, in operation, only one of them is set at a time - as a function of which band you are operating on. Two further outputs are available for switching a T/R relay and controlling a bias line - if required.

All these switched outputs are buffered by IC2 which can sink up to 500mA per output. This is more than enough for several relays. IC2 also contains integral transient suppression diodes. These output lines are grounded when active.

The SIL resistor network R14 is precautionary. It holds all the inputs to IC2 low during the power up phase, so that if any of them were floating, no output switching would occur.

D1 is an LED which lights when the transmit frequency has been successfully measured. If it flashes or glows dimly or intermittently, the most likely cause is that not enough power is reaching the PIC for reliable frequency determination.

D2, the second LED, is lit during channel switching. This happens at power-on - and on first use of the transmitter after switching to a band that is allocated to a different output channel - as confirmation that the change has occurred. Should you prefer an audible indication, a small Piezo sounder (with integral oscillator) may be connected in parallel with (or instead of) D2. R7 may then be increased in value (but not decreased) to reduce the volume.

Both D1 and D2 may be mounted off the board, say on a front panel, with the leads bypassed where they leave the board.

CRYSTAL OSCILLATOR

If the 7th harmonic of X1 falls in the CW DX portion of 10m, you can increase C2 and/or C3 to reduce it to 28MHz.

CONFIGURATION OPTIONS

THESE ARE DETERMINED by your application - and the location - of Pic-A-Switch. They are independent options, so you can pick-and-mix.

LOCAL/REMOTE LOCATION

With a 12V supply readily to hand, you may connect it directly to the +12V relay feed line and omit RFC1 and C4. The RF would then not be routed through the board, but rather 'Teed' off a passing coax line and connected directly to R4.

For remote fitting (eg at the masthead), you will need the shack unit to feed DC power up the coax. This simple unit is

* Danvers House, Wigmore, Herefordshire HR6 9UF.
E-mail: G3XJP@qsl.net

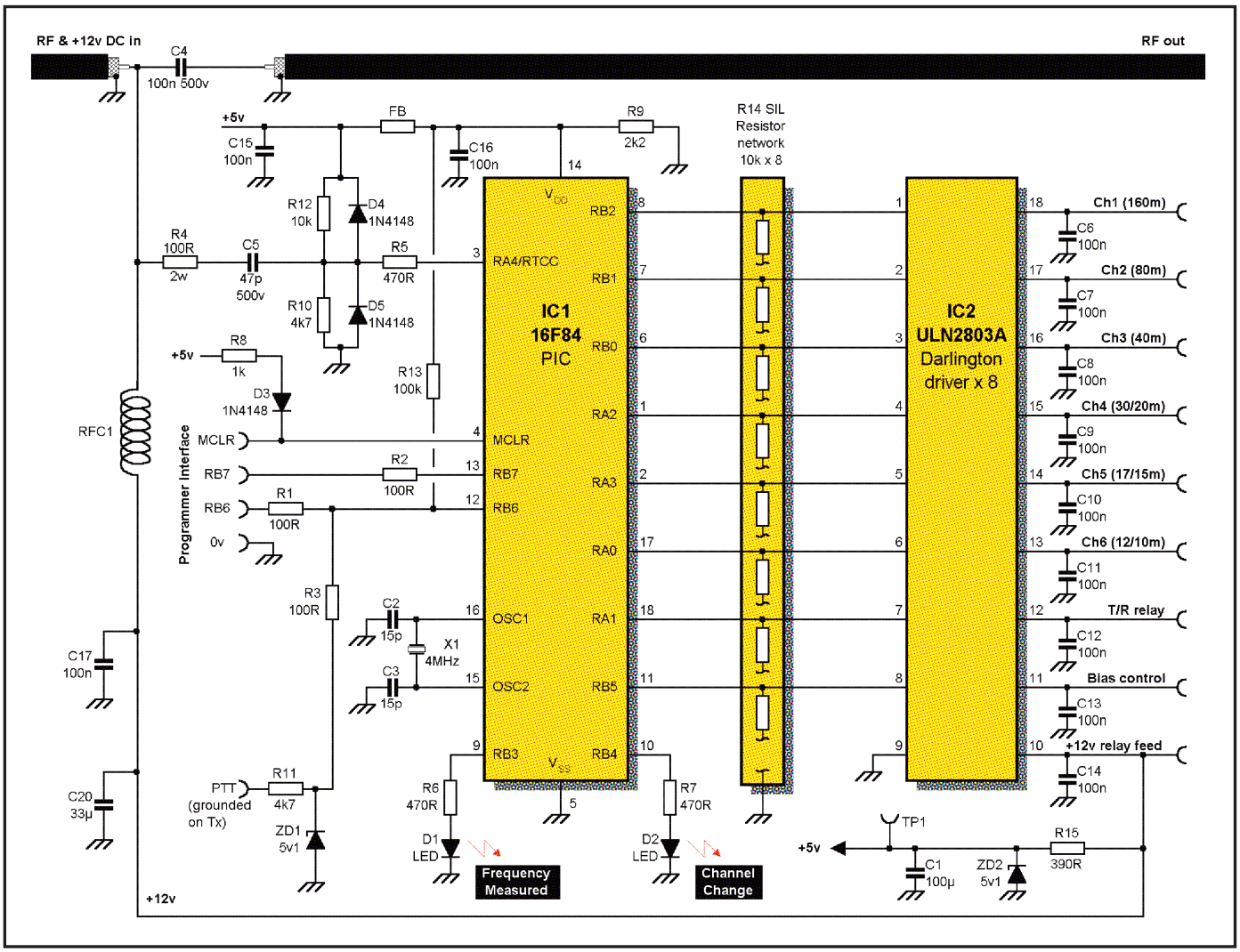


Fig 8: A fully-configured Pic-A-Switch. See text for options. The six output channels - as shown - have the nine HF bands allocated to them as per the default software settings. These can be reallocated as required.

shown in **Fig 9**. Be careful to connect it 'last' in the coax line to avoid applying 12V to any SWR bridges, coax switches etc.

PTT LINE

If this is not fitted, omit R11, R3 and ZD1.

IN SITU PROGRAMMING

The PIC may be loaded with the program by plugging it briefly into the programmer. For occasional use, this is fine and you can omit R1, R2 and the connector. If you visualise any development work, it is best to fit the programmer interface to allow *in situ* programming.

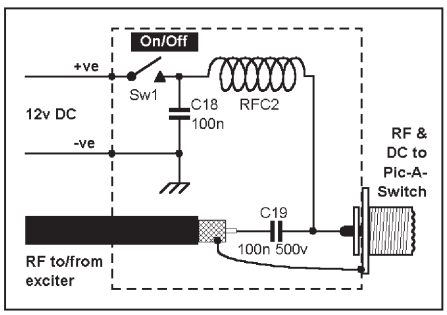


Fig 9: Shack unit for multiplexing DC power up the coax to a remote Pic-A-Switch. No constructional detail is provided. If 12V is available at Pic-A-Switch, this unit is not needed.

RF POWER LEVELS

R4 and C5 determine Pic-A-Switch's sensitivity. The values shown are suitable from a few milliwatts to about 20W. For a range of 5W to 400W, increase R4 from 100Ω to 680Ω and decrease C5 from 47pF to 10pF. At the lower power levels the voltage ratings of C5 and C4 could be reduced - as could that of C19 in the optional shack unit.

T/R RELAY AND BIAS CONTROL

If not using these lines, simply make no connection to them. For masthead applications, they could be useful for switching preamplifiers or transverters. For local use, they were included for control of a solid-state linear.

In this context, **Fig 10** shows the switch I use for controlling the bias to my PA. The MOSFET should have an on-resistance of less than 1Ω and be capable of passing the PA peak base current ie several amps. For a 100-200W linear, devices such as the IRF9520 or IRF9640 would be suitable.

The Pic-A-Switch software assumes a solid-state switch here (absolutely *not* a relay), since it needs near-instantaneous control of this line.

CONFIGURATION UTILITY

You will need TP1 either if you purchase the software from me - or if you write your own configuration utility. It mounts within the socket of IC2 to prevent access while IC2 is plugged in.

MAKING THE PCB

THE PCB is illustrated in **Fig 11**. It has been designed explicitly - without compromising

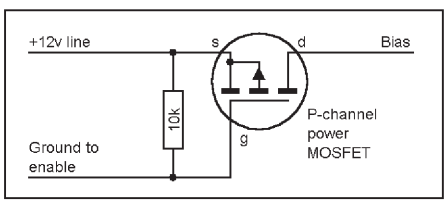


Fig 10: Bias switch used in the author's linear. The sense of the enable line is compatible with direct connection to the Pic-A-Switch bias control line.

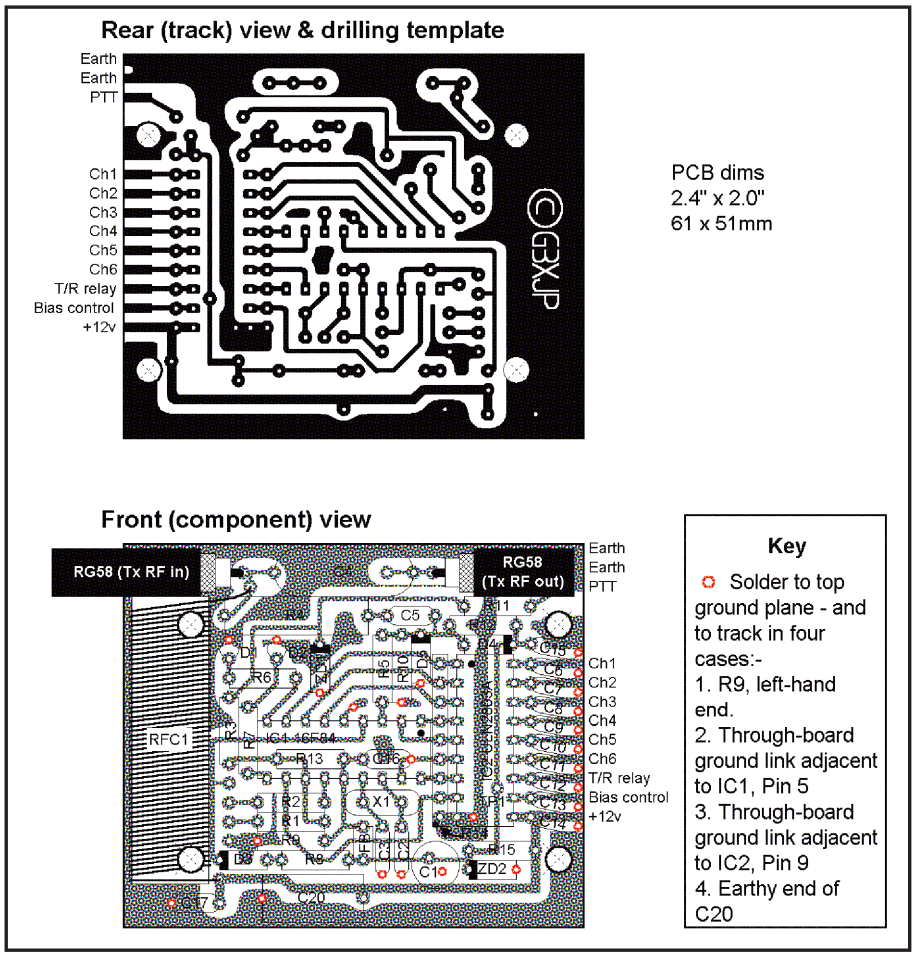


Fig 11: Pic-A-Switch PCB using double-sided board. The component side is completely unetched, providing screening and a low impedance earth plane. The board has been laid out for maximum component density but with a low track density suitable for simple production with an indelible pen. Drill holes 0.7mm initially - and then drill out further as required for C4 and R4. If RFC1 and C4 are not fitted, the board dimensions may be reduced somewhat.

the layout in any way - for ease of one-off production. Specifically, I have avoided routing any tracks *between* the IC pins.

If you are one of those who still resist etching (pardon the pun), here is your chance. From much correspondence, a fear among many seems to be focused around the handling of dangerous chemicals.

Although ferric chloride is not completely benign and needs sensible precautions when handling, it is far less obnoxious than, say, DIY paint stripper. You can purchase it by mail order packed in a mere polythene bag without signing the Poisons' Register. And just because it has a 'chemical name', that does not make it dangerous.

The only capital equipment you need is a domestic power drill. Do not be fooled by the pages of expensive items in the catalogues - which you *would* need if you were into mass production.

The other frequently-voiced objection is that of lack of process detail. Since I don't want to give you any excuse to duck the software aspects, all the detail is spelled out here - though there isn't actually that much! Once you have produced your first board, you will wonder what all the fuss was about. So, give it a try on an easy one.

You need the following stock materials:

- A small piece of double-sided PCB (to make for easier drilling, SRBP would be fine - in this application).
- A small quantity of ferric chloride crystals (or pre-dissolved solution).
- A polythene box as an etch tray, typically stolen from the kitchen - or even an old ice-cream tub will do. As small as will fit the board - laid flat on the bottom - is best.
- A 0.7mm drill bit and a power drill. You do *not* need a pillar drill. You may also need a pin chuck to grip small drill bits. Although professionals use significantly more expensive tungsten carbide bits for longer life, unless you really know what you are doing, you will snap them long before you get better value.
- A spray can each of matt black and clear acrylic paint from any car accessory shop. Also some cellulose thinners.
- A rubbing block or, failing that, an ink rubber - for cleaning and polishing PCB copper.
- Some water-soluble glue.
- A Staedtler Lumocolor Permanent, Black, Medium Nib Pen, 317. From any good stationers. Accept *no* substitutes!
- For centre-popping holes, a small sharpened masonry nail and a hammer to tap it with. Do not use a real centre punch (too coarse) - or worse - one of those spring-loaded contraptions (you will split the board!)
- A couple of pairs of disposable gloves - from most garage forecourts.

THE PROCESS

Everyone has his own way of doing this, but this is what works for me every time. It also has the merit of being quick and cheap (if you are making a one-off).

PREPARING THE BOARD

- Take a photocopy of the rear track view. Check with an IC socket that it has not been reduced or enlarged by the copier.
- Cut both the PCB and artwork to size.
- Stick the artwork to the PCB with a thin even coat of glue.
- Centre-pop all the holes with a light tap on the masonry nail - on a firm backing surface. (If using a pillar drill, I would omit this stage as increasing the risk of bit-snapping at drill time.)
- Drill all the holes. It's confession time. I do this sitting down, holding the drill with its weight on my lap and the board gripped in my other hand. With the drill stopped, I offer the board to the drill, centre up the bit, start the drill and apply pressure to the board. I find that any positive location of either the board or the drill - or worse, both - increases my snap rate on the bits. I have *never* snapped one using the fully hand-held approach.
- Peel off (or dissolve off in hot water) the artwork.
- Turn the board over and mark any holes which are 'earthy' with a felt-tip pen. Then lightly countersink all the rest with something like a blunt 2mm drill. This also removes the slight 'volcano effect' you get, having drilled from the other side.
- Only if there are any heavy scratches, use fine wet-and-dry with a drop of washing up liquid - and air dry. Then polish both sides with the rubbing block.
- Spray the component side with two good coats of matt black, letting it dry *completely* between coats. You are about one hour into the job at this stage, so time for a cuppa.
- Rest the component side on a soft but firm surface to avoid scratching the paint. Wear a disposable glove on your non-writing hand to avoid contaminating the surface with grease or acid. Give the whole track side a last quick polish - and brush away all debris.
- Using the pen, dip it vertically into each

hole to create a basic circular land. Then just join up the dots! Start with the easy and obvious ones and leave the larger earthy areas till last. With the 'medium' pen, the ink flows freely, so as long as the surface is clean you will achieve good adhesion and plenty of ink thickness.

- If you make a mistake, let that area dry and then remove the errant ink with a craft blade and the debris with a paint brush. Do not use a solvent as the residue may resist the etch.
- Don't forget to write your callsign somewhere. This is art to be proud of - and a good provenance will increase its value to later generations.
- Fill in any large areas of exposed copper. It is best if you end up with similar gap widths between the areas of exposed copper - uniformly across the board.

ETCHING THE BOARD

Do not wait long before etching the board, as the clean copper is oxidising all the time. Do all this outside if it is a pleasant day, otherwise in the confines of a stainless steel sink lined with old newspaper. Allow about an hour for this.

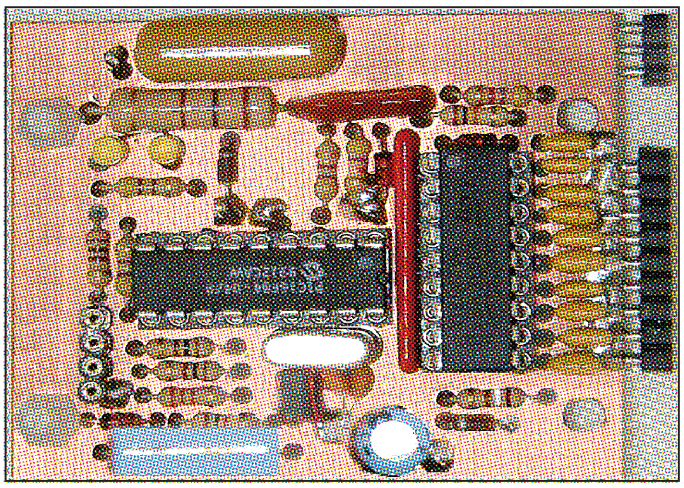
- Pour about 2cm depth of near boiling water into the etching tray. Add about 1 heaped tablespoon of ferric chloride crystals. But don't measure it accurately and certainly don't use a tablespoon.
- Rocking the tray gently, wait until the crystals have completely dissolved and no visible steam is rising from the surface.
- Lower the board into the solution, track side up, component side resting on the bottom.
- Gently but continuously rock the tray back and forth, letting the little wavelets wash across the board's surface.
- After about 5-10 minutes you will start to see definite 'damage' to the exposed copper and after about 15-25 minutes it will all have disappeared.
- If it takes much longer than this, you can remove the board - and then reheat the tray and solution in a microwave. Do *not* leave the board in, or all the copper will disappear in a flash!
- Pour all the solution off into a plastic bottle and seal it if you want to re-use it. Place it out of reach of little hands.
- Wash the board under the hot tap and dry with kitchen paper.
- Wearing disposable gloves and definitely outdoors over newspaper, wipe the paint and ink off the board with kitchen towel soaked in cellulose thinners. Repeat until it is all off. You may want to drill the paint out of the holes quickly and rewash it in thinners.
- Wearing disposable gloves, re-polish the component side and immediately give it two coats of clear lacquer. This will prevent the board from discolouring later and revealing those nasty acid fingerprints.
- With a small board like this, I postpone lacquering the track side until all the components are soldered in. But normally I would polish and lacquer both sides first, because you can solder through the lacquer with no problem - and then you are free to use your bare hands.

POPULATING THE BOARD

For ease of access fit the components in the following order:

- R13, C16 under IC1 socket.
- Through-board ground links adjacent to IC1 pin 5 and IC2 pin 8.
- TP1 within IC2 socket and R14.
- The IC sockets - taking care not to ground the pin shoulders and then X2 - checking it does not short to IC1 socket.

Then fit the remaining components in any order.



Pic-A-Switch component side view. For fitting as a daughter board, I have used SIL connector strip.

SUPPLIERS

THERE ARE no difficult-to-source components here. They are all available through Farnell and doubtless many others.

HARDWARE COMMISSIONING

TO TEST the board once the software is loaded, connect up the appropriate inputs and outputs to your relay coils. At this stage, route your transmit RF directly to a dummy load, not via the relay contacts.

At power-on, note that *one* of the frequency-sensitive output channels is activated and that D2 briefly flashes.

Apply a small amount of RF carrier and note that D1 comes on at an acceptable power level - denoting successful frequency measurement. Check that the appropriate channel is activated on each of the nine HF bands. In particular, check power sensitivity on both the highest and lowest frequency bands of intended operation.

If using the T/R relay and/or the bias control lines, verify correct operation of these also. Some temporary LEDs may prove useful.

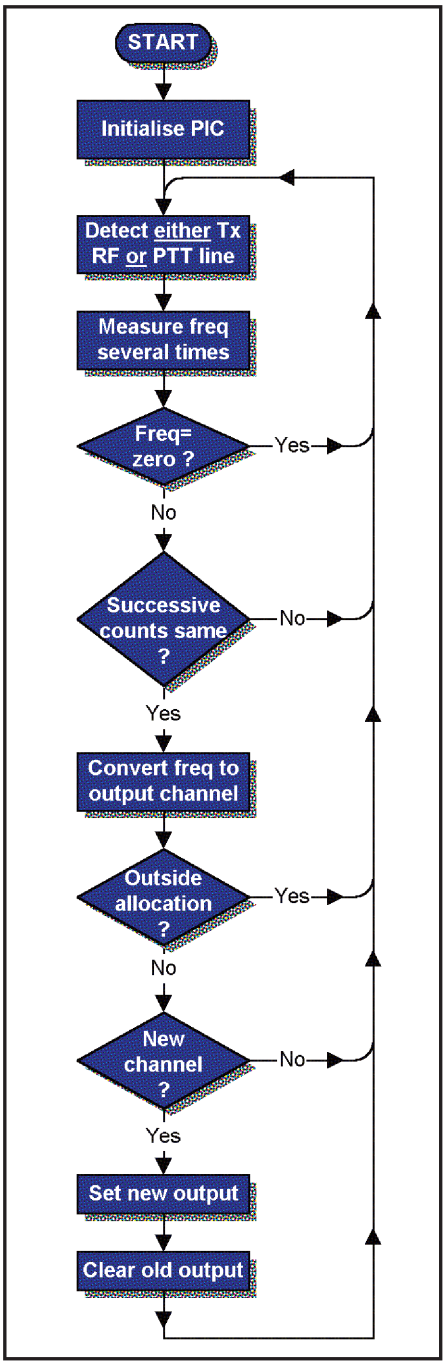


Fig 12: Developing the 'system behaviour' flowchart.

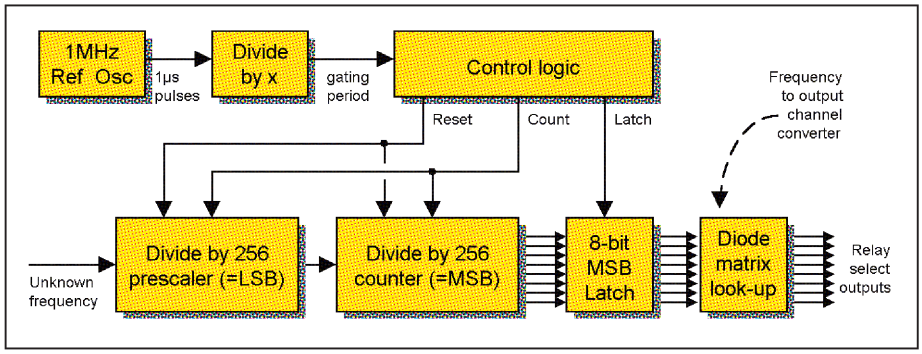


Fig 13: Equivalent hardware implementation of a scheme to measure frequency once only - and to convert the result to an output channel. Perhaps £10's worth of TTL? Except that the count is binary and not BCD, this is in essence the block diagram of a standard frequency counter. Fitting diodes to the matrix is precisely analogous to editing a software look-up table.

Obtain some realistic values for the 'operate' and 'release' times of your relays. This is preferably done by measurement *in situ* with an oscilloscope. Include any bounce times in the values. If this is not possible, use the manufacturer's data and add about 50% for bounce time if it is not specified. Either edit the values into the code or use the utility in the PIC supplied by me. At the same time, configure the band-to-channel relationship and test.

All being well, you can now route the RF through the relay contacts.

BACK TO OUR FLOW-CHART

LAST MONTH, an elementary flow-chart was drawn to provoke some thought about how Pic-A-Switch should behave.

Fig 12 develops the theme somewhat further, answering some questions but - as is the way with these things - raising some new ones. Note that a significant amount of the logic is concerned with handling situations which should *not* arise. Making sure all these 'error situations' are covered is an essential part of the discipline - and often the biggest part of the work.

- The idea of explicitly detecting the receive-to-transmit transition is introduced. Presumably until this happens, the system would just sit idly waiting until it did? A little more clarification is needed here.
- Equally, some clarification is needed for the transmit-to-receive transition.
- The difficulties surrounding frequency miscounts are handled by measuring the frequency several times - and proceeding only if a consistent (and non-zero) result is obtained. How many times is 'several'? Difficult to say at this stage. It would take literally 30 seconds to edit and download the code to change it. Certainly a safe value needs to be used, since miscounts and spurious switching are definitely not wanted.

  To implement this in hardware feels very expensive. **Fig 13** illustrates a typical scheme for measuring the frequency *once*. For multiple measurements, you either need more than one counter - or more realistically, you would need to latch the results of several successive counts separately, and then compare the latched values.

  It turns out that this is exactly what the software implementation does - but in a few lines of code (eg an 8-bit latch is but one instruction to the PIC). So Fig 13 is equally valid as a software block diagram.

  If this were implemented as a software subroutine, it could be called as many times as needed. It turns out even easier than that, because our £3 PIC comes with a built-in 50MHz prescaler and counter. This is starting to get too easy!
- The concept of converting measured frequency to output channel is introduced. In hardware, this would be implemented classically with some diode matrix arrangement. In software, a lookup table would be used. The exact implementation detail is not important yet, but it does give us the opportunity to spot frequencies outside the amateur allocation - and simply ignore them. (They could result from either miscounts or genuine use of Pic-A-Switch outside an amateur band - ie outside the spec. Either way, they get ignored.)
- This also begs the question of what counting period is needed to discriminate between bands.
- Finally, the suggestion is that, in the event of a new channel being needed, the switching would be implemented in a 'make before break' fashion.

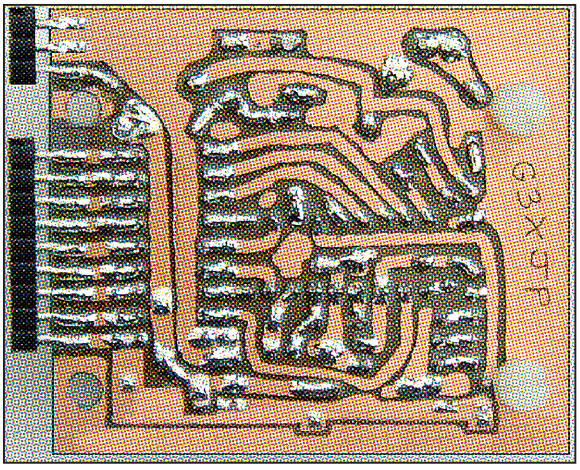
  Thus the transmitter would always see *some* load during the dynamic switch interval. Certainly this is better than an open circuit and is surely good enough for a remote Pic-A-Switch - which, by its nature, is fitted downstream from ALC and reflected power protection. But is it good enough for LPF switching, where it will be the 'wrong side' of the SWR head?

  You may care to give all this some thought. ♦

COMPONENT LIST

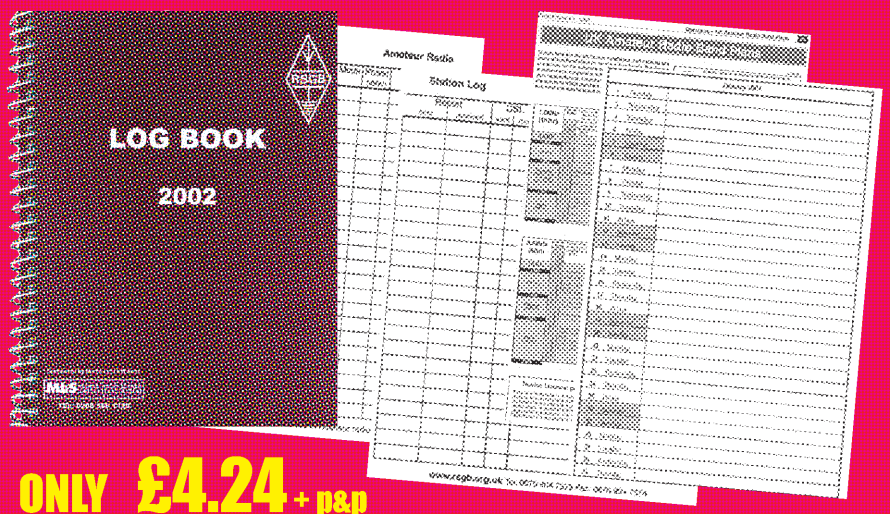
Resistors	$^1/_8$-$^1/_4$W, 5-10% unless specified otherwise
R1-R3	100R
R4	100R 2W non-inductive *
R5-R7	470R
R8	1k
R9	2k2
R10, R11	4k7
R12	10k
R13	100k
R14	10k x 8 SIL network, one lead common
R15	390R
Capacitors	
C1	100µ 16V radial electrolytic
C2, C3	15p small ceramic plate *
C4, C19	100n 500V *
C5	47p 500V silver mica *
C6-C18	100n 15V ceramic or monolithic
C20	33µ 25V axial electrolytic
Inductors	
FB	Six turns thin enamelled wire on any small ferrite bead
RFC1, RFC2	3/8in (10mm) dia ferrite rod approx 1.5in long. Fully wind with one layer of 28SWG enamelled copper wire.
Semiconductors	
IC1	PIC16F84-04/P
IC2	ULN2803A
D1, D2	LEDs
D3-D5	1N4148 or similar
ZD1, ZD2	5V1 250mW
Miscellaneous	
Sw1	SPST power on/off
TP1	1-way SIL socket or similar A mating plug is required.
X1	4MHz HC49 crystal
18-pin DIL turned-pin sockets	2 off
Some double sided PCB - does not need to be fibreglass	
Input/output connectors as required	

* see text for discussion of values.



The Pic-A-Switch PCB from beneath, after the components have been fitted. Note that the tracking is substantially wider than that of the artwork. This makes for a more reliable etch - given that there are no performance considerations. In this application there are none. Is it beautiful? No! Did it allow the manufacture of a working board from scratch in a few hours - for next to nothing? Yes!

DELUXE LOG BOOK & DIARY 2002



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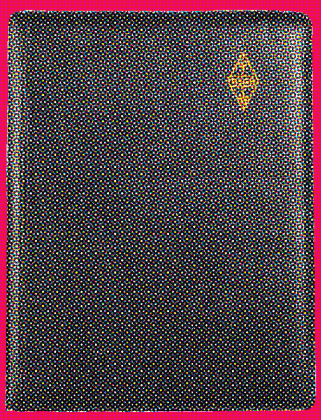

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A New Structure for Amateur Radio Licensing in the United Kingdom

THE Radiocommunications Agency (RA) has announced a series of changes to the radio amateur licensing regime, designed to make it more attractive as a technical hobby. The changes include lowering the Morse code speed requirement for full licensees, amalgamating some licence categories, allowing trainees to operate while supervised before passing an examination and the introduction of a new Foundation Class licence.

For more than a hundred years radio amateurs have been at the forefront of developments in telecommunications. In the current information and communication technology expansion, the Radiocommunications Agency (RA) and the Radio Society of Great Britain (RSGB) have agreed that it is in the national interest that access to amateur radio be improved so that radio amateurs can continue to play a key role in these technologies.

Amateur radio offers:

- a source of ongoing investigation and innovation in radio communication;
- a way of drawing people into a technical activity which can result in them pursuing a career in engineering, so enhancing the technical skill base of the United Kingdom;
- a source of emergency communications at times when conventional communications links are strained or out of action;
- a contribution to international friendship; and
- a rewarding and challenging leisure activity.

The current structure of licensing has been based on three levels, the Novice, Class A/B and the Full Licence. Both Novice and Full licences have two categories, one providing access to all amateur bands, the other restricted to those at 50MHz and above.

It is hoped that it may be possible to simplify this structure after the World Radio Conference in 2003. In the meantime the following changes are being made to the amateur radio licensing structure:

UK CLASS A AND CLASS A/B LICENCES

EARLIER THIS YEAR the European Conference of Postal and Telecommunications (CEPT) recommended that the Morse requirement for their Class 1 licence (equivalent to a UK Class A) be reduced from 12 to 5 words per minute (WPM). This has provided the Agency with an opportunity to review the amateur radio licensing structure. To this end the Agency intends with immediate effect to reduce the Morse requirement for the Class A licence to 5WPM and to incorporate the Class A/B into the Class A licence. Class A/B licence holders will be offered the choice of either retaining their existing M5 callsign or change to an M0 callsign.

Additionally, to encourage the practical aspect of amateur radio training, unlicensed trainees (on a registered training course) may be supervised by full licence-holders to operate a station and contact other UK licensed amateurs. There will be no time limit on the duration of any message.

NOVICE LICENCE

WITH EFFECT FROM 1 October 2001, the Novice Amateur Radio Licence will be re-named the Intermediate Amateur Radio Licence. Intermediate (A) licensees will be allowed access to all amateur radio bands. Intermediate (B) will be allowed access to all amateur bands at 50MHz and above. All Intermediate licensees will be allowed 50 watts output in all bands except where a lower power limit already applies to Amateur (A) licensees, in which case the lower level shall apply.

Frequency Bands (MHz)	Max O/P Power
0.1357 - 0.1378	1W (ERP)
1.810 - 24.990	10W
50.00 - 438.0	10W

Table 1: Abbreviated schedule for the new Foundation Licence.

FOUNDATION LICENCE

THE FINAL CHANGE to the amateur radio licensing structure prior to WRC 2003 will be the introduction of a new 'Foundation' licence at the beginning of 2002. This licence will provide access to most of the amateur bands, and restrict licensees to a maximum power of 10 watts RF output (see **Table 1**). Transmitting equipment will need to be commercially-manufactured items, or properly designed commercial kits.

Study for the Foundation licence may be undertaken over a weekend, and is based on the tradition that amateur radio is a hobby learnt mainly through self-training. The Foundation syllabus is based on the concept of producing 'safe and competent' radio amateurs.

- safe, in terms of understanding the personal safety issues involved.
- competent, in terms of understanding correct operating procedures and the need to ensure that transmissions do not interfere with other radio users, and being able to operate radio equipment efficiently and effectively.

With effect from 1 October 2001, pilot courses will be run to evaluate the syllabus and training material, and the Agency expects the full scheme to be operational from January 2002. The RSGB is working with the Agency to organise these pilot courses, and will be handling much of the routine administration of the training and examination process, with the Agency remaining as the licensing authority.

The resulting structure of amateur licensing is shown in **Fig 1**.

The Agency and the RSGB hope that by introducing this new licence level, amateur radio will become more attractive and accessible to both young and old, and that by taking this first step onto the licensing ladder, Foundation licensees will be encouraged to undertake a process of self-training to acquire higher licence privileges in due course.

It is intended that from 1 January 2004, a revised integrated structure of qualifications and examinations for amateur radio in the UK will come into effect. ♦

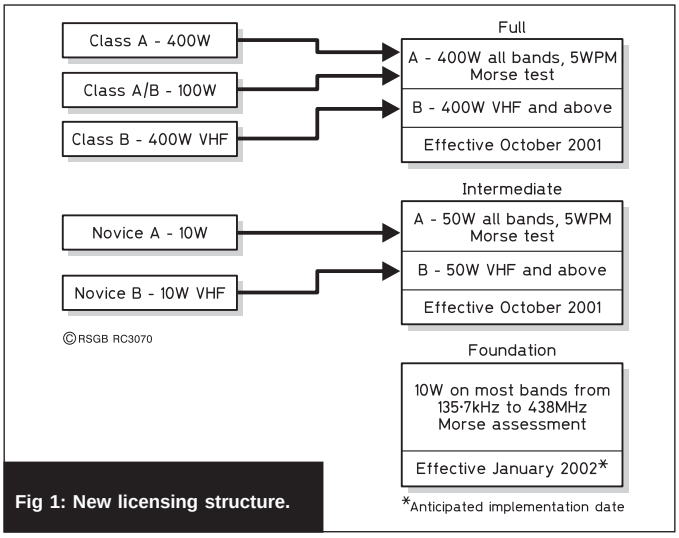

Fig 1: New licensing structure.

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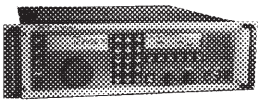

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Book Review

RSGB YEARBOOK 2002
Edited by Steve White, G3ZVW

EVERY YEAR the *RSGB Yearbook* just keeps on getting bigger and bigger. This year is no exception and the *Yearbook 2002*, at 784 pages, is the biggest and best yet, a massive 70% bigger than last year's book - and at the same price too! Every page has been checked and updated, so you can be confident that the most up-to-date information is at hand.

The *Yearbook* is far more than 'just' the UK and Ireland callbook. The information section contains virtually every conceivable piece of amateur radio information that you may need. There's not enough space here to describe everything that's in - you'll have to buy the book for that! - but it includes a world prefix list, a complete listing of all RSGB affiliated clubs and societies throughout the country, details of the QSL bureau and the RSGB audio-visual library, the GB2RS news broadcast schedule, how to deal with EMC problems, lists of repeaters and beacons, the UK bandplans, contest details and stationery and much, much more. The information was, as far as is possible, correct as of 1 August, but the publication remains current until December 2002, so changes that occur during this period will be published on the Internet at www.rsgb.org

A full-colour section includes a review of the amateur radio year from July 2000, listings and photos of RSGB trophy winners and maps for all UK 6m, 2m, 70cm and 23cm FM, 24cm TV and 10GHz TV repeaters. The *Yearbook 2002* includes reviews of equipment such as the new Yaesu FT-1000MP Mk V and Kenwood TS-2000 transceivers and station logkeeping software. Many of these reviews are also in colour. Satellite users are not left out either, with a feature on operating through the new Oscar 40 satellite.

The callsign listing (the 'callbook') contains all 57,334 UK licences, as supplied by the Radio Licensing Centre, with their addresses, unless the details are withheld by the licenceholder. Even if the licensee prefers to withhold his or her complete address, many take advantage of the opportunity to include personalised entries, either instead of, or in addition to, their address. There are over 1500 such entries.

In addition to the listings in callsign alphabetical order, *Yearbook 2002* includes short wave listener callsigns, special contest callsigns (new this year), EI (Republic of Ireland) listings, a listing by surname and a listing by post towns.

Contrary to popular opinion, only a handful of pages in the *Yearbook* are identical to last year's. This makes it well worth while buying the book every year, and not just once in a while.

RSGB Yearbook 2002:
Members' price £13.59
Non-members price £15.99

CALLSEEKER PLUS 2002

THIS YEAR sees a significant enhancement of the well-known *Callseeker* CD-ROM. In addition to its usual fare (every single page of the *RSGB Yearbook 2002*), it is supplemented by the contents of the *EuroCall* CD-ROM.

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There are facilities for printing address labels and anything else that appears on your screen from the *Yearbook*.

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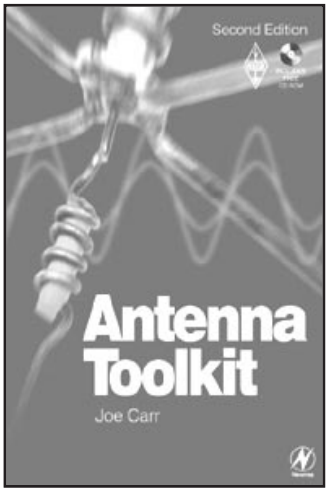
Non-members price £13.99

See p26 for a combined *Yearbook / Callseeker Plus* offer!

THE RSGB ANTENNA TOOLKIT
by Joe Carr

THE LATE Joe Carr, K4IPV, completed work on this book shortly before his untimely death last year. Although this was the first time that Joe had written for the RSGB, this book is a revised Second Edition of his very popular original *Antenna Toolkit*. New sections on propagation and additional antennas have been added to this second edition. Like the first one, it includes a *free* CD-ROM containing software which can be used to calculate the dimensions of antennas described in the book.



Antenna Toolkit is first and foremost a practical book. Antenna theory *is* covered, but at a basic level, using the minimum of mathematics. Around half the book is devoted to descriptions of antenna designs, grouped into separate chapters by antenna type (Marconi and other unbalanced types; Hertzian; 'limited space'; large loops and wire antenna arrays). There are two completely new chapters in this new version of the book, on Small Loop Antennas and Yagi Beam Antennas.

Each design is described clearly with a simple but informative line drawing. Tables give dimensions and - where necessary - values of capacitance or inductance for different frequency bands. There are many dozens of antenna designs described, including such favourites as the G5RV, quad loops, delta loops, the double-extended Zepp and slopers, plus a few more unusual designs such as the swallow tail and the capacitor-tuned wideband dipole. Wire beam arrays such as the Sterba curtain, the W8JK array and the 'bobtail curtain' are well covered.

The book is written in an easy-to-read, almost 'folksy', style which shows that the author has spent many years carrying out *practical* antenna experimentation for himself and that he knows what he is talking about.

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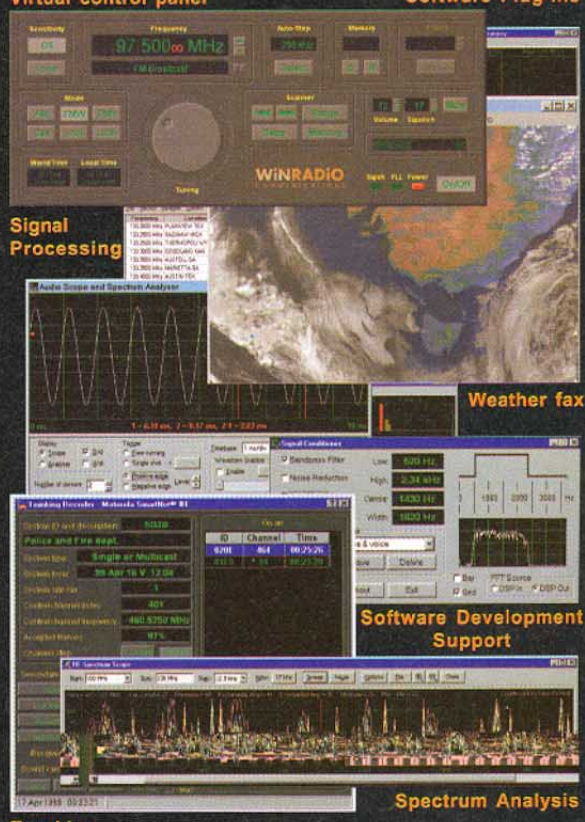

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Come to the 2001 RSGB INTERNATIONAL HF AND

This year's HF Convention features a lecture stream devoted to DXing and DXpeditions. Here's a pictorial account of this year's 3B6RF DXpedition to Agalega - if you want to hear the full story, come along to the Convention!

3B6RF, an Expedition to Agalega

by Derek Cox, G3KHZ

The *Lady Esme*.

AGALEGA (IOTA AF-001), at 10°22' S, 56°36' E, is situated in the Indian Ocean and belongs to Mauritius. Approximately 370 people live on the two islands that comprise Agalega. Although English is the official language it is not generally understood: Creole and French are widely spoken. The dominant religion is Roman Catholic. The climate is tropical, hot and humid. The vegetation consists of mangroves, conifers, and coconut palms. A bird peculiar to Agalega is the Black Ibis and this may be featured on some future postage stamp.

The most recent previous amateur radio activity came from Jacky, 3B8CF, operating as 3B6CF over 20 years ago. Battery-powered equipment was used and, to conserve power, candles were used for lighting.

Licensing and authorisation are extremely difficult to obtain. Four government departments are involved and the final authorisation requires the Prime Minister's signature.

Getting there is also extremely difficult! A supply ship visits Agalega twice a year and light aircraft use the airstrip. The first attempt, last October, ended in failure due to an unexpected change of government. The second attempt was almost aborted after the abrupt change in departure date of the supply ship. This caused many problems and financial embarrassment for the 3B6RF team. We finally got to the island by flying back from Mauritius to Mahé in the Seychelles, then to the Seychelles island of Coetivy and finally by ship to Agalega.

Hotel accommodation for G3KHZ.

Main street in village of Vingt Cinq, North Island, Agalega.

The landing strip at Coetivy Island.

Nine nations were represented on the team: Mauritius, Switzerland, Israel, Portugal, Germany, France, Poland, the USA and Great Britain. The banter, comradeship and team spirit made it a pleasure to be on the DXpedition, despite all the setbacks.

After the team had recovered from seasickness and the rain had stopped, six stations were assembled. In the main, we used Yaesu FT-1000MPs and VL-1000 amplifiers with Force 12 antennas. All worked extremely well with virtually no faults. Details of the operating modes and QSOs are included in the two tables for the 8.5 days activity.

Space limits the detail of what can be written here but come to the RSGB HF Convention in October to hear and see the full story!

	SSB	CW	FM	RTTY	SSTV	PSK31	Total
160	0	227	0	0	0	0	227
80	145	1047	0	0	0	0	1192
40	107	3206	0	0	0	0	3313
30	0	3881	0	0	0	0	3881
20	6870	5961	0	72	6	7	12916
17	2661	4910	0	0	0	0	7571
15	7762	9139	0	885	62	0	17848
12	2027	4357	0	0	0	0	6384
10	5012	4240	1058	0	0	0	10310
6	82	365	0	0	0	0	447
SAT	124	26	0	0	0	0	150
ALL	24584	36968	1058	957	68	7	64239

	EU	NA	SA	AF	AS	OC	Total
QSOs	35169	15130	750	513	12016	661	64239
%	54.7	23.6	1.2	0.8	18.7	1.0	100.0

IOTA CONVENTION! Old Windsor, 12 - 14 October

Full Programme of Events

Friday 12 October 2001

Evening	**IOTA Buffet**

Saturday 13 October

Time	Lecture Stream A	Lecture Stream B	Lecture Stream C	Video Stream
0930	**1000 IOTA Numbers, one milestone down, what next?** Roger Balister, G3KMA, IOTA Manager, and Martin Atherton, G3ZAY, IOTA Committee Chairman.	**HF Contest Forum.** Chairman: Justin Snow G4TSH, Chairman, RSGB HF Contests Committee.	**LF propagation and some effects of Solar Disturbances**. Alan Melia, G3NYK	**VP8SSI** South Sandwich Islands
1045	**RI0B Ushakova and the Lost Islands of the Central Arctic**. Valery Sushkov, RW3GW, President, and Yun Zaruba, UA9OBA, Vice-President, Russian Robinson Club.	**HF Trophy Presentations**, HF Contests Committee.	**The 136kHz Trans-Atlantic QSOs** Peter Dodd, G3LDO, et al.	**FO0AAA** Clipperton Island
1200	**Mounting a One-man DXpedition**. Martin Atherton, G3ZAY, IOTA Committee Chairman, and Phil Whitchurch, G3SWH.	**HF Trophies** (continued)	**LF Forum**. Chairman: John Gould, G3WKL.	**A52A** Bhutan
1400	***Keynote Speech.*** **From DX Fun to Missionary DXpeditioning - another DX journey of 40 years! Martti Laine, OH2BH.**			
1500	**The D68C Story**. Neville Cheadle, G3NUG, and the D68C team [see pages 30 - 31 - *Ed.*]		**Digital Voice at HF and related techniques**. Andy Talbot, G4JNT.	**VK0IR** Heard Is
1615	**The Agalega DXpedition**. Derek Cox, G3KHZ [see opposite - *Ed.*]		**HF Datamodes via the soundcard**. Phil Cooper, GU0SUP.	**ZD7K/ ZD8K** (GW0ANA)
1800	**Pre-dinner entertainment** - something rather different.			
1930	**DX Dinner**. Compere: Martyn Phillips, G3RFX.			

Sunday 14 October 2001

0930	**Falklands, VP8SDX**. Gavin Taylor, GM0GAV.	**Intelligence Services for the Keen DXer**. John Butcher, G3LAS.	**Getting the best out of multiband doublets and dipoles**. Alex Allan, G3ZBE.	**ZL9CI** Campbell Island
1030	**VK9 Cocos (Keeling) and ZL7 Antipodes**. Roger Western, G3SXW.	**Where did Cycle 23 Go?** Gwyn Williams, G4FKH, Vice-Chairman, Propagation Studies Committee.	**Historical Aspects of Morse**. Zyg Nilski, G3OKD, Editor *Morsum Magnificat*.	**D68C** Comoros (G3NUG)
1130	**PLT and EMC: no more HF radio?** Robin Page-Jones, G3JWI, and RSGB EMC Committee.			**FO0AAA** Clipperton Island
1400	**Logbook of the World**. Wayne Mills, N7NG, ARRL HQ staff.			
1515	**Raffle**	**Raffle**	**Raffle**	
1900	**Dinner** at *Bells of Ousley*, Old Windsor, details from Roger Balister, G3KMA (QTHR)			

Note: The videos of the ZD7K St Helena and ZD8K Ascension Island DXpeditions will be presented by Glyn Jones, GW0ANA; and the D68C Comoros video will be presented by Neville Cheadle, G3NUG, with members of the D68C team. Other videos of VP8SSI, FO0AAA, A52A, VK0IR and ZL9CI will also be shown.

(Please note the schedule may change at short notice. Please check for the latest schedule on the RSGB web site at www.rsgb.org/hfc2001/ or on arrival at the venue)

Come to the 2001 RSGB INTERNATIONAL HF AND Meet the D68C Team at the HF Convention

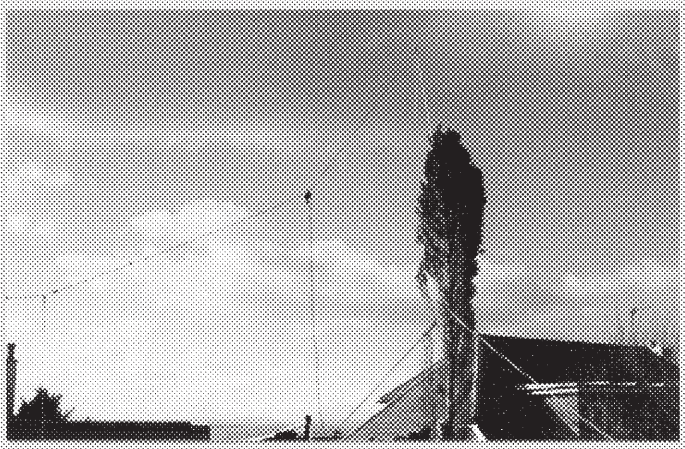
by Neville Cheadle, G3NUG, Team Leader D68C and President of CDXC

THERE WILL BE one complete stream of lectures devoted to DXing and DXpeditioning at this year's RSGB International HF and IOTA Convention. This stream will include:

- 3B6RF Agalega DXpedition - Derek Cox, G3KHZ [see page 28 - *Ed*]
- D68C (two presentations) - Neville Cheadle, G3NUG, and the D68C team
- From DX Fun to Missionary DXpeditioning: another DX journey of 40 years! - Martti Laine, OH2BH
- IOTA - Roger Balister, G3KMA et al
- VK9C Cocos (Keeling) and ZL7 Antipodes - Roger Western, G3SXW
- VP8SDX Falklands DXpedition - Gavin Taylor, GM0GAV
- ZD7K / ZD8K St Helena and Ascension DXpeditions - Glyn Jones, GW0ANA
- RI0B Arctic Islands RI0B - Russian team.

The D68C presentations about the record-breaking February 2001 Comoros DXpedition will be featured on both the Saturday and on the Sunday. A video presentation will be given one day, followed by a slide presentation on the next. This will allow visitors attending for just one day to see one of the two presentations.

There is a recent quote that the D68C team members really liked about the DXpedition. Peter Ourednik, OK1RP, wrote: "In view of your D68C operations, web pages, organisation, logistics and over 160k contacts, I have to send you my sincere thanks for the great job. It was so excellent in general that it was not like an amateur radio event, but more like the US Army or an SAS elite Guards mission!" Do come to the Convention and hear all about it!



The 12m sloping dipole antenna built to the design in the February 2001 *RadCom* and used successfully by Alan Oatey, M0AVN, to work the D68C DXpedition.

IOTA

SOME TIME WILL be devoted in the IOTA session to the organisation of IOTA DXpeditions. IOTA is a good place to start your DXpeditioning activities with a fairly small project and reasonably sized pile-ups.

Over 3400 UK stations worked D68C and the team would really like to meet as many of you as possible to hear your views and answer your queries. Many of us will be there. Just where should we go next? We would be very happy to talk about improving antenna systems; you may remember the article in the February 2001 *RadCom*, 'Working D68C - a 'How To' Guide'. This generated a great deal of interest and we know that many built the sloper antenna described in the article to work D68C. One person who did just this is Alan Oatey, M0AVN, whose sloper is shown (left).

