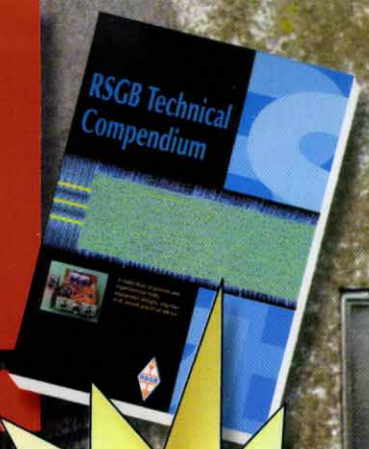
Results & Analysis from the RSGB Members' Survey

RadCom

www.rsgb.org

0202



£3.95 Vol 78 No 2 ♦ February 2002 The Radio Society of Great Britain Members' Magazine

New Year Sale! Page 20

The Centenary of Trans-Atlantic Radio

Sonic Wattmeters - Audio Aids to Antenna Matching

Reviewed: the 'Miracle Whip'

WATERS & STANTON

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INTEREST FREE OPTION – ON SELECTED ITEMS

Specially designed by Watson to offer extra large terminals and increased terminal spacing to make it easier to attach the thicker HF radio DC cables.
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.

Pay **10% DEPOSIT** and 6 low monthly payments - with OPTION to pay balance* off at **ZERO INTEREST** or continue monthly payments over 30 months (= 26.8% APR)

Example: FT-817 £799 Pay deposit £80 plus 6 payments £28.20. After 6 months pay balance of £549.80 interest FREE or 30 months at £28.20. Interest charge over 30 months: £297.10

W & S PLC IS A LICENSED CREDIT BROKER. OFFER IS SUBJECT TO STATUS.

B-12-18 GEL CELL BATTERY. £19.95 Plus £6.00 Carr.

The B-12-18, is a sealed 12V 18Ah lead acid battery that is ideal for portable or noise free mobile operation. Able to run an HF transceiver at up to 100 Watts or QRP for many hours. Size 18w x 16.5h x 7.5d mm, weight 6kg. These are brand new and offered at a fraction of their normal price, just **£19.95**. **(Carr £6.00)**

NOTE:

The illiustration left shows the 100W "suitcase" station built by Peter Waters, G3OJV, using our gel cell, an IC-706 and a power tool case available from Homebase.

YAESU

FT-1000MP Mk-V 200W HF All Mode £2899
3 YEARS FREE WARRANTY Plus £8.00 Carr.

SPECIAL OFFER

SPECIAL OFFER ONLY FROM W&S.

INTEREST FREE	
DEPOSIT	£290
6x MONTHLY	£102.36
OPTION	£1994.84

When you buy the amazing FT-1000 MK V from us, we will offer you FREE the equally amazing Heil Gold Line microphone with dual inserts and matching lead (base stand optional extra).

FREE HEIL GOLD LINE MICROPHONE

FT-847 160m - 70cm All Mode £1199
Plus £8.00 Carr.

INTEREST FREE	
DEPOSIT	£120
6x MONTHLY	£42.33
OPTION	£825.02*

3 YEARS WARRANTY

FT-100 D 160 - 70cm All Mode £1049
SAVE Plus £6.00 Carr.

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

FT- 920AF HF 160m-6m-100w £1099
Plus £8.00 Carr.

100 Watts from 1.8 to 54MHZ with dual VFO controls. Supplied with FREE FM unit.

FT-817 160m - 70cms 5W Portable £799
Plus £8.00 Carr.

INTEREST FREE	
DEPOSIT	£80
6x MONTHLY	£28.20
OPTION	£549.80

NEW MINI SM PSU PS-817 **£19.95** Plus £2.00 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.

KENWOOD

TS-2000 160m - 70cms+23cms option £1695
3 YEARS FREE WARRANTY Plus £8.00 Carr.

+FREE HEIL MIC

INTEREST FREE	
DEPOSIT	£170
6x MONTHLY	£59.83
OPTION	£1166.02

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.

TS-570DG 160 - 10m All Mode £849
3 YEARS FREE WARRANTY Plus £8.00 Carr.

INTEREST FREE	
DEPOSIT	£85
6x MONTHLY	£29.97
OPTION	£580.18

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	£61.95B

TS-870 HF TRANSCEIVER 160m - 10m 100W Advanced DSP £1349
Plus £8.00 Carr.

INTEREST FREE	
DEPOSIT	£135
6x MONTHLY	£47.63
OPTION	£928.22

It has IF-stage digital signal processing on transmit and receive. This raises the performance to a level that is impossible for analogue circuitry to achieve. Also features automatic ATU, interactive menu system, built-in electronic keyer and 100 memories.

SGC SG-2020 £599
Plus £2.00 Carr.

0 - 20 Watts Output
SSB CW AM Data
RF & VOGAD Processing
Variable Selectivity (100HZ)

Ideal for QRP, but with VOGAD and RF speech processing it can sound like 100 Watts! Very low current (4A max) makes it ideal for portable work. Variable selectivity down to 100Hz means no extra filters to purchase.

- NEW SG-2020 ADSP now available £799 carriage £8.00
- SG-237 mini auto coupler ideal for SG-2020 £369

ICOM

IC-756 PRO II NEW £PHONE
Plus £8.00 Carr.

This is Icom's new Flagship. Arriving February

IC-746 160m - 2m All-mode £1195
3 YEARS WARRANTY Plus £8.00 Carr.

STILL A FIRM FAVOURITE!

INTEREST FREE	
DEPOSIT	£120
6x MONTHLY	£42.18
OPTION	£821.92

If you don't want 70cms, this rig is great value!

IC-756PRO 1.8 - 52MHz 100W £1895
3 YEARS WARRANTY Plus £8.00 Carr.

INTEREST FREE	
DEPOSIT	£190
6x MONTHLY	£66.89
OPTION	£1303.66

IC-706IIG 160m - 70cm All Mode £999
3 YEARS WARRANTY Plus £8.00 Carr.

The IC-706MkIIG is the latest enhanced version of this popular HF/VHF/UHF mobile rig. It has more features but in the same physical size.

£50 HEIL VOUCHER

IC-706IIG ACCESSORIES	
AT-180 Auto ATU	£379 B
FL-100 500Hz CW	£59 B
FL-232 350Hz CW	£59 B
FL-103 SSB 2.8KHz	£59 B
FL-223 SSB 1.8kHz	£59 B

INTEREST FREE	
DEPOSIT	£100
6x MONTHLY	£35.27
OPTION	£687.38

DC Lead (spare)	£16 A
3.5m sep cable	£33 A
5m sep. cable	£49 A

IC-718 100W HF £549
SAVE £150 Plus £8.00 Carr.

If you are looking for a radio with pedigree, but without a high price tag, then this may the one for you. Covers all HF bands plus wideband receive. Plus auto notch, dual vfo, swr meter etc. Plus options including DSP & filters.

LIMITED SPECIAL OFFER!

MFJ PRODUCT CATALOGUE THOUSAND PRODUCTS FROM MFJ/ MIRAGE/ VECTRONICS/HYGAIN + AMERITRON PHONE OR SEND LARGE SAE FOR FREE COPY

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20, WOODSIDE WAY, GLENROTHES, FIFE KY7 5DF ENQUIRIES: 01592 756962 FAX: 01592 610451-CLOSED MONDAYS

CARRIAGE CHARGE CODES: A=£2, B=£6, C=£8 Others: phone

YAESU

FT-1500M 2M FM Mobile £159 Plus £8.00 Carr.

SPECIAL OFFER
SAVE £70

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

KENWOOD

TM-D700E 2m + 70cm FM £449 Plus £8.00 Carr.

Large detached screen and APRS, make this a firm favourite. 50W on 2m and 35W on 70cms. Features 200 memos, CTCSS, Band Scope, built-in TNC, DX cluster monitor, alphanumeric etc.

TM-G707E 2m + 70cm FM £289 Plus £8.00 Carr.

If you are looking for simplicity and low cost, here's the answer. 2m &70cms with detachable front panel and "Easy operation mode." GREAT!

TM-V7E 2m + 70cm FM £359 Plus £8.00 Carr.

A lovely cool blue display, easy with 50/35W output. 50W/35W p;us 280 memos and five storable operating profiles.

ICOM

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 colour display with video input, and airband rx. 50W/35W and remote head unit.

IC-2100H 2M FM Mobile £229 Plus £8.00 Carr.

Rugged design with switched receive filters 12.5/25kHz

IC-910 2m + 70cm All Mode £1299 Plus £8.00 Carr.

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

YAESU

FT-7100 2m/70cm Mobile £399 Plus £8.00 Carr.

NEW

Just arrived is this new dual band radio that has extended rx. Power is 50/35W. Features dual in-band reception and detachable display (requires YSK-7100).

£25 ACCESSORY VOUCHER

AV-40 VSWR METER £39.95 Plus £6.00 Carr.

- 144 - 470MHz
- Impedance 50 Ohms
- Power 0 - 30W / 0 - 300W switched
- Measures forward / reflected power + VSWR
- Sensitivity 3W for full scale deflection
- Accuracy 10% at full scale
- Sockets SO-239
- Size 85 x 87 x 95mm * Weight 280g

KENWOOD

TH-D7E 2m + 70cm £299 Plus £8.00 Carr.

DATA COMMUNICATOR

One of the most successful handhelds over the past few years. It has a built-in TNC for Packet use. You can also use it for APRS operation in conjunction with an external GPS unit. Plus NMEA, 200 memos, and up to 5W output.

TH-F7E 2m + 70cm £269 Plus £8.00 Carr.

NEW

WITH EXTRA WIDE RX COVERAGE

Up to 6W out with Li-ion battery and "scanner" style coverage from 100kHz to 1300MHz including SSB on receive! This is a great radio to have at all times when you are on your travels.

HORA

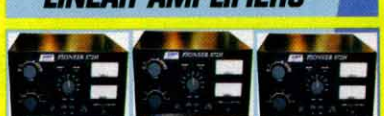
HORA C-408 70cm £49 Plus £6.00 Carr.

HOCKLEY ONLY

Very much underrated handy. Covers the full 70cm band. Wideband receive possible. Very compact fits into top pocket. Ideal for use at rallies. Only uses 2x AA batteries (not included). 230mW, CTCSS Digital Display

SPECIAL OFFER

LINEAR AMPLIFIERS



CHALLENGER II	HF LINEAR AMP10-160m	£2095	D
EXPLORER	HF LINEAR AMP10-160m	£1595	D
PIONEAR-572H	HF LINEAR AMP10-160m	£1295	D
RANGER-811H	HF LINEAR AMP10-160m	£895	D
HUNTER	HF LINEAR AMP10-160m	£1195	D
HUNTER-6	6m LINEAR AMP 50-54MHZ 800W OUT	£895	D
DISCOVERY-2	2m LINEAR AMP 400-1000W OUT	£1395	D
DISCOVERY-6	6m LINEAR AMP 50-54MHz 400-1000W OUT	£1395	D

ADI

ADI AT-600 2m/70cms £179 Plus £6.00 Carr.

HOCKLEY WAREHOUSE EXCLUSIVE

- Dual Band 2m/70cms
- Up to 5 Watts out
- Airband Receive
- Nicad Pack * CTCSS
- Hod Charger

You won't find better value than this. Limited stocks

ADI AT-201 £99 Plus £6.00 Carr.

- 2m Handy
- 2.5W, 5W (13.5V)
- 1750Hz & CTCSS
- Wideband receive
- Drycell case
- Batteries not included
- Full keypad

Higher power than most palm sized models. Fully illuminated keypad for ease of frequency entry. Channel or frequency readout.

ADI AT-147 2m 50W £199 Plus £8.00 Carr.

With Airband Receive

2m FM mobile transceiver. Three power levels 50,10,5W. Displays frequency or channel numbers, and offers Airband AM receive

YAESU VX5R BLACK OR SILVER FINISH £269 Plus £6.00 Carr.

Tiny but incredibly rugged, the VX-5R provides transceiver capability on three amateur bands (50/144/430MHz) and almost continuous reception from 500kHz up to 999MHz.

YAESU VX1R 2m/70cm Handheld £145 Plus £6.00 Carr.

Ultra-wide frequency coverage which includes VHF and UHF TV audio, AM broadcast, FM broadcast and AM airband.

SELECTION FROM SECOND HAND LIST

HF Transceivers		AR-8200 II	£299.00
IC-706 Mk II	£549.00	MVT-7300	£229.00
MX-3.5S	£149.00	**Station Accessories**	
LINC-10	£149.00	PK-232MBX	£185.00
TS-120S	£295.00	PK-900	£299.00
FT-1000	£849.00	ALS-600XCE	£899.00
FT-900AT	£599.00	AV-200	£35.00
VHF/UHF Base/Mobile Transceiver		DC144/28	£29.00
		SX-100	£69.00
AR-446	£199.00	AMT-3	£50.00
2001 x4	£145.00	FAX-1	£125.00
DR-110E	£125.00	NTR-1	£99.00
IC-207H	£199.00	KPC-3+	£109.00
IC-275E	£549.00	EP-925	£69.00
IC-2100H	£169.00	MFJ-247	£129.00
TM-G707E	£199.00	MFJ-812B	£25.00
FT-290R x3	£159.00	MFJ-901B	£39.00
FT-290R II	£249.00	MFJ-1020A	£65.00
FT-690R II	£299.00	MFJ-1274	£100.00
FT-5200	£299.00	MFJ-1276	£99.00
FT-8100R	£299.00	MFJ-1278BX	£225.00
VHF/UHF Hand Held Transceiver		MFJ-1610	£4.00
		RU-20	£79.00
DJ-480	£99.00	MML-144-30-LS	£69.00
DJ-G5	£169.00	2600HA	£79.00
IC-M11	£199.00	3000A +	£289.00
C-108	£89.00	Micro-RF	£69.00
FT-811	£99.00	Mini-Scout	£129.00
Shortwave Receivers		Pico-2 x2	£149.00
IC-R75 x3	£499.00	PowerClear	£199.00
HF-225	£249.00	LT-23S	£499.00
HF-250	£325.00	HL-37V	£49.00
WR-2085	£29.00	W-GMM	£29.00
R-9914	£69.00	WMM-1	£49.00
ICF-SW7600G	£89.00	FL-2025	£99.00
WA-8000	£199.00	G-650C	£389.00
Scanners Mobile/Base		**Miscellaneous**	
AR-2002	£199.00	AE-2850	£50.00
Scanners Hand Held		Etrex	£89.00
AR-1000	£69.00	GPS-3000	£89.00
AR-8000 x2	£199.00		

- 3 MONTHS PARTS + LABOUR GUARANTEE.
- PLEASE RING BEFORE SENDING AN ORDER.

YAESU

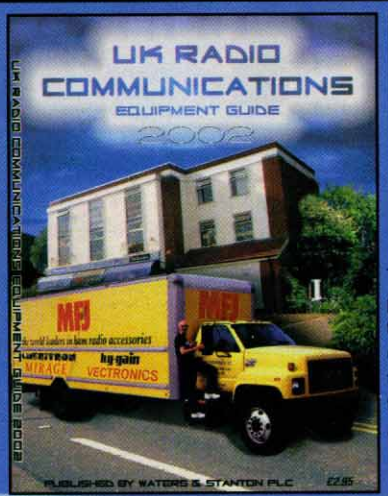
C-105 Standard Dual-Band £99 Plus £6.00 Carr.

SPECIAL OFFER!

ONLY 3 PIECES

2m/70cms
280mW
AM airband Rx
1750Hz & CTCSS
Wideband Rx 100 - 999MHz

NEW AND EVEN BIGGER



New 2002 Catalogue
336 pages
£2.95
carr. £1.25

VISA MasterCard

The foremost guide to amateur radio products from the latest transceivers to the smallest of accessories. Full colour pages with comprehensive specifications, there is nothing else like it in the world! There is also some editorial and reviews. Three times the size of many magazines, yet it costs no more.

INCLUDES MONEY SAVING VOUCHERS

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Get in Front with HUSTLER — NUMBER 1 IN THE USA

5BTV

£209.95
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4BTV

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HUSTLER®

BASE 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!

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	£24.95 B
RM-20	20m	80-100kHz	£24.95 B
RM-30	30m	50-60kHz	£26.95 B
RM-40	40m	40-50kHz	£26.95 B
RM-80	80m	25-30kHz	£29.95 B

Model	Band	Bandwidth	Price
RM-10-S	10m	250-400kHz	£19.95 C
RM-15-S	15m	150-200kHz	£26.95 C
RM-20-S	20m	100-150kHz	£31.95 C
RM-40-S	40m	50-80kHz	£37.95 C
RM-80-S	80m	50-60kHz	£51.95 C

Lower mast sections

MO-1	54" (FOLD @ 22")	£33.95 C
MO-2	54" (FOLD @ 27")	£33.95 C
MO-3	54" (NON FOLD)	£26.95 C
MO-4	27" (NON FOLD)	£22.95 C

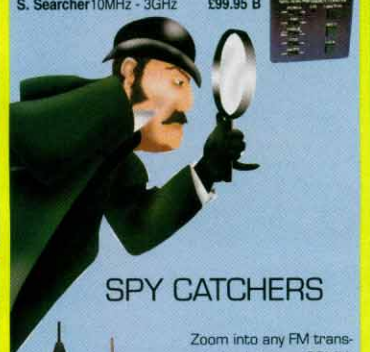
WATSON

CAPTURE THAT FREQUENCY!

Supplied with telescopic antenna and AC battery charger. If you are within 200 ft or so of the hand-held, you should be able to read off the frequency. Note it down and enter it in your scanner. It's that simple and it's pocket sized.

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



SPY CATCHERS

Zoom into any FM transmission between 30MHz and 900MHz and monitor the audio. It takes a fraction of a second. The WR-5001 comprises a complete receiver with auto tuning, skip button, squelch adjustment and built-in speaker. The WR-5002 is similar, but adds an auto-hold control and a bargraph signal meter. It also adds a CI-V port for reaction tuning Icom and AOR receivers fitted with this feature. These monitor receivers are designed for nearfilled use and the range is from a few hundred metres to around 1km, depending on frequency and power of the transmitter.

WR-5001 £99.95 WR-5002 £159.95

CUSHCRAFT
COMMUNICATIONS ANTENNAS

HF Horizontal Beams + Dipoles

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
X-7	10-20m 7 el. 12.5 - 13dBi 2kW 6.09m radius	£669.95 D
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

The Mini-Beam For Small Gardens

Cushcraft MA5B

The best 3 element mini beam you will ever find. 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 element length of just 5.2m Turning radius is 2.7m. Uses a single feeder, this really works the DX. Get one up before winter!£299.95 C

Cushcraft Verticals

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

NEW MA5V VERTICAL 20-10m **£229.95 C** NOW IN STOCK

WATSON

WEP-300B Earpieces £2.95 Plus £2.00 Carr.

SCOOP

Over-the-ear earpiece, popular for security and emergency use. Its low cost and firm mounting even in arduous conditions make this a popular item. Fitted with 3.5mm jack plug.

WSA-1 PSK-31 Adaptor £39.95 Plus £6.00 Carr.

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

YS-130 Rotator £79.95 Plus £8.00 Carr.

Ideal for medium sized VHF antenna systems, the YS-150 is a good quality Japanese manufactured product. It is supplied with control box with rotary direction setting, plus upper and lower in-line mast clamps.

REVEX 15W DUMMY LOAD £19.95 Plus £2.00 Carr.

* Range DC - 500MHz
* Power 15W/50W
* VSWR 1.15:1
* Connector PL-259
* 50 Ohms impedance
* Size 34 x 72mm
* Weight 70g

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

WATSON

QS-112 Speaker Mic £16.95 Plus £2.00 Carr.

Combined speaker-mic. with PTT switch. Models for Yaesu, Kenwood, Icom, Alinco and Motorola.

SPM-102 Speaker Mic £9.95 Plus £2.00 Carr.

Incredible value!

Has 4-way 3.5mm plug for VX-1, VX-5, FT-50 and IC-Q7E Handies

Limited stocks.

WM-308 Base Mic £59.95 Plus £6.00 Carr.

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. The plug needs to be wired for your radio. We can do this but phone for quote.

WCT-321 Lapel Talker £19.95 Plus £2.00 Carr.

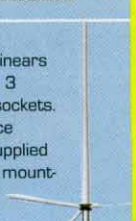
The elegant way of personal communications. Earpiece with combined lapel hanging mic and PTT. Models to suit most radios. State: Kenwood, Yaesu or Icom when ordering

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 B
AV-400 140 - 525MHz 5/20/200/400W £49.95 B
AV-600 1.8 -525MHz 5/20/200/400W £59.95 B
All fitted with SO-239, PEP/RMS readings, 3W for FSD approx. AV-600 has dual sensors.

Base VHF/UHF Verticals



2m / 70cm fibre glass colinears with stainless steel fittings, 3 short radials and SO-239 sockets. These are high performance antennas, pre-tuned and supplied with all hardware for mast mounting.

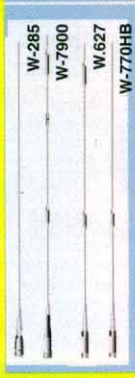
Dual Band 2m/70cms

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

Great Value Mobile Whips



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.

RSGB Matters

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

Founded in 1913 incorporated 1926
Limited by guarantee
Member society of the International Amateur Radio Union
Patron: HRH Prince Philip, Duke of Edinburgh, KG, KT

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

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Honorary Treasurer:
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Details of the Society's volunteer officers can be found in the RSGB Yearbook 2002

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 (managenal)

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.

MORSE ASSESSMENTS AT RSGB HQ

THREE MORE Foundation Licence Morse Assessment sessions will take place at RSGB headquarters in Potters Bar, Herts, during February. They each take place between 10.00am and 12 noon on Fridays; **1, 8 and 15 February**. There is a maximum of 12 places available at each session and places will be allocated on a first come, first served basis. Application forms can be obtained from the RSGB website or by contacting Jennifer at RSGB HQ, tel: 0870 904 7373; e-mail: ar.dept@rsgb.org.uk

AROS TALKS AT LOCAL CLUBS

THE AROS Coordinator, Barry Scarisbrick, G4ACK, will be giving presentations on the work of the RSGB Amateur Radio Observation Service (AROS) at the **Trowbridge & DARS** on **Wednesday 6 February** (details: Ian, G0GRI, tel: 01225 864698 evenings / weekends); at **Colchester Radio Amateurs** on **Thursday 14 February** (details from Frank Howe, G3FIJ, tel: 01206 851189), and at the **Shefford and District Amateur Radio Society** in Bedfordshire on **28 February** (details from Derek, G4JLP, tel: 01462 851722).

AWARDS PRESENTED AT RSGB AGM

THE FOLLOWING trophies and awards were presented at the RSGB AGM on 1 December 2001:

The Calcutta Key, awarded for outstanding service to International Friendship through amateur radio, went to J Johnson, ZL2AMJ; the Don Cameron, G4STT, Memorial Trophy, awarded for outstanding contribution to low-power amateur radio communication, was presented to George Dobbs, G3RJV; the Founders' Trophy, awarded for distinguished service to the Society, went to David Lauder, G0SNO; and the Raynet Trophy, awarded for outstanding services to the Radio Amateurs Emergency Network, went to Ian Kyle, MI0AYZ/GI8AYZ.

The following awards were made on behalf of the Technical and Publications Advisory Committee (TAPAC) for articles published in *RadCom*: the Courtney-Price Trophy to Peter Martinez, G3PLX, for 'Chirps: a New Way to Study HF Propagation' (Jul / Aug 2000); the Wortley-Talbot Trophy to John Hey, G3TDZ, for 'Cave Radio. The Story So Far' (Jul 2000); the Norman Keith Adams Prize to Brian Horsfall, G3GKG, for 'A Precision Peak-Following Power Meter' (Mar 2001); and the Ostermayer Trophy to Peter Rhodes, G3XJP, for 'PicATUne - the Intelligent ATU' (Sep 2000 - Jan 2001).

The Jack Wylie Trophy was awarded to Tommy Menzies, GM1GEQ, for his hard work promoting the hobby of amateur radio and of promoting the RSGB as its representative body. The Jock Kyle Memorial went to the Central Scotland FM Group for its work associated with the continued maintenance of voice repeaters in Scotland, including their re-installation away from commercial sites.

Peter Sheppard, G4EJP, was made a Life Vice-President of the Society in recognition of his outstanding contribution to Society affairs, in particular his work on the establishment of the RSGB's new regional structure.

John Hey, G3TDZ (left), receives the magnificent Wartley-Talbot Trophy from 2001 RSGB President Don Beattie, G3BJ.

WANT TO JOIN THE HQ TEAM?

THE JOB:

GB4FUN Project Administrator

Hours - Part time (flexible)

Salary - Competitive

Applicants must be IT-literate and be familiar in particular with Microsoft Word and Excel software.

Applicants must also live within easy travelling distance of RSGB HQ at Potters Bar.

Interested? Telephone Peter Kirby, G0TWW, General Manager on 0870 904 7373 or e-mail: gm.dept@rsgb.org.uk

GB4FUN at the RSGB 2001 AGM in Hamilton.

QSL BUREAU NEWS

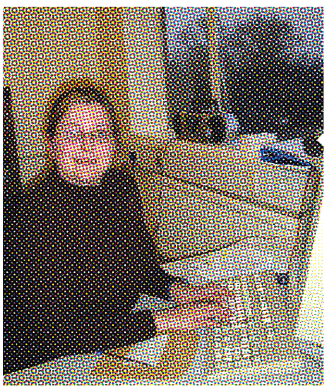
AN RSGB QSL Bureau Sub-Manager for the new series of M3 callsigns held by Foundation Licensees has now been appointed. He is Steve Brainbridge, M1SWB, 6 Sandyville Grove, Liverpool L4 8UL. All those holding Foundation Licences, and who wish to receive QSL cards through the RSGB bureau system, should send a series of SASEs to Steve Brainbridge.

Eric Parkes, G1PEY (QTHR), is the new QSL Bureau Sub-Manager for Abbreviated Contest Callsigns. He takes over from Mr F M Graseley, M0CKX, who is thanked for his service.

G6NYC, the RSGB QSL Bureau Sub-Manager for the M0C - series of callsigns, has a large filing cabinet of uncollected cards which he wants to send or destroy. If you wish to collect your cards from G6NYC, please send him some SASEs.

FOUNDATION LICENCE VHF AWARD

TO COINCIDE WITH the introduction of the Foundation Licence, a new RSGB VHF award has been introduced. It's available only to Foundation Licensees for contacts in the first year of holding the licence. No QSL cards are required. Further details are available from the Awards Manager, Tony Jarvis, G6TTL (QTHR), or on the VHF awards website.



Jennifer Ward, who has recently rejoined the RSGB HQ staff as a member of the Amateur Radio Secretariat.

CLUBS OFFERING FOUNDATION LICENCE COURSES

(updating list published in Jan 2002 *RadCom*)

Club	Contact	Tel:	E-mail:
Aberdeen ARS	Robert Duncan, 2M1HRS	01224 896142	aars@btopenworld.com
Bishop Auckland RAC	Mark Hill, G0GFG	01388 745353	
Bredhurst R&TS (Kent)	Charles Darley, G4VSZ		g4vsz@darleys.co.uk
Cambridge & DARC	John, G0GKP	01954 200072	j.bonner@ntlworld.com (change of contact)
Carrick ARGroup	John Branagh, GI3YRL	02893 367208	JH.Branagh@ulst.ac.uk
Dundee ARC	Alan Thompson, MM1EQE	01241 855 152	amthomp@rsgb.net (change of contact details)
Glenrothes & District ARC	Ken Horne, GM3YBQ	01592 872770	
Great Lumley ARC	Michael Stott, G0NEE	01661 832020	mstott7302@aol.com
Halton Radio Club (Runcorn)	Paul Jones	01928 770974	
Hastings E&RC	R C Gornall, G7DME	01424 444466	
Isle of Man ARS	John Butler, GD0NFN		gd0nfn@thersgb.net
Keighley ARS	Ian Townson, M1BGY	01274 723951	ian.m1bgy@btinternet.com
Kilve Court Education Centre (North Somerset)	Adrian Dening, G4JBH	01288 331113	g4jbh@compuserve.com
Milton Keynes ARS	V Webley, G0RKV	01908 672 920	
Moray Firth ARS	Geoff Crowley, MM5AHO	01542 882818	
Newbury & DARS	Alan Davidson, G4PSU	01635 861155	alan@davidson2000.freeserve.co.uk
Nortel (Paignton) ARC	Ron Ediborough, G0BAJ	01803 550 493	ron.edinborough@lineone.net
Oulder Hill RS (Rochdale)	Dennis Upton, G0UAF	01706 621998	
Portsmouth area	Paul Steed	023 9237 1677	g0vep@ntlworld.com
Sheffield ARC	Contact Sheffield ARC, 31 Earl Marshal Drive, Sheffield S4 8JZ		
Thornton Cleveleys ARS	C Webb, G4FWM	01253 876 313	mail@tcars.org.uk (add e-mail address)

VHF AWARD NEWS

AS IN previous months the bulk of claims have involved 50MHz with advantage being taken of the good propagation there has been in recent months. Both John Button, G3YSK (SO), and your Award Manager Tony Jarvis, G6TTL (PE), tendered 6m claims which included cards that went back some 11 years. G3YSK and G6TTL successfully gained certificates and stickers for 10, 20 and 30 Countries (2-way) and also for 25, 50 and 75 Squares. G6TTL additionally gains stickers for 40 Countries and 100 Squares.

Don McKay, MM5AJW (KW), sent 10 cards, including a number from the far east, which has raised his country tally to 60. Regular claimant John Ridd, G8BQX (TN), successfully claims a sticker for 475 squares. G8BQX now has the facility for 400W and John admits to: "having to use the 'afterburner' quite a lot to keep up with the rat-race." John now occupies second position in the 50MHz table, just 25 squares below the leading station. David Jarrett, G4DCJ (PE), has also been active in recent weeks. His successful claim was for 400 squares with the majority of contacts taking place during the October and November trans-Atlantic openings.

There has also been welcome activity at the microwave end of the spectrum. David Dodds, GM4WLL (EH) has after the recent contest period been able to successfully claim 10 squares on 1296MHz. David, as usual in these events, was working from his portable location in IO85. Two Microwave Distance Awards were claimed by John Quarmby, G3XDY (IP), on 2.3 and 10GHz. Both contacts were with OE5VRL/5 (JN78) and took place on 11 October 2001 over a distance of 1012km. John also sent in successful claims for 100 squares on 1296MHz and for 5 squares on 10GHz.

Congratulations to all recipients.

Details of all VHF, UHF and Microwave Awards can be obtained on receipt of an A4 or A5 SASE from the Awards Manager, Tony Jarvis, G6TTL (QTHR). They are also available on the Internet at www.rsgb.org Queries may also be sent by e-mail to vhf.awards@rsgb.org.uk

Summary of Award Recipients in December

50MHz: 10 Countries (2-way): G3YSK, G6TTL. 20C: G3YSK, G6TTL. 30C: G3YSK,

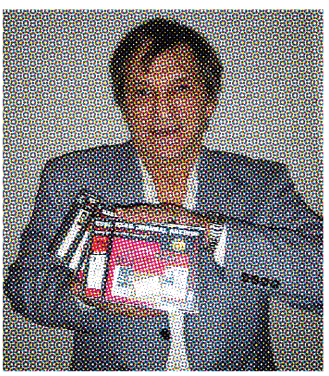
G6TTL. 40C: G6TTL. 60C: MM5AJW

25 Squares: G3YSK, G6TTL. 50S: G3YSK, G6TTL. 75S: G3YSK, G6TTL. 100S: G6TTL. 400S: G4DCJ 475S: G8BQX.

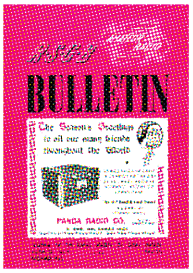
Microwaves: 1296MHz: 10S: GM4WLL/P. 100S: G3XDY.

10GHz: 5S: G3XDY.