NEVADA COMOROS TROPHIES

AS AN encouragement to all established DXers throughout the world - as well as to newcomers to DXing - Nevada Communications sponsored 18 trophies - the 'Nevada Comoros Trophies'. There were six categories: UK high power, UK low power, Rest of the World high power, Rest of the World low power, UK clubs and SWLs. We used the *CQ* World Wide contest definition of low power, ie 100 watts or less but with single-element antennas (eg dipole or vertical). We wanted to promote activity by all types of station. A secondary objective was to encourage the use of modes such as FM and PSK. The maximum achievable score was in fact 26 band-mode slots made up as follows:

CW: 10 (160m to 6m)
SSB: 9 (160m to 6m exc 30m)
PSK: 3 (10m, 15m, 20m)
RTTY: 3 (10m, 15m, 20m)
FM: 1 (10m)

In cases where scores were equal the highest position went to the person 'first past the post', ie to those making the earliest final contact. In the event 254 amateurs took part either as individuals or as club members and the winners are shown in **Table 1** opposite.

Congratulations to all the winners and also to Bob Harrison, G4UJS, who also achieved 23 band-slots in the UK High Power section. Several stations made CW and SSB QSOs on both 160 and on 6m!

The very attractive Nevada Comoros Trophies will be presented at the HF Convention. These incorporate models of the local Comoran galawa boats which are featured on the D68C QSL card shown above right. These models were carved on the beach near our operating site. The full list of participants and their scores can be found on the D68C web site [1].

It was good to see that a number of UK clubs participated in this programme. In addition to the winners they were: Bracknell ARC, Cray Valley RS, Echelford ARS, Itchen Valley ARC, De

IOTA CONVENTION! Old Windsor, 12 - 14 October

Neville on the air from D68C - come to the Convention and hear from him first hand what it was like!

The D68C QSL card shows galawas - Comoran fishing boats - on the beach. Hand-carved model galawas form the basis of the Nevada Comoros Trophies.

Montfort University ARS, Shefford & DARS, Three As Contest Group, Warrington RC, Worthing & DARC.

Our thanks to Nevada for sponsoring these trophies.

Here's a suggestion to clubs generally: why not organise a club trip to the Convention and have a great day or weekend there? There are special deals for group visits this year.

		Score
UK - High Power		
1st	John Butcher, G3LAS	23
2nd	Darren Collins, G0TSM	23
3rd	Ron Stone, GW3YDX	23
UK - Low Power		
1st	Victor Brand, G3JNB	20
2nd	A J Morgan, M5ZAP	19
3rd	Jim Martin, MM0BQI	19
Rest of the World - High Power		
1st	Mark Demeuleneere, ON4WW	23
2nd	Vilnius Young Technicians Club, LY3MR	23
3rd	Martin Jonink, PA4WM	23
Rest of the World - Low Power		
1st	Alain Tuduri, F5LMJ	17
2nd	Jean-Louis Chabernaud, F5UJK	16
3rd	Krzysztof Hodyr, SP7ICE	16
UK Clubs		
1st	Cheltenham ARA	242
2nd	Stockport RS	170
3rd	Reading & DARC	150

SWLs
See Bob Treacher's 'SWL' column on page 85.

Table 1: Winners of the D68C Nevada Comoros Trophies.

SPONSORS

MARTIN LYNCH and Sons and Yaesu UK are again sponsoring the HF Convention. Martin will no doubt be showing a wide range of kit. Yaesu is providing a demonstration station with the new FT-1000MP MkV transceiver and the Quadra VL-1000 linears. Six of these stations were used on the Comoros for 24 hours a day for all 18 days and were faultless. The new Yaesu 6m transverter, the FTV-1000, will also be demonstrated. This is completely integrated with the MkV and the Quadra linear.

There will be two Yagi antennas, one for 6m and one for HF, mounted on the push-up masts used at D68C. We will also be demonstrating the RTTY and PSK31 software that we used on the island. D68C was in fact the first DXpedition to use PSK31 as a major mode.

CDXC & IOTA 2000

THE CDXC team will also be in force at the Convention. We would like to meet as many members as possible including of course our many recent joiners. Why not come along and say hello?

We would also like to talk to potential members about the work we do in supporting DXing and DXpeditioning throughout the world.

The RSGB IOTA Millennium Programme - 'IOTA 2000' - has been run by CDXC and has proved to be very popular. The certificates are very attractive and will be on display. Thanks to the sponsorship of Nevada they are issued without charge. QSLs are not required; the closing date for applications is 31 December 2001, so do come and talk to us if you have any queries about how to apply. Also see the CDXC web site [2] for further details.

CONVENTION PROGRAMME

THE PROGRAMME is set out on page 29 and updates can be found on the RSGB web site [3].

Let's have a great turnout. There is plenty to interest both day and overnight visitors. The programme will be excellent and the social side is a particular feature of this convention - the bar stays open into the early hours of Saturday and Sunday mornings!

WWW.

[1] D68C: www.dxbands.com/comoros
[2] CDXC: www.cdxc.org.uk
[3] RSGB HF Convention: www.rsgb.org/hfc2001/

Come to the 2001 RSGB INTERNATIONAL HF AND IOTA CONVENTION!

YOU CAN COME to the HF Convention on the Saturday, the Sunday, or both days. See the full programme on page 29.

Admission to the Convention is just £6 - other prices are shown in the panel below. You may also wish to take advantage of the special Convention packages which include overnight accommodation at the Beaumont. Getting to the Beaumont is easy - see the map for details.

DAY VISITORS WELCOME!

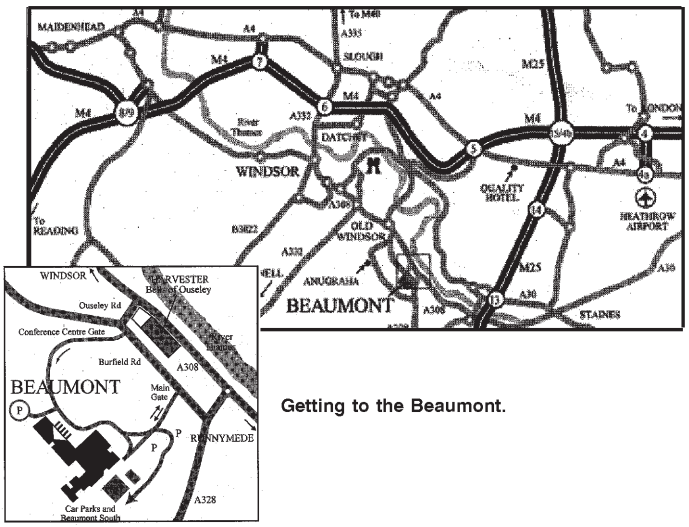
IF YOU ARE not taking advantage of the Convention package deals, we welcome day delegates to the event and you can book to attend some events in advance.

Please note that for the IOTA buffet and the DX Dinner, as space is limited, priority is given to those booking package deals with other tickets being allocated on a first come, first served basis.

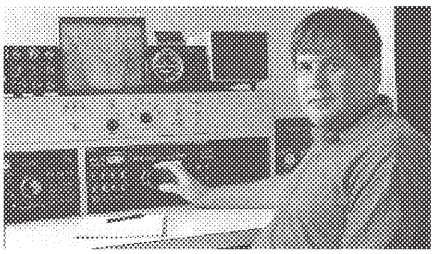
Whether you're a day visitor or taking advantage of the package deals, bookings can be made on the Internet at: www.rsgb.org/hfc2001/ by following the 'booking form' link, or made over the phone by calling 0870 904 7373. Day visitors can, of course, just turn up on the day.

SPECIAL REQUESTS

IF YOU HAVE any special requests for the Convention, eg vegetarian meals, please send a separate e-mail to: sales@rsgb.org.uk listing your requirements. ♦



Getting to the Beaumont.



Keynote speaker Martti Laine, OH2BH.

Join in the fun at the DX Dinner.

DAY VISITORS' PRICES

Admission on either Saturday or Sunday	£6.00
Weekend Delegate (Saturday *and* Sunday)	£10.00
IOTA Buffet on 12 October	£16.00
DX Dinner on 13 October	£26.00
Partner's Programme (Saturday *and* Sunday)	£10.00

SPECIAL GROUP OFFER:
Groups can now visit the Convention and get extra discounts on prebooked day tickets! If you buy four tickets you can receive one FREE EXTRA TICKET - and there is no limit to the number of group tickets you can buy! The more tickets you buy the more free tickets you will receive. (Please note that all group tickets must be purchased by 30 September to qualify and weekend tickets are excluded from this offer.)

BOOKING:

Tel: 0870 904 7373 or via the web: www.rsgb.org/hfc2001

CONVENTION PACKAGES

HFC2001 Package A - Two night Package
Includes accommodation on 12 and 13 October. Breakfast and Lunch on Saturday and Sunday. The Friday evening IOTA buffet and the Saturday evening DX dinner. Price: £175.00.

HFC2001 Package B - Two night Package for Two
As per Package A, but for two people and with the optional Partner's Programme on Saturday and Sunday included (NB please advise separately if you will not be participating in the programme). Price: £255.00.

HFC2001 Package C - One Night Package
This includes admission to both days of the conference and one night's accommodation on Saturday 13 October. DX Dinner on Saturday night and breakfast on Sunday. Price: £100.00.

HFC2001 Package D - One Night Package for Two
As per Package C, but for two people and with the optional Partner's Programme on Sunday included (NB please advise separately if you will not be participating in the programme). Price: £145.00.

The RSGB International HF and IOTA Convention is sponsored by:

ML&S YAESU COXC CHILTERN DX CLUB The UK DX Foundation

Newcomers' News

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

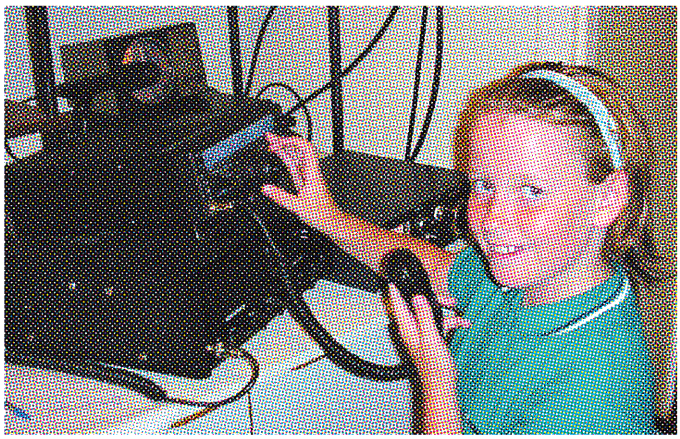
MORE CLUB news involving newcomers this month. It is always encouraging to hear of clubs helping newcomers into the hobby, but I think it gives us even more hope for the future when you hear of young people actually getting involved in club activities.

YOUNG EDITORS

THE CRAY VALLEY Radio Society (CVRS) has two new editors for their newsletter, *QUA*. Bob Mersh, G8JNZ, had been the editor of the magazine for more than 10 years and he quite rightly felt it was time to bow out. Bob had done a fine job, with the newsletter always being an interesting read. It was always available on time, averaged four to six pages per issue, looked at CVRS happenings and provided interesting radio (and non-radio, but technical) articles. Bob gave plenty of notice of his impending 'retirement', but no licensed members came forward to take on the mantle.

Clare Treacher, RS102891, and brother Simon, RS177448, expressed an interest in having a go and the committee agreed. Their first issue was the May 2001 one. It ran to eight pages and they went from strength to strength with both the June and July issues covering 10 pages of news about CVRS activities.

Simon Treacher, RS177448, who with sister Clare, edits the Cray Valley newsletter (see Young Editors).



Stacey-Anne Barber, 2E1SAB, on the mic (see Proud Grandfather).

Clare and Simon now have around six members writing articles for *QUA* on a monthly basis. They share the responsibility of editing, but Clare does the final edit to check the spelling and grammar. It has been a very successful venture so far.

Clare has just completed her first year studying A levels while Simon is in his second year at secondary school. Clare gets little time for radio these days, but was Awards Manager for the special Millennium station, M2000A. Simon is an active short-wave listener (SWL) and is keen to get his licence before work on GCSEs curtails his radio activities. He has heard 146 DXCC countries and is keen on Islands On The Air (IOTA).

Great to see youngsters getting stuck into club activities. Keep the news coming!

PROUD GRANDFATHER

SOME THREE YEARS ago, Reg Barber, M5REG, managed to pass the Radio Amateurs Examination (RAE), and the five words per minute Morse test. Since then he has derived so much enjoyment from the hobby that early this year he thought it was time to try to put something back by becoming a Novice instructor.

Reg was very pleased when his first two pupils, his granddaughter, Stacey-Anne, aged 10, and his good lady (XYL), Gloria, who admits to being a tad older, both managed to pass the NRAE at their local club, the Colchester Radio Amateurs.

Thanks to the efforts of Reg, and also Frank, G3FIJ, and all the other members of the Colchester club, Stacey-Anne is now 2E1SAB and Gloria has the callsign 2E1WGB.

Hopefully Reg will be running another course soon and we will be hearing of more successes.

WREXHAM CLUB

MORE CLUB NEWS, this time from Darlene Conde, MW0CQR. The Wrexham Amateur Radio Society ran a special event station GB2WHO for the museums on the air weekend. Information about the event, and further details of the Wrexham club, can be found on the club's web site.

Darlene says that readers may find the Novice course web page, run by GW0VMR, one of the Novice instructors in the Wrexham area, most interesting and helpful.

KAMUSINGA

FOLLOWING IN the footsteps of Ted Alleyne, 5Z4NU, Peter Bradley, G4BZE, is trying to establish an amateur radio club at a school in Kenya. Peter grew up in Kenya and first became interested in amateur radio as a youngster at Kamusinga. Peter's father was the founding headmaster of Friends' School, Kamusinga, located in the western part of Kenya on the foothills of Mount Elgon, in the mid-50s. He has been back to Kenya and Kamusinga on a number of occasions and has often thought that a radio club at the school might interest some of the students.

When he was invited back to the school to be guest of honour at a memorial service to his late father this February, Peter took the opportunity to introduce amateur radio to the school through talking to staff and some pupils and giving them a few books, journals and sample QSL (confirmation of contact) cards provided by FDS Graphics in Exeter.

Having read of Ted's sterling efforts in starting a radio club at Starehe Boy's School and getting a number of students through the Kenyan Novice licence exam, Peter felt that he may be able to help with the idea. Ted kindly provided a copy of the *Novice Guide* to take to Kamusinga as an aid to getting a club started.

More recently another amateur, Max Raicha, 5Z4MR, made a detour to visit the school. He presented them with a receiver, on loan from the Amateur Radio Society of Kenya, and formally opened the school radio club. Max showed how the radio worked and tuned into a couple of amateur stations as a demonstration.

The club is now looking for more equipment so that Kamusinga may have the fully-operational station in the same way that Ted was able to set up a station for the Starehe Boys' School. Should any readers wish to make donations they should contact Peter by e-mail to: pjb@eclipse.co.uk For those without access to e-mail, please send any offers (not equipment) to me at the address on this page (below left) and I will forward them on.

We all wish you well with the new venture, Peter. ♦

WWW.
Wrexham ARS: www.qsl.net/wars
FDS Graphics: www.fds-graphics.com

* *5 Sydenham Buildings, Lower Bristol Road, Bath BA23BS; e-mail: newcomers.radcom@rsgb.org.uk*

Down To Earth

A Simple, Rugged Power Supply

A new 25A, 13.8V design by Jesper Fogh Bang, BSc, OZ1XB *

* Elmevej 10, DK-3500 Vaerloese, Denmark.
E-mail: foghbang@tiscali.dk

IMPORTANT NOTICE

This PSU design involves working with mains voltages and with low voltages at high current. Both of these can be dangerous so, if construction is attempted, make sure that you understand the dangers involved and take the appropriate precautions when building and especially when testing. If in any doubt, enlist the help of a friend who is familiar with such circuits, their construction and testing. Neither the author nor the RSGB can accept liability for any accidents resulting from the construction or operation of this power supply.

IS THIS yet another power supply unit? The answer is maybe, but there are a few deviations from what is seen in such units.

The circuit has been inspired by the heavy-duty power supply unit featured in [1]. The main difference is that the present circuit uses only two heavy-duty power transistors rated at 50A instead of the usual multiple-2N3055. It was originally planned to add short-circuit protection but, after the unit had survived two short-circuit incidents with the fuse only being blown, it has never been installed. Remote sensing has been included, thus providing a constant supply voltage *at the input terminals of the transceiver*.

The maximum ratings have not been tested, but the output voltage is set to 13.8V and it easily handles 25A peak for SSB operation, mainly limited by voltage drop on the unstabilised 24V feeder. The PSU has served my Drake TR5 for many years without any trouble.

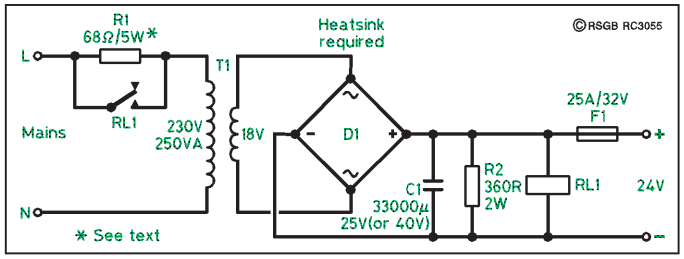


Fig 1: The unregulated power supply, with soft-start relay.

DETAILS

THE UNIT is divided into two separate parts, a 24VDC unregulated supply (**Fig 1**), including the mains transformer, T1, bridge rectifier, D1, smoothing capacitor, C1, and soft-starting circuit in one box; the regulated power supply (**Fig 2**) with the pass transistors, TR2 and TR3, heat sink, and control section PCB is in another box. These could, of course, have been built into one complete enclosure, but having them separated has other advantages. The bulky transformer box can be stowed away, and can be used for other regulators as well. The regulated supply section can be placed close to the transceiver and can also be used with two 12V batteries in series for field days, without the need to carry the transformer box, and while still maintaining 14V at the transceiver input. A single, loaded, car battery will provide only 10 - 11V during transmission.

The soft-starting circuit, comprising the relay, RL1, and the resistor, R1, in the mains lead, limits the inrush current of the diode bridge and the capacitor to a safe value. R1 should be adjusted for each individual design, as its value is dependent upon the transformer, diode bridge and capacitor ratings. A time delay of about 0.5 second should be the objective. If R1 is too large, the capacitor will never charge up sufficiently to energise the relay, and may burn out instead.

Relay RL1 switches 230VAC mains voltage and is energised by the 24V unregulated supply and, as such, must be an industrial type with 4000V test rating, according to IEC regulations.

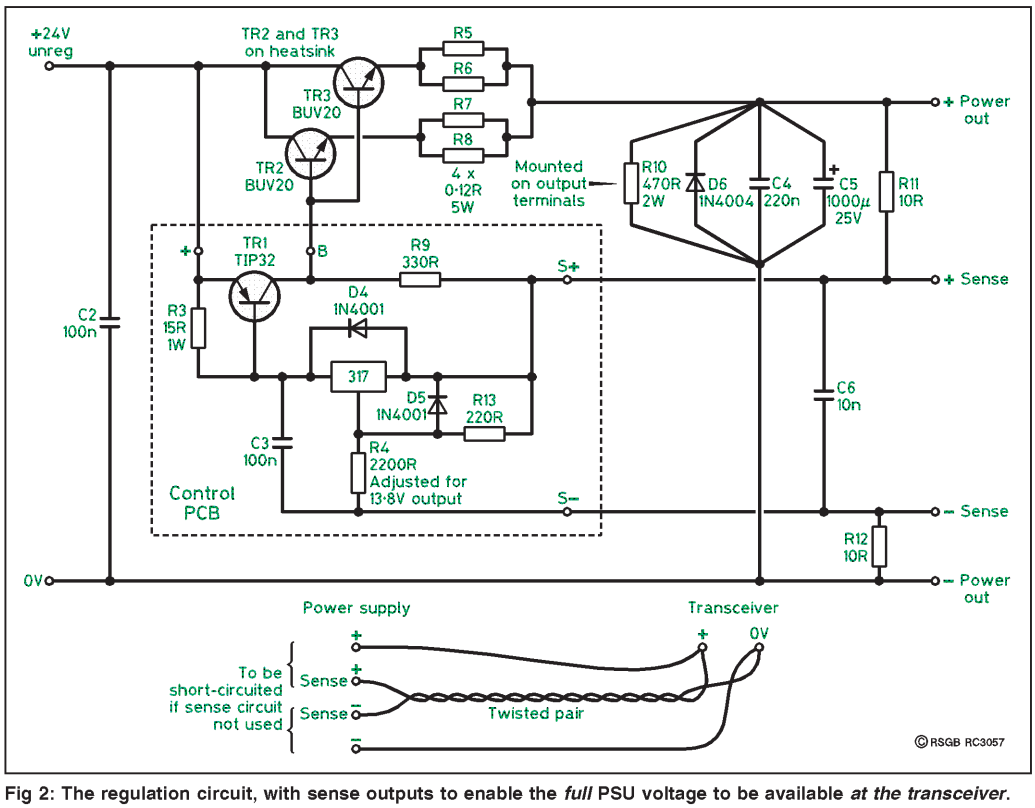


Fig 2: The regulation circuit, with sense outputs to enable the *full* PSU voltage to be available *at the transceiver*.

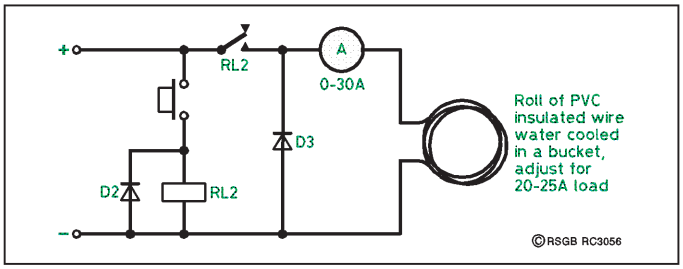


Fig 3: The test circuit for the power supply. Do not omit D2 or D3.

COMPONENTS LIST

Resistors

R1	68Ω 5W *
R2	360Ω 2W
R3	15Ω 1W
R4	2.2kΩ, adjusted for 13.8V output
R5 - R8	0.12Ω 5W
R9	330Ω
R10	470Ω 2W
R11, 12	10Ω
R13	220Ω

Capacitors

C1	33,000µF, 25V or 40V *
C2, 3	0.1µF
C4	0.22µF
C5	1000µF 25V
C6	10nF

* see text

Semiconductors

D1	Diode bridge *
D2	1N4001
D3	Power diode *
D4 - D6	1N4001
TR1	TIP32 (TO-220E style)
TR2, 3	BUV20 (TO-3 style) * (Farnell stock no 361811)
Regulator	LM317

Miscellaneous

T1	230V primary, 18 to 20V secondary, 250VA *
RL1	SPST relay, 24VDC *
RL2	SPST relay, any 12V type
F1	25A/32V automotive type *

Veroboard or PCB for control circuit
Metal cases for both units
Heatsink for D1 (RS 402-945, 1.4°C/W)
Heatsink for TR2, TR3 (RS 189-8763, 1.1°C/W)
100m roll of 2.5mm² PVC-coated copper wire (or similar) for test circuit load

The 18V secondary on the transformer, T1, has been found to be too low at very high current ratings, because the voltage drop across the pass transistors is not sufficient. A 19-20V transformer may be a better choice. This would increase the power dissipations of the pass transistors and C1 should then be rated at 40V instead of 25V. See also the note in the final paragraph.

The fuse, F1, is a 32V/25A slow-blow automotive type. I would be very reluctant to use ordinary 230V or 415V household types, because the back-EMF generated when they blow is much bigger, and could lead to fatal damage of the unit. *On no account must the circuit be used or tested without this fuse in circuit.*

The two pass transistors (BUV20) are not the cheapest, but they are very rugged and only two are needed for a 25A power supply, although the type I use is the 2N5685 with an h_{FE} (forward current gain) of about 100 at 8A load current. It is no longer easily available, and the BUV20 is a good equivalent. If you are planning to use another type, it must have I_c = 50A, V_{ceo} = 60V, 15 ≤h_{FE} ≤60 at 25A, and a power dissipation of 300W.

The transistors are bolted directly on the heatsink without insulating washers, but with heatsink compound between the transistors and the heatsink to improve thermal conduction. The heatsink must be insulated from the cabinet.

The bridge rectifier, D1, was rescued from my junk box. If you aim to do the same, make sure that the maximum forward current capability exceeds about 70A and the PIV is 600V or better.

The components list gives the case styles for the transistors, from which the constructor can obtain the connections.

The remote sensing circuit provides a constant voltage *at the load terminals*, where the sensing leads are normally connected to the power leads. The sense leads are colour-coded and twisted to minimise RF pick-up. They run alongside the power leads. Shielding the sense leads has not proved necessary in my installation.

You will notice how the output voltage of the power supply is increased with the load current to overcome the voltage drop in the power leads and at the terminations. The two 10Ω resistors, R11 and R12, will return the power supply to a safe state if the sense leads are accidentally disconnected. *If the remote-sensing circuit is not being used, the positive sense lead must be connected to the supply positive and the negative sense lead to the supply negative* ***at the power supply***.

Resistor R4 is adjusted to give the required output voltage. The PSU has been checked for any parasitic oscillations with an oscilloscope and found to be totally free of them.

TESTING

HOW DO YOU TEST such a unit? I used a 100m reel of 2.5mm² PVC-coated copper installation wire (from the junk box) as a load, together with a heavy-duty relay to switch the load on and off (**Fig 3**). The test load current was 20A at 14V and the wire gets quite warm, hence the reason for immersing it in a bucket of cold water!

The inductance of such a coil is not to be neglected, so don't omit the diode, D3, to limit the surge of back-EMF. This should be a hefty high-current type, although a cheap alternative could be the base-collector junction of a 2N3055 transistor. D2 is there for the same reason - when the relay opens, there is a back-EMF across the relay coil winding.

The soft-starting relay, RL1, must not drop out during current peaks; if it does, the transformer and smoothing capacitor ratings are insufficient for the current being drawn. ♦

REFERENCE

[1] 'Technical Topics', *RadCom* February 1994, p53.

Helplines

RadCom FOR MEMBERS

● Ken, ZS2ACB, needs the address of the suppliers of **Alfac rub-down transfers** for PCB design and construction. He is also seeking a book named ***Circuit Designs*** (Collected Circards) Volume 1, published by *Wireless World* about 1980. Payment and delivery will be arranged in UK. ZS2ACB, e-mail: kaywood@iafrica.com

● Mr A Hitchcock, G3ESB, urgently requires operating manuals or handbooks for the **Trio CS1022** oscilloscope and the **Airmec 304A** oscillator. All costs gladly defrayed. G3ESB, QTHR. Tel: 01332 735 896.

● Ron, G3ZSJ, needs to repair his **HP5300A** counter. Any circuits and information gratefully received and expenses paid. G3ZSJ, QTHR.

● Peter, G3MCL, needs *any* information on the **Heathkit SB101** transceiver. G3MCL, QTHR. Tel: 01962 865 814.

● Jack, G3OLW, is looking for a 466.66kHz carrier crystal FT type channel 52, marked 25.2MHz, to renovate a **G2DAF receiver** with 465kHz IF. Any other holder would be OK. All expenses paid. G3OLW, QTHR. Tel: 01684 772 360.

● John, G3ZKZ, is searching for an operator's handbook or circuit diagram to photocopy (quick return guaranteed) for an **Alinco DR-130** 2m VHF FM transceiver and will meet all expenses, including postage. G3ZKZ, QTHR. Tel: 01284 810 620 or e-mail G3ZKZ@ic24.net

● John, G3PHA, is searching for a small quantity of obsolete type **BB109 varicap (varactor) diodes**, having a plastic rectangular housing and a white dot or bar. Any help will be much appreciated. G3PHA, tel: 01204 84069 or e-mail jjmorris@gofree.co.uk

Down To Earth

The Birth of Radar

Part One, by Brian Kendal, G3GDU *

IF YOU ASK 'the man on the Clapham omnibus', he will almost certainly tell you that that radar was a British invention and as we had it and our opponents did not, this was a major factor in the 1939 - 45 conflict.

Although radar was certainly a major factor in the Allies' success, it was not *just* a British invention. The first suggestions of using radio for location can be traced back to before WWI and at the outbreak of WWII no fewer that eight countries were working on the techniques, although only the United Kingdom and Germany had brought it to operational status in the hands of the military.

This article will explain the background of the early experiments which led to the development of the British radar system, including the so-called 'Daventry Experiment' and the establishment of the stations at Orford Ness and Bawdsey Manor (see **Fig 1**). This work culminated in the radar coverage shown in **Fig 2** by the time of the outbreak of WWII.

EARLY IDEAS

COMPARED WITH several other countries, the United Kingdom was slow off the mark and it started in a truly British manner. Throughout the early 1930s, rumours had been circulating about a 'death ray'. Although this concept seemed far-fetched to say the least, Dr H Wimperis, the then Director of Research at the Air Ministry felt that it was necessary to assess the feasibility of the proposal. Accordingly, or so the story goes, he invited the Director of the Radio Research Station at Slough, Robert Watson Watt, to dinner at, where else but, the Athenæum Club. There he broached the subject and Watson Watt agreed to look into the possibilities.

Back at Slough, Watson Watt put the problem to his assistant Arnold Wilkins. After a few calculations, Wilkins reported that within the available technology, the proposal was not feasible. However, it should be quite possible to design a system for detecting distant aircraft. Working on this, Watson Watt wrote a memorandum which he submitted to the Committee for the Scientific Study of Air Defence in early February 1935, which contained proposals for both detection of aircraft and identifying friend from foe.

The Committee considered the memorandum and recommended a preliminary trial to demonstrate the feasibility of the proposals. This resulted in one of the most famous demonstrations in the history of radio - 'The Daventry Experiment'.

THE DAVENTRY EXPERIMENT

ON 25 FEBRUARY, Arnold Wilkins and a driver, Dyer, took a small Morris Commercial van (see picture opposite) to a field near Weedon, a few miles distant from the BBC short-wave transmitting station at Daventry. The van was equipped with a very sensitive receiver, the output of which was connected to a cathode ray oscilloscope (see **Fig 3**).

On arriving at the field, two dipole aerials were erected and fed through a phasing unit such that the direct signal from the BBC station was almost phased out. The alignment took some considerable time and darkness fell long before it was completed.

It was then Wilkins found the first problem - the internal light in the van was unserviceable and they had to do all the adjustments by the light of flickering matches. The race was on, for they knew that the BBC station was ceasing transmissions at midnight. However, adjustments were completed with five minutes to spare and they decided to return to their hotel.

At this point they found the second problem. When they arrived at the field it was soft and muddy, but by midnight a hard frost had fallen and the van was frozen to the ground. However, with the help of shovels, they freed it and they returned to their hotel.

The following morning, they returned to the site and quickly set up their apparatus. They were soon joined by A P Rowe, secretary to the Committee and Robert Watson Watt who had brought his nephew, Pat, along for the ride, but had left him at a nearby road junction as he was not security cleared. Dyer was also dispatched to a distant corner of the field for the same reason.

A short while later, a Heyford

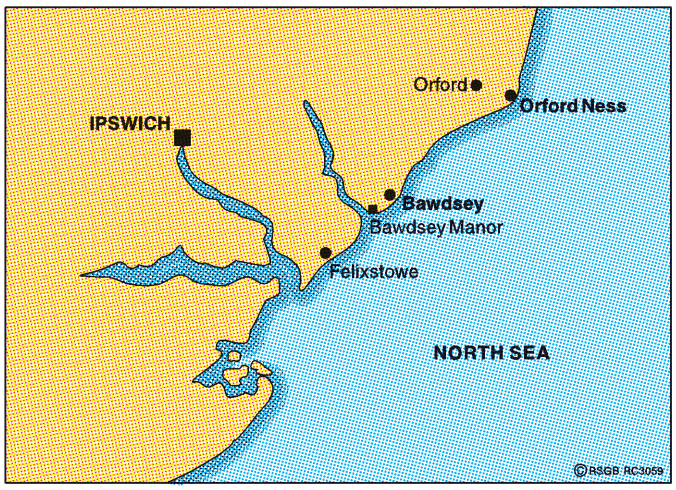


Fig 1: Location of Orford Ness and Bawdsey on the Suffolk coast.

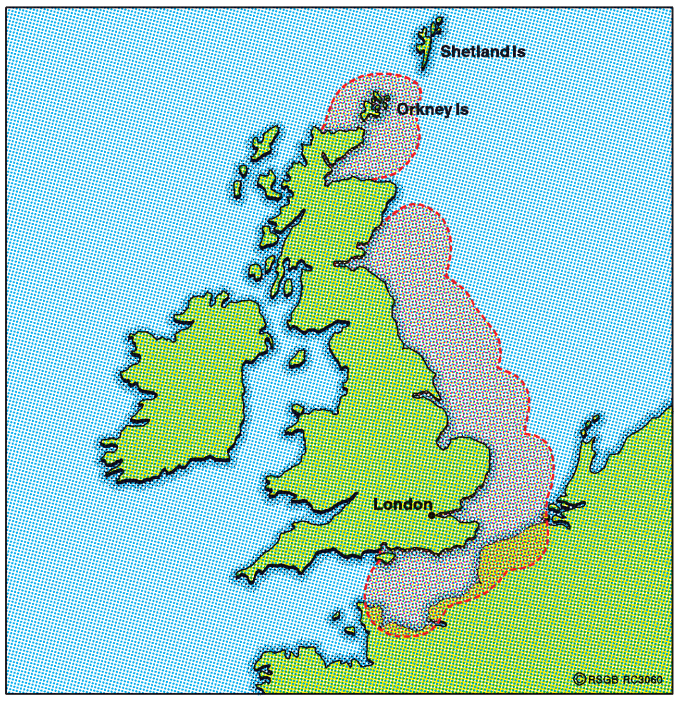
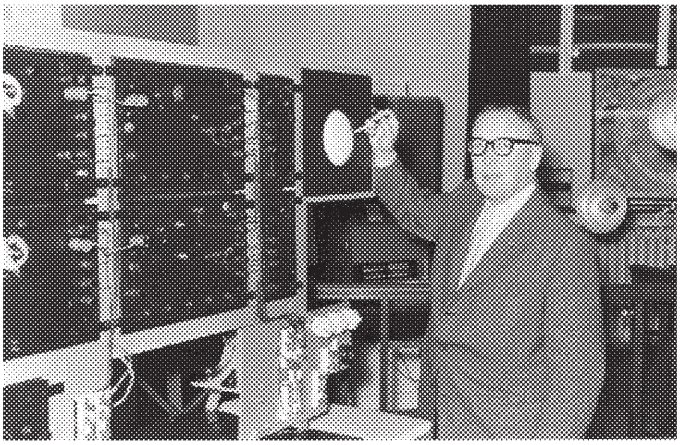


Fig 2: Radar cover at 15,000ft as of 3 September 1939.

12 Weald Drive, Furnace Green, Crawley, West Sussex RH10 6JU.



Robert Watson Watt with the receiver used in 'the Daventry Experiment'.

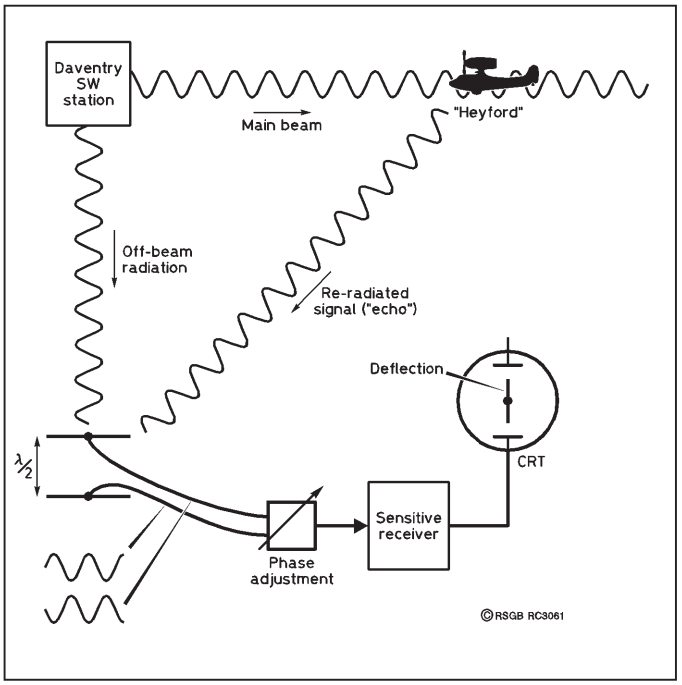


Fig 3: Phasing diagram for the 'Daventry experiment'.

bomber, piloted by Flt Lt Blucke and which had taken off from Boscombe Down, was heading on a track between Daventry and the test site. On the first run the aircraft was off course and no variation of the signal received at the test site was observed, but on the return run, rhythmic beats in the signal strength resulting from reflections from the aircraft were seen which did not subside until the aircraft was more than eight miles away.

Watson Watt and Rowe were delighted with the result and immediately left for London in a state of high elation. Only when they were well on their way home did they remember that they had left Pat at the roadside and had to return for him.

When the success of the Daventry Experiment became known, it was immediately classified Top Secret and £10,000 allocated to set up an experimental station at Orford Ness. The receiver used in the Daventry experiment is now housed in the Science Museum in London.

ORFORD NESS

ORFORD NESS, on the Suffolk coast (see Fig 1), had been a military establishment in WWI, but the buildings had not been occupied since that time. These were immediately refurbished, but the delay meant that the team from Slough could not take possession of the site until 13 May. On that day L H Bainbridge-Bell, A F Wilkins and E G (Taffy) Bowen together with five support staff left Slough in RAF lorries and made their way to their new research station.

It had been decided that Bainbridge Bell, assisted by 'Taffy' Bowen should develop the transmitters whilst Arnold Wilkins would take responsibility for the receivers and aerials. Furthermore, the initial experiments should take place on 6MHz as the wingspan of the average bomber aircraft was equivalent to a half-wavelength at that frequency. Two half-wave dipoles were erected for the initial experiments.

HIGHER POWER

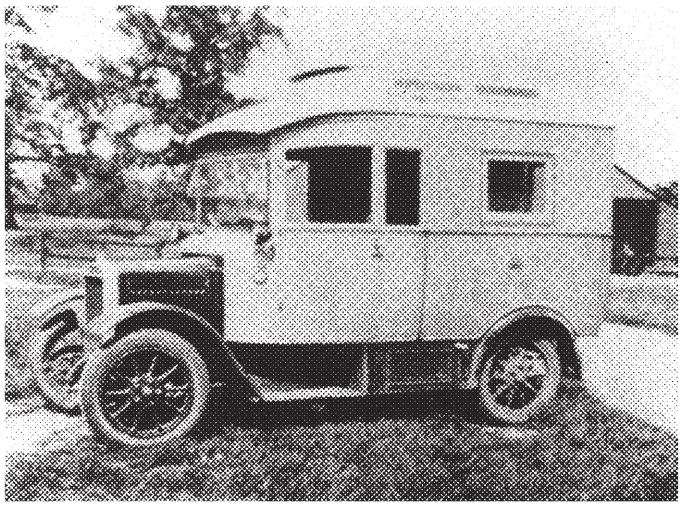
RECEIVERS FOR THE project provided few problems because those used for ionospheric research at Slough were quite satisfactory. However, the transmitters were quite another matter, as the requirement was for a pulse transmitter of the highest possible power.

The most powerful valves available were type NT46 which had a maximum rated anode voltage of 5000 and a tungsten filament which took 20 amperes at 20 volts. A transmitter was constructed which used two of these in push-pull, and with 5000 volts on the anodes, the circuit gave about 25kW output. Bowen then set about increasing the output power by gradually increasing the anode voltage and then the filament voltage until the valves showed signs of distress. By the time that the anode voltage had reached 10,000 volts, the transmitter was delivering 100kW. When, however, this was connected to the aerial, the voltage developed at the ends was sufficient to arc across three nine-inch insulators! Later, Arnold Wilkins claimed that the noise generated by this arc could be heard over half a mile away. This was cured by the simple expedient of fitting two copper balls of the type used in lavatory cisterns, one at each end of the antenna.

By the weekend of 15 June, the team was receiving spectacular ionospheric echoes at ranges of 60 miles and more, but had not at that point seen any aircraft. That weekend the site was visited by members of the Committee for the Scientific Survey of Air Defence (commonly called the Tizard Committee after the Chairman, Sir Henry Tizard), accompanied by Robert Watson Watt. The committee was apparently impressed by what it saw.

That weekend, Watson Watt had, unusually, decided to stay another day. The following morning, the equipment was run up and a clear echo was received at a range of 17 miles.

Next month, in the second part of 'The Birth of Radar', Brian Kendal looks at how methods were discovered to determine the height of an aircraft, and its bearing from the radar station. ♦



The 'mobile laboratory' used in the Daventry Experiment.

Regular Feature

in practice

IAN WHITE, G3SEK

52, Abingdon Road, Drayton, Abingdon, OX14 4HP.
Web site: www.ifwtech.com/g3sek
E-mail: g3sek@ifwtech.com

PRESSURE-SLEEVE PL259

THE ITEM IN July 2000 about pressure-sleeve PL259 plugs sparked a lot of interest from both the UK and abroad.

THE INTEREST SHOWED that there definitely is a need for an improved PL259 in some situations, especially outdoors where soldering of the braid can be very difficult. A number of people commented that ordering from the Farnell web site was quick and simple, once they had 'cracked the code' for searching by stock number (you have to omit the hyphen and enter one continuous string of numbers). It was also pointed out that these connectors have actually been around for a long time in the Greenpar (now M/A-COM) catalogue, but with a low profile and a high price. Henry Westlake (01409 253 758 and regular adverts in *RadCom*) has the silver-plated Greenpar plugs at £3.00 each; these are better but also dearer than the nickel-plated ones from Farnell. Both makes have a gold-plated centre connector.

COMPACT MICROPHONE PREAMP

HOW CAN I interface a Heil microphone insert to my IC-706/746? How can I use my normal radio microphone with a PC sound card?

THE HEIL HC-4 and HC-5 microphone inserts are great favourites with SSB DXers and contesters because they give a great improvement in readability compared with the microphones that come with most transceivers. The HC-4 is the all-out 'DX' version with a strong peak at 2 - 4kHz for maximum articulation; the HC-5 has a less strong peak at 1.5 - 3kHz which gives very clear and pleasant audio quality with most voices. These ceramic elements work well with the typical low (500-600Ω) or medium (2000-5000Ω) input impedances of many transceivers, and are a simple solder-in replacement for most Yaesu and Kenwood dynamic microphones. Just fit the insert where the original insert used to be, nestled in a bed of foam plastic. Note the warnings in the instruction leaflet about soldering quickly and cleanly to the terminals on the insert - solder it as you would a semiconductor, and you'll be fine.

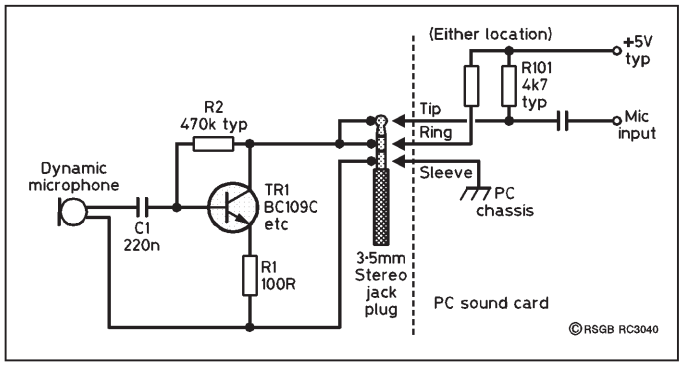


Fig 1: A simple preamplifier to interface most dynamic microphones to most PC sound cards. Note the wiring of the stereo jack plug.

Icom transceivers are different, because Icom has always favoured electret microphones. Electret inserts have a built-in FET preamplifier, and the Icom transceivers provide the necessary DC supply voltage along the same wire as the audio signal coming from the insert. You can replace the electret insert in an Icom microphone with a Heil insert, if you insert a capacitor of 0.47-1.0µF in series to block the DC. But there's still a problem: because the standard Icom microphones contain a preamp, the transceivers themselves tend to be low on microphone gain. When a replacement microphone without a preamp is used, the front-panel MIC GAIN needs to be set close to maximum. This works fine for some users, but people who are softly-spoken may find themselves continually straining to 'talk it up.' Such voices - my own included - often benefit a lot from speech processing, but there may not be sufficient audio gain to make the processing work. On the air, the audio quality sounds excellent but the speech sounds 'too quiet'.

The answer, of course, is a preamp in the microphone to add a moderate amount of extra gain [1]. Heil offers a range of complete microphones, preamps and equalisers, and the UK dealers who supply the inserts (Martin Lynch and Waters & Stanton) will no doubt be happy to advise you on these too. There is also a combined microphone/earpiece incorporating a new Heil electret insert which gives much better audio quality for the IC-706. However, standard hand microphones often incorporate function buttons as well as the PTT switch, so many users will want to fit a Heil insert into the existing microphone housing. At present only the HC-4 and HC-5 inserts are available separately.

PC sound cards have a similar problem of low gain when using an ordinary dynamic microphone, because they too are designed for electret microphones only. **Fig 1** (right-hand side) shows how R101 in the sound card is meant to provide the supply voltage to the electret insert, typically from a 5V rail. An article in *QST* by N4TMI [2] described a very simple preamp using a low-noise bipolar transistor such as a BC109C. Fig 1 (left-hand side) shows how R101 now becomes the collector load resistor for the transistor, which gets its DC bias via R2 between the collector and base. The emitter resistor R1 helps stabilise the DC operating points and, since R1 is un-bypassed, this raises the input impedance to suit most dynamic microphones, and also reduces the gain to the modest level required. The sound card input accepts a 3.5mm stereo jack, and in various types of card R101 may be connected to either the 'tip' or the 'ring' contact, or possibly both. The connections shown in Fig 1 take care of all those possibilities. If you want to talk to a PC sound card using your normal dynamic radio microphone, this preamplifier circuit is probably what you need.

Fig 2 shows how I adapted N4TMI's preamp circuit to interface a Heil insert to the IC-746. As far as I'm aware, this should also work with the IC-706 which has a very similar microphone input circuit. Once again, R101 inside the transceiver provides both the collector load resistance and the supply

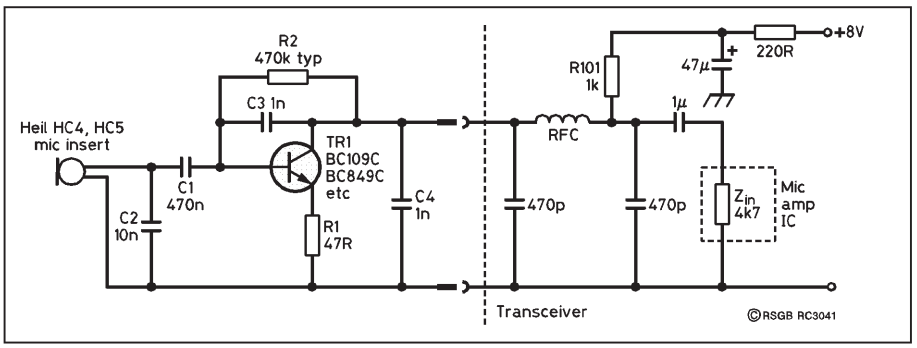


Fig 2: Preamplifier similar to Fig 3, with extra RF bypassing and interface to IC-746 (IC-706 similar).

voltage for TR1. Fig 2 also shows several additional components, both in the preamp and inside the transceiver, which are intended to prevent RF feedback. These are essential for use with any transmitter - see below. I have made three versions of this preamp: (1) a prototype using 'ugly' construction inside the Icom HM-36 hand microphone, after first removing the electret insert and associated components; (2) a conventional PCB layout for the BC109C and similar wire-ended transistor packages; and (3) a tiny version for the SMD equivalent BC849C, which will fit almost anywhere (if you can see to build it). The PCB layouts for the two boards are on the 'In Practice' web page.

When testing the preamps of Fig 1 or Fig 2, you should check that the collector voltage is reasonable, because it may vary a little with the individual transistor and the available voltage. The best possible margin against either positive or negative peak-clipping is when the collector voltage is about half the open-circuit voltage supplied from the sound card or transceiver. The stated value of 470kΩ for R2 should be about correct for the recommended BC109C clones (be sure to use the C-suffixed devices which have high current gain). Don't worry about deviations of half a volt or even more but, if necessary, try changing R2 within the range from 220kΩ to 1MΩ.

I have now converted both the HM-36 hand microphone (HM-4 insert) and my old favourite Airlite pilot's boom-mic headset which uses an early HM-3. The result is good-quality audio that sounds like me, with plenty of compression available without any effort to 'talk it up'.

BAND-GAP REFERENCES

WHAT IS A band-gap voltage reference? How does it work?

A 'BAND-GAP' VOLTAGE reference is an integrated circuit that maintains a constant voltage across itself, when current is fed through a resistor from an unregulated source. In its simplest form it is a two-terminal device which can be used as a substitute for a Zener diode, but with greatly improved voltage regulation and temperature coefficient. Band-gap voltage references are also very commonly used as sub-circuits in more complex ICs, since they are much easier to fabricate than good-quality Zener diodes.

Ironically, the precision band-gap reference is based on a type of voltage reference that is normally regarded as almost useless, namely the forward-biased voltage drop of a silicon diode junction or the base-emitter junction of a transistor. V_{BE} is normally a poor voltage reference because there is a large change in voltage with current, and also a large negative temperature coefficient (V_{BE} decreases as temperature rises). The band-gap circuit overcomes these vices in two clever ways: by feeding the reference junction with a constant current; and by adding-in another voltage that has an equal and opposite temperature coefficient.

In more detail, the band-gap device starts out with a circuit called a 'current mirror' (**Fig 3(a)**). This circuit is seldom seen using discrete transistors, but it is very common in ICs because it's so easy to fabricate. TR1 and TR2 are two transistors that are fabricated on the same silicon die and made to be identical except for the ratio of their junction areas. The two transistors have a common negative connection, and the unique feature of this circuit is that if you supply a certain current I1 to TR1, then the current I2 which is passed by TR2 will be related to I1 by the ratio of the two base-emitter junction areas (call it k). In effect, I2 is forced to follow or 'mirror' any variations in the control current, I1. The voltage, V_{R2}, developed across the resistor, R2 (**Fig 3(b)**), is thus dependent on the control current, I1,

$$V_{R2} = I2 \times R2 = k \times I1 \times R2,$$

and V_{R2} can be shown to have a positive temperature coefficient (tempco) [3]. When TR3 is inserted (Fig 3(b)) you can see that its V_{BE} voltage drop adds to V_{R2} so that the total output voltage is:

$$V_{OUT} = V_{R2} + V_{BE(TR3)} = k \times I1 \times R2 + V_{BE(TR3)}.$$

The stability of V_{OUT} now depends entirely on I1 being constant - and this is easily achieved by connecting R3 directly to the stabilised V_{OUT}. The V_{BE} of TR3 has the normal negative temperature coefficient, and by choosing R2 appropriately, the positive tempco of the current mirror can be cancelled to make the overall tempco equal to zero. IC technology makes a precise band-gap voltage reference quite easy to achieve and, with laser trimming of the resistors, the performance can be made better still. 'Band-gap voltage' is simply another name for V_{BE} but the name of the circuit also comes from the fact that when the temperature coefficient is trimmed to zero, the stabilised output voltage is equal to the band-gap voltage that a silicon diode junction would have at absolute zero temperature. This is about 1.22V and you find many band-gap ICs that stabilise at approximately this voltage. Commonly, an op-amp buffer is added to the basic circuit of Fig 3(b) to reduce the dynamic impedance, and it then becomes easy to generate other output voltages such as 2.5V or 5.0V by using a resistive voltage divider within the feedback loop. For more details, including the derivation of the temperature coefficients, see Horowitz and Hill [3]. ♦

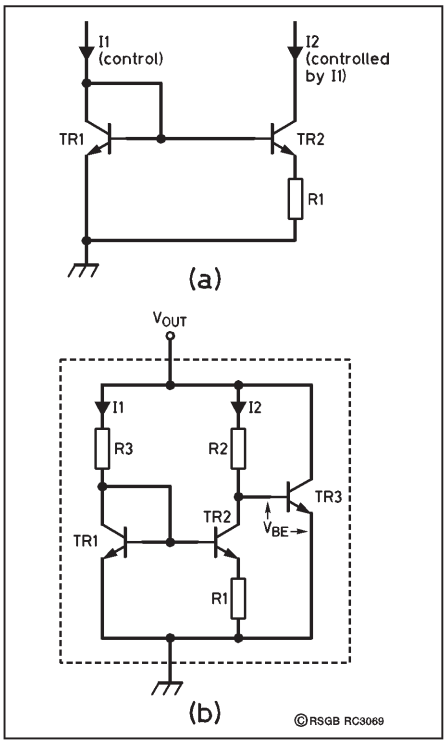


Fig 3: (a) Basic current mirror circuit - I1 controls I2; (b) Basic band-gap voltage reference circuit.

NOTES AND REFERENCES

[1] It is possible to modify the IC-706 and IC-746 microphone amplifier circuits to increase the gain (details are on the Heil web site in their December 1999 Newsletter) but many owners will prefer a solution that doesn't involve modifying the rig itself.

[2] 'Solving Sound Card Microphone Problems', by Michael Covington, N4TMI, *QST*, June 2000, p61. (I have changed the transistor type to the European BC109C or one of its many equivalents.)

[3] *The Art of Electronics*, Horowitz & Hill, Cambridge University Press, ISBN 0-521-37095-7.

WWW.

Heil Sound **www.heilsound.com**

The 'In Practice' web site [**www.ifwtech.com/g3sek**] contains links to all pages mentioned in this column.

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. Please remember that I can only answer questions through this column, so they need to be on topics of general interest.

technical feedback

Variable Power for the Alinco DX-70TH

***RadCom* August 2001**

On p24, Fig 3 shows the labels of ZD1 and ZD2 transposed. The circuit diagram of Fig 2 is correct. In the following discussion, the labels of Fig 2 are used.

G4FON writes:

"... Disconnecting ZD1 and R2/RV1/R3 for a second, the voltage at the junction of C2, D1 and D2 would switch between +0.7V (the forward bias voltage of D2) and -8.4V (9.1 - 0.7). Therefore, I would expect C3 to charge to -7.7V (-8.4V minus the 0.7V drop across D1).

"However, and this is where the problem arises, as soon as you connect ZD1 the voltage across C3 is limited, by ZD1, to -6.2V. As the output of IC1b increases in the negative direction, towards the ground rail, at +1.5 Volts (-7.7V minus -6.2V) ZD1 will conduct, D1 is already conducting and both appear effectively as short circuits at the junction of D1 and C2. Since the reactance of C2 at 20kHz is around 36Ω, the output current in the gate will rise very rapidly.

"The likelihood is, although I have not built the circuit, that IC1 pin 4 will not reach the ground potential that it is aiming for, leading to significant additional dissipation in the IC. If the output does reach ground, the lower FET in the output driver of the gate will have to sink 40mA to achieve it (1.5V/36Ω), which is certainly outside its specification. In either case there is potential for an early failure of the output stage of IC1b.

"Secondly, and probably less significantly, C2, because of its size in relation to C1, may affect the operation of the oscillator to the point where it refuses to start. It is always good design practice to buffer the output of an oscillator, and in this case it would be possible to use one of the otherwise-unused gates in the package...".

G3ZVW replies:

"The statement about the negative voltage being 'hard limited' by ZD1 is correct. The suggestion that using one (or both) of IC1's spare gates to buffer the output of the oscillator into the voltage doubler would be a good thing is quite true but, having now used the device for quite some time, I can only say that the oscillator has never failed to start and the chip has not failed.

"The suggestion of adding a separate limiting circuit to ZD1 might not work in reality, because the amount of voltage available across C3 if the Zener is removed is actually -6.7V (not the -7.7V suggested). I checked this by clipping the component lead, so R2, R3 and RV1 remained in circuit. This implies that the potential for current flow back into IC1 is rather more limited."

G4TRN writes:

"... The approach described in the article does not really work for the following reasons. (I do not dispute that it appears to work; it all depends on how the tests are conducted and what modes are tested.)

"A manually-adjusted DC source is not part of an active system. There is no feedback loop. With no automatic function there is only gain control, and gain has no limiting influence on available power output.

"You can alter the output in this way, but you cannot define it unless there is limiting taking place before the controlled stages. No mention has been made of the function of speech processors to this end. They can be set to reduce output power on SSB very effectively.

"For linear modes it should be obvious that the possibilities for severe distortion and the overdrive of linears are inevitable. For non-linear modes, the technique has some value, but they are not mentioned in the article, and I suspect that the tests were done on FM or CW. Had they been done with SSB with a variable-amplitude sine wave input and the output properly monitored, the problems would have been instantly visible.

"At best, the circuit described will lead to the transgression of QRP conditions of operation. At worst, it will lead to the destruction of linear amplifiers. Other effects would include the radiation of unfiltered amplitude-limited signals and the destruction of intermediate stages in the transmitter."

G3ZVW replies:

"The suggestion of using a carefully-controlled external speech processor to control RF output is perfectly valid, but this would not constitute a simple add-on to the DX-70. Neither would it work on any mode other than SSB. I can assure G4TRN that my Henry Radio linear (which is not equipped with an ALC output) operates quite comfortably and cleanly from the DX-70 and power controller.

"To put G4TRN's concerns to the test, I took my DX-70TH to RSGB HQ and demonstrated it. The transceiver was placed at one end of the GB3RS shack and connected to a dummy load. At the other end of the shack *RadCom* Editor Steve Telenius-Lowe, G4JVG, sat at the Society's Icom IC-781, which was used with a few inches of wire as a receive antenna. With the power controller connected, transmit tests were conducted on SSB at full output (approx 100W), reduced output (approx 10W), and minimum output (milliwatt level).

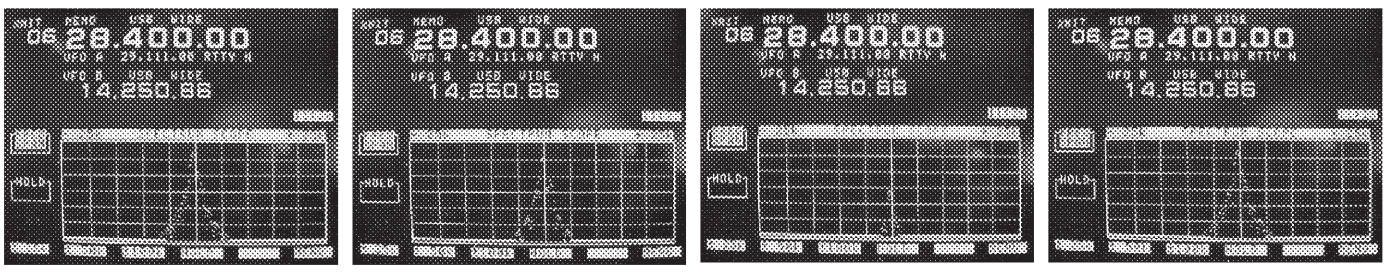
"The photos of the RF output as displayed on the Icom's spectrum scope are shown. At no power level did the transmission appear to spread, indeed it seemed to get narrower as the power was reduced. No perceived difference in audio quality resulted from varying the power between maximum and minimum.

"Next, a test was conducted with the power controller disconnected and the DX-70's 'low power' setting selected. This produced approximately the same output power as the reduced output setting in the earlier test (not by coincidence, as we wanted a comparison that was as direct as possible). The photo taken during this test is also shown. The width of the trace looks remarkably like that of the reduced-power setting in the first set of tests and, once again, the audio quality sounded the same. Finally, we tried a CW test, sending a series of dots from an automatic key. No clicks or chirp were audible."

Antenna Tuning by Stealth

***RadCom* April 2001**

Several readers have pointed out that, on p18, Fig 4 should show the labels of R8 and R11 transposed. The circuit diagram of Fig 2 is correct. ♦

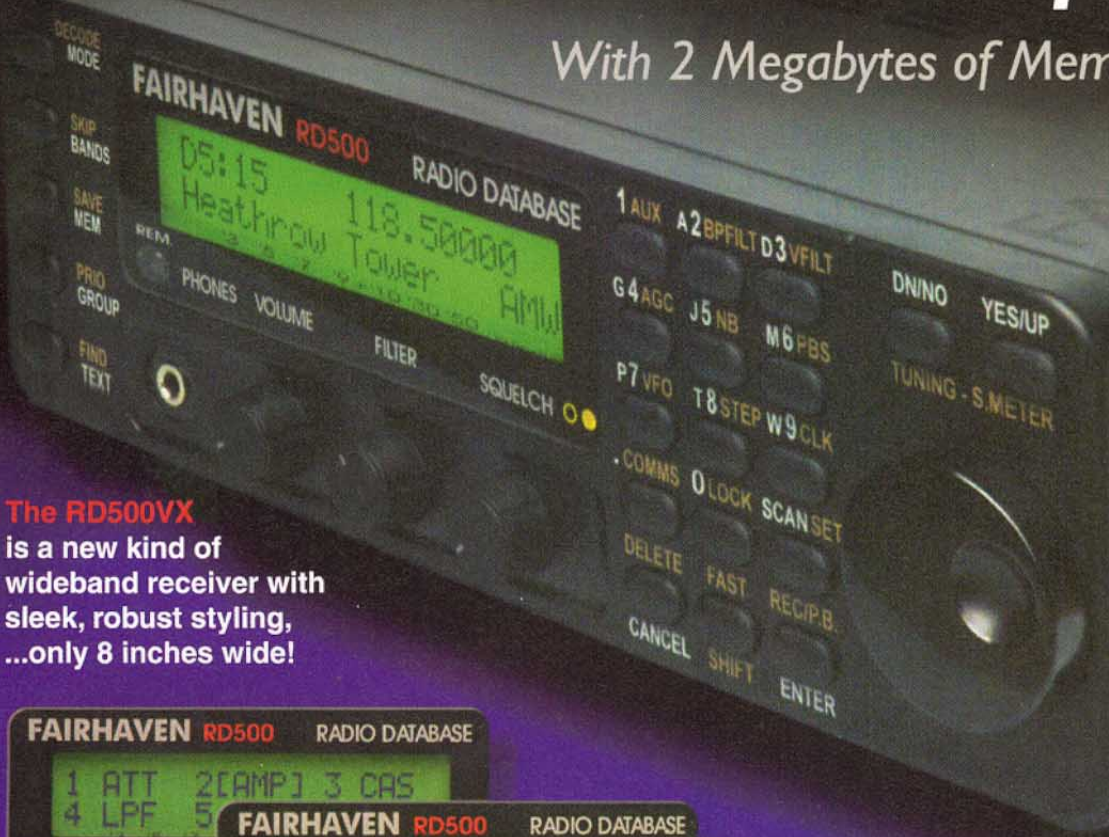


Spectrum plots of the DX-70TH at various SSB power levels. L - R: 100W; 10W; milliwatt level; Alinco 'low-power' setting (see text).

...bring your scanning directories to life!

With 2 Megabytes of Memory

FAIRHAVEN RD500VX
RADIO DATABASE



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KENWOOD TS-870 SAT		895
KENWOOD TS-940 SAT		799
KENWOOD TS-950S	HF BASE STATION	999
PRESIDENT LINCOLN	10M MULTIMODE TRANSCEIVER	159
YAESU FT890	100W HF TRANSCEIVER	399
YAESU FT900	100W HF MOBILE BASE	599
YAESU FT920	HF/6M 100W TRANSCEIVER	949
YAESU FT1000MP	100W HF TRANSCEIVER + DSP	1395

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ALINCO DJ-SR1	PMR 446 TRANSCEIVER	79
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ICOM IC-T8E	6M/2M/70CM HANDIE TX	229
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STANDARD C8900	2M FM MOBILE	85
TRIO TS-700S	2M MULTIMODE BASE	299
YAESU FT411	FM HANDIE - BOXED	125
YAESU FT690R II+FL6020	6M MULTIMODE+10W AMP	299
YAESU FT790R II+FL6020	70CM MULTIMODE+25W AMP	329
YAESU FTL2014	VHF PMR TRANSCEIVER	75

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TOKYO HL700	SOLID STATE HF AMP	599
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TOKYO SAGRA 600	2M 700WAMP 2X4CX250R	799

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ICOM ICR-7000 + REMOTE	WIDEBAND RECEIVER	475
LOWE HF-150	HF RECEIVER	225
NEVADA MS1000	BASE SCANNER	125
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REALISTIC DX394	HF RECEIVER	95
SONY PRO-80	HANDHELD RECEIVER	159
YAESU FRG100	HF RECEIVER	279
YAESU VR-5000	WIDEBAND RECEIVER	599
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KENWOOD VS2	VOICE BOARD	40
KENWOOD SP 940	SPEAKER	79
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SGC SG230	SMART TUNER	25
SWAN WM6200	50-150MHZ PWR/SWR M	30
TONO Q-550	TERMINAL UNIT	125
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WATSON W25 AM	POWER SUPPLY	75
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- 200W output
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NEW!

- Dual band 144/430 TX
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- Multimode reception AM/FM/CW/SSB

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TRL 6-5	5 Element	10.2dBi	3.6m	4.2kg	£128.95

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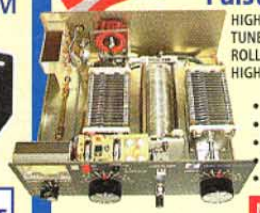
Palstar AT1500



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ANTENNA TUNER

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- 4:1 Balun

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** 20 optional coil*

A 6/2/70cm Whip that accepts 1, 2 or 3 HF coils for up to 6 Band operation. Simply screw on any combination of HF coils you choose.

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postage & packing £4.75 (UK MAINLAND)

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SM-A3..SMA connector 144/432/900MHz	£19.95
SH-95..BNC connector 144/432/1200MHz	£26.95
RX-5....SMA connector 144/430MHz + wide RX	£26.95

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RS-730 .....Hatch/Trunk Mount fully adjustable	£19.95
TBR.....Hatch/Trunk Mount standard model	£14.95

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CF-30MR ..32MHz Low pass, 1kw PEP	£37.50
CF-50S.....50MHz low pass filter, 150W CW	£21.50
CF-50MR ..50MHz low pass, 1kw PEP	£37.50

COMET BAND PASS FILTERS

CF-BPF6....50MHz band pass filter, 150W CW	£42.50
CF-BPF2....144MHz band pass filter, 150W CW	£42.50

COMET BASE ANTENNAS

GP-15N.....50, 144, 430MHz, L: 2.4m 300W PEP	£89.95
GP-1.....144/430MHz 3/6dB 1.25mtrs 200W	£49.00
GP-3.....144/430MHz 4.5/7.2 1.78mtrs 200W	£59.95
GP-6.....144/430MHz 6.5/9.0 3.07mtrs 200W	£89.95
GP-98.....144/430/1.2GHz 2.94mtrs	£129.95

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CA-UHV.....7, (14) 21, 28, 50, 144, 430MHz 1.9 mtrs	£89.00
L14.....Optional 14MHz coil for CA-UHV	£19.95
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HR-50.....50MHz centre loaded , length 2.13 mtrs	£39.95
SB-15 .....50/144/432MHz with w/fold-over	£46.95
SBB-2 .....Dual band Mobile 144/432 length 0.46 mtrs	£19.95
SBB-4 .....Dual band Mobile 144/432 length 0.92 mtrs	£29.95
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CF-416B ....144/430MHz SO239/PL/'N	£28.50
CF-360A ...1.3-30MHz/49-470MHz SO239/PL/PL	£37.95
CF-530 .....1.3-90MHz/125-470MHz SO239/PL/PL	£39.95

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Low profile 3 band Mini Beam

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Gain	10m/6.1dB, 15m/4.2dB, 20m/3.5dB
F/B Ratio	From 16 to 18dB
Boom Length	2 mtrs
Element length (max)	5 mtrs
Turning Radius	2.6 mtrs
Weight	11kg
Mast Diameter	50mm
Wind Load	(144 km/h) 255 N
Power	500 Watts

MONO BAND YAGIS

MODEL	BAND	EL.	BOOM LGTH	TURNING RADIUS	GAIN DB	F/B RATIO	WEIGHT (KG)	PRICE
6m Band								
ZX6-2	50MHz	2	0.60m	1.53	6.2	-18	2.20	£49.95
ZX6-3	50MHz	3	1.75m	1.74	9.1	-25	3.00	£89.00
ZX6-4	50MHz	4	2.75m	2.03	11.4	-28	4.30	£99.95
ZX6-5	50MHz	5	4.35m	2.64	12.1	-28	6.50	£129.00
ZX6-6	50MHz	6	6.40m	3.53	12.5	-35	7.70	£149.95
10m Band								
ZX10-4DX	28MHz	4	5.80m	3.90	12	-26	10.80	£166.00
ZX10-4CL	28MHz	4	5.00m	3.60	11.4	-28	10.20	£149.00
ZX10-5DX	28MHz	5	8.00m	4.80	12.7	-35	13.40	£215.00
12m Band								
ZX12-3	24MHz	3	3.50m	3.30	9.1	-25	6.90	£128.00
15m Band								
ZX15-2	21MHz	2	1.30m	3.36	6.3	-18	6.60	£112.00
ZX15-3	21MHz	3	4.15m	3.98	9.1	-25	10.90	£155.00
ZX15-4	21MHz	4	6.40m	4.67	11.4	-28	15.40	£185.00
17m Band								
ZX17-2	18MHz	2	1.45m	4.26	6.3	-18	6.80	£123.95
ZX17-3	18MHz	3	4.90m	4.85	9.1	-25	11.58	£159.95
20m Band								
ZX20-2	14MHz	2	1.70m	4.57	6.3	-18	10.00	£149.95
ZX20-3	14MHz	3	6.20m	5.60	9.1	-25	13.50	£199.95
ZX20-4	14MHz	4	9.40m	6.58	11.4	-28	21.00	£259.00
30m Band								
ZX30-3	10MHz	3	8.55m	8.10	9.1	-25	27.50	£220.00

ZX YAGI

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- 35/5 watts 70cms
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- 40 memory ch+1 call ch

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TIMEWAVE DSP 599ZX V-5
NOW WITH PSK 31 INTERFACE
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YAESU FT-8100
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YAESU VX-5R
- 50-144-430MHz
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- All mode 6mtr/2mtr
- 100 Watts
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*1200MHz optional

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KENWOOD TS-570 DGE
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KENWOOD TM-D700E
Dual band DATA mobile radio

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KENWOOD THD7E
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KENWOOD TM-G707E
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- 50/35W RF output
- Large display
- CTCSS ENC/DEC
- 12009/9600 pkt

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High class 21W 10mtr Multimode Transceiver
- 28 - 30MHz
- AM/FM/SSB

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PALSTAR PS-50
50 Amp heavy duty supply with meters. 13.8V DC 40/50 Amp

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PALSTAR PS-30
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THE 64th COMMONWEALTH CONTEST 2001

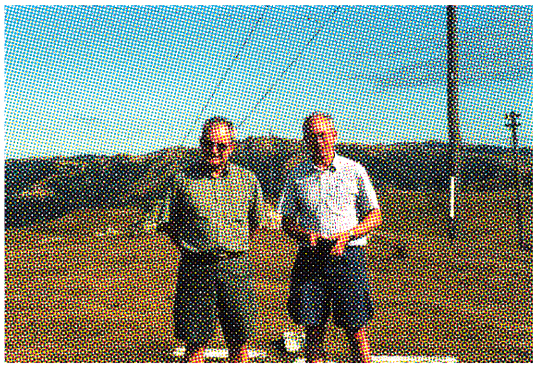
*by Harold Owen, G2HLU, and Bob Whelan, G3PJT**

A SPLENDID entry and few complaints about conditions this year! There were 158 entries in total, a figure which approaches that for the 60th Anniversary contest in 1997. The HF bands (especially 10m) were very good, though 40m and 80m were disappointing, with the latter particularly noisy in most areas. Numerous entrants said that they had achieved a personal best.

Scores were high: the total of points scored by the top 10 in the Open section was 83,281 this year (73,104 in 2000), with 8502 QSOs (8150 last year). Yet the number of stations participating, as opposed to entering, was not as large as might have been expected, given the good conditions.

OPEN SECTION

WELCOME BACK to Jeff, 9H1EL. With a record score, Jeff is the winner of the Open section, and the Senior Rose Bowl. It has been a few years since Jeff himself entered. He was winner in 1991 and he has generously made his QTH available to others who have used it to good effect. His skills are evidently undiminished even though they were thoroughly tested by John, VE3EJ, always very near if not at the top, and who was beaten only by a whisker into second place. Third was Bruce, ZF2NT, last year's winner. Dave, VE2ZP, is closing up on the leaders and moved up to fourth (sixth last year, seventh in 1999). And a welcome back too to Dave, VE3OI, who came fifth: his first 'BERU' since he won in 1986 and 1974. Bob, G3PJT, operating as ZL4CC this year, gave many a valued bonus, often on several bands, and was sixth. Vladimir, 9H1ZA, and Lee, VE7CC, occupy the same positions (seventh and eighth) as last year, while John, VK4EMM, maintained his reputation of usually being in the top ten, and made ninth. Andy, G4ZVJ, as 9M6AAC, put out a splendid signal on all bands and, one might feel, deserved a better placing than 10th in gratitude for the bonuses he dished out. The leading G station was again Jan, G0IVZ, in 13th place, and he takes the Col Thomas Rose Bowl again. But Jan was given a good run by Clive, GM3POI, just 108 points behind. Those 80m bonuses and aurora made all the difference. Third in the UK was Dave, G3TBK.



Bob, G3PJT / ZL4CC, with Brian, ZL1AZE, the operator of ZL6QH, at the ZL6QH Quartz Hill station.

RESTRICTED SECTION

IN THE Restricted section the clear winner of the Junior Rose Bowl is George, 5B4AGC (second in the Open section last year). Second was Yuri, VA3UZ, up from 18th in 2000. Excellent entry, Yuri! Bill, VE6BF, again operated VE6JY (winner in the last two years), but - despite his best score in four years - had to settle for third place. While Barry, VK2BJ - usually well up in the Open section - had trapped nerve problems so settled for the Restricted section this year and came fourth. Fifth, and another stranger to this section, was Dave, G4BUO, who had family commitments which prevented an entry in the Open section. Dave just held out over Peter, G3LET (winner in 1963 as VP8GQ), and Cris, GM4FAM, only 109 points separat-

Jeff, 9H1EL, at his station.

The splendid roof-top antenna farm at 9H1EL.

36 Green End, Comberton, Cambridge CB3 7DY.

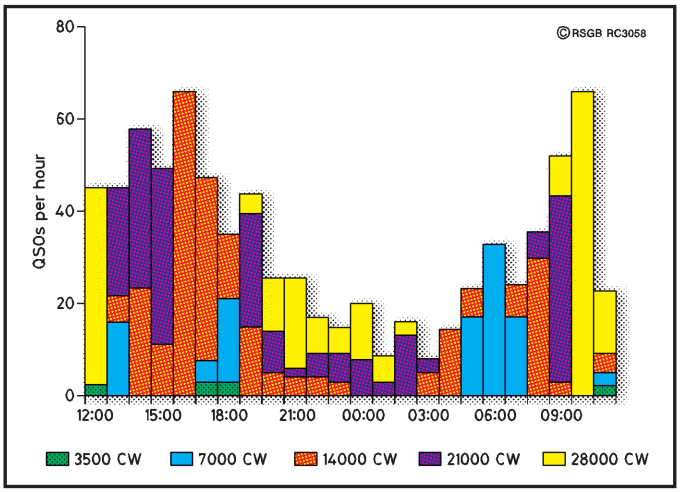


Table 1: Hourly QSO totals per band at ZL4CC.

ing the three of them.

Many thanks are due to the five HQ stations who were active, though logs were not received from VA6RAC and VU2UR. Also deserving mention is Des, G3HKO, who is some way up from the foot of the Open section table, with 5 watts and a G5RV.

The Committee has decided that this year two Commonwealth medals will be awarded, one to John Tutton, VK3ZC, and one to Frank Cooper, G2QT. These two stalwarts of BERU have consistently supported the contest since 1935. Gentlemen, we salute and thank you!

PARTICIPATION

DESPITE THE good HF conditions and increased activity, slightly fewer callsigns were recorded than last year. The total of 777 over all bands contained 500 Gs, 127 VEs, 52 VKs, 38 ZLs and 11 ZSs. VEs were down on last year, ZLs up (thanks to G3PJT/ZL4CC!); the number of ZSs worked will surprise many. But of course the rarities were not available to all. Call areas were the same in number as last year, but the composition was different: 3B8, 3D2/R, 5B, 5H, 5W, 7P, 7Q, 8P, 9H, 9J, 9M2, 9M6, 9V, G (including GD, GI, GJ, GM, GU, GW, M, MI, MJ, MM, MU, MW), GB (HQ), S7, V5, VE1-9, VE3 (HQ), VE6 (HQ), VK1 - 9, VK4 (HQ), VO1, VP2V, VP6, VP8 - 9, VU, VU (HQ), VY0, ZB2, ZD7, ZF, ZK1 - 2, ZL0 - 4, ZL6, ZS1 - 3, ZS6.

Participation by band was: **80m** 211 stations including 133 Gs, 33 call areas; **40m** 340 (209 Gs), 43; **20m** 528 (351 Gs), 43; **15m** 490 (342 Gs), 36; **10m** 467 (312 Gs), 42. There were few marked differences from last year; total numbers were up for 80m and 10m; conditions on 10m were much better than last year, and they must have been better generally on 80m despite all that noise! Call areas were down a little on all bands.

LOGS

FOR THE FIRST TIME paper logs were (just) in a minority: 49%. E-mailed logs again increased, to 41%, with 11% sent on disk. Of course some logs sent on paper owed much to the computer. A few stoutly protested that theirs did not. There were several splendidly neat hand-written ones, only a very small number of (paper) logs were of an unworthy character. The highest-scoring logs in which no errors were found were those of VE3VHB in the Open section and G3LZQ in the Restricted section. Only a quarter of entrants had worked out their Band / Call Areas (BCA) total, some incorrectly. Eighty-four entrants - the same number as last year so a smaller percentage of the entry - qualified for the special certificate, which this year required a total of 64 or more BCAs to be worked.

CONDITIONS (by Bob, ZL4CC)

THIS WAS MY first experience of propagation from the other far, far end of the G - ZL path and there is no doubt it is very different. I pulled out for your interest the hourly rate graph by band for ZL4CC, shown in **Table 1**, opposite.

Look at the first hour, bearing in mind that 1200UTC is the middle of the night local time in ZL. 28MHz isn't often open *anywhere* from the UK at that time. I had been warned by Brian, ZL1AZE (ZL6QH), and Baz, ZL1DD, to look for Gs on 28 in short openings right at the start, but I never expected that I would have to break off after an hour to go to LF! As no such opening was indicated in the March *RadCom* propagation predictions I had a look using the W6EL program.

What that showed was that the path needs flux in the 180-plus range with a low K index, and there you are: it pays to run your own predictions. Operating from Waiheke, there seemed to be very little, if any, long-path propagation. As everything was coming in from the north, I missed any African stations because they come in over the South Pole. Like most others I found 80m very noisy and I gave up in the end as the score shows!

TACTICS

WE HAVE CHANGED the way the results are presented this year to show QSOs and bonuses for each band and the total of Band Call Areas. This gives a much better idea of the tactics employed by various entrants. There is no doubt that whilst many could exploit the good HF conditions, the problems on 80 really pulled down all but a few of the leading stations.

SOAPBOX

"Don't expect such good conditions to be repeated, ever!", G3GMM. "Best yet", G3HEJ. "What about a separate booklet for results?", G3VDL (see below, John). "Worked more ZLs than ever before", G4IIY. "BERU is getting better and better", VE2ZP. "I failed to learn it's really worth going after the bonus points", VE3QAA. "If only 80m had opened", VK2AYD. " Just gets better and better and the level of activity from India going up every year (tnx VU2UR)", VK6VZ. "Conditions were appalling, at first I thought I had the wrong weekend", ZF1WD. " Haven't worked such strings of Gs for years", ZL1MH. " Difficult to compete with high-power stations, should have high power and low power sections", ZL2BR. " Looking forward to next year", ZL2TX. That this contest has a special place in the affections of many was brought out in the comments which accompanied logs.

INFORMATION

AS USUAL, all of the non-UK entrants will receive a copy of the results, this report and details of next year's dates. If any Gs want a copy, send an A5 SASE to Bob, G3PJT. We hope to be able to repeat the mail out again to non-UK stations, especially in ZL and VK. All special certificates were mailed out in August.

If you enjoyed the contest, why not do as VE3XN suggests: "I was personally disappointed that more Commonwealth stations were not active. I think it is up to each of us contesters to try to encourage and 'work on' amateurs in Commonwealth countries where we know individuals who might make an appearance." And to say "thanks" to those who do!

RULES & THINGS FOR 2002

SEVERAL ENTRANTS commented that some stations, located in Commonwealth countries, would not give serial numbers. Whilst it's a bit sad that they won't join in, you can still claim a valid scoring contact and bonus as long as you log what info they *do* send: a blank is quite acceptable as a serial number in such cases.

We have had requests from some entrants to move the start / finish times forward by an hour or two. Whilst this would benefit stations in Oceania, it might prove troublesome for others, especially in Canada and the Caribbean. Please let us have your views on this suggestion.

Next year, 2002, is the Queen's Golden Jubilee. Therefore a special certificate will be sent to every entrant working more than 50 Band Call Areas. This will be a very attractive commemorative certificate for a very special occasion. Dates to note are **9/10 March 2002.** We have had a word with the powers that be, saying we would like the same conditions in 2002 as this year, but could he ask Thor to go easy on the crashes and bangs. ♦

WWW.

G3PJT's Commonwealth Contest site: **http://ourworld.compuserve.com/homepages/Bob_G3PJT/**
RSGB HF Contests Committee: **http://www.rsgbhfcc.org/**

FULL RESULTS OVER THE PAGE!

2001 Commonwealth Contest - Results

Open Section - (QSOs/Bonuses)

Pos	Call	80m	40m	20m	15m	10m	Score	QSOs	BCAs
1*+	9H1EL	84/19	160/35	228/62	268/57	270/54	9562	1010	128
2*	VE3EJ	83/25	195/45	240/55	248/47	246/51	9489	1012	119
3*	ZF2NT	65/19	163/40	266/53	239/48	255/44	8975	988	111
4	VE2ZP	69/28	160/37	238/66	199/53	210/41	8807	876	130
5	VE3OI	30/19	169/42	206/50	259/49	195/45	8329	859	106
6	ZL4CC	12/11	108/40	257/55	218/48	205/55	8062	800	134
7	9H1ZA	84/11	150/31	224/53	239/43	226/39	8058	923	103
8	VE7CC	26/22	105/43	219/54	205/44	132/47	7592	687	120
9	VK4EMM	13/13	73/37	237/54	197/44	169/42	7209	689	111
10	9M6AAC	15/13	76/25	239/55	201/54	127/49	7198	658	108
11	ZL6QH	36/22	98/29	224/52	168/37	149/46	7080	675	105
12	VE3QAA	63/18	163/27	204/51	161/26	177/22	6677	768	87
13++	G0IVZ	36/26	68/44	107/61	78/52	76/45	6341	365	127
14	GM3POI	28/22	74/47	93/61	68/51	65/49	6233	328	131
15	VK2AYD	12/12	44/28	243/52	175/32	115/37	6150	589	99
16	ZL1MH	21/16	55/35	149/41	165/38	112/45	6006	502	101
17	VE2AYU	28/15	100/20	185/39	163/23	196/29	5866	672	74
18	G3TBK	20/16	44/36	91/61	71/52	64/48	5694	290	122
19	ZL2BR	12/12	30/26	156/47	166/32	84/45	5474	448	99
20	VO1MP	66/15	95/21	147/35	143/28	101/26	5241	552	77
21	VE3VHB	28/15	48/24	98/42	85/43	107/40	5110	366	98
22	G0ORH	11/11	44/35	66/49	52/36	60/44	4649	233	108
23	G0WAT	15/13	50/33	81/54	51/40	35/25	4453	232	99
24	G3GLL	12/12	32/29	64/48	55/42	48/39	4448	213	106
25	G3IAF	13/12	34/27	59/47	48/41	48/40	4341	202	109
26	ZL2AZ	22/18	63/32	88/31	53/31	52/35	4328	278	92
27	VE3XN	7/7	21/18	118/25	131/29	115/31	4135	392	72
28	G0CKP	4/4	20/20	79/55	64/42	43/33	4120	210	90
29	GW3HGJ	13/13	31/27	56/46	56/45	31/27	4086	187	101
30	G4CZB	12/9	29/26	56/45	49/43	42/33	4058	188	96
31	G4IIY	9/9	28/23	52/42	59/45	42/13	3983	190	94
32	ZB2EO	-	11/7	207/43	174/26	24/17	3935	416	68
33	G2QT	14/14	36/28	45/42	46/34	49/33	3907	190	97
34	VE7UZ	4/4	40/28	70/32	75/22	82/38	3822	271	76
35	G2HLU	16/12	30/24	47/39	44/36	36/32	3725	173	93
36	VE7JKZ	8/7	38/30	68/32	71/27	43/28	3620	228	77
37	VE3KP	19/16	29/17	120/22	96/19	93/17	3593	357	54
38	VO1GO	35/12	49/24	84/24	117/22	24/19	3565	309	57
39	9J2BO	-	11/10	40/28	118/16	211/26	3486	380	58
40	G3IGW	10/10	32/24	48/37	33/29	39/31	3415	163	90
41	G3LIK	10/10	21/19	51/40	44/33	33/28	3375	157	80
42	VE1AYY	28/12	88/21	74/19	99/16	86/8	3330	375	44
43	VE2AWR	6/6	46/18	76/21	108/24	78/18	3300	314	52
44	G3JJG	8/8	24/23	41/37	36/30	33/27	3208	142	88
45	G3HEJ	9/9	14/11	47/37	46/37	36/28	3195	152	87
46	VE7NH	2/2	74/27	64/24	78/21	28/23	3154	246	60
47	G3KKP	4/4	17/16	51/40	45/37	24/19	3019	141	75
48	VE3HX	9/8	22/15	38/23	47/24	72/26	2858	188	63
49	G3DEF	9/9	14/13	42/36	31/28	30/25	2840	126	70
50	G3JKY	5/5	19/16	37/32	37/31	29/25	2808	127	74
51	G3TEV	-	19/19	37/35	36/30	29/25	2763	121	77
52	G3NAN	-	9/9	40/35	40/34	37/29	2758	126	71
53	G3EBH	4/4	14/13	44/38	39/30	28/20	2720	129	68
54	G3MPB	1/1	25/21	33/29	43/38	19/15	2684	121	73
55	G5MY	4/4	21/15	50/33	37/32	21/17	2683	133	70
56	VK6HQ	-	21/15	135/33	35/26	22/5	2598	213	48
57	G3VDL	10/10	17/14	39/31	32/27	18/16	2536	116	70
58	VK2YN	8/8	14/13	83/33	55/19	10/10	2503	170	55
59	VE3NXB	8/8	19/13	55/22	37/19	33/17	2331	157	47
60	VE3EZP	20/12	50/26	31/21	35/19	2/2	2255	138	53
61	VK3ZC	7/7	24/22	47/30	17/17	8/8	2181	103	57
62	G3HZL	4/4	11/11	36/36	17/17	17/16	2097	85	61
63	VK2EL	-	12/12	53/28	35/18	16/15	2011	116	48
64	G3ZDD	11/10	26/20	20/15	24/18	18/17	2047	99	53
65	ZL2TX	-	23/13	92/36	10/10	-	1901	125	35
66	VE1LS	10/9	24/12	32/11	32/16	25/7	1699	123	36
67	VE1EP	6/6	8/8	17/17	18/18	15/15	1600	64	61
68	G3GMM	-	-	27/21	28/25	21/16	1597	76	42
69	VE4IM	-	-	136/41	-	-	1500	136	23
70	G3HKO	5/5	7/7	25/22	17/14	14/11	1496	68	44
71	VK2DID	-	12/12	30/22	8/8	11/11	1341	61	43
72	VE3MQW	-	1/1	30/21	23/13	16/8	1204	70	26
73	VK4XW	-	3/2	24/18	25/9	13/13	1152	65	28
74	VE1KB	-	-	-	-	97/32	1078	97	20
75	VA3TTT	-	111/28	-	-	-	1077	111	18
76	G0VQR	-	3/3	27/22	8/8	9/9	1075	47	32
77	VE2AQC	2/2	11/8	64/14	2/2	-	910	79	18
78	VK8HA	-	4/4	-	-	46/28	886	50	22
79	VK5HO	1/1	15/14	8/8	7/7	-	736	31	22
80	VA3IX	-	4/4	13/13	8/4	8/7	708	34	20
81	VK3KS	-	-	22/21	-	-	519	22	13

+ Senior Rose Bowl ++ Col Thomas Rose Bowl * Certificate of Merit

Restricted Section - (QSOs/Bonuses)

Pos	Call	80m	40m	20m	15m	10m	Score	QSOs	BCAs
1*+	5B4AGC	44/10	90/23	215/52	161/41	180/35	6644	690	94
2*	VA3UZ	26/13	81/27	139/47	169/41	149/37	6097	564	102
3*	VE6JY	4/4	83/28	203/36	195/40	119/39	5892	604	87
4	VK2BJ	13/13	66/28	146/37	145/30	113/36	5287	483	93
5	G4BUO	26/22	42/33	78/54	56/43	42/36	4946	244	109
6	G3LET	20/17	41/34	72/54	56/45	45/37	4899	234	109
7	GM4FAM	13/13	32/28	63/51	64/52	55/41	4827	227	114
8	G4OBK	16/15	33/29	71/50	69/48	47/39	4790	236	110
9	VK6VZ	16/10	65/15	170/37	120/19	133/27	4642	504	72
10	VK2APK	9/9	30/27	207/40	94/30	45/28	4587	385	85
11	VE6JO	6/5	36/29	107/40	131/28	67/31	4359	347	79
12	G3BJ	14/12	26/23	63/47	62/43	48/37	4300	213	99
13	VE3STT	3/3	40/15	122/34	130/22	115/32	4153	410	67
14	GW3NJW	10/10	36/27	58/45	44/36	35/30	3865	183	99
15	G3LZQ	16/14	39/34	46/39	42/35	33/24	3795	176	91
16	ZL2CD	8/8	30/20	77/30	95/26	36/31	3501	246	70
17	GM3CFS	4/4	26/20	46/43	45/39	34/25	3384	155	83
18	G3KZR	10/10	23/18	35/30	52/44	30/27	3315	150	83
19	VE7VF	2/2	30/22	65/35	65/22	79/24	3259	241	66
20	G3LHJ	10/9	23/17	40/35	39/31	41/32	3241	153	82
21	G4AZN	6/6	17/14	37/33	41/36	41/33	3143	142	85
22	G2VJ	5/5	16/15	40/40	37/35	30/28	3089	128	82
23	GW0GEI	10/10	37/24	34/29	24/22	39/29	2968	144	76
24	G3KNU	1/1	8/8	44/37	55/40	34/27	2960	142	74
25	VK6AJ	-	6/5	121/32	40/21	104/22	2922	271	53
26	G3TXZ	5/5	21/17	42/37	34/31	24/20	2828	126	78
27	G2AFV	9/9	23/19	45/34	36/29	21/16	2803	134	66
28	G3KKQ	5/5	15/15	37/33	30/28	24/23	2631	111	75
29	GW3WWN	4/4	9/9	44/37	29/27	28/22	2521	114	69
30	ZL1HV	4/4	15/14	39/29	34/26	24/24	2514	116	67
31	GU3SQX	7/7	15/14	29/28	37/31	22/16	2465	110	68
32	ZF1WD	5/5	16/9	52/21	54/17	88/18	2450	215	46
33	GW4MVA	-	13/13	40/36	32/26	22/17	2371	107	66
34	VA3NR	2/2	29/15	54/27	51/16	27/18	2355	163	55
35	G3RSD	5/5	16/13	23/22	26/24	31/27	2316	101	65
36	G4OGB	-	8/8	40/36	36/30	17/16	2293	101	57
37	G3VYI	-	17/16	41/34	30/26	13/11	2243	101	62
38	G3ZGC	3/3	8/7	28/23	32/29	30/22	2183	101	61
39	VE5SF	3/3	14/10	67/19	79/19	18/10	2081	181	35
40	G3GMS	1/1	9/9	29/25	29/26	23/20	2073	91	51
41	GW3KJN	-	17/15	37/29	19/15	25/20	2065	98	53
42	GW4XXF	-	8/8	30/27	24/21	25/24	2030	87	58
43	G4DDX	-	7/7	35/29	30/25	20/17	2018	92	56
44	VK5GN	2/2	6/6	23/21	54/23	60/14	2012	145	49
45	GW4HBK	1/1	17/16	21/20	19/15	24/23	1905	82	56
46	G0UKX	-	10/9	26/24	31/27	19/15	1916	86	50
47	M0AJM	1/1	4/4	25/21	34/31	18/17	1868	82	57
48	G3UFY	10/10	27/21	39/27	-	-	1536	76	37
49	ZL1AIH	-	-	12/11	28/23	29/26	1535	69	41
50	G4GCI	-	8/8	22/20	26/23	10/9	1523	66	43
51	GW3SB	1/1	7/6	23/21	26/22	12/9	1519	69	41
52	G4BJM	-	-	17/14	23/21	25/24	1490	65	49
53	G3VQO	2/2	8/8	23/19	16/14	12/12	1405	61	42
54	G4UZN	3/3	4/4	11/11	27/23	14/14	1395	59	42
55	G3JJZ	3/3	15/13	17/17	10/10	13/12	1385	58	47
56	G3GC	-	-	23/22	21/18	19/14	1370	63	36
57	VE3FU	4/4	18/13	4/4	22/6	52/16	1355	100	35
58	G0RDO	-	-	5/4	32/26	26/20	1301	63	33
59	G4EBK	3/3	11/11	7/7	21/21	9/9	1275	52	42
60	G4ZME	-	3/3	22/20	14/12	11/11	1161	50	34
61	G3RZP	-	-	-	-	29/27	685	29	18
62	G0MRH	-	-	9/9	12/8	4/3	534	25	18
63	G4XPE	-	-	4/4	10/10	6/6	500	20	15
64	ZB2/G4FDC	1/1	22/4	14/5	1/1	1/1	455	39	8

+ Junior Rose Bowl * Certificate of Merit

HQ Stations

Pos	Call	80m	40m	20m	15m	10m	Score	QSOs	BCAs
1	VA3RAC (VE3KZ)	75/22	172/39	250/59	242/45	228/40	8861	967	99
2	GB5CC (GM3WOJ)	103/17	142/32	194/58	186/53	145/45	7923	770	115
3	VK4WIA (VK4TT)	9/9	28/25	168/39	101/32	104/39	4887	410	87

BCAs = Band Call Areas (see page 45).

Checklogs from G3HAL, G3KXF, G3SXW, G3TXF, G3WP, G3XMM, G8DR, ZL2AOH, ZL2RX and ZL2ZLW are gratefully acknowledged.

WHATEVER NEXT

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

IN PARTS OF Britain, and presumably in many other places where the density of population is high, cellphone antennas now seem to be everywhere. The increasing use of such phones, coupled with the limited bandwidth available, make the proliferation of antennas understandable, because network operators need to decrease the size of the cells to keep pace with increased demand. However, in areas where the density of population is low, it is not a question of how small an area you can cover from one base station, but how much. Increasing the height of base station antennas above ground or locating them on hilltop sites helps, of course, as does adjusting the angle at which they point (see **Fig 1**), but even so there is a practical / economic limit. Clive Ousbey, G0CHO, kindly sent me details of development that has been taking place and which is now set to bring cellphone coverage to some of the world's more thinly-populated areas.

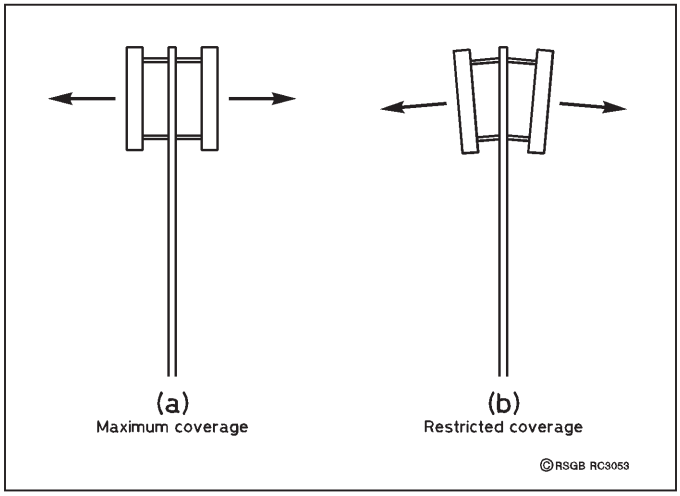


Fig 1: (a) Pointing cellphone antennas straight at the horizon - in some cases even slightly above - maximises coverage. (b) Angling antennas downwards restricts coverage.

REALLY HIGH ANTENNAS

PLATFORMS WIRELESS International, a US-based company, is set to launch a unique digital wireless communication 'platform', the first one of which will be some 15,000ft (4.6km) above the Brazilian state of Goias. Named the Airborne Relay Communication (ARC) system, it is constructed around a 150ft (46m) long aerostat. Francois Draper, the chief technology officer of PWI, commented: "This is the first commercial airborne wireless communications system in the world". He added: "At less than half the cost and more than twice the profitability of most terrestrial cellular systems, we believe the ARC system will revolutionise the wireless communications industry."

Moored to the ground, and floating in restricted airspace, one ARC can provide coverage to an area of about 16,000 sq miles (40,000 sq km). To equate this kind of area to closer to home, it means that one ARC could provide cellphone coverage to:

a) all South-East England and East Anglia, or

b) all of Wales plus part of the Midlands, or

c) just about all of Belgium (or Holland)

As **Fig 2** demonstrates, directional antennas mounted underneath the aerostat provide coverage in 'spots', which would (presumably) overlap in the same way that ground-based systems do. A ground station up to 100 miles (160km) away from the aerostat carries the calls to and from the Public Switched Telephone Network. The initial system has been configured to serve up to 125,000 subscribers (about one-fifth of the population of that part of Brazil).

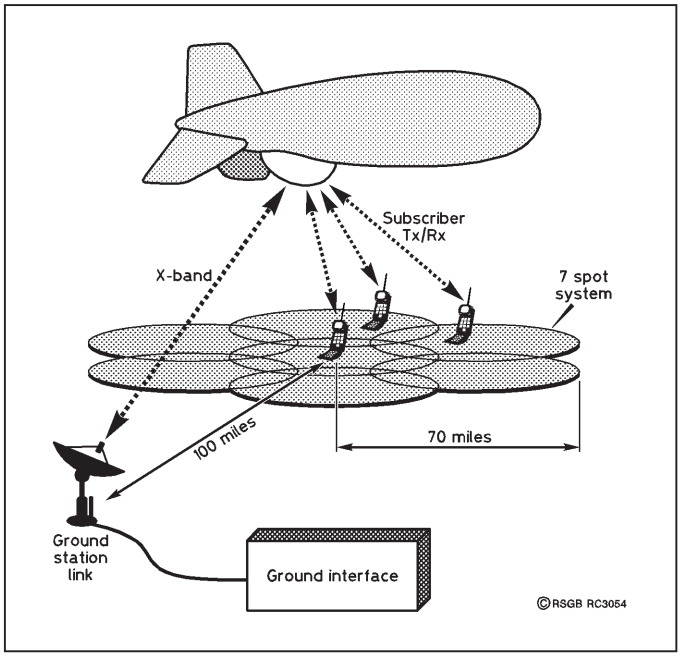


Fig 2: Moored at 15,000ft, one ARC can serve an area 140 miles (225km) across.

SHRINKING WORLD

THEY SAY the world is getting smaller, and that statement is very hard to argue against when it comes to modern electronic devices. This month I want to highlight some of the advances that are taking us into the realms of nano-engineering. While you're reading the items, you might like to refer to **Table 1** over the page, which gives a comparison between them and the thickness of a human hair.

MICROSCOPIC TRANSCEIVER

Hitachi Ltd has developed a new 'wireless' chip. The 60-micron thick CMOS 'Mew chip' integrates RF communications circuitry and 128 bits of ROM. It transmits data stored on the ROM, including encrypted data, over the 2.45GHz band. The chip measures 0.4mm square and can store security and identification information for items into which it is embedded. Originally developed to protect against counterfeit documents or bank notes, the chip is so small and thin that it won't damage material into which it is placed, nor be damaged if that material is folded.

When connected to an antenna it can transmit over a distance of about 30cm. At present the antenna is separate, but Hitachi intends to offer a version of the chip with an attached antenna. Hitachi expects the chip to meet much higher demand than conventional RF ID chips, which measure several mm per side. They also expect the chip to open up new applications, possibly by linking information on the Internet with the Mew chip's ID number.

HOW SMALL?

The latest generation technology used in the production of

	nm	µm	mm
Thickness of a human hair	100,000	100	0.1
Thickness of Hitachi 'Mew' chip	60,000	60	0.06
Imminent size of mass-produced transistors in Intel & AMD chips	130	0.13	
'Vertical' transistor	50	0.05	

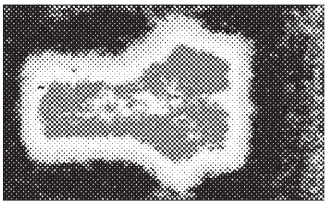
Table 1: The sizes of modern devices, compared with that of a human hair.

integrated circuits calls for transistors that are 0.13 microns in size. Intel and AMD are expected to switch to production at this size later in the year, down from the 0.18 microns typically in use at the moment. Development of production techniques is now taking place for transistors that are no more than 70nm (0.07 microns) in size, although I expect there will be intermediate steps between the two.

HOW MUCH *SMALLER*?

According to the BBC, scientists have already eclipsed the 70nm transistor with one that measures just 50nm (see photo below). It is currently the world's smallest transistor. Not only will this new design allow integrated circuits to continue to get smaller, it could also double the processing speeds of some chips.

This new device is known as a 'vertical' transistor because all of its components are built on top of a silicon wafer. Ignoring for a moment such things as dual gate MOSFETs, another key difference quoted is that a conventional transistor has only one gate, whereas the vertical transistor resembles a rectangular block with a gate on two sides. This means that it could nearly double the processing speeds of some silicon chips.



The world's smallest transistor, at 50nm in size!

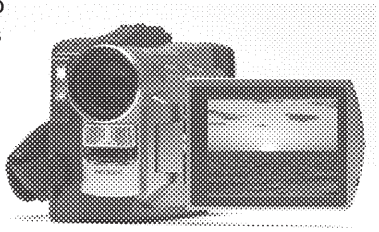
To quote Jack Hergenrother, a researcher at Bell Laboratories, "Our vertical transistor eventually could supersede the conventional transistor, which many experts in the semiconductor industry anticipate will hit a brick wall within the next 10 years" [1].

At present, light is used to etch patterns on silicon chips. However, as transistors continue to shrink in size, light will be unable to produce the smaller features required. The vertical transistor may solve this problem by using the thickness of a precisely-controlled layer of material, rather than light, to set the gate size. "Suppose you have a can of paint and a big paintbrush, and you are asked to paint the thinnest possible line," Hergenrother said. "If you just tried to paint the line freehand, that would be similar to the light approach. However, if you paint a flat surface, cut it vertically and look at it on edge, you will see a line that's as thin as the layer of paint. A similar principle is used in our transistor to produce the smallest gates ever made with the control that industry requires."

The vertical transistor design also may help forestall another challenge faced when making smaller transistors; the ever-shrinking insulating layer. This layer, between the transistor's gate and the channel through which current flows, prevents a short circuit. In recent years the insulating layers have shrunk dramatically to increase the amount of current that transistors can carry, but these layers will soon be so thin that electrons can leak through, which wastes power and can cause failures. Many scientists believe that this will be the end of the conventional transistor, but industry is trying to find alternative materials for the insulating layer, instead of today's silicon dioxide. A major problem is that most potential replacements are sensitive to the high temperatures used in the semiconductor manufacturing process, but the vertical transistor approach eliminates this problem because the gate and insulating layer are applied last in the manufacturing process, after all the high-temperature steps are completed.

SHORT-LIVED FORMAT?

WHILST MANY camcorder owners are still using one of the traditional analogue formats - VHS-C or Video-8 - Digital Video (DV) camcorders are now firmly established in the marketplace. Indeed, DV has already become the dominant camcorder format in certain parts of the world, but will it last? The reason I ask is that DVD-RAM camcorders are now starting to reach the market, the first being the Hitachi DZMV100A (see photo below).



Hitachi's new DVD-RAM camcorder. Will it usurp DV as the preferred digital camcorder format?

This new camcorder is quite interesting, incorporating as it does an 8cm cartridge DVD-RAM drive. The capacity of the media is 1.46GB per side, which equates to 60 (2 x 30) minutes of recording in high quality mode, 120 (2 x 60) minutes of recording in standard quality mode, or almost 2000 megapixel-quality still photos. Being a system where there is no physical contact with the recording media, repeated playing should not lead to deterioration in quality (Hitachi quote 100,000 times) and, unlike tape-based recorders, there is no need to rewind or worry about accidental over-recording. Instant replay also becomes a reality.