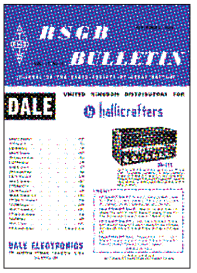
Microwave Distance Awards: 2.3GHz: G3XDY. 10GHz - Advanced Level: G3XDY.



Mike Kremer, G8VLN, of Hampstead, London NW11, with his prize of all seven *RadCom* archive CD-ROMs, worth over £200. Mike was the lucky winner of the RSGB Survey Prize Draw, and he visited RSGB HQ recently to collect his prize. The results and analysis of the survey can be found in the article on pages 37 / 38 this month.



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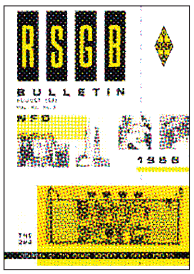

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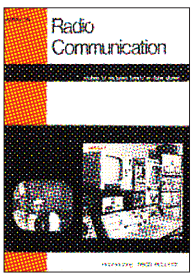

RadCom 1991-1995 (3 CD set)

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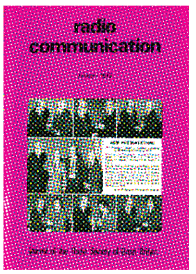
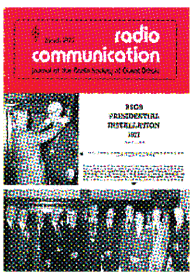
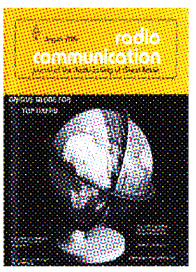
Each of these 7 boxed sets contain between 60 - 120 magazines - that's over five thousand pages. Each page can be viewed on screen, zoomed for maximum readability (ideal for those with vision difficulties), or printed out for future reading. Complex search facilities are available on the indexes, and indexes from several sets can be searched at the same time. If you have dog-eared piles of *RadCom* and the *RSGB Bulletin* gathering dust in the loft, or have thrown them away and regretted it, or just want to have more information at your fingertips, this is the answer for you.

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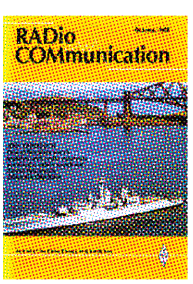
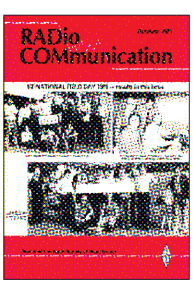
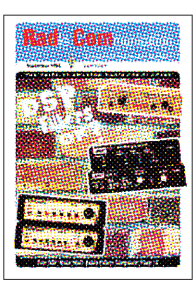



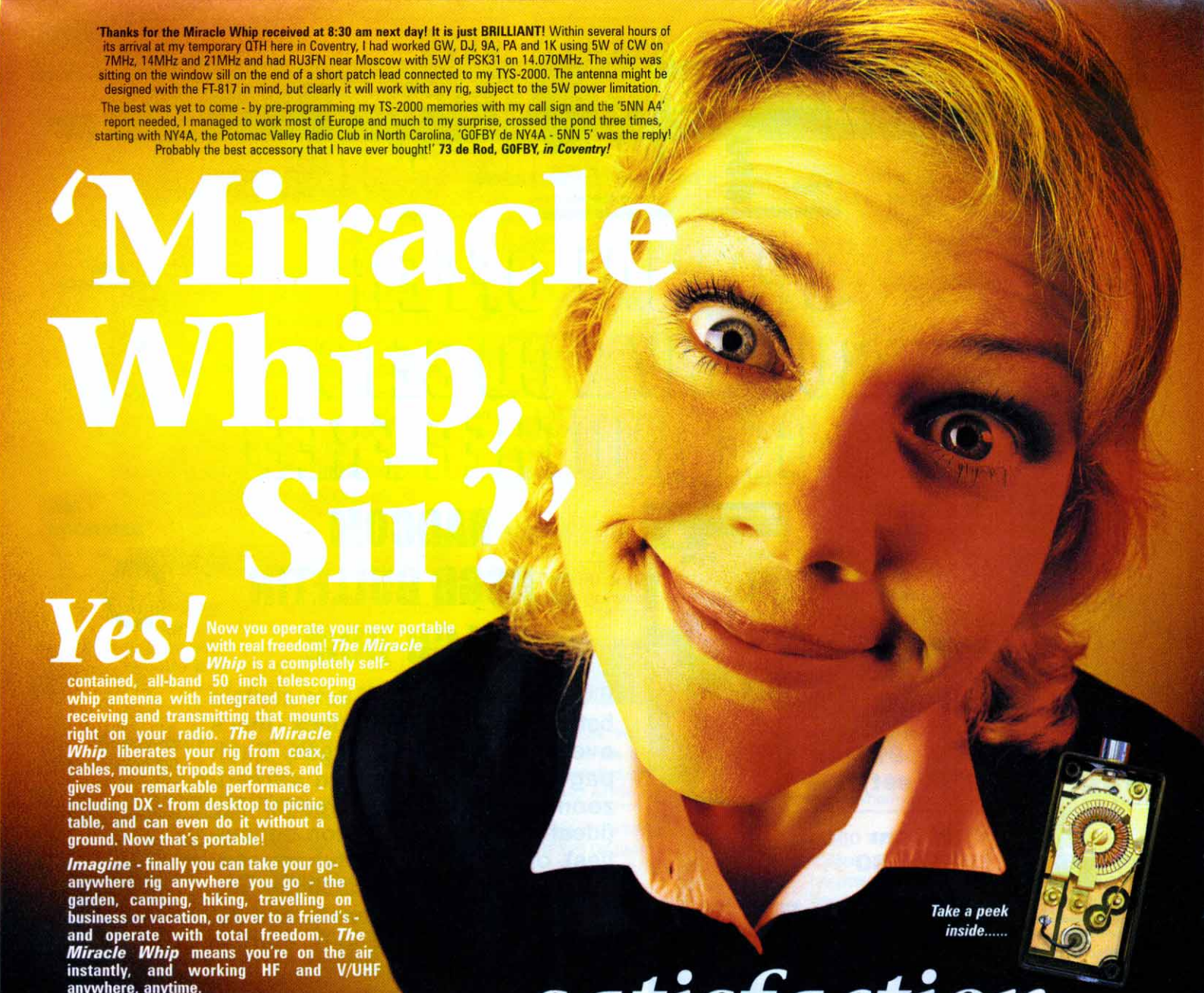





'Thanks for the Miracle Whip received at 8:30 am next day! It is just BRILLIANT! Within several hours of its arrival at my temporary QTH here in Coventry, I had worked GW, DJ, 9A, PA and 1K using 5W of CW on 7MHz, 14MHz and 21MHz and had RU3FN near Moscow with 5W of PSK31 on 14.070MHz. The whip was sitting on the window sill on the end of a short patch lead connected to my TYS-2000. The antenna might be designed with the FT-817 in mind, but clearly it will work with any rig, subject to the 5W power limitation.

The best was yet to come - by pre-programming my TS-2000 memories with my call sign and the '5NN A4' report needed, I managed to work most of Europe and much to my surprise, crossed the pond three times, starting with NY4A, the Potomac Valley Radio Club in North Carolina, 'G0FBY de NY4A - 5NN 5' was the reply! Probably the best accessory that I have ever bought!' **73 de Rod, G0FBY, *in Coventry!***

'Miracle Whip, Sir?'



Yes!

Now you operate your new portable with real freedom! ***The Miracle Whip*** is a completely self-contained, all-band 50 inch telescoping whip antenna with integrated tuner for receiving and transmitting that mounts right on your radio. ***The Miracle Whip*** liberates your rig from coax, cables, mounts, tripods and trees, and gives you remarkable performance - including DX - from desktop to picnic table, and can even do it without a ground. Now that's portable!

Imagine - finally you can take your go-anywhere rig anywhere you go - the garden, camping, hiking, travelling on business or vacation, or over to a friend's - and operate with total freedom. ***The Miracle Whip*** means you're on the air instantly, and working HF and V/UHF anywhere, anytime.

The Miracle Whip doesn't really perform miracles, but its performance is truly remarkable. You can work a DX SSB or CW station oversees on 10, 15 or 20, check in to the local forty-metre net, zip up to two meters or 432 for a chat with the boys, check six for openings, catch the last bit of the football game on MW, and wrap up the evening with the BBC World News - all on the same, super-portable antenna.

The Miracle Whip is perfect for any shack and any rig - for emergencies, testing, field days, cottage, camping, canoeing, fishing - the list goes on. Wherever your big antenna won't go, a ***Miracle Whip*** can put you on the air.

It's a superb SWL and scanning antenna too. ***Miracle*** antenna's C-VAT technology reduces broadband noise while permitting sensitive, tuned reception over a wide range without retuning. Got a portable! Then get portable! Get a ***Miracle Whip*** and get on the air - from anywhere - ***TODAY!***

Take a peek inside.....

...satisfaction guaranteed!

A posting from the **YAHOO FT-817 NEWS GROUP**

Subject: Miracle Whip

Last night I worked stations from the east coast to the west coast on 20,15 and 10 meters. This was all from the kitchen table.

Only counterpoise was the power supply. Great thing is it is very small and light weight. I for one do not want to walk around with a MP-1 and counterpoise wires trailing behind me and a MP-1 wound mot fit on the kitchen table! In fact it is much lighter then my ATX antenna.

73 Bill W9WCR

SPECIFICATION

RX: 60kHz - 460MHz *(NO GAPS)* TX: 3.5MHz - 460MHz *(NO GAPS)*

POWER: 5 Watts continuous, 10 Watts CW/SSB

RRP

£129.95

P&P £4.00

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Front Cover:

Guglielmo Marconi looks out towards Newfoundland while sitting on his grandfather's memorial at Poldhu, Cornwall. See the special feature on page 42. *Photo copyright Steve Nichols, G0KYA.*

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

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

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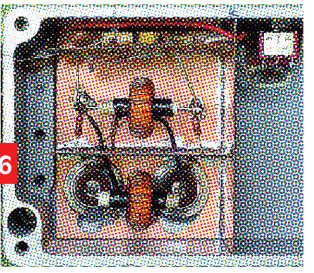
RadCom This Month
February 2002

News and Reports

Technical Features



Down To Earth - Amateur Radio From The Ground Up

Reviews

Regulars

RadCom NEWS

'Miracle Whip' Competition

THE 'MIRACLE Whip' is a new HF / VHF / UHF portable antenna designed to complement Yaesu's new go-anywhere FT-817 transceiver, but which can be used with any QRP transceiver. It is reviewed by Chris Lorek, G4HCL, on pages 29 - 31 this month. Now, Martin Lynch of ML&S has announced a new competition exclusively for RSGB members. Full details will be published in the March *RadCom*, but you will need to be using a 'Miracle Whip' to take part. The first prize will be an FT-817 transceiver kindly donated by Yaesu (UK), and the second prize will be a Maldol HF mobile antenna system covering 3.5 - 28MHz and donated by ML&S. ML&S has recently become the UK distributor for Maldol, which manufactures VHF / UHF mobile antennas and which has recently introduced an HF mobile range.

Thinking Day on the Air

THE ANNUAL 'Thinking Day on the Air' (TDOTA) takes place over the weekend of **16 / 17 February**. A TDOTA pack, comprising a list of participating stations and details of countries which permit third-party greetings messages, will be available from RSGB HQ. Groups using a GX or similar prefix instead of a GB call are asked to inform HQ so that their details may be published in the pack. The closing date for the receipt of this information is **Wed 6 February**.

RNLI Amateur Radio Club

THE ROYAL NATIONAL Lifeboat Institution Amateur Radio Club has recently been formed in Poole and has received the highly-appropriate callsign M0RNL. M0RNL is active from 160 - 10m after 1700, and occasionally at lunch times. More details from Alex Marshall or Roy Lacken on tel: 01202 663134.

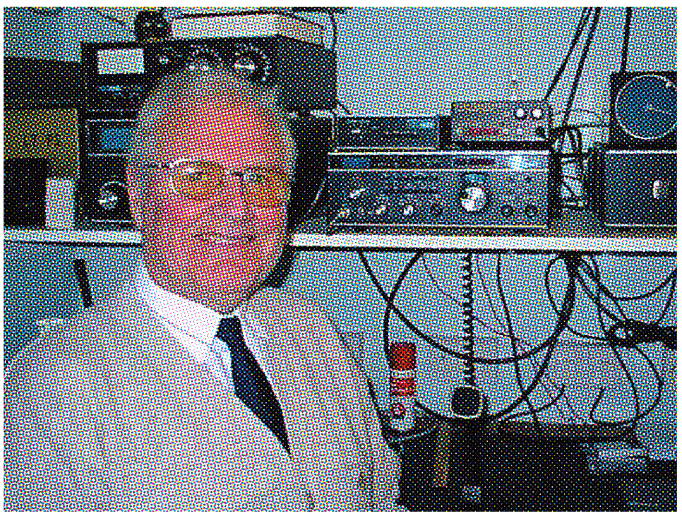
ATC's 60th Anniversary

Cadet Sergeant Huw Thomas, Cadet Elizabeth Roberts and Cadet Corporal James Davidson looking on as Peter Park, GM3PIP, transmits using the vintage radio equipment.

2001 WAS THE 60th anniversary of the founding of the Air Training Corps. 1296 (Turriff) Squadron Air Training Corps operated using the special event callsign GM60ATC during the month of November. The squadron was visited by Peter Park, GM3PIP, of Banff and Buchan Amateur Radio Club, who set up his WWII-vintage Lancaster bomber T1154 transmitter and R1155E receiver at the squadron headquarters in Turriff, Aberdeenshire. This equipment was used in almost all types of RAF heavy bomber aircraft of that era. Peter tuned up the radio equipment on 40m and several Morse contacts were made. The 60-year old equipment worked well and was the focus of much interest both by local radio amateurs and the air cadets.

GM3PIP has subsequently been presented with a commemorative engraved whisky glass as a thank you for his support of the 60th year celebrations.

CRACA Reopens its Doors (Just a Crack!)



AT THE AGM of Christian Radio and Computer Activities (CRACA) it was decided to reopen the doors for membership to make membership more accessible to radio amateurs. CRACA was formed in January 2000 and by the summer of 2001 had over 1000, could no longer cope and had to close its membership. By the end of last year they had a waiting list of over 300. CRACA Chairman Charles Elliott, G4UJW (pictured in his shack, above), explained that the original intention of CRACA was to try and keep an equal proportion of radio and computer hobbyists. He explained, "One of the reasons we had to close the membership was that we were in danger of having an unequal balance with too many computers and not enough radio amateurs. So now, following the AGM, any radio amateur applying for membership of CRACA will go straight to the top of the waiting list." Membership of CRACA is free. Further information from Charles, G4UJW, tel: 01283 791213, e-Mail: craca@qsl.net or visit the website at www.qsl.net/g4ujw/

South Yorkshire Repeater Group & RSGB Region 4 Hamfest

THE SOUTH YORKSHIRE Repeater Group in conjunction with the RSGB Region 4 (North East England) will be holding a one-day 'hamfest' in April (in addition to the usual 'Great Northern Hamfest' in November).

The new event will take place on 21 April at the Metrodome Leisure Complex, Queens Road, Barnsley. Doors open at 10.00am. The venue is in the town centre, less than 2 miles from Junction 37 of the M1 and talk-in will be available via GB3NA on 145.675MHz.

Further details from Ernie Bailey, G4LUE (QTHR) or tel: 01226 716339 / 07787 546515 (between 6.00 and 8.00pm, please).

Argent With Profits Bonds for RSGB Members

THERE HAS BEEN a good response to the special Standard Life With Profits Bond deal for RSGB members (see p6, *RadCom* November 2001 and the 'flyer' enclosed with that issue). Argent promised another offer with a lower minimum amount for RSGB members and they are now in a position to accept £5000 or more into a similar bond with Clerical Medical Investment Group (in this case the 'uplift' is 2%). Argent will provide full details of these and you will be sent an illustration, as required by law, with an information pack. Please see the advertisement on page 95 of this issue for further details.

Epsom Rally to Support Schools

THE COUNTDOWN to the Epsom Rally on 16 June has started. As part of a national drive to encourage young people into the hobby, the organisers are giving away up to 1000 entry tickets to schools and colleges in the south-east. They would like to hear from anyone who knows of any potentially active schools who may want tickets. To find out more, look at the new website at www.epsomrally.co.uk It is packed with information.

GB2CW Morse Practice

A BROADCAST of Morse code practice is provided by GB2CW for the benefit of operators anxious to improve their standards each Thursday evening from 2045 until approximately 2230. The text used comprises extracts from the current GB2RS news broadcast. Morse speeds used are 15, 18, 22, 25, 27 and 30WPM. The frequency is 3527kHz and an opportunity is provided for feedback and QSOs 'on the key' following the broadcast.

● NEIL Stackhouse, G1SCL, has been installed as the Worshipful Master of Radio Millennium Lodge 9709. He welcomes all enquiries about membership from existing Freemasons and others interested in joining; tel: 0161 748 4479 (this corrects details published in the December 2001 *RadCom*).

Cray Valley RS and 'Gus', M5GUS, Leading Club and Individual

Radio Amateurs Raise Record Sum for Transmission 2001

EVERY YEAR in September, the British Wireless for the Blind Fund (BWBF) organises 'Transmission', a fund-raising event in which amateur radio clubs and individuals are sponsored for the number and distance of contacts made. The Cray Valley Radio Society (CVRS) took part for the first time in 2001 and raised £2167, helping to swell the total raised for BWBF to £6681.48 - a new record! Money pledged was still coming in and BWBF was hoping that the final total might reach £7000.

Since the event, it has been confirmed by BWBF that CVRS won prizes for the club raising the most money and for making the most contacts. CVRS will be receiving the top prize of a Tennamast, donated by Tennamast (Scotland) Ltd. The previous year's winners, the Port Talbot Radio Club, achieved second place in 2001.

'Nobby' Styles, G0VJG, was the driving force behind CVRS becoming involved in the event as he had supported previous 'Transmissions' from his home station in Dartford. The CVRS committee agreed with Nobby's suggestion that the club support 'Transmission' by mounting a 'multi-multi' style operation. The event was organised by Nobby; Dave, G4BUO; Chris, G0FDZ, and Bob, BRS32525. Special thanks were due to the 9th Dartford Scout Troop who agreed to loan their headquarters to CVRS for the weekend. The special callsign GB2FB was obtained. Four stations were set up - three on HF and the fourth on 2m. 1988 contacts were made in 90 DXCC entities, the best being with ZL7/G3SXW in the Chatham Islands at a distance of over 19,000km.

Part of the Cray Valley RS team operating GB2FB during Transmission 2001.

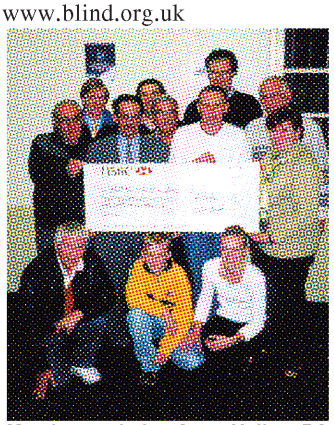
Robert Guscott, M5GUS, operating as GB0WB from Truro, won the top prize for the leading individual. He made 203 contacts with 44 countries, including Australia and Antarctica, and raised £215. Gus will be receiving a top-of-the-range digital radio, donated by Roberts Radio.

Norrie Brown, GM4VHZ, of Tennamast (Scotland) Ltd said "Tennamast is happy to be associated again with the British Wireless for the Blind Fund's Transmission 2001 competition, with the donation of a 7.6m Adapt-A-Mast as the main prize." It is a galvanised, wall-mounted, telescopic mast that can be adapted to tilt-over use with a set of tilt brackets. Norrie said, "Tennamast send their congratulations to everyone who entered this worthwhile competition, and hope that the winners have many years of use from their prize."

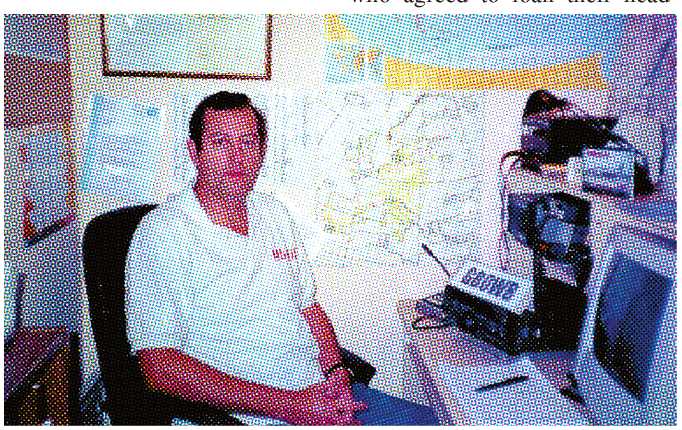
Fiona Fountain of the BWBF said, "Our grateful thanks to each and every one who took part. They will all be receiving their certificates shortly. Our thanks to the RSGB as well for all the support you gave."

Put a note in your diary now: 'Transmission 2002' will take place on **14 / 15 September**. Maybe you and your club can help to raise a record sum for this very worthwhile cause this year?

The British Wireless for the Blind Fund is a Registered Charity (No: 211849) dedicated to providing the companionship of radio to every blind person in need throughout the UK. Full details are available from the British Wireless for the Blind Fund, Gabriel House, 34 New Road, Chatham, Kent ME4 4QR; tel: 01634 832501, or from the Fund's website at www.blind.org.uk



Members of the Cray Valley RS present their cheque to BWBF. Left to right (standing): G8LDV, BRS32525, G0FDZ, G4BUO, G0WLF, G0VJG, G7GLW, G3JJZ, Fiona Fountain of the BWBF: (crouching) G4DFI, RS177448, RS102891.



Robert Guscott, M5GUS, operating as GB0WB, was the leading individual.

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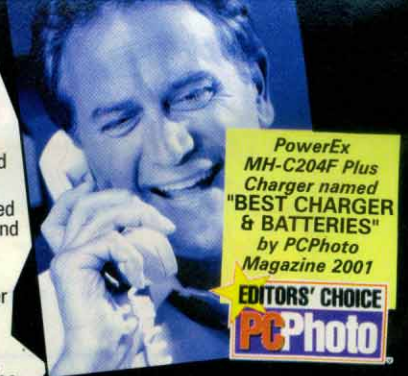

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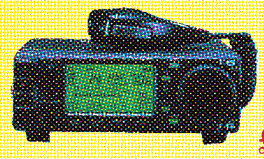

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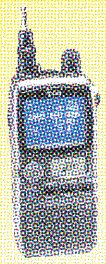

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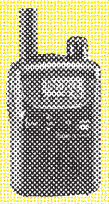

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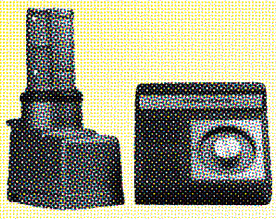

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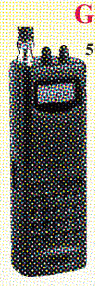

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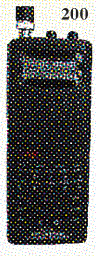

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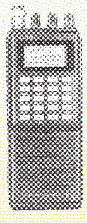

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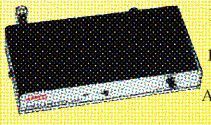

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Sonic Wattmeters:

audio aids to antenna matching

by Brian Horsfall, G3GKG *

A COUPLE of years before designing the Peak-Following Power Meter [1], I had made several 'sonic' wattmeters for a blind operator who uses a valve linear amplifier with a balanced aerial and its associated coupling/matching unit. Initially these were battery-powered units, but a later model incorporated a self-powering facility (from the RF power itself). All were tested and used by Keith, GW4NBY, with fairly satisfactory results, but also with one or two reservations.

The battery-powered version of the Sonic Wattmeter.

In all of these I had used the conventional Breune circuit [2] for the RF section. Conversion of the resulting DC signal to audio was effected by the voltage-controlled oscillator (VCO) function of a CMOS phase-locked-loop chip, type CD4046. This has an almost linear voltage-to-frequency relationship. A simple transistor output stage was used to drive a small loudspeaker.

By reducing the audio signal to a series of very brief ticks, at a repetition rate extending from near zero to a frequency of several hundred per second, the battery current drain was reduced to minimum. This technique had also proved to be a very effective way of achieving discriminating indications of relative power, both in the forward mode, where the ticks blend to produce a 'musical' note and at low power levels in the reflected mode, where the hearing is very sensitive to changes in the repetition rate of the individual ticks. Indeed, with a trained ear it is possible to calibrate the power-to-frequency relationship so as to provide a reasonably accurate estimation of absolute power and standing-wave ratio (SWR).

Unfortunately, various versions of the Breune circuit were (as usual, in my experience) found wanting in their ability to maintain an accurate setting of the characteristic impedance calibration regardless of the frequency band. My later experience of the Tandem Match coupler [3] convinced me that it offers the only real method of deriving an accurate, in-line measurement of RF power, and a new design was undertaken accordingly.

* West Mount, 183 Chester Road, Macclesfield SK11 8QA.
E-mail: brian@g3gkg.fsnet.co.uk

THE BATTERY-POWERED VERSION

THE PRINCIPLES, design considerations, practicalities and calculations pertaining to this type of 'RF Head Unit' are described in detail in my earlier article [1] and will not be repeated here. The toroidal windings (**Fig 1**) were designed to give a full-scale forward power range, with a new battery, of 600W into a 50Ω resistive load. If the battery voltage is allowed to drop below 7V, the range will be curtailed to less than 400W. Normally, one of the good features of the tandem match circuit is its complete symmetry as regards the relative positions of the RF input and aerial output

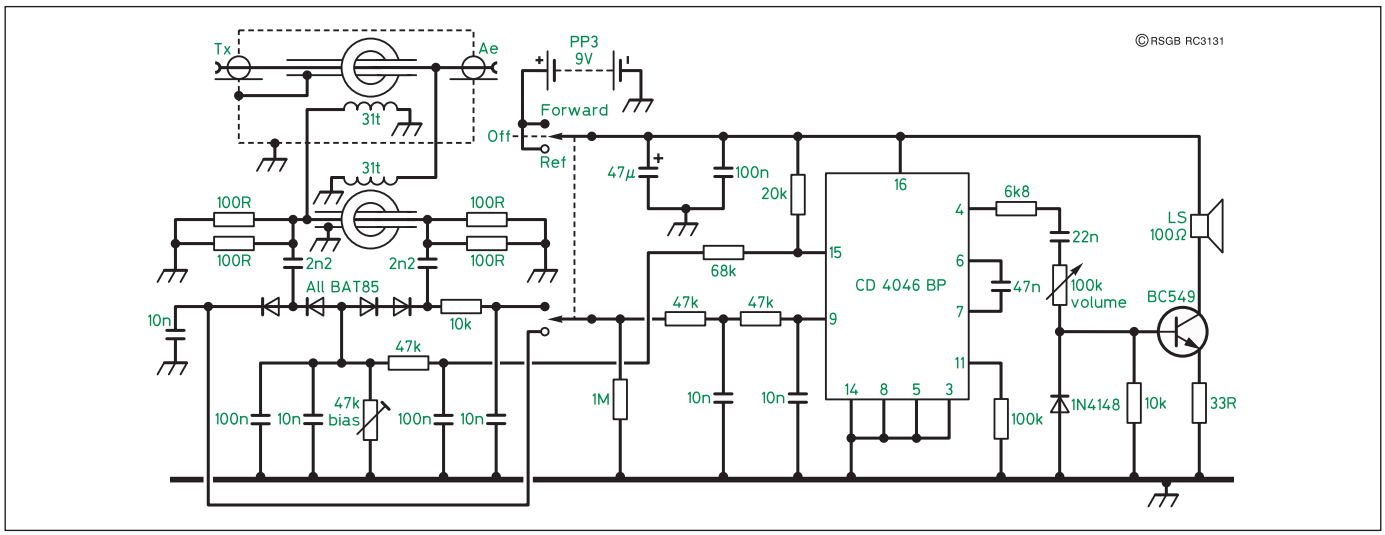


Fig 1: The battery-powered version of the Sonic Wattmeter. NB - The 100Ω moving coil speaker shown was actually one of the units from an old pair of earphones, but commercially-available speakers, which would appear to be eminently suitable, are listed in the current ElectroValue catalogue, Stock No CS264, (64Ω, 2.5in), and in the Maplin catalogue, Stock No YT29G.

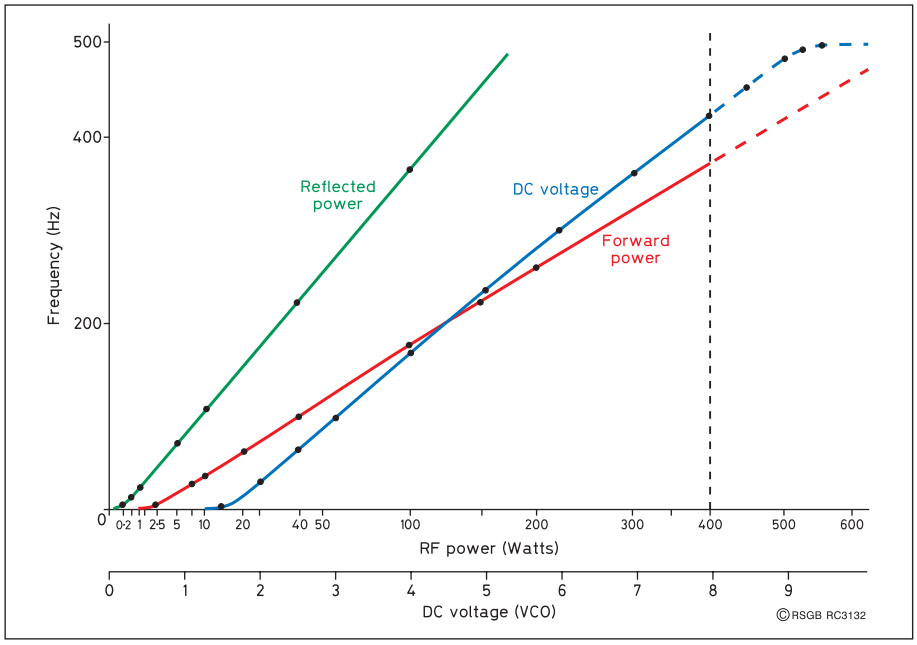


Fig 2: Performance graphs for the battery-powered version.

connections in relation to those of the 'forward power' and 'reflected power' voltage output ports. In this instrument, however, we really require the sensitivity (and hence the output voltage) at the 'reflected' port to be much greater than that at the 'forward' one. As in the original article, it should be arranged during construction that the winding connections of at least one of the toroids could be easily reversed if necessary, on test, so as to obtain the correct phase relationship.

Some simplification and modification of the circuit used to derive the DC signal was required in view of the characteristics of the basic VCO circuit. Although the voltage/frequency relationship of the 4046 VCO is essentially linear, there is a 'dead-band', the size of which varies with different samples of the IC between about 0.3V and 1.3V, below which there is no frequency output. Above this level the pulse rate starts from zero and then increases linearly.

With the dead-band voltage added to that normally encountered in any type of semiconductor diode, the instrument would be very insensitive at low RF power and completely useless in detecting reflected power at a reasonable level. However, applying sufficient forward voltage bias via the diodes themselves overcomes both the dead-band of the IC and that of the diodes, thus allowing detection and conversion of the RF signal at very low levels. It also provides a convenient and simple way of incorporating a warning reminder to the user that the instrument is switched on *and* an indication of the need to change the battery. Both these features are accomplished by adjusting the 47kΩ preset resistor (accessible through the hole in the top of the box) to the point where the bias is just *beyond* the dead-band level, so that a very slow audible tick is heard from the speaker whenever the instrument is switched on and the battery is OK.

The switch is a miniature double-pole toggle type with three positions; centre is off, to one side is forward power and the other way is reflected power (arranged in the construction so that the switch dolly 'points' backwards relative to the RF direction). As long as either 'on' position is selected, the occasional tick serves to remind the user that the device is active. The 4046 CMOS chip incorporates a 7V Zener diode which, in stabilising the source for the forward bias, also ensures that, when the battery voltage drops below 7V, the ticking ceases altogether. Once transmitter adjustment has been finalised, the switch should be kept in the reflected mode during on-the-air operation so as to warn of any trouble with the aerial itself or with the matching situation.