To complement the DVD-RAM camcorder, Hitachi have also introduced the DV-RX2000, a 4.7GB DVD-RAM video recorder. No doubt they hope this will take a slice of the home video market, as this machine is also capable of playing DVDs and audio CDs. ♦

NOTE:

[1] The reason why the continued reduction in size of silicon-based devices is expected to hit the buffers in about 10 years time is 'Moore's Law' which, despite the fact that it is unofficial, has proved remarkably accurate over the last 30+ years. Specifically, Moore's Law states that every three years the amount of data that can be crammed onto a chip will quadruple. The problem with this is that by the year 2012 the projected thickness of a layer of silicon will be just five atoms, and according to Davis Muller of Bell Laboratories four atoms of silicon dioxide is the fundamental lower limit for a useable device.

WWW.

Mew chip: www.eetimes.com/story/OEG20010702S0060

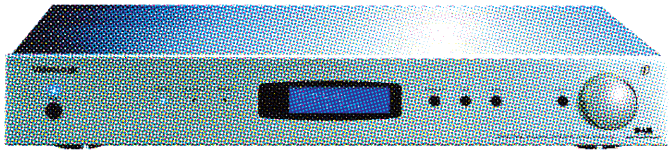
Smallest transistor: http://news.bbc.co.uk/hi/english/sci/tech/newsid_528000/528109.stm
http://news.bbc.co.uk/hi/english/sci/tech/newsid_376000/376616.stm

DVD-RAM camcorder: www.simplydv.co.uk/hitachi_dvd.html

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.

The VideoLogic DRX-601E/ES Digital Radio Tuner

reviewed by RSGB HQ Staff

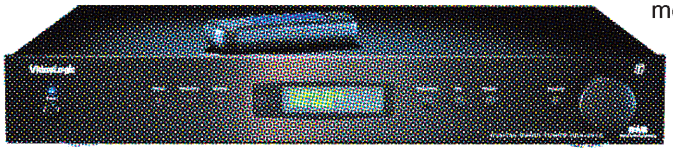


UNTIL VERY recently Digital Radio Tuners cost typically £700 or £800. That has all changed now with the release of the new VideoLogic DRX-601E/ES which, despite having comparable specifications, is hundreds of pounds cheaper than similar models on the market.

Digital Radio has been broadcast by the BBC since 1995, and by national commercial stations since 1999. It now carries over 60 national, local and digital-only channels. The system enables broadcasters to provide additional text information such as the station name and a scrolling ticker showing sports results, news headlines etc.

The VideoLogic DRX-601E/ES Digital Radio Tuner is a high-sensitivity RF tuner covering the whole of the Band III Digital Radio spectrum, 174 - 240MHz. It is available in two versions, with a black case (the DRX-601E) and, at a slightly higher price, with a silver anodised aluminium front panel, silver finish casework and controls (the DRX-601ES). Both have blue LED indicators and easy-to-read LCD text displays.

The tuner has clearly been designed to complement existing hi-fi separates systems and, being a tuner, it does require an amplifier and loudspeakers (or headphones). The DRX-601E/ES comes complete with infra-red remote control unit, stereo phono leads to connect to an amplifier, and a wire dipole antenna suitable for temporary indoor installation. The tuner measures 430W x 59H x 270Dmm. Despite being simplicity itself to set up, there is a telephone support hotline. It comes with a two-year warranty.



IN USE

THE DRX-601ES was hooked up to a good-quality analogue hi-fi stereo audio amplifier and loudspeakers. It proved exceptionally easy to set up the tuner, simply requiring a push of a button for the set to tune automatically across the Digital Radio band, putting each station received into a memory ready for instant recall. Even using just the simple wire dipole antenna provided, indoors, and in a notoriously poor VHF location, a very wide range of stations with the expected perfect reception quality were received.

Naturally these included BBC Radios 1, 2, 3, 4 and 5 Live, but also Radio 4 Longwave (ideal for *Test Match Special* cricket enthusiasts!), BBC World Service (unusual to hear it without the usual pops and crackles associated with shortwave or even mediumwave reception!), and R5L Sports Extra, an additional BBC digital-only sports service. National commercial stations such as Classic FM and the (normally medium-wave-only) talkSPORT were there, as were a number of unique digital-only services, such as 'Planet Rock' (a 24-hour a day provider of 'classic rock' music), Bloomberg Radio providing financial news , and a continuous rolling news service from ITN.

A number of local stations which are only available with poor to middling reception quality by analogue radio (either on mediumwave or Band II VHF/FM) at the review location were suddenly available with crystal-clear reception. These included LBC, the London mediumwave talk station, and 'Magic', an easy-listening music station.

The audio quality of the stations received really was excellent. It is difficult to describe the difference between 'normal', good VHF/FM reception and Digital Radio, but it can probably best be likened to the difference noticed going from mediumwave AM to VHF FM radio reception, or the same sort of difference between an old LP and a CD. The specified frequency response is 20Hz to 20kHz (or 20Hz - 12kHz for 24kHz low sample frequency (LSF) decode).

The LCD display shows data supplied by the broadcaster, always including the station name plus a line of scrolling text that provides information on the music playing, programme summaries, news headlines, sports results etc. The DRX-601E/ES also allows the user to display service information such as the Digital Radio ensemble name, multiplex number, frequency, etc. The 'Info' button switches the LCD between signal strength indicator, mono/stereo mode and service's data rate.

The DRX-601E (black case) costs £299, with the ES (silver case) version costing £349. This is excellent value compared with other Digital Radio Tuners available. ♦

RSGB Members' Special Offer

Save £40.00!

EVEN THOUGH these digital tuners are already excellent value, at less than half the price of other digital tuners, the RSGB has negotiated a extra special discount for its members, not available elsewhere. RSGB members can now save a massive £40 off the RRP, that's up to 13% off the normal high street price. Delivery is quick too, being shipped direct to you from the manufacturer's warehouse.

VideoLogic DRX-601E Digital Radio Tuner (black case) ~~£299~~. RSGB members' price **only £259**
VideoLogic DRX-601ES Digital Radio Tuner (silver case) ~~£349~~. RSGB members' price **only £309**

Carriage is *FREE!*

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ML&S £2899
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Yaesu FT1000MP Mk5

Yaesu's Flagship radio still our number one selling radio among the discerning DXers.

ML&S £799
£80 DEPOSIT!
48 * £23.64

FTV1000

Yaesu's new 200 Watt six metre transverter for the FT1000MP Mk5 at only £799.00

RRP £1499
ML&S £1099
ZERO DEPOSIT!
48 * £32.52

FT920AF

a top grade starter radio HF and 6 metres with internal ATU

Icom IC756 Pro Mk2

YES, THE SECRET IS OUT - the *IC756 Pro* has been improved. The new model will be called the *IC756 Pro Mk2* and *IC7500* in some countries. Estimated price to be about **£2495.00** offering:

- *Improved Twin Pass Band Tuning*
- *Better strong signal handling*
- *Extra display modes*
- *Digital Voice storage*

Orders are being taken for the new model with first shipments expected in October (In time for Donnington we hope).

We still have some of the original *IC756 Pros* but *be quick* as they are going FAST at only **£1899.00**

LAST FEW!
ML&S £1899
ZERO DEPOSIT!
48 * £56.19

This radio ONLY
ML&S £999
ZERO DEPOSIT!
48 * £29.56
FREE 5 year warranty

Icom IC706 Mk2G

the original mobile multiband radio. Now the 3rd variant offering HF/6/2&70 with DSP and detachable head. Icom certainly got this radio spot on with features and performance.

ML&S £3999
ZERO DEPOSIT!
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Yaesu Quadra VL1000

The ultimate add on for your station. Offering 1000 Watts of effortless RF on HF and six metres this amplifier is a delight to use.

RRP £799
ML&S £549
ZERO DEPOSIT!
48 * £16.24

Yaesu FT840

an excellent basic radio offering top notch performance at a budget price.

RRP £1299
ML&S £1249
ZERO DEPOSIT!
48 * £39.96

Yaesu FT100D

following on from the FT100 the D version offers a few extras and improved HF performance.Auto repeater shift on VHF and UHF plus an easy menu system make this the most popular HF mobile radio.

RRP £339
ML&S £269
ZERO DEPOSIT!
24 * £13.48

Yaesu VX5R

Our best selling hand held ever with free SU1 and Case giving 5 Watts on 2/70 & 6metres. With built in wide band receiver (inc AM & WFM) this is a scanner and a hand held.

Icom IC910H

The LATEST VHF/UHF multimode. Features include 100W on VHF, 75W on UHF and true dual receive.

STANDARD UNIT
ML&S £1299
ZERO DEPOSIT!
48 * £38.43

OPTIONS AVAILABLE 1296MHz, DSP units, TCXO, Voice Synthesiser, TCXO, Narrow CW filters.

Icom IC718

this is Icom's entry level HF radio. offering 100W HF CW/AM/SSB and DSP. The performance is staggering for a budget radio ! Only £699.00 with DSP

FREE DSP this month
ML&S £699
ZERO DEPOSIT!
48 * £20.68

RRP £1699
ML&S £1199
ZERO DEPOSIT!
48 * £35.48

Yaesu FT847

at only £1199.00 this is still the best selling multiband base radio offering HF/6/2 and 70cms plus still the only radio to offer all mode four metre operation.

FT817 PACKAGE
- Nicads
- Charger Case
- HF Walkabout
- VHF/UHF rubber helical

ML&S £850
ZERO DEPOSIT!
48 * £25.15

Yaesu FT817

this is a radio that every radio ham should own. As well as being an excellent portable radio this makes an ideal second receiver for the shack. Supplied as a package with nicads, charger, protective case VHF and HF aerials at only £850.00 you are ready to sample the delights of QRP operation.

THE VERY *BEST* RADIO EQUIPMENT *brought to you by MARTIN LYNCH & SONS*

Yaesu VX1R

still the smallest handheld around with built in scanner offering up to 1 Watt on 2 & 70 and Lithium ion battery that last for ages this is the ultimate pocket radio at only:

ML&S £189
ZERO DEPOSIT!
12 * £17.36

IC746

This radio still ticks along as a great shack in a box giving 100 Watts HF/six and 2 metres.

This radio ONLY
ML&S £1395
ZERO DEPOSIT!
48 * £41.28

ML&S £2195
ZERO DEPOSIT!
48 * £64.95

Icom IC775DSP

This is the Icom Flagship and still a very popular choice with the daytime net guys. TX audio is first class and despite being a top grade radio the uncluttered controls and simple display make it a delight to own.

Have a

.....STOP PRESS...MARTIN LYNCH & SONS OPEN DAY....24TH-2

The BEST RADIO EQUIPMENT at the

Nice to see you all at Donnington, we have a very few post event specials - so be quick, once they're gone that's it!

FT100MP Mk V with FREE FT 1500	£2899.00
FT1500 50W 2m micro rig	£159.00
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FT840HF starter radio	£549.00
VX5R FREE SU-1 FREE Case FREE CN-3	£269.00

Martin Lynch is to launch their NEW website

with special features never seen on a ham radio site before

DON'T FORGET the ML&S open weekend 24th-25th NOVEMBER We shall be awarding the FT817 challenge trophies during the weekend

Yaesu VR-5000
the new desktop scanner from Yaesu all bands and all mode with a host of features.

ML&S £699
ZERO DEPOSIT!
48 * £20.68

If you require the B2000 or 23cms CALL FOR A PRICE PACKAGE

Kenwood TS2000
Every once in a while a new product comes along that sets a new trend and the TS2000 has certainly done that. Offering all bands 1.8 to 23cms *(23 cms optional)* Built in DX cluster monitor and auto QSY plus dual speed packet modem make this radio stand out. Add to that the excellent Kenwood build quality and reliability you have a radio that is going to be around for a long time.

The Millennium Radio Station

ML&S £1699
ZERO DEPOSIT!
48 * £50.27

Kenwood B2000
all the features of the TS2000 but no knobs. This radio is controlled via your PC or the Head of a TMD700E *(Upgrade will be required on early versions of the TMD700E)*

ML&S £1599
ZERO DEPOSIT!
48 * £47.31

Kenwood TS570DGE
this is a first class radio that has no competition in its price bracket. Offering 100 Watts HF and built in ATU. A good choice for your first HF station but equally at home in the experienced operators shack.

ML&S £849
£85 DEPOSIT!
48 * £25.12

Kenwood VCH1
Handheld Slowscan unit at only

ML&S £299
ZERO DEPOSIT!
36 * £10.87

Kenwood THD7E
the Packet handheld that every one wants.

ML&S £299
ZERO DEPOSIT!
36 * £10.87

Kenwood TS870S
The original DSP radio still very popular and very reliable offering 100 Watts and built in ATU

ML&S £1395
ZERO DEPOSIT!
48 * £41.39

ML&S £459
ZERO DEPOSIT!
48 * £13.58

Kenwood TMD700E
with packet cluster monitor and APRS built in this is fast becoming THE mobile radio for VHF/UHF in car operation.

Kenwood TS50S
this is the original HF mobile radio still selling at only £599.00 - an absolute BARGAIN

ML&S £599
£60 DEPOSIT!
48 * £17.72

ML&S £299
ZERO DEPOSIT!
36 * £10.87

Kenwood TMG707
a simple twin band VHF radio with a large display and speech option make this an ideal choice for people with Eyesight problems.

Whats new!

New Icom radio!
Icom have announced the New IC7400, replacement for the IC746. Many improvements including 32 bit DSP! *CALL FOR DETAILS*

MD200A8X
The new "Old Style" microphone from Yaesu. The audio is very punchy with top class clarity. A superb match for any Yaesu Base radio. This microphone has room for a second insert which is switchable. *At an introductory price of* **£249.95** *delivered to your door.*

SGC Smart Tuners
we have the full range of these unique tuners in stock with an SG230 and 20 foot of wire you are ready to operate top band to ten. The SGC tuners start at **£259.00** with different types to suit specific needs. Give us a call with your requirements.

Samlex SEC1223
Back in stock! The best selling original 23 amp switch mode power supply Only **£99.95** accept no substitute!!!!!!

MFJ-269
Antenna Analyser 160m-70cms Probably the best analyser MFJ have made! Every shack should have one. Only **£299.95** delivered to your door.

Hustler Antennas are BACK!
If you want the best mobile HF whips around then Hustler is the choice. For £195.00 you can have the full set of 1kw rated coils and the MO3 mast (10/15/20/40&80m)

Diamond WD330
wide band dipole covering 2-30mhz at 100 foot long this centre fed Broadband Dipole will give a flat SWR over all bands above 2mhz.ATU is not required. Only £189.95 Delivered

Diamond SX1000
1.8-1300mhz power and swr meter. 200W and dual sensor. The ideal companion for the TS2000/FT847 at only **£169.95**

Diamond Power Supplies
When it comes to a shack supply so many times we hear of people having a £1500 radio on a budget power supply. Those who care about there radio use Diamond GSV3000s and GSV4000s.
- GSV3000 is a first class linear PSU rated at 30 amps at £150
- GZV4000 is the best Switch Mode Comms power supply rated at 40 amps at **£160.** Prices include delivery.

TS870s at £1399.00 Payment illustration
Zero deposit • 48 payments of £41.39 • *Total amount payable:* £1986.72
APR 19.9% ML&S is a licenced credit broker. Finance offered subject to status. Full written details on request. E&OE

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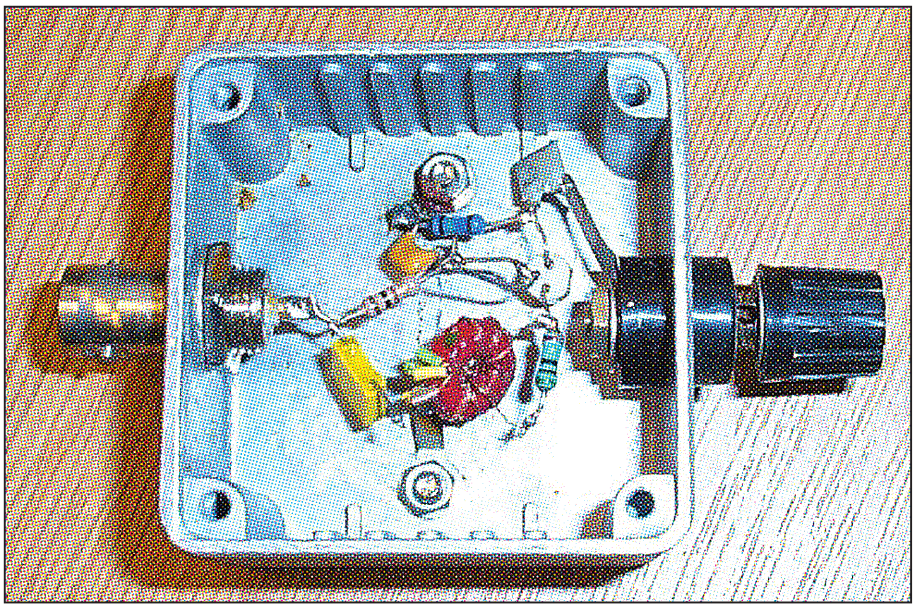
TH NOVEMBER.....YAESU, ICOM AND KENWOOD ATTENDING.....

BEST PRICES at ML&S - where else!

An Active Antenna for 160 to 4 metres

By Ian Braithwaite, G4COL *

THIS active antenna has been doing its job in my loft for well over 10 years. I've seen a number of designs over the years, and this is the simplest, deriving from experiment. When I recently saw a highly sophisticated-looking commercial unit, I felt it was time to 'go public'.



The active antenna circuitry built into a diecast box.

Active antennas rely on a combination of an antenna element (such as a dipole, monopole, or loop) and an amplifier, which is the 'active' part. The antenna element is non-resonant, and tends to be physically small. They have broad operating bandwidths, so don't need to be tuned. In comparison, a resonant antenna would need tuner adjustments to cover the whole HF and lower VHF spectrum. So, the attraction of active antennas is convenience.

It is only fair to point out that some people dislike them, and there are pitfalls, which I shall point out. If you want a really excellent receiving antenna for all the HF amateur and broadcast bands, and have masses of space, why not put up a Beverage or rhombic antenna? If, as in my case, that's out of the question, then consider an active antenna and, better still, try building your own! This one can be put together in a few hours and covers 160 to 4 metres.

DESIGN CONSIDERATIONS

THE CHOICE of a small antenna element (less than a tenth of a wavelength or so) is between the dipole and monopole, which respond to the electric field component of the radio wave; and the loop, which responds to the magnetic field component. A broadband active loop antenna is still on my list of things to try.

My first homebrew active antenna was a dipole, and was quite successful. The main thing it taught me was that it's not a good idea to have too much gain. It is natural to conclude that, as a short antenna picks up a smaller signal than a resonant dipole, the gain must be made up in the amplifier. Being a broadband device, the amplifier is subjected to the entire HF radio spectrum including powerful broadcast transmitters. What tends to happen in practice is that it distorts, generating intermodulation products. These appear to the receiver as additional signals and, though giving the impression of a 'lively' receiving system, are entirely unwanted. An attenuator between the active antenna and receiver is of no use at all, if the distortion has already happened in the active antenna.

It occurred to me to try a single wire monopole, which made for a simpler amplifier. This worked and has been in use ever since.

CIRCUIT DESCRIPTION

THE AMPLIFIER, shown in **Fig 1**, is a source-follower circuit designed around Tr1, a J310 FET (field-effect transistor). This has to present a high impedance to the small monopole, otherwise signal voltage is lost, and then deliver the signal to the receiver input, commonly a 50Ω impedance.

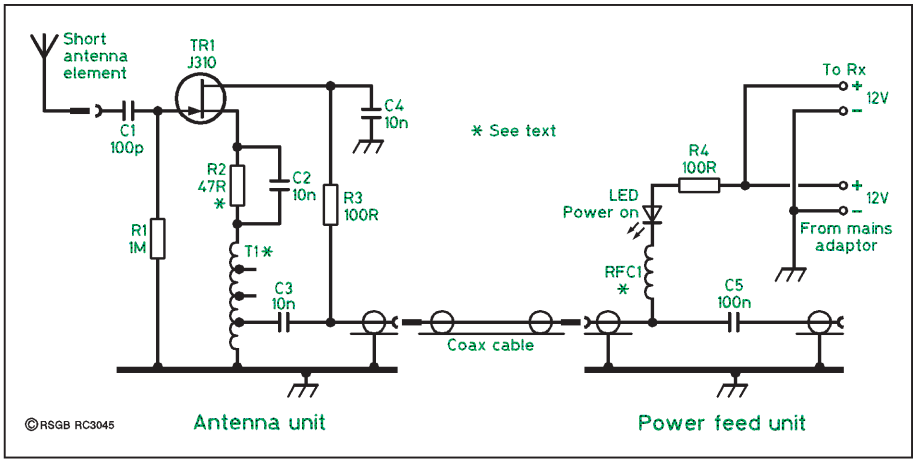


Fig 1: Circuit diagram of the antenna and power feed units.

* 28 Oxford Avenue, St Albans, Herts AL1 5NS.
E-mail: ianb@g4col.demon.co.uk

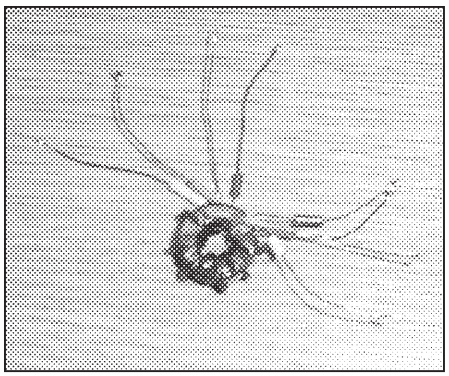
Maker	Maker's part no	Supplier
Amidon	FT37-61	JAB, Sycom
Amidon	FT50-61	JAB, Sycom
Philips (3C85 material)	433003037790	Farnell (stock code 178-504)

Table 1: Suitable toroidal cores and their suppliers.

The FET has an output impedance in the region of 50 to 100Ω, which means that, if the FET source fed the receiver 50Ω input, more than half the signal voltage would appear across the FET, and less than half would be delivered to the receiver. That's where the transformer T1, in the source circuit, comes in. I used a quadrifilar winding to give a 4:1 voltage step down ratio. This gives the source follower an overall gain of almost $^1/_5$ in voltage (-14dB when the ratio of gate voltage to output voltage is expressed in decibels).

The benefit of doing this is that the FET has much less work to do. The action of the transformer makes the impedance presented to the FET source bigger by a factor of $4^2 = 16$ times, which is 800Ω. The result is improved linearity. Locations differ, but I have never known the active antenna produce unwanted signals. You may be concerned that this low gain would produce a rather 'deaf' receiving system but, from experience, comparing it to a transmitting dipole and tuner, you won't miss much, if anything. The internally-generated noise is very low, and the background noise in most of the HF spectrum is high.

Power to the active antenna is fed via the coaxial cable, and the supply is injected via choke RFC1 housed in the power-feed unit near the receiver. R4 is included to limit the current in the event of an accidental short-circuit. An LED in series with the supply indicates that current is being drawn, and protects against inadvertent supply polarity reversal. Shown on the circuit diagram is a power feed for a receiver. This is for the case where the receiver and antenna can share the same power supply. You may choose to omit it.



Detail of the toroidal transformer, T1. Notice the placement of the individual turns, and their identification with coloured sleeving from ribbon (rainbow) cable.

The frequency response is shown in **Fig 2**, and is nominally flat to within 1dB to 60MHz and within 2dB to 100MHz.

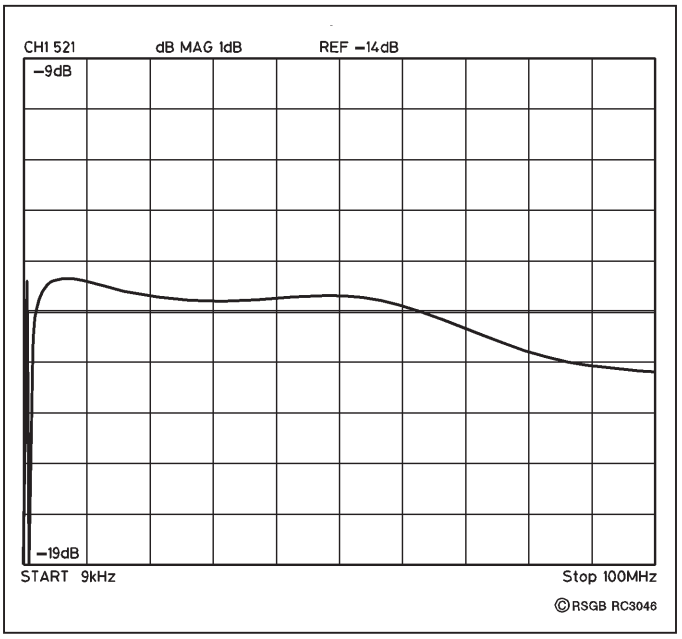


Fig 2: Frequency response of the active antenna.

CONSTRUCTION

TRANSFORMER T1 requires some care in construction, and is described in some detail, starting with the quadrifilar wire itself. This would probably be a labour-intensive and expensive item to produce commercially, and is where the amateur's craft skills come into their own.

Take four strands of 0.2mm diameter (35/36 SWG) enamelled copper wire, length approximately 300mm for each strand. Placing the wires side-by-side, clamp one end and, pulling the wires taut, fix the free end in the chuck of a hand drill. Turn the drill to twist the strands together. There is no need to twist too tightly, a few twists per centimetre being adequate.

The core should be a high-permeability (greater than 100) ferrite toroid, 10 to 15mm in diameter. The purpose of the core is to produce a sufficiently high inductance to avoid gain roll-off at low frequencies, and given a high enough permeability, a wide variety of types, still to be found at rallies, should be suitable. If you are buying new, **Table 1** shows the types that should be suitable. Supplier contact details are given at the end of the article. Between them, they should be able to source all items needed for construction.

Wind seven or eight turns of the quadrifilar wire on the core. (Each time the wire passes through the core counts as one turn.) The photograph shows how this has been done on a T37-61 core. To secure the winding, the core has been dipped in polyurethane varnish and left to dry.

The individual wires need to be separated and the windings identified. Each wire end should be stripped of its insulation. An easy way to do this is to hold the wire end in a blob of solder on the end of a soldering iron for a few seconds. Make sure you do this in a well-ventilated area and avoid inhaling the fumes or getting them in your eyes.

The ends of each winding can then be identified with a multimeter or continuity tester. I found it useful to mark the windings with short strips of insulation stripped from ribbon cable, and slid over the wires as shown in the same photograph. If you do this with three windings, the fourth can be left plain.

Naming the windings arbitrarily 1 to 4, take the *end* of winding 1, and twist together with the *start* of winding 2. The *end* of 2 is then twisted with the *start* of 3, and so on. Twist fairly close to the toroid, and make electrical connection using the soldering iron, as described above, observing the precautions. The transformer is now complete. Check for electrical continuity through the whole transformer by measuring across the un-paired wires.

Once the transformer is done, the rest of the construction is straightforward. Start with R2 as 47Ω or 68Ω. It may need to be changed on test. The photograph on p 52 shows my loft unit built into a diecast box, with a couple of solder tags for earthing to the box. Alternatively, the circuit can be built above a small piece of plain copper-clad board, which can then be fitted inside a weatherproof enclosure if outdoor mounting is required. The enclosure itself can be plastic - it is an antenna after all!

Make sure you select the correct tap on transformer T1 for the output, and take care to prevent the unused taps from shorting to any other part of the circuit.

COMPONENTS LIST

Positive supply (negative earth) version

Resistors (0.25-watt metal film)

R1	1MΩ
R2	see text
R3, 4	100Ω

Capacitors

C1	100pF ceramic plate
C2, 3, 4	10nF ceramic disc
C5	100nF ceramic disc

Inductors

T1	see text
RFC1	20 turns on high-permeability toroid

Semiconductors

Tr1	J310
LED	Red or chosen colour

Negative supply (positive earth) version

Resistors (0.25-watt metal film)

R1	1MΩ
R2	see text
R3	100Ω

Capacitors

C1	100pF ceramic plate
C2, 3	10nF ceramic disc
C4	100nF ceramic disc

Inductors

T1	see text
RFC1	20 turns on high-permeability toroid

Semiconductors

Tr1	J310
LED	Red or chosen colour

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Tel: 01372 372 587.
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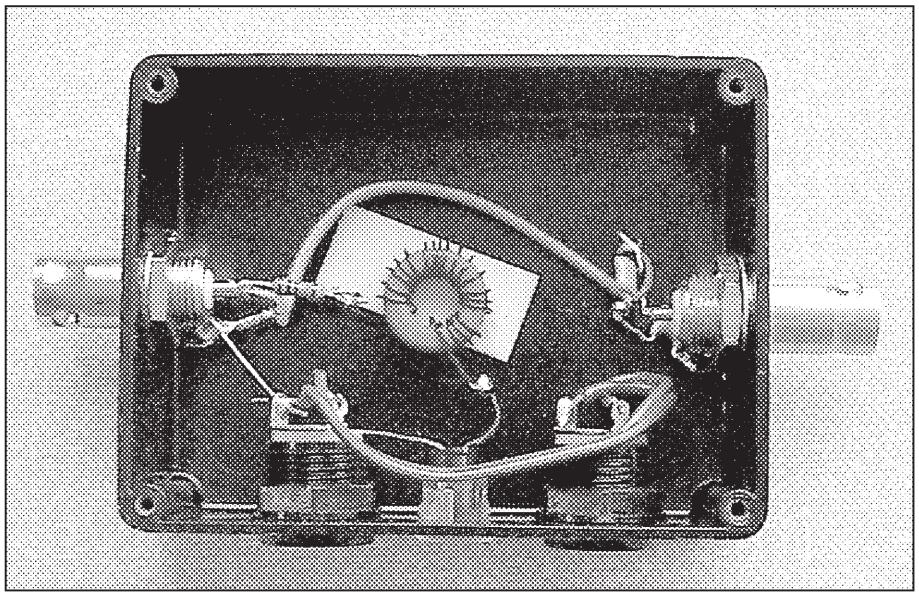
www.sycomcomp.co.uk

THE POWER FEED

AS THE PHOTOGRAPH (right) illustrates, I built my power feed unit in a small plastic box. The choke is a single winding of around 20 turns on another high permeability toroid, which can be the same type as that used for the transformer. A metal enclosure would make sense for the power feed unit, since it will be near the receiver and possibly also domestic interference sources. If using a plastic housing, link the coaxial sockets with coaxial cable: I used some RG178. Keep the braid 'tails' short to avoid unwanted pickup.



The power feed unit.

TESTING AND COMMISSIONING

CHECK CAREFULLY for wiring errors. For bench testing, the power feed and antenna units can be linked with a short coaxial cable. Having ensured that its voltage and polarity are correct, connect the power supply and check that the LED is lit. Measure the voltage across R2 and divide this by its resistance to find the current, or measure the supply current directly. This should be in the region of 10 to 20mA. I selected R2 for a current of around 15mA.

If the power feed output is now connected to a receiver, a small amount of additional hiss should be heard. Nothing should be heard until a short wire (1 metre or less) is placed on the antenna input. Signals should be heard on the HF bands, given suitable propagation conditions, or perhaps television or PC monitor timebase harmonics.

The antenna unit should be installed as high and as far away from local sources of interference as practicable. Mine is at the apex of the loft, with an antenna wire of around 1 metre length, suspended from a hook in the highest beam. Avoid the temptation to increase the wire length excessively in order to increase the signal. This brings the risk of distortion, and departure from a flat gain with frequency.

POSITIVE - EARTH VERSION

WITH A NEGATIVE supply and positive earth, a couple of components can be omitted. This is shown in **Fig 3**, below. However, note that, while this is fine on its own, *it must not be connected to a receiver with a negative earth, because this shorts out the supply.* ♦

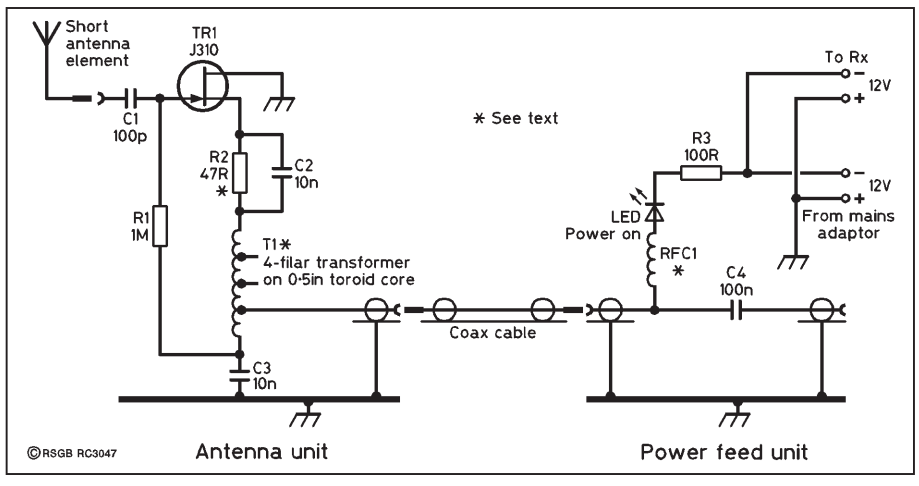


Fig 3: Circuit diagram of the antenna and power feed units for a positive - earth version.

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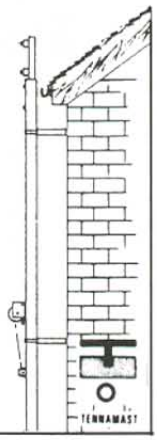

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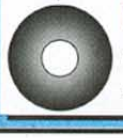

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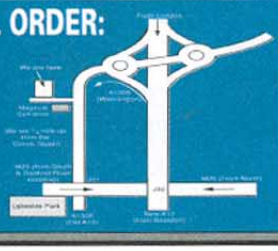

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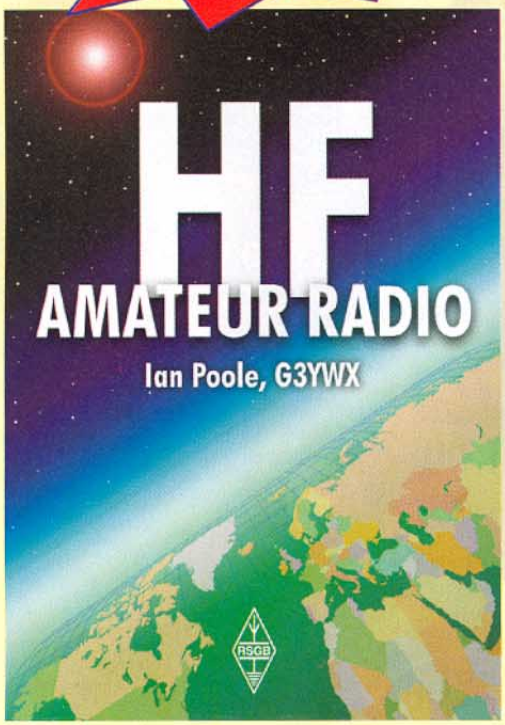

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Technical Topics

PAT HAWKER, G3VA
37 Dovercourt Road, London SE22 8SS

WORKSHOP HEALTH HAZARDS

BACK IN THE 1970s 'TT' drew attention to the health hazards arising from the solvents commonly used in electronic workshops ('Watch those cleaning solvents', 'TT'. August 1974, p527, and in several editions of the out-of-print *Amateur Radio Techniques*). This recalled how, as a newcomer to amateur radio in the 1930s, I had purchased from the chemist a small bottle of carbon tetrachloride and then often used this solvent liberally to clean my 7MHz crystal when this became sluggish in its open holder and later for cleaning switch contacts etc. "Nobody warned me to go carefully with it – and it was not until many years later that I had the slightest knowledge that it is highly risky stuff to use... is extremely toxic and can be absorbed through the skin."

The 1974 item quoted an American article that listed a large number of solvents used for cleaning including acetone, benzene, carbon tetrachloride, ethyl alcohol, isopropyl alcohol, methylene chloride, 1,1,1-trichloroethane, trichloroethylene, xylene, etc. "The author warns that all organic solvents are harmful to some degree, and some are very harmful; most are highly flammable and the vapours can form dangerously explosive mixtures with air and may attack internal organs and the nervous system..."

Five years later, thanks to Dr Gerald Bulger, G3WIP, attention was drawn ('TT' November 1979, p1034) to an editorial in *The Lancet*: 'Fluxes and Wheezes'. This editorial pointed out that it had been known for some years that the fluxes used in 'hard soldering' could have a dual reaction on some persons inhaling fumes from the fluxes: an acute response within about 20 minutes (prevented by sodium cromoglycaye inhalations); and a more common delayed reaction, some four to eight hours later, sometimes accompanied by fever.

I wrote: "Of more concern to amateurs, however, are the results of a series of investigations carried out in the past two or three years; these show that conventional soft soldering can also produce a form of asthmatic condition, with coughing, wheezing and tightness. Soft soldering with lead/tin alloys at 250 - 450°C generally involves non-corrosive fluxes such as the common cored solder-flux. These contain colophony which is the solid material remaining after turpentine has been distilled off pine resin. The investigations show that an appreciable percentage (of the order of 20 - 25%) of those exposed to flux fumes, whether or not actually doing the soldering, develop asthmatic symptoms. *The Lancet* editorial stressed that "efficient exhaust ventilation

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is a first step, and a search for a safer flux will be a long-term objective". Since most factory assembly areas are large compared with an amateur shack, it would seem that quite small concentrations of the fumes can be troublesome to those who have become sensitised to them over a long period. The symptoms disappear after a day or two of non-exposure..."

Since then, some brands of cored solder have become colophony-free, but this is not universally the case. Good ventilation is always advisable, particularly if you are at all asthmatic.

An update on these topics: 'Chemical Hazards - Pete Roberts explains the health hazards and regulations associated with chemicals commonly found in TV repair workshops' was published in *Television*, February 2001, pp202-205. Even this extensive treatment of the subject includes an editorial warning: "In compiling this work, Pete has carried out extensive research, in addition to sharing his own experience. However, this article should be treated as a guide only; if you are using any chemical regularly, or in large quantities, find out from the supplier exactly what are the regulations relating to it, and whether it poses a safety risk."

The article points out that "many familiar materials are potentially harmful and their uses in the workshop are subject to COSHH (Control of Substances Harmful to Health). They include domestic products carrying a CHIP (Chemical Information and Packaging Regulations) label. Materials like washing-up liquid, that do not carry a CHIP panel, do not come under the requirements of COSHH, but toilet bleach, for example, does.

"Other candidates are cleaning solvents, paints and varnishes, adhesives and sealants, together with what is arugably the most significant hazard in the electronics industry - rosin (colophony) flux fumes. Materials like solder that contain lead come under separate regulations. Does COSHH apply to you? Yes, if you employ others, or if members of the public – including your family – have access to your premises."

It seems evident that an amateur radio workshop or workbench would not normally be subject to the COSHH regulations, but that does not mean that anyone using chemicals etc in the pursuit of their hobby should not be aware of the potential health hazards to themselves or to their families. As Pete Roberts states: "It doesn't pay to play Russian roulette with your health, particularly as the harm inflicted by some materials may not show up for several decades.

"Some substances can no longer be legally sold (or, in some cases, manufactured), although quantities may still exist. Chlorofluorocarbons (CFC) and their temporary replacements, hydrochlorofluorocarbons (HCFC) - in normal use as aerosols - may be regarded as non-toxic although they contribute to ozone depletion. In very high concentrations they can kill by excluding oxygen, ie by asphyxiation. Above a certain threshold, CFCs can also cause heart or respiratory failure, but this threshold is unlikely to be reached. They can be used in the cleaning of delicate items such as video heads or CD pickup lenses. However, when exposed to extreme heat, they will break down to form extremely dangerous products such as phosgene, hydrogen chloride and hydrogen fluoride gases."

It is noted that the sale of previously popular chlorinated solvents, including 1.1.1-trichloroethane, trichlorethylene and carbon tetrachloride for general-purpose cleaning and degreasing is now forbidden under EU law. All chlorinated solvents are hazardous with pronounced narcotic and anaesthetic properties. Acute exposure to high levels, or long-term exposure at low levels, is known to result in kidney and liver damage. Many are suspected carcinogens.

"Replacement cleaning agents now fall into two main classes, aqueous (water-based) typified by Electrolube's 'Softwash 2000' and non-aqueous (which tend to be

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alcohol based)... Methylated spirits (meths) [although most dangerous to drink] is an excellent general-purpose cleaner, relatively cheap and readily available from any pharmacy. It's harmless to plastics, including polystyrene, natural and synthetic rubbers. Its main drawback is that it can contain significant amounts of water. This may cause problems in some applications and slows down evaporation... it is not good at removing flux from PCBs. It is a relatively safe material to handle. While the ethanol content is harmless, methanol is harmful by skin absorption and inhalation of the vapour although, in practice, the amount to which you'll be exposed by casual contact is unlikely to cause harm.

"Becoming very popular for general cleaning is isopropyl alcohol (IPA) – known as 'rubbing alcohol' in the USA. IPA vapour is not particularly toxic by inhalation but, like its cousin ethyl alcohol, IPA is very, very flammable. As an all-round service aid, IPA is almost as good as the CFC cleaners it is intended to replace. It is harmless to most plastics and finishes, safe on rubber belts and friction surfaces, and very good at removing flux residues from PC boards...

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"Never use petrol for any cleaning work. It is very aggressive towards most thermoplastics, paints and finishes. Petrol vapour forms an explosive mixture with air, turning the workshop into a potential bomb. Petrol contains many poisons, including benzene, arguably the most dangerous human carcinogen known. Cancers caused by exposure to benzene may take 20-30 years to develop...

"The major health hazard facing electronics engineers is posed by rosin, or colophony, flux fumes. When used as a flux, rosin forms fumes that are a known cause of industrial asthma... From experience, it is difficult to make a good join with so-called 'low-fume' solders – even using a temperature-controlled iron. It's also been found that these fluxes can pose even more of a health hazard than conventional rosin types.

"By far the most effective means of reducing exposure is by extracting the fumes


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at source. Extractor kits comprising a tube mounted above the iron tip are available... Next best is the miniature version of a cooker hood that sits on the bench behind your job. These use a fan to draw the fumes through a charcoal filter before returning cleaned air...

"As far as electronic servicing is concerned, lead represents a low hazard... While it is obvious that you must not smoke when handling flammable solvents or aerosols, smoking while using non-flammable materials also poses risks... All chemical splashes to the eyes must be treated as serious accidents. The affected eye must be immediately irrigated with clean, cold tap water for at least 15 minutes. The patient should then be taken to the nearest A&E department, even if no further symptoms are apparent... To avoid inadvertently swallowing anything harmful, always wash your hands before eating... Never use cleaning agents on live equipment, and after cleaning a PCB, allow it to dry thoroughly before applying power..."

Over the years several other safety precautions have been noted in 'TT' including recommendations such as using eye protectors when soldering or metalworking, taking precautions against fire (smoke detector, fire blanket, fire extinguisher suitable for electrical equipment fires), etc.

WHEN RECEIVERS WERE LARGE AND HEAVY

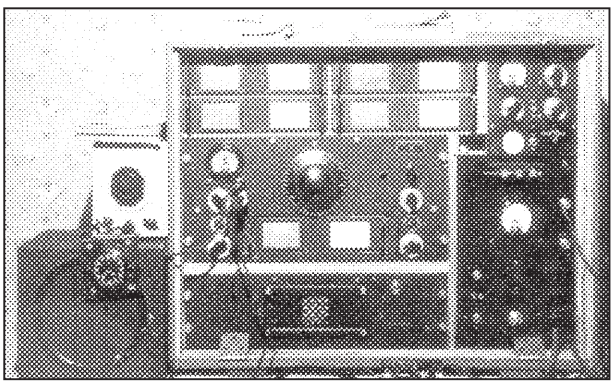
I OFTEN THANK my lucky stars that I became interested in 'short-wave radio' in the mid-1930s when the trade still recognised the home-constructor by marketing components with screw-terminals that eliminated any need for soldering. This was an era when it was still virtually necessary in the UK to home-brew HF receivers. The relaxation of dollar currency restrictions a year or two later opened the way for imports of factory-made American communications receivers by Hallicrafters, National, RME, Hammarlund etc. Similarly, there soon followed the appearance in the UK of 'all-wave' broadcast receivers, some of which were capable of receiving 7 and 14MHz amateur AM phone and could be made capable of receiving CW by the addition of a simple BFO or by inducing the IF stage to oscillate. Home-building of receivers began to decline, but transmitters remained overwhelmingly home-built.

In 1935, a schoolboy had little choice but to set about building a short-wave receiver, usually a simple two-valve 0-V-1, ie a regenerative detector plus audio amplifier with triode or pentode battery valves. The 2V filament supply usually came from an 'accumulator' (wet lead-acid cell), a 90V or 120V HT battery and often a 9V grid-bias battery for the audio amplifier stage. The more ambitious constructors included a tuned or untuned (aperiodic) RF stage.

For CW signals, the 0-V-1 or 1-V-1 receivers could be remarkably sensitive and for newcomers to amateur radio opened the way to a modest degree of DX operation. But, more importantly, they also ensured that many newcomers absorbed a lasting interest in constructing receivers and learning the basics. There was no technical examination to pass until 1946.

It was WWII that really spelled the demise of home-brew receivers for most amateurs. In the Services they became acquainted with the high-performance superhet communications receiver and then saw thousands of these models appearing on the surplus market that flourished in the late 1940s. It was perhaps largely by accident that I did not follow this path, although by then I had become a fan of the HRO receivers that I had used for five years.

Instead, in 1946, I acquired from a Special Communications colleague Johnny Bowers, G4NY, a pre-war Model H Tobe tuner, two-excellent IF transformers with tertiary windings and a drilled metal chassis. In 1935-36 the Tobe-Deutschmann Corporation had marketed a kit receiver designed by Glen Browning featuring a pre-assembled Model H tuner covering four ham-bands - only (1.7, 3.5, 7 and 14MHz) - probably the first receiver to be designed



A wartime HRO receiver as part of a Special Communications 'Coffin' W/T station comprising HRO, HRO-PSU, HRO coil-set, Mk III 30W transmitter and Mk III-PSU, as located in Brussels, late 1944. The package formed an effective but heavy and bulky HF station. By myself, I once had the memorable experience of manhandling one of these packages up a narrow spiral staircase. If only I had known how solid-state would shrink the size and weight of modern transceivers (though not necessarily greatly improving performance)!

with this feature. In 1938 this tuner had been featured in several articles in the *Television & Short-Wave World* and a few must have been imported into the UK.

Using metal-octals (6SK7 etc) and a regenerative detector (6SJ7), it proved possible to construct a reasonable receiver without resource to any test gear. Subsequently I introduced many modifications to my first implementation, including the use of several 465kHz crystals, external preamplifier and converter for 21 and 28MHz. In fact it remained the main CW-only station receiver at G3VA for over a quarter of a century. About 1973 it was discarded.

Recently, for no good reason, I have spent many happy hours attempting to restore the basic receiver to something like its old performance, with reasonable success. There is something very satisfying about hearing the traditional HF CW bands come to life on a home-brew or indeed any vintage valve receiver. Indeed, I would claim that the repair or restoration of equipment capable of good performance is one of the most satisfying aspects of our hobby – although, it must be admitted, one of the most frustrating when, despite the expenditure of much time and effort, little is achieved.

A series of articles 'Restoring Vintage Radio Sets' (dealing with valve-type broadcast receivers) by Ian Rees began in *Television*, July 2001 following a change in name to *Television and Home Electronics Repair.* The articles aim to provide a detailed guide to circuit operation of valve sets, restoration techniques and the need for such sets to conform to modern safety standards. They emphasise that valve sets are becoming rare and that those still turning up at car boot sales etc have become collectable, although restoration and repair require a good understanding of the principles and practices of valve receiver design.

An unusually ambitious restoration project is described by Mike Lemin, G4UUB, in 'Rebuilding a National HRO' in *Radio Bygones* (No 72, August/September 2001, pp4-12). It stemmed from a "box of HRO bits" donated by the late G3JQI: "There it was, the remains of the cabinet, the chassis and a cardboard box full of rather murky-looking IF transformers. There was also the all-important tuning capacitor, rather corroded and full of greasy fluff and other debris, together with numerous UX valve bases and old fixed resistors and capacitors… inspection showed it to be an early model HRO Senior."

Clearly, this was a major rebuilding project and must have taken a great deal of effort, but the illustrations in the article show the gleaming result - not an exact rebuilding of the original model. G4UUB used 12SK7-etc metal octals rather than the 6D6 etc. He also introduced a 150V stabilised line for the oscillators. The final result outperforms the three other HROs of which G4UUB is the fortunate owner.

He concludes: "Well, was it all worth it? Most definitely, if only to watch other people's faces when the set's inside and the under-chassis wiring are revealed. It certainly works well… It has given me a lot of satisfaction because I was not sure if I was still able to wire up a valve set to the high standard I deemed necessary … A lot depends on how [these old HROs] are going to be used. Are they for communication or just listening to broadcast stations? Or, even worse, dead museum pieces? Mine is for the first suggestion. Used in conjunction with a vintage transmitter, the rebuilt model certainly comes up to expectations, one 'Black Box' that I really like!"

G4UUB provides some interesting notes on the history of this classic receiver, although there is one that I find debatable. He notes correctly that the model was known in its early development stage as the HOR, but this was changed to HRO when it was realised that HOR was a pronounceable word. But he believes that the initials HOR stood for 'Ham Operator's Radio'. Personally I support the view expressed by the late Bill Orr, W6SAI, in 'The Wonderful HRO Receiver or, They Don't Build Them Like They Used To' (*CQ*, May 1975, pp17-21, 64-65) that the engineers and workshop used HOR as short for 'a Hell Of a Rush'. 'Ham Operator's Radio' seems unlikely since the original development was a rush job to meet the demand of some American airlines for a receiver more sophisticated than the earlier National AGS (Aviation Ground Station) receiver. The very first HRO models apparently did not have the ingenious 'amateur bands' bandspread facility introduced in the 1936 'HRO Senior' clearly directed at the amateur market. Models were fitted with glass valves with either 2.3V or 6.3V heaters. Apart from the outstanding mechanical drive for the four-gang tuning capacitors, this then state-of-the-art receiver had two tuned RF stages to minimise image reception. It was one of the first factory sets to incorporate the James Lamb crystal filter described in *QST* in 1932, based on the work in the UK by Dr Robinson for his 'Stenode' receiver. The HRO used an external PSU to reduce heating although Bill Orr claimed the company later regarded this as a major 'goof'. By modern standards the HRO with its PSU was large and heavy (but a minnow compared with the GPO whale discussed below).

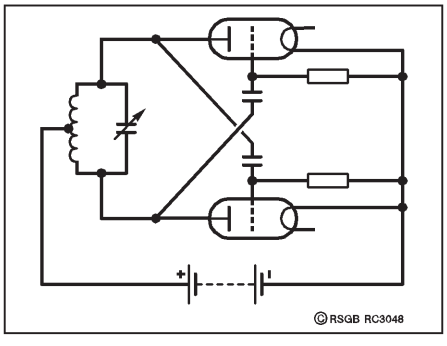


Fig 1: The VHF (30-35MHz) tunable push-pull (Kallitron) oscillator used in the 1934 'Quick Search' receiver. The tuned circuit was designed to have as low a resistance as possible, with all elements extremely rigid. The whole oscillatory circuit was enclosed in a lagged box so as to protect it from rapid changes in temperature due to heat generated in the valves or to changes in the ambient. Particular attention was paid to the tuning capacitor. Capacitance was varied by a rotating plate, series gap capacitor, and in switched steps connecting in parallel the individually-insulated plates of a fixed air capacitor. By using these two capacitors in combination, the capacitance variation was spread over sixteen ranges, each of which corresponded to the 180° movement on the continuously-variable capacitor dial.

Incidentally, the Public Records Office shows that, in 1938, the HRO was recommended for the British Y Service (inter-services intercept organisation) by Albert Mumford of the Post Office Research Station. He reported to the Y Board that the HRO had been tested and found to be a highly satisfactory receiver.

[Sir] Albert H Mumford (1903-1989) was well placed to judge. He had held an amateur (experimental) licence in the mid-1920s, joined the GPO Engineering Branch in 1924 and rose to become Engineer-in-Chief 1960-65, President of the IEE in 1963-64 and knighted (KBE) in 1963. He was acknowledged by G6CL in *World at their Fingertips* as playing a major role in securing at Atlantic City 1947 the footnote to the Radio Regulations that gave British amateurs alone the continued use of 1800-2000kHz. He was also instrumental in opposing demands to hand over the whole of the 7MHz band to HF broadcasting in Europe.

In 1933-34, with colleague Harold Stanesby, he developed a remarkable, truly innovative, if gigantic, HF receiver. This is described in 'A New Type of Quick-Search Radio Receiver' (*Post Office Electrical Engineers Journal,* July 1934, pp122-128), brought to my notice by George Cripps, G3DWW. The 'Quick Search' receiver covering 0.1-25MHz was developed for use at the Portishead HF Coast Station. It occupied four 6ft racks forming a console 7ft long, 6ft 6in high and about 1ft deep!

Basically, it was a double-conversion superhet receiver with a number of features still found in the latest solid-state receivers, including the use of a high 30MHz first IF (three push-pull stages) used with a 'single-span' push-pull (Kallitron) 30-55MHz tunable oscillator: **Fig 1**. A second oscillator was at 30.6MHz, the second IF (another

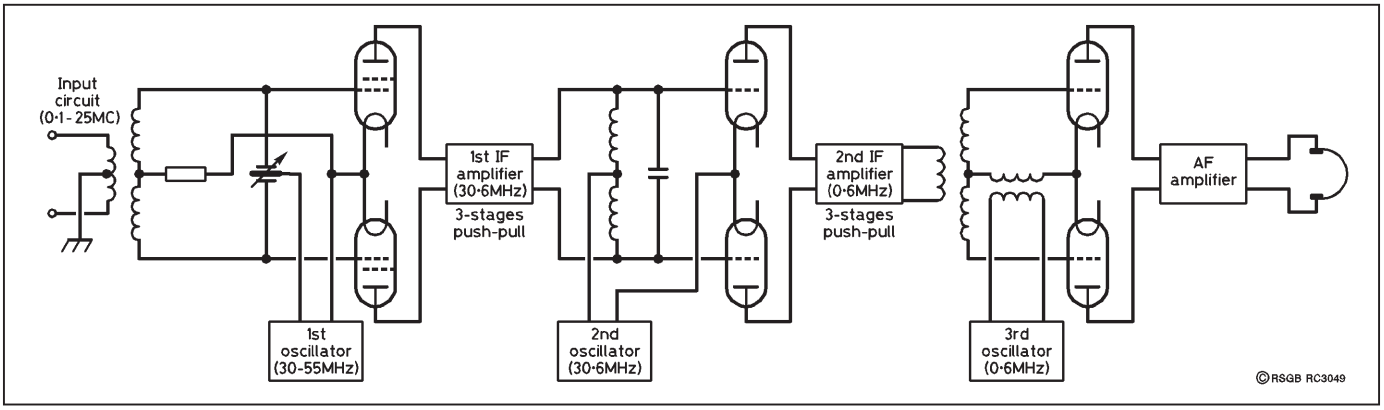


Fig 2: Outline diagram of the 'Quick Search' HF receiver developed in 1934 for the Portishead Coast Station by Mumford & Stanesby. By placing the IF above the signal frequency in the 'single span' technique, it was a forerunner of the modern frequency-synthesised receiver and achieved 60dB of image rejection throughout its 0.1-25MHz range, despite the absence of any RF amplifying stages.

three push-pull stages) was at 600kHz, with a third heterodyne mixer (product) detector. Push-pull mixers were used throughout: **Fig 2**.

In spite of the absence of any tuned-signal-frequency RF amplifiers, the image was 60dB down even at 25MHz. The one input tuned circuit used plug-in coils, eliminating the need for any band-switching of the coils. As can be imagined, great care was taken in the mechanical construction and heat lagging of the VHF VFO to achieve the degree of stability required. The concept of 'noise factor' was not developed until later, but the balanced first mixer using tetrode valves would have been far less 'noisy' than the conventional multigrid mixers. A truly remarkable design for 1933-34, although flawed by the absence of crystal filtering. It must have proved extremely expensive to develop and build. No wonder that Mumford and Dollis Hill were impressed by the relatively compact and economical (around £35 retail in the UK) HRO!

N1BYT'S WBR RECEIVER

DAN WISSELL, N1BYT, is a firm believer in the continued appeal of the simple regenerative receiver: "Despite its well-known drawbacks, the elegance and simplicity of the regenerative detector is still appealing." In *QST*, June 1998 (noted in 'TT', September 1998) he introduced the 'Optically-Coupled Regenerative Receiver (OCR)' as a method of overcoming two of the drawbacks of the simplest regenerative receivers arising from insufficient isolation of the antenna both from the regeneration control and the RF input to the detector. He argued that such coupling can result in RF radiation from the receiver, frequency instability due to a swaying antenna, 'suck-out' affecting the regeneration control when a resonant length of antenna is used, etc.

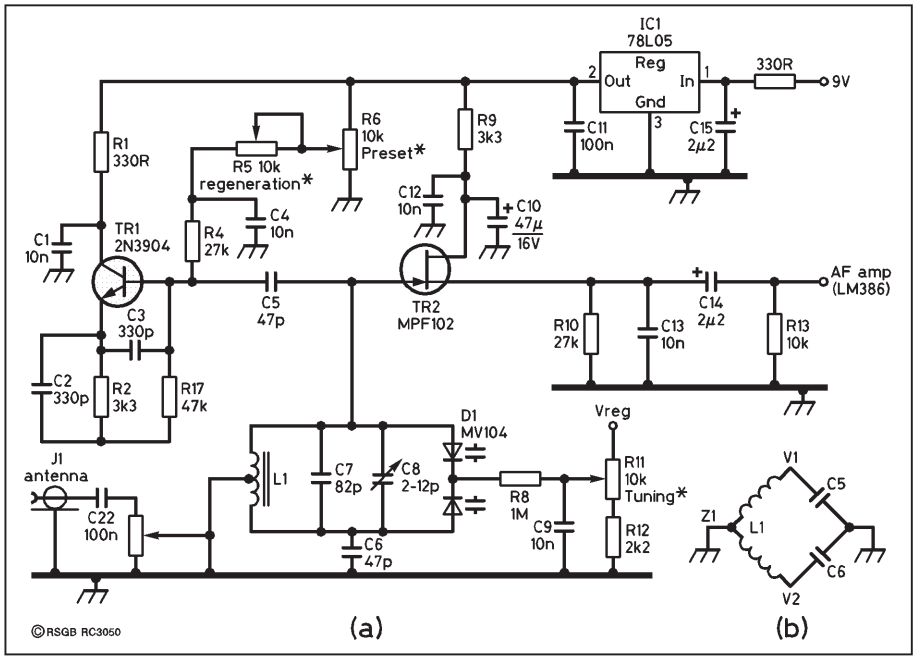


Fig 3: (a) RF section of N1BYT's WBR regenerative 7MHz receiver using a bridge arrangement to isolate the antenna etc. (b) Simplified tank circuit redrawn to show how the antenna coupling resembles a Wheatstone Bridge. L1 approximately 3.7µH - 28 turns of No 22 AWG enamelled wire centre-tapped on T-68-6 core (yellow); R3 (1k), R5 (10k) and R6 (10k) are linear-taper potentiometers; R11 is a 10-turn potentiometer; C2, C3, C5, C6 are 5% NP0 capacitors.

In the OCR there is no physical connection to detector or oscillator with the input signal optically coupled using a Hewlett Packard HCPL-4562, wide bandwidth linear optocoupler.

In *QST*, August 2001, pp34-37, N1BYT returns to this subject, presenting a simple receiver that bridges the gap between regenerative and direct-conversion receivers. In this new design, he eliminates reliance on "expensive, hard-to-find, electro-optical components with limited bandwidths". However, he again maintains that the key to a simple 7MHz regenerative receiver design lies in the coupling of the antenna. N1BYT has found a method of coupling that is reminiscent of a Wheatstone Bridge circuit and hence he has given the design the name 'Wheatstone Bridge Regenerative (WBR) Receiver'. He claims this opens the way to a *high-performance* regenerative receiver with the added plus that the design virtually eliminates such negative aspects as antenna radiation, frequency pulling, microphonics and hand capacitance effects.

The WBR design follows many of the features of the OCR other than the removal of the opto-coupler and rearrangement of the oscillator tuned circuit. **Fig 3(a)** provides the outline of the new RF section. The stable Colpitts oscillator and infinite-impedance detector have been retained. A major difference is that oscillation is now controlled by directly varying the base current of TR1 (R5 and related components). The tank circuit comprises L1, C7 and C8 and tuning diode D1. As shown in the insert, **Fig 3(b)**, the tank circuit can be represented in the form of a Wheatstone Bridge circuit with C5 and C6 the balancing capacitors for centre-tapped L1. In practice, the bridge cannot be perfectly balanced because the oscillator load capacitance changes as the level of regeneration is changed. Despite that, the arrangement still yields a significant reduction in oscillator voltage at the centre tap of L1, providing good antenna isolation. The *QST* article provides full constructional details, and a printed-circuit board is available. ♦

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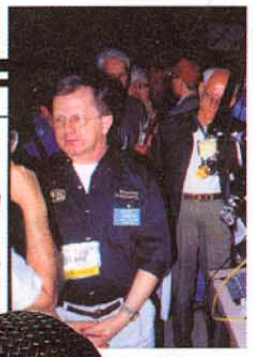
KENWOOD	YG-455CN-1 270Hz CW CRYSTAL FILTER	£100.00
KENWOOD	YK-88A-1 AM FILTER	£40.00
KENWOOD	YK-88C-1 500Hz CW NARROW FILTER	£40.00
KENWOOD	YK-88CN1 270Hz CW FILTER 8.83MHz IF	£40.00
KENWOOD	YK-88S-1 2.4KHz SSB NARROW FILTER 8.83MHz IF	£40.00
KENWOOD	YK-88SN 1.8K SSB FILTER (TS-440 /R5000)	£40.00
KENWOOD	YK-88SN-1 1.8KHz SSB NARROW FILTER 8.83MHz IF	£40.00
KENWOOD	PS-430 POWER SUPPLY	£120.00
KENWOOD	TM-G707E MOBILE TRANSCEIVER	£220.00
MCL	MCL1100 EASY READER	£75.00
MFJ	MFJ-1020B INDOOR ACTIVE ANTENNA	£40.00
MFJ	MFJ-1278 MULTI MODE DATA CONTROLLER	£199.00
MFJ	MFJ-462B MULTI READER	£140.00
MFJ	MFJ-462B MULTI-READER	£100.00
MFJ	MFJ-956 SWR AND ANTENNA TUNER	£30.00
MFJ	MFJ-986 ANTENNA TUNER	£195.00
MFJ	MFJ-989 3KW ROLLER COASTER ATU	£230.00
MFJ	MFJ-959B RECEIVER ANTENNA TUNER	£55.00
MICROSET	PT-135 POWER SUPPLY	£80.00
MICROWAVE MODULES	MML-144/100 2m 100W LINEAR AMPLIFIER	£129.00
MICROWAVE MODULES	MML-144/50S 2m 50W LINEAR AMPLIFIER	£80.00
MICROWAVE MODULES	28/144 TRANSVERTER 28/144	£125.00
NAIGAI	NAG-144XL 2m 400W PEP LINEAR AMPLIFIER	£325.00
OPTOECLECTRONICS	SCOUT FREQUENCY COUNTER Inc MEMORIES	£220.00
PAC RATT	PIC-232 Multimode, dual port data controller	£175.00
PACCOM	TNC-320 TNC	£90.00
PANASONIC	DR-49 RECEIVER	£125.00
QM 70	28/144 TRANSVERTER	£100.00
SAGRA	AMP-600 2M 1KW PEP MAINS AMPLIFIER	£750.00
SEM	TRANSMATCH Z MATCH ATU INC 160m	£75.00
SEM	ANTENNA TUNING BRIDGE	£30.00
SHURE	SR-444 CLASSIC BASE MIC	£35.00
SMC	T3-170L SWR & POWER METER	£20.00
SML	SWR-25 SWR & POWER METER	£20.00
SOMMERKAMP	FT290R 2m MULTI-MODE TRANSCEIVER	£180.00
SSB ELECTRONICS	LT-23 23cms TRANSVERTER	£450.00
ST3 HEADPHONES	DELUXE HEADPHONES	£45.00
STANDARD	AX-700E WIDE BAND RECEIVER - BASE SCANNER	£170.00
SYNCRON	PS-1220VU 20 AMP POWER SUPPLY	£60.00
TAGRA	22AMP POWER SUPPLY	£70.00
TIMEWAVE	DSP-599ZX TOP OF THE RANGE DSP UNIT	£250.00
TIMEWAVE	DSP-9+	£125.00
TOKYO HY-POWER	HL-166V 6m 160W LINEAR AMPLIFIER	£175.00
TOKYO HY-POWER	HL-30V 2M and 25W AMPLIFIER	£75.00
TOKYO HY-POWER	HL-37V LINEAR AMPLIFIER	£60.00
TONNA	7000E TERMINAL	£130.00
TRIO	TR-2300 2M PORTABLE TRANSCEIVER	£60.00
TRIO	TR-9130 2M ALL MODE TRANSCEIVER	£250.00
TRIO	TS-940SAT HF TRANSCEIVER	£750.00
WELZ	AC-38M 200W MOBILE MATCHING NETWORK	£50.00
WELZ	SP-15M SWR & POWER METER	£20.00
YAESU	FC-102 1.2KW ATU WITH 4 WAY SWITCHING UNIT	£200.00
YAESU	FC-20 AUTO ANTENNA TUNER FOR 847/FT100	£175.00
YAESU	FC-757AT FULLY AUTOMATIC ATU	£180.00
YAESU	FC-902 ATU 500W	£140.00
YAESU	FEX-767-2M 2m MODULE for the FT-767GX	£140.00
YAESU	FEX-767-6M 6m MODULE for the FT-767GX	£140.00
YAESU	FEX-767-70CM 70cms MODULE for the FT-767GX	£150.00
YAESU	FL-2100Z HF AMPLIFIER	£450.00
YAESU	FP-107E POWER SUPPLY	£120.00
YAESU	FP700 POWER SUPPLY	£100.00
YAESU	FP-757HD HEAVY DUTY POWER SUPPLY	£120.00
YAESU	FRG-100 HF RECEIVER	£300.00
YAESU	FRG-7 HF RECEIVER	£99.00
YAESU	FRG-7700 HF RECEIVER	£220.00
YAESU	FRG-9600 60-905MHz All mode Receiver	£199.00
YAESU	FT-1000MK5 200W DSP HF TRANSCEIVER	£2,600.00
YAESU	FT-1000MP AC HF BASE DSP TRANSCEIVER(Late serial no)	£1,550.00
YAESU	FT-1000MP DC BASE TRANSCEIVER	£1,200.00
YAESU	FT-101 TRANSCEIVER MINT!	£200.00
YAESU	FT-101ZDmk111 HF TRANSCEIVER inc FM	£375.00
YAESU	FT-23R HANDY TRANSCEIVER	£89.00
YAESU	FT-2500M MOBILE TRANSCEIVER	£190.00
YAESU	FT-290RMK1 2M ALL MODE TRANSCEIVER	£180.00
YAESU	FT-290RMK1 Includes Bracket + FL-2010 LINEAR AMP	£275.00
YAESU	FT-290RMK11 MOBILE 2M MULTIMODE TRANSCEIVER	£275.00
YAESU	FT-3000M 2m 70W MOBILE TRANSCEIVER	£175.00
YAESU	FT-41R HANDY TRANSCEIVER	£120.00
YAESU	FT-470 DUALBAND HANDIE TRANSCEIVER	£150.00
YAESU	FT-690MK11 6M MULTIMODE MOBILE TRANSCEIVER	£295.00
YAESU	FT-7 MINT! CONDITION	£275.00
YAESU	FT-726R 2 / 70 / 6m TRANSCEIVER	£575.00
YAESU	FT-730R 70CM MOBILE TRANSCEIVER	£120.00
YAESU	FT-736R 2m / 70cm TRANSCEIVER	£650.00
YAESU	FT-736R 2m / 70cm / 6m TRANSCEIVER	£750.00
YAESU	FT-7400 70cm MOBILE TRANSCEIVER	£160.00
YAESU	FT-747GX HF TRANSCEIVER	£399.00
YAESU	FT-757MK1GX HF TRANSCEIVER	£375.00
YAESU	FT-767GX HF BASE 100watt built-in ATU	£599.00
YAESU	FT-790R 70CM MULTIMODE MOBILE TRANSCEIVER	£225.00
YAESU	FT-7B HF 50 W MOBILE TRANSCEIVER	£199.00
YAESU	FT-80C 0-30MHz COMMERCIAL TRANSCEIVER	£375.00
YAESU	FT-840 HF MOBILE TRANSCEIVER	£450.00
YAESU	FT-847 HF / 2 / 6 / 70cm BASE TRANSCEIVER	£999.00
YAESU	FT-900AT HF/ DETACHABLE FRONT BUILT IN ATU	£650.00
YAESU	FT-980 HF TRANSCEIVER	£495.00
YAESU	FT-ONE HF BASE TRANSCEIVER	£450.00
YAESU	FTV-901 TRANSVERTER Inc 2m Mod	£165.00
YAESU	MD-1 DESK MICROPHONE	£75.00
YAESU	SP-5 LOUDSPEAKER Including Audio Filters	£100.00
YAESU	SP-767 LOUDSPEAKER Including Audio Filters	£80.00
YAESU	SP-8 LOUDSPEAKER Including Audio Filters	£100.00
YAESU	SP-980 LOUDSPEAKER Including Audio Filters	£55.00
YAESU	VX-5R 2 / 70 / 6 HANDIE 5W	£220.00
YAESU	XF-114SN 2KHz SSB FILTER	£60.00
YAESU	YO-100 SCOPE VERY RARE!	£150.00
YAESU	YS-60 SWR METER 1.6 - 60MHz	£30.00
ZETAGI	B-132 10 / 11m LINEAR AMPLIFIER , MAINS	£60.00

HEIL QUALITY

THERE IS NO ALTERNATIVE

BOB HEIL



BOB HEIL VISITED THE LEICESTER SHOW TO RUN WORKSHOPS ON HAM RADIO AUDIO

Goldline Hand Microphone

* High quality Stick Microphone
* Zinc die-cast body
* Heavy-duty gold cylindrical screen
* Choice of Inserts - HC-4 or HC-5
* PTT switch - non latching type
* Requires CC-1 adaptor
* Includes stand threaded adaptor.

Product Code	Price
GM4 (HC4)	£124.95
GM5 (HC5)	£124.95

Studio Hand Microphone

* High quality Stick Microphone
* Zinc die-cast body
* Heavy-duty gold cylindrical screen
* Studio insert
* PTT switch - non latching type
* Requires CC-1-I adaptor
* Includes stand threaded adaptor.

Product Code	Price
HM-1	£89.95 B

Hand Microphone

* Convenient Stick Microphone
* Choice of Inserts - DX or normal
* Dual version has both inserts switchable.
* PTT switch - non latching type
* Requires CC-1 adaptor
* Includes stand threaded adaptor.

Product Code	Price
HM-10-4(HC4)	£69.95 B
HM-10-5(HC5)	£69.95 B

CC-1 Interface Leads

Cables for the GM4/5 & HM-10-4/5/DUAL and Kenwood, Icom and Yaesu modular sockets.

Product Code	Price
CC-1-KM KENWOOD	£25.95A
CC-1-IM ICOM	£25.95A
CC-1-YM YAESU	£25.95A

Matching Desk Stand

This smart desk stand perfectly matches the HM stick series of microphones. Base diameter is approx 120mm and total height of stand is approx 110mm.

Product Code	Price
TB-1	£24.95 A

AD-1 Interface Leads

These leads interface the Heil headsets to standard 8-pin mic sockets. A 3.5mm mono socket accepts the mic output of the headset whilst a 1/4in jack socket enables an external PTT to be connected. Models available for Icom, Yaesu and Kenwood.

Cables for PROSET 4/5PRO54/55/PRO MICRO4/5 and Kenwood, Icom, Yaesu 8-pin and modular type connections.

Product Code	
AD-1-K8 Kenwood 8-pin	£14.95 A
AD-1-I8 Icom 8-pin	£14.95 A
AD-1-Y8 Yaesu 8-pin	£14.95 A
AD-1-KM Kenwood modular	£14.95 A
AD-1-IM Icom modular	£14.95 A
AD-1-YM Yaesu modular (8 way)	£14.95 A

Pro-Set Headset

* Standard Low impedance Dual Earpiece headset
* Padded Earpieces - 2.5m cable
* Adjustable headband
* 2K Ohm Cardioid dynamic mic
* Normal or DX inserts available
* Fully adjustable boom
* Earphone - 1/4in stereo jack
* Mic - 3.5mm plug (matches AD-1 adaptors)

Product Code	Price
PRO-SET-4 (HC4)	£129.95 B
PRO-SET-5 (HC5)	£129.95 B

Pro Headset

Product Code	Price
PRO-SET-5-4 (HC4)	£114.95 B
PRO-SET-5-5 (HC5)	£114.95 B

* Standard Low impedance Single Earpiece headset
* Padded Earpiece
* Adjustable headband
* 2K Ohm Cardioid dynamic mic
* Normal or DX inserts available
* Fully adjustable boom
* Earphone - 1/4in stereo jack
* Mic - 3.5mm plug (matches AD-1 adaptors)

Mic. Capsule Inserts

Product Code	Price
HC-4 DX mic element	£32.95 A
HC-5 mic element	£32.95 A

Lightweight Single Headset

NEW HS-706
FOR ALL IC-706 RIGS
BAGS OF AUDIO!
£59.95

Product Code	Price
BM-5-4 (HC4 DX)	£69.95 B
BM-5-5 (HC5)	£69.95 B

* Standard Low impedance single earpiece headset
* Padded Earpiece
* Adjustable headband * Fully adjustable boom
* Non latching PTT * Lapel clip
* Either HC-4 or HC-5 insert
* HS-706 High gain electret mic matches IC-706
* Plugs directly into IC-706 via modular plug
* Matches AD-1 Adaptors

Lightweight Dual Headset

Product Code	Price
BM-10-4 (HC4 DX)	£89.95 B
BM-10-5 (HC5)	£89.95 B
BM-10-I (ICOM 8 PIN)	£89.95 B

* Standard Low impedance Dual Earpiece headset
* Padded Earpieces
* Adjustable headband * Fully adjustable boom
* Either Dx or Normal range inserts
* Earphone - 1/4in stereo jack
* Mic - 3.5mm plug (matches AD-1 adaptors)
* Requires AD-1-Y (Yaesu) or AD-1-K (Kenwood)
* Icom version with electret insert & 8-pin lead (AD-1-I)

HMM Fist Microphone

Slide switch for selecting inserts on dual Kenwood & Yaesu Models only.

* High quality Fist Microphone * Three versions, Icom, Yaesu, Kenwood * Choice of Inserts for Yaesu & Kenwood * Electret condenser insert - Icom
* Industrial grade cable * All terminated in 8-pin connectors
* Yaesu modular requires AD-100-8
* HMM-IC requires OPC-589 for IC-706

Product Code	Price
HMM-IC (ICOM)	£59.95 B
HMM-K (KENWOOD)	£59.95 B
HMM-Y (YAESU)	£59.95 B

CARRIAGE CHARGES: A=£2.00 B=£6.00

Waters & Stanton PLC, 22 Main Rd, Hockley, Essex, SS5 4QS
Tel: 01702 206835, e-mail: sales@wsplc.com, web: www.wsplc.com
Also available at our Matlock and Glenrothes stores

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 callsigns and QTHR, provided their addresses in the current edition of the RSGB Yearbook are correct. RS members will have to provide their names and addresses or telephone numbers. Please include your town and phone number in the free boxes provided to assist readers. Advertisements will be placed in the first available edition 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.*

EXCHANGE

BRAND new boxed Cushcraft. 20-3-CD antenna. Exchange for a wide coverage scanner with cash adjustment if required, or sell. 01407 832 841 (Anglesey).

FOR SALE

ALMONERS silent key/shack clearance sale. Five pages of rigs, linears, accessories (HF/VHF/UHF). E-mail or ring for lists. 07866 077 249 (Notts).
E-mail: howardwalton@thersgb.net

AMERITRON 811 linear amplifier HF, 600W, £350, boxed, spare valves £10 each, boxed. Earth resistance meter, £80 (essential efficiency measure for your aerial/earth system). Capacitance meter 200pF-2000µF, £10. Ferromagnetic: (1) HF doublet 76ft feed, 84ft top, £15; (2) Choice balun, £15. RAE course six books. I passed with credits first time! 01634 379 140 (Gillingham).

DRAKE stations: R-4C/T-4XC, Sherwood filters, £550. R-4C/T-4XB, £450, R-4B/T-4X, £400. TR-4/RV-4, £400. All with MS-4/AC-4 PSUs. L-4B linear, PSU, £550. Collins R-390A, £400. TS-830S, £200. FT-101ZD, £200. FL-2100Z, £300. All silent key clearance, full list at www.riola.com - many interesting items. Wanted: cabinet for Collins 32S-1 transmitter or scrapper. 028 2588 0740 (Ballymena).
E-mail: gi4gnz@riola.com

FT-50/VX-10 NiMH battery packs, 1800mA 7.2V, uses standard charger, £15 each inc post. Note these are new packs. (Southampton).
E-mail: geoffrey.brown3@btinternet.com

FT-817 HF/VHF/UHF all-mode portable tcvr, 6 months old, nicads, charger, boxed, £650 plus free ATX walk about antenna & soft case. FT-50R UHF/VHF h/held plus speaker mic & case, charger, nicad, boxed, £80. MFJ-9406 6m SSB/CW tcvr 10W o/p, £140. All above plus postage. Terry, G4OXD. 01462 435 248 after 6pm (Hitchin).

HY-GAIN DX-77 7-band vertical antenna, immac, as new, offers around £175. Unique tilt-over design. 01332 755 513 eves or 07901 913 893 (Derby).

ICOM R-9000 wideband rcvr, immac cond. This rcvr covers 100kHz to 1999MHz continuous in a 19in rackmount unit, with CRT tube showing spectrum analysis menu and data. Purchased just 3 years ago in the USA, genuine reason for sale, cost over £5,000 new, will accept £1850 ovno or p/x your HF rig + cash. WHY? 01332 755 513 eves or 07901 913 893 (Derby).

KENWOOD TL-922 linear amplifier – produces 1kW+ on HF bands, immac cond, £800 ovno. 01332 755 513 eves or 07901 913 893 (Derby).

KENWOOD TS-570DGE with matching speaker, immac cond, hardly used, boxed with mans, can deliver, £575. Simon, G4JFK, QTHR. 01452 550 535 (Cheltenham).
E-mail: woobag@blueyonder.co.uk

KENWOOD TS-940SAT HF tcvr 0.30MHz and general coverage receive, auto internal ATU fitted, superb rig, price, £520, collect or pay cost. G0BPM, QTHR. 0114 287 2358 (Sheffield).
E-mail: dennisg0bpm@aol.com

ULTIMAST 30ft, c/w auto-brake winch and Cobwebb. New and unused mounting pillar, £80 ono. Buyer collects. G4KUU, QTHR. 01287 635 278 or 01305 812 818 (Guisborough).

YAESU 2100B HF linear amplifier, 65W drive in, 800W out, exc cond. Still has cellophane on the front panel (like new), careful owner. It has to be seen to believe its condition and power output. Air test can be arranged; comes with man and original box. This is not a piggy! £325 carriage paid. Alinco DR-150E 2m FM tcvr 10W, 25W, 50W out. Tx 144-146MHz. Rx 108-199.9MHz AM & FM, also 430-511, 800-900MHz, as new, little used, box and man. Post paid at £150. Carolina Windom 1.5kW 80m to 10m, 133ft heavy gauge insulated wire, balun, USA made, £20 + p&p. Pair 40m traps unused, £10 + p&p. GM3NVU. 01324 813 349 (Falkirk).
E-mail: george@gm3nvu.freeserve.co.uk

YAESU FL-2100Z linear amplifier - produces 1kW+ on HF bands, vgc, £300 ono. 01332 755 513 eves (Derby) or mobile 07901 913 893

YAESU FT-847 HF/VHF/UHF tcvr as new with Inrad 2.1kHz narrow SSB filter and 500Hz CW filter on receive. Collins SSB filter on transmit side. Voice option installed. Reluctant sale due to impending house move to unsuitable radio site! £1095 ono. 01423 874 451 or 07764 356 240 (Harrogate).

10ft aluminium lattice tower, KR-400 rotator, controller, 20ft aluminium pole, buyer collects; £100 the lot, no offers. 07768 878 958 (Watford).
3-ELE beam antenna for 10-15-20m, £120. 30ft telescopic mast, price negotiable. CDP antenna rotator, £120. 01707 325 257 (Welwyn Garden City).
4-SECTION tilt-over Versatower, approx 15m high, complete and as new, buyer collects, £250. Mosley TA-33 3-ele tri-bander, gwo, £50. Home-brew 7MHz vertical, requires ground screen or radials, 10m high, straight ¼-wave, no loading coils, £25. Yaesu G-400RC medium duty rotator, gwo, £20. EL-40 coils to extend half-size G5RV to cover 80m or make 80/40 dipole, £5. MFJ-989C, £160. 01239 654 880 (Cardigan).
E-mail: mw5zzr@aol.com
5-ELE ZX 6m beam, as new, £75, no offers. Paul. 01920 871 639 (Ware).
ALTRON 30ft free-standing lattice tower, £150. Also 45ft wall-mount Altron lattice, £125. Linear Amp UK 2m Discovery, as new cond, £950 or WHY? Swap HF rig TS-870, 850 FT-1000MP etc. 4m tvrtr, 2m IF, £75. 4-ele 4m Yagi, £30. 3-ele 10m Yagi 10-3C, £55. 40m HP traps, £15. Daiwa CN620A 1kW SWR/PWR meter, £30. Hy-Gain TH3 Mk3, £50. RDX-70 4m multimode, part-built, £125 (£175 new). 01803 392 969 (Paignton).
ALTRON CM35 telescopic tiltover 35ft mast, vgc, surface-mounted post, head unit with Yaesu G-400RC rotator and indicator. Height retracted 15ft complete and ready for mounting, £125. GEM 2-element quad (10-15-20m), dismounted and ready to reassemble (less wire), £50. Detailed instructions for mast and antenna, buyer collect. Tom, GW3LJS, QTHR. 01267 202 321 (Carmarthen).
ALTRON telescopic tiltover tower, 36ft, lowers to 15ft, offers around £300, buyer dismantles and collects. 0121 682 7045 (Surrey).
E-mail: wagtails@tesco.net
B2 for sale in gwo and in gc, offers please? G3MBW, QTHR. 01943 874 794 (Leeds).
B2 transmit unit with case but missing meter and valves, in gc, £300. Ten-Tec Scout 555 HF tcvr, band modules for 40 20 15 and 10m with h/book, £300. 01728 604 621 (Saxmundham).
E-mail: john@bramble-corner.freeserve.co.uk
COLLINS KWM-2, £300. PM-2 power supply/speaker, £60. MP-1 12V mobile PSU, £45. All with mans. 312B-3 speaker, £100. MM-1 fist mic, £45. CC-2 carrying case, £30. 180S-1 ATU, £150. 351-D 2 mobile mount, £20. Collins 75A-2 rcvr restored to nice cond, fitted calibrator and product detector, with man, £300. Ten-Tec Corsair II fitted 500 and 250Hz CW filters, 215 desk/hand mic, model 260, PSU, 12V DC lead with circuit breaker, all mans, £295. MFJ Cub 20m QRP rig, £75. Heavy/large items, examine and collect. G3GGK, QTHR. 01954 210 374 (Cambridge).
E-mail: peter@g3ggk.freeserve.co.uk
COMPUTER programme for Windows, Paintbox / Notepad. Any poison pen and/or font scale, 16M colors, filing system, nice gift or order your components on £9.99. G8WCQ, QTHR. 01297 23421 (Seaton).
CUSHCRAFT A50-5S 5-ele 6m beam antenna, very good cond, little used, £80. G0SRX, QTHR. 01202 873 895 (Ferndown).
DEVIATION meter TF2303 25 - 520MHz with man, £40. Mainline 4m tvtr board, £20. Icom IC32/5W dual-band, £30. G3LBA. 01865 821 503 (Abingdon).
E-mail: rgreenwood@compuserve.com
FT-101Z, WARC, mic, fan, 250Hz filter, £100. Decca Ezimatch, £30. Welz SP-200, £20. All vgc, no split, buyer collects. 0116 287 3723 (Leicester).
FT-225RD, Mutek front end preamp, 250W linear, PSU, £375, ovno, cash & carry only. Vacuum caps 2500pF, 250pF 7/15kV, £15 cash. G3LTN. 01295 710 623 (Banbury).
FT-7575GX HF tcvr with FP-757HD PSU and FC-757AT auto ATU, good cond, buyer collects, £480. Dave, G0JBT, QTHR. 020 8304 6189 (Sidcup).
FT-817 boxed as new. A few months old c/w ant, mic ATU and CW filter, £640. Colin, G3TA. 01285 821 571 (Cirencester).
FT-980, £395. FT-990, £725 with mic, box and mans. Top of line base stations (HF), must sell one or other!!. 07901 932 763 (Morecambe).
E-mail: g3lll@onetel.net.uk
HEIL Proset-5 boom headset with HS-5 insert plus AD1 Kenwood interface lead and HS1 PTT hand switch, boxed as new. Little used. Bargain at £70. 01223 232 905 (Cambridge).
ICOM 290E multimode, original mic, mobile mount, c/w h/book and wiring diagrams, original box, good cond. 0113 294 3211 (Leeds).
ICOM 745 HF tcvr, gen cov, 100W, mic, man also matching Icom automatic ATU, man, lead etc, will split, £450. Yaesu FT-107 HF tcvr, 100W solid-state, mic YM34 man, FT-107E power supply, plus speaker, Yaesu FC-107 ATU, full station, £295. 01332 880 633 (Derby).
ICOM 746 multiband multimode, as new, £699. IC-706 MkII with new unused Heil headset, £575 (will not split). Hy-gain TH-11 new, unused, £780. DX-100 AM rig with SB-10 SSB adapter, gc, offers? G3WRT, QTHR. 01473 311 665 (Ipswich).
ICOM IC-761 HF tcvr, gwo, boxed with mans, £550. 01494 778 686 (Chesham, Bucks).
ICOM IC-765 base mic, mans, pwo, £650 ono. KW Viceroy transmitter, KW77 rcvr, gc, mans, £120 pair, ono. Yaesu 844 mic, £10. 01745 890 646 (Denbigh).
KENWOOD HF tcvr TS-140S complete, boxed with leads as new, £500. Sony SW55RX, £100. MFJ crossed-needle tuner, £50. Pair JVC SPE2L speakers, 60W music, 8-ohms, £20 pair. Yaesu all-mode 2m tcvr, £100. Collect or carriage extra. G8CK, QTHR. 01384 394 360 (Stourbridge).
KENWOOD TS-440SAT tcvr, in-built ATU, power supply, speaker, matching units, boxed, mans, exc cond, £450. (Equipment can be viewed, Chester area.) GM0ATQ, Laurence. 07901 516 859 (Gourock).
E-mail: laurencemorgan@bpipoly.com
KENWOOD TS-570S (USA version TS570DGE), 100W 160m-6m, auto ATU, boxed, man, mint cond, £700. Kenwood TL-922 1kW linear, 160-10m, recent 3/500ZGs, exc order, £650. Force 12 10-12m 7-ele Yagi, 14ft boom, man, good order, cost £379, £80 wanted. FT-847 vgc. 01751 476 380 (Pickering).
E-mail: phil.catterall@ntlworld.com
KENWOOD TS-830S with SP-230 speaker, vgc but VOX not working, £285. Mans for Drake R4C TR4CW Collins 6251 30LI, also ATC88, £7.50 each plus postage. 01379 783 657 (Diss).
KENWOOD TS-870 very limited use, please ring for details, £650 or near offer. 01603 782 109 (Norwich).
E-mail: ivor4920@aol.com
KENWOOD TS-870S HF tcvr, used receive only, boxed, mans, mint cond, £925. 01789 842 369 (Warwickshire).
E-mail: alang8xaz@hotmail.com
KENWOOD TS-950SD digital HF 150W tcvr, internal ATU etc, vgc, boxed, instruction book, mic, £950. MFJ-986 ATU boxed, £120. Vibroplex original Morse key, £35. Oil-filled dummy load, £15. 5A power supply, £10. Low-pass filter, £10. Send SAE for full list. Silent key sale, non-smoker, buyer collects or arranges carriage. GM4FSB, QTHR. Phone evenings 1800 - 2200. 01382 543 069 (Newport, Fife).
LIST of 12 books on wireless, earliest 1922. Stamp for list. Max, G3BSK. 0121 744 4671 (Birmingham).
MFJ-259B HF/VHF SWR/antenna analyser, boxed, £60. Watson W-25AM 25A PSU, £50. Watson W-620 SWR/power meter, dual-range 1.6-200MHz, 118-530MHz, 5/20/200W ranges, £40. CX-401N 4-way N-type co-axial switch, £20. MFJ-704 low-pass filter 0-30MHz 1.5kW, £22. All ex cond, ono, plus carriage. 01423 874 451 or 07764 356 240 (Harrogate).
MFJ-989C 3kW ATU mint, £175. Hustler super mobile antennas, 1.5kW coils, 80-10m, £75. Daiwa 6400 rotator, £150. Cobwebb, £100. Jaybeam 2m 8-el crossed Yagi, £40. PacComm Tiny-2 TNC, £80. Watson FC-130 frequency counter, £50. Lake 40m QRP, £75. MX295PMR 2m converter, £60 each. 01257 249 185 (Chorley).
E-mail: k555arc@aol.com
MOSLEY TA-33JR, £100. Jaybeam 2m 8X/Y, £20. Wall-mount brackets for 2in scaffold, engineer-made, strong construction, stand-off 13in, £8 for three. Linear 5-band, 2 x 813, £25. CDR AR-22, £15, buyer collects.

CONGRATULATIONS

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

50 years		*60 years*	
G3HRB	Mr J Coatsworth	AB4SW	Mr I T Haynes
G3HRE	Mr F Watson	G2DKI	Mr P N Ridout
G3JMX	Mr P C Hayward	G8XXV	Mr G L Clarke
G3KKP	Mr J Burgess	VK2FFF	Mr S J Hutchinson
G3LMX	Mr T W Mitchell		
GM0UPE	Dr G R Sutherland		

Richardson, 257 Mackenzie Road, Beckenham. 020 8325 3502 (Beckenham).
PSION-5 8MB RAM with 16MB compact flash card, m/adaptor, case, software, virtually unused, £125. Kenwood AT-230 ATU, £85. Yaesu FT-90 dual-band micro tcvr with MM-36B mic, YSK90 kit, £205. Icom MB-65, £15. Hy-Gain AR-40 rotator and control, gwo, £24. Citizen 120D, gwo, £12. Kenwood MC-60 desk mic, £32. Ken. 01582 670 592 (Dunstable).
QRP HF tcvr TS-120V, gc with man, £150. Yaesu FL-110 HF 100W linear amp, £50. 01268 456 833 (Basildon).
E-mail: nick.bradley@unisoneastern.ndirect.co.uk
RACAL SSB transmitter drive, Racal auto preselector, Watkins Johnson 112-5 4 - 8GHz rcvr, £550. WJ Panadaptor, non-working, £100. Original Eddystone mans, phone. Band 3 mobiles, new, £20. Link colour pulse-and-bar generator, £40. VG video level corrector, £45. 143MHz pagers, £5. 020 8297 2440 (London).
E-mail: nj.tansley@btinternet.com
RARE rcvr type R1949, 27 to 143MHz, man and motorised tuning. Set of B2 PA coils and tuning capacitor. AR88 mains transformer, offers? G3IFB. 01452 713 792 (Cheltenham).
SILENT key sale. Kenwood TS-850S, £350. TS430/PS430, £350. Yaesu FT-757GX, £325. ETM 8C keyer, £35. Watson W30AM power supply, £50. Ameritron linear amplifier AL80B 1kW (1 x 3-500Z), £400. MFJ-989C Versatuner-V 1.5kW, £100. Strumech P60 tower, c/w winches, G600RC rotator - controller, TA33 beam (buyer to dismantle). Offers for this item please. Prefer inspect/collect. G3CVK, QTHR. 01684 562 552 (Malvern, Worcestershire).
E-mail: peter.bolton3@btinternet.com
SILENT key sale. Multi-UII 70cm tcvr, £100. Yaesu FT-208R 2m h/held, £150. FT-708R 70cm h/held, £150. KR-400 rotator (qty 2), £125 each. 023 9258 0114 (Gosport).
E-mail: rakf@rforster.freeserve.co.uk
SINCLAIR ZX-81 computer, Sinclair add-on RAM, Sinclair PSU, offers? Gents master clock, like new with slave clock, offers? Geoff. 01634 253 056 (Medway).
STRUMECH 60ft tower, motor cage, auto winches, 3 years old, as new, dismantled, ready to collect, £500. Cushcraft A3WS 12 - 17m beam, £60. Moonraker SQBM 1000, 2-70-6 triband colinear, £30. Yaesu G-1000SDX heavy-duty rotator, £80. Heatherlite Hunter 1000W PEP linear, £200. Datong FL-3 multimode filter, £15. 01827 880 719 (Atherstone).
SWAN 100MX tcvr 3.5-30MHz, 12V, mic, SWR meter, circuits, ready to go, £125. G4GWW. 01572 812 472 (Rutland).
TAIT T-375 base rcvr, ideal 144MHz repeater rcvr, £80. Tait T-198, £10. Bird 6154 Termaline wattmeter c/w man, £100. Tait T-535, £40. T-508 £10. AVO-8 Mk5 gwo, case, £50. Alinco DX7-0TH c/w mobile mount and remote cable kit, boxed, man, £425. Schlumberger Stabilock 4011 radio test set, 4920 Selcal tester, CTCSS test set, £500. Various Pye PMR mans £5 each. 01354 741 168 (March, Cambs).
TEN metres multimode, Superstar RCI2950F, CE approved, 26-32MHz coverage, USB/LSB/CW 25W, AM/FM 10W, tuning 100Hz steps, memories scanning repeaters, £125. Zetagi model BV135 10m linear 720W SSB/CW, 240W AM/FM, 170W x 100H x 280D mm, 230VAC, £125. Yaesu FT-690RII with nicads and charger, £175. Pan 1068 13.8V regulated PSU, 8A output, £25. All items as new. 07831 101 143 (Bournemouth).
TEST equipment sale. Advance scope type OS2100, Solartron digital multimeter type 7054, Marconi frequency counter/timer TF2417, signal generator CT452, Taylor 62A signal generator, Marconi wide-range oscillator TF2130 offers to G4MH. 01484 654 650 (Huddersfield).
TINY-2 MkII TNC, £60. Welz SWR/power meter (1.8-500MHz), £50. Western Electronics power meter (50-150MHz), £20. Peter, G0BAG. 023 9241 2187 (Portsmouth).
E-mail: pccox@clara.co.uk
TOKYO 2m linear HL-180V 3-10-25W input, auto select, used three times £100, carriage extra. Yupiteru h/held scanner MVT7100 530kHz - 1650MHz, £100, carriage extra. 01775 722 940 (Spalding).
TOWER Altron 3-section lattice 45ft, 2 x autobrake winches, head unit, £170, could deliver. Grant, G4ILI. 01452 855 339 (Cheltenham).
E-mail: g4ili@the-maples.com
TRIO HF SSB tcvr model TS-180S, exc cond c/w operating man and mic, requires 12V supply, £125. 020 8455 8831 (NW London).
E-mail: kennethb@btinternet.com
TS-520 HF rig, 80m - 10m, gc, recent realignment, £120. IC-4E 70cm 1W synthesised h/held, £25. 1m Lenson Heath dish, as new, £15. Buyers collect or pay shipping. Steve, G8SBF. 07887 881 959 (Newbury).
E-mail: stevelarkins@yfi.co.uk
TS-870, £800 ono. TS-50 £350 ono. AKD2001 h/held, £60. Icom 290H, £120. KW107, £60. Alinco 190 h/held, £60. Trio 2500 h/held, £50. Osker Power & SWR, £12. KFC power & SWR meter, £5. Altai grid dip meter, £7. Raymart grid dip meter, £5. Power supply 12V 8A, £7. 100W per channel stereo amp, £55. PSR9000VR, new cond, £1200 ono. Silent key, G3VYP. 0121 747 8489 (Birmingham).
WATSON W-30AM 30A PSU, variable with twin meters, as new, boxed, £75. KW monitor scope, offers? Daiwa CN801H SWR/power meter, boxed, £55. All plus carriage or collect. G3XNP. 01992 632 434 (Cheshunt).
WWII Dinghy hand generator QY3-125s (updated 813 replacement), £7.50 each (New). QQV06-40s (New), £3 each. Eddystone 898 dials, new unused £18 each. Parmeko potted transformer 1000-750-0-750-1000V @ 250mA, £10. HV caps to suit. All cheap, carriage extra, many other valves & mans. Please state requirements. 01332 735 896 (Derby).
YAESU FT-101ZD MkIII FM board, CW filter, fan, vgc, £250. FV-901DM, £70. FT-901R (2m module) transverter, £70, all with mans. 10m 25W SSB tcvr, £25. 10m FM with 25W amp, £25. Carriage extra. 028 9079 4552 (Belfast).
YAESU FT-102, £180. Heathkit SB200 linear, £180. Capco SPC-3000 ATU, £100. Trio R-600 rcvr 150kHz - 30MHz, £80. Telequipment S54A oscilloscope, £45. Heathkit HM11U SWR meter, £20. 2-ele triband beam, £60. G-400RC rotator, £100. All little used. Non-smoker. G4WSE, QTHR. 0151 339 0842 (South Wirral).
E-mail: g4wse@cwctv.net
YAESU FT-7 tcvr, £185. Stabilised 13V 6A PSU, £20. Morse key, WWII brass & silver contacts, enclosed case, £25. Yaesu 2m FT-290 Mk1 multimode, £180. Morse practice audio unit (new), straight key, £25. Absorptive harmonics filter, h/brew, 35MHz cut-off, £20. ATU h/brew, 10 to 80m approx, 25W, £10. PWR/SWR meter Monacar 1.7-30MHz, £15. Altai low-imp headphones, £5. Wavemeter BC221/T, PSU, low-imp h/phones, £25. 10m tcvr, M4OFM, 6W/2W, £24. All good cond. Buyer inspects or carriage extra. 0191 455 2223 (South Shields).
YAESU FT-840 HF tcvr with CW filter, £450. Yaesu VX-1R VHF/UHF h/held, £125. Icom FL-53A 250Hz CW filter, £55. Datong AD-270 indoor active antenna with mains PSU, £40. All as new cond and boxed. G4EDR, QTHR. 01723 515 675 (Filey).
E-mail: g4edr@arrl.net

WANTED

COLLINS 312-B4 and 312-B2 station controllers. Good price paid for nice units, but anything considered. Also looking for pre-1948 *T+R* / RSGB *Bulletins* - can you help? Manual for Swan 350C needed, will buy or borrow to copy. 01434 633 913 (Corbridge).
E-mail: simon@nomis.co.uk

CRYSTAL sets and early valve radios wanted; all old equipment, valves, horn speakers, Morse keys, spark txs. Spy sets are of interest; keen to find Hallicrafters SX42 or similar rcvr, also Meccano and Bassett Lowke crystal sets. Jim, G4ERU, QTHR. 01202 510 400 (Bournemouth).

WANTED any information about where to buy coil formers, cans and cores, suitable for HF rcvrs. Also info about valve type 7360. Also where to buy flywheels, drive spindles, bushes, pulleys etc for tuning drives. 01635 49484 (Newbury).
E-mail: wilkinsrl@aol.com

12V battery case/charger, TP2 Mk5 trailer pack, required for school amateur radio station, public address etc. Dave, G4LQT. 01785 356 356 (Stafford).
E-mail: headtacher@barnfields.staffs.sch.uk
ADA compiler wanted for Pentium PC. G8NHN. 0161 740 9124 (Manchester).
E-mail: brian@xlewis.freeserve.co.uk
ALPHA Delta Communications variable response console. Previously available from Waters & Stanton, must be gwo. 020 8723 5414 (Harrow).
E-mail: bobmarshall@lineone.net
AVO valve tester, good price paid. TR McElroy bug key, must be in vgc. Please phone evenings or weekends, thanks. 028 9268782 (Hillsborough).
DISABLED fan of old days seeks QSLs, log books and pre-1970 magazines. Mike, 8 Windsor Road, Southwold, Suffolk IP18 6PQ.
EDDYSTONE 960. Their first transistor radio, non-worker acceptable (they didn't work very well anyway). Also wanted EB35, EB36, EB37. 01789 293 375 (Stratford-upon-Avon).
E-mail: g0ogn@aol.com
FT-480 Yaesu 2m and FP-80 PSU. Sony ICF111L broadcast band rcvr. Nigel, G4OFO. 020 8949 2317 (Kingston).
MICROWAVE Modules 4m tvtr unmodified, gwo, by well-known special events group c/o G8AZA, QTHR. 01723 583 200 (Scarborough).
E-mail: tedagar@btinternet.com
MORSE keys wanted by private collector. Post office and Marconi keys, all types of straight and bug keys, heliographs. All telegraphy-related items wanted. Anything considered. Gerald. 0118 983 4307 (Reading).
R1155 rcvr in working order for enthusiast, MM5WIG. (Wigtown).
E-mail: weebooks@globalnet.co.uk
ROTATOR Yaesu G-450 or similar type with control box and cable. Good cond please. John, G6HKQ. 01842 878 703 (Thetford).
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
T2X, Ham IV, or Emoto 1105, 1300, 1305 rotator wanted, any cond considered. Cash waiting! Chris, GM3WOJ. 01862 842 762 (Invergordon).
E-mail: gm3woj@talk21.com
TEN-TEC Century 22 tcvr extras: model 226 calibrator board and model 679 keyer board; operator and service mans, original or copies also needed; spare 4-pin power connectors also sought. Richard Perzyna, G8ITB, QTHR. 01689 602 948 (Bromley, Kent).
TRIO JR-310 HF rcvr, gwo c/w man. 01224 735 321 (Aberdeen).
E-mail: allanchalmers@hotmail.com
WANTED B29 Navy rcvr, also Drake L-4B linear. Man for Gould Advance oscilloscope OS3000A. all costs paid. Frank, G3KJG, QTHR. 0113 284 2597 (Leeds).
WANTED h/book or photocopy Kenwood TH-205E, will reimburse all costs. John, M0CRW. 01246 568 541 (Chesterfield).
WANTED instruction manual and also if possible circuit diagram for Trio TS-700G all cost incurred will be paid. Peter. 01603 812 136.
WANTED Kenwood SM-230 station monitor, please call John, G0CHQ. 020 8561 3837 (Hayes).
E-mail: john@pepps.demon.co.uk
WINDING machine suitable for mains transformers. Also wanted: scrap Heathkit HW/SB series tcvr for spares. G3WCE. 01692 538 794 (North Walsham).
XTALS any type/size. 96kHz. 97kHz. 98Hz. 99kH. 101kHz. 102kHz. 103kHz. 104kHz. Ted, G8HLJ. 0151 632 0614 (Holylake).
YAESU FT-736R 6m module. Gerald Peck, G4OIG, QTHR. 01604 408 438 (Northampton).
E-mail: postbox@meridianhouse.freeserve.co.uk

SILENT KEYS

WE REGRET to record the passing of the following radio amateurs:

G0AOG	Mr R Tribbeck	03/05/01
G0FCL	Mr D Kitchen	30/08/01
G0UNZ	Mr I A Harrison	
G1PNF	Mr R Broadberry	23/07/01
G2DWZ	Mr S Archer	25/08/01
G2FIF	Mr L Bazeley	29/07/01
G3FQC	Mr W Edwards-Hanham	26/07/01
G3HHM	Mr F J S Chandler	05/01
G3IPL	Mr D Winters	
G3MML	Mr E G Augood	18/06/01
G3RRK	Mr A D W Atkins	02/07/01
G3VYP	Mr K C Muller	07/08/01
G4FYL	Mr D P Godfrey	05/08/01
G4ILG	Mr L G Logan	16/08/01
G4MOJ	Mr A L Jeffries	02/08/01
G4NEW	Mr F Briggs	28/07/01
G4PZF	Mr A Jennings	05/07/01
G4RBD	Mr D W Batchelor	
G4RSM	Mr R Sanders	14/08/01
G4TWN	Mr A J Keates	
G4VLY	Mr J Smith	18/06/01
G6DKA	Mr K Twist	28/07/01
G6YZZ	Mr D L Stanley	17/08/01
G7ABL	Mr A Goodwin	05/06/01
G7OAM	Mr G Tollefson	30/06/01
GW3RNC	Mr J A Brown	29/06/01
GW4XLK	Mr E W S Meredith	16/11/00
IK4NGC	Dr L Leoni	
M0CHH	Mr A Austin	03/08/01
M1BWA	Mr K Moore	27/07/01
RS173506	Mr R Franklin	03/07/01
W6SAI	Mr W I Orr	

Rallies & Events

7 OCTOBER 2001

GREAT LUMLEY AR & ES Rally - Community Centre, Front Street, Great Lumley, just off the A1M. OT 10.30am, £1, accompanied under-14s free. CP free, C, SIG, B&B, TI. Nancy, 0191 274 4274 (W) or 07990 760 920, or e-mail lumley.rally@ic24.net
MANSFIELD ARS Radio, Computer & Electronics Rally - New Venue (under cover), Intake Leisure Club, Kirkland Avenue, Mansfield. OT 10am. David, G0RDP, 01623 631 931 or david.g0rdp@lineone.net or web site www.andange.btinternet.co.uk/rally.htm

12 - 14 OCTOBER 2001

RSGB International HF and IOTA Convention HFC 2001 - Beaumont Conference Centre, Old Windsor. RSGB, 0870 904 7373.
WACRAL 2001 Conference - Bournemouth. G4EZU, QTHR or 01474 533 686.