By employing two diodes in a voltage-doubler arrangement for the detector on the reflected side, the power sensitivity is quadrupled and is maximised by using Schottky diodes. With this arrangement it is possible to observe the reflected component down to a very low level. In order to maintain the same degree of forward bias in both forward and reflected modes (and hence preserve the low-battery warning tick in both 'on' positions), the forward detection circuit employs two similar diodes, in series.

The audio output stage in this battery-powered model has been designed to provide maximum efficiency with low current consumption. This now stands at about 120µA in the quiescent state (in the reflected mode with no RF detected) and only rises to 2.5mA at full RF power with maximum audio volume. The frequency range could be altered by changing the value of either the resistor from pin 11 to ground or the capacitor between pins 6 and 7, or both.

PERFORMANCE

The graphs of **Fig 2** were plotted using data obtained by measurements on this model and the results are agreeably close to the theoretical predictions. The power output limit of my transmitter meant that the extent of the full scale power range had to be 'guesstimated' by extrapolation but, as can be seen from the other plots, linearity is such that the resulting figure will be quite close to the true value. The 'reflected power' plot is of the response obtained with the instrument switched to the reflected mode, with the RF input and output leads reversed.

The plots shown in **Fig 3** use an expanded audio frequency scale in order to illustrate explicitly the instrument's capability in the practical situation. In these graphs, the pulse rate (frequency) is plotted against the applied *forward* power when the input/output leads are the right way round with the mode switch in the *reflected* position, using different mismatched resistive loads to produce the stated SWR. It is difficult to show the very fine discrimination that the ear demonstrates where very low pulse rates are concerned, but these curves *do* show that, by gradually increasing the forward power as the ATU approaches the correct settings, it is possible to achieve an essentially perfect match.

Not shown here but included among my recorded data, is the result of a series of tests showing that the calibration of RF power versus perceived frequency is virtually constant, 50W producing (134 ± 2)Hz on all bands from 80 to10 metres and, almost certainly (but not measured), down to topband and below.

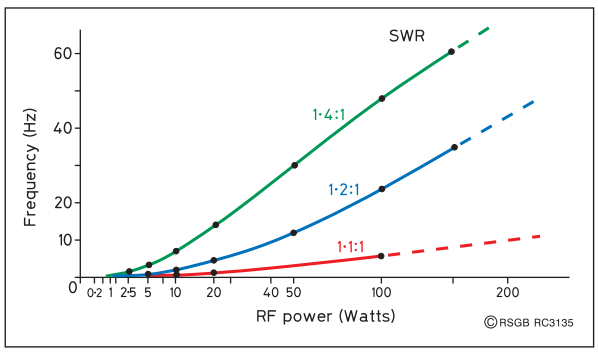


Fig 3: SWR sensitivity relative to forward power.

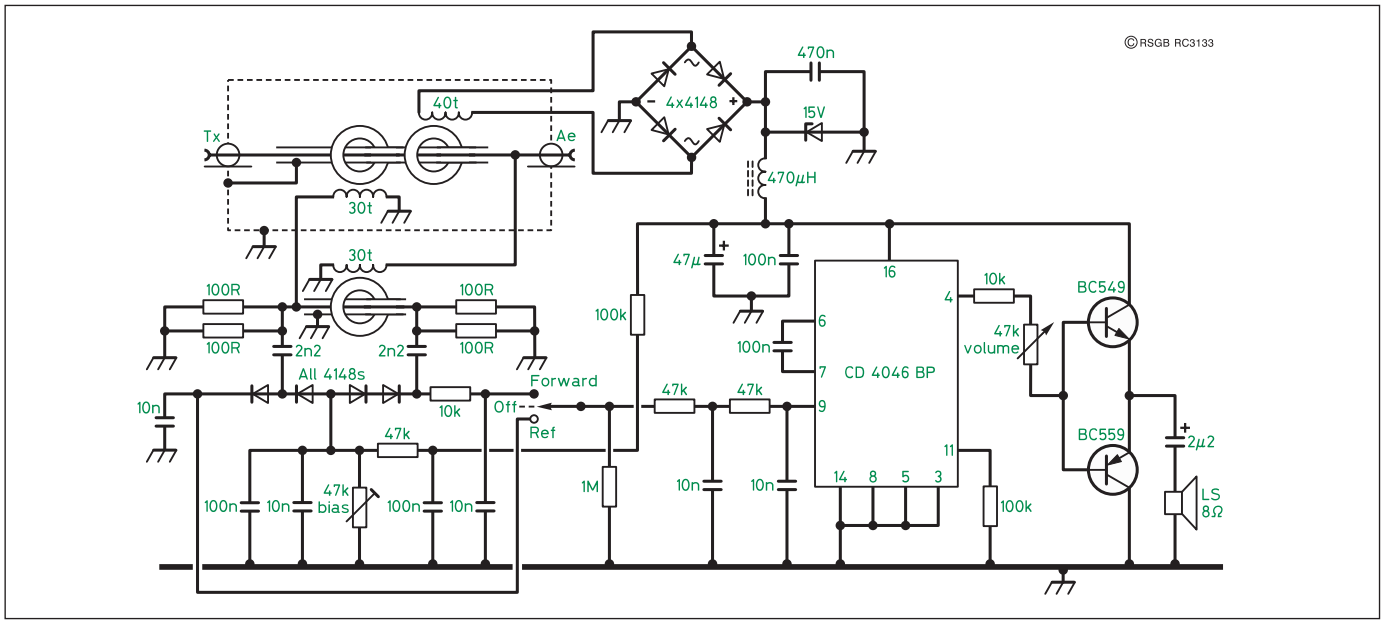
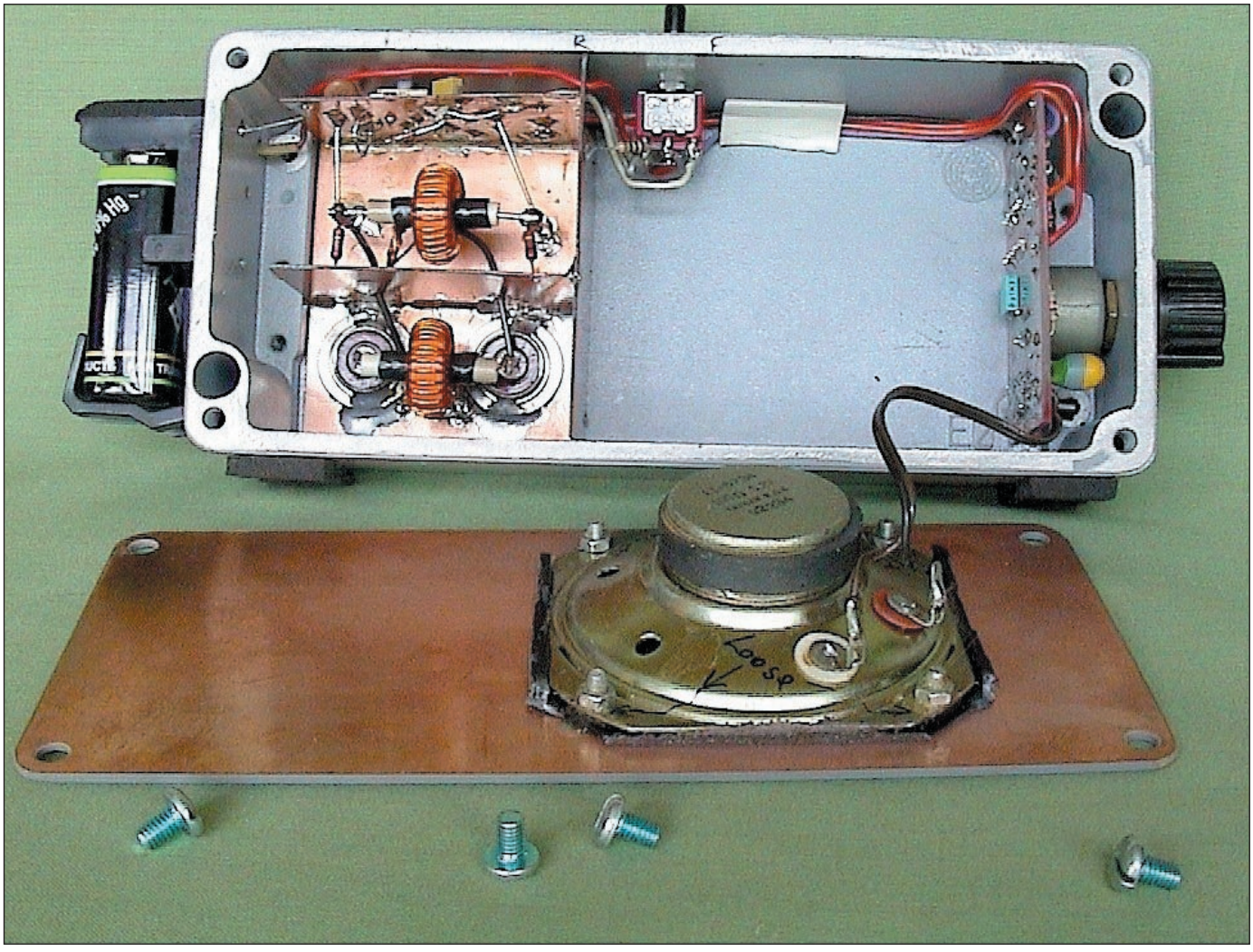


Fig 4: Circuit diagram of the self-powered wattmeter.

THE RF-POWERED VERSION

Powering the device from the RF, apart from the obvious but dubious advantage of obviating the need to change the battery (literally, every few years), allows a higher and reasonably constant supply voltage over most of the power range (and therefore a higher input voltage to the VCO, extending the range where required). This DC supply (up to 15V) is derived from the transmitter RF itself by virtue of an extra toroid on the through coax, as shown in **Fig 4**, and consumes negligible power. Above a low threshold of RF power, the voltage is governed by a self-regulating mechanism whereby a 1.3W Zener diode



Simplicity: Interior view of the Sonic Wattmeter.

Tailoring the toroid windings to suit the required power range

AS IN THE Peak-Following Power Meter, the number of turns, t (needed to produce the desired voltage, V, from the wanted full-scale-deflection (FSD) power range, W), can be readily and simply calculated.

Peak voltage, V_p, in the antenna load, Z:

$$V_p = \sqrt{2WZ}\ .$$

Number of turns, t, on the toroid:

$$t = \frac{V_p}{V}\ .$$

This will almost always produce a figure that includes a decimal fraction of a turn, so t *must* be rounded to the nearest integer, t_n.

The exact FSD voltage should then be:

$$V = \frac{V_p}{t_n}.$$

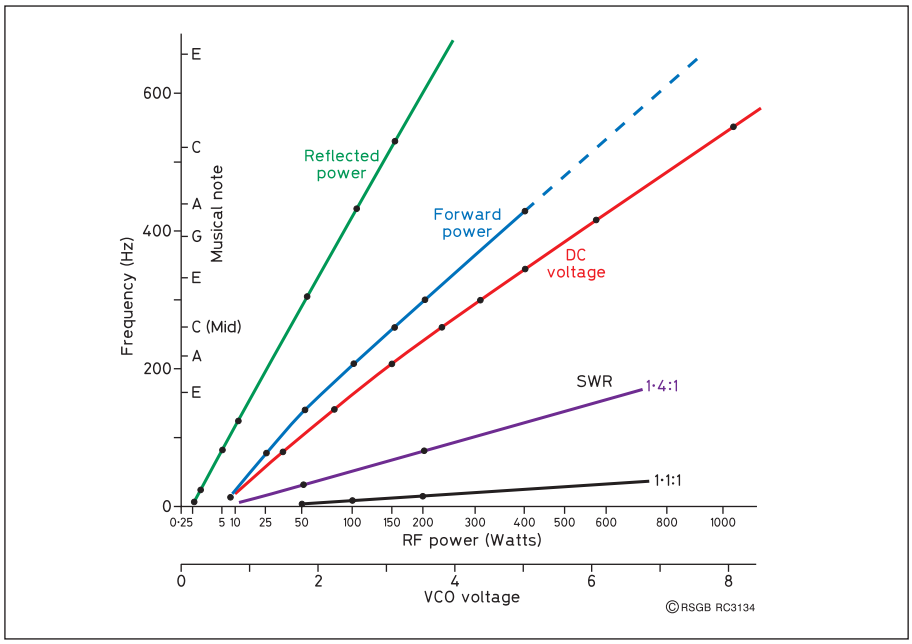


Fig 5: Performance graphs for the self-powered version.

provides, via the diode bridge, a load on the toroidal winding which increases with power applied, thus limiting and stabilising the DC supply.

Although the design is somewhat simplified because the warning tick is not required, there is still the need to provide forward bias to the diodes. In this case I used ordinary silicon diodes because of their higher reverse-voltage rating. They perform very well, because of the bias. It also uses an earlier version of the audio output stage; this takes rather more current and, because there are two ticks per cycle of the square wave output of the 4046, the audio frequency is doubled for given component values in the VCO circuit.

PERFORMANCE

As well as plotting features similar to those in the other set, the graphs of **Fig 5** include a scale of musical notes which, once 'calibrated', enable the discerning operator to get a very good idea of absolute power. As can be seen from the graphs, the self-powering facility does introduce a further slight degree of non-linearity. Again, not reproduced here, are data showing that, above a low power threshold, which becomes somewhat higher with increasing frequency, the supply voltage levels off at a value which is virtually constant for all powers and HF frequency bands.

In the light of experience it may be that, although I like the elegance of the design, the self-powering facility might just be 'gilding the lily' unnecessarily. It appears that Keith has only changed the battery once in each of the earlier designs and that was because he thought he ought to, rather than from any obvious need.

Whilst this description is concerned solely with one application, it is obvious that the simple voltage-to-frequency converter, with its output stage, could readily be adapted to many other instances where an audio signal would enable blind or partially-sighted operators to interpret the meters on their equipment. A simple 741 (or low-current equivalent) operational amplifier would enable connection to virtually any moving-coil meter or other display device.

ACKNOWLEDGEMENT

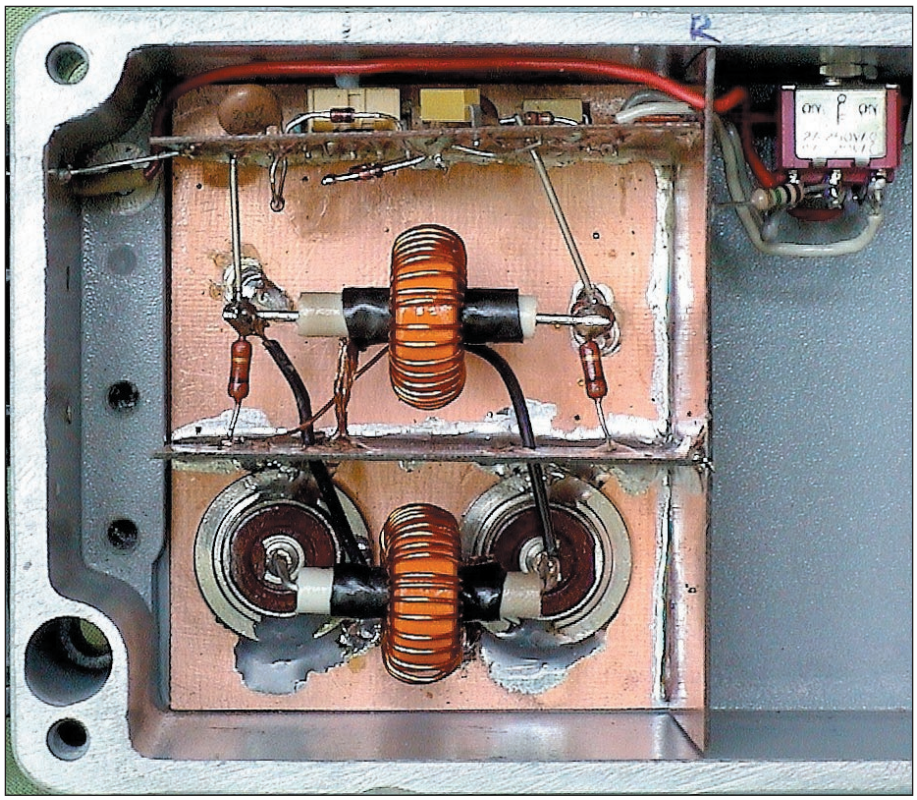
THANKS AGAIN to Don, G3ALP, for the digital photography of the box used to good effect by the late John Stanyon, G4BGZ, and kindly returned to me by Dave, G3YXM. ♦

REFERENCES

[1] 'A Precision Peak-Following Power Meter', by B Horsfall, G3GKG, *RadCom* March 2001, pp17 - 23.

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

[3] 'The Tandem Match - An Accurate Directional Wattmeter', by J Grebenkemper, *QST* January 1987, pp18 - 26.



A close-up of the RF board, showing the forward / reverse switch and the wiring of the toroids.

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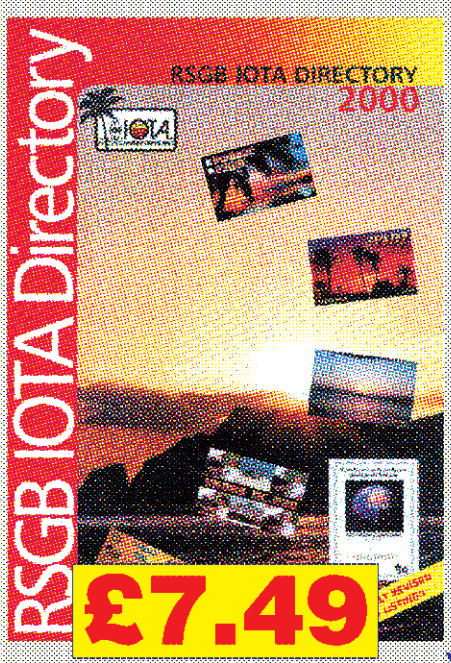

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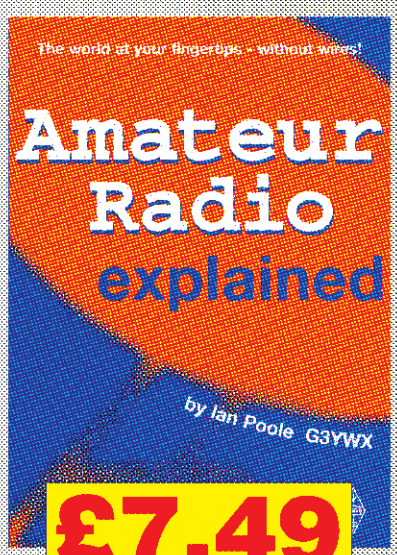

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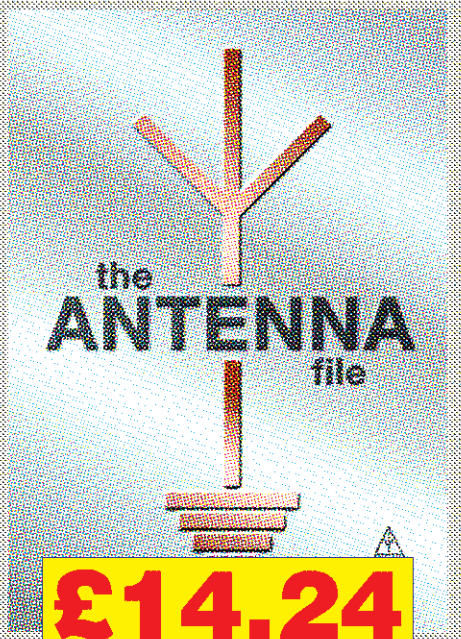

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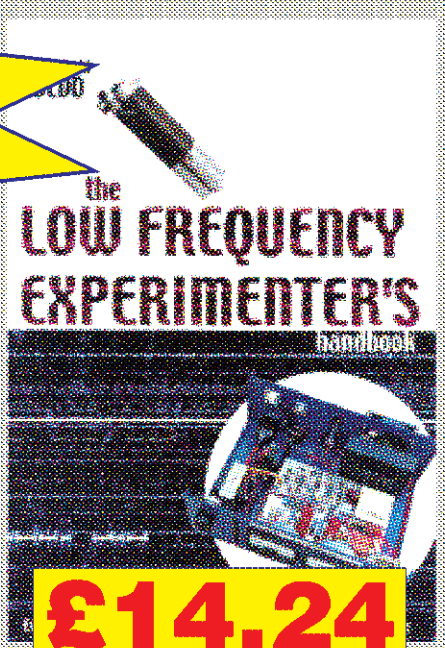

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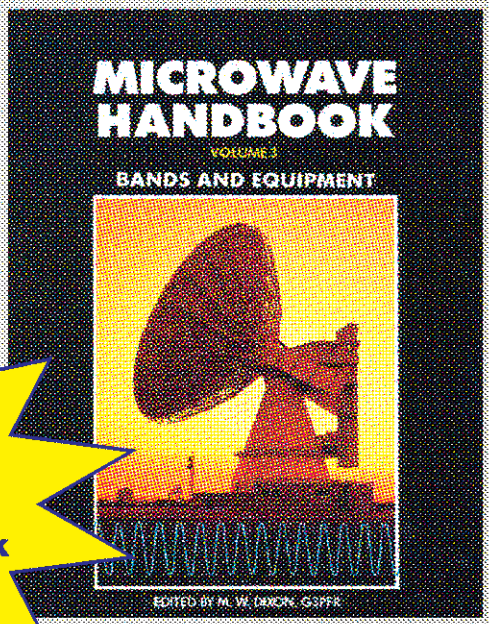

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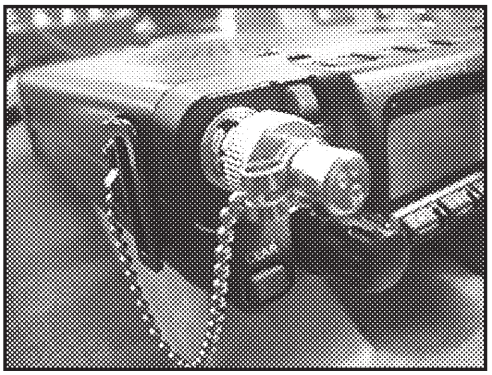

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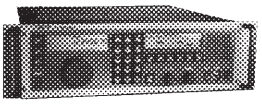

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WHATEVER NEXT

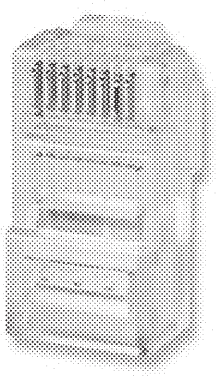
STEVE WHITE, G3ZVW
31 Amberley Road, London N13 4BH.
e-mail: steve.white@rsgb.org.uk

A CENTURY AGO houses were built that didn't include electric wiring, but such a thing would be unthinkable today. Fifty years ago houses were built that didn't contain a telephone socket as standard, but they do now. What I would like to start the column with this month is a look at what other kind(s) of wiring we might expect as standard in the houses of years to come.

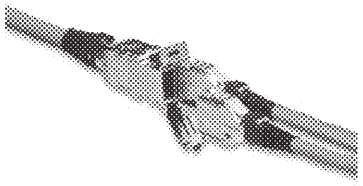
Cat 5 and Cat 5e ('Cat' standing for 'category') seem the logical starting point. Employing four twisted pairs, Cat 5e is a 100MHz 'Structured Wiring System' (SWS) now popular in offices for carrying networked data, as well as telephones. I don't know of any house builders fitting SWS as 'part of the deal', but I do know people who have cabled-up their houses to this standard. The question is, '*Whatever Next*?'

The standards for Cat 6 and Cat 7 are already defined, Cat 6 as being good to 200MHz (the connector is an RJ-series, ie like Cat5 and Cat5e, and pictured below) and Cat 7 to 600MHz (the connector is quite different, and pictured below right), but should they be seen as stop-gap standards?

Even though they are insecure, I can envisage wireless networks operating around 2.4GHz becoming more popular as they drop in price, for the simple reason that they require practically no installation, but optical systems also seem to be on the ascendancy, although not yet around the home.



The RJ series of connector that is used for Cat 5, Cat 5e and Cat6 cabling.



The new connector that is used for Cat 7 cabling.

NEW TERMINOLOGY

RECENTLY, TWO major building blocks for all-optical networks have been agreed by the ITU, with the adoption of two draft global standards for increasing the efficiency and survivability of optical fibre access networks based on Passive Optical Network (PON) techniques. The draft new standards are designated ITU-T Recommendations G.983.4 and G.983.5. Inevitably this means a lot of new acronyms to get to grips with.

A PON is a system that brings optical fibre cabling and signals all or most of the way to the end user in residential and new small / medium business networks. Depending on where the PON terminates, the system can be described as Fibre To The Curb (FTTC), Fibre To The Building (FTTB), Fibre To The Cabinet (FTTCab), Fibre To The Office (FTTO) or Fibre To The Home (FTTH).

PONs utilise laser light of different wavelengths over optical fibres to transmit large amounts of information between customers and network / service providers. The 'passive' simply describes the fact that optical transmission has no power requirements or active electronic devices once the signal is going through the network. With PONs, signals are carried to their appropriate destination by devices that act like highway interchanges, without the use of any electrical power, eliminating expensive powered equipment between the provider and the customer. PONs offer customers video applications, high-speed Internet access, multimedia and other high-bandwidth capabilities.

Although the technique of PONs has been known for around 20 years as an alternative to twisted pair or coax cable, it is only now, with the need for fast Internet access, that they are looking attractive for mass deployment in, for example, new building developments. Line rates are up to 622Mbit/s in both the upstream direction (customer to network/service provider), and the downstream (network/service provider to customer) direction - over 1000 times faster than a 56kbit/s modem. In addition to speed, another advantage of optical technology is that it is flexible and is expected to require less maintenance than older cable technologies.

Because a PON is independent of bit rates, signal formats and protocols, only the equipment needed for delivering specific services needs to be added at the ends of the network when the time comes to add new services to existing customers or to add new customers. As services can be mixed or upgraded cost-effectively as required, PONs offer scalability - an important consideration for operators who want to expand capacity in line with market demand. Such a degree of flexibility is unmatched in most of today's network architectures.

Draft standard G.983.4 specifies a Dynamic Bandwidth Assignment (DBA) mechanism which improves the efficiency of the PON by dynamically adjusting the bandwidth among the Optical Network Units (ONUs) that are near end users or in homes, for example, in response to bursty traffic requirements. The practical benefits of DBA are twofold. Firstly, network operators can add more customers to the PON due to the more efficient utilisation. Secondly, customers can enjoy enhanced services, such as those requiring bandwidth peaks beyond the traditional fixed allocation. G.983.5 specifies a number of protection options for PONs which will enable enhanced survivability for in the case of FTTCab, and the delivery of highly reliable services in the case of FTTO.

These draft new standards complement G.983.3, which was approved in 2001. The G.983.3 standard adds an additional wavelength band to the downstream direction of a Broadband - Passive Optical Network (B-PON). Until now, only two wavelengths have been specified, one for each direction of transmission. The new wavelength band could, for example, allow separate wavelengths for interactive and broadcast services over an optical distribution network.

This additional wavelength band is transparent and, with optical amplification and further power division in the feeder network, could allow a national, regional or local broadcast TV overlay. The television signals can be broadcast in a number of formats, although the new generation of digital set-top boxes would give best performance and could offer up to 400 TV channels on a single wavelength. Some vendors already have products that support high-speed data and Internet over the fibre access network, and work is now starting in the ITU-T on standards for TV multiplexing and modulation schemes for the

broadcast overlay.

Meanwhile, new global standards for Automatically Switched Optical Networks (ASON) and their control mechanisms have been adopted as a result of a work programme initiated by ITU to support bandwidth-on-demand applications. The standards, which add switching capability to the installed optical fibre infrastructure, were developed and agreed upon in less than a year. The ITU state that this is likely to result in "The 40Gigabit per Second Phone Call".

"The ASON family of standards build on Optical Transport Network (OTN) standards . . . [and] move us towards the Optical Internet" said Peter Wery, Chairman of ITU-T Study Group 15, adding "They can create tremendous business opportunities for network operators and service providers, giving them the means to deliver end-to-end, managed bandwidth services efficiently, expediently and at reduced operational cost". ASON standards can also be implemented to add dynamic capabilities to new optical networks or established SDH networks.

The expected business benefits include:

- Increased revenue generating capabilities through fast turn-up and rapid provisioning, as well as wavelength-on-demand services to increase capacity and flexibility
- Increased return on capital from cost-effective and survivable architectures that help protect current and future network investments from forecast uncertainties
- Reduced operations cost through more accurate inventory and topology information, resource optimisation and automated processes that eliminate manual steps

ASON control mechanisms provide support for both switched wavelength and sub-wavelength connection services in transport networks to provide bandwidth on-demand. Wavelength connection services make use of an entire wavelength of light while sub-wavelength services use a channel within a wavelength.

The ASON control mechanisms also enable fast optical restoration. Traditionally, transport networks have used protection rather than restoration to provide reliability for connections.

With protection, connections are moved to dedicated or shared routes in the event of a failure of a fibre or network equipment. With restoration, the endpoints can 'redial' to re-establish the connection through an alternative route as soon as a loss of the original connection is detected. Restoration is a definite advantage for carriers, because it makes better use of the network capacity. Moreover, with this new standard, it can be performed much faster than with most proprietary restoration systems available today.

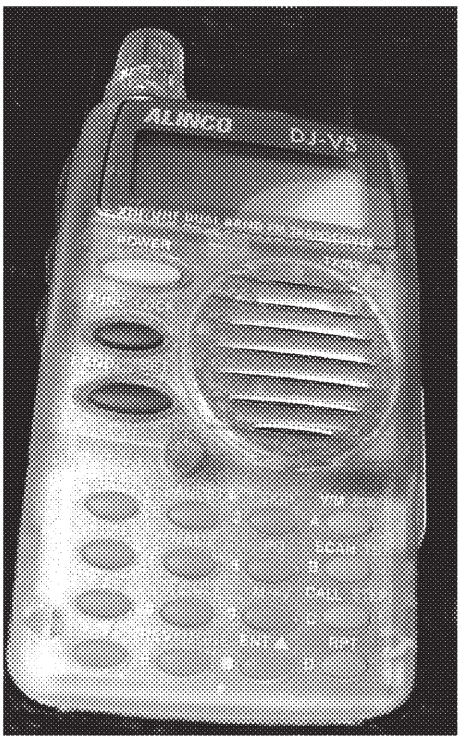
To me, the one thing it seems reasonable to suppose is that there will continue to be progress and new systems, so whilst one system might enjoy supremacy for a while, it is unlikely that it will remain so.

FASHION ACCESSORIES

WITH THE introduction of the Foundation Licence, aimed particularly (but not exclusively) at bringing youngsters into the hobby, it occurred to me that the young might not be particularly impressed with the appearance of some of the commercial amateur radio transceivers that are on the market today.

My reasoning behind this statement is that every kid on the block wants to be seen with the newest and sexiest-looking mobile phone, indeed we see adverts on TV that ridicule mobile phones that aren't the latest model. The young treat phones almost as disposable items, and upgrade frequently, so why wouldn't they expect the same to apply to amateur radio equipment? Why shouldn't amateur radio equipment have:

- clip-on covers, or
- a case that is made from translucent coloured plastic (like parts of many computer cases are now), or
- a completely transparent case, so that you can see clearly what is within?



The Alinco DJ-V5EDS, a non-black box. Should we expect to see more colourful equipment in the future?

It is not uncommon to visit a rally and see an item of equipment that has had, for demonstration purposes, a metal cover removed and a Perspex one installed in its place, but the only commercial amateur radio equipment I have seen built for the fashion conscious is the Alinco DJ-V5EDS (pictured right). 100 of these transceivers were made for the millennium, and when I spoke to Nevada recently they had just one left on the shelf.

When it comes to computer control of equipment, shouldn't we have a choice of appearances (or 'skins', as they are known), like the latest version of Windows® Media Player has?

UNIVERSAL NUMBER

IN THE BEGINNING there was the landline telephone. If you moved to a different exchange area you had to have a new number, but then (in the UK) came 07000 numbers, which you could take with you. Late last year the process was taken a step further, when the ITU allocated a 'country code' for Universal Personal Telecommunications Numbers (UPTN).

The code allocated is 878 plus a 12 digit 'Global Subscriber Number' (the first two of which are 10), so now, according to the ITU, there is "global number portability regardless of geography or telecommunications carrier". In practical terms it means that it is possible to have one number that can make a phone ring anywhere in the world, be it on an IP-based mobile network or a fixed line. The service is being provided by VISIONng, a non-profit making organisation whose goal is to promote an open and harmonized architecture for IP based applications.

So who is going to want a UPTN? In fact it is more likely to be companies than individuals, because it will give them the opportunity to advertise one number globally, with the promise that incoming calls can be routed to different destinations, allowing them to be directed to the most appropriate location.

In the event that you want a UPTN, VISIONng has already begun to work on the development of the new database and will allocate numbers on a first-come, first-served basis on a commercial basis, so get in there!

Whatever Next? A global 'Freephone' number, country code 800? It's a code that doesn't seem to be in use - I checked. ♦

WWW.

Cat 5, 5e, 6 and 7 cabling:
www.siemon.com/white_papers/99-12-17-demystifying.asp
Automatically Switched Optical Networks:
www.itu.int/newsroom/press_releases/2001/29.html
40Gigabit per Second Phone Call:
www.itu.int/newsroom/press_releases/2001/27.html

technical feedback

A Practical Approach to Operating AO-40 (*RadCom* Nov 2001, p22ff)

Consequent upon the success of this article, Howard Long, G6LVB, has put many frequently-asked questions (FAQs) and their answers on a website. Interested readers are asked to consult www.g6lvb.com/radcomclarifications.htm

A Simple, Rugged Power Supply (*RadCom* Oct 2001, p34ff)

This article has generated much interest and correspondence, some critical, some supportive. In the latter category is a letter from **ZL1DD**, who writes: "The OZ1XB power supply is excellent. A similar design has been in use here for over 20 years, with no problems, [but] builders should be advised to put a simple Zener / thyristor crowbar across the output in case the pass transistors fail high, and to use a circuit-breaker instead of F1.

"... There can be advantages in using several lower-rated pass transistors (eg 8 x 2N3055), as the individual leads to the devices can be made from ordinary stout hookup wire, the balancing resistors can be 2W rating and the heat is spread over a larger area of sink, of which you cannot have too much!"

We also thank, among others, G8RPI and RS37390 for their comments, some of which are covered in this comprehensive letter we received from Tony Plant, **G3NXC**. He writes:

"It is implied in the subtitle of this article that the design is capable of providing 25A at 13.8V. The actual performance achieved, however, will fall significantly short of this claim if the specified components are used. More importantly, there are concerns about a lack of information in the article on such essential matters as safety and EMC protection.

"Any equipment built into a metal case and supplied from the AC mains *must* be earthed. A hard connection between any metalwork that can be touched when the equipment is in use and the mains earth is absolutely essential. If the author's suggestion to split the supply between two separate cases is adopted, *both* cases need to be earthed.

"A fuse in the primary circuit of the transformer is an essential requirement for power supplies. Apart from protecting against faults in the wiring of the supply to the transformer, the fuse also provides protection against other eventualities such as shorted turns in the transformer and the reservoir capacitor (C1 in Fig 1 of the article), becoming short-circuit. For a power supply of this category, a 3A slow-blow fuse would be appropriate.

"However, the design of the soft-start circuit in the article is such that the fuse is rendered ineffective for many of the possible failure modes. Any faults causing the 24V supply to be reduced significantly will result in the soft-start relay, RL1, being de-energised. The primary current will then be limited by R1; with a value of 68Ω, this would mean a limit of about 3.3A. Instead of blowing the primary fuse, the result of a failure would be that R1 dissipates some 780W - followed rapidly by the rather spectacular failure of this component, and probably several others in the vicinity.

"One solution is to divorce the soft-start function from the 24V output. A possible arrangement is shown in **Fig 1**. The operation of the circuit is quite straightforward and gives a delay of 0.5 - 1 second. The fuse, F2, can be a 3A slow-blow device as mentioned previously.

"As shown in the diagram, a double-pole switch should be included in the input. The neon indicator provides an indication that the unit is 'live', even when F2 has blown.

"No EMC protection is shown in the article, but is very necessary in practice. The simplest way of protecting the input is to feed in the mains via an appropriately-rated filtered IEC socket. For the output, three or four ferrite beads should be slipped over each lead (including the sense leads) close to the output terminals and 100nF 50V disc ceramic capacitors connected from before and after the ferrite beads to the case.

"When using a bridge rectifier followed by a reservoir capacitor, as in the published design, it should be noted that the RMS current being supplied by the transformer is significantly higher than the DC load current. The usual 'rule of thumb' is that the RMS AC current is 1.65 times the DC load current. In practice, though, the relationship is not linear and the factor can be somewhat higher. Commercial transformers are usually designed to run close to the limit, so it is unwise to use them continuously above their ratings. A *very* short duration increase to twice the maximum ratings should be tolerable.

"A continuous DC output current of 7A or so is all that can be provided without exceeding the transformer's specified 250VA rating, although a short duration peak of 17A is possible. If higher currents are required, the answer is not to go for a transformer having a higher voltage output and the same 250VA rating, but for one with a higher volt-ampere rating. Taking the suggestion in the article of a transformer with a 20V output and a 250VA rating, the continuous load current limit would fall to 6A with a short term peak of 14.5A.

"The minimum transformer rating to provide an 18V AC output together with a 25A peak DC load is 400VA. This would allow a continuous load current of 11A with the peak of 25A.

"When choosing a suitable capacitor for C1, four parameters need to be considered, these being the capacitance, the voltage rating, the ripple current rating and the effective series resistance (ESR). First, it needs to be said that 33,000µF, as specified, is not really sufficient. The ripple voltage will be about 1.25V peak-to-peak at the continuous rating of 7A and 2.9V at the peak rating of 17A. Under worst case conditions, it is possible that the DC voltage across the capacitor will rise above 25V when there is no load on the supply, thus exceeding the rating of the device. A 68,000µF 40V capacitor should be regarded as being the minimum. The capacitor should be at least 120,000µF with the same 40V rating when using a 400VA transformer.

"The ripple current flowing through the reservoir capacitor will be around 9A when using the 250VA transformer at the continuous load of 7A. At the peak load of 17A the ripple current rises to 23A. The ripple current will be about 15A at the continuous DC rating of 11A and 33A at a 25A load if a 400VA transformer is used. It would be sensible to choose a capacitor with a rating somewhere between the minimum and maximum values. It may be necessary to put two or more capacitors in parallel to achieve the required rating.

"Capacitors with a low ESR should be used. A figure of 15mΩ or lower should be satisfactory.

"When wiring the rectifier/capacitor circuit it should be noted that there are some very high peak currents flowing - 80A peaks are likely. The leads between the transformer and bridge, and between the bridge and the reservoir capacitor should be as short as possible and the DC output taken from directly across the capacitor. This arrangement avoids the possibility of the AC and DC currents flowing in the same wires." ♦

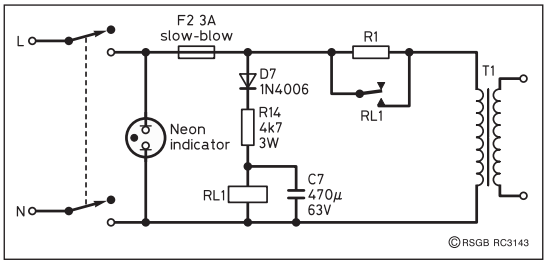


Fig 1: The mains input and soft-start circuit suggested by G3NXC. RL1 has a 24V 1200Ω coil (Maplin QC90X).

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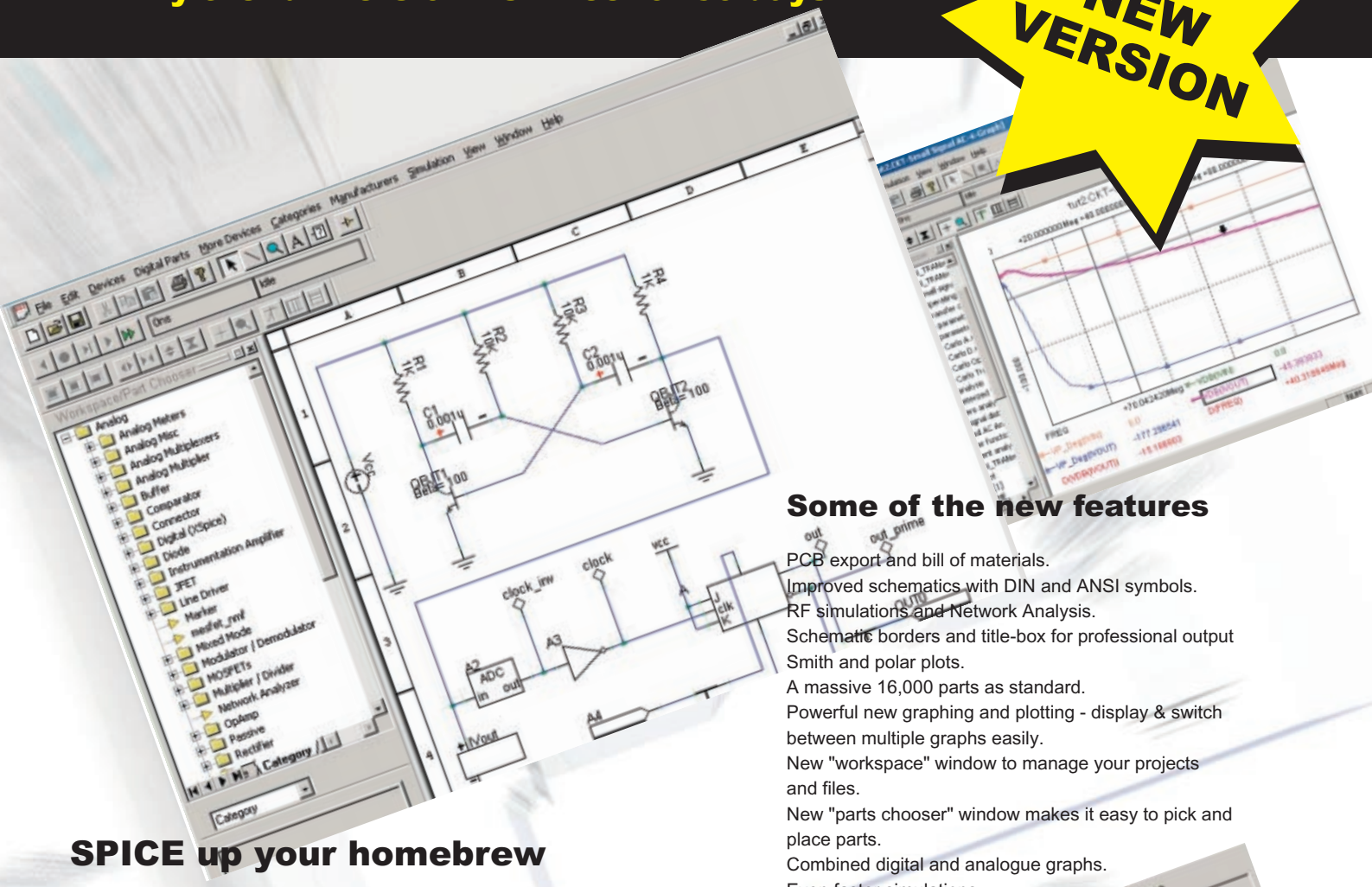

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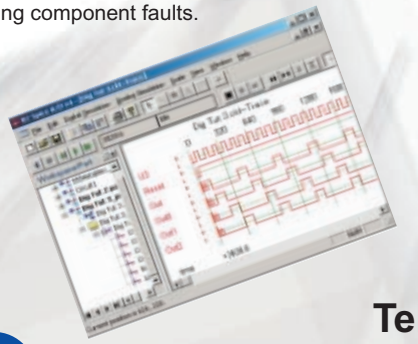

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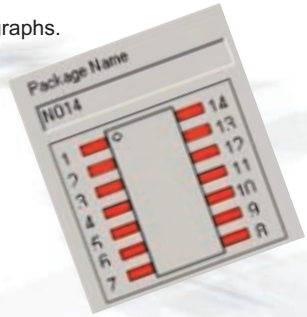

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The 'Miracle Whip' Antenna

Reviewed by Chris Lorek, G4HCL *

AS SOMEONE WHO regularly operates from temporary accommodation on business, often from hotel rooms and the like, I appreciate keeping in touch via amateur radio. I fondly remember putting out the first CQ from my hotel room in Kigali, Rwanda on 20m as 9X/G4HCL. After an initial chat with a semi-local in Tanzania, one of my friends from Hampshire called me immediately after we'd finished. We had a lovely long chat, obviously much to the frustration of what seemed to be thousands of other amateurs who were waiting to get a call in. After we'd signed, my rig's speaker almost exploded with a cacophony of calls!

From this, you'll probably gather I'm not primarily a DXpedition-type of amateur, instead just someone who enjoys operation away from home, for pleasure rather than for giving out points or rare squares. I'm sure there are plenty like me, who like to take along an easily-portable rig and an equally portable antenna system. This usually means a self-powered QRP (low power) transceiver and a simple antenna, usually a 'throw it out of the window' HF wire type or, for VHF/UHF operation, a set-top whip or window-mounted dipole. Rigs like the superb little FT-817 from Yaesu (Vertex Standard) are absolutely great in packing all-mode all-band operation into a tiny package.

Matching the FT-817 very nicely, the 'Miracle Whip' has been designed to fulfil the need for an easily-transportable all-band HF (and indeed VHF and UHF) self-contained antenna system, for portable 'go anywhere' operation. Although intended as an ideal accessory for the Yaesu FT-817, it will indeed work with any QRP (5W or less) amateur-band transceiver. Physically, it has a 1.2m long telescopic whip on a hinged base, which retracts to a handy carrying size, mounted on a base matching box with a PL259 plug which allows direct connection to the transceiver's SO239 antenna socket. With it plugged in and the whip retracted and folded over for carrying, it nicely fits within the overall 'footprint' of the already tiny FT-817.

IN THE BEGINNING...

THE 'MIRACLE WHIP' started life with its designer Robert Victor, VA2ERY, who needed a portable antenna to go with his FT-817. He says: "Here was this wonderful little radio that could do so much, in such a great little package, but there wasn't a single antenna on the market that would allow me to take it, plonk it down in the backyard, and use it. I wanted an antenna that really suited the portability and flexibility of the rig - and there were none. So I decided to build one." Robert even shared his design with other amateurs, by writing a construction project which was published in the July 2001 issue of the ARRL *QST* magazine.

All this ended with Robert saying that he intended to produce a high-quality commercial version of the whip, and this certainly became a reality. The 'Miracle Whip' is made in Montreal, Canada, in small and carefully-controlled production runs using professional-grade techniques and components (rather than the 'junk box' type construction we amateurs would typically use!). As you'd expect, there's a lot of 'hand-craftsmanship' involved; it's not a mass-produced piece of kit, and it's something that came from a proven need by amateurs. Just in case you fancy making one yourself, the manufacturers kindly supplied me with a 'snapshot' of all the parts used - enough to put most people off!

The 'Miracle Whip' matching box. Its size can be judged from the PL259 plug.

VSWR RESULTS

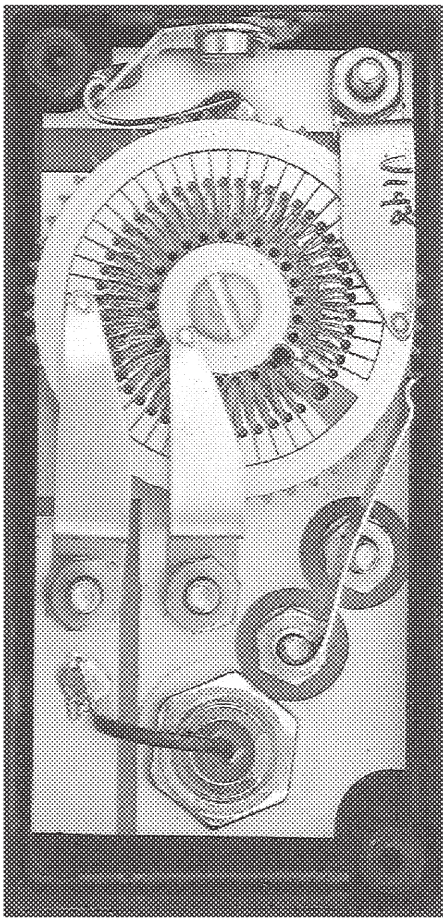
APART FROM EXTENDING the whip element itself there's only one tuning control, which is the click-step rotary knob on the black plastic base. On HF, you rotate this initially for the best-received signal strength, then fine tune it a click or two back and forth for best VSWR match. For listening only, the latter isn't necessary of course, but most HF transceivers have automatic protection built in to reduce the transmit output power with a VSWR of 3:1 or greater, so a good match is important.

The FT-817 has the useful facility to give a VSWR reading on transmit on its display as an alternative to the relative transmit power, and in practice I used this for fine adjustment. The 'Miracle Whip' manufacturers claim that a typical VSWR is 1.5:1 or better is achievable, although they add that operation below 5MHz is optimised for best signal rather than minimum VSWR. **Table 1** shows the actual resonant 'steps' that I obtained using an RF network analyser for test purposes, and graphs of the VSWR at 80, 40, 20, 12 and 2m are shown in **Fig 1(a)** to **(e)**. Note that the discrepancies between the values measured in Table 1 and Fig 1(a), for example, are due to changes in surroundings at the time of the measurements. Above around 21MHz, multiple resonances occurred, as Fig 1(d) shows. This shows a 1.5:1 VSWR at exactly 21.0MHz and a 3.2:1 VSWR at 24.9MHz. Some degree of experimentation is often needed for on-air use. The VSWR plots show increasing VSWR on the vertical scale, 1:1 being at the bottom, the next line being 2:1, the next 3:1 and so on. The horizontal frequency range is shown at the bottom of each plot, eg start at 20MHz and stop at 30MHz on the 12m plot (1MHz per division). Other plots have a 2MHz span, giving 200kHz per division.

VHF

YOU CAN ALSO USE the whip on VHF and even UHF frequencies, by setting the adjustment knob to the 'VHF' position. This effectively gives a direct connection

* *PO Box 400, Eastleigh, Hants SO53 4ZF. E-mail: g4hcl@rsgb.org.uk*



The rear of the unit, showing the clever method of achieving tapping points on the coil.

between the PL259 centre pin and the uppermost tap on the autotransformer, the coil itself then simply acting as an RF choke and the antenna working as a resonant whip. This can be, say, a ¼-wave at 2m with the whip reduced in length accordingly, again for the best VSWR. I found this length also worked well as a ¾-wave at 70cm. On 6m the whip is just a fraction short of a full-length ¼-wave, but I managed to get a good VSWR with it extended to its full length.

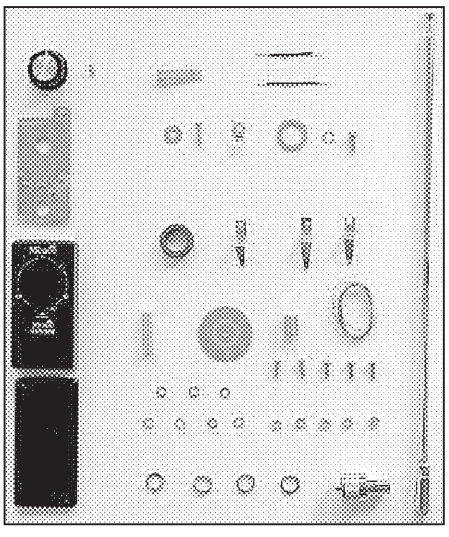
INSIDE

THE WAY IN WHICH the antenna operates is by the use of a switched RF autotransformer, ie a transformer having one winding with a tap along it to provide a voltage and impedance step-up or step-down. The 'Miracle Whip' uses several taps to provide coverage across a wide frequency range, with the entire winding acting as the secondary and with selectable taps along this acting as variable-length primaries. This, in effect, gives an impedance step-up, to match the relatively short (in wavelength terms) whip on HF to the 50Ω impedance required by the transceiver. A specially-made rotary switch is used to select the tapping point along the toroidal coil, and the accompanying photo shows the switching arrangement. As the internal RF currents can be fairly high, even with an input power of just a few watts, gold-plated connections are used inside the case to provide good RF continuity. Although the toroid is lossy at RF to some degree, at QRP power levels the core is not saturated; be warned and don't try to use it with your 100W HF rig!

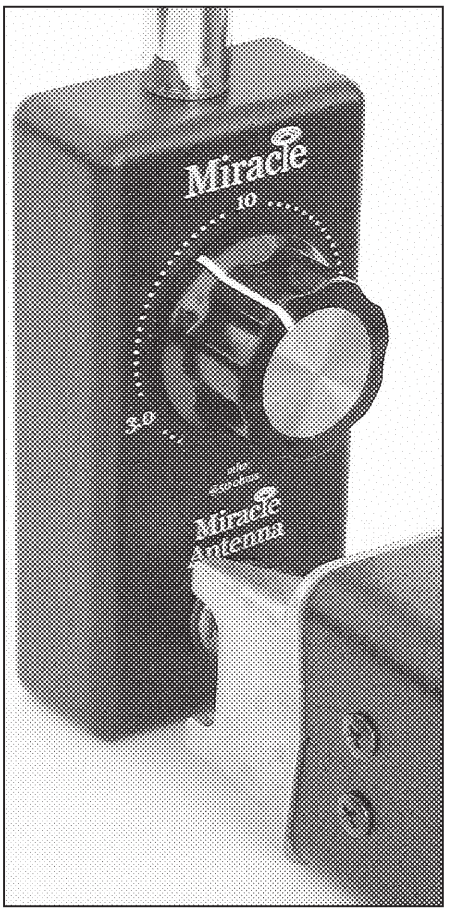
ON THE AIR

I WAS FORTUNATE in being able to use the 'Miracle Whip' with a Yaesu FT-817 in a wide variety of locations. I was more than tempted to take the pair with me to my next destination, Libya, but my thoughts of reality quickly intervened. So I settled on UK use as well as a quick trip to France, operating outdoors in locations ranging from gardens to hilltops (I did get rather cold during the wintertime review spell, but the equipment worked well), from alternative indoor locations, and while travelling around as a passenger. I even managed around 500 miles of 'train mobile' listening operation using personal earphones from a seat next to the window - I'm sure the other passengers thought I was possibly a foreign spy. Many years ago, because of this suspicion, an elderly lady *did* attack me with her umbrella in a train compartment, but that's another story!

I won't bore you with boasts of stations and countries worked. If you're either a realist, or an experienced amateur, or both, you'll acknowledge that a relatively-short telescopic whip with a QRP rig won't match the performance of a tower-mounted beam and full legal power. But the 'Miracle Whip' did perform about on a par with, say, a base-loaded mobile whip on the HF bands. In terms of distances and contacts, often with a little persistence due to the 2.5W power level available from the FT-817 on battery power, and operating tactics like 'searching and pouncing' on a first CQ rather than trying



The 'Miracle Whip' - in pieces!



The 'Miracle Whip' mated with the FT-817.

in vain to break through a pileup, the world was worked. The performance on 80m wasn't fantastic. For example, my small 80m 'G-Whip' worked rather better but, to be fair, the 'G-Whip' also outperformed a significantly more physically substantial 'Outbacker' multi-band antenna on my car on 80m. The 'Miracle Whip' did work very well indeed on bands such as 40m, 20m and 15m, again, with results I'd reasonably expect from, say, a base-loaded mobile whip of the same length. The difference is that there's no need for a 'car counterpoise' to be attached to the antenna!

Talking of counterpoises, the 'Miracle Whip', by its design, is effectively a free space antenna on HF and doesn't need a ground plane to operate. I found this to be true; the only improvement I usually got was physically moving the rig/antenna combination to a better spot, especially outdoors when operating from inside such Faraday Cage approximations as a metal-framed car or train carriage. But on 10m, 6m and, to a lesser extent, 2m, placing the rig directly on a ground plane, eg my car roof, helped my signal get out a little better. So I connected a length of around 3m of plastic-coated stranded wire to a crocodile clip and used this, clipped to the metal rear panel of the transceiver, as a handy portable counterpoise.

For VHF and UHF, the FT-817 comes

Switch position	Frequency (MHz)	VSWR
1	3.80	6.9
2	3.78	5.5
3	3.85	3.8
4 (3.0')	3.85	3.4
5	3.92	3.4
6	4.31	3.6
7	4.62	3.5
8	4.77	3.2
9	4.87	3.2
10	5.10	3.3
11	5.34	3.2
12	5.60	2.9
13	5.79	2.5
14	6.09	2.2
15	6.36	1.7
16	6.65	1.5
17	7.09	1.2
18	7.51	1.8
19	7.91	2.4
20	8.33	2.9
21	8.80	2.9
22 (10')	9.31	2.5
23	9.87	1.9
24	10.20	2.1
25	10.97	2.0
26	11.39	1.6
27	12.35	1.8
28	12.89	2.0
29	14.12	2.3
30	14.75	2.0
31	16.31	2.0
32	17.08	1.8
33	18.78	1.3
34	19.56	1.3
35	20.29	1.2
36	20.73	1.1
37	21.04	1.3
38 ('30')	21.26 *	1.7
39	21.36 *	2.0
40	21.46 *	2.4
41	21.53 *	2.8
42	21.57 *	3.0
43	21.60 *	3.3
44	21.60 *	3.7
45 ('VHF')	21.65 *	3.5

Table 1: Resonant frequencies for the switch positions. * multiple resonances found; fundamental resonance shown (see text).

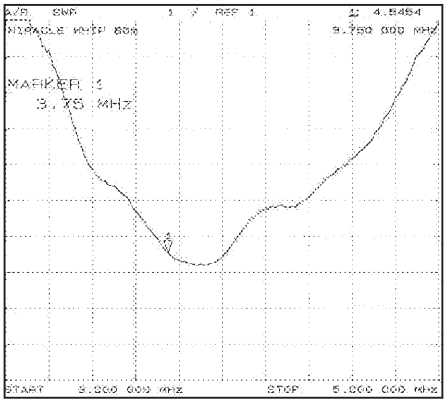
supplied with helical whips for connection to the front BNC antenna socket. I found these worked fine on 2m and 70cm. The 'Miracle Whip' was naturally significantly better on 6m and a little better on 2m, due to the overall-longer antenna element. An excellent tropospheric opening one evening on 2m brought in plenty of DX with the system while I was away in Lancashire for a few days. I was pleased I didn't miss out on this, thanks to the sheer portability of the FT-817 / 'Miracle Whip' combination, which lent itself to being slipped into my overnight bag very easily.

CONCLUSIONS

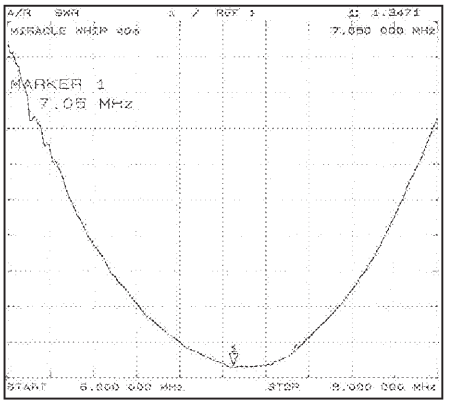
WITH THE FT-817 and similar rigs in mind, I would describe the 'Miracle Whip' as possibly one of the very best accessories you could get for a portable QRP transceiver. It's easy to use, it works well; it's not really a miracle, but it's certainly an innovative development.

ACKNOWLEDGEMENTS

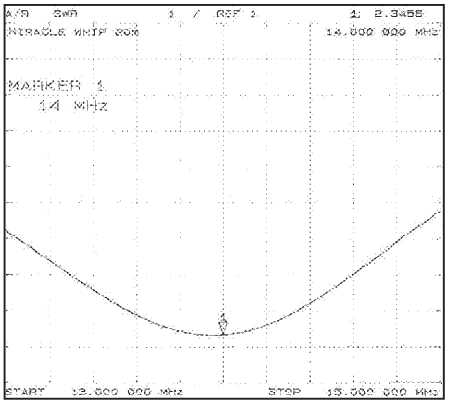
THE 'MIRACLE WHIP' is currently priced at £129.95, and is available in the UK from Martin Lynch &Sons (tel: 020 8566 1120), to whom my thanks go for the loan of the whip for review. My grateful thanks also go to Yaesu UK for its kind loan of an FT-817 and Nicad pack; these are available from all authorised UK Yaesu dealers. I had great fun with the pair! ♦



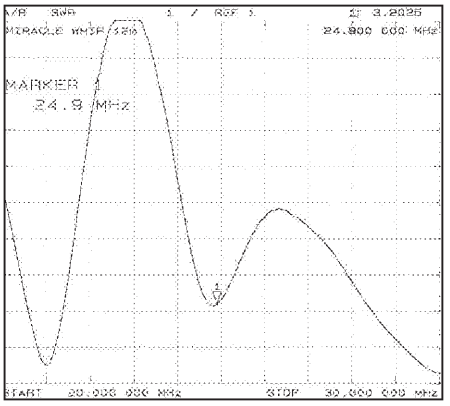
(a) 80m



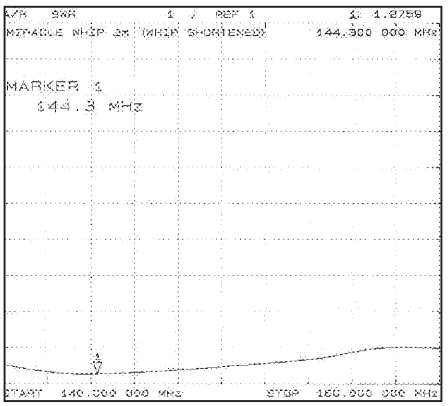
(b) 40m



(c) 20m



(d) 12m



(e) 2m

Fig 1: VSWR plots from a network analyser, over a selection of amateur bands from 80m to 2m. VSWR is plotted along the y-axis, starting at 1:1, the next line being 2:1, then 3:1, and so on. (a) 80m, at 200kHz per horizontal division; (b) 40m, at 200kHz per horizontal division; (c) 20m, at 200kHz per horizontal division; (d) 12m, at 1MHz per horizontal division, showing one instance of multiple resonance, (see text); (e) 2m, at 2MHz per horizontal division.

Newcomers' News

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

TO THE OUTSIDE world, 'ham radio' is a single hobby or pastime, but one of the things that never ceases to amaze me is how many different hobbies amateur radio actually is. This is reflected in the numbers of special interest groups that radio amateurs form to promote their particular interests.

For some reason I seem to have been 'targeted' over the last couple of months by several of these groups who have sent me copies of their newsletters or journals. I thought it might be useful to outline some of them for newcomers who may be unaware of groups with similar specialist interests to their own.

SCOUT RADIO

REGULAR READERS will know how this newsletter is about to disappear in its current paper format. No further subscriptions are being accepted, but the newsletter will continue to be sent to existing subscribers and will be produced for all via the Internet [1].

The newsletter is intended to cover amateur radio activities within the Scouting movement. The latest edition includes information on the 44th Jamboree on the Air (JOTA), the 'new' operating mode - PSK31, tricks with coax - how to make effective filters for multi-operator stations, Morse code and a report from the Scout Fellowship's 25th anniversary station, GB25SF.

Malcolm Bell, G4CXT, is the editor and he is always keen to receive material at 3 Heather Close, Martlesham Heath, Ipswich IP5 3UE, or via e-mail to editor@radio-scouting.org.uk

KEY NOTE

THE MENTION of Morse code in Scout Radio leads nicely on to the next specialist group, the FISTS club, which is dedicated to the preservation and promotion of Morse code.