13 OCTOBER 2001

THE G QRP CLUB MINI-CONVENTION - St Aidan's Hall, Sudden, Rochdale. OT 10am, £1. TI on S22, LEC, large social area, B&B, surplus - junk - components - kit traders, C (including the famous pie and peas). George, G3RJV, g3rjv@gqrp.com

14 OCTOBER 2001

MICROWAVE ROUND TABLE - GCHQ, Cheltenham, Glos. Admission by prior application only. Application forms available from Peter, G3PHO, QTHR, on receipt of an SASE. Personal and car security checks on entrance and exit, and some form of identification will be needed.
NORTH WAKEFIELD RC 18th Amateur Radio & Computer Rally - Outwood Grange Secondary School, Potovens Lane, Outwood, Wakefield, W Yorkshire. Follow signs from M1 jn 41. CP free, TS, SIG, B&B, C, MT (two photos needed). 01924 824 451 or www.nwrc.mcmail.com

KEY
Rallies & Events
TI - Talk-In; **CP** - Car Park; **£** - admission; **OT** - Opening Time - time for disabled visitors appears first, eg (10.30/11am); **TS** - Trade Stands; **FM** - Flea Market; **CBS** - Car Boot Sale; **B&B** - Bring and Buy; **A** - Auction; **SIG** - Special Interest Groups; **MT** - Morse Tests; **LB** - Licensed Bar; **C** - Catering; **DF** - Disabled Facilities; **WIN** - prize draw, raffle; **LEC** - LECtures/seminars; **FAM** - FAMily attractions; **CS** - Camp Site.

20 OCTOBER 2001

WATERS & STANTON@JAYCEE Open Day - Glenrothes, Fife. Yaesu, Icom, Kenwood in attendance. **See the RSGB GB4FUN Mobile Shack**. 01702 206 835 or 01702 204 965.

20/21 OCTOBER 2001

REF-UNION HamExpo 2001 - Auxerre, France. OT 9am, 50F, ladies and children under 16 free. C, TS, SIG. Web site www.ref-union.org E-mail ref@ref.tm.fr

21 OCTOBER 2001

BLACKWOOD & DARS Radio, Computer and Electronics Rally - Newport Centre, 1 mile from jn 25A, M4. OT 10.30/10.45am, £1.50. B&B, TI, TS, SIG, LB, C, DF. Dave, GW4HBK, 01495 228 516 (eve).
HORNSEA ARC Radio & Computer Rally - Floral Hall, Hornsea. OT 11am, £1.50. TI, CP, B&B, SIG, LB, C. Duncan, G3TLI, 01964 532 588 or e-mail duncanheathershaw@lineone.net

28 OCTOBER 2001

GALASHIELS & DARS Annual Rally - Volunteer Hall, St Johns Street, Galashiels. OT 10.34/11am, £2 including free cash prize draw ticket, TS, B&B, C. Jim, GM7LUN, 01896 850 245 or e-mail jimk@gm7lun.freeserve.co.uk
HANNOVER 19th INTERRADIO Exhibition - Hannover fairground. OT 9am, 10DM. TS, FM, WIN, LEC, SIG. Web site www.interradio-hannover.de

3 / 4 NOVEMBER 2001

NORTH WALES RRC Rally 2001 – North Wales Conference Centre, Llandudno Promenade. OT 10am, £2, accompanied under-14s free. C, LB, B&B, DF, TI on S22. Muriel, GW7NFY, 01745 591 704 or www.nwrrcw.org.uk

4 NOVEMBER 2001

NORTH DEVON 21st RADIO RALLY - Holsworthy Memorial Hall. OT 10am. B&B, etc. G8XMI, 01409 241 202.

6 / 7 NOVEMBER 2001

LOW POWER RADIO ASSOCIATION Radio Solutions 2001 - Commonwealth Conference & Events Centre, Kensington. 01422 886 463 or www.lpra.org or e-mail info@lpra.org

10 / 11 NOVEMBER 2001

MARTLESHAM MICROWAVE ROUND TABLE - Adastral Park, Martlesham. Entry is free, but visitors must be pre-booked, so contact Jason, G7OCD, quickly by e-mail to jason.flynn@btinternet.com OT 2pm Saturday, 9am Sunday. C. www.btinternet.com/~jewell

11 NOVEMBER 2001

SOUTH YORKSHIRE REPEATER GROUP Great Northern Hamfest - Metrodome Leisure Complex, Queen's Road, Barnsley town centre (follow the Metrodome signs from all directions). OT 10am, £2.50. DF, TS, SIG, B&B, MT between noon and 3pm (two photos needed), TI on S22. Ernie, G4LUE, 01226 716 339 or 07787 546 515.
SPALDING & DARS Radio & Computer Surplus Sale - Bromley Hall, Pode Hole, Spalding-to-Bourne road (A151). OT 10am. A, C including Helen's bacon butties. John, G4NBR, 07946 302 815 or www.sdars.org.uk

18 NOVEMBER 2001

COULSDON ATS Bazaar - 4th Purley Scout HQ, behind Lion Green Road public car park, Coulsdon, Surrey. OT 10am. Andy, G0KZT, or coulsdon_ats@hotmail.com
MIDLAND AMATEUR RADIO SOCIETY 12th Radio & Computer Rally - New venue. OT 10am, £1. CP free, C, TS, local clubs. Peter, G6DRN, 0121 443 1189.
WEST MANCHESTER RC Red Rose Rally - Horwich Leisure Centre, Horwich, Bolton, off M61 jn 6. OT 10.30/11am, £1.50, OAP £1. B&B, C etc. Don, G3BSA, phone/fax 01942 871 620 or e-mail don@g3bsa.freeserve.co.uk

24 NOVEMBER 2001

ROCHDALE & DARS Traditional Radio Rally - St Vincent de Paul Catholic Church, Caldershaw Road, off A680 Edenfield Road, approx 2 miles west of Rochdale. Follow orange arrows from M62 jn 20. OT 10.15/10.30am, £1. TI on S22, CP free, TS, B&B, C. John, G7OAI, 01706 376 204 (eve), or e-mail radars@mbc.co.uk Please note that this is a *Saturday*!

24 / 25 NOVEMBER 2001

LONDON AMATEUR RADIO & COMPUTER SHOW - Lee Valley Leisure Centre, Pickett's Lock Lane, Edmonton, London N9. OT 9.45/10am. TS, B&B, SIG, DF, C, LB, MT, TI on 2m & 70cm, CP, CS, FAM (cinema, swimming, golf, spa). 01923 893 929, www.radiosport.co.uk

25 NOVEMBER 2001

BISHOP AUCKLAND RAC Rally - Spennymoor Leisure Centre. OT 10.30/11am, £1, accompanied under-14s free. Radio, computers and electronics, B&B, TI on S22, TS, CP, C, LB, MT (two photos needed). Mark, G0GFG, 01388 745 353 or Brian, G7OCK, 01388 762 678.

1 DECEMBER 2001

RSGB ANNUAL GENERAL MEETING - Strathclyde Fire Brigade Headquarters, Hamilton. Starts at 12 noon. Refreshments and hot food available. RSGB, 0870 904 7373.

8 DECEMBER 2001

WORCESTER Radio, Electronics & Computer Rally - Perdiswell Leisure Centre, Bilford Road, Worcester. OT 10am, £2. CP free, TI on S22, TS, FM, SIG, LB, C, WIN. John, G8MGK, 01527 545 823 or 07762 203 355. Web site www.qsl.net/gb2tcr

20 JANUARY 2002

OLDHAM ARC Rally - Steve, 01706 848 092 or m5aeg@btinternet.com

3 FEBRUARY 2002

SOUTH ESSEX ARS Rally - Brian, G7IIO, 01268 756 331 or www.southessex.ars.btinternet.co.uk

10 FEBRUARY 2002

HARWELL ARS Radio and Computer Rally - Ann, G8NVI, 01235 816 379 or annstevens@compuserve.com

17 MARCH 2002

NORBRECK Amateur Radio, Electronics & Computing Exhibition - Peter, G6CGF, 0151 630 5790.

6 / 7 APRIL 2002

RSGB Spring Radio & Computer Show (incorporating the **RSGB National VHF Convention**) - Jan, 0870 904 7377.

19 MAY 2002

MIDLAND ARS Drayton Manor Radio & Computer Rally - Peter, G6DRN, 0121 443 1189 (eve).

26 MAY 2002

Spalding & DARS Annual Rally - Ray, M0CTM, 01775 711 953, or John, G4NBR, 07946 302 815. www.sdars.org.uk

13 JULY 2002

CORNISH RADIO AMATEUR CLUB Radio & Computer Rally - Ken, G0FIC, ken@jtarry.freeserve.co.uk or John, G4LJY, g4ljy@hotmail.com

26 - 28 JULY 2002

RADIO AMATEURS OF CANADA 2002 National Convention - www.rac2002.org/

11 AUGUST 2002

FLIGHT REFUELLING ARS Hamfest - Keith, G1VHG, 01202 577 937 or keithg1vhg@netscapeonline.co.uk

20 / 21 SEPTEMBER 2002

LEICESTER Amateur Radio Show - Geoff, G4AFJ, 01455 823 344, fax 01455 828 273 or e-mail g4afj@argonet.co.uk

GB calls

These callsigns are valid for use from the date given, but the period of operation may vary from 1 – 28 days before or after the event date. Operating details are provided in an abbreviated form as follows:

T = 160m; L = 80 or 40m; H = HF bands (30 - 10m); V = 6 and / or 4m; 2 = 2m; 7 = 70cm; S = satellite and P = packet.

Please send operational details of your special event station to the *RadCom* office at least five weeks before publication.

The QSL Bureau Sub-Managers for special event station callsigns are as follows:

GBxAAA-MZZ - Mike Evans, 322 Heol Gwyrosydd, Penlan, Swansea SA5 7BR, e-mail mw0cna@ntlworld.com

GBxNAA-ZZZ - Graham Ridgeway, 37 Highfield Gardens, Blackburn BB2 3SN, e-mail m5aav@zetnet.co.uk

Will organisers of special event stations please ensure that they lodge plenty of envelopes with their sub-managers?

2 Oct	GB2MCG: Commonwealth Games. Moston, Manchester. (G0TOG)
6 Oct	GB0SM: St Mary's. TLH (G3WNI) GB100MPD: Marconi Poldhu Centenary. Mullion, Cornwall. (G0JVR)
13 Oct	GB0TCF: The Cobweb Foundation. Elgin. L2 (GM0MUN) GB2RAF: Royal Air Force. Neatishead, Norfolk. LH2 (G4PSH)
14 Oct	GB8ST: Science & Technology. London. LH2P (M0BGR)
20 Oct	GB0BWS: Bishops Waltham Scouts. Bishops Waltham, Hampshire. LH27P (G0JLX) GB0RFS: Raunds First Scouts. Wellingborough, Northants. LHV27P (G0VCW) GB4BIM: Beck Isle Folk Museum. Pickering, North Yorks. L (G0HKH) GB5AMS: *CANCELLED*. LHV27P (M5ELF)
21 Oct	GB2NRM: National Railway Museum. York. LH2 (G3WVO)
24 Oct	GB2UTA: University of the Third Age. Scarborough. LH2 (G3WVO)
27 Oct	GB25STD: 25th Anniversary of St.D.ARS. Brighton, East Sussex. LH2 (G3SEJ) GB2GG: Geroge Green. Sneinton, Nottingham. TLHV (G3XBE) GB2KSS: Kilve Space Science. Kilve, Somerset. LH27S (G4JBH)

Helplines FOR MEMBERS • RadCom

● Peter, G4EVY, wishes to thank, on behalf of himself and the Rochester Squadron of the ATC, all those who responded to his plea in the June 'Helplines' column regarding Icom and Pye VHF and HF transceivers. His squadron now has nine cadets with (or awaiting) 2E1 callsigns. G4EVY, QTHR, Squadron Radio Officer.

● Ken, G3PSZ, requires **813 valve bases** for linear amplifier project. He can dismantle from unit if required. G3PSZ, QTHR. Tel: 01837 53021 or e-mail kgjones@lineone.net

● Gerry, GM4BAE, would like to contact anyone who uses digital modes with **Logger** (Version 7.09) and a KAM-Plus TNC. GM4BAE, QTHR. E-mail: gd.maxwell@cwcom.net

● Adrian, G4JBH, is looking for operating instructions for the **Trio VT-108 FET VOM**. He would be grateful for any information regarding the meter, and is happy to reimburse costs. G4JBH, tel: 01288 331 113 or e-mail g4jbh@compuserve.com

● George, G3RHM, would like to know of any **Tandy outlets**, because all his local stores around Honiton have "gone away". G3RHM, QTHR.

● Ken, G3FVD, is searching for a service sheet or diagram for a **Sharp C1495 TV**. G3FVD, QTHR. Tel: 01208 72487 or e-mail kennim@kmildren.freeserve.co.uk

● Ken, G3DJK, wishes to thank all those who responded to his query about XZ2 callsigns. A circular letter is on its way. XZ2AF/G3DJK, tel: 020 8679 2717.

● Peter, G0PHU, has a 1960s **Pye 405-line VHF TV** in search of a good home. Its new owner must be willing to collect it from Epping. G0PHU, QTHR. E-mail: peter_pleydell@email.com

● Jon, G1OSP, is looking for a copy of the circuit diagram of the **Yupiteru MVT-7100** multiband receiver. G1OSP, QTHR. E-mail: castlecolumbus@tinyworld.co.uk

● Mike, G3XEF, requires manuals for the **Heathkit SB-401** transmitter and **SB-301** receiver. G3XEF, QTHR. Tel: 01952 606 373 or e-mail mfle@mail.com

Regional and Club News

Region1: Scotland West & Western Isles

PAISLEY (YMCA) ARC

3, Why use VHF simplex when there is a repeater? 17, That's a beam isn't it? 31, Solving EMC problems; it's not always your fault. Jim, GM3UWX, 01505 862817.

Region 2: Scotland East & the Highlands

ABERDEEN ARS

5, Junk sale. 12, 'Foxhunt'. 19, Building competition. 26, Talk by winner of building competition. Robert, 01224 896 142.

COCKENZIE & PORT SETON ARC

5, 'Normal club night'. 19, Video night. Bob, GM4UYZ, 01875 811723.

DUNDEE ARC

2, Club night. 9, VP8SDX Falklands DXpedition, Gavin, GM0GAV. 13, 16, Club night. 23, 'Map reading for the terrified', Alex, GM7IIL. 27, 30 Club nights. Donald, GM0PIV, 01382 455771.

Region 3: North West

MID CHESHIRE ARS

3, Adventure Radio, Richard Newstead, G3CWI. 10, VHF on air. 17, Activity night & committee meeting. 24, HF on air. 31, Surplus equipment sale. Niall, G0VOK, 01606 871413.

STOCKPORT RS

2, Skills meeting. 10, G0HAL lecture, 'Going up in the world'. 16, Skills meeting. 24, Construction competition & slide show. David, M1ANT, 0161 4567832.

THORNTON CLEVELEYS ARS

1, Visit from RA. 8, Silent key auction. 15, AGM. 22, 'Operation Raleigh in Chile'. 29, Video 'Japanese Morse'. Jack, G4BFH, jack@jduddington.fsnet.co.uk

WARRINGTON ARC

2, D68C Comoros Island DXpedition, Steve Wilson, G3VMW. John, G0RPG, 01925 762722

Region 4: North East

GOOLE RES

5, Fund raising at Barnes Wallis Inn. 12, LF demo night at QTH of G0GLZ. 19, Social evening at Barnes Wallis. 26, RSGB video at Courtyard Centre. Richard, G0GLZ, 07867 862169.

GREAT LUMLEY AR & ES

3, On air & planning for Rally. 7, Rally. 10, Post-rally discussion. 24, Committee meeting. Nancy Bone, lumley.rally@ic24.net

GRIMSBY ARS

4, AGM. 11, Committee meeting. 18, Junk sale. Brian, G4DXB, 01472 231383.

HAMBLETON ARS

3, Talk. 11, *PW*, Rob Mannion, G3XFD. 17, Operating night. 31, Talk. Ian, 01609 775598.

HORNSEA ARS

21, Hornsea Rally. Duncan, G3TLI, 01964 532588.

HULL & DARS

19, Natter night. 26, Chairman's quiz. Leigh, G0UBY, leigh@sydney.karoo.co.uk

KEIGHLEY ARS

4, Natter night. 11, On air. 18, Talk & demo, Ian, M1BGY. 25, Used equipment auction. Ian, M1BGY, 01274 723951.

NORTH WAKEFIELD RC

14, Radio & Computer Rally. Jim, G3YDL, 01924 824451.

YORK RADIO CLUB (AMATEUR)

4, AGM. 11, 18, Morse practice, G4XIV & G0YRC. Tony, G4XIV, 01904 330502.

Region 5: Midlands

BROMSGROVE ARS

9, Talk. 23, Quiz night, usual rules apply. Angus, G8DEC, 01257 875573.

COVENTRY ARS

5, AGM. 12, On air, Novice class, CW practice. 19, Outdoor event TBA. 26, On air, Novice class, CW practice. John, G8SEQ, 024 76273190.

DERBY & DARS

8, 90th anniversary luncheon (12 noon). Tickets from Fred Ward, G2CVV, 01332 766931.

GLOUCESTER AR & ES

1, On air on HF. 8, Home-built transmitter evening - bring & show. 15, 5WPM Morse practice. 22, 29, On air on HF. Tony, 01452 618930 (day).

HEREFORD ARS

19, Optimising your VHF Station, David, G4ASR. Mike, G0WZY, 01981 251743.

KIDDERMINSTER & DARS

2, Surplus equipment sale. Phil, G4SPZ, 01299 403025.

LEICESTER RS & COMPUTER CLUB

1, Bingo and usual activities. 8, Activities HF, VHF and computers. 15, Quarterly progress meeting & usual activities. 22, 15-minute lecture night. 29, Activities HF, VHF and computers. Stan, G3HYH, 0116 2242598.

LINCOLN SW CLUB

3, On air. 10, Committee meeting. 17, Surplus equipment sale. 24, Video: 'Bletchley, Pt 2'. John, G1TSL, 01522 793751.

MID-WARWICKSHIRE ARS

9, 2002 programme planning meeting. 23, 'The perils of PMR Conversion'. Bernard, M1AUK, 01926 420913.

RAF WADDINGTON ARC

4, RAE course. 11, 'My Lightning Experience', Bob, G7AVU. 18, 25, RAE course. Bob, G3VCA, 01522 528708.

SALOP ARS

4, 'Safety in the Shack' and Telford works visit, G7SBD. 11, AGM. Diane, M5DSJ, 01743 341654.

SHEFFORD & DISTRICT ARS

11, CQWW planning. 18, Grand autumn junk sale. 25, 5WPM Morse Tests & DX practice evening, use of rigs, technique and logging computers. 27/28, CQWW contest. Derek, G4JLP, 01462 851722.

SOUTH NOTTS ARC

3, On air HF & VHF. 10, Abokwa Island 9G5MD DXpedition, Ken, G0OGX. 17, 24, On air HF & VHF. 31, College closed. Details, tel: 01509 569679.

STOURBRIDGE & DRS

22, Trunked radio systems / PMR, Iain Sharratt of Car Tel. John, M1EJG, 01562 700513.

TELFORD & DARS

3, Open evening & on air. 10, Visit BT at Whittington. 17, Club project. 24, Club project. 31, Digital filtering, illustrated talk, M1RKH. Mike, G3JKX, 01952 299677.

WEST BROMWICH CENTRAL RC

GX4WBC meets at the Horse & Jockey Public House, Stoney Lane, West Bromwich at 7:30 each Sunday evening. Ian Leitch, G0PAI, iantleitch@friends-of-the-eso.co.uk

Region 6: North Wales

DRAGON ARC

1, Discussion night. 15, Restoring old radios, John, GW3VVC. Stewart, GW0ETF, 01248 362229.

Region 7: South Wales

BARRY ARS

2, GW4BRS on air. 9, Morse practice on air & training. 16, Lecture night & construction projects. 23, 'Pie & Pint' social night. Ken, GW1FKY, 01656 656909.

SWANSEA ARS

18, Construct a novel continuity tester. Frank, GW8BME, 01792 390233.

Region 8: Northern Ireland

BANGOR & DARS

3, DXpedition Videos. Mike, GI4XSF, 028 42772383.

Region 9: London & Thames Valley

CHESHUNT & DARC

3, Members' forum. 17, Construction competition. John, G3WFM, 01707 651532.

COULSDON ATS

8, HF & VHF operation evening, G4FUR/P & M1FUR/P. Steve, G7SYO, 01737 354271.

CRAY VALLEY RS

4, Surplus sale. 14, Special

Region	RSGB Regional Manager
1. Scotland West & Western Isles	John Martindale, GM4VPA
2. Scotland East & the Highlands	Tommy Menzies, GM1GEQ
3. North West	Kath Wilson, M1CNY
4. North East	Geoff Darby, G7GJU (temp)
5. Midlands	Vacant
6. North Wales	Liz Cabban, GW0ETU
7. South Wales	Simon Lloyd Hughes, GW0NVN
8. Northern Ireland	Jeff Smith, MI0AEX
9. London & Thames Valley	Roger Piper, G3MEH
10. South & South East	Ivan Rosevear, G3GKC
11. South West & Channel Islands	Richard Atterbury, G4NOI
12. East & East Anglia	Malcolm Salmon, G3XVV

RSGB Regional Managers (as of 4 September).

event station GB8ST at Crown Woods Festival of Science & Technology. 18, 55th anniversary party. 20 - 26, CVRS activity week. 27 / 28 *CQ* World Wide SWL multi station at BRS-32525. Bob, BRS32525, 020 82657735 after 8pm & w/ends.

CRYSTAL PALACE & DRS

3, Make your own PCBs at home, Bob Burns, G3OOU. 19, Knots by Jim Gale, G4WYJ. Bob, G3OOU, 01737 552170 or Victor, 020 86532946.

DORKING & DISTRICT RS

23, Insight into media, community and government attention towards safety of mobile phone base stations, demo / lecture SiteSafe products, David Lees of Crowncastle UK Ltd. John, G3AEZ, 01306 631 236.

ECHELFORD ARS

11, Getting Started on Packet, G7TOF. 25, DX from the Antipodes, Roger Western, G3SXW. Robin, G3TDR, 01784 456513.

EDGWARE & DARS

11, Club field trip (no meeting at Edgware). 25, D68C Comoros DXpedition, Steve, G4JVG. David, G5HY, 01923 655284 (days) / 020 89549180 (eve).

GUILDFORD & DISTRICT RS

12, Bring & show. 26, Talk on licensing conditions, Simon, G7HHI. Stella, 01483 831044.

MAIDENHEAD & DARC

4, Junk sale. 16, Test gear evening, Roger, G3VCT. John, G3TWG, 01628 525275.

RS OF HARROW

5, A beginner's guide to astronomy, Fred, 2E1ICQ. 6, GB2DHH operating day at Mosquito Museum, London Colney. 19, Hungarian evening. Jim, G0AOT, 01895 476933 / 0207 278 6421.

READING & DARC

11, Construction for beginners, Robin Caine, G4IWS. Pete, G8FRC, 0118 969 5697.

SURREY RADIO CONTACT CLUB

1, Autumn surplus equipment sale. Ray, G4FFY, 0208 6447589.

VERULAM ARC

22, Clubs (local to SW Herts) evening. Walter, G3PMF, 01923 262180.

WELWYN-HATFIELD ARC

1, DXing the easy way, Alan, G8OO. 15, Annual junk sale. 22, Construction evening at Lakeside School. Details: dean@g3wgc.freeserve.co.uk

Region 10: South & South East

FAREHAM & DISTRICT ARS

3, On air. 10, ESD, Dave, G4BMQ. 17, Practical heavy magnetism, Colin, G7MTA. 24, Radio links & tone signalling, Dave, G7CFR. 31, Repairing your radio - practical demonstration of fault-finding, G4ITF & G0AMS. Steve, G7HEP, 01329 663673.

FARNBOROUGH & DARS

10, Surplus equipment sale. 24, Construction contest, John, G3OQB, John, G3KND. Norman, G0VYR, 01483 835320.

HARWELL ARS

9, Teletext and sub-titles, Ray, G4FON. John, G6LNU, 01235 223250.

HASTINGS ELECTRONICS & RC

17, Final surplus equipment auction for 2001. R C Gornall, G7DME, 01424 444466.

HORNDEAN & DARC

23, AGM. Stuart, G0FYX, 023 92472846.

HORSHAM ARC

4, Junk sale. David, G4JHI, 01403 252221.

ITCHEN VALLEY RC

12, TBA. 26, Magnatronics. Mike, G6AIQ, mamjh@yahoo.com

MID SUSSEX ARS

19, AGM. 26, Shack operations. Geoff, G6MJW, 01273 845103.

OXFORD & DARS

11, History of the Oxford club, part 2, Paul Goodhall, BRS176562. Dave, G3BLS, 01865 247311.

SWINDON & DARC

4, Table-top direction finding competition, Deryck, G3YKC. 18, Amateur Radio Observation Service, Barry Scarisbrick, G4ACK. Den, M0ACM, 01793 822705.

TROWBRIDGE & DARC

3, Standards and calibration, Dennis, G3LLZ. 17, Natter night. Ian, G0GRI, 01225 864698 (eves / w/ends).

WATERSIDE (New Forest) ARS

2, Packet rejuvenated, Bill Simmons, G0XAZ. A Horton, G0LKG, 02380 844316.

WORTHING & DARC

3, Circuit systems and noise, G8FCD. 10, AGM. 17, Discussion evening. 24, Emergency planning and the radio amateur. Roy, G4GPX, 01903 753893.

Region 11: South West & Channel Islands

APPLEDORE & DARC

15, TBC. Brian, M0BRB, 01237 473251.

CORNISH RAC

4, Life with oil palm production in West New Britain, Tony Bevington, G4ZUI. 8, Computer section. John, G4LJY, 01872 863849.

NORTH BRISTOL ARC

5, Upgrading your computer, Frank, G0CEN. 12, Committee meeting. 19, Morse tests (appointment required). John, G3IZM, 01179 572176.

SALTASH & DISTRICT ARC

8, Visit to Saltash Museum. 18, Constructors' contest. Brian, M0BHG, 01752 844321.

SOUTH BRISTOL ARC

3, CW practice, Peter, G0DRX. 10, Why match your antenna? Frank, G0CEN. 17, VHF workshop for newcomers, Peter, G0DRX. 24, Linux for beginners, Steven, G0UQT. 31, HF activity evening. Len, G4RZY, 01275 834282.

THORNBURY & SOUTH GLOUCS ARC

3, Operating night. 10, Practical night: bring your projects / failing gear / mistakes - let's see if we can fix it. 17, Video night. 24, Club speaker TBA. 31, Operating night. John, 01454 850798.

TORBAY ARS

19, Track, Turnpikes and Tollhouses. Michael Vyner. John, G3RMA, 01803 556425.

WEST SOMERSET ARC

2, South Africa video. Alan, M0AOJ, 01643 707207.

YEOVIL ARC

4, 'My Experience of SSTV', G3ICO. 11, TBA, M1DGP. 18, More weapons, M1RMW. 25, On air. Derek, M1WOB, 01935 414452.

Region 12: East & East Anglia

BRAINTREE AR & CCC

15, JOTA planning. Keith, M0CLO, 01376 347736.

BROMLEY & DARS

16, Construction contest, Ian Daniels. Alan, G0TLK, alangm2@clara.net

BURY ST EDMUNDS ARS

16, 160m DX from a small garden, Phil, G3XAP. George, G3LPT, 01359 259518.

CHELMSFORD ARS

2, AGM & quiz. David Bradley, M0BQC, 01245 602838.

HARWICH ARI GROUP

10, 'Science of Secrecy', Jonathan, G0DVJ. Eugene, G4FTP, 01206 826633.

IPSWICH RADIO CLUB

3, Florida quad antenna, John, G4FSP. 31, Morse practice, John, G4BAV. Keith, G7CIY, 01394 420226.

LEISTON ARC

2, Virtual shack tour, Jonathan, G0DVJ. Lisa, 2E1HBF, 01728 833202.

MAIDSTONE YMCA ARS

5, RAE DC theory. 12, RAE AC theory. 19, RAE reactance and impedance. 26, RAE resonance. Andy, M0CST, 01622 661035.

NORFOLK ARC

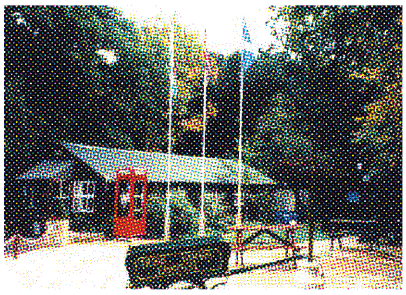
3, Using the oscilloscope, Doug, G0UYC. 10, Morse practice and instruction. 17, Linear amplifier construction, Bruce, G3WCE. 24, Morse practice and instruction. 31, Radio systems in light aircraft, Alan Norton of Norwich Aviation Centre. Peter, G3ASQ (QTHR).

NORTH KENT R & EC CLUB

2, Surplus equipment sale. 16, Internet-linked radio, G4EGU. Dave Collings, 01322 330 830.

CLUB NEWS IN BRIEF

Special Event in the Woods!



THE TAUNTON and District ARC are activating GB2TWH at the Taunton Scout Group's Huish Woods campsite, about 5 miles to the south east of Taunton. The club has been operating Jamboree on the Air (JOTA) from the site for many years and has been invited to join the celebration of the 40th anniversary of the acquisition of Huish Woods by the Scouts on the weekend of 22/23 September. Modes are likely to be SSB, PSK31 and possibly ATV.

Huish Woods is a glorious, elevated and partly wooded site and is available to visiting Scouts. It extends to around 40 acres with purpose-built buildings and facilities sensitively developed to blend with the beautiful surroundings.

Co-ordinator Peter Robinson, G0EYR, says, "Former Scouts may well recall visiting Huish Woods since 1961 and we would be delighted to hear from anyone with recollections of the site." If you would like to arrange a sked please e-mail Peter at: pgr46@hotmail.com

Giant's Special Event

THE FINN MacCool Festival in Bushmills, Northern Ireland, got an international flavour when members of the Ballycastle-based Marconi Radio Group set up special event station GB0FMF, making contacts throughout Europe and into the USA. Bushmills is best known for its whiskey but is also the home of the myth of the giant Finn MacCool, who, legend has it, created the Giant's Causeway.

More information about the Marconi Radio Club may be obtained from Kevin McAuley on tel: 07885 217901.

Peter Bell, John Anderson, Kevin McAuley, Paul Quinn, Trevor Campbell, David Kyle and Peter Dellet at the Finn MacCool Festival.

Derby & DARS 90 Years Young!

THIS MONTH the UK's oldest amateur radio club, the Derby and District Amateur Radio Society, celebrates the *90th* anniversary of its founding. Congratulations to all past and present members of the club for this remarkable achievement. The anniversary is celebrated on 8 October with a luncheon to be held at Littleover Lodge Hotel Restaurant between 12 noon and 2.00pm. Tickets, priced at £6.65 are available from Fred Ward, G2CVV, tel / ans / fax: 01332 766931.

The club is currently changing its venue after more than 50 years and the day of the meetings to Tuesdays, after meeting regularly for 90 years on Wednesdays.

Ryan Pike, G5CL (ex-M0CXU), the Deputy RSGB Regional Manager for Hertfordshire and North Buckinghamshire, and Roger Piper, G3MEH, the RSGB Regional Manager for London and Thames Valley, at the Milton Keynes and District ARS Rally on 26 August 2001. Look out for your RSGB Regional Manager (RRM) and Deputy RSGB Regional Managers (DRRMs) at your local rally or amateur radio exhibition throughout the year!

A Morse, a Morse, My Kingdom for a Morse

MEMBERS OF the Stratford-upon-Avon and District Radio Society held their ninth special event station, GB0NTC, at Charlecote Park National Trust property earlier this year. The fine weather allowed for open-air operating, with the original Tudor gatehouse providing a fine backcloth to the station. Activity was mainly on 40m and 2m, and operators G0IHM, G0MRH, G3MXH, G3OOQ, M0AIZ and M1AUK were kept busy all days making contacts and discussing the operation with members of the public. Visitors took a lot of interest in the contacts made by Morse code and many were anxious to try their own hand on a Morse practice key. A good number of ex-services visitors took particular interest in the activities and recounted their own radio communications experiences.

Colchester Club's Cloud-Free Rally

THE 33rd Colchester Radio, Computer and Electronics Rally was held in glorious sunshine on 29 July at St Helena School in Colchester. The outdoor flea market had over 70 traders offering everything from resistors to rigs and antennas while, indoors, Waters & Stanton and Moonraker joined the many clubs, societies and special interest groups.

Talk-in on 145.550MHz proved even more useful than usual after the local Highways Authority placed a ban on unauthorised direction signs on their verges. The club is already preparing for next year's rally and has a provisional date of 28 July 2002. The Chairman, Richard, G7BIV (QTHR or e-mail: Richard.Hudson@btinternet.com), would welcome comments and suggestions for improvements or new services that could be provided next year.

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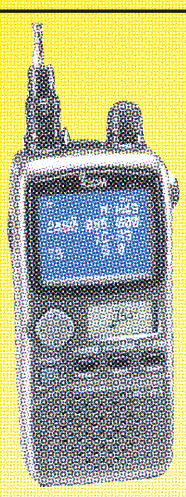

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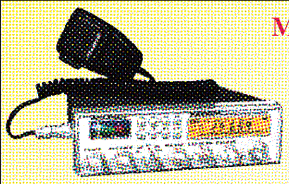

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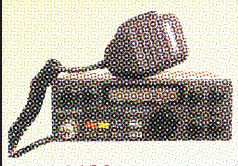
FEATURES (RDS) RADIO DATA SYSTEM



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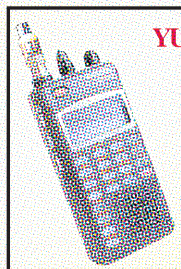

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QUITE A rewarding month for VHF / UHF operators with a reasonable Perseids meteor shower and some excellent long distance tropospheric contacts made. Sporadic E (Es) tailed off on 144MHz but was more frequent on 50MHz on which band there were some trans-Atlantic openings.

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, (EX), (GU) etc refers to the postcode area and (JN26), for example, is the Maidenhead grid reference.

PUBLICATION

THE MAIN TECHNICAL contribution in Issue 2/2001 of *DUBUS* magazine is the second part of Gerhard Hoffmann's, DK4XP, article on 'Low-noise VHF Crystal Oscillators'.

The extensive EME sections include the EME Toplist, the abridged results of the 2000 ARRL EME Contest, the final results of the 2000 ARI Worldwide EME Marathon and the rules for the 2001 year-long event. There is the full tabulation of the REF / *DUBUS* 2001 European EME Contest results - more of that in the Moonbounce section. There are dozens of photographs of superb antenna arrays and groups of operators. There are short sections on 6m news, tropo, aurora and meteor scatter, rounding off with News and Comments pages. Roger Blackwell, G4PMK (QTHR), is the UK agent for *DUBUS* and his e-mail address is dubus@marsport.demon.co.uk

SOLAR ACTIVITY

THE AVERAGE 2.8GHz radio flux for the 30 days up to 14 August was 141.4 units, 7.3% down on last month's data. The peak of 167 was on 8 August and the minimum was 115 on 30 July. The SESC sunspot number average was 144.5, the daily count varying from a low of 59 on 29 July to a maximum of 214 on 5 August. 37 new regions were noted. The mid-latitude A-index at Fredericksburg was below 10 on 17 days, falling to just 2 on 28 July and 11 August with a peak of 21 on 25 July. The three-hourly K-index never exceeded 4.

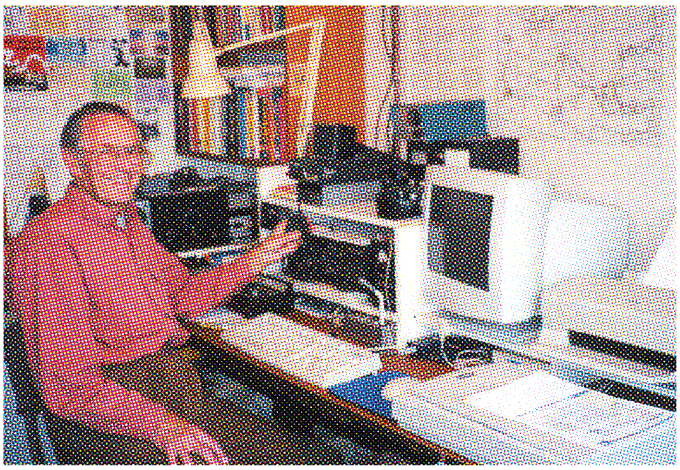
I acknowledge receipt of the May issue of *The Six and Ten Report* containing an extensive analysis of propagation during that month. The *Report* is an activity of the RSGB's Propagation Studies Committee (PSC), and is edited by Steve Reed, G0AEV, and Prof Martin Harrison, G3USF. Subscription inquiries should be addressed to Steve (QTHR) whose e-mail address is g0aev@explore.force9.co.uk

The June issue of Neil Clarke's, G0CAS, *SunMag* includes an article about solar flares. To study these phenomena, the NASA has launched a new satellite called HESSI - the High Energy Solar Spectroscopic Imager - to orbit about 600km above Earth, where it can record X-ray and gamma-ray emissions from flares. The remaining pages contain daily solar, geomagnetic, particle and sunspot group data, a list of solar flares and plots of M5 or greater X-ray flares observed in cycles 20 through 23 to date. *SunMag* is compiled and published by G0CAS (QTHR) whose e-mail address is neil@g0cas.demon.co.uk and he has a website - see the list.

MOONBOUNCE

ACCORDING TO THE August *432 and above EME Newsletter*, the July sked weekend was pretty much a repeat of the June one, with most reporters noting low activity. Conditions were generally good on all bands with VK4ALF reporting them very good on 70cm. SP6JLW is a new station on the band and who could provide a new country for some. There were no reports from any UK stations.

Howard Ling, G4CCH (IO93), was QRV on 23cm over the 11/12 August weekend and completed 13 QSOs, new initials being W2DRZ and IK3COJ to bring his tally to 154. On the 11th W2DRZ* started at O/O improving to 449/429, K2UYH 55/55, F2TU 54/45 and IK2MMB* 559/559 were his completions. Next day brought IK2MMB* 559/559, OZ4MM* 579/569, IK3COJ* O/539, OE9ERC 57/56, W2DRZ* 539/539, F2TU 54/44, K2UYH 54/55, DL1YMK* 539/



Paul Pique, G8KDQ, in his shack.

LOCATOR SQUARES TABLE

Starting date: 1 1 1979

Callsign	50	70	144	430	1296MHz	Total
G3IMV	672	20	616	125	53	1486
GJ4ICD	780	1	267	121	79	1248
G4RGK	409	-	345	233	78	1065
G0FIG	460	-	385	94	-	939
G0JHC	836	26	48	4	-	914
G4TIF	477	28	254	112	-	851
G0FYD	538	1	276	20	-	835
G0EVT	416	14	292	77	16	815
GW7SMV	550	-	198	-	-	748
G1SWH	350	42	240	81	30	743
G4YTL	-	51	511	101	-	663
GW6VZW	488	-	146	6	-	640
G8TOK	348	32	135	56	29	600
G3XDY	-	34	251	173	122	580
G7CLY	244	-	248	16	-	508
G8HGN	270	-	163	58	-	491
G0XDI	182	-	239	67	-	488
G3FIJ	268	29	107	50	23	477
G6TTL	220	-	133	90	27	470
MM5AJN	316	-	76	32	-	424
G1UGH	273	-	130	17	-	420
GU6AJE	338	13	32	-	-	383
G4OBK	318	-	57	-	-	375
G4DEZ	282	13	37	10	-	342
G0ISW	196	-	80	22	-	298
G1EFL	221	-	67	2	-	290
GM4VVX	186	-	100	-	-	286
G3FPK	30	-	246	-	-	276
GW3EJR	252	-	-	-	-	252
GM1ZVJ	235	-	-	-	-	235
G4APJ	166	-	44	21	-	231
M1DUD	190	1	30	-	-	221
G8GNI	139	15	46	18	-	218
GM6MEN	166	-	-	-	-	166
G4OUT	-	23	107	-	-	130
M5PLY	120	-	-	-	-	120
G4FUJ	68	18	23	5	5	119
M1DRK	113	-	-	-	-	113
EA7IT	-	-	102	-	-	102
MM0BQI	44	-	18	1	-	63
M0CNP	-	1	31	12	-	44

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Next deadline is 9 October.

WSJT - What is it?

IN CASE YOU are wondering, WSJT is a newish weak signal communication mode, the software for which was developed by K1JT - hence WS = Weak Signal, the JT bit being part of his call sign. It is a four-tone MFSK system occupying an SSB channel and runs at 9000 letters/minute.

Within a few weeks of its release, MS operators were using it quite extensively as an alternative to the more conventional high-speed CW - HSCW - method. It is being used in the 'DX' section of the 2m band - 144.0 - 144.4MHz - and not everyone is happy with this. There is a vigorous debate in progress on the vhf-dx-discuss reflector about where it should go.

Several MS operators were using WSJT in the SSB sub-band during the Perseids shower. Conrad Farlow, G0RUZ, writes, "I made some SSB skeds way before the WSJT revolution and I had to suffer 20 - 30s bursts of it during a couple of skeds." He asks, "Why would anyone want to use the mode when bursts are very long around the peak? It becomes inefficient and SSB is better. Of course it is difficult to predict this. I heard some WSJT bursts where I could have worked five stations on SSB. WSJT's forte is short reflections in my opinion."

Andy Cook, G4PIQ, is already having trouble with PSK31 activity around 144.075MHz and agrees with Pit's, YO3JW, suggestion that it would be better to centre it around 144.61MHz, in the all-mode section, 144.5 - 144.8MHz, as per the Region 1 Band Plan, likewise WSJT. In sympathy with others Andy says, "I'm definitely not trying to have a go at individual modes here - simply looking for the best coexistence options."

Neither David Anderson, GM4JJJ, nor Martin Platt, G4XUM, want WSJT in the CW part of 2m anywhere near the EME section, but David does not think it appropriate for it to be above 144.4MHz. Graham Daubney, F/G8MBI, is quite clear that, as it's a digital mode, it belongs in the 144.8 - 144.99MHz sub-band, again as per the IARU Region 1 band plan. Michel Rouselett, F5FLN agrees. But others think this would lead to clashes with packet stations.

This illustrates the difficulty faced by those with responsibility to formulate band plans, since we cannot foresee future technical developments. There are dozens of messages on this 'new' mode on the aforementioned reflector. If you would like to join it and contribute to the debate, e-mail majordomo@blacksheep.org to join. Once a member, you can contribute by e-mailing: vhf-dx-discuss@blacksheep.org

Meantime, this digital mode is increasingly being used in the SSB / CW part of the 2m band. As it will be a long time before any revisions to VHF band plans will be discussed by IARU Region 1, perhaps we should consider adopting a Code of Practice to avoid what has been inferred as 'a WSJT / SSB war'. G0RUZ writes, "May I suggest that all SSB QSOs take place well below 144.350MHz in future? It is inevitable that WSJT will take place between 144.350 and 144.400MHz and it can happen at *any* time. It is time to stop moralising on the rights and wrongs of this allocation and face the fact that this portion of the band *will* be used for WSJT."

559 and VE1ALQ* 569/569.

The suggested sked weekend for October is 6/7, when London latitude stations will have about 29.7 hours of Moon time. The declination varies from +15.23º to +21.80º while the 144/432MHz sky temperatures range from 400/28K to 507/38K. The signal degradation, referred to perigee, varies from -1.16dB to -0.73dB and the Sun offset at Saturday midnight is -129º.

The following weekend sees the first leg of the ARRL International EME Contest the rules for which can be found on the ARRL's web site - see the list. The data are 28.8 hours of Moon time, declination +16.26º to +7.76º, sky temperatures 216/16K to 252/19K, signal degradation -0.00dB to -0.04dB and Sun offset -39º.

The results of the 2001 European EME Contest are published in *DUBUS* 2/2001. On 2m SM5FRH with 862,400 points was the clear winner, with F3VS second and RU1AA third. Roy Reed, G3ZIG, was a very creditable fifth out of 32 entries and was the only UK station listed. On 70cm OZ4MM won with 180,000 points, closely followed by HB9Q and DL9NDD. There were 22 scoring entries and the only UK station was Pete Etheridge, G4ERG, who came 10th. On 23cm there were 22 entrants the winner being SM3AKW with 130,000 points. K0YW and OE9XXI were second and third. G4CCH was joint fifth with 105,600 points.

THE PERSEIDS

MATTHEW CABBAN, G0XDI (WD), says that the shower was a very good one for him, with 90% of his 2m SSB skeds completed bringing 10 new grids. He reckons the peak was 0900 - 1200 on the 12th with a much better one at 0100 - 0300 on the 13th when only the 'big guns' were on. He worked six Is, a couple of S5s, an EA1 and a YZ, plus LA0BY/P (JP40), OH6MAZ (KP21), ES0SM/3 (KO19), LY2SA (KO14), LA8KV/P (JP62) and RK2FWA (KO04).

Derek, G8TOK (JO01), completed on 6m, 4m and 2m with the EI4VWY group in IO54 on 12 August. Clive O'Hennessey, GM4VVX (IO87), completed on 2m SSB with F5FVP (IN95), while CW successes were OH3AWW (KP21), F1DUZ (IN97), F5LRL (JN26), DL5GAC (JN47), F5GHP (IN96), OK1UAK (JO70) and DL0UL (JN48). None of his skeds with EA and CT stations were successful. It was difficult to decide when the peak occurred, but he recorded over 300 meteors an hour in the 0000-0400 period on the 12th and 200 during the same time on 13th.

Jamie Ashford, GW7SMV (NP), has been using WSJT mode on 2m completing with I1JTQ on 5 August, TK5JJ (JN41) on the 6th, SM1BSI (JO97) on the 10th, OE3FVU (JN78) and RK2FWA on the 11th, IK1SPR and OK1YA (JN79) on the 12th and F6FHP (IN94) and HA5KDQ (JN97) on the 13th. I8MPO and LA0BY/P were worked on SSB in single bursts. He comments, "I didn't rate the shower as all that good and didn't really notice a sharp peak at all."

Charles Coughlan, EI5FK (IO51), ran 50W to a 19-ele Yagi on 2m and completed nine WSJT QSOs with IW2HAJ (JN62), DG2NBN, DL2OM (JO61) and DF1IAZ (JN49) on the 11th. Next day he worked OM3LQ (JN88), IK1SPR (JN34) and DL1UU (JO62) and on the 14th, DK5WO. He completed on SSB with EA7GTF (IM87) and EA1BFZ (IN81) and with HB9FAP* (JN46) on HSCW. Charles has upgraded his web page to include logs and locator maps for 6m, 2m and 70cm - see the list.

BAND REPORTS

50MHz

Ivo Novak, 9A1AA, forwarded the results of last year's IARU Region 1 6m Contest in which the single operator section attracted 132 entries. The winner was 9H1XT (JM75) who made 544 QSOs. EH8BYR (IL38) was runner up with 9A6A (JN83) third. The leading British station was Steve Reed, G0AEV (IO81) who was 26th and 16 others took part. 46 stations competed in the multi operator section which was won by the LZ1KWT (KN32) team. LZ4A and ER6A/P came next and G8T (IN79), who made the most QSOs, was fourth and there were 13 UK participants.

In the second half of July Ted Collins, G4UPS (EX), records Es into Europe and North Africa on 18, 19, 21, 23and 26 - 30. From 1928 on the 22nd I2ANP* and ON4ANT* were heard working Ws. Ws and VEs in EN and FN fields were heard working into IO90 and 91 with W3ZZ* at 569 the best signal. The last station heard was WA3SIX* at 2124. PY5CC (GG54) was worked at 2013 on the 24th in a brief opening. The next trans-Atlantic opening was in the evening of the 29th when Ted contacted K1SIX* (FN43), VE9AA* (FN), K1TOL* (FN44), WA1CEF (FN41), VE1YX (FN74), W1CU* (FN42), W1GF*

81

CONTEST

TIM KIRBY, G4VXE
11a Vansittart Road,
Windsor SL4 5BZ
E-mail:tim@ukgateway.net

THE COMMENTS from Chris Burbanks, G3SJJ, in last month's 'Contest' column on the future of National Field Day have drawn quite a reaction from readers. The majority of you who responded felt that a combined CW and SSB Field Day would be an idea that you would support, if it 'saved' the event. A couple of replies mentioned the possibility of an event such as the ARRL's Field Day, which is not only multi-mode, but HF and VHF as well!

One particularly interesting reply was received from Steve Knowles, G3UFY, who for many years served on the RSGB's HF Contests Committee. Steve did not favour the idea of a combined CW and SSB field day and, indeed, he was concerned that the inclusion of Chris's comments in the column implied they had tacit approval of the HF Contests Committee. That's not the case, and like other comments I include from time to time, they were 'floated' to try to help the committee gauge your reaction.

Steve said of the idea to have a combined CW / SSB Field Day, "In considering the possible combination of CW and SSB Field Days I would remind you how SSB FD came into existence. It originated as High Power FD, a CW-only, 150-watt input event, introduced in an attempt to reduce the level of cheating in NFD and to provide a field day opportunity for those groups that were unable or unwilling to build rigs or modify commercial equipment to comply with the PA dissipation limits then in force in respect of NFD equipment. The event was not well supported, most groups preferring to support a single, traditional, NFD. Within a few years, in an attempt to improve support, the rules were relaxed to make it a mixed-mode event and in next to no time the CW content of the event had reduced to nothing. This was partly because there were no incentives for working on the key but primarily because it is possible to make many more QSOs per hour on SSB than on CW. Subsequently the rules were changed again, and SSB FD was born."

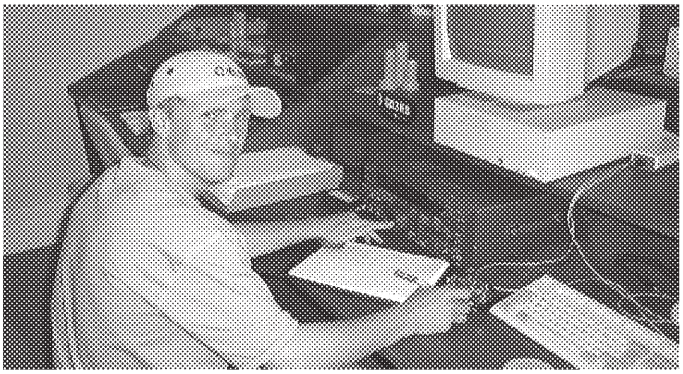
Steve is understandably concerned that to combine the events would lead to a reduction in the CW participation. Would this be the case? I'm not certain. There are several groups who currently don't enter the CW version of the contest because they don't have enough 'good' CW operators. If they were able to split their operation between the modes, perhaps they might participate. Clearly, the formulation of the rules is paramount - to encourage people to share their activity between the two modes. Some groups might well opt to operate CW only. So, there are lots of considerations that need to be made when planning such an event.

A combined CW / SSB Field Day would need to be co-ordinated with our European neighbours, but perhaps co-operation between UK, German and Swiss societies might provide a useful starting point, should those societies also be in favour of the change.

The major consideration, though, is whether it would increase participation? Would your club or group find it easier to support a combined field day rather than a single mode event? We know that entries to NFD have been declining over recent years, so, if you are one of the groups that has had to drop out, would you support a combined event? Let us know: write or e-mail either myself (details above) or Justin, G4TSH (QTHR, hfcc.chairman@rsgb.org.uk). We want to know how you feel.