Key Note is its newsletter and it is available through an annual membership fee of £5 for UK members, slightly more for those in other countries.

I was passed the latest edition by local amateur Brian Davis, 2E0BGD, who is a very keen Morse (CW) operator. The newsletter covers the sad events of 11 September last year, the history of Morse code, CW operating times, frequencies and contests. There is also a piece on avoiding computer virus attacks, something I have been plagued with of late.

If CW is your main interest this is the newsletter for you! Details can be obtained from George Longen, G3ZQS, at 119 Coventry Road, Darwen BB3 2LZ, or via the web [2].

MICROWAVES

THE *MICROWAVE Newsletter* is actually published by the RSGB. Edited by Peter Day, G3PHO, and Dr Chambers, G8AGN, it describes itself as 'an amateur radio publication for the microwave enthusiast'.

Topics covered in the latest edition include such diverse matters as 47GHz problems, 23cm Scottish beacon news, AO-40 24GHz news, a 57GHz rain scatter detector and sulphation of lead acid batteries. There is also news of Brian Coleman, G4NNS, from Andover who made his first moonbounce contacts on the 10GHz band in October last year working PA3CSG and W5LUA with just 9 watts.

I have to confess that I have never ventured on to the microwave bands but I found this newsletter quite fascinating. Subscriptions are available from RSGB headquarters, Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE.

RAF NEWS

QRV IS THE JOURNAL of the Royal Air Force Amateur Radio Society (RAFARS) whose aim is to promote and foster amateur radio activities within the RAF. The society also seeks to maintain links with retired servicemen and those with a close association with the RAF.

The autumn 2001 edition runs to over 60 pages with articles on ground controlled approach, controlled descent through cloud, some thoughts on small antennas and one or two personal recollections of RAF radio days gone by. The text is broken up with some very clear photographs and diagrams. Those who produce the journal are to be congratulated on the quality.

Requests for details of RAFARS membership should be addressed to RAFARS Headquarters, RAF Cosford, Wolverhampton WV7 3EX. Any readers with suitable material for *QRV* should send it to Eric Palmer, G3FVC, at 1 Highbank, Watchet TA23 0DG.

AERIAL ANTICS

ABOUT THIS TIME of year you will find several Novice classes putting up aerials and looking to exchange greetings messages under the watchful eyes of their instructors. If you are licensed and hear our plaintiff CQ calls please answer and bring us in from the cold!

Gary, M1FGS (crouching), supervising a Novice field trip with Fred, Carl and Dick from the Radio Society of Harrow (see 'Aerial Antics').

CORRECTIONS

DESPITE ALL attempts to keep things straight, spell checkers are not the 'be all and end all', especially when it comes to names and addresses. I have been taken to task for a couple of tryping errors or spilling mistrakes, so may I take this opportunity to apologise to those concerned and to provide corrected details.

First came a note from Terry Barclay, G0TBD, who kindly offered to get newcomers going by arranging scheduled Morse code contacts (skeds) in the December column. Terry's e-mail address should have read: Stahlhammer@btinternet.com

Also in the December column I gave Howard Jones, one of the Novice tutors at the Finningley ARS, a new callsign. He is, of course G3SFO and always has been.

PC BLUES

HAVING SUFFERED two catastrophic computer failures in as many weeks I must apologise to any reader who e-mailed me during November. All was lost (twice) but hopefully, by the time you are reading this, Santa will have delivered a nice new flying machine and normal service will have been resumed.

Please keep your news and views coming in and if you belong to a specialist group not mentioned above why not let the newcomers know about it by sending me the details? ♦

WWW.

[1] Radio Scouting
www.radio-scouting.org.uk
[2] FISTS club
www.asel.demon.co.uk/fists-hq/

* *5 Sydenham Buildings, Lower Bristol Road, Bath BA2 3BS; E-mail: newcomers.radcom@rsgb.org.uk*

QSLing Hints and Kinks

. . . or , all you wanted to know about QSLing direct but were afraid to ask.

Part 1. by Phil Whitchurch, G3SWH *

ALMOST AS SOON as the licence drops through the door, the newly-qualified amateur must decide whether or not to start collecting QSL cards. Their principal use is in support of claims for awards of operating achievement. But even if you don't chase awards, many operators still like to have a QSL card from an exotic place merely to decorate their shacks, to record a particularly memorable QSO, or just to impress their friends. Many amateurs decide *not* to collect cards, either on grounds of cost or simply because of a lack of interest. Once started, it's an easy matter to stop collecting, but less easy to start at some time in the future.

There has been, and continues to be, much discussion about the need to exchange QSL cards in these days of e-mail and the Internet. These arguments continue to rage, but as long as the major operating awards, such as DXCC and IOTA, require you to submit cards with your applications, QSL cards in one form or another will be with us.

By far the largest numbers of cards are exchanged via the QSL bureau of the various national societies, such as the RSGB, ARRL, REF etc. Such arrangements work well between the countries of the developed world. RSGB members are extremely fortunate in that the cost of running the QSL bureau is met from members' subscriptions, and no other charges are made. In the six months ending 31 December 2000 the unaudited accounts showed the running costs of the bureau at £14,507. Other national societies make a supplementary charge for the use of their QSL bureau, based on the weight and number of cards sent by each member, eg ARRL make a charge of $4 per half pound, which I calculate at about 75 cards. This is in addition to the annual membership fee.

A QSL manager's work is never done! This is Phil, G3SWH, taking delivery of the blank cards for the 9M0C DXpedition, for which he is QSL manager.

However, it is an unfortunate fact of life that many DX stations are in third world countries and probably do not have access to a QSL bureau, or do not want to be bothered with writing out piles of cards. In such cases, and in recognition of the wish of other amateurs to have written confirmation of their contact, they may appoint a QSL manager, usually in a country with a reliable and secure mail service.

Severe criticism has been quite rightly levelled at the bad practice of a very small proportion of DX stations and QSL managers who are just plain greedy. These people sometimes demand funds vastly in excess of return postage, decline to use the bureau system, refuse to deal with multiple callsign QSL requests, or just simply fail to respond. They pose a moral problem to the active DXer and the 'powers that be' can complain as much as they like, but the only way to get a card from one of these guys is to play by his rules! Apart from working another station in the same DXCC entity or IOTA island group (and this option may not exist), about the only practical thing that can be done is for the 'bad boys' callsigns to be publicised as widely as possible in the hope that we don't waste our cards and money on a lost cause.

THE ETHICS OF QSL MANAGEMENT

THE FOLLOWING 'Ethics for QSL Management' were adopted by the IARU Region 2 Conference in Curaçao in 1992 and are based on a proposal by the Radio Society of Great Britain to the IARU Region 1 Conference in 1990:

1) Any DX station appointing a QSL manager must ensure that satisfactory arrangements are in place for receiving and responding to incoming bureau and direct cards.

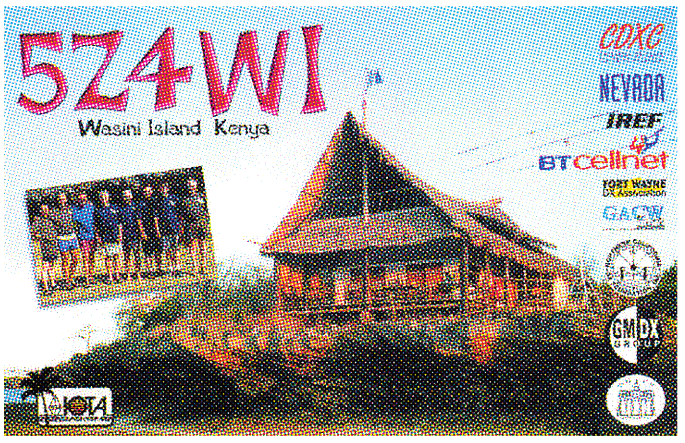
2) QSL managers must respond to incoming SWL cards.

3) Any DX station appointing a QSL manager must accept responsibility for that manager's performance.

4) QSL managers must respond 'direct' and within a reasonable period of time, as long as sufficient funds / IRCs / stamps to cover the exact cost of return postage (and a return envelope, if one isn't supplied) are enclosed with the request. Airmail must be used if sufficient funds / IRCs / stamps are enclosed.

5) QSL managers must not insist on separate envelopes / applications for different QSOs or different stations. They must establish internal procedures to handle such multiple requests.

6) Recognising that mistakes of time and / or date are frequently



Phil, G3SWH, was also QSL manager for the 5Z4WI Wasini Island DXpedition, on which he was also one of the operators, along with Jim, G3RTE; David, G3UNA; Rob, 5Z4RL; Ian, 5Z4IC; and Graham, 5Z4GS.

* 21 Dickensons Grove, Congresbury, Bristol BS49 5HQ; e-mail: Phil@g3swh.demon.co.uk

made, QSL managers must make a reasonably diligent search for QSOs that can't immediately be found in the log.

7) It is unacceptable to demand a specific number of IRCs or 'green stamps' (US dollar bills) if a smaller number would cover the costs mentioned in Point 4.

8) It is unacceptable to return cards via the bureau if the cards are received direct with sufficient funds / IRCs / stamps as defined in Point 4.

9) There should be no time limit for applying for QSL cards. Old logbooks should be passed to responsible DX clubs when the manager no longer wishes to retain them.

It is important to understand the difference between a resident amateur in a DX location and a DXpedition to a (possibly) uninhabited island or DXCC entity.

The resident amateur and / or his manager are not usually interested other than in meeting the cost of printing his QSL cards and paying for the outgoing postage etc. For this reason, it is reasonable to expect you to include a few extra pennies (maybe in the form of an extra IRC) over and above the actual cost of the return postage.

A DXpedition specifically to activate a much-wanted DX location is another matter altogether and will cost a substantial amount of money to organise and execute. Usually, the organisers will seek commercial sponsorship in the form of equipment, such as from Yaesu and cash sponsorship from the various amateur radio organisations, such as NCDXF, CDXC, EuDXF etc. This sponsorship will never fully meet the cost of the expedition, and any shortfall will have to be met by the expedition members themselves or generated from the cash surplus from the QSLing process. No self-respecting DXpedition will want to be accused of charging for its QSL cards, but it is reasonable to expect you to include a donation (maybe a few extra US dollars) over and above the actual cost of the return postage. The more QSOs you make, the larger should be the contribution. It is one of the primary and unashamed tasks of an expedition QSL manager to maximise the income whilst at the same time satisfying the reasonable demands of the 'Deserving'.

THE IRC

ONE OF THE most convenient ways to obtain your much-wanted card, particularly from a foreign station or his QSL manager, is by the use of International Reply Coupons (IRCs). Unfortunately, much myth and misinformation surrounds what is and is not a 'correctly' stamped and valid IRC, which is often compounded by different countries' postal administrations interpretation of the rules, so the purpose of this article is to set the record straight.

An IRC is a device by which a person in one member country of the Universal Postal Union (UPU) can prepay the return airmail postage cost of a letter of a specific maximum weight from a different UPU member country. At the time of writing, and in theory at least, IRCs are exchangeable in *all* countries with the exception of Taiwan. UPU member countries *may* decide not to *sell* IRCs, but their exchange is *compulsory* in all countries.

There are three types of IRC in wide circulation. There are two versions of the type C22 and the more modern type CN01 (old C22). The front text of all versions is printed entirely in French, but there is a translated version in English as well as Arabic, Chinese, German, Russian and Spanish on the reverse (**Fig 1**). The earlier version of the C22 (**Fig 2**), which was available for sale until

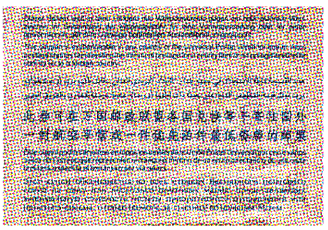


Fig 1: Reverse of the IRC, with text in German, English, Arabic, Chinese, Spanish and Russian.

Fig 2: The earlier version of the 'C22' type of IRC.

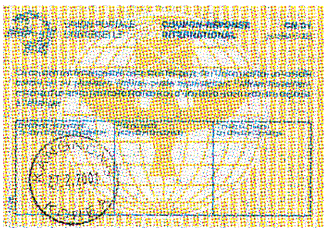


Fig 3: The more modern 'CN01' IRC, which has replaced the word 'surface' with 'air'.

Fig 4: The new 'C22' also uses the word 'air'.

the early 1990s (and which is still in circulation today) says that *"This coupon is exchangeable in any country of the Universal Postal Union for one or more postage stamps representing the minimum postage for an unregistered letter sent by surface to a foreign country."* The more modern CN01 (**Fig 3**) and the C22 (**Fig 4**) both say exactly the same, except that the word *"surface"* has been replaced by *"air"*.

THE NEW IRC

THE FAMILIAR CN01 style remained on sale until 31 December 2001. On 1 January 2002, a completely new style of IRC was introduced - also known as the CN01. This new type of IRC is larger than those previously in circulation and will remain valid until 31 December 2006. The name of the country of origin will be printed on these coupons as a matter of course. Also printed on them, amongst other things, will be a standardised UPU bar code containing the ISO code of the country and the date of printing. Each country's postal administration will have the option of printing the selling price on the coupon itself.

There is, at present, no theoretical limit to the period of exchange for IRCs, although Postal Officers can, not unreasonably, satisfy themselves as to their genuineness, particularly in respect of the older versions. In my own experience and if properly stamped, either type is generally accepted without question in exchange for the current minimum

Fig 5: Some IRCs have the name of the country of origin pre-printed in red in the left-hand box.

airmail postage. This may change in the light of the new style of CN01.

IRCs can be bought 'new', over the counter of larger post offices. at a current cost of 60p each and may be hand stamped in the *left* hand box by the issuing office. This box is marked *"Empreinte de contrôle du pays d'origine (facultative)"*. This means: *"Control stamp of the country of origin (optional)"*. Some IRCs have the name of the country of origin pre-printed in red in the left-hand box (**Fig 5**).

Even with this pre-printed information, there can be a hand stamp from the issuing office over this writing. Contrary to popular opinion, the hand stamping by the issuing office or the over printing by the country of origin is merely *optional*, and the lack of this detail does not invalidate the IRC. Ideally, and where used, the hand stamp should include the date of issue, but this is not essential. For some unknown reason, IRCs issued in France do not always bear the date of issue, merely the name of the issuing office (**Fig 6**).

Next month, in the second and final part of 'QSLing - Hints and Kinks', Phil Whitchurch, G3SWH, looks at more types of IRCs, then discusses alternatives to their use. He also discusses when you should QSL direct and when the bureau system is more appropriate. ♦

Fig 6: IRCs issued in France bear the name of the issuing office, but not always bear the date of issue.

Down To Earth

'Seeing' is Believing

Using Digipan DSP Software to 'Look' at CW Filters, by Steve Seabrook, MOECS*

MANY MODERN rigs boast sophisticated DSP (Digital Signal Processing) features and the option of additional filters to improve clarity of received signals. Evaluating the performance of those features is difficult and getting the best practical value is largely a process of trial and error. This article describes an interesting CW operating problem and a solution from an unlikely source: data mode software.

I was still working away at reaching that elusive 12WPM standard for the RSGB Morse code test [now 5WPM - *Ed*] before I graduated to my Full A licence. Following the advice of my CW mentor, Tony, G0PEH, I regularly listened to CW on the HF bands to aid my receiving practice. Using an Icom IC-706, I found the radio's bandwidth too wide to pick out the signals I wanted to hear. A 500Hz narrow filter seemed to offer a good solution. However, getting good results in practice seemed to be very difficult.

Often switching in the filter obliterated what little signal there was to start with! Had I wasted my money? Tony reported that effective use of the 'APF' and 'ANF' functions on his Icom IC-746 seemed to require the operator to be 'spot on' frequency for any improvement to be noticed. I encountered similar difficulty using my '706's more basic DSP functions. These features add significantly to the retail cost of our radios. We were puzzled. How could we get the best out of these much-heralded features?

Tony sparked my interest in this subject when commenting that another member of the Swale Amateur Radio Club (SARC) had not always seen any improvement in signal quality upon switching in expensive filters. So, after a little 'empirical research' (a posh phrase for fiddling about until something worked better!), I discovered a solution that will quite literally 'show' you the improvement you can get from your filters or your rig's DSP features.

E-mail: steveseabrook@waitrose.com

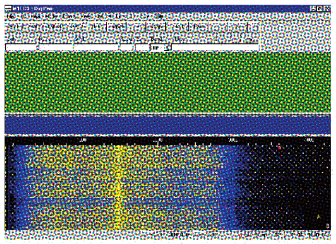


Fig 1: The full screen shot of *DigiPan* 1.6. The audio spectrum is displayed in the bottom section of the screen. The waterfall display 'pours' down from the top, showing the latest received audio at the top of the waterfall. A strong CW signal is shown at 1.5kHz.

There are a variety of programs available on the Internet for a computer and sound card to operate PSK31 through the radio. One such program is the excellent *DigiPan* by KH6TY and UT2UZ. I used this program for my experiments because it provides a full screen-width 'waterfall display' of the audio output of a receiver (**Fig 1**). The 0 - 4000Hz scale is also very helpful (to display the audio frequency scale, alter the configuration to show the actual audio frequency in Hertz. Use the drop-down 'Configure' menu: select 'Band', then select 'Tone' for the band in question).

With *DigiPan* running and the rig tuned to a busy CW spot, the operator will see the waterfall display at the bottom of the screen. The received audio spectrum is shown progressively flowing down the display, while the audio frequency scale is displayed across the width of the screen. Yellow trails show strong signals. A faint blue haze is the noise one can hear. Those signals represented by a higher pitch will appear further up the spectrum whereas lower-frequency audio signals appear towards the bottom end. Sidebands and harmonics are readily visible.

Admittedly the spectrum does not show what the RF end of the rig is receiving in the strictest sense, but it does show what the operator actually gets to hear. So in effect you can 'see' what you hear and 'see' the changes you make when you switch in filters or DSP features. For example, reducing the RF gain will cause the blue haze to start to disappear and the strong yellow trails start to turn blue, indicating weaker received signals.

My problem was that my 500Hz filter appeared to obliterate received signals altogether.

THE SOLUTION

WHEN I USED the *DigiPan* software I could see why. My CW note is set to 600Hz. Many folk prefer a high-frequency tone, like 800Hz. As I tuned in a CW signal I found that I almost always tuned in until the tone was quite high (1 - 2kHz), mistakenly believing that the higher note represented a stronger signal strength (see Fig 1). In fact an occupational hearing test revealed my own hearing had better frequency response towards 2kHz than at 600Hz. So tuning the signal towards a 2kHz tone did make the signal *seem* louder to me than it was at 600Hz even if in fact the actual signal strength decreased! But switching in the narrow filter silenced the signal! Why?

The filter was centred at 600Hz (the rig's set CW tone) with a bandwidth of 500Hz. In other words it would reject anything from 350Hz down and above 850Hz. At 1 - 2kHz, my received signal would always be outside the passband (see **Fig 2**). Obvious, perhaps, but I wonder how many others have been caught out by this effect?

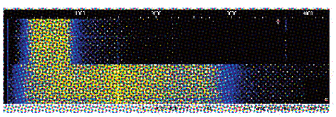


Fig 2: In the bottom half of the screen is the 1.5kHz signal of Fig 1. When the 500Hz filter is switched in - the top half of the display - the desired signal is ignored. The width of the filter's passband is clearly visible.

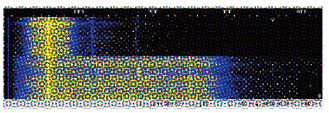


Fig 3: The bottom half of the display shows the CW signal tuned in so it is heard at 600Hz. A lot of noise is shown up to about 2.8kHz. Switching in the 500Hz filter - the top half of the display - eliminates the noise, leaving the desired signal.

You can demonstrate this with *DigiPan* very easily. Switch in a filter and notice what happens to the audio spectrum. Some of the higher-pitch signals you could hear before simply disappear. Activate your various DSP controls and you will see how they affect the audio too. The 'cure' for my problem was to tune in the received CW signal until it could be heard as a 600Hz tone (or anywhere comfortable between 350 and 850Hz) and *then* switch in the filter. The desired signal can now be heard and all the other signals and noise are significantly reduced (see **Fig 3**.)

You may find, like me, that your ears have tricked you into thinking that your filters and features are not as good as they really are. Of course you don't need a computer to run software to get the filter to work at its best. I found that if I switched off the break-in feature on CW, I could key CW and listen to my own tone without sending the rig into transmit mode. I compare this tone with the received signal and tune until they are almost identical and then switch in the filter (like tuning a guitar, when two strings - or in our case the two tones - are resonant they 'sing'). The desired signal is now well within the filter's passband and only the unwanted signals are rejected. ♦

WWW.

***DigiPan* software download:**
http://members.home.net/hteller/digipan/download.htm
Swale Amateur Radio Club:
www.swalerc.fsnet.co.uk/

RSGB Members' Survey, 2001

a report from the RSGB Management Committee*

WE HAD A very high return on our survey: there were 5729 valid responses, around 20% of the membership.

A big 'thank you' to all respondents. There is much detail to examine, and this article represents the initial conclusions from the data obtained. As promised, here is an overview of the responses, which will be used to guide the Society's future direction.

In general terms, the conventional image of the radio enthusiast being highly technical with a hands-on approach to technology and making things work is strengthened by the high percentage having computer interests.

The latter is perhaps not surprising in view of the many aspects of computer involvement in the hobby, including computer logging, control of radio equipment and digital modes of communication.

A significant percentage of respondents use e-mail and access the RSGB website. This finding opens up new ways for the RSGB to communicate with you.

The age profile of those responding to the survey shows the maturing of the membership. The average age of survey respondents is 59.

Of those who responded, 40% are members of a local radio club, and 31% attend meetings frequently.

The survey was carried out before the announcement of the Foundation Licence, which, though targeted primarily at the young, has attracted considerable interest from members holding VHF licences. This new licence structure seems to have been well timed, as the average age of those including their date of birth (90% of the survey) is 59. Only 20% of the respondents are under 50, which demonstrates the need to interest the younger generation who may have been distracted from the hobby by the ready access to other pastimes, the ubiquitous mobile phone and the Internet.

This is not only a hobby issue, and the Society sees as a major mission to interest younger people in science and technology and to ensure an adequate supply of radio engineers. Such engineers are currently in great demand, and, in the past, have been stimulated into this career by the amateur radio hobby.

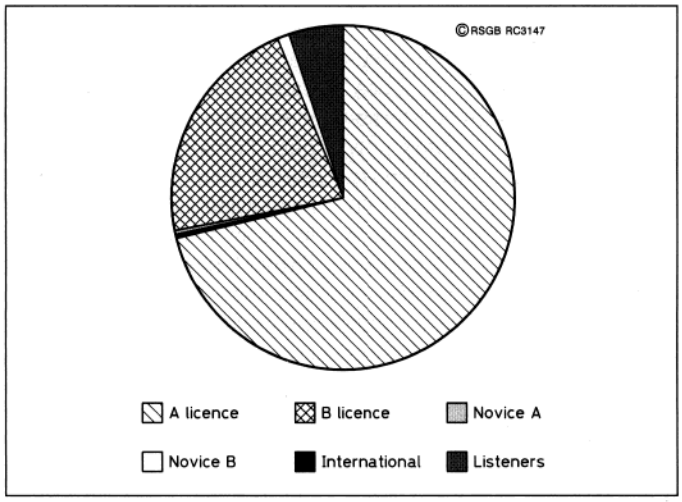


Fig 1: Survey respondents by licence class.

ARE YOU Mr AVERAGE RADIO HAM?

ACCORDING TO THE RESULTS of our survey, the average radio ham (or at least the average **RSGB** member who responds to surveys!) is a 59-year old male. He is a Full Class A amateur, whose main amateur radio activities are general HF band operation and 'home-brew' of equipment. He is interested in keeping abreast of modern techniques and is likely to have a go at repairing his hi-fi amplifier if it breaks down. When the bands are quiet he might be found putting up shelving units, repairing the shower, pottering about in the garden or - more likely - surfing the web. If his son is also a licensed amateur, the chances are that junior op will be more interested in DXing and contesting than Mr Average Amateur.

AMATEUR RADIO INTERESTS

GENERAL HF and VHF operating seem to be among the major interests of respondents, with construction and QRP showing strongly. The interest in HF is no surprise in view of the high proportion of A and A/B licence-holders responding. **Fig 1** shows the respondents broken down by licence class, while **Fig 2** shows the amateur radio interests of the respondents.

The profile of interests matches quite well the dedicated columns in *RadCom* and the continuing emphasis on home construction articles in the magazine. Look out for some challenging projects later this year.

The survey was also interested to explore the day-to-day activities of members. The results, shown in **Fig 3**, were less conclusive, except to note that keeping up with modern communication techniques was a major interest. One might interpret this to mean that radio amateurs are generally an inquisitive bunch, with an on-going interest in new technology. This confirms quite neatly the self-training aspect of amateur radio, one of the major goals of the Amateur Service regulations.

Apart from this, one is struck by the sheer diversity of interests and one wonders whether there is a 'buffet' mentality in all of this. Clearly maintaining an array of interesting topics to meet this appetite for plenty of experimentation remains a major challenge for the RSGB committees and the editor of *RadCom* in

* *c/o RSGB HQ, E-mail: gm.dept@rsgb.org.uk*

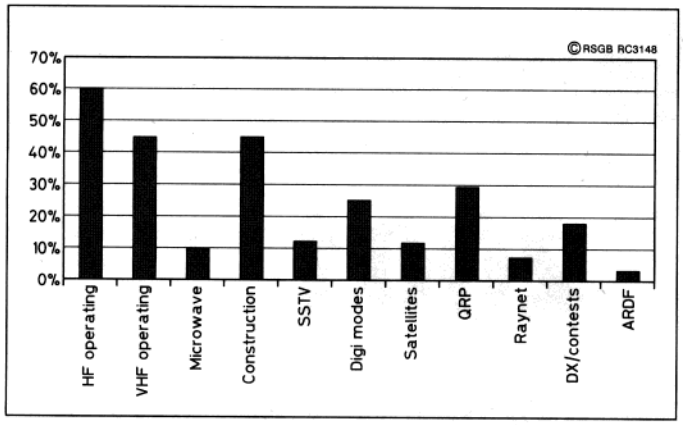


Fig 2: Amateur radio interests of respondents.

particular. This freedom to try new techniques has to be a core part of any enhancement of licence privileges.

OUTSIDE INTERESTS

THE GENERAL INTERESTS of respondents are summarised in **Fig 4**. Apart from the expected electronics and computer interests, one would gain a general impression that this is a group of people that is confident with practical techniques (DIY, gardening, engineering), but which has broader interests (travel, military history, country pursuits). They don't seem to have much interest in sport, however, and don't expect any articles on DIY or bedding plants in *RadCom* in the foreseeable future!

There is a very great deal of valuable information in the survey data, especially that of how your interests change with longevity of licence and age. We intend to continue to study this information to inform our work on the new licence structures, the contents of *RadCom* and the way amateur radio is communicated to the public at large.

Given this picture of a technically-aware membership, keeping up with the latest techniques, it's no surprise that nearly three-quarters of all members now have access to e-mail, rising to nearly 90% of those under 60 and with some age groups reaching 92%. In addition, more than half of this latter category have used the RSGB website in the last month and been users of the members' only website. Older members are also very computer literate, with 72% of those aged 60 - 70 having e-mail and far more than half of those aged 70 - 80 (amateur radio keeps you young!)

Combined with the statistics of those who quote computers as a subject of high interest we are easily one of the most computer-literate communities. This pattern is completely consistent with the qualitative surveys that we have been conducting at club meetings this year.

INTERNATIONAL SURVEY

WE ALSO SURVEYED our international members and nearly 450 replied to the survey. Although the majority of the questions were as for their UK brethren, we did add some specifically overseas questions. On the whole the survey results matched the interests of the UK amateurs, with the perhaps not surprising variation that they tend to be keener on HF contesting and DXpeditions.

Overseas hobbies showed, however, that the UK reputation for looking after our gardens is alive and well, with far fewer people overseas being interested in gardening.

Americans compose the biggest contingent of overseas RSGB members and they supplied twice as many survey returns as any other nationality. **Table 1** shows the 'Top Ten' countries for survey returns; these figures are also broadly reflective of our overseas member totals.

The various post offices around the world seem to have varying standards too, but pleasingly 77% of overseas members get *RadCom* within two weeks of publication. This seems to include far-flung places such as Australia and Canada, where the average is two to three weeks. However, travel across the Irish Sea seems to be a problem with nearly half our Irish members reporting that their copy of *RadCom* takes three weeks to arrive. Strangely, the balance report that it arrives within a week.

USA	17%
AUSTRALIA	8%
NETHERLANDS	6%
IRELAND	6%
CANADA	6%
SWEDEN	5%
FRANCE	5%
GERMANY	5%
SPAIN	4%
BELGIUM	4%

Table 1: Returns from overseas RSGB members.

WHAT DOES IT ALL MEAN?

MANY OF YOU will say that you knew this all this all the time but, if the survey results conform to your impressions, then it must have been a good survey. It will be taken as a *guide* to future policy, rather than something to follow slavishly.

Clearly there are changes in the interests of the radio hobbyist, with the computer and digital interests becoming clear. Not all members follow this pattern, so the importance of support for the wide mix of interests revealed in this survey must be at the forefront of the Society's future strategy.

SURVEY PRIZE DRAW

ONE OF THE 5729 returned forms was picked at random in the survey prize draw.

The lucky winner of all seven RSGB *RadCom* archive CD-ROMs - worth over £200 - is Mike Kremer, G8VLN, of Hampstead, London NW11. ♦

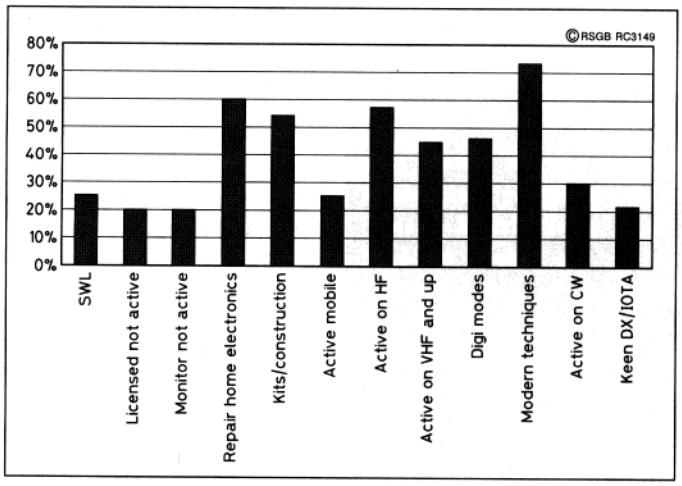


Fig 3: The day-to-day amateur radio activities of respondents to the survey.

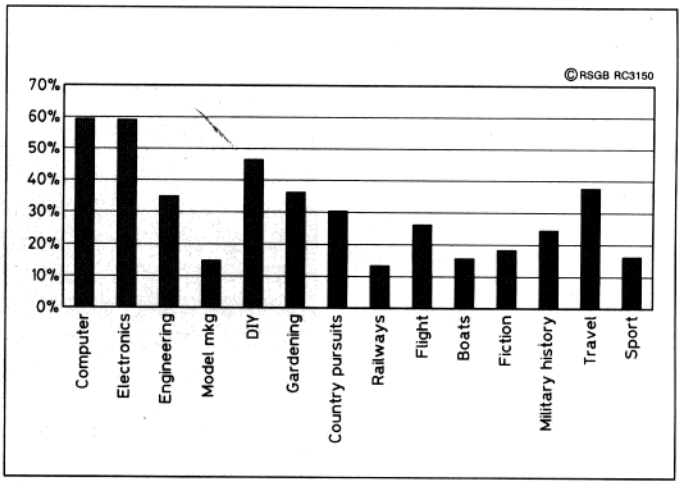


Fig 4: Respondents' interests outside that of amateur radio.

A Meeting with an Antenna Master - Frank Cooper, G2QT

by Bob Whelan, G3PJT*, with excerpts from G2QT's workbook

FRANK COOPER, G2QT, started experimenting with antennas in the 1930s. In those far-off days a licence was granted for the purpose of experimentation and, with 10-watt output limits, the antenna made a very big difference to what you could hear and work [Foundation Licensees take note! - *Ed*]. 60-odd years later, Frank is still experimenting. He has kept an antenna workbook which describes the results of all of the modifications and variations and these 100 pages provide a valuable insight into what works and what doesn't. I will attempt to summarise some of the key findings and so continue Frank's tradition of helping the experimentally-minded of us to try something new, make it, get it to work well and learn something in the process.

As everyone knows, one of the most important things is 'location, location, location' and at Sellindge near Ashford in Kent, Frank is blessed with an open field of about 400ft x 200ft in size. He has five 60ft wooden masts arranged along the edges of the field and an 80ft tower with a 10ft extension in the centre. It's an almost ideal location for antenna experimentation.

In trying a very wide range of antennas, from Zepps to quads to delta loops to Yagis, possibly as many as 40 or 50 variants, it has to be kept in mind that Frank experimented with and changed antennas for two main reasons:

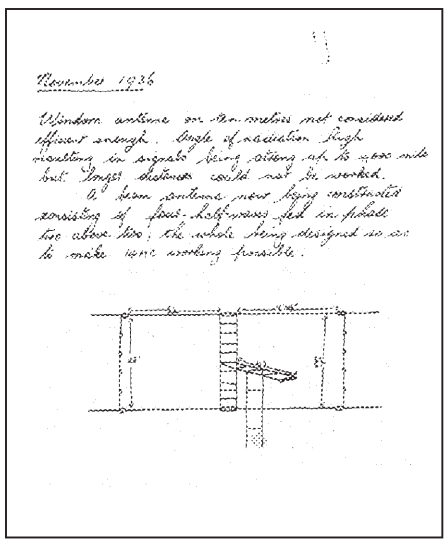


Fig 1: Extract from Frank's workbook dated November 1936, showing his 14MHz wire beam.

* c/o RSGB HQ; e-mail: g3pjt@rsgb.org.uk

- that performance in terms of gain or front-to-back ratio was poorer than alternatives; and
- that there were practical difficulties in construction, robustness or reliability.

These are the same real-life considerations that you and I use to judge antenna performance, and so Frank's experience is relevant to all of us.

HF (10, 15, 20m)

FRANK STARTED IN the early '30s with simple wire doublets, fed with open wire feeders, an effective arrangement if up in the clear. Frank noted, *"considerable DX has been contacted, including an R8 report from Siam"*. By correlating his contacts with the antenna orientation, Frank was able to show that the radiation pattern was as theory expected and was relevant in deciding the orientation of such an antenna for DX.

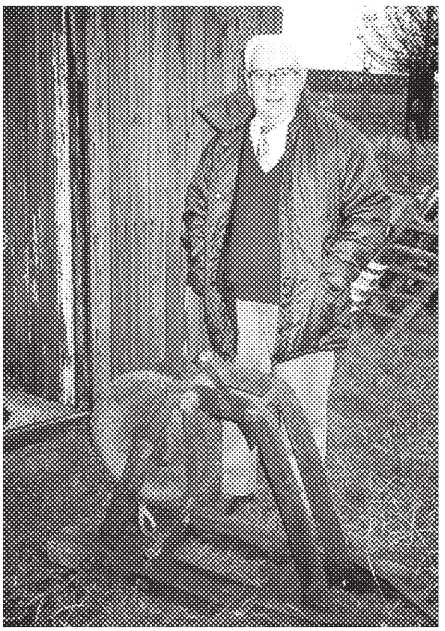
By November 1936 his ideas were moving to beam arrays in order to improve his DX performance. He noted, *"a beam antenna now being constructed consisting of four half-waves fed in phase two above two; the whole being designed to make 14MC* [megacycles per second = MHz - Ed] *working possible"* (as well as 28MHz). See **Fig 1**.

Frank's experiments in the late 1940s were with driven doublet arrays for 28MHz, fed with open-wire line. Even at this stage Frank was finding some anomalous results, such as that a two-element array had *"no discernible advantage over a single element"* (a double extended Zepp).

Following the move to his present location at the end of 1956, Frank started work with a six-bay Sterba Curtain array with reflectors for 28MHz. Since then he has used cubical quads (up to eight elements), delta loops, log periodics and Yagis of various sorts.

DELTA LOOPS

One of Frank's all-time favorite antennas is the delta loop, in both tubing and wire forms, and as single elements or as part of a multi-element array.



In comparison with fixed three-bay Sterba and fixed quads, a two-element triband delta loop came out ahead on gain and ease of construction. This design, shown in **Fig 2**, has also been described in *QST* [1]. The boom is 2.5in diameter and 13ft long and the element dimensions are given in **Table 1**. The sloping element sides are best made of telescoping tubing, or else the weight would be excessive. 1in, 7/8in and 3/4in suffice for 14MHz, 3/4in and 5/8in for 21MHz, and 5/8in and 1/2in for 28MHz. For single-band delta

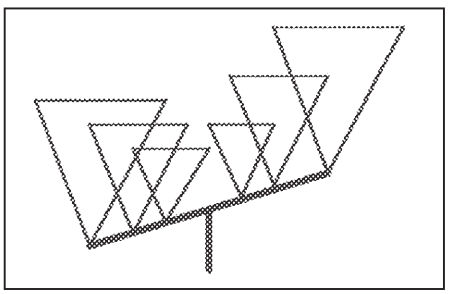
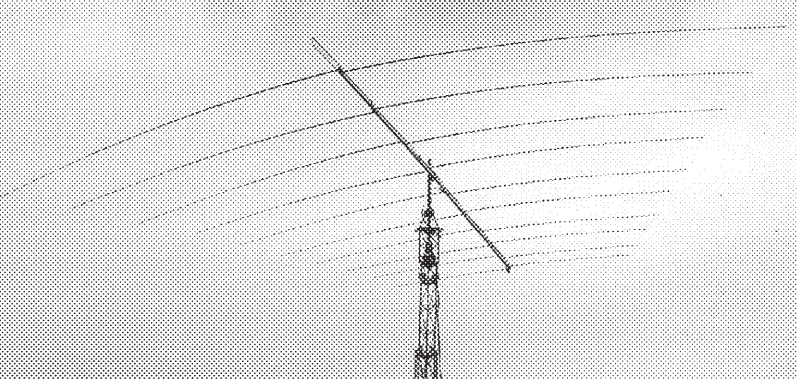


Fig 2: The G2QT 2-element triband delta loop beam.

Frequency	Driven element tubing side and wire top	Reflector element tubing side and wire top	Spacing
14MHz	26ft 7in and 20ft	26ft 3in and 22ft 4in	12ft
21MHz	16ft 6in and 14ft 6in	16ft 9in and 15ft	9ft
28MHz	12ft 7in and 10ft 6in	12ft 9in and 11ft 4in	6ft 6in

Table 1: Frank's dimensions for a triband two-element delta loop array (see Fig 2).



The Tennadyne log periodic Yagi, in use since 1997.

loops a single tubing size would probably be adequate. Later versions used fibre-glass fishing rods for the outer parts of the 14MHz elements.

It was quite difficult to drill the boom accurately and so to help alignment, and for additional strength, a reinforcing plate was added to each element where the side arms meet the boom. Also, the 14MHz elements were locked with bolts and an end plate at each boom end. This stopped the elements rotating on the boom.

The three driven elements were matched to the feedlines with gamma matches, tuning up being *"easy and broadband"*. Frank was able to improve further the performance of the 21 and 28MHz delta loop array by trimming the reflectors and driven elements.

Few of Frank's antennas could beat the delta. The fact that the entire antenna is above the boom more than compensates for the lower gain of the triangular element compared with the conventional square or diamond-shaped quad element. Also, when compared with a commercial triband Yagi the delta was superior.

4 ELEMENT QUAD

After building a fixed 4-element quad, Frank found that it had one S-point gain over a two-element version, and indeed showed even more improvement when the match was improved. As a 4-element delta would be too heavy for the tower, Frank used a Gem Quad spider and spreaders to construct a 4-element triband quad of conventional design. He used element lengths he had derived from other experiments and individual feedlines to the three driven elements.

There are two constructional points worth noting. Frank used the diamond rather than square configuration, and, secondly, used a mast extension truss to hold up the boom and a horizontal strut to the apex of the loops. Thus the loops were prevented from moving back and forth relative to the boom. This greatly improved the rigidity of the structure, as can be seen in **Fig 3**.

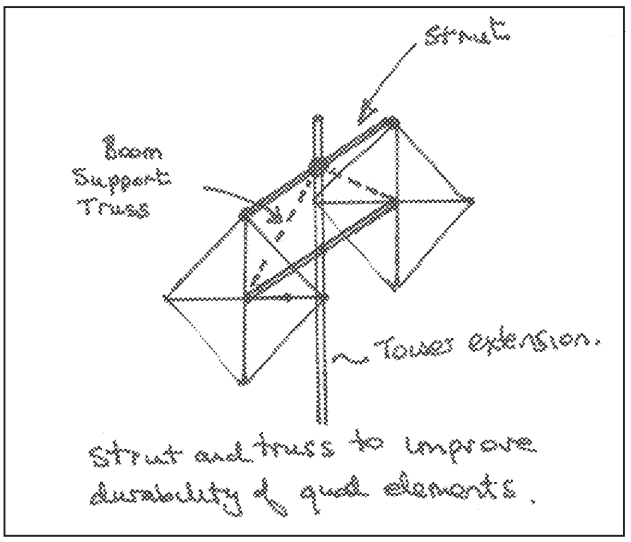


Fig 3: Frank's method of improving the rigidity of the cubical quad design.

Like many others, Frank observed performance differences between the three bands and element trimming was again necessary for best performance. The typical F/B ratio was 20dB. In making adjustments to multi-director antennas, Frank found that *"results could be confusing if directors were adjusted individually. If directors were adjusted as a set then much more consistent results could be achieved."*

A 28MHz rhombic was constructed for a wave angle of 20° and having 113ft legs, but *"the quad is superior."*

The other way of improving the gain of quads and delta loops is to use Yagi directors, and indeed Frank was able to see a dB or so gain by doing this, but he comments that, *"the mechanical problems are difficult"* and in some tests the gain was *"inconclusive"*.

In 1997, after using a 4-element quad for 20 years, Frank changed to a 10-element Tennadyne log periodic [see *RadCom* January 2002 page 39 - *Ed*]. Apart from covering all the HF bands with low SWR, it showed two S-units gain over a dipole on most of the HF bands. The front-to-back ratio was about six S-units and front-to-side eight S-units. Frank comments that one other advantage was that *"all the elements are in the plane of the boom, unlike a quad, where the elements are partly below the boom. This means I can guy the tower at the top and therefore the system is more robust in the gales on the south coast"*.

The author with Frank on a cold winter's day, with one of the G2QT wooden masts in the background.

THE LOW BANDS (40, 80, 160m)

40m

FRANK HAS PROBABLY experimented with more antenna types, in order to try to find the most effective antenna, on 40m than on any other band. For example, following the success of the delta loop beams for HF, Frank constructed a 5-element array of loops. These were configured as two 3-element beams, back to back, with a common reflector and two driven elements, as shown in **Fig 4.** Although this arrangement had adequate gain, as good as a 3-element Yagi, it proved very difficult to tune, there being considerable interaction between the two halves.

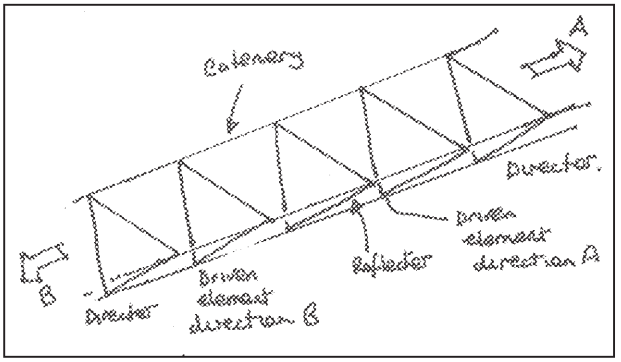


Fig 4: Two three-element 40m delta loops back to back.

In January 1992 Frank started systematic comparisons between various antenna types for 7MHz. He first erected a 33ft vertical with a single 33ft horizontal, a sort of bent dipole configuration. This was to be a reference 7MHz antenna. Comparing this with the 7MHz Yagis in use at the time showed that it was better to the US East Coast! This was a surprising result. The wire Yagis were replaced with two delta loops, but the vertical was still better. The addition of two director loops, tuned for maximum forward gain, eventually gave the delta loop array a two S-unit advantage. The vertical was then raised off the ground and four radials added. Any improvement in the performance of the now elevated vertical was not discernable. The next comparison was with a 4-element wire Yagi. This also showed considerable gain over the vertical.

It is well known that antennas need to be tuned for maximum performance. A 2-element delta loop for 7MHz, when erected with dimensions straight from the book did not

match the performance of the vertical. However, when the loops had been adjusted for optimum performance they were two S-units superior. They were also superior to a dipole. The addition of more radials to the vertical made no difference to these findings.

The delta loops were found to be noisy on receive. Yagis were quieter and had as good gain. Bobtails were also constructed for 7MHz but were originally discarded because the SWR bandwidth was too narrow and this caused problems with the linear. However, it was found that although they were bi-directional, they had comparable performance to the loops. A pair of Bobtails were constructed at right angles as they took up less space than the delta loop arrays.

In 2000 Frank installed an 8-element 7MHz wire Yagi which had about the same performance as the simple vertical in terms of gain. Needless to say the Yagi was scrapped and replaced with a 4-element version which when adjusted correctly delivered one S-unit gain over the vertical.

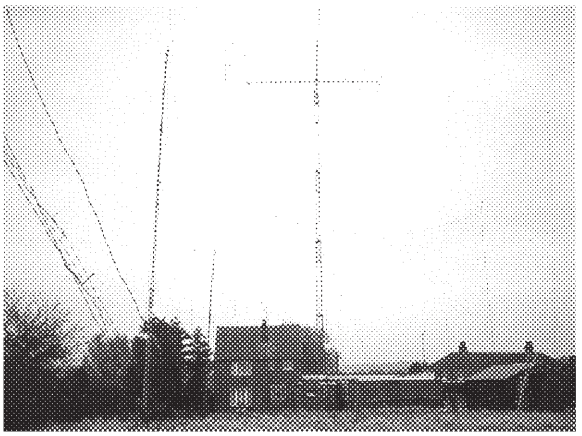
80m

The best antenna Frank used for 80m was the sloping W8JK in a 'vee' configuration and hung from the top of the extension to the tower (see **Fig 5**). His workbook comments in August 1980, *"This antenna sloping NE worked very well. SWR excellent. In 'BERU'* [the RSGB Commonwealth Contest - Ed] *several ZLs answered CQs... The phasing line is not at all critical."*

Running this design through *ELNEC* shows that the main lobe is broadside with about 3dB gain and a F/B of about 10 - 15dB. The 90ft metal tower distorts the pattern somewhat and the lower the tower the less effective the antenna becomes. But for a simple antenna for 80m it would be difficult to beat. Frank has a pair of these still in use. The W8JK was also far better than a 3.5MHz vertical.

The other antenna Frank has used on 80m is a wire log periodic. Although this had a good match at 3.8MHz, it did not appear to be particularly broadbanded. It also took up too much space and was discarded as its performance was not particularly impressive.

In 1988 Frank installed a Bobtail curtain for 80m. This antenna required 64ft vertical sections which, due to the lack of available height, had to be folded back on themselves. The curtain was easy to tune up at its design frequency of 3.5MHz but not at 3.8MHz, showing that different lengths were needed for the two ends of the band.



A dream QTH? G2QT's location with the Tennadyne log period beam centre.

160m

Initially Frank copied the 80m sloping W8JK for 160m, but was disappointed by the results. *ELNEC* modelling shows why this might be: as the tower height becomes lower in terms of wavelength, the effectiveness of the antenna declines. It becomes less directive and more coupled into the ground.

Frank constructed a Marconi-L using the tower as the vertical leg, about 90ft high. However, the tower sections generated electrical noise due to poor contacts. A wire was therefore used running from the top of the tower to the base and this cured the problem.

Although this arrangement was used for many years, it has since been modified to a half-delta, as shown in **Fig 6**. The overall length is 290ft, of which 90ft is vertical, 120ft slopes from the tower top to the matching unit, which is 80ft from the tower base and connected to it by a buried wire.

Although this was much more noisy on reception than the sloping W8JK, on transmit it was much better and *"the States were raised with ease."*

SUMMARY

AT 87, FRANK is still experimenting. He does all his antenna work without assistance. He has a windlass, liberated from a sailing ship, with which he can raise and lower each of his masts by himself. And as I and many others can testify, he puts out an excellent signal into far-off places from a very modern station.

Frank makes frequent assessments of his amateur radio system and is not afraid to change when necessary, changing from a lifetime with quads to the log periodic when it became clear that the tower wasn't robust enough. Frank is interested in all sorts of new ideas, he is into e-mail, packet *DXCluster* and computers, and is clearly fascinated by the relentless march of new technology and its use in amateur radio.

REFERENCE

[1] *ARRL Antenna Anthology* (1978), page 84 and page 86. ♦

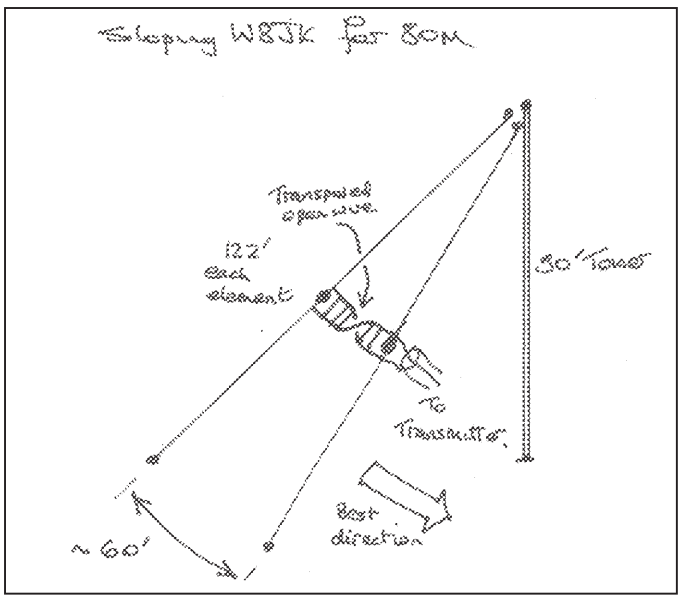


Fig 5: Sloping W8JK beam for 80m.

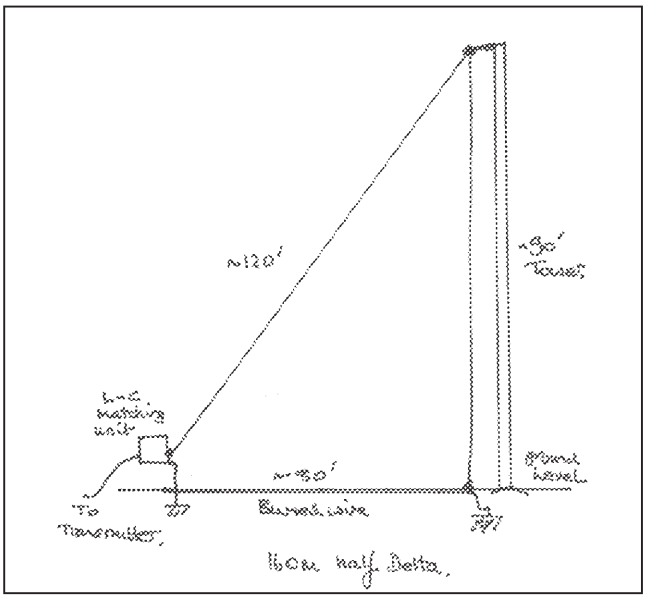


Fig 6: The G2QT 160m half-delta.

The Marconi Trans-Atlantic 100th Anniversary

All Poldhu images copyright Steve Nichols, G0KYA

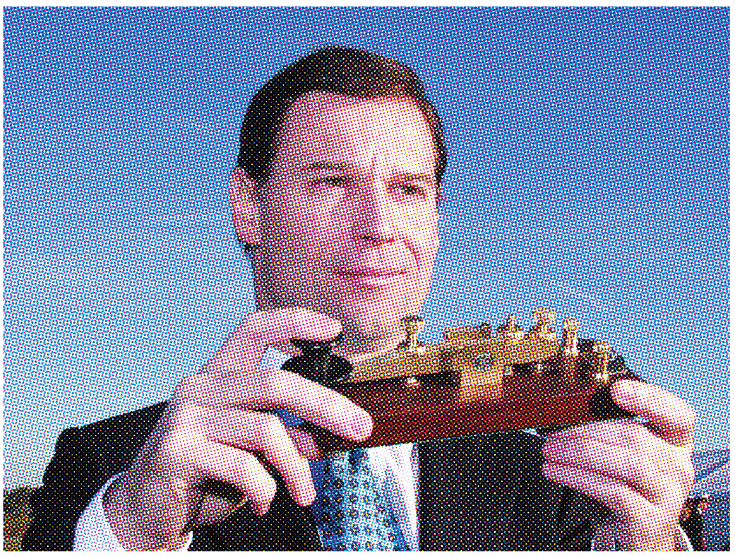
. . . At Poldhu, Report by Steve Nichols, G0KYA*

WEDNESDAY 12 December 2001 marked the 100th anniversary of Marconi's first trans-Atlantic transmissions. But the date also marked the opening of the new Marconi Centre on the Lizard in Cornwall - home to Poldhu Amateur Radio Club (PARC) and destined to be the number one tourist attraction for radio amateurs visiting the south-west.

The new Marconi Centre is a joint project between the National Trust, Marconi plc and PARC, with major funding from the Objective One Partnership for Cornwall and Scilly. It features an exhibition and multi-media presentations on the history of Poldhu and communications in Cornwall and is the result of four years' hard work. Based at the northern edge of Marconi's original 'Wireless Field', the Centre is within a stone's throw of the Marconi memorial and the rugged Cornish coastal path.

The guest of honour at the opening was Guglielmo Marconi – the grandson of the father of radio. Bearing an uncanny resemblance to his famous grandfather, he spoke of the tremendous contribution his grandfather had made to modern telecommunications and said that he had brought the people of the world closer together. "He chose Cornwall because he wanted to demonstrate that signals could cross the Atlantic Ocean, and Cornwall was chosen as being the closest point to the USA", Marconi explained. "This is quite an emotional day for me."

The centre was officially opened by Lady Mary Holborrow, Lord Lieutenant of Cornwall. She transmitted a greetings message from HM Queen Elizabeth II to VO1S, the special event station of the Society of Newfoundland Radio Amateurs (SONRA) on Signal Hill, St John's, Newfoundland. VO1S, responded on 14160kHz at a good 59+ with its own greetings before Lady Holborrow, with the help of PARC's Chairman Carolyn Rule, M0ADA, then transmitted three rather shaky 'Ss' via Morse code from special event station GB100GM. VO1S responded with three 'Rs' to show the signal was received. This symbolically recreated Marconi's reception of the letter S back in 1901. GB100GM then went on to work other special event stations in Newfoundland.



Guglielmo Marconi and the Morse key used to re-enact the transmissions.

* 7 Quebec Close, Cringleford, Norwich NR4 6XU, e-mail: steve@infotechcomms.co.uk

Wednesday 12 December 2001 was the 100th anniversary of Marconi's first trans-Atlantic transmission. The event was commemorated with celebrations at Poldhu in Cornwall, from where Marconi's assistants made the historic transmission; from Chelmsford, home of Marconi plc; and with a reception at the Radiocommunications Agency's headquarters in Docklands, London. Amateur radio special event stations were also set up on the Isle of Wight, at the RA's laboratory at Whyteleafe in Surrey, at the Holyhead Coast Station on Anglesey, in Leicester, on the east and west coasts of the USA, from several locations in Italy - Marconi's country of birth - and, of course, at Signal Hill in Newfoundland.

We have three reports, from Poldhu, Chelmsford, and the RA headquarters in London.

The interior of the new Marconi Centre.

Engineers from the Royal Navy's Engineering Sponsorship Scheme based at Southampton University, the so-called 'Thunderer Squadron', re-enacted the first trans-Atlantic wireless communication using a spark transmitter. The project had been dogged by problems, and Lt Mickey Rooney, Project Co-ordinator, explained that their chances of making it across the Atlantic with the 20kW, 20,000V, transmitter on the planned 1.7MHz were slim. On the day the decision was made to relay the signal locally at Poldhu and then use modern Naval communications equipment on a frequency of 17682kHz to make the symbolic trans-Atlantic transmission.

Throughout the day the centre's three dedicated shacks, named 'Paget', 'Kemp' and 'Franklin', to mark the contribution of three of Marconi's employees, operated as GB100GM on 20, 30 and 40m, creating massive pile-ups on each band. The station has linear amplifiers feeding a three-element tribander for HF and two trap dipoles for the low bands. A 6m rig was also put into action, feeding an HB9CV. This resulted in numerous QSOs with American and Canadian stations. 2m FM operation via a vertical collinear gave many West Country and Irish stations a valuable contact too.

Immediately following the Queen's message, Cornwall, Canada and Marconi's native country of Italy were linked by satellite as Guglielmo Marconi sent greetings messages around the world – aptly using a satellite named 'Marconi'.

The day also marked the official launch of the GB3SSS 2m beacon at Poldhu on 144.407MHz, which it is hoped could result eventually in the first confirmed reception of a 2m signal on the other side of the Atlantic. PARC's 'Davey', G3AGA, explained that the beacon has an effective ERP of 1kW, thanks to a 120W PA (provided by the IEEE in the US via Professor Hugh Griffiths at UCL) and an eight-over-eight Yagi beaming at 284º. G3AGA said: "The beam-width covers everywhere from Miami to the St Lawrence River. It runs 24 hours a day and while we don't expect it to be heard on a regular basis there is certainly a chance that the right conditions might exist for short durations."

The Marconi centre is bound to be one of the biggest advertisements for amateur radio since the demise of GB2SM at the Science Museum in London. Carolyn Rule said that PARC owed a big debt of gratitude to many organisations for their help in bringing their dream to fruition. In particular she thanked the RA, Kenwood, Nevada, the IEE

Marconi Centre, Poldhu
(Tel: 01326 241656)
Opening Times

Sunday	1330 - 1630
Tuesday	1900 - 2100
Friday	1900 - 2100

(Plus additional times during summer season)

Info: www.mulliononline.com

Marconi and Lady Mary Holborrow, Lord Lieutenant of Cornwall, cut the ribbon to open the centre, watched by PARC Chairman Carolyn Rule, M0ADA.

Above: Marconi with members of the Poldhu Amateur Radio Club. Above right: Lady Mary Holborrow sends the Morse 'Ss' to VO1S. Right: Lt Mickey Rooney RN and the Thunderer Squadron spark transmitter.

in Cornwall, Worsley Communications and Linear Amp UK. Even Mullion Parish Council funded two Morse keys.

The centre on the cliffs overlooking Poldhu Cove (Locator IO70IA, WAB SW61) is open to the public - see the panel on page 43 for times. Entrance is free although donations are welcome - the whole project has completely emptied the club's piggy bank.

The day's event's ended with a celebration dinner. Lady Mary Holborrow said that she felt Guglielmo Marconi senior had been with them in spirit during the day's events, a view echoed by all who attended.

. . . At Chelmsford, by members of CARS*

ON SATURDAY 8 December, members of the Chelmsford Amateur Radio Society (CARS) operated GX0MWT from the RSGB GB4FUN van located in Chelmsford High Street to mark the centenary of the first transmission across the Atlantic. The highlight of the day was when Marconi's daughter, Princess Elettra, escorted by CARS Vice-President Charles Shelton, G0GJS, sent the following message to VO1S on Signal Hill, Newfoundland: "In celebration of the occasion of the Marconi Centenary of the first Atlantic radio transmission, the Princess Elettra sends greetings to the people of Newfoundland and to all who have benefited from the invention of Guglielmo Marconi, my father."

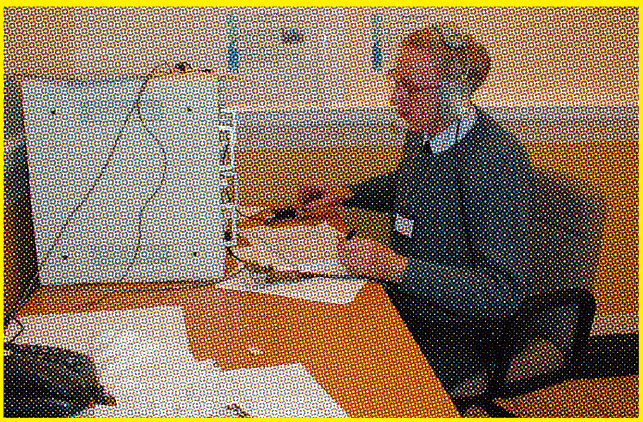
Four days later, on the actual anniversary, members of CARS operated a station with the very special callsign 2MT from the Marconi New Street factory in Chelmsford. 2MT, or '2 Emma Toc' as it was known, was the callsign of the station originally set up in Chelmsford by Marconi's Wireless Telegraph Company and run by Captain P P Eckersley in order to provide the first regular public broadcasts.

Special event station 2MT was established just 12 metres from Guglielmo Marconi's original office in New Street. It comprised all Marconi-produced equipment: H1550 / H2550 drive / receiver, H1086 400W transmitter and H1482 ATU to an AWW whip antenna.

The operators used a variety of Morse keys during the day including a replica of the Grasshopper key, named after its distinctive shape, and originally used in 1896. This key proved a 'challenge' to those who attempted to use it, and only Donald Imber, G0VIS, managed to perfect the technique for sending readable Morse with it.

In addition to 2MT, the Chelmsford Amateur Radio Society also operated GX0MWT from the Chelmsford Science and Industrial Museum. One of the antennas used was an aerial kite similar to that used by Marconi 100 years ago. The kite, which stands over 2.5m high, was flown by Tony Gilbey, G4YTG, and put a very strong signal into Newfoundland. In all 85 kite contacts were made.

Princess Elettra Marconi sending her greetings message to VO1S on 20m SSB from the station in the RSGB GB4FUN van located at Chelmsford.



Donald Imber, G0VIS, operating 2MT (in this case, using an ordinary Morse key).

* *Details from David Bradley, M0BQC, e-mail: DavidWBradley1@activemail.co.uk or visit the club's website at www.g0mwt.free-online.co.uk/*

The Marconi Trans-Atlantic 100th Anniversary

. . . And At RA Headquarters, Docklands, London

THE RSGB AND *RadCom* were honoured to be invited to a reception given by the Radiocommunications Agency at its headquarters in Docklands, London, on 12 December to celebrate the trans-Atlantic radio centenary. The reception was attended by around 150 leading businessmen and executives from the radiocommunications and broadcasting industries.

During the reception, there was a 'live' link-up with Poldhu, so that those in London could witness first-hand the celebrations in Cornwall. The RA's Barry Maxwell, at Poldhu, gave a commentary on the events taking place there, and the Poldhu Amateur Radio Club's Carolyn Rule, M0ADA, addressed the audience in London and thanked the RA for its help in making the day such a success. It was interesting to note the prominence given to amateur radio by the RA at the event which was, after all, primarily for industrialists in the radio business.

The Minister for E-Commerce and Competitiveness, Douglas Alexander MP, made a speech in which he paid tribute to radio amateurs who "keep alive the pioneering spirit of those who first proved the power of long-distance communication by radio". The full text of Mr Alexander's speech is given in the sidebar. ♦

Text of speech given by Douglas Alexander, MP, Minister for E-Commerce and Competitiveness, at RA headquarters on 12 December 2001

"I'm delighted to be here with you today to celebrate 100 years of radio, and I'm pleased to see so many of you from the radio world. We're here to celebrate one of the great scientific and technical events of the last century – a breakthrough that had implications for one of the most basic human activities – how we communicate with each other.