CQ World Wide SSB Contest

THE LAST FULL weekend in October marks the *CQ* WW SSB contest - almost certainly the single most popular amateur radio contesting event. At the time of writing, the results for last year have just been published. Don, G3XTT, will be listing them elsewhere, but particular congratulations to GW4BLE, M6T, GI0KOW and GM4FDM, all of whom all feature strongly in the results. It's good to see many other familiar callsigns from the UK too.



Sergei Rebrov, M0SDX, was one of the operators at the GB3RS club station during the RSGB IOTA contest at the end of July.

When you're planning your entry for this year, decide whether you will operate on all bands or perhaps a single-band entry. A single-band entry does not seem as glamorous, somehow, as an all-bands one! Over the years, though, I have discovered that they are great fun. You get a real sense of exactly what is happening on the band and always learn something about propagation. And perhaps, if you choose your band carefully, you might also get some sleep! So, if you have an antenna which performs well on a particular band, or you can put one up for the weekend, why not consider a single-band entry? With a careful choice of the band and section you enter, you might end up with one of the prized *CQ* certificates. Good luck, and enjoy the activity that the contest brings!

VHF Contests

OWING TO restrictions to portable contesting this summer, we haven't carried much about VHF contests of late. We can only hope that next year we'll all be able to get back to the VHF bands from our portable locations. Judging by the comments on various reflectors, I know we are all itching to get back on the bands! The events that have taken place during the summer, with sections for fixed stations, have been well supported and it's been fun to work some of the regular 'combatants' from their home locations.

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Event
6 Oct	*0000-2400*	*PSK*	*TARA PSK Rumble*
6 Oct	*1500-1900*	*SSB*	*EU Sprint*
6-7 Oct	*2000-2000*	*SSB*	*URE Iberoamerican*
7 Oct	0700-2100	SSB	RSGB 21/28MHz SSB
13-14 Oct	*0800-0800*	*CW*	*Oceania DX*
21 Oct	0700-1900	CW	RSGB 21/28MHz CW
27-28 Oct	*0000-0000*	*SSB*	*CQ WW SSB*

VHF Contests

Date	Time	Mode	Event
2 Oct	1900-2200	ALL	RSGB 144MHz Activity
2 Oct	*1700-2100*	*ALL*	*Nordic Activity Contest 144MHz*
6-7 Oct	1400-1400	ALL	RSGB 432MHz–248GHz
6 Oct	0000-2400	ALL	RSGB 1.3/2.3GHz Trophies
7 Oct	*1000-1600*	*ALL*	*VERON 144MHz and up (PA)*
9 Oct	*1700-2100*	*ALL*	*Nordic Activity Contest 432MHz*
11 Oct	1900-2130	ALL	RSGB 1.3/2.3 Cumulatives #1
12 Oct	1900-2130	ALL	RSGB 432MHz Cumulative #1
14 Oct	*0600-1000*	*ALL*	*ON 144MHz (ON)*
16 Oct	*1700-2100*	*ALL*	*Nordic Activity Contest 1.3GHz up*
19 Oct	1900-2130	ALL	RSGB 144MHz Cumulative #5
21 Oct	*0500-1100*	*ALL*	*Courteduree 432MHz up (F)*
21 Oct	0900-1300	ALL	RSGB 50MHz
23 Oct	*1700-2100*	*ALL*	*Nordic Activity Contest 50MHz*
26 Oct	1900-2130	ALL	RSGB 1.3/2.3GHz Cumulative #2
29 Oct	2000-2230	ALL	RSGB 432MHz Cumulative #2

Microwave Contests

Date	Time	Mode	Contest
7 Oct	0900-2100	ALL	RSGB 10GHz Cumulative #6
7 Oct	0900-2100	ALL	RSGB All Bands Microwave
21 Oct	0900-2100	ALL	RSGB Millimetre Bands

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

Affiliated Societies (SSB) Contest - 2001

CONGRATULATIONS to the Lichfield ARS who take the Flight Refuelling ARS trophy as the winning team in this years event, beating last year's winners, the Martlesham DX & Contest Group by a healthy margin. Roger Smethers, G3NLY, takes the RSGB Lichfield trophy as the top individual station with his score of 2720 points.

Soapbox: "Used the contest to induct a new club member into SSB contesting and PC logging" - GW0GEI. "The contest was great!" - G3HEJ. "Hard work" - G4PDQ. "The usual 'wall of noise' but good fun all the same" - G3OLX. Several entrants commented on how crowded the band was and that some operators were less than courteous in trying to establish a run frequency. This year's event is one of the first to be adjudicated under new rules that require the loss of all points for any errors in a QSO. While this may seem a bit harsh to some, it should be noted that logs with unmarked duplicate QSOs are no longer penalised with the loss of 10 times the QSO points as previously.

It is nice to see a few M5 callsigns in the entries this year and I noted a few Novice calls in the operator lists too. Let's hope this trend continues. Guest operating by newer licensees from better-equipped stations is usually a good way to cultivate interest in contesting and the hobby in general, so, if your club only managed one team entry this year, how about trying to make that two teams next year? Thanks to EI5IY and G3VQO for checklogs.

Justin Snow G4TSH

Affiliated Societies (SSB) Contest – 2001

Affiliated Societies Section

Pos.		Team		Team		Score
1	Lichfield ARS	A	G3NLY	G3SJI	GW3YDX	7870
2	Martlesham DX & Contest Group	A	G4PIQ	G4MRS	G0KRL	7060
3	De Montfort University ARS	A	G4FPH	G3ORY	G3SDC	6880
4	Chiltern DX Club	A	G4BUO	G3RTE	G0CKP	6810
5	Bristol Contest Group	A	M0AXF	G3RFX	G4WBV	6390
6	Mimram CG	A	M0ABC	G8OO	G4KZD	6260
7	Cheltenham ARA	A	G4ERP	G3SNN	G4PDQ	6240
8	Dragon ARC	A	GW4VEQ	GW0GEI	GW0MOI	6130
9	Horsham ARC	A	G3WZT	G4LRP	G3ZBU	5350
10	Newbury & Dist. ARS	A	G3SVD	G3NVO	G3RVM	5250
11=	Grimsby ARS	A	G3TBK	G3RSD	G4EBK	5010
	Stratford-on-Avon & Dist RS	A	G3MXH	G0REP	G3XZO	5010
12	RAFARS Waddington	A	G0TQI	G3SET	G0RAF	4640
13	RAFARS Cosford	A	G3VAO	G0RNX	G8FC	4600
14	Stroud ARS	A	G4VZR	G0MZK/P	M0ATX	4560
15	Chesham & Dist. ARS	A	G0ODQ	G3MEH	G3XZG	4310
16	Cheltenham ARA	B	G3TA	G3NKS	G4ENA	4300
17	Scunthorpe Steel ARC	A	G3KNU	G4FUH	G4OGB	4170
18	Clifton ARS	A	G0UJK	G0UXM	G0DCG	3960
19	Orkney ARC	A	GM3POI	GM4DZX	GM0HTT	3850
20	Southdown ARS	A	G3SYL	G4RUL	G3DQY	3770
21	Harwich Amateur Radio Interest Group	A	G0DVJ/P	G4YJO	G4FTP	3640
22	Horndean & Dist. ARC	A	G3LIK	G0UHM	G4FBS	3630
23	Wythall Radio Club	A	G0MTN	G3YCH	G0ICJ	3580
24	Torbay ARS	A	G3LHI	G3SNU	M5WNS	3350
25	Harwell ARS	A	G0AOZ	G3VPW		3330
26	Farnborough & dist. ARS	A	G3HEJ	G0VYR	G4UEL	3260
27	Gloucester AR & Electronics Soc.	A	G3MA	M5LET	G4HBV	3230
28	Taunton & Dist. ARC	A	G4HDD	G0EYR		3220
29	Itchen Valley RC	A	G0VNI	G4EOW	M0ACL	3180
30	Dragon ARC	B	GW3PRL	GW4DRR	GW3GUX	3110
31	Reading and District ARC	A	G0VQR	G0LHZ	G4ELY	3090
32	Newbury & Dist. ARS	B	G4ZGC	G0ORH	G4TPH	3040
33	Stockport Radio Society	A	G4APA	G3SHF	M0BEX	2970
34	Cockenzie & Port Seton ARC	A	GM0CLN	MM0CPS	MM0CCC	2820
35	Stevenage & Dist. ARS	A	G2BKZ	G4DDX		2780
36	Sutton and Cheam Radio Society	A	G3WHK	G3OLX		2730
37	Echelford ARS	A	G0VDZ	G3HBZ	G3KKQ	2650
38	Wythall Radio Club	B	M5UCG	M0COP	G0EYO	2480
39	Mid Northants Expedition Group	A	G5LP			2410
40	Cray Valley RS	A	G3UJZ	G4DFI		2400
41	RAFARS Waddington	B	G0DBX/P	G4AOP	G0SWO	2330
42	RNARS Colchester	A	G3YAJ	G3YEC		2220
43=	Cambridge University Wireless Society	A	G6UW			2140
	De Montfort University ARS	B	G4CZB			2120
45	Harlow & Dist. ARS	A	G3UEG	G4YBN		2120
46	Lichfield ARS	B	G3NAS			1840
47	Horndean & Dist. ARC	B	G0ASZ	M0CAA	G0BAG	1770
48	Chippenham & Dist ARC	A	G3VRE			1660
49=	Southgate ARC	A	G0MEE	G0FQT	G3GUI	1630
	Worthing & Dist. ARC	A	G4SLE	G0WMG	G4KIT	1630
51	Torbay ARS	B	G4VTO	G3BIT	M0APB	1620
52	Hastings Electronics & RS	A	G3IKY	G4CUS		1490
53	Cheltenham ARA	C	G3VTS	G4GVZ		1350
54=	Farnborough & District ARS	B	G0YYY	M0AHI		1300
	Harwich Amateur Radio Interest Group	B	G3YYZ	G0SCP	G0GGM	1300
56	RNARS Portsmouth	A	G0FQD	G3OZY		1250
57	Wythall Radio Club	C	M0AEJ	G4WAC		1160
58	Verulam ARC	A	G3YER			1150
59	Moray Forth ARS	A	MM5AHO			1120
60	Carmarthen ARC	A	MW0COZ	GW0CVY	GW0UMC	1100
61	Midland Contest Group	A	G2HDF/P			980
62	Grimsby ARS	B	M0BZU	G0EJQ		910
63	RAFARS Waddington	C	G4CZV	G3UYV		890
64	Guernsey ARS	A	GU3HEN			880
65	RNARS Plymouth	A	G3VNG			690
66	Southdown ARS	B	G4LYU			600
67	Trowbridge & Dist. ARC	A	G3GKC			590
68	Prudential ARS	A	GW0PPS/P			470
69	Torbay ARS	C	G0WWD			410
70	Echelford ARS	B	G2HS			370
71	Horsham ARC	B	G3PYC			340
72	Mid Beds Contest Association	B	G4BIM			280
73	Clifton ARS	B	M5AJX			250
74	RNARS Chatham	A	G4PIE			230

Individual Scores

Pos	Callsign	Score	Equipmt
1	G3NLY	2720	4C16
2	G4PIQ	2640	4C16
3	M0AXF	2620	4C1-
4	G3SJI	2610	-
5	GW3YDX	2540	-
6	G4BUO	2470	4C16
7	G5LP	2410	4C11
8=	G3RTE	2380	4C13
	G4MRS	2380	4Q17
10	M0ABC	2360	-
11	GW4VEQ	2350	4C14
12	G8OO	2320	-
13	G4FPH	2300	4C1-
14=	G3ORY	2290	4C15
	G3SDC	2290	4C1-
	GW0GEI	2290	4C15
17=	G3TBK	2230	4C16
	G3WZT	2230	4W1-
	G4VZR	2230	4C1-
20	G4ERP	2210	4C5-
21	G4HTD	2200	4C12
22	G6UW	2140	4C13
23	G4CZB	2120	4C13
24	G0AOZ	2100	-
25=	G3SNN	2070	4C1-
	G3VAO	2070	4C11
27	G0KRL	2040	4C15
28	G4LRP	2010	4C1-
29=	G4PDQ	1960	-
	G0CKP	1960	4C1-
	G3SVD	1960	3C13
	G3TA	1960	4C1-
33=	G3RFX	1930	4C1-
	GM3POI	1930	4G10/C18
35=	G4WBV	1840	-
	G3NAS	1840	4C1-
37	G3MXH	1790	4C13
38	G3WHK	1700	4C12
39	G0MZK/P	1690	4C1-
40=	G0ODQ	1680	3C1-
	G3SVL	1680	4W13
42	G0REP	1670	3C13
43	G3VRE	1660	3C16
44=	G3NVO	1650	4C13
	G0TQI	1650	3C14
46	G3RVM	1640	4C14
47	G3KNU	1630	4C1-
48	G3SET	1610	3C1-
49	G4KZD	1580	-
50	G3IJZ	1570	3W13
51	G3XZO	1550	4C12
52=	G0UJK	1520	3C1-
	G3MA	1520	3C1-
54	G2BKZ	1500	3W1-
55=	G0UXM	1490	3C1-
	GW0MOI	1490	4C1-
57	G0MTN	1470	3C11
58	G3LIK	1460	3C13
59=	G3HEJ	1450	3W13
	G3RSD	1450	3C13
61=	G0RNX	1440	4C1-
	G3LHI	1440	3W1-
63=	G3UEG	1400	3C1-
	G0DVJ/P	1400	4G10
65	G0RAF	1380	4C17
66	G4FUH	1370	3C1-
67=	G3MEH	1340	3C1-
	G0VQR	1340	3C1-
69=	G4EBK	1330	3W13
	G3ZGC	1330	3C13
71	G3XZG	1290	3C1-
72=	G0UHM	1280	3C1-
	G4DDX	1280	3C2-
74	G3NKS	1270	4C13
75	G4APA	1260	3C11
76=	GM0CLN	1240	3C1-
	G3YAJ	1240	3C11
78	G3VPW	1230	-
79=	GM4DZX	1220	-
	GW3PRL	1220	3C12
81	G0VDZ	1200	3C13
82	G4YJO	1190	3W12
83	G0VNI	1180	3C1-
84	G4OGB	1170	3C13
85	G3SHF	1160	3C13
86	G3VER	1150	-
87	G4EOW	1140	3C1-
88	MM5AHO	1120	-
89=	G3ZBU	1110	3C1-
	G0LHZ	1110	3C1-
	G0DBX/P	1110	3W14
92	G8FC	1090	3C1-
93=	MM0CPS	1070	3C1-
	G3SNU	1070	3C1-
	G3YCH	1070	3C4-
	G4ENA	1070	4C13
97	G0ORH	1060	-
98=	G4FTP	1050	3C14
	G4RUL	1050	3C12
100=	G3DQY	1040	3W1-
	G0ICJ	1040	3W1-
102=	G0VYR	1030	3C13
	G3OLX	1030	3W12
104	G0EYR	1020	3C11
105=	G2HDF/P	980	3C1-
	G3YEC	980	4C1-
107=	G3IKY	970	3C11
	GW4DRR	970	3C13
109	G0DCG	950	-
110	GW3GUX	920	3W1-
111=	G0FQD	910	3C1-
	M5UCG	910	3C1-
113	G4FBS	890	3C1-
114=	G3HBZ	880	3C1-
	GU3HEN	880	3C14
116	M5LET	870	3C1-
117	M0ACL	860	3C1-
118	G0ASZ	850	3C1-
119=	G4HBV	840	3C1-
	M5WNS	840	3C11
	M0COP	840	3C1-
122	G4DFI	830	-
123	G4UEL	780	-
124	G3VTS	770	-
125	G0MEE	750	4C12
126	G0EYO	730	3C11
127=	G4YBN	720	-
	G0YYY	720	3W1-
129	G3YYZ	710	3C14
130=	GM0HTT	700	3C1-
	G4SLE	700	-
	M0AEJ	700	3C1-
133	G3YNG	690	4C1-
134	G4TPH	680	4W11
135=	G4ELY	640	3C1-
	M0ATX	640	3C1-
	G4VTO	640	4G1-
138	G4AOP	620	4C1-
139=	G0SWO	600	3C1-
	G4LYU	600	3W1-
141=	G3GKC	590	3C1-
	G4CZV	590	3C1-
143=	M0AHI	580	3C1-
	G4GVZ	580	3W1-
145=	G3KKQ	570	3C13
	M0BZU	570	3W11
147=	G0FQT	560	3C1-
	G0SCP	560	3W12
149	M0BEX	550	3C12
150	M0CAA	540	3W1-
151	G4CUS	520	4C1-
152=	MM0CCC	510	3C11
	G3BIT	510	3G10
154=	G0WMG	480	3G1-
	M0APB	480	3W1-
156=	GW0PPS/P	470	3W1-
	G4KIT	470	3C1-
158	G4WAC	460	3W1-
159	MW0COZ	420	4C1-
160	G0WWD	410	3C1-
161	GW0CVY	390	3C1-
162	G0BAG	380	2W1-
163	G2HS	370	-
164=	G3OZY	340	3W13
	G3GUI	340	3G1-
	G0EJQ	340	3C1-
	G3PYC	340	3Q10
168	G3UYV	300	3C1-
169	GW0UMC	290	3C1-
170	G4BIM	280	4C1-
171	M5AJX	250	3C1-
172	G4PIE	230	3G1-
173	G0GGM	30	3C1

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(FN43) and W4MW* (EM96). It all faded out by 2240.

Robin Burrows-Ellis, M1DUD (IP), continues to work some DX with up to 2W. His July successes include DL7UCW (JO63), OZ1KSN (JO57), LA9VFN (JP28) as well as Fs and GMs. Paul Thompson, GM6MEN, was QRV on 28 July and in the 1720 - 1905 slot found himself on the end of a pile-up during short-skip Es. As he was about to go QRT he was called by 5B/G1JJE (KM64), for a nice double-hop Es contact.

GM4VVX was in great demand during Es openings and reports ". . . an immense wall of QRM from Europe" on 28 July. He got a dozen new grids each day in over 400 QSOs. GW7SMV turned in some fine DX making trans-Atlantic QSOs on 21, 22, 28 and 29 July, and 5 and 11 August. Grids worked were EM89, EN91, FN00, 03, 13, 25, 41, 42, 44 and 65, ODX being W5EU (EM12) in Texas at 1633 on 28 July. Jamie contacted LU3HR (FF76) on 8 August and WP4U (FK68) on the 11th.

The GB3BUX beacon on 50.000MHz is QRV again.

70MHz

It seems that YU stations now have access to 4m. During a Balkan opening on 29 July Steve Bunting, M0BPQ (DE), heard YU1EU reporting he was using 10W to a ground plane antenna on CW and SSB. Gary Norris, G6DCS (DE), decided to blow the dust off his transverter on 26 July and worked S53J (JN75) and S51DI (JN76) using 30W to an HB9CV antenna.

M1DUD is now QRV on the band with 4W of FM and mentions G7CIY's Sunday morning nets on 70.450MHz in East Suffolk. G8TOK reports significant activity on 70.450MHz FM as well as SSB and Derek has worked six S5s several times this summer. He reports that 5B/G1JJE is QRV on the band and has worked into EI and YU.

Bryn Llewellyn, G4DEZ (JO03), heard GM4ODA/P (IP90) in the Trophy Contest and worked EI3IO (IO63) for a new country. David Dodds, GM4WLL/P, was QRV in the contest with 90W and a 6-ele Yagi. Activity was well down on previous years but EI3IO was an all-time new country. Beacon GB3BUX is QRV again on 70.000MHz.

144MHz

In a very selective Es opening on 28 July, Dave Cawley, EI4IX (IO53), made 10 QSOs over 2000km, starting at 1653 with ODX being IZ8DWL (JM88) at 2559km, after which he worked another 14 Italians in JN53, 61 and 70 until 1726. It started again at 1836 when he worked nine DLs in JO42, 62 and 72, and SP3VSC (JO92 at 1848km) for DXCC country number 28. Dave says that EI8IP (IO63) with an EME station was QRV but heard nothing. The session ended at 1853. In an excellent tropo opening starting at 2035 on 1 August, G0XDI made 109 SSB contacts, 26 of which were over 1000km. ODX was HG7KLF (JN97) at 1518km. Matthew worked 71 DLs, an F, 4 HAs, 2 OEs, 9 OKs, an OM, 3 ONs, 10 PAs and 8 SPs. His last QSO was at 0759 on the 2nd.

1296MHz

In addition to his website for 23cm operators mentioned last month, GM4WLL has an e-mail discussion group which currently reaches 15 stations in northern G, GM, GD and GI - see the list. In the Microwave Contest on 12 August David worked G4BRK (IO91) at 460km. He also worked G0EHV and G1LPS (IO94) and all three QSOs came about in response to information posted on his web site. G4DEZ should be QRV again on the band with four 23-ele Yagis by now.

DEADLINES

PLEASE NOTE the early deadlines for December: **9 October** and January: **6 November**. My CompuServe ID is g3fpk and the telephone answering / fax machine is on 020 8763 9457. ♦

WWW.

SunMag **(G0CAS):** www.g0cas.demon.co.uk/main.htm
ARRL: http://www.arrl.org
EI5FK: http://www.qsl.net/ei5fk/
GM4WLL: http://groups.yahoo.com/group/GM-23

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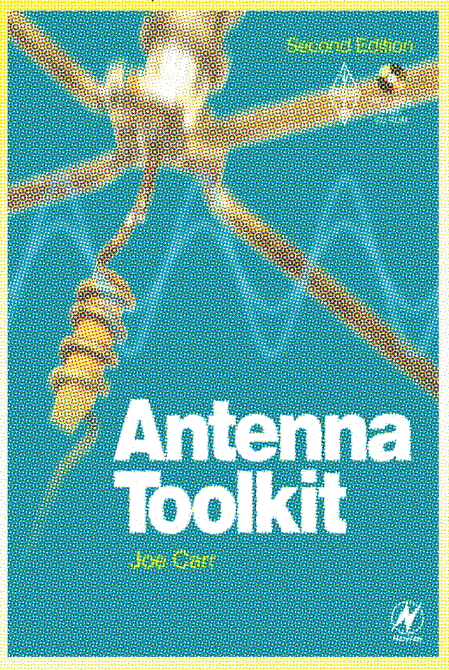

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STATISTICS FROM major expeditions such as D68C, along with those from the most popular international contests (CQWW, IOTA) make it clear that there continues to be huge interest in HF amateur radio. D68C made 168,000 contacts but, perhaps more significantly, had 45,000 unique callsigns in the log. Each leg of the CQWW contests attracts several thousand entries, but there are always thousands more 'casual' participants (ie those whose callsigns appear in one or more logs but who don't themselves send in an entry).

Which leads me to wonder why, when there are no contests and no expeditions, most of our HF bands are increasingly empty for much of the time, particularly on weekdays? I know people are at home; from D68C the European pile-ups in particular were as large during the week as at weekends. But it seems that fewer and fewer amateurs are happy to go on the bands for a casual ragchew any more.

It's not propagation. Often, for example, it's possible to tune across 15m and hear loud VK and JA stations, as well as Europeans, but with huge tracts of empty band between them. Is it because simply chatting to someone in another country is no longer 'sexy' or interesting in these days of cellphones and the Internet? Hopefully not. The joy of HF is, in many ways, its unpredictability: never knowing just where your signals might end up, or who you might find yourself speaking with. The fact that an expedition brings out the callers suggests that many operators spend their time in the shack listening, rather than transmitting, which is always a good discipline, but it would be good to hear more casual activity on the bands too.

DX NEWS

DAVE, G0DBX, writes that Chris, G0WFH, will be active from **Jersey** 16 to 30 October, using the ISWL call GH4BJC/P. G0DBX will take care of the QSLs. Further information can be found on the web site.

Jose, ON4LAC, reports he will be active (on SSB, and possibly PacTOR and RTTY) as 3B8/ON4LAC from **Mauritius** (AF-049) between 16 October and 6 December. QSL direct only to his home call.

W7XU, W0SD, and K5AND will operate from Elmina, **Ghana** from 26 October to 4 November (including the contest). They will have two transceivers and one amplifier.

Pierre, HB9QQ, will be back in the **Maldive Islands** the last week of October and first week of November. He will operate as 8Q7QQ, favouring 10, 12, 17 and 30m CW.

A multi-national group has announced plans for a DXpedition to both the **North** and **South Cook Islands** between mid-October and mid-November. First stop will be Manihiki (OC-014), in the North Cook Islands between 18 October and 1 November. The team will sign ZK1CG in the CQ WW Phone Contest. Next it's on to Rarotonga (OC-013), in the South Cook Islands between 1 and 13 November.

Bert, PA3GIO, will be active as VK9LO from **Lord Howe Island** (OC-004), probably around 9 to 15 October (depending upon flights), on 80 - 10m SSB. Bureau QSLs are preferred.

JH7IMX will sign KH0/K7WD from Saipan, **North Marianas**, 28 September until 2 October. QSL to his home call. JF1MIA will also operate from Saipan, 26 - 29 October, as KH0A.

Members of the Central Arizona DX Association (CADXA) will conduct a special event operation honouring the late Senator Barry M Goldwater on 20/21 October. The callsign used will be Senator Goldwater's old call, K7UGA. Operation will be all bands, SSB and CW. Special commemorative QSL cards will be available for stations that send direct requests. QSL via the club station trustee, KC7V, at 6545 E Montgomery Rd, Cave Creek, AZ 85331, for commemorative QSLs, otherwise via the bureau.

VE3RZ, N6JRL, AC8G, W8ILC and WA8LOW will operate from **Jamaica** with three high-power stations and two 100-watt stations from 23 to 30 October. They will be on all bands and modes, signing 6Y6L. QSL via WA8LOW.

Several Brazilian operators have announced plans for an October expedition to **Trindade Island**. They hope to have two stations on for two or three days, using the calls ZW0TB on phone and ZW0TW on CW. Dates will remain vague until late in the day, as the team is relying on the Brazilian Navy for transport. There was a brief Trindade operation in July, but this one remains in high demand. QSL via PY2KQ.

Cliff, G0MMI, writes that he has been receiving QSLs for YI1BGD/5, but is unable to help. Although Cliff *is* manager for YI1BGD, the /5 operator is Hussein who, while waiting for his own call, has been allowed to use this particular call. However, he is in Basra, not Baghdad where the club station is located. Cliff will do his best to pass cards to the operator concerned, but there may be a significant delay.

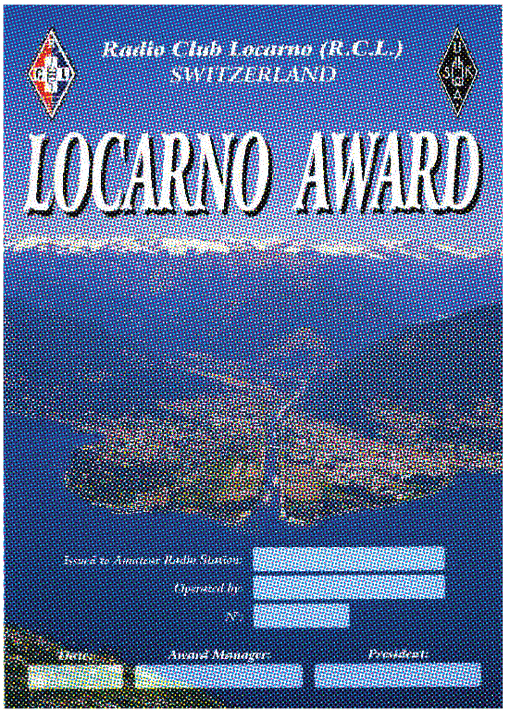
IOTA

MASA, JA6GXK, will operate (on 40, 20 and 15 SSB) from Meshima, Danjo Islands (AS-056) from 5 to 16 October. QSL via bureau.

Michael, DL1YMK will operate as XF1/DL1YMK from Magdalena Island (NA-078) from 7 to 13 October, 10-80m, mainly SSB. QSL via home call.

LOCARNO AWARD

THE LOCARNO AWARD (valid for QSOs after 1 January 1999) is for working members of Radio Club Locarno (RCL). UK stations need to amass 7 points, with contacts with the club stations HB9RL and HB9CL counting 2 points and club members one point. Each station can be worked once per band. The fee is CHF 20 or $15. Send a log extract, signed by two other amateurs, to Radio Club Locarno, Award Manager, POBox 826, CH-6616 Losone, Switzerland.



CQ World Wide Phone Contest 2000 UK Results

Single-Operator

Call	Category	Points
ENGLAND		
G3NAS	A	2,577,064
M0SDX	**A**	**1,539,513**
G3TMA	A	585,785
G4OBK	A	5586
GX4WSM	28	526,925
G3TBK	28	424,941
G8D	28	244,416
G4IUF	28	79,837
G3UFY	28	75,488
G4WPD	3.7	19,530
*G6QQ	A	149,593
*G3VAO	A	146,148
*M0BWY	A	140,679
*G0VDZ	A	120,681
*G4DDX	A	108,878
*M0BEX	A	85,116
*G4NXG	A	11,280
*G0KDS	28	254,683
*M3C	28	36,525
(op: G0VQR)		
*G0KXL	28	28,435
*G0EYO	28	25,232
*M0BDQ	28	16,740
*M4R	21	228,463
(op: G4AXX)		
*G4WSE	21	171,508
*M0BJL	21	168,883
*M2W	21	115,710
(op: G0MRF)		
*G0MRH	14	21,120
*G4VGO	1.8	10,074
GUERNSEY		
*MU0FAL	A	94,500
NORTHERN IRELAND		
GI0KOW	28	1,641,046
*GI0KVQ	A	1,382,850
*GI4SIZ	A	242,730
*GI0OUM	A	66,230
*GI4SNA	21	458,458
SCOTLAND		
MM0LEO	A	107,254
GM0AZC	28	137,195
*GM0FET	A	793,650
*GM3BCL	A	755,758
*MM0BRG	A	487,259
*MM5AJW	A	268,074
*GM0CLN	A	59,696
*GM4OBK	28	46,080
*MM2R	28	38,976
(op: GM3YOR)		
*GM4FDM	21	508,536
*GM0IIO	21	50,499
WALES		
GW0RYT	A	401,988
*GW4BLE	A	4,529,292
*MW5EPA	A	319,062
*GW3NJW	A	117,420
*GW0AJI	28	47,663
*GW4HBK	28	26,158
QRP		
G3FNM	A	74,734
GW0VSW	A	53,949
GM4ELV	A	15,732
Assisted		
G3MXJ	A	622,485
MM0BQI	A	378,169
G0NWY	**28**	**128,877**
GI4KLG	28	79,414
G8A	3.7	17,820
(op:G0KXL)		
Multi-Single		
M1P		6338164
GD6IA		5336425
G6YB		**4,664,604**
GB3RS		2,721,864
GJ1Y		2,252,384
G9Q		2,305,086
G3B		1,380,740
M2G		1,362,060
M4U		708,000
GN0XYZ		260,768
G0WIH		101,722
Multi-Multi		
M6T		23,968,284
GZ7V		10,538,220
GM0B		3,791,871
GM2T		1,400,091

Note: an asterisk indicates low power; those entries in bold are certificate winners.

CONTESTS

THIS MONTH BRINGS the world's biggest contest, the *CQ* World Wide (CQWW) Phone on the last full weekend (27 / 28 October) and, even if you are not a die-hard contester, you can dip your toes in the water and work some rare DX.

Even in the days leading up to the contest, many contest expeditioners will be on the air, testing their stations, and keen to work you.

Some of the operations already announced for this year's CQWW Phone contest include a large multi-op as IG9A from Lampedusa Island (Italian Africa); IH9P multi-multi from Pantelleria Island (also African Italy); FY5KE will be a multi-single activity by a large French group; XP1AB (Greenland) by Danish amateurs; J75J (Dominica) multi-single; 8P (Barbados) by a muti-national group; FG5BG (Guadeloupe) by Sarajevo Contest Group; GD6IA by Yankee Clipper Contest Club members; GZ7V (Shetlands) by GM operators; JW5E (Svalbard) by LA operators; PJ2 (Netherlands Antilles) by a US group; V47KP (St.Kitts) by W2OX; and VP2E (Anguilla) by US operators. There will be many others announced nearer the time.

Results of last year's contest appear in the table above. Congratulations especially to Steve, GW4BLE, world fourth and leading European in the low-power category, to G4VGO, world fifth on 160m, GI0KOW, second in Europe on 10m, GM4FDM and GI4SNA, European third and fourth on 15m, and to the M6T team, winning European station in the multi-multi category. 74 UK calls appear in the results, compared with 62 the previous year.

The ON Contest 2001 takes place as follows: 7 October, 80m SSB; 14 October, 80m CW, both from 0600 - 1000. Work ON stations. Send RS(T) and serial number. Receive same plus three-letter club code. 3 points per contact. Send your logs no later than 3 weeks after the contest to: Welters Leon, ON5WL, Borgstraat 80, B2580 Beerzel, Belgium (ON5WL@amsat.org).

The Oceania DX contest will be held on 6 / 7 October (Phone) and 13 / 14 October (CW), 0800 - 0800 in both cases. There have been several changes to the rules and format. Full details can be found on the web site, or by dropping me a line.

TABLES

SOME NEW ENTRANTS to the annual table, once again. John, G4IRN, writes that he has been back on the air since April, after a 20 year break. He is using a Yaesu FT-920 plus parallel dipoles for 20 / 17 / 15m and a vertical for 40m, with eight radials. The vertical is on a 33ft fibreglass telescopic rod so that

COUNTRIES WORKED, 2001

(sorted this month by CW totals, where declared)

CALL	CW	SSB	RTTY	MIXED
G0NXX	235	0	0	235
G4OBK	221	107	75	249
G3SXW	217	0	0	217
G3IGW	210	0	0	210
G3TXF	193	1	1	193
G0TSM	186	146	14	223
G4DUW	182	210	0	256
G3LHJ	175	57	47	187
G3XTT	155	84	2	169
ZC4DW	143	67	80	160
G3JFS	142	99	103	172
ZC4BS	131	186	42	200
MU0FAL	129	128	0	158
G3YVH	126	67	1	161
GM0VIT	111	106	2	167
G4IRN	91	85	0	119
GM4OBK	89	10	0	95
MM0BQI	81	101	90	140
G4DDL	54	35	18	66
G3WP	46	0	0	46
G4FVK	45	92	0	101
M5AEF (QRP)	20	77	0	79
G0ARF	0	0	126	126
G0VHI	0	190	0	190
G3MDH	0	103	0	103
G4MUW	0	75	0	75
G4YWY/M	0	85	0	85
GI0NQC	0	15	41	49
GW4SKA	0	0	66	66
M0AWX	0	202	0	202
M0CAL	0	113	0	113
M0LLW	0	149	0	149
M5PLY	0	111	0	111
M0CTQ	-	-	-	231
M0BIB	-	-	-	231
M0BZQ	-	-	-	204
G0CAS	-	-	-	142
M0CNP	-	-	-	112
GM4ELV	-	-	-	107
GM4FAM	-	-	-	102
M0ASJ	-	-	-	21

it can be hidden away from the neighbours during daylight hours! Robin, M5AEF, writes with an update of what he has been able to work with his low power (2 watts or less). DX at the 1 watt level includes TA, 5B4, VE, OY and W, all on SSB. Not bad!

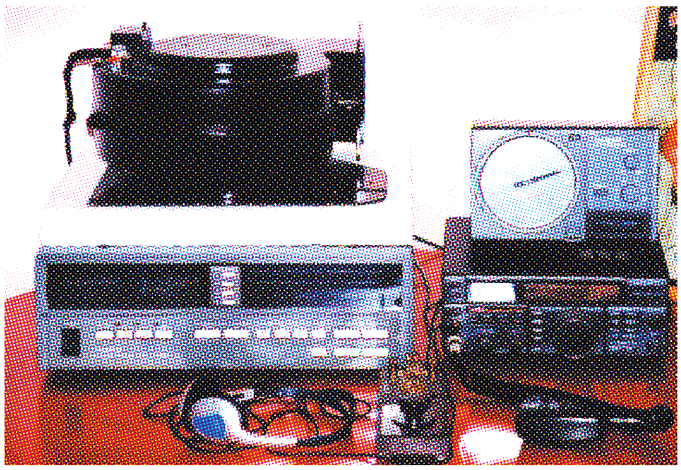
SILENT KEYS

ARNOLD TAMCHIN, W2HCW, passed away on 3 June. Arnold started in the hobby as a teenager and was 83 years old. Despite recent illness, he was still very active working DX and always had a big signal on all the bands. He was probably best noted for his large 80m Yagi, and I even recall hearing loud SSB signals from him on 160 when he was trying out a 2-element quad on that band!

Another notable loss is Bahri Kacan, TA2BK, who died recently of a heart attack. Bahri was one of the most consistent signals out of Turkey.

THANKS

SPECIAL THANKS GO to the authors of the following for information extracted: *OPDX Bulletin* (KB8NW), *The Daily DX* (W3UR) and *425 DX News* (I1JQJ). Please send items for the **December** issue (including table updates) by **12 October** (please note earlier deadline this month). ♦



The station of Peter Emmerton, G4IOV / 3W2EA. Peter had been off the airfor a few months due to overheating of his linear amplifier in the tropical climate of Ho Chi Minh City, Vietnam. He has cured the problem by fitting this fan coil above the top air extract grill and is now back on the air again.

WWW.

CQWW Contest Official Web Page:	http://www.cqww.com/
CQWW Phone Announced Operations:	http://cpcug.org/user/wfeidt/Misc/cqs2001.html
GH4BJC/P:	www.hamplanet.com/gh4bjc
GM DX Group:	www.gmdx.org.uk
Oceania DX Contest:	www.nzart.org.nz/nzart/update/contests/oceania/
Trindade:	www.radiohaus.com.br/trindade.htm
XP1AB:	http://www.qsl.net/xp1ab

HF F-Layer **Propagation Predictions** for **October 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	997...169999	668533679888	..87778899632	229999999744	..899999852.	...88887....	...68885....
*** Asia							
Yakutsk	2.....6664	4.....36776	..422356536.	...435.....	...553.....	...66.....	.....
Tokyo	.....121.	.....1211.	.....1...	....1.....	....1.....	...22.....	...11.....
Singapore	37664	188765	698642	....38983..	....16897...	...457885...	...56778....
Hyderabad	.....	.....	.....111.	.....144...	..1...354...	..2334662...	..1445661...
Tel Aviv	997....28888	9992..179899	879877799699	324887887.54	...888885.3.	...788874...	...66676....
*** Oceania							
Wellington	...645899...	...999999...	..49999997..	...999989...	...899878...	...888857...	...7887.....
Perth	.....344.	.....4654.	.....16531.	....277632.	....4663...	..2357762...	..256652....
Sydney	.....254..	.....2675..	....16772..	....388872..	....68876...	..2578875...	..2678852...
Honolulu	..67.....	.4797636....	...876.75...	...7...67...	.....57...	.....6...	.....
W. Samoa	..37.....	..698777....	...999985...	...799977...	...599957...	....798.6...	....687.....
*** Africa							
Mauritius	4.....3444	3.....35555	2.....67533	77211	.....176...	.....273...	...1..261...
Johannesburg	99.....7999	99.....9999	998....89999	9898778999999	7.9999999998	..999999997.	..89999998..
Ibadan	.....	.11.....	1.2.....	..241...11..	..16211112...	..18766661...	...877773...
Nairobi	.....	12.....1	55.....1123	435...23366	21631.135633	..764346631.	..57666672..
Canary Isles	8885....6888	99971..27899	9788766789 89	645998989975	4.3999999963	...8888985..	...8888883..
*** S. America							
Buenos Aires	8881.....68	8787.....77	6559.....265	4..94...2763	...863.2563.	...7642352..	...665355...
Rio de Janeiro	545.....34	6551.....255	4226.....442	52295..16863	...87545784.	...7766776..	...6776773..
Lima	3211.....1	3115.....12	1..6.....1.	2..743...122.	...6363343..	.....75552..	.....7665...
Caracas	222.....2	3453.....23	51.42....133	....61...3..	....653235..	....688886..	....488884..
*** N. America							
Guatemala	4323.....2	4216.....2	1..5.....1.	.....2.....	.....22.1...	.....6766...	.....4765...
New Orleans	6562.....5	76672.....26	5..6.....54	5..6.8888864	.....999994.	.....89998..	.....79996..
Washington	8887.....68	99897....289	854696.35888	5...58888864	.....999995.	.....99998..	.....99996..
Quebec	8885.....788	61.7.....766	...762.2562.	...79889983.	...5899986..	...4899985..	....799973..
Anchorage	8998.....67	8.876.....77	78886	69977	.....87..	.....77..	.....7...
Vancouver	111.....	1.11.....	.....	.....5661.	.....573..	.....483..	.....27...
San Francisco	1111.....	1..1.....	.....	.....1343..	.....452..	.....56...	.....24...

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 August 2001 issued by the Sunspot Data Centre, Brussels, was 106.8. The maximum daily sunspot number was 130 on 5 August and the minimum was 62 on 1 August. The predicted smoothed sunspot numbers for October, November and December are respectively: (SIDC classical method – Waldmeier's standard) 97, 96, 94 (combined method) 93, 92, 91.

SWL

BOB TREACHER, BRS32525
93 Elibank Road, Eltham, SE9 1QJ.
E-Mail: brs32525@compuserve.com

THE *CQ* World Wide SSB contest will be a matter of days away when you read this. I hope that many of you are planning to be active during perhaps the most frenetic - yet rewarding - weekend of the radio calendar. My Challenge rules were included last month to give you all early notice. I look forward to an interesting mailbag during the four weeks after the contest. Rules were sent with all direct D68C QSL cards, so I hope for a bumper entry this year.

HOLIDAY DXING

SIMON AND I returned from GW at the end of August. As in 2000, we took the Sony ICF-7600G receiver with us. We took it in turns to monitor the bands both from our Tenby hotel and from various portable locations. I managed to raise my DXCC tally to 147, with 21 new ones logged from the hotel between 2100 and 2300UTC and a further 21 logged /P between 1100 and 1600UTC on various days. Best DX logged at the hotel was probably TY22DX on 7MHz SSB, while A52UL, A92GJ, EL2DT, FR5FD, 3B8GO, 3V8CB, 4S7DA, 9N7ZK, and no fewer than three 5R8s (DL, ET and GT) were heard from /P locations.

Simon, RS177448, logged 184 stations at the hotel and a further 233 while /P. He logged 47 DXCC entities at the hotel and 54 while /P, and added a further 16 islands for IOTA. His best DX was BV2RS on 7MHz SSB; HL4GAB, R1ANZ and ZL1BOF on 14MHz; and D44AC, P43E, 4K8M and 9K2ZZ on 21MHz.

We will be having special QSL cards produced again this year.

Simon and I heard over 50 stations during the International Lighthouse / Lightship Weekend (ILLW) while out portable this year. There was certainly a great deal of activity. Some were giving IOTA references, too, which raised Simon's interest level. Mike, GM4SUC, has advised that there were actually over 300 stations active from lighthouses or lightships in 43 different countries. A full list of stations with details can be found on the Internet.

e-QSLs

LISTENERS SEEM to be concerned these days more with their e-QSL returns than anything else! A number of SWLs have told me how much more successful their QSLing has become since they switched to e-QSLs. I'm afraid that e-QSLing does nothing for me at all: I prefer to send a card either direct with postage or via the bureau and wait for the return card. However, some SWLs seem to have abandoned the 'old fashioned' way of getting a QSL card, and they boast an e-QSL total of over 300 replies in a few months.

I am very pleased that some SWLs get a great deal of pleasure from receiving e-QSLs, and I have been advised that certain Award Managers are now accepting e-QSLs from SWLs claiming certain awards. The e-QSL movement seems to be growing by the month . . . but I don't think I'll be joining!

D68C QSLS

ALL D68C SWL QSLs received prior to my going on holiday in early August had been processed. Listeners may be interested in this band-by-band breakdown:

28MHz:	89
24MHz:	52
21MHz:	75
18MHz	56
14MHz:	60
10MHz:	21
7MHz:	36
3.5MHz:	32
1.8MHz:	15

I have so far been unable to confirm 50 reports as QSL card details did not match the D68C log.

SWL D68C NEVADA COMOROS TROPHIES

THERE WERE 23 entries for the SWL Nevada Comoros Trophies and my RS178500 contest team entered a 'team' entry, just for fun. The results are shown in the table below left. Congratulations to the first three listeners, each of whom will receive a Nevada Comoros Trophy.

1	UA9-165-700	18
2	LY-R-404	17
	DE1MGL	17
4	DE1UCS	16
5	OK1-35042	15
6	UA3-147-122	14
7	DE0TMD	11
8	BRS31976	10
9	DL-G20/1523497	9
	BRS32525	9
11	RS177448	8
	DL-312WW	8
	NL-213	8
	IS0-405/CA	8
15	DL-SWL Noecher	7
	BRS173787	7
	DL-SWL Sinke	7
	UA3-121-66	7
	RS102891	7
20	DL-SWL Helfenbein	6
	RS96462	6
	RS93781	6
	DE1GFM	6
	RS178500	*38*

SWL winners of the D68C Nevada Comoros Trophies.

DX NEWS

ROBERT SMALL, BRS8841, and David Whitaker, BRS25429, provide a good insight into band happenings this month. Although Robert had been away, he had done a fair amount of listening but when he listened during the day, most bands were poor or closed.

However, there had been exceptions, with the occasional goodie to be found amongst the gloom. He reports T5W on 3.5MHz and T5W, YM0KI and ZP1HJ on 7MHz. What DX there had been on 14MHz had been heard during the evening such as 3V8GI, 8P6GH, YV5JBI/P, YS1CQ and XU7ABT. The highlights on 18MHz were JW0PK, 4S7QHG, XE1UN, HK5MQZ/0/M (Malpelo Is), KG4AS and 4M1X. 21MHz had been the best of the bunch, when it had been open - Robert logged P29IO, 3W2NWS, JD1BFA, OX3HX, FY5GS, V47UY and S21YT.

David refers to "just a sprinkling of HF news". He heard T5W on 18MHz, and bagged FH/PA3GIO on 28MHz and TZ/9G1MR was heard on 7MHz. FW5ZL had been audible at 0700UTC on 21MHz some mornings in August. He also logged S92TX on 14MHz.

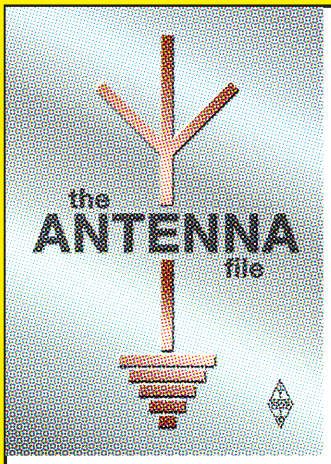
On 50 MHz, his total DXCC entities for 2001 stood at 56, with 257 QRA locator squares heard - many fewer than in 2000! However, best recent DX had been SU1SK who had an outstanding signal at 1115UTC on 23 July. Other notable 50MHz DX had been UR7TO, OY9JD, some 4Xs, SV9CVY, HB0/DL1FDH, SV5BYR, 5B/G1JJE, CU8AO, ZA/LZ3XV, Z36W and UT3BW being the pick. ♦

QSL card from German school SWL club.

WWW.

ILLW: www.vk2ce.com/ILLW/2001.htm
Mike, MW0CNA (GB bureau QSLs): http://homepage.ntlworld.com/mw0cna

RSGB BOOKSHOP



The Antenna File

The Radio Society of Great Britain produces some of the best works on antennas and this is a collection of that work from the last ten years. This book contains articles drawn from the Radcom magazine and includes:

- Every band from 73kHz to 2.3GHz
- Beams, wire antennas, verticals, loops, mobile whips and the G2AJV Toroid
- 50 HF antennas, 14 VHF/UHF/SHF antennas, 3 receiving antennas, 6 articles on masts and supports, 9 articles on tuning and measuring, 4 on antenna construction, 5 on design and theory, and 9 Peter Hart antenna reviews.

A4 publication 288 pages

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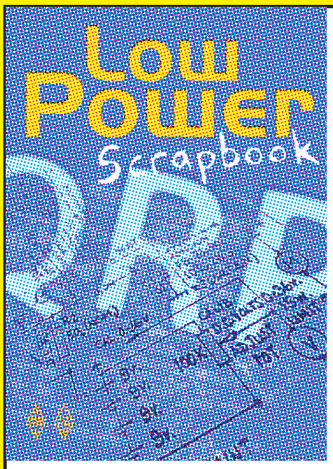

Low Power Scrapbook

The G-QRP Club are renowned as the leaders in Low Power and this book contains 133 of the very best projects from the Club's magazine Sprat. This book is full of the original material, brought together in this handy book.
Choose from dozens of simple transmitter and receiver projects for the HF bands and 6m, including the tiny Oner transmitter and the White Rose Receiver. Sample the many VFOs, tuners, accessories and antennas on offer. Learn from the construction techniques of experienced constructors.
Ideal for the experimenter or someone who likes the fun of building and operating their own radio equipment.

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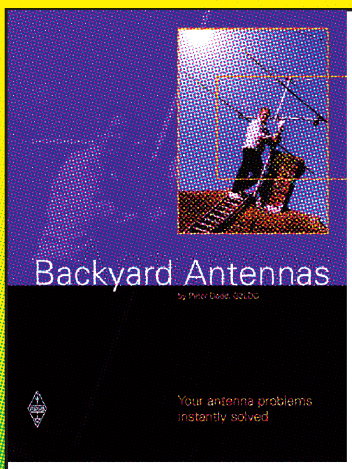

Backyard Antennas

Antenna guru Peter Dodd explains how, by using a variety of simple techniques, it is possible to achieve very high performance from a compact antenna. Also detailed is how to make an antenna efficient on several bands at once. The book covers end-fed and centre-fed antennas, rotary beams, loops, tuning units, VHF/UHF antennas, antenna and mast construction, transmission lines, and how to estimate and measure performance. Whether you have a house, bungalow or apartment, Backyard Antennas will help you find the solution to radiating a good signal on your favourite band.

244x183mm - 208 pgs

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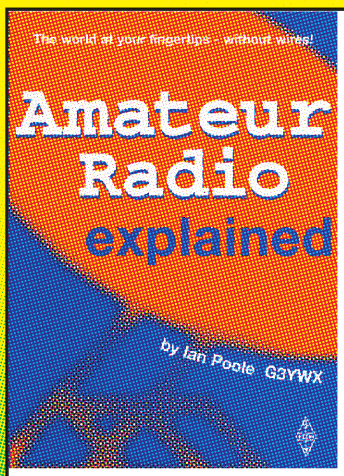

Amateur Radio Explained

Have you ever needed to explain to someone what amateur radio is all about? Have you ever wanted something to help fan the flames of someone's initial interest in the hobby? Do you give talks about amateur radio? If so, this book will help you.
Building on the success of *Amateur Radio for Beginners* (thousands of copies sold), this new volume covers setting up a station, what you are likely to hear on each band, how to receive and transmit, what's involved in getting a licence, codes, propagation, equipment, construction and much more. In short an ideal introduction to the diverse world of amateur radio.

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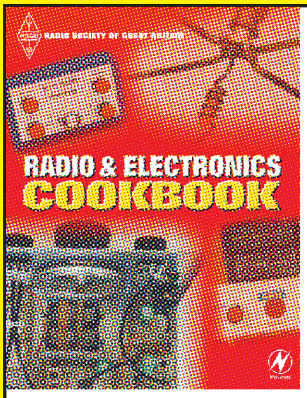

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- Simple Receivers, Transmitters, Antennas & Peripherals
- Projects for HF, VHF and UHF

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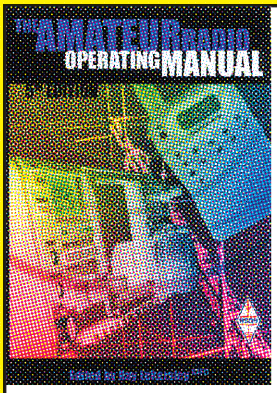

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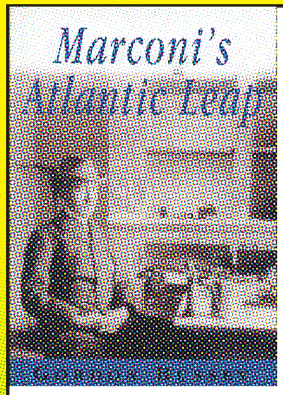

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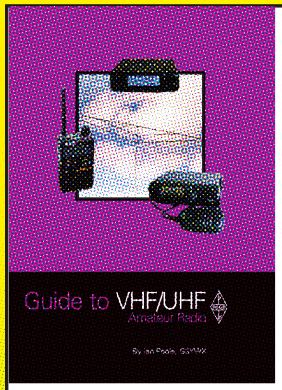

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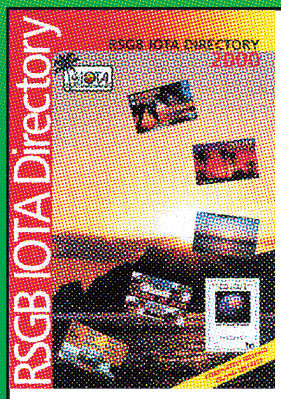

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REPEATERS

MARK LEWIS, GW7KDU

14 Hornbeam Close, St Mellons, Cardiff CF3 0JA. E-mail: rmc-wales@net.ntl.com

Commercial cavity filters.

THERE ARE MANY pieces of equipment that are used to build a repeater. The transmitter and the receiver will be obvious to most but what about some of the other items?

You will often hear members of repeater groups refer to 'the cavities', as a part of the repeater equipment. This is not a mysterious reference to holes in the equipment that should be tended by a dentist, although they *can* cause big holes in the group's funds! The cavity is a general term for the special antenna filters needed to allow a repeater to transmit and receive simultaneously on closely separated frequencies. The successful operation of repeaters with a separation of 600kHz in 145MHz and 1.6MHz in 433MHz is one of the areas in which amateurs have broken new ground. In PMR systems, the typical transmit / receive spacing is more like 10 times that amount.

There are two filtering jobs that must be done, the first is the obvious one of reducing the level of the transmitter carrier at the receiver input, to prevent reduction in sensitivity by overloading or 'blocking'. The second is not so obvious, and involves reducing the level of wideband noise from the transmitter at the receiver frequency. Even the 'best' transmitters have a significant level of noise many megahertz away from their nominal carrier frequency, which will be much stronger than the weakest signal the repeater is to receive.

Both tasks are performed in essentially the same way, a series of high Q filters, often quarter-wave cavity resonators, is fitted between the receiver and antenna and transmitter and antenna. The coupling to the resonators is made in such a way that they provide a minimal loss at the 'pass' frequency, and a deep notch at the 'reject' frequency.

Typically for a 2-metre repeater, two resonators will be used in each 'leg', providing less than 2dB loss at the 'pass' frequency and more than 70dB attenuation at the 'reject' frequency. This is enough to ensure that the transmitter can operate on the same antenna as the receiver without any reduction in the receive performance, save for the small attenuation from the filter. Groups with access to precision machining can make or modify existing filters. Others will purchase commercial units that can cost many hundreds of pounds.

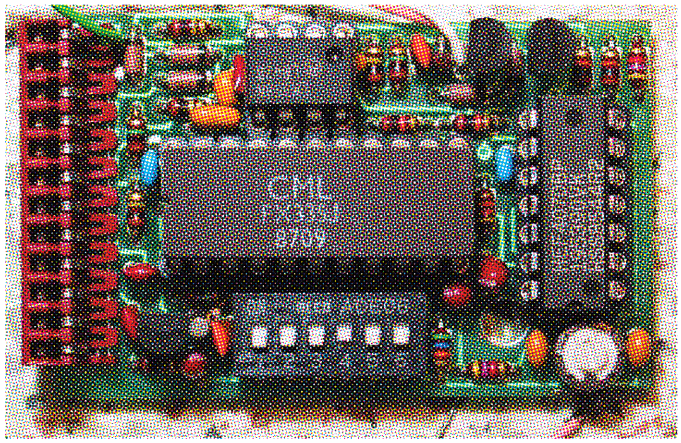
LATEST CLEARED REPEATERS

Callsign	Type	Channel / Freq.	Keeper
GB3CK	Site change 70cm, Charing, Kent	RB0	G6ZAA
GB3FJ	New 70cm, Spilsby, Lincs	In: 438.550MHz Out: 430.950MHz	G8LXI
GB3MT	Site change 70cm, Blackrod, Lancs	RB12	G8NSS
GB3UK	Site change 6m, Blackrod, Lancs	R50-6	G8NSS
GB3WF	Site change 70cm Otley, West Yorkshire	RB14	G0NIG

Outstanding voice repeater proposals submitted for licensing are:

Callsign	Type	Process Stage	Proposed Keeper
GB3RD	Site change 2m Aldworth, Berks	NFAP	G8DOR
GB3MC	Site change 23cm, Blackrod, Lancs	NFAP	G8NSS
GB3LR	Frequency change Newhaven, Sussex	Primary User	G7PUV
GB3NK	Site change 70cm, Erith, Kent	RA	G8JNZ
GB3MD	Site & freq change 70cm, Mansfield	Proposals Manager	G0UYQ
GB3MX	Site change 2m, Mansfield	Proposals Manager	G0UYQ

Repeater proposal status as of 10 August 2001.



A commercial CTCSS unit.

CTCSS

MANY REPEATERS in the UK now use CTCSS as a means of access in addition to the traditional 1750Hz 'tone burst'. Some repeaters also transmit CTCSS when they have been accessed, which allows users to listen without disturbance from 'beacon' callsign transmissions. A receiver equipped with a CTCSS decoder, will remain silent until there is activity on the repeater.

Most modern commercially-made amateur VHF / UHF transceivers have CTCSS as an option or a standard feature. Recent PMR equipment frequently can be programmed to use it as well. In PMR circles, CTCSS is also referred to as 'Sub Audible Tone' and 'Private Line' (PL).

The tone frequencies used are all below 250Hz, and should deviate the transmitters at no more than 10% of the peak deviation of speech and tone. That is tone deviation of 500Hz for 25kHz units on 70cm and above, 250Hz for 12.5 kHz units on 2 metres and 200Hz for 10kHz units on 6 and 10 metres. Note that the peak deviation is a combination of speech and CTCSS, so speech deviation should be reduced accordingly when it is transmitted.

The actual frequencies of the tones are taken from a series originated by the Electronic Industry Association (EIA) in the late 1960s, and are produced digitally by a number of commercially available ICs. However, a simple RC oscillator made with suitably stable components can make an effective encoder. The precise frequencies are determined by RMC to minimise co-channel interference. Most repeaters are allocated a tone frequency to use but as CTCSS is not mandatory there is no guarantee that it is actually in operation. If the Morse ident of a repeater is followed by a single letter (A to H and J), CTCSS should be in use.

Remember, if you use repeaters from a well-sited fixed station, employing CTCSS rather than 1750Hz for access can reduce annoyance to users of other repeaters that will not be opened by the tone for your local unit. The CTCSS tones are: A 67.0Hz, B 71.9Hz, C 77.0Hz, D 82.5Hz, E 88.5Hz, F 94.8Hz, G 103.5Hz, H 110.9Hz and J 118.8Hz, and the tones allocated to repeaters are listed on the RMC web site [1].

CHANGES TO RMC

ANDREW 'BAZ' Barrett, G8DOR (QTHR), has joined the committee as Manager for the South and South West regions of England. He brings to the committee about 30 years of experience with amateur radio repeaters and the PMR industry. Andrew can be contacted by e-mail at g8dor@tvrg.org.uk or tel: 01494 713289. ♦

WWW.

[1] RSGB Repeater Management Committee www.coldal.org.uk/rmc

Regular Feature

EMC

DAVID LAUDER, G0SNO
20 Sutherland Close, Barnet, Herts EN5 2JL.
E-mail: emc.radcom@rsgb.org.uk

THE SUBJECT of EMC in intruder alarms has not been mentioned much recently, but I am planning to include an item on this soon, so please let me know of any problems and solutions.

FINLAND REJECTS PLT

THE JUNE 2001 edition of the Finnish Amateur Radio League's monthly magazine reported the Finnish Minister of Transport and Telecommunication as stating that, for the present, PLC technology would not be introduced in Finland because of the technical problems encountered. This appears to refer to radio interference problems.

BELOW THE NOISE?

SUPPORTERS OF PLC, and other types of data communication that allow RF to leak out, often claim that emissions from their systems are 'below the background noise level'. The important question is, below the noise level of *what*?

Most EMC measurements of magnetic or 'H'-field emissions below 30MHz are made with a 600mm diameter active loop EMC-measuring antenna such as the Rohde & Schwarz HFH 2-Z2 or Schaffner HLA6120. These are untuned loops that cover 9kHz - 30MHz, but the sensitivity is inevitably low compared to a good amateur HF antenna which is much larger. Some users of these loops do not realise that in most cases, they are not looking at the background man-made or natural *atmospheric* noise level, but *the noise level of the preamplifier* in the active antenna!

TV/SATELLITE RECEIVER EMISSIONS

PETER, G7PFH, has a neighbour three doors away who has just bought a new flat-screen TV. Peter reports that it is putting out a signal on 433.525MHz at S9 + 20dB, even when it is in standby mode. Peter wonders whether this complies with the relevant EMC standard.

The signal could be a harmonic of an oscillator, but it could also be the local oscillator for a type of 433.92MHz remote control receiver that uses a 500kHz IF. As for EMC, the ETSI standard ETS 300 683 allows such receivers to radiate up to 2nW of local oscillator power and that is a far-from-insignificant signal on 70cm.

The source may not actually be the TV set, as most TVs use infra-red remote control rather than radio. Some satellite receivers use radio remote control, however, and 433.92MHz radio links are also used for remote control extenders, either stand-alone types or those built into video senders (see later).

Similar 433.92MHz receivers are also used in many cars and the local oscillators can often be heard on the higher 70cm repeater output channels such as 433.300MHz upwards. Irritatingly, the oscillator runs all the time, even when the car is being driven and the remote control receiver has nothing to receive.

Enver, G3DCS, and his friend Peter, G3IRQ, both bought 'Echostar AD-3000IP Via Access' analogue / digital satellite receivers in autumn 2000. They are pleased with the performance for satellite TV reception, but are less pleased about the RFI emitted by the receivers.

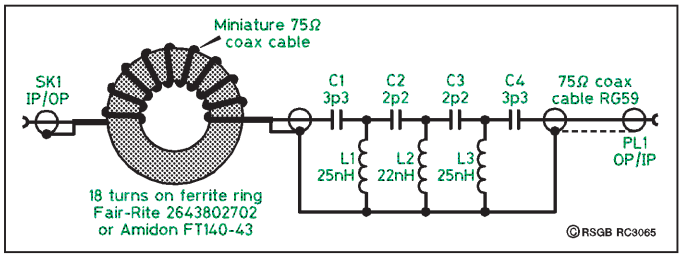


Fig 1: Circuit diagram of the G0SNO screened UHF TV high-pass filter and ferrite ring choke.

Enver reports that the receivers radiate a warbling tone that can be detected at intervals of about 66kHz across the long-, medium- and short-wave bands. On the 1.8, 3.5 and 7MHz amateur bands, Enver finds that it renders certain frequencies unusable.

It is not clear whether the RF emissions come from the digital electronics or the switch-mode power supply. In either case, it is on continuously unless switched off at the mains. This is not an attractive option, however, as satellite receivers normally take time to resynchronise to subscription services when switched on again.

Enver has written a letter of complaint to Echostar International Corporation in The Netherlands, but had not received a reply after 11 weeks.

We have no reason to suppose that this model does not comply with the relevant EMC standard, but the fact that satellite receivers and TV sets normally have a long coaxial cable connected to the dish or TV aerial can increase radiated emissions due to interfering currents on the outer braid of the coaxial cable.

VIDEO SENDERS

VIDEO SENDERS transmit the audio and video outputs of a video recorder, satellite TV receiver, etc to another room via a radio link. There is now an approved European licence-exempt allocation at 2.4GHz, and video senders for this band are available from many suppliers including Argos and Maplin. This band is also used by other devices such as wireless local area networks (LANs), 'Bluetooth' data links, microwave ovens and, of course, the 13cm amateur band (2310 - 2450MHz).

Most video senders can operate on one of four selectable frequencies, 2400, 2427, 2455 or 2482MHz using wideband FM. It will be interesting to see how immune these are to 13cm amateur TV transmissions.

Some types, such as the Response Electronics 'Videosender Plus', also have a remote control extender function. Signals from an infra-red remote control are modulated onto a 433.92MHz radio link which transmits them back to the video recorder, satellite receiver, etc.

LOW-LOSS TVI FILTER

THE arrivals of Channel 5 and digital terrestrial TV have underlined the need for a really low-loss TV interference filter to cure breakthrough of amateur transmissions.

For the HF bands and sometimes at VHF, a 'braid breaker' is also required to block amateur signals picked up on the braid of the coaxial downlead from the TV aerial. A 1:1 RF transformer type of 'braid breaker' as used in the AKD HPFS and BB1 filters can

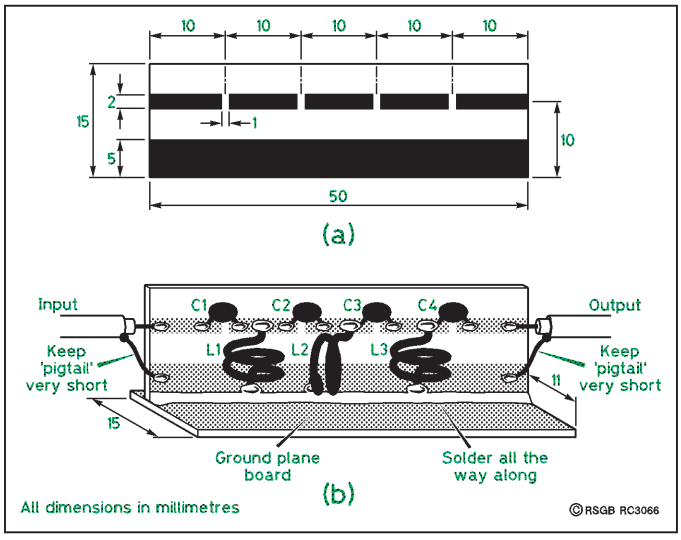


Fig 2: PCB pattern (actual size); (b) component layout.

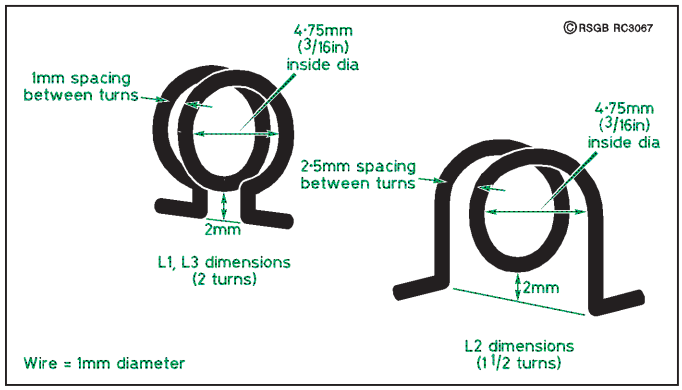


Fig 3: Coil dimensions.

be very effective, but has a significant loss in the UHF TV bands. Another type, more correctly called a 'common-mode choke', consists of thin coaxial cable wound through a ferrite ring. This has a very low loss to the wanted TV signal.

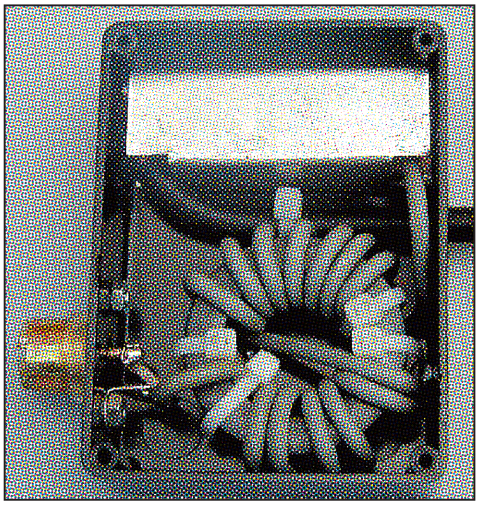
In the past, the Post Office and then the DTI Radio Investigation Service had a range of filters including the FS72A UHF TV high pass filter and the FS64/1A and FS64/2A ferrite ring common-mode chokes. These excellent filters have not been manufactured for many years, although some local offices of the Radiocommunications Agency may have a few in stock.

An FS72A with an FS64/1A cured most cases of TV breakthrough due to amateur transmissions on all bands up to 145MHz, although some neighbours objected to the size and appearance of these items.

I designed the filter shown in **Figs 1 - 4** as a replacement for the FS72A and FS64/1A. It is neat and fairly compact with very low loss in the UHF TV bands, 470 - 860MHz. See also the June 1997 and February 1998 'EMC'.

The prototype high-pass filter alone has less than 1dB loss in the passband, which is slightly better than the FS72A. The 0.9m length of miniature coaxial cable on the ferrite ring adds about another 0.75dB. In the case of the FS72A, the cut-off frequency had been set to 470MHz, probably by adjusting the coils individually. For home construction without RF test equipment, I have selected a cut-off frequency of around 420MHz to allow for component tolerances. Although this does not give any rejection at 432MHz, the FS72A did not give much rejection at this frequency either. High rejection of the 70cm band requires an AKD HPF6 filter (RSGB Filter 6).

Both my filter and the FS72A have at least 60dB of rejection at 144 - 146MHz, which is significantly better than an AKD HPFS. The rejection increases at lower frequencies.



The screened filter and ferrite ring choke mounted in the box.

The construction details should be followed exactly to achieve a flat pass-band with the lowest possible loss. The screening cover is important to reduce loss due to the filter radiating. It also minimises direct pickup of amateur signals and TV signals in the filter. The latter could cause problems with teletext and digital TV reception.

The 'PCB' pattern in Fig 2(a) can be cut by hand onto 1.6mm thick single-sided copper-clad glass-fibre circuit board without the need for etching. Using a Stanley-type knife, carefully make three cuts through the copper foil along the length of the board. Solder the corner of the unwanted strip, deliberately overheating it. Lift the corner with a knife blade then gradually peel off the whole strip with tweezers while sliding the soldering iron along. Make eight cuts in the top track and remove four short sections of track by overheating them with a soldering iron.

If you have some double-sided copper-clad board, peel off the copper from the other side in two strips as described above. Do *not* leave copper on the back of the filter board as it will completely alter the response of the filter. Solder the filter board to the ground plane board at right angles as shown in Fig 2(b). You will need at least a 25W soldering iron. Solder the screening can to the ground plane board at all four corners. Strips of copper-clad circuit board can be used instead of tinplate.

The outer box *must* be plastic and should have minimum inside dimensions of 72 x 52 x 22mm. The prototype used a BCL type T2 box (Maplin KC91Y or Farnell 645-655).

The ferrite ring is a Fair-Rite type 2643802702 (Fair-Rite grade 43 material) from the RSGB Shop [1]. An Amidon FT140-43 is identical. The miniature 75Ω coaxial cable is 0.9m of RG179 type or Maplin XR88V. Wind 18 turns in two sections of nine turns as shown in the photo and in the 'EMC' section of the *RSGB Yearbook*. Secure the cable to the ring and the ring to the box using cable ties.

For the short flying lead, RG59 or URM70 type 75Ω coaxial cable is recommended, because it has much better braid than standard TV coaxial cable. The flying lead must be firmly secured to the base of the box using a cable tie. ♦

REFERENCE

[1] Fair-Rite grade 43 material from the RSGB Shop. Two rings for £3.85 (Members' price).

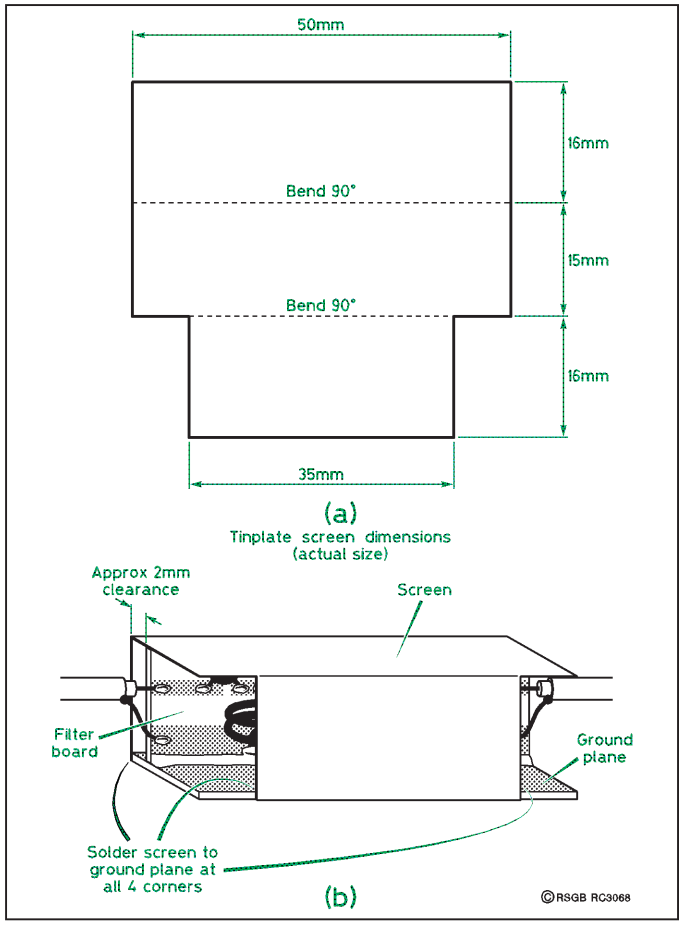
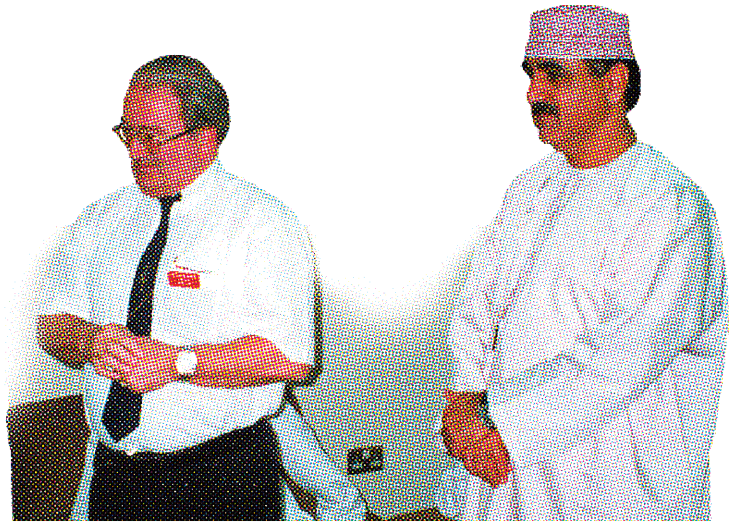


Fig 4: (a) Screen dimensions; (b) fitting of screen.

IARU

TIM HUGHES, G3GVV
10 Farm Lane, Tonbridge TN10 3DG.



PA0LOU and A41JT at a presentation at the IARU Region 1 Executive Committee meeting in Muscat.

THE PREVIOUS 'IARU' column contained an important message about the IARU 7MHz strategy from PA0LOU, Region 1 Chairman, one of many matters considered at the EC's annual meeting. What other topics were considered which were of general interest to all radio amateurs? (It must be remembered that all amateurs benefit from the work of the IARU, whether they belong to their national Societies or not).

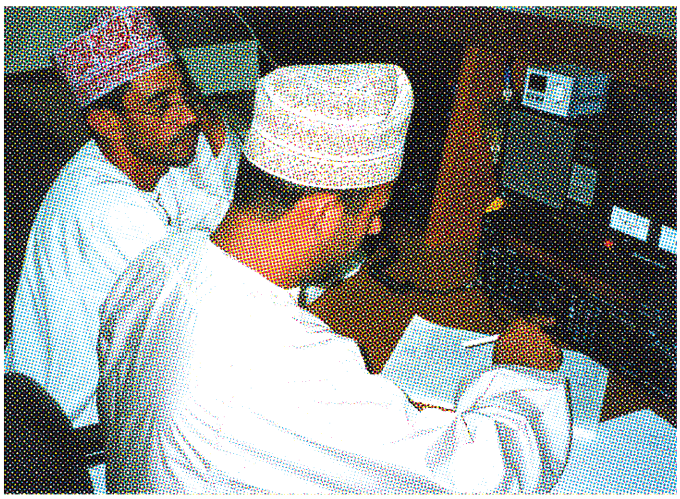
REGION 1 EXECUTIVE COMMITTEE MEETING

AS A RESULT of decisions made at the 1999 Lillehammer Conference, measures have been taken to reduce the cost of running the Region's administration, including the extensive use of e-mail instead of the postal system (but 25 of the Region's 87 Member Societies still do not have this facility), and changes to the financing of the Secretariat.

There are still several National Societies which are not IARU members, reducing our overall representation internationally. One of our objectives is to encourage more to add to our numbers and therefore our effectiveness in promoting and protecting the interests of all amateurs. Where a Society expresses interest in joining, its credentials are examined and if satisfactory its application forwarded to the International Secretariat for scrutiny by the Administrative Council. This process is sometimes protracted. Several cases concerning this topic were considered.

Amateur Radio Direction Finding is an activity which has particular attractions for young people, last year's event being organised by the Czech society, CRC, and this year by the Polish society, PZK, both under the auspices of Region 1. High Speed Telegraphy World championships assist in promoting skill and interest in CW operating, and again there are special sections for Juniors, all with backing from the Region. Reports from the enthusiasts who run these events were perused.

Guidance and advice to several Member Societies are provided by the STARS programme, in some instances this being given by correspondence, and in others by visits. Swaziland, Libya, Turkey, Algeria were amongst those with which contact was reported.



Two Omani operators of the ROARS club station, A47RS, in Muscat.

Extensive documentation showed the extent to which preparatory work for the next World Radio Conference, WRC-03, has been initiated by CEPT and the ITU. It also showed the growing credibility of IARU representatives who are being entrusted with responsibilities such as chairing meetings of ITU subbodies, drafting important CEPT documents and participating in ITU actions such as the Disaster Communication Handbook. Together with the technical position achieved at CEPT-SE, CISPR, ETSI and ITU-R, all these achievements mutually reinforce each other. There was, too, successful Region 1 involvement in CEPT Civil-Military frequency management meetings.

WRC-03

THE POTENTIAL impact of WRC-03 on VHF / UHF / SHF allocation matters was emphasised, and with it the need for direct consultations with the Region 1 HF and VHF / UHF / Microwave Committees. Further steps are being taken to extend implementation of the 136kHz allocation. The Executive Committee discussed the requirements for suitable persons to attend meetings on behalf of IARU, all of which comes under the auspices of the Region 1 External Relations Committee.

A lengthy discussion took place on topics related to the CEPT Radio Regulations Working Group, before it was decided to request the International Secretariat to formulate a document on S25. This is intended to be of assistance to Member Societies when briefing their licensing authorities. Reciprocal licensing procedures were considered.

Work on EMC and related matters are again of assistance to all amateurs, so that the investigations and reports relating to Pacemakers and Power Line Communication (PLC) are of general importance and relevance.

The next Region 1 General Conference takes place from 14 to 21 September 2002, hosted by the San Marino society, ARRSM. It was decided that all conference documents would be distributed electronically to those societies which have this facility, and that societies would be responsible for internal distribution of these documents. It was further decided that, following the normal procedure, the pre-conference EC Meeting would be held at the Conference Hotel.

All EC members were present, together with visitors K1ZZ (Secretary of the International Secretariat), VE3CDM (President Region 2), and ZL2AMJ (Chairman Region 3). The meeting was held in Muscat, Sultanate of Oman, at the invitation of the Royal Omani Amateur Radio Society, ROARS. A message of greeting was received from the Minister of Telecommunications, HE Sheikh Suhail bin Mustahaid Shamas, A41SM. Before the proceedings commenced, a minute's silence was observed in memory of LA5QK who had been a member of the EC until elected Region 1 HF Manager. ♦

DA DATA DATA TA

ANDY TALBOT, G4JNT
15, Noble Road, Hedge End, Southampton SO30 0PH.
E-mail: data.radcom@rsgb.org.uk

A FEW MONTHS AGO, one reader of this column e-mailed me a text-listing 'broken out' from some commercial station transmitting something out of the ordinary, and requested information on the station. I cannot recall what was special and was not the slightest bit interested.

Perhaps it is time to say that such interception of commercial and private communications *is illegal* and *always has been*! The fact is now enshrined in European law as part of the *Regulation of Investigatory Powers Act, 2000*. Acting on such received information, (which certainly includes publishing it!) has always been illegal, but the position has now been refined. There are several organisations whose jobs include interception on the grounds of national security or law keeping, and they have to obtain Home Office warrants to conduct their affairs. This column, hopefully, will never refer to such activities again.

BARTG UPDATE

THE SUMMER copy of *DataCom*, the BARTG journal, appeared in time for this issue. Fortunately for its future existence, a new editor appeared (after a frantic search) in the shape of Dick Whittering, G0URA, so the magazine is able to continue its publication, four times a year. In this issue, there is a personal view from GU0SUP on data operations, contesting and software, a look at the shack and radio station of the University of Plymouth, G0UOP, and how it merged with the Plymouth Radio Club. Basic technical articles cover the 'Isoterm', a fully-isolated PSK31 (and similar modes) audio interface, and a review of *DXPSK v1.7c*. Finally, there is a very good comprehensive article by G3FDU reprinted from the Royal Signals Amateur Radio Society's journal, *Mercury*, reviewing recent keyboard modes and comparing their performance, practical implementation, issues and their ease of use. This is an excellent overview article, well worth a read for those interested in the science of data communications over radio, as well as amateurs wanting to give data a try. BARTG can provide back issues of its magazine on request.

MODES COMPARED

THE G3FDU ARTICLE compares graphically the popular amateur modes in terms of raw data rate versus bandwidth, ignoring error correction. The graph is shown reprinted in **Fig 1**, courtesy of BARTG, with points plotted on it for RTTY, PSK31, AmTOR, PacTOR, etc.

Of particular interest is the fact that most of these modes lie roughly on a straight line, indicating they are all approximately as efficient as each other in terms of bits/second/Hz, but giving no indication of their performances in noise.

Two modes stand out as being significantly worse, however: MT63-1K and HF packet. We all know about FSK HF packet and its poor performance in noise as well as its poor spectrum utilisation, but the placing for MT63 may come as a bit of a surprise to many readers. It needs to be said, however, that MT63 is a mode designed for HF propagation in extremely poor conditions of multipath fading and noise.

For any code to work in these conditions, redundancy and extra bits need to be added which show up as a poorer coding efficiency in terms of b/s/Hz, so graphs like this do not tell the whole story by any means. MT63 probably works a lot better in these conditions than many of the others.

The best code I have ever seen for HF propagation would, if plotted on this graph, fall off the left-hand side! PSK31 is the limiting low speed mode - sitting right on the line, and Clover the highest speed / bandwidth combination also sitting on the line. Their operating characteristics, however, are totally different, one being for keyboard-to-keyboard chatting with no error correction, and the other aimed at store-and-forward non-real-time communications, with full repeat-request error correction.

For typical amateur-type communications, PSK31 and MFSK16 seem to come out tops, with the latter performing better in multi-path and the former in very crowded conditions.

MULTIPLE DATA MODES: DIVIDE AND WITHER

OF CONCERN to beginners in datacomms these days is the huge number of incompatible systems coming on the bands, all using the soundcard and employing the same interfacing hardware, making for very easy implementation. It is now so easy for DSP software writers to come up with another modulation and coding type that several do just this from time to time. The software is released into the public domain, it gets downloaded and used as 'something different to have a play with'. So yet another waveform appears in the overcrowded data segments. The casual operator or beginner to data communications, having just downloaded *DigiPan* or similar, is now presented with a plethora of incompatible signal types. Although many can be recognised by their sound, or their appearance on a waterfall plot, the higher-speed ones often cannot. Fortunately, the various software authors *do* talk to each other and several of the enduring popular public domain modes are all available by menu selection within the various software packages. This is not the case, though, for the commercial systems such as Clover and PacTOR, where expensive hardware modems are still needed (at least the Hal modems do cover these, as well as RTTY and AmTOR). Commercial and intellectual property rights presumably prevent implementations of these at will. However, at least the variety does show that amateur experimentation is alive and well - something difficult to show in operation on the bands in other ways.

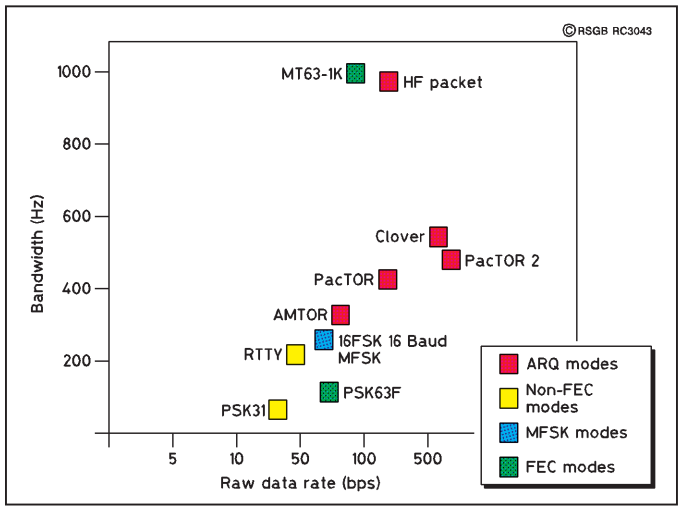


Fig 1: Relative speeds and bandwidths of data modes. **Source: BARTG**

WINDOWS PROGRAMMING

NOTWITHSTANDING the comments above, any software authors who want to get started on soundcard programming would do well to get a copy of *Programming Windows* [1]. This gives all the information needed to 'get at' the soundcard, with a CD of the 'C' source code from which much can be lifted to make life simple.

No space for a fundamentals section this month, so we'll continue with waveform shaping to control signalling bandwidth next time. ♦

FURTHER READING

[1] *Programming Windows*, by Charles Petzold, ISBN 1-57231-995-X, available at 15% discount from the RSGB Members-Only web site.

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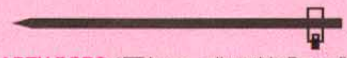

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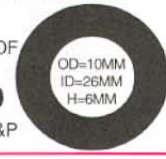

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the last Word

Beware of Birmingham!

In response to G0KRK's letter ('A Cautionary Tale', The Last Word, August 2001) stating the difficulty of not being permitted to take a hand portable on a flight, I too have experienced this problem - and strangely only at Birmingham (UK) and at no other airport. As I travelled fairly frequently through this airport I tried a number of strategies, the most successful being removing the antennas before packing the rigs in my briefcase so that they were not obviously 'walkie-talkies'. In this state I was rarely questioned. I also learned *never* to use the word transmitter, but to describe the rig as a radio.

I was once asked in Austria to demonstrate a 40m Mizuho rig and trying to get a signal in the very electrically-noisy environment of the X-ray area with only a 6ft whip antenna was not easy! Luckily I never lost a rig.

Graham Cooke, M0CUQ / G6LFT

. . . I was sorry to read of B G Cockfield's unfortunate troubles with Birmingham Airport resulting in the loss of his TH-79A with no insurance cover under his travel insurance. Mr Cockfield rightly advises fellow members to "go with a good airline and a good insurance policy" and I am pleased to say ARIS can help with at least one of these! Our special insurance policy for RSGB members has been available for over 30 years now and the wording is very wide indeed. We give up to 30 days cover world-wide under the mobile and portable cover option - including losses by airlines!

Any RSGB member not currently insured with ARIS is welcome to contact us on tel: 020 7335 1647 for full details and an application form, without obligation.

David Allison, Amateur Radio Insurance Services

[We have also received yet another letter with a complaint about Birmingham airport. It seems as if there may well be a problem specific to this one airport. You have been warned! - *Ed.*]

Make it Easy to Take RAE!

Recently I met a man who was ex-Royal Signals, and in conversation, I asked him if he had ever thought of continuing his interest in communications by taking out an amateur radio licence.

He related to me a rather pitiful story and one which I feel puts us all to shame. He told me that, yes, he was very keen to become a radio amateur, and apart from his already wide knowledge, he had purchased from the RSGB all the necessary RAE books and studied the licence conditions etc, and was now ready and willing to take the RAE. Unfortunately, when he tried to enrol somewhere to sit the RAE he was quite unable to do so. The only route he could find, in London, was to join up to one of the Education Centre courses, at the normal tuition fees and attend the college, which he felt he had neither the time nor the need to do so. This is after searching the web, telephoning the RSGB, the RA and City and Guilds. None of these organisations was able to offer any constructive help.

We are all, traders, the RSGB and other interested organisations, crying out for enthusiastic newcomers to our hobby. Yet it seems that if someone wants to join us under their own initiative it is not possible. Others will have, I am sure, had the same or similar experience. Is there anything that can be done, please, to rectify this absurd situation?

Jimmy Bolton, G3HBN

Reflections on NVIS

Thanks to Pat Hawker for his phone call apologising for referring to "the late" G3BGL ('Technical Topics', September 2001). At the age of 75 one realises the time is getting nearer by the day, but at present I am still keeping NVIS skeds on 80m three times a week around the country using a horizontal full-length dipole stretched between the bottom branches of trees, the wire being not more than 4 metres above ground - 1/20 wavelength. This always gets out with "a super signal" or "good solid copy" at ranges of 25 to 250km using an old KW2000A.

The interesting thing about the pioneering experiments 50 years ago was that the skywave signal on 40m was stronger than the groundwave from a transmitter using a separate antenna only 100 metres away from the receiving antenna. I still have photographs of the oscilloscope displaying up to five successive reflections of the vertical incidence signal. The pulse observed was applied to the modulator of the AM transmitter at the repetition rate of the time base. The use of "NVIS" describing the mode as 'near-vertical' should not be taken to imply that the truly vertical direction is excluded!

73 & God Bless,

Father Wilfrid Sollom OSB (Paul, G3BGL)

Any Advance on 110?

I wish to thank everybody who was kind enough to telephone and send e-mails [in response to the 'Helplines' request in the May *RadCom* - *Ed*]. How they managed this I don't know because the wrong address somehow was printed or given by me (a dot instead of a hyphen between 'Tony' and 'G7JAV').

I was contacted by Mr Badger himself who gave me very valuable advice, plus received floppies and circuit diagrams from friendly amateurs. I am very grateful for all the help I received.

Tony Wilkins, G7JAV

. . . In the August *RadCom* my request for a user's manual for a DX394 receiver appeared. Since the *RadCom* was issued I have received 53 e-mails and in excess of 60 phone calls all offering help.

It pays to ask! Thank you.

Peter Furminger, G3MZF

[We often receive feedback from those whose Helplines request has been published, saying what a helpful lot RSGB members are. But in excess of 110 responses may just be a record. . . unless you know differently? - *Ed*]

Beware of Rogues

Radiosport makes a fair point about computer traders at rallies (The Last Word, August 2001). A bigger problem, in my view, is rogue traders passing off manufacturers' warranty returns as new products.

At the York rally I purchased an apparently new cordless drill / screwdriver kit from a trader for £15. On getting it home I found that the wall wart to power the charger didn't work. After charging the battery from my bench supply I then found that it wouldn't hold a charge. With nothing to lose I disassembled the battery pack to find that the cells had been inserted the wrong way round. I reassembled them with the right polarity and amazingly, after having been reverse charged, they now take and hold a charge. I ended up with a working tool, but the initial feeling was that I had thrown £15 down the drain and I started wondering why I bother going to rallies.

This isn't the first time something like this has happened. I think organisers should be a but more fussy about who they allow to trade at rallies.

Julian Moss, G4ILO

Microwaves vs SHF

Clearly there can be no clear-cut demarcation corresponding to the onset of the microwave spectrum, but Simon Lewis's, GM4PLM, interpretation as "the term microwave refers to any frequency above 1GHz" stated in his article dealing with microwaves in the August 2001 issue of *RadCom* is the most accurate one. I cannot agree with the editor's interpretation saying that "Strictly speaking, the lower limit of the microwave band is 3GHz".

Regretfully, misinterpretation of the term 'microwaves' is currently causing problems for the instigators of TETRA, the BT's new "airwave service based on digital communications" whose frequency is nominally 400MHz, yet those in opposition to any new communications service are proclaiming 'dangerous microwaves' and hence stirring fear in the minds of the non-initiated.

Gordon J King, G4VFV

[Gordon King is, of course, quite correct. The UHF band is 300MHz - 3GHz but 'microwaves' are generally accepted to start at 1GHz. It is the SHF band that starts at 3GHz. Apologies for the confusion - *Ed.*]

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

MICROSET AMPLIFIERS

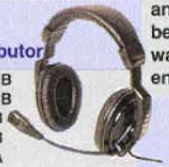
All FM/SSB with GaAsFET pre-amps and RF switched. 13.8V DC powered.

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

HEIL AUDIO

Appointed by Heil as UK Distributor



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

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

ALINCO NI-CD OFFER

EDC-53	fast charger	~~£80~~ £39 B
EBP-30N	7.2V 700mAh	~~£30~~ £19 B
EBP-31N	7.2V 1200mAh	~~£50~~ £25 B
EBP-32N	12V 700mAh	~~£60~~ £29 B

EME-6 Padded Earpiece

Made by Alinco, this has padded earpiece and right angle 3.5mm plug.

£4.95
Plus £2.00 Carr.

RADIOCOM 5.1 DSP-Filter Analyser & Decoder Program

New! For Windows™ '95/'98/'ME/'2000 and NT 4.0

Professional style DSP filter analyser decoder and rig control program. Works with any modern version of Windows and is a must if you are into radio communications analogue or digital. Other programs at best only emulate part of what this program is capable of.

Radiocom 5.1 (RC-HAM)	£149.95 B
Radiocom 5.1 (IC-SWL)	£149.95 B

Leather Cases for Alinco DJ-580

£9.95
Plus £2.00 Carr.

Genuine leather ESC-17L leather case for DJ-580 in conjunction with EBP-20N/22N and EDH6 Packs.

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 Japan, 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	£349.95 C
RC5-3	Control box features pre-set or manual control. Otherwise the same as RC5-1 above	£449.95 C
MC-2	Lower mast clamps	£49.95 B

CASE FOR FT-817

We have a quantity of cases made by Motorola, that are ideal for the FT-817. They will house the radio, microphone, spare battery and our ATX whips. Can be configured as as waist band or lengthened as shoulder strap.

£9.95
Plus £2.00 Carr.

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

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.

KH-WS1 World Space digital receiver

S-3878 external antenna kit in stock £49.95

£149.95
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.

CAROLINA WINDOMS

CW-80 Special

Carolina Windom 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 £8.00 Carr.

Other Models (all with low angle radiator stub)

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

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

WATSON

UK'S TOP SELLING POWER SUPPLIES.

£89.95
Plus £8.00 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

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.

HEAD OFFICE

22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS

ENQUIRIES: 01702 206835/204965

FAX: 01702 205843

MON-SAT: 9am-5.30pm

VISA

MasterCard

.....SEE INSIDE FRONT COVER FOR DETAILS

MFJ-Cubs *Single band QRP Rigs*

OUR PRICE £89.95 (KIT) £139.95 (BUILT) Carr. £8.00

Case etc. included.

VFO controlled up to 2W(1W on 15m), you can adjust it down to milliwatts. Measure just 90 x 47 x 98mm and requires 12v DC. Models for 80m, 40m, 30m, 20m & 15m. Order **MFJ-9380, 9340, 9330, 9320** or **9315** (plus **"K"** for kit or **"W"** for built).

MFJ 5W QRP *Low Power CW Transceivers*

OUR PRICE £189.95 Carr. £8.00

VFO control, single band, 12V 750Hz xtal filter, sidetone, break-in, speaker, 162 x 60 x 150mm. Great value! Order **MFJ-9040, 9030, 9020, 9015** or **9010**. All ready built.

MFJ-989C ATU

OUR PRICE £349.95 Carr. £8.00

3kW 1.8- 30MHz "T" Match

This design has a roller coaster coil and a 4:1 balun to match balanced line. Ideal for coax, end fed wires and open wire feeder. Features PEP or RMS power measurement VSWR, antenna switch, bypass, built-in dummy load etc. Size 270 x 375 x 115mm.

MFJ-986 ATU

OUR PRICE £319.95 Carr. £8.00

3kW Differential 1.8 - 30MHz

One less knob to twiddle, but all the facilities of the MFJ-989C

MFJ-969 ATU

OUR PRICE £189.95 Carr. £8.00

HF + 6m! 300W "T" Match ATU

It has a very accurate PEP meter built-in, (PP3 battery needed) Includes VSWR cross needle meter, dummy load and lovely roller coaster for critical adjustment. Handles coax, balanced an wire. Size 268 x 242 x 95mm.

MFJ-949E ATU

OUR PRICE £149.95 Carr. £8.00

1.8 - 30MHz 300W "T" Match ATU

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-934 + MFJ-931 ARTIFICIAL GROUNDS

OUR PRICE MFJ-934 £169.95

MFJ-931 £89.95 Carr. £8.00

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-8100 *Short Wave Receiver*

Ready built or kit

OUR PRICE £75.95 (KIT)

£99.95 (BUILT)

carr. £8.00

Case etc. included.

Experience the thrill of short wave listening on this regenerative receiver that has amazing sensitivity. Brand new solid state design. Just a short length of wire will bring good signals in. Covers all the major short wave general and ham bands. Simple to build and operate.

MFJ-962D ATU

OUR PRICE £259.95 Carr. £8.00

1.8 - 30MHz 1.5kW "T" Match

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-941E HF 300W *Budget ATU*

OUR PRICE £109.95 Carr. £8.00

Matches all types of antennas.

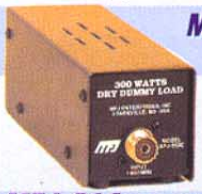
At this price there is no excuse for not having an ATU and offering your transceiver a perfect match. Covering 1.8 - 30MHz, rated at 300W and having built-in VSWR and power meter. it will match wires, coax systems and balanced feed.

MFJ-1700B *Tx - Rx 6-way Switch*

OUR PRICE £79.95 Carr. £8.00

2kW from 1.8 - 30MHz, use it to select up to 6 antennas and 6 transceivers in any combination. Unselected terminals are automatically grounded

MFJ Dummy Loads



MFJ-264 or MFJ-264N	
1.5-150MHz 1.5kW	£64.95
"N" version of above	£69.95
MFJ-260C or MFJ-260CN	
1.5 - 150MHz 300W	£32.95
"N" version of above	£39.95

Carr. £8.00

MFJ-914 *Auto ATU Extender*

OUR PRICE £59.95 Carr. £8.00

Match into that G5RV or similar

If your internal auto atu is having trouble matching your G5RV or similar antenna. this should solve the problem. Just place it in series with the coax feed to the rear of your transceiver. Magic!

MFJ-382 Amp + Speaker

OUR PRICE £39.95 Carr. £8.00

This desktop speaker will amplify and improve the audio of scanners and QRP radios etc. Powered from 9V batt (extra) or external 12V supply, it measures 89 x 45 x 114mm comes with mono - mono lead.

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. £8.00

MFJ-269 and MFJ-259B

The most advanced antenna analysers

MFJ-259 £249.95 Carr. £8.00

MFJ-269 £329.95 Carr. £8.00

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-1704 *4-way switch*

OUR PRICE £59.95 Carr. £6.00

DC - 500MHz 2.5kW

This is a heavy duty die-cast 4-way switch with SO-239 sockets, central earth position and built-in static discharge protector. Makes changing antennas a breeze!

MFJ-1025 "Local Noise" Canceller

OUR PRICE £119 Carr. £8.00

Kills local noise, but lets signals through. Handles electrical noise, TV time-base etc. Short length of wire picks only local interference and cancels it out.

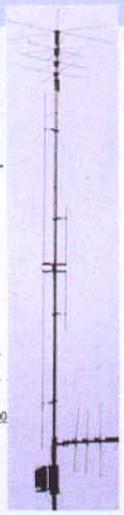
MFJ-1026 As MFJ-1025, but has active whip antenna for picking up noise signals (as illustrated above). **£159.95** Carr. £8.00

MFJ Compact Verticals

MFJ verticals are compact, yet offer a large number of bands. Being vertical dipoles, they offer exceptionally low angle of radiation for DX. They are rated up to 1kW on the HF bands.

MFJ-1796 (40, 20, 15, 10, 6 & 2m)
Just 3.65m long, it is the ideal antenna for really small spaces.VSWR typically 1.2:1 **£209.95** Carr. £8.00

MFJ-1798 (80, 40, 30, 20, 17, 15, 12, 10, 6 & 2m!)
Only 6.7m long, it covers every popular band. No radials and no ground needed. **£279.95** Carr. £8.00



MFJ-392 *Mono Padded Communications Earphones*

OUR PRICE £22.95 Carr. £3.00

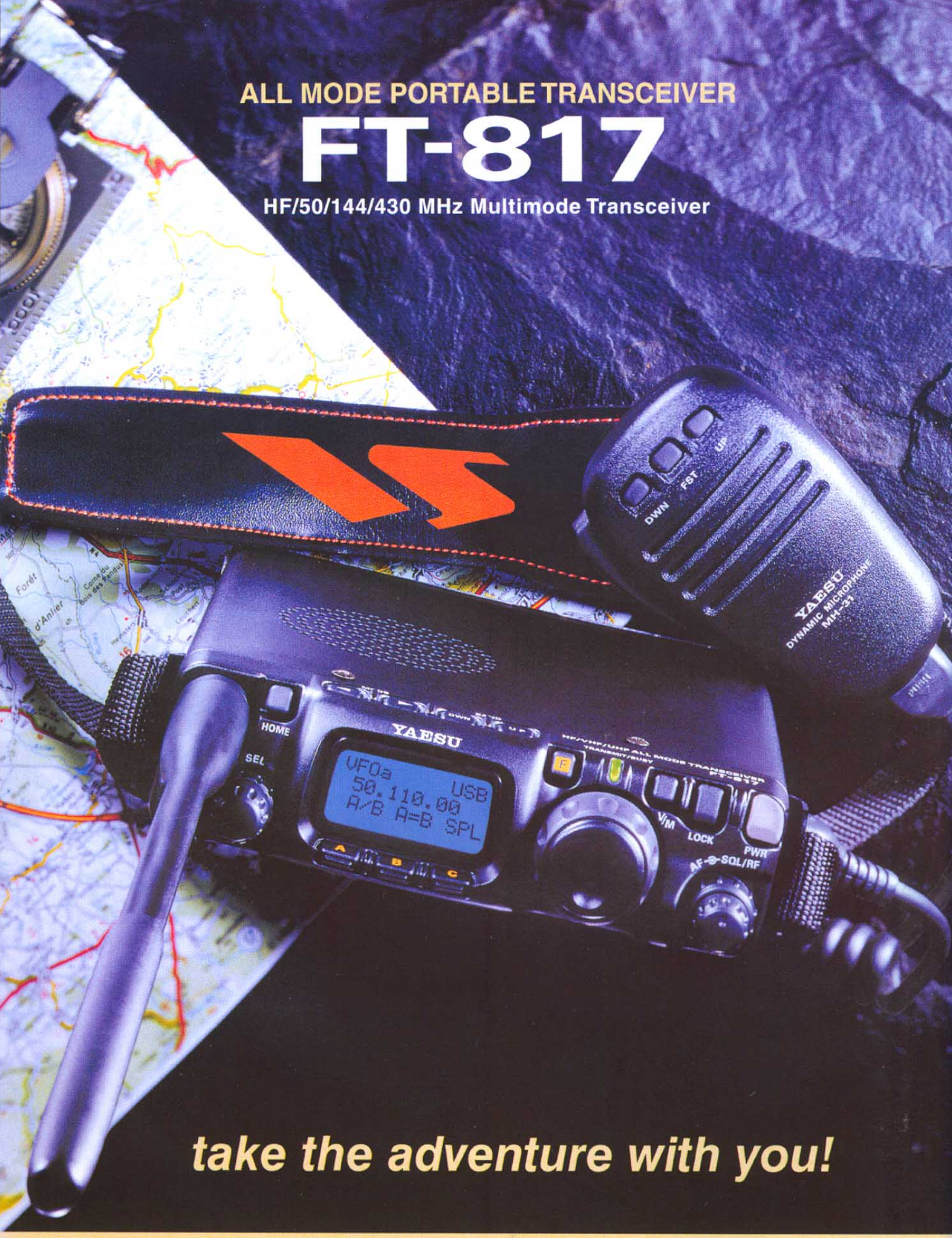
These are purpose designed communications padded headphones that are ideal for all the modern transceivers and receivers. Suits 3.5mm and 1/4" jacks - adaptor provided.

MFJ-616 *Speech Intelligibility Enhancer*

OUR PRICE £169.95 Carr. £8.00

Hear Signals Better

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!



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Sun Valley Business Park,
Winnall Close, Winchester,
Hampshire, SO23 0LB, U.K.
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