"The UK played a critical role in this moment of history – it was from Poldhu in Cornwall that Dr Ambrose Fleming sent the first long-distance radio signal across the Atlantic. It was heard by Guglielmo Marconi at Signal Hill near St Johns, in Newfoundland. The signal – the Morse letter S – three dots repeated over and over – was received in St Johns by a flying aerial wire suspended 400 feet up in the air by a kite. Marconi picked up the signal through his telephone earpiece and had it confirmed by his assistant.

"It must have been tremendously exciting – it created a surge of public interest and the newspapers of the day published reports, some sceptical, believing the effects were due to atmospherics. But Marconi was right, as quickly became apparent.

"This breakthrough didn't just happen out of the blue – knowledge about radio had been developing since 1887, when Heinrich Hertz demonstrated the existence of radio waves. The first international radio communication had happened in 1899, but the real breakthrough was Marconi's trans-Atlantic signal in 1901, because this proved that radio waves followed the curvature of the earth, and didn't just head off to space in a straight line.

"The successful experiment in 1901 was followed by rapid development in radio applications. We think that our generation is seeing technological change at an unprecedented pace – but progress was no less exciting in the early years of the 20th century.

"Radio went on quickly to prove its worth in dramatic ways. Ship-to-shore radio led to the arrest of the notorious murderer Dr Crippen in 1910 while attempting to flee to Canada. Entertainment wasn't far behind. The first advertised radio broadcast took place in 1920 – with a performance by Dame Nellie Melba. The forerunner of the World Service, the British Empire Service – started broadcasting in 1932.

"We've come a long way since 12 December 1901, but one constant is the tremendous power of innovation. In the radiocommunications area innovation has led to such developments as geostationery satellites for long-distance communications, live pictures broadcast from the moon, revolutionary medical techniques and cellular radio technology. As a result radio touches nearly all parts of our lives. Not just our business lives, but our leisure time and our family life too. From hailing a taxi to being rescued by an air ambulance, from the mobile phone to opening the garage door, and from motor racing to weekend sailing, wireless technology is now an invisible but indispensable tool in our lives.

"All this activity is bringing huge economic benefit to UK industry. A recent study on the economic impact of radio showed that the value of the radio industry is some £20 billion per annum, with broadcasting and public mobile radio together accounting for around three quarters of these benefits.

"So, we are not only looking back, but also looking forward. Today we are entering the second century of radio. Convergence is a central reason for our decision to form a new Office of Communications, or OFCOM. The aim is to create a simpler, more flexible framework, which will be best fitted to match the accelerating pace of change in the communications sector. The existing regulators have been working closely together to lay the groundwork for OFCOM and the intention is to have it up and running by the end of 2003.

"But returning to our main theme for today. We are here in Docklands to celebrate 100 years of radio, in the midst of one of the most dynamic areas of development in the country, as you can see. But this is not the only celebration happening today. As you've been hearing, a message will be sent this afternoon by the Queen's representative to the Governor-General of Canada, replicating the path of the original signal, from Poldhu in Cornwall to St John's.

"In keeping with the character of the original transmission, it will be sent using amateur radio, using equipment which has been donated to the Poldhu Amateur Radio Club by the Radiocommunications Agency, whose local staff have also assisted with technical issues.

"I would like to pay tribute to our amateur radio societies around the country who keep alive the pioneering spirit of those who first proved the power of long-distance communication by radio, and to all those who have helped to make this afternoon's events a reality.

"That in 1901 Marconi and others working in Britain and America were committed to proving that radio waves could be used to communicate. The message today is that we are equally committed to innovation and to pushing forward the boundaries of communication. Through working together, and sustaining a climate for innovation, we can ensure that radio is as successful in its second century as it has been in its first."

David Hendon, Chief Executive of the RA (left), and Douglas Alexander, MP, the Minister for E-Commerce and Competitiveness, during the live link-up with Poldhu.

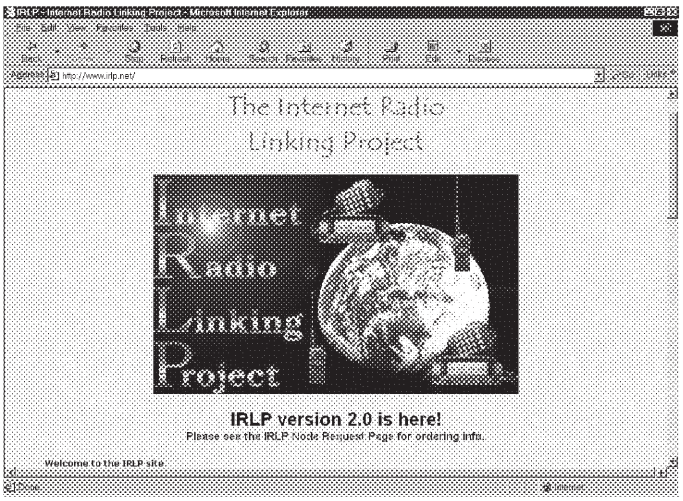
Internet Linking Through IRLP System

by Greg Cook, G4CUT*;
Tony Whitaker, G3RKL,
and Dave Cameron, VE7LTD.

SINCE THE beginning of the hobby, amateur radio has always been about communication between like-minded enthusiasts, be they in the next street or on the other side of the world. Over the decades, advances in both RF and computer technology have allowed techniques additional to voice and CW communications to be developed, such as RTTY, AmTOR, PacTOR, PSK31 and packet, increasing both the diversity and range of contacts. Long distance QSOs have traditionally been made on HF, though always subject to the uncertainties of propagation. The OSCAR satellites introduced the possibility of some such contacts 'on demand', independent of propagation, but only under certain restricted conditions. Logically, the next step is to ask if there is any way that long distance contacts could be made with simple equipment at any time, especially for those whose licence does not give them access to HF. The answer is now "yes", facilitated by the Internet.

As of summer 2001, connection of amateur radio equipment to the Internet has been authorised in the UK by the Radiocommunications Agency (RA) for about 18 months. This has been implemented by issuing an NoV (Notice of Variation) to individual amateurs, allowing *attended* operation on a few specific frequencies in the 2m and 70cm bands, and, with the keeper's permission, through named repeaters. For the greater part of this period, the software package used on the computer has been VocalTec's *Internet Phone (IPhone)* [1], with the station (gateway) operator selecting the remote Internet connection. Initially, linking was point-to-point between single gateways, but as experience was gained it became possible to include more stations at a time with multiple gateways in 'conference rooms' [2]. Here, everybody can hear and talk to everyone else, whether coming in directly on the Internet or via a radio path. However, one of the drawbacks of the *IPhone* system for someone operating a radio rather than a computer is that he or she is entirely dependent on the gateway operator's choice of which station(s) are connected to the link radio. What would be desirable is a system which allows the radio operator to have a direct choice of where to link, without the need to involve the gateway operator, and the IRLP system does just this.

A previous article [3] described how GB3US was linked to the Internet via the *IPhone* system, and here we present a superior system for Internet linking using *IRLP*, offering better audio quality and more control of the link by the radio operator.



http://www.irlp.net

WHAT IS *IRLP*?

IRLP STANDS FOR Internet Radio Linking Project, and was devised by Dave Cameron, VE7LTD. A much fuller description can be obtained from the *IRLP* website [4], but essentially it is a system which connects one *IRLP* node to one or more other nodes via the Internet. It differs from the *IPhone* system in several ways, a major one being that the node owner (equivalent to the *IPhone* gateway operator) is not usually involved in selecting connections between nodes, control being in the hands of the radio operator. Another important difference, and this also applies to the *ILink* system being developed by M0CSH [5], is that it is not possible to connect directly from the Internet, only via an amateur radio link, thus excluding potential unlicensed operation. Each node, which can be anywhere in the world, is allocated a three-digit identification code. For example, the original *IRLP* repeater, VE7RHS, in Vancouver is 100, and GB3US in Sheffield is 515. To make a connection between two nodes, all that is necessary is for the radio operator to first establish radio communication with a node, then key in the desired ID followed by a *zero*, using DTMF tones to turn the link ON, and the ID followed by a *one* to turn the link OFF. So, keying in 1000 would connect to VE7RHS and keying in 1001 would disconnect the link.

Although *IRLP* mainly caters for node to node links, there are some 'reflectors' to which several nodes can connect concurrently. Input from one node is then broadcast to all others, in a similar way to *IPhone* conference rooms. These reflectors can be dialled up just like any other node, but there is much more control with *IRLP*, since the radio operator can also disconnect the node from a reflector. This contrasts with the *IPhone* system, where traffic is continuously relayed until the gateway operator switches it off.

THE *IRLP* NODE

AS MENTIONED, the *IRLP* system is a collection of nodes, any two of which can be connected together. A node comprises a link radio and a computer with an appropriate Internet connection, running RedHat *Linux* v5.2 or 6.2 [6] as the operating system. The *Linux* platform allows relatively slow PCs (eg 120MHz Pentium) to run the proprietary software with good efficiency and reliability. There is also a small interface board, which contains the DTMF decoder and simple logic to control the radio PTT line and to detect the squelch state on the COS (Carrier Operated Squelch) line, that connects to the parallel port.

Receive audio from the radio connects to

PORT No	DESCRIPTION
22 or 23	TCP (SSH/Telnet) for remote admin
2074, 2075	UDP for IRLP audio (bi-directional)
15425,15426,15427	TCP for control and update (bi-directional)

Table 1: Ports required to allow incoming packets.

* *1 St Albans Road, Sheffield, South Yorks S10 4DN; e-mail: g.cook@sheffield.ac.uk*

GB3US Using the

this board, and also is input to the PC sound card, whilst the sound card output goes directly to the radio's mic input. It should be noted that the system is designed to have hard control of the radio, rather than the dual VOX method used by *IPhone*. All the essential control software is loaded and maintained remotely by VE7LTD through FTP and Telnet, which not only means that all the nodes are running the same up-to-date programmes, but also lessens considerably the burden on the node owner, who is probably not a *Linux* guru.

The IRLP system was originally designed for fast internet connections (>100kbps), and many overseas nodes are installed at the 'work's QTH' of node owners (as is the GB3US node), where high-speed Internet access is provided by office intranet systems. Under these conditions, ADPCM protocol is used for the voice IP, potentially providing high quality audio. However, *IRLP* will work very satisfactorily with a dial-up connection using a standard BT line and modem, although a GSM software codec is then used. Although generally not a problem with a dial-up type ISP, firewalls may cause problems with installations at commercial or business locations, since in-bound IP packets must be allowed as well as out-bound.

The required ports for *IRLP* in-bound data are detailed in **Table 1**. Normally out-bound packets should not be blocked, but for information purposes the ports 80 (http), 873 or 8873 (rsync) and 10000 (IP determination) must additionally allow out-bound data.

The RedHat v6.2 *Linux* platform is the preferred version to use with *IRLP* and, indeed, the software will run only under RedHat versions 5 and 6 at present. There are considerable security patches built into the system, and the node operator has a degree of flexibility in designing the node functionality through the use of script files. These are similar to the old DOS **.bat** files, and can be executed from the command prompt. In MS-DOS *command.com* is the

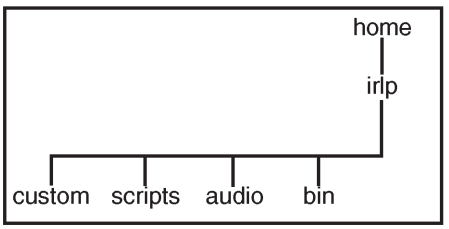


Fig 1: Part of IRLP software package directory tree.

command interpreter, whereas *IRLP* under RedHat *Linux* uses the *Bash* shell. The purpose of such a shell is to display a prompt and execute the command typed in at the keyboard, as well as executing shell scripts, which are text files containing one or more commands. A special **custom_decode** script file allows script files and binaries to be run when specific DTMF sequences are received by the radio on the uplink. This very useful feature allows node owners to customise their stations by playing specific audio **.wav** files over the downlink in response to an uplink DTMF sequence. For instance, when *12345* is received by the GB3US node, a short **.wav** file describing *IRLP* is transmitted. Similarly the G4CUI dial-up node initiates a connection to the ISP when *12002* is received on the uplink. The free off-peak Internet call deal offered by BT / Freeserve used by G4CUI only permits two hours of Internet access at a time, after which the call is terminated. Hence the facility to allow remote users to re-dial the Internet connection using their radios and thus re-establish the *IRLP* link is most useful.

Interested readers with some past programming experience should soon master the script file syntax, using a combination of existing files that come with the IRLP software and a good *Linux* manual [6]. However, a brief idea of the syntax is given in **Table 2** with reference to the directory tree in **Fig 1**. The actual files are displayed in bold, and are of three basic types; **custom_decode** and **info** are script files, **cosstate**, **key**, **unkey** and **play** are binary files, and **info.wav** is the audio file. The binaries all come as part of the *IRLP* software package, leaving the node owner to customise the script and audio files.

The *Linux* operating system can either be installed on a virgin hard drive, or on a drive with a native partition of at least 500MB. The latter option allows the useful feature of being able to import files directly across from a Windows partition. The *IRLP* 'package' obtainable from VE7LTD [4] comprises a suitable version of *Linux* on CD-ROM and the interface board plus leads with basic instructions. Subsequent to *Linux* installation and connection to the link radio, a session is then arranged with VE7LTD who FTPs the *IRLP* software over.

USING AN *IRLP* NODE ON AIR

WHEN A VALID four-digit sequence is detected requesting a link, the node interrogates the system to see if the connection can be made, and the appropriate status message is then played. If all is well, this will be in the form of a welcome message from the target node, ending with "Link On". If the requested node is busy, the message will state that it is either "in use locally" or already "connected to node *callsign*". Once connected, CQ calls and QSOs can be made in the usual way, since one of the features of *IRLP* is the excellent audio quality, and many comments have been made to the effect that remote stations sound just like locals. With high speed Internet access, the turnround time is very short, but a delay of a few seconds can occur with slower modems.

When the link is no longer required, the four-digit disconnect sequence can be sent from either end and a farewell message will be sent ending with "Link Off". As a safety feature, if no traffic is detected in one direction for a certain time period, the link is automatically closed, which has already caught out a few people in 'waffle mode'. The node owner can also add his own features to customise the node, using *Linux* script files as mentioned previously. A list of

FILE	/home/irlp/custom/**custom_decode**	/home/irlp/scripts/**info**
CONTENTS	#!/bin/bash if ["$1" = "12345"] ; then /home/irlp/scripts/**info** #runs info exit 1 fi	#!/bin/bash /home/irlp/bin/**cosstate** #checks if squelch open if ["$?" = "1"] ; then #..if so, exits exit 1 fi /home/irlp/bin/**key** #keys ptt line /home/irlp/bin/**play** /home/irlp/audio/**info.wav** #plays wav /home/irlp/bin/**unkey** #releases ptt exit 0

Table 2: Syntax to transmit audio file on down-link in response to DTMF 12345 received on up-link.

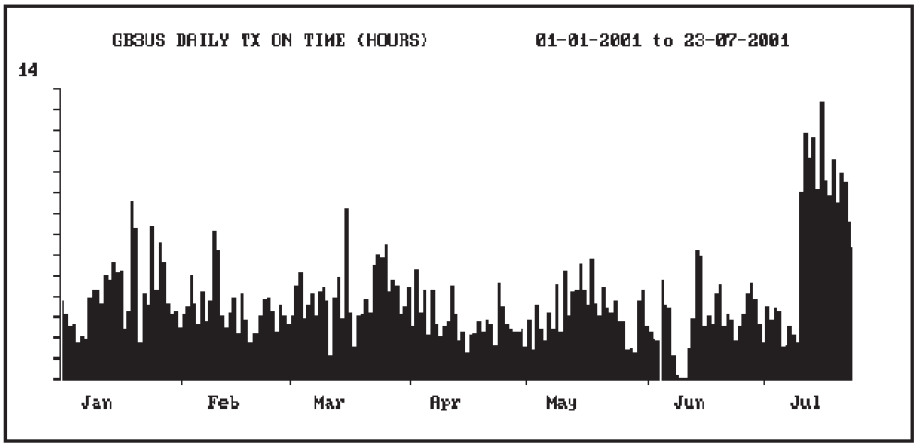


Fig 2: GB3US daily usage, January to July 2001.

node IDs and current status can be found on the web [7].

GB3US: UK's FIRST PERMANENTLY LINKED IRLP REPEATER

THE MAJORITY OF *IRLP* nodes are located in Canada and the USA, and large numbers of these are connected to existing VHF / UHF repeaters, although some work on simplex frequencies. The first node in the UK was set up at the home location of G4CUI, with the first UK *IRLP*-linked QSO between G4CUI (working his own node with a handheld) and VE7MAN via remote node VE7URG occurring at 2045UTC on 12 March 2001. Realistically, this node can only be activated intermittently for a few hours on some days, as the NoV specifies continuous attendance, and dial-up time costs money! Nevertheless, it demonstrated the power and popularity of the system, especially when linked to the wide coverage of GB3HH at Buxton during the normally quiet couple of hours either side of midnight. Interestingly, VE7LTD had never set up a node with such a low baud Internet connection before (56k Hayes dial-up modem with standard BT connection), and was surprised at how well the GSM compression worked. The only constraint with a standard dial-up connection, however, is that reflectors cannot be accessed.

The second UK node was established a few weeks later by G4NJI in Rotherham, who, with G3ZHI, had pioneered *IPhone* linking to GB3US from the start [3]. Even though he was able to activate his node for longer periods on an almost daily basis, both through GB3US and simplex on 2m, local opinion favoured it being available at any time and on a fixed frequency. Since the current linking NoVs require *attended* operation, this really excludes an individual running a 24/7 (24 hours a day, 7 days a week) node on practical grounds, unless an actual repeater licence is applied for.

However, GB3US was already licensed for such continuous, *unattended* type operation, so, through the RSGB Repeater Management Committee (RMC), in early July 2001 the RA gave permission to connect GB3US as a 24/7 *IRLP* node, a week or so after GB3CL (Clacton) became a 24/7 *IPhone* gateway.

Node 515 is connected to the Internet via the University of Sheffield's high-speed intranet system, and runs on a 120MHz Pentium I. Firewall problems had to be overcome by obtaining special permission to have the ports detailed in Table 1 opened for in-bound data. In fact port 23 could not be opened under any circumstances, and port 22 was opened only on the condition that the latest version of SSH was run.

Fig 2 shows the marked increase in usage after switch-on, compared with the rest of the year. **Fig 3** shows one of the busiest days, with a fair amount of 'night-owl' activity. As mentioned before, most nodes are in North America, but there are a few in Dominica, Hawaii and Australia, the latter proving particularly popular from both sides.

It has also been possible to compare *IRLP* linking to *IPhone* linking, and, although *IPhone* certainly has its place, *IRLP* seems to have the better quality and reliability. Its main advantage, though, is that link selection is in the hands of the radio operator rather than the gateway operator or the unknown occupants of a conference room.

THE FUTURE

INEVITABLY, THERE ARE some who view any type of linking as 'not amateur radio'. In one respect, they are correct, since a majority of the path is not via amateur radio, although, paradoxically, the majority may still be by *radio*, through a satellite link. However, they are missing the point, since the hobby is concerned with *communication* between amateurs using one, or a combination of, the various techniques available, linking being just the latest addition to the arsenal. The ability to be able to select a part of the world and then chat to a mobile station in Vancouver, say, on his way to work, whilst you are on your way home, with the same quality as a local QSO is a significant addition to amateur radio operating. Mobile HF operation does not provide anywhere near the quality and reliability, especially in urban environments. It is also nothing like a telephone call, since at both ends of the link the conversation is being broadcast to many other hams who often join in. There are already well over 200 active *IRLP* nodes and this number will continue to grow, giving an ever increasing choice around the world.

Simplex linking via *IPhone* and *ILink* is fine for gateway operator supervised contacts. However, with *IRLP* connected permanently, just sitting in the background, a repeater can be used locally, or with a few DTMF keystrokes people from much further afield can be included. It is therefore not nearly as intrusive as a permanent *IPhone* connection. The days of selecting, then talking to, a fellow amateur on the other side of the world using a small, VHF / UHF handheld have finally arrived, and are long overdue. ♦

REFERENCES

[1] http://www.vocaltec.com
[2] http://www.qsl.net/g3zhi
[3] 'Internet Linking via the GB3US Repeater', A J T Whitaker, G3RKL, *RadCom*, April 2001, pp39 / 40.
[4] http://www.irlp.net
[5] http://www.aacnet.net/radio.html
[6] *RedHat Linux Secrets*, Naba Barkakati, IDG Books Worldwide Inc (2nd edition), ISBN: 0-7645-3175-1.
[7] http://status.irlp.net

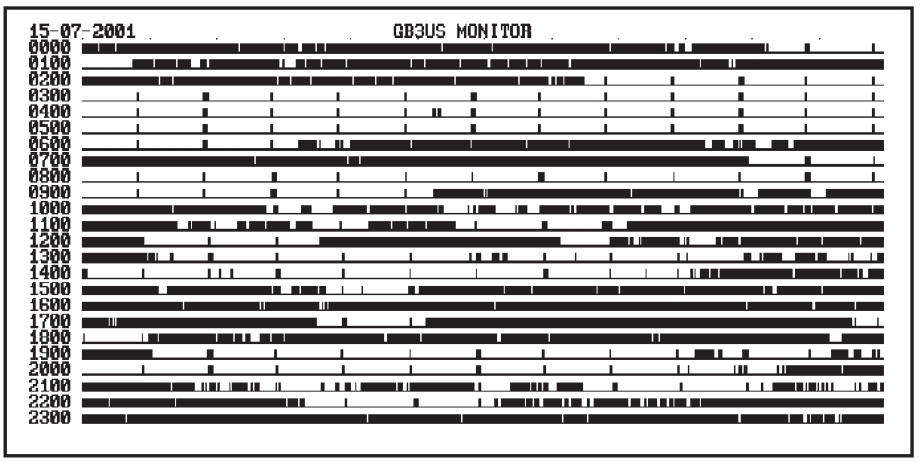


Fig 3: GB3US usage for 15 July 2001 (times in UTC).

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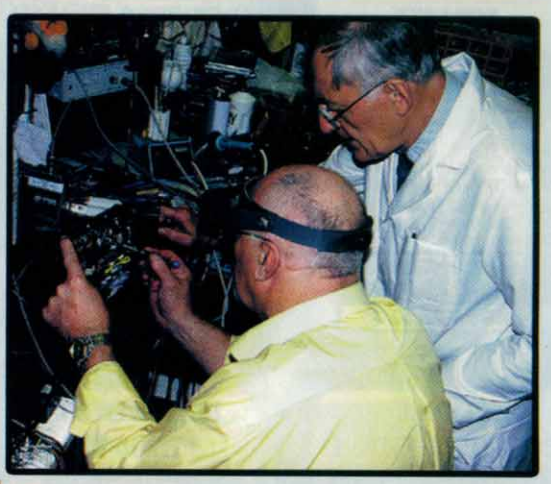

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PA OUTPUT IMPEDANCE?

WHAT HAPPENS TO reflected power from my feedline? Is it absorbed in the output impedance of my transmitter, causing heating?

IN THE SIMPLEST possible terms... that isn't the best question to ask. It has been the subject of a long-running controversy that seems doomed never to be resolved in a way that everyone can understand and agree. When this happens, it generally means that the fault lies not so much in either viewpoint, but in the question itself.

Let's slice the problem cleanly in two. If you want to know what happens to your transmitter, first disconnect the antenna! Much of the difficulty has been caused by trying to solve two problems at the same time: the mechanics of reflections and successive re-reflections in transmission lines and tuners; and the resulting effects on the transmitter. Let's concentrate here on the transmitter, and leave the transmission-line topics for another time. Any antenna and feedline will present a certain load impedance to the transmitter's output socket, which is measurable at the plug. If you replace those measured (R ± jX) values with a dummy load constructed from lumped components - a resistor in series with a capacitor or inductor - the transmitter has no way of noticing the substitution. The steady-state load impedance it sees is the same. So from now on, let's think only about how the transmitter responds to various load impedances.

The next step is to understand the difference between a signal generator and a transmitter. A signal generator is usually calibrated in terms of output into a 50Ω load, and the oscillator inside is followed by attenuators designed to present a 50Ω impedance to the outside world. This means that a signal generator can be represented by the classic model from Thévenin's circuit theorem, **Fig 1**: to the outside world it looks like an ideal zero-impedance voltage generator in series with an internal resistance of 50Ω. The output impedance is always 50Ω regardless of the power level, or even if the device is completely switched off [1]. When connected to a 50Ω load, half the power from the voltage source is dissipated in the load, and half in the internal impedance, so the maximum possible efficiency is 50%.

A transmitter is very different - it's much more complicated. Regardless of the type of output device - bipolar transistor, FET or valve - you can think of that device as a variable resistance connected between the DC supply rail and the ground rail. Controlled by the input signal (RF drive), the collector/drain/anode voltage can either be pulled down towards the ground rail or allowed to rise. There is also some kind of impedance-transforming network connected between the output device and the RF load. In a valve PA this network is usually an L/C tank circuit with significant loaded Q, but in an HF solid-state PA it is more likely to be a low-Q broadband ferrite transformer. **Fig 2** shows a common equivalent circuit for all of these (practical power amplifiers may be 'shunt-fed' with an RF choke and a DC blocking capacitor but the principle is the same). To make practical PAs even more complicated to analyse, the output devices are generally operated in class AB, B or C, which means there are parts of the RF cycle when the device is not conducting at all. However, even when the active device is cut off (no current), the RF voltages at the anode/collector/drain and at the output continue to change because the impedance-transforming network gives back energy that has been stored in its inductors and capacitors. During parts of the RF cycle when the device is in or close to cutoff, the network may be able to pull the anode/collector/drain voltage up *above* the supply voltage.

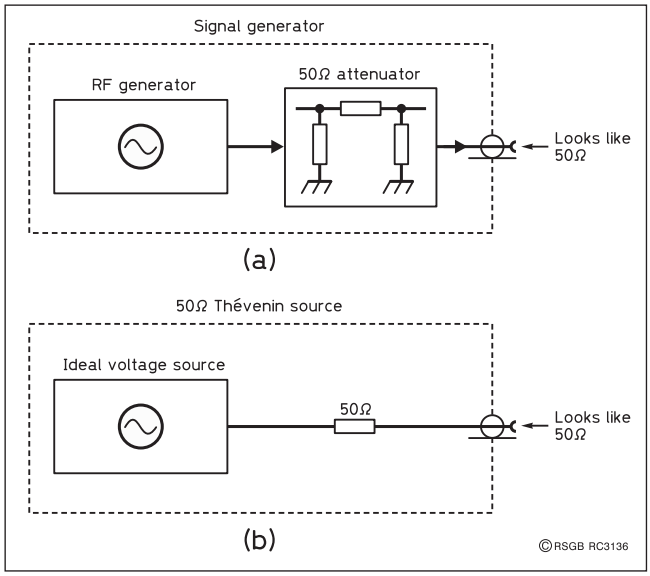

Fig 1: (a) A signal generator which includes resistive 50Ω attenuators is a good approximation to the classic Thévenin model, (b), but this model does *not* accurately represent a transmitter power amplifier.

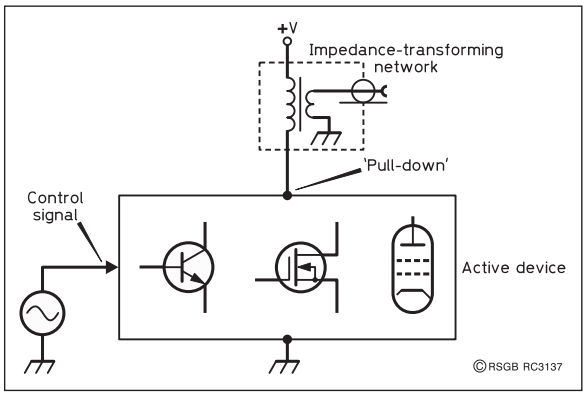

Fig 2: Various kinds of transmitter PA can be represented as a controlled 'pull-down' resistance in series with an impedance-transforming network.

All these complications make the amplifier's output impedance a very elusive quantity. The voltage and current at the collector/drain/anode are both varying from moment to moment throughout the RF cycle. At best, the output impedance can only be defined as an 'effective' value averaged over the whole cycle. At worst, you have to wonder whether the output impedance is a physically meaningful quantity at all.

What *is* meaningful is the load impedance into which the output device is operated. This determines the *load line* along which the anode/collector/drain voltage varies in response to the RF drive. **Fig 3** shows a typical set of anode voltage / grid voltage curves for a valve - similar curves can also be drawn for bipolar transistors and FETs. Each sloping line corresponds to a particular value of anode current, and the bottom line is for essentially zero anode current - the cutoff condition. Also shown on Fig 3 is a typical load line **O** - **A**. As the RF drive varies the grid voltage along the y-axis, the load line shows the resulting anode voltages and currents. You can read the instantaneous anode voltage from the x-axis, and the instantaneous anode current by interpolating between the lines. The point **O** is the zero-signal DC bias point; once you have chosen this point, it forms a pivot around which the load line can rotate. For an anode voltage

of 3000V, let's choose an idling current of about 100mA. This can be achieved with zero grid bias - check the location of point **O** on Fig 3.

The top left-hand end of the load line, point **A**, is where we go as the instantaneous grid voltage swings positive. The location of point **A** is a matter of engineering judgment. It depends on the instantaneous peak anode current, and on how low we're prepared to let the instantaneous anode voltage swing towards ground. Notice how the anode current lines begin to curve upwards at high currents and low voltages - this is the area of 'flat-topping' and distortion which we want to avoid in a linear amplifier.

The slope of the load line represents the load impedance, R_L, presented to the output device. Read that again carefully. I didn't say "the impedance of the output device" - I said the impedance *presented to it* by the outside world.

$$R_L = \frac{V_O - V_A}{I_A - I_O}.$$

Having decided where points **O** and **A** should be, we can calculate R_L and design the output transformation network accordingly. In Fig 3:

$$R_L = \frac{3000 - 300}{0.9 - 0.1} = 3375\Omega.$$

We design the output transformation network so that when it is terminated in 50Ω, the impedance it presents to the output device is R_L [2].

Notice what happens on the *negative* swings of grid voltage. These are equal to the positive swings, but they extend the load line downwards and to the right of point **O**. In class AB, B or C operation, some or all of this negative swing is into territory where anode current is practically zero - the valve is cut off. Meanwhile, the anode voltage continues to swing higher, using the energy that was stored in the impedance-transforming network in the parts of the cycle when the valve was active. This is often known as the *flywheel effect*. While the valve remains cut-off, the anode voltage can easily swing above the DC supply voltage. The valve only starts to pull its anode downwards again after the grid voltage has completed its negative swing and is coming back positive.

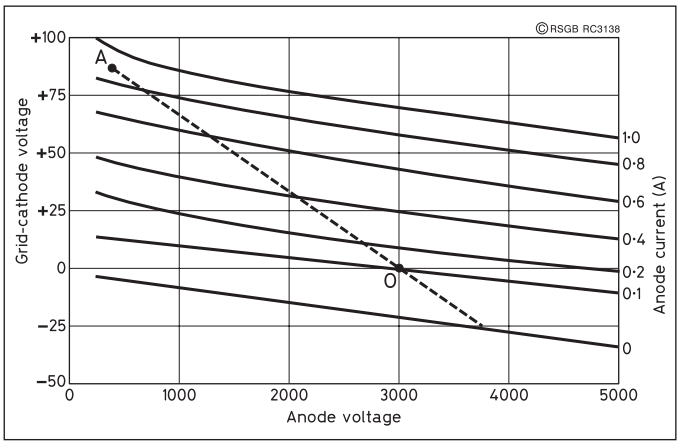

Fig 3: Typical load line for a valve. Other PA devices have equivalent voltage/current characteristics.

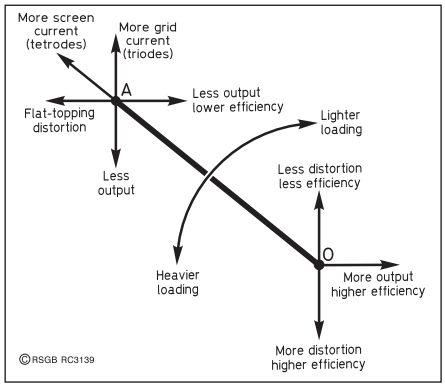

Fig 4: Effects of moving ends O and A of a load line [3].

As I said, the locations of point **O** and particularly point **A** are matters of engineering judgment. **Fig 4** summarises the various competing aspects of performance, all of which need to be taken into account and a suitable balance found [3]. The device manufacturer's recommendations take account of the parameters that must not be exceeded to avoid damaging the device, but they also reflect the manufacturer's own judgment of the balance between the competing factors shown in Fig 4. Your judgment may be different. For example, if you give a higher priority to avoiding distortion, you would avoid excessive drive which would push point **A** too far to the left, and you would also want the load line to be less steep - otherwise known as 'heavier loading'. This is the origin of the saying that for improved linearity you should find the setting that gives maximum achievable RF output, and then increase the loading a little. What you're actually doing is moving point **A** downwards, away from the non-linear region where the anode current lines start to curve significantly. With a valve PA you usually have a variable loading control, but with a solid-state PA you have to rely on a fixed choice of transformer turns ratio.

For any given valve and load line you can then predict what the power output and efficiency will be [3, 4, 5] although those techniques are beyond the scope of this short article.

As you can see, I've strayed quite a long way from the original question about the amplifier's output impedance - and that really is my whole point. You can design a power amplifier, and understand very well how it operates, without thinking about its output impedance at all (except in a few special cases that are not relevant to amateur radio). If you wish to know what effect a varying or mismatched antenna impedance will have on your transmitter, I hope you can now see that "What happens to the reflected power?" and "Is it absorbed in the output impedance of the amplifier?" are not the most useful questions to ask. Changes in antenna impedance will indeed affect the power output and efficiency, but not in any way that could easily be described as 'what happens to reflected power'.

NOTES AND REFERENCES

[1] The 50Ω source impedance becomes less and less valid as the amount of in-line attenuation is reduced, and with no attenuation it behaves like a 'transmitter' output.

[2] A network designed to transform 50Ω to a desired value of load impedance R_L will also transform that same value of R_L to 50Ω. Unfortunately, this has led some people to believe that the output impedance of the PA device actually *is* R_L - but this is a fallacy.

[3] *Single Sideband Principles and Circuits*, by E W Pappenfus, W B Bruene and E O Schoenike. First edition, McGraw-Hill, 1964.

[4] *Radio Engineering*, by F E Terman. McGraw-Hill, 1932 -.

[5] KD9JQ has written a very useful program for grounded-grid triodes which predicts the operating conditions from the characteristic curves and the load line - see 'WWW' below. ♦

WWW.

KD9JQ's grounded-grid triode software
http://sites.netscape.net/kd9jq/hamradio/kd9jq.html

The 'In Practice' web site contains links to all pages mentioned in this column, as well as a cumulative index and links to component suppliers etc.

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.

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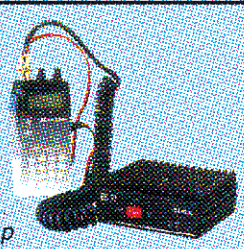

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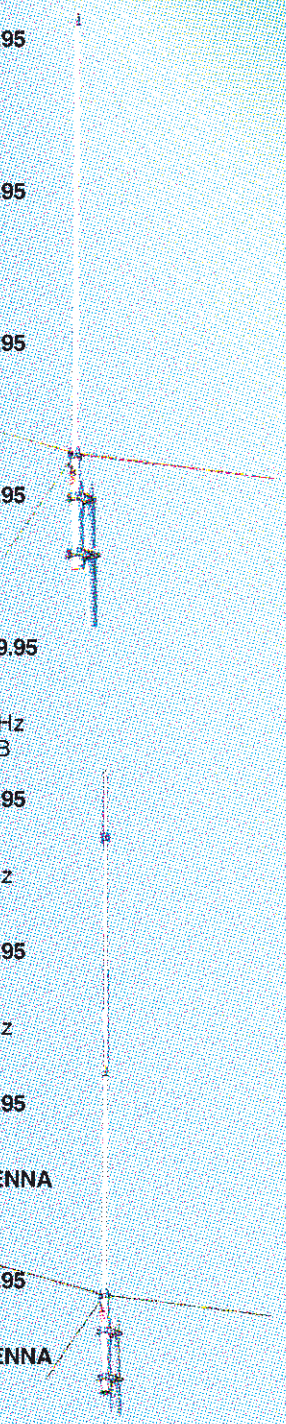

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MORE ON NVIS

THE SEPTEMBER ITEM on 'cloud-warming' near-vertical-incidence skywave (NVIS) antennas produced interesting feedback, not only from G3TNO (January 'TT', pp71 / 2).

Michael Rogers, of Lee, North Devon, who hopefully will be taking the UK amateur radio examination before long, writes: "In the early 1980s, I experimented with the type of antenna shown in Fig 1 (September 'TT' p61) for a bush hospital, fixed-frequency SSB R/T network in Central Africa. The idea came from a journal lent to me by an American pilot.

"We used mainly 20-watt transceivers in the range 5 - 7MHz, and had to battle against very heavy tropical static. Communications often proved difficult, even with a good base-station dipole or maypole. With a Land Rover in the bush, a whip was often useless, so I experimented with a multiple-folded dipole and a ground reflector. The folded element comprised three or five wires, the middle one being centre-fed. In free space, such antennas would have an impedance of 675 or 1500Ω but, with the ground reflector and low inverted-V configuration, both the three- and five-wire versions provided a reasonably good match to the 50Ω coaxial feed to the transceiver, with the five-wire version closer to the ground reflector.

"The folded element could be quickly erected between the Land Rover and a nearby tree, a metre or so above the reflector wire laid underneath on the ground. The set up was accomplished with a tape measure, a dodgy multimeter, and a 12V soldering iron. Nevertheless, these antennas provided a very impressive signal over a wide area."

Brian Otter, 9J2BO, sent along a manual describing an ambitious NVIS antenna system designed and constructed by Akira Minagawa, 9J2AM, while working as a Japan Overseas Corporation Volunteer in Zambia. The antenna was for use by the National Parks and Wildlife Service HQ at Chilanga, just south of Lusaka, for maintaining HF communications with the various game park and wildlife reserve personnel within the country. He believes the frequency used was around 8MHz. This seems rather high for a fixed-frequency NVIS system, but perhaps the nearest out-station was fairly remote from base.

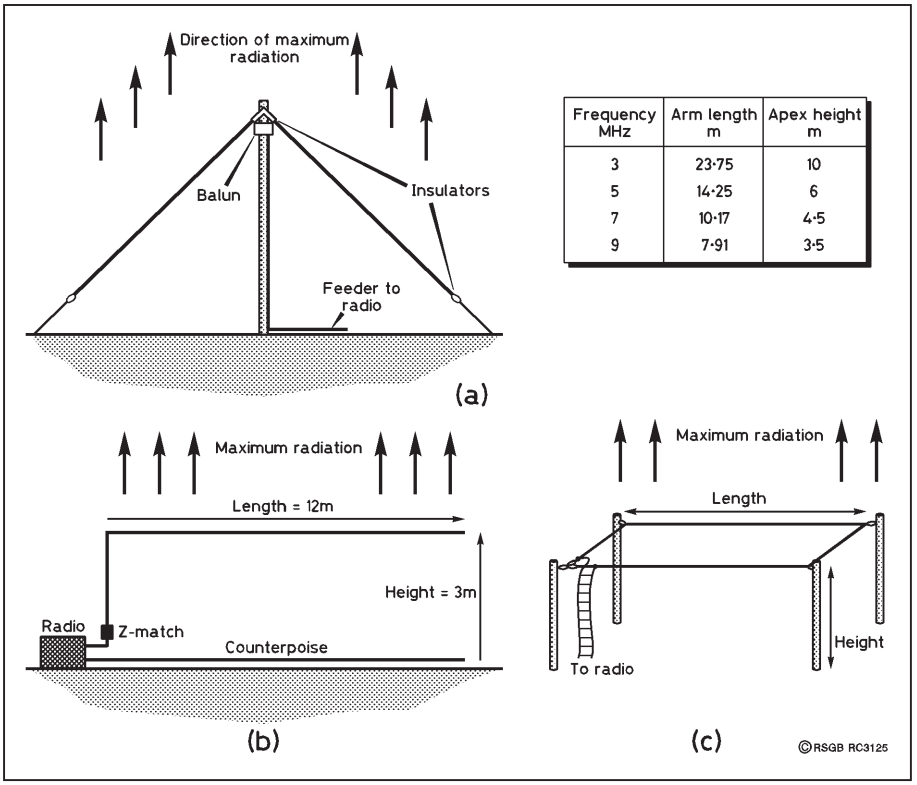
The technical manual, dated December 1999, describes an 'Upward Crossed Two-Element Yagi Antenna' mounted on a lattice tower. In effect, the antenna comprises two two-element Yagi array mounted in X fashion, the driven radiator elements 7.5m above the crossed reflectors. It is claimed the fixed array provides an upward gain of over 5dB with a non-directional horizontal pattern and providing a circularly-polarised wave which dramatically reduces fading, even if the remote station is using a simple dipole antenna.

While it seems unlikely that an amateur would contemplate building such a system, it shows the increasing importance being given to NVIS propagation for civilian and military communications. 'TT' has referred previously to the detailed article by Dr Noel Evans, GI4BDR, and Samuel Burgess 'Short-Haul Communications Using NVIS HF Radio' (*Electronics & Communication Engineering Journal,* April 1999, pp95-104). **Fig 1** shows a selection of simple antennas suitable for NVIS operation taken from this article: (a) Inverted-V antenna with dimensions for 3, 5, 7 and 9MHz (I wonder if the many amateurs using low inverted-Vs appreciate that the main radiation is upwards?); (b) a low 5MHz 'inverted-L' antenna fitted with a wire counterpoise to enhance vertical radiation; (c) a full-wave loop antenna, each side a quarter-wave in length, with height in the range 0.15 to 0.25λ. A 4:1 balun is needed for low-impedance coaxial feed.

The importance of NVIS for amateur radio emergency communications is emphasised in detailed information supplied by Paul Gaskell, G4MWO, who is secretary of the Raynet® HF Team. G4MWO has been actively propagating the advantages of NVIS. In 1999, a number of Raynet® members in north-west England began making more use of HF and conducting regular nets in which NVIS techniques were tried. This has been expanded with NVIS nets on the 1st and 14th of each month, currently using mainly 7045 and 3663kHz (higher first), both ±5kHz. Details can be found on www.raynet.demon.co.uk/raynet/HFNVIS.html

The optimum frequency for NVIS working with complete elimination of the skip zone is just below the critical frequency of the F-layer. This varies from about 2MHz at night to about 8MHz in daylight during years of high solar flux. It is possible to obtain a reasonably reliable estimate of the critical frequency by observing the skip conditions on the higher frequencies. Roughly, the critical frequency is about one third the frequency of the MUF. It can be estimated, for example, from the frequency at which strong signals are received from a distance of about 1500 miles (say Moscow) divided by 2.3. The information in **Table 1** is a useful, if only rough, guide.

G4MWO has pointed out that the all-important foF2 and E-layer frequencies (and the MUF) are available from Chilton on a near real-time basis. The Chilton Ionosonde site (www.wdc.rl.ac.uk/ionosondes/view_latest.html) requires you initially to register



Frequency MHz	Arm length m	Apex height m
3	23·75	10
5	14·25	6
7	10·17	4·5
9	7·91	3·5

Fig 1: Simple NVIS antennas as described in *Electronics & Communication Engineering Journal,* April 1999 by S J Burgess (GI4BDR) and N E Evans. (a) Inverted-V dipole; (b) 5MHz low inverted-L; (c) full-wave loop with a height of less than a quarter-wave.

Skip Distance Factors						
Distance (miles)	Factor					
0	1.0	0.8	0.7	0.6	0.4	0.35
500	1.2	1.0	0.8	0.7	0.5	0.4
750	1.5	1.3	1.0	0.8	0.6	0.5
1000	1.8	1.5	1.2	1.0	0.8	0.6
1500	2.3	2.0	1.5	1.3	1.0	0.8
2500	2.9	2.4	1.9	1.6	1.2	1.0

Table 1: Skip distance factors. Example - when the skip appears to be about 1000 miles (1.0), the critical frequency will be about 0.6 times and the MUF about 1.6 times the frequency (see text).

and asks the purpose for which you require the data. It would seem that this request can be satisfied by an answer such as 'Amateur radio interest in NVIS' etc.

There is no doubt that amateur radio use of NVIS for emergency or other purposes would be greatly facilitated by an additional small frequency allocation at about 5MHz, and it is understood that this has already been receiving the attention of Gordon Adams, G3LEQ, the RSGB Spectrum Manager.

At present, when the F-layer critical frequency is lower than 7MHz, the only band available is 3.5MHz, which is too low for optimum use of NVIS. As pointed out in the paper by GI4BDR, "daytime transmission frequencies well below the F-layer's critical value are subject to higher fading in terms of depth and frequency. During low solar activity the critical frequency in winter is higher than that in summer. Because of increased D-layer absorption in summer, path losses are higher than in winter. To ensure full 24-hour operational NVIS, frequency agility will invariably be required…".

G4MWO kindly sent me a complimentary copy of the excellent 144-page (A4 format) soft-cover book *Near Vertical Incidence Skywave Communication – Theory, Techniques and Validation*, by American servicemen LtCol David M Fiedler and Major Edward Farmer, AA6ZM, published in 1996 by Worldradio Books in California at $14. G4MWO (131 Greenfield Road, St Helens, Merseyside WA10 6SH) usually keeps a small supply for UK purchase at £10 (inc P&P). Part one includes four chapters on 'How and Why NVIS Works'. Part two has nine chapters on 'How To Do It' and part three, 'Yes, It Works!', has five chapters. Some chapters are reprints of magazine articles, but together provide a comprehensive and understandable treatise on NVIS and can be warmly recommended.

George Cripps, G3DWW, has been testing the system of crossed monopoles devised by Duncan Telfer, G0SIB ('TT' September 2001, pp61-62), from his QTH in south-west London. He writes: "I have found it very effective indeed for the range up to 300 miles. It has allowed contacts with South Coast stations previously screened by the South Downs and almost unworkable with conventional antennas. The upward gain of the crossed monopoles is quite marked. Distant interference on 7MHz from Italy has almost disappeared, while contacts with Germany, Holland, Denmark, Belgium and Northern France are solid. The earth plane here is good, being only a few feet above sea level. The power used is never more than 30-40W and the input impedance at the end of 20m of 50Ω coaxial feeder is 129Ω. The apex of the conical monopoles is at 13ft. The base of the cone is one metre across. I have been very impressed!"

MORE ON RF FILTER SWITCHING

THE DECEMBER 2001 'TT' item 'RF Switching Diodes – Devices & Faults' attracted some pertinent comments.

Harry Leeming, G3LLL, questions whether any manufacturer would be brave enough to turn the clock back and reintroduce the multi-section rotary switch. He writes: "There remains only one reliable, high-performance, long-term-proved, solution to the front-end switching of an HF receiver: a rotary switch. Solid-state devices, even if good enough when new, are subject to damage by spikes and transients. Hence many HF rigs have leaky diodes, and are not operating at their best. [As underlined in the December 'TT' (p64) by Ray Perrin, VE3FN - *G3VA*.] Relays develop contact resistance, and even when this does not result in intermittent operation, it can result in an appreciable reduction in performance. Quite apart from curing intermittent troubles, I have found, when I replaced the five FT-102 relays on the RF band, that users often comment 'It has been like using a new rig'" [For a further suggestion on the FT-102 relays see G3RZP's comments below].

G3LLL continues: "The big advantage of a good-quality rotary switch is that, as the contacts wipe over each other, they are to a large extent self cleaning. Even when oxidation does occur, curing the problem is simplicity itself. Take a 60-year-old AR88, apply a little cleaning fluid to the main band-change switch, rotate the switch, and then add a little lubricant. The contacts will then be as good as new.

"With the almost-universal introduction of band-pass front-ends in HF rigs, there is no reason why they could not be switched by a multi-section rotary switch. This approach would be rather more expensive and difficult than the use of diodes or relays but, where cost and space are not too critical, should result in top performance, together with reliability. It might, of course, entail a little operator 'brain work' to ensure the correct front end was switched-in for the band being used, but surely radio amateurs could cope with this?"

In the course of a long letter, Peter Chadwick, G3RZP comments: "I'm personally happier with a relay than an IC. The classic rig that did this was the FT-102, which is renowned for the relay problems in the front-end! People have changed relays to a different type, sometimes with lasting results. But any old-time Post Office Telephone engineer, who practised some 40 or so years ago, could have told of the problems of the dry-switching of very low-level signals. By adding a few judiciously-placed resistors around the FT-102, a small current (1mA) can be bled through the low-level contacts. Being derived from 24V (or, in one case, 300V), there is enough voltage to break down the oxide film and cure the problem with the original relays. My FT-102 incorporates this idea and still uses its original relays."

G3RZP adds: "My FT-102 also has two of the original 6146B valves, despite having taken a beating in a number of contests. Not that I would wish to change a valve unless really necessary. In 1936, my father, G8ON, bought a pair of Raytheon 6L6G valves for 2s 3d each (total 22.5p) from the then well-known G5NI shop in Birmingham. One of them is still in use as the screen regulator in my linear, with the other available as a spare. I guess I am getting the old man's money's worth out of them!"

CHALLENGES OF AMATEUR RADIO

THE DECEMBER 2001 'TT' item, 'The Challenge of Amateur Radio', recalled that the official ITU definition of our hobby includes "…a service of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique…". This brought in a number of comments showing that some readers regret the inexorable phasing out of the days when it was accepted that experience of practical construction as well as some theoretical knowledge of radio techniques were prime requirements for the majority of amateurs. Even 10 or 15 years ago, it was accepted that amateurs should be interested in circuitry and in gaining some practical experience of home construction, if only of ancillary units, antennas etc.

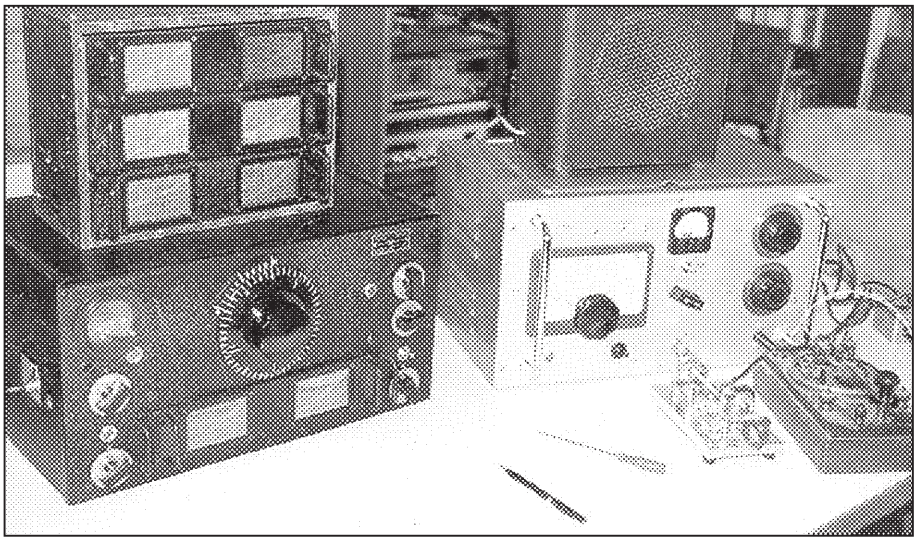
The changing face of amateur radio is most obvious to those who have recently returned to the hobby after some years when professional or domestic duties ruled out activity. The argument of those who embrace the changes is that amateur radio must face the future or lapse into a tiny community of Luddites, with national societies having much-reduced membership,

lacking the power to influence the authorities. They would be unable to continue to provide the publications and membership services that we have come to expect.

Those who still endorse at least some home construction are turning increasingly either to QRP or valve equipment. Peter Chadwick, G3RZP writes: "I have been pretty busy over the past few years with ITU work and so on (plus a spell in hospital that slowed me down a bit), but have managed this year (2001) to find time to build things. Once the remote antenna tuner and antenna selection unit was done and installed in a shed at the base of the tower, recycling G8ON's 19-inch rack bought in 1946, I got round to restoring my old HRO that can be dated to early 1939. The poor old thing had been modified over the years, including the removal of the crystal filter and substitution of a mechanical filter. I figured that on the HF bands, stability and image rejection were not going to be sufficient, by present day standards, for a top-class receiver. There was no possibility of restoring the old HRO to its original condition. The valve holders and screening cans had long gone. A rebuild with octal valves and the original crystal filter, still in my possession, was my solution.

"My line-up is 6SG7 1st RF, 6SK7 2nd RF, 6AC7 mixer, 6J5 HF oscillator, two 6SK7 IF stages, 6SQ7 AGC/detector and AF, 6SJ7 BFO/product detector, and 6V6 output, plus a VR150 voltage regulator. A point worth noting is that many of the older receivers had an appreciable signal voltage at the diode detector to minimise AM distortion. By using a pentode as BFO, some signal tapped off the diode detector using a few pF and applied to the suppressor of the BFO provides a very effective product detector without blocking the AGC-AF taken off the product detector anode.

"Once the receiver project was completed, it seemed fitting that the RSGB Low Power contest should have a 'classic entry'. The photograph shows the HRO together with a home built transmitter of traditional form constructed for the contest. Its line-up is: 6SJ7 Colpitts VFO on 1.8MHz, doubling in the anode circuit to 3.5MHz, with the anode tank circuit arranged to be series resonant on 1.8MHz (parallel resonance on 3.5MHz) to reduce fundamental breakthrough; this is coupled to a similar circuit in the grid of a 6AG7 as buffer on 3.5MHz, and doubler on 7MHz; the 807 power amplifier has 350 anode volts to provide up to 10 watts output; an STV280/40 provides voltage regulation. Relays driven by a 6V6 are energised on 'receive' to even out the power supply requirement. A 6SL7 Schmitt trigger and RAF VR54 (EB34) steering diode give key-controlled changeover. Only the 6SJ7 valve (circa 1964) was not of WWII vintage, all the others had US VT, RAF VR &VS, or Naval NR numbers. Time prevented the building of an OZ7BO electronic keyer, so I used a mechanical Vibroplex 'bug' key together with a 1915 double-current landline key in parallel to maintain the 'classic' station approach. Obviously no computer logging!



The 'classic' station used by G3RZP in the 2000 RSGB Low Power Contest. The receiver is a re-valved HRO dating from early 1939 using metal-octal valves (see text). The brass vernier fitted alongside the tuning knob was originally provided to Peter's father, G8ON, with an HRO by the RSS when, in 1944 after RAF service, he again became a Voluntary Interceptor. The HRO was returned, but the vernier plate remained. With it, the 500 calibration logging points of the PW-type dial are, in effect increased to 5000. The newly-built 10W transmitter uses, with one exception, valves of WWII vintage. One can only hope that current IC devices and semiconductors will remain available as spares in 60 years' time. On present showing they won't! The double-current 'straight' key is dated 1915.

"A 'fun' but effective rig. Built from junk, in a cabinet rescued from the garage and treated to a coat of Hammerite. Chassis bending was made easy by my good mechanical workshop with lathe, vertical mill, guillotine, bender, pillar drill, grindstone, small brazing hearth, etc.

"The LP contest was fun, although, with separate receiver and transmitter, very different from operating a modern transceiver. Additionally, on 7MHz in the afternoon, the HRO selectivity really didn't cut the mustard under today's conditions.

"I took the opportunity of checking out the common belief that the HRO tracking was flawed. I measured the tuning capacitance against dial reading every 50 divisions. I measured the padding capacitors – some were up to 50% out. However, calculation showed that, with the tuning gang and the nominal padding capacitor and the given dial calibration, the receiver could track accurately at only two points rather than the customary three points. Since the concept of three-point tracking was not published until late 1931, it is not surprising that it had not come into common use by 1933-34 when the initial design work on the HRO was carried out. More surprising that it was still not incorporated by 1939 - and possibly even later for the HRO5 or HRO7. I redesigned my HRO to achieve three-point tracking. There was some improvement, but the image suppression on the top range is still not very good, although about what would be expected. One of the biggest problems was getting the dial to take white filling in the engraving. It was reasonably successful in the end - the inner dial was done using the white thermally-conductive paste normally used for heatsinks!

"There is a lot of HRO history on the web. Correspondence with US collectors enabled me to fill in more of the story. I particularly liked the story that, after Pearl Harbor, National were told to make RAS receivers (HRO Junior with 175kHz IF) 'until told to stop' ..."

OSCILLATOR TRACKING RECALLED

THE MENTION BY G3RZP of 'three-point tracking' is a vivid reminder of how, in the past couple of decades, the basic design of high-performance HF communications receivers has changed. The use of sub-octave bandpass RF input filters, the use of independently-tuned frequency synthesisers with up-conversion to a VHF first IF, have eliminated ganged variable capacitors and the need to track the signal-frequency circuits reasonably accurately with the HF local oscillator tuned circuit. Tracking problems were most demanding in receivers with two preselector stages. These include the better classic models such as the HRO, AR88 and the Hammarlund Super Pro. With only one RF amplifier stage, the input resonant circuit is damped by the antenna and could usually be brought into resonance by means of an 'antenna trimmer'.

In some early superhet receivers, the variable capacitor for the oscillator had a different maximum value or different 'law'

from the sections tuning the signal frequency circuits. This soon gave way to the use of identical sections in which it was necessary to modify the law of the oscillator section, so that its resonant frequency was higher than the signal frequency by the value of the first intermediate frequency. This was achieved by using different values of inductance and parallel capacitance (trimmer) and adding a series capacitance (padder) as shown in **Fig 2.**

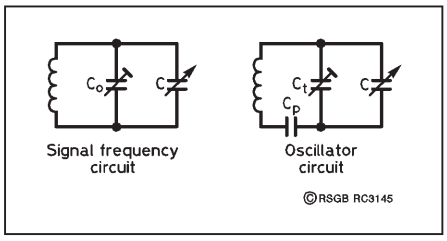


Fig 2: Basic arrangement for tracking a local oscillator with the signal frequency circuit. C_o and C_t are trimmers. C_p is the padding capacitor (usually variable)

As described, for example, in the 'Communication Receivers' section by F W J Sainsbury of the Marconi Company in the *Radio & Television Engineers' Reference Book* (Newnes, 1954, 56, 60, 63): "It is not possible to obtain accurate tracking over the whole of the variable capacitor sweep, but the method gives accurate tracking at three points. Probably the best tracking points are those which give the minimum value of peak-tracking error between the tracking points." He shows how the most appropriate three alignment points can be calculated for a given signal frequency range using fairly straightforward mathematics, although there is no space to reproduce the full process here. Perhaps the simplest solution is to take the geometric mean (square root of the highest times the lowest frequency) for the centre alignment point, using standard practice for the conventional lower (padding) and higher (trimming) points. Accurate alignment is more important for the lower frequency bands. An example of three-point tracking for a signal frequency range of 1.5 to 2.75MHz with an IF of 1.2MHz is shown in **Fig 3.**

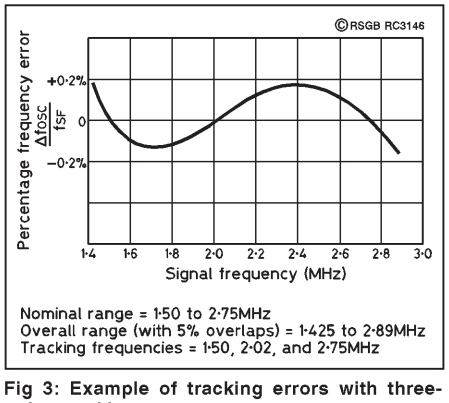


Fig 3: Example of tracking errors with three-point tracking.
(Source: *Radio & TV Engineers Reference Book*)

F W J Sainsbury points out that the theoretical calculation of the total image protection of a receiver may be modified by ganging errors and possibly by a small amount of reaction [positive feedback]. "The effect of the latter will be to improve the image protection at the ganging points, but may degrade the protection at other points."

It should be noted, when restoring an old high-performance receiver, as G3RZP showed, that optimum results would be achieved only if the front-end was designed for three-point tracking. It would seem that National depended to some extent on the SLF (straight-line frequency) law of its four ganged variable capacitors.

BATTERY-LIFE EXTENDER

C STANFORTH in the December 2001 issue of *Electronics World* (p957), provides a novel pulsing-type battery life extender: **Fig 4**. Although intended for torches and bike-lamps, it seems possible that other applications could be found in amateur radio. A CMOS-type 555 timer IC (7555) acts as an astable driving a transistor switch, permitting a 2.5V bulb or other load to be powered from a 3.5V battery, yet providing virtually constant illumination as the battery voltage falls to about 1.8V. As the battery voltage falls, the IC timer-regulator increases the pulse-width-modulator (PWM) circuit's 'on'-time so that the lamp is run constantly at the equivalent of a 1.8V battery voltage. It is pointed out that this increases both lamp and battery life.

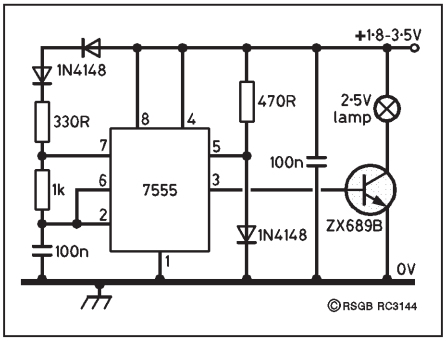


Fig 4: Battery-life extender. As the battery voltage falls, this regulator increases the 'on' time, so that the 2.5V bulb's brightness stays roughly the same (1.8V equivalent).
(Source: G Stanforth, *Electronics World*)

HERE & THERE

PETER CHADWICK, G3RZP, feels that a point often overlooked in the quest for ever-higher intermodulation performance in receivers, is that much-improved IMD is of no use unless balanced by low phase noise. [A point underlined by Colin Horrabin, G3SBI, in connection with his super low-noise oscillator in 'TT', July 1994. See also 'TT' January 1995 for a general discussion on the effect of oscillator noise on receiver performance.]

G3RZP gives as an example that a receiver with a 10dB noise figure, a 1kHz bandwidth and a +20dBm intercept point, has a noise floor of -134dB, giving a spurious-free dynamic range of 102dB. In order that phase noise is not dominant, the oscillator noise needs to be below -134dBm when the signals 102dB higher are applied – so the phase noise needs to be at least -132dBc/Hz at the same offset as the closer of the signals causing IMD. Even then, the noise floor will be of the same magnitude as the IMD product. A similar argument can be applied to both internal and external spurious responses, although not to the same degree unless they are many in number, as occurs in many DDS schemes. I have made some rough measurements here, but have not yet written them up. They suggest that the signal levels on quite large antennas (5-element Yagi at 62 ft up on 14MHz) are such that IMD is not much of a problem if the input intercept exceeds about +14dBm or so." The G3SBI approach has recently been invesitgated by Wes Hayward, W7ZOI, and will be further discussed in a future 'TT'.

MICHAEL O'BEIRNE, G8MOB, draws attention to the recent sell-off by auction of high-cost test equipment etc as the result of the severe reduction in demand for personal mobile telephones and the like. A recent series of auctions in the midlands sold off equipment from two UK Sony factories that new must have cost in the region of £30m, including current test equipment by R&S, Agilent/HP etc, some in their original, unopened boxes, and which will have been paid for by British taxpayers in the form of development grants. A lot of it went abroad to set up new factories. Few of the best goodies are likely to turn up in the UK surplus market.

RICHARD HORTON, G3XWH, commenting on the long-established G3PDM VFO ('TT' November 2001), points out that, although this design was first published in 'TT' April, 1977, it must have been designed some years earlier. As a student at Durham University (where G3PDM worked at the time) he recalls that at a meeting of the Durham City ARS in 1970 or at the latest 1971, G3PDM handed out copies of the circuit diagram of this stable design. Mike Hall, G3USC, has also commented on this and related VFO designs and I hope to refer to his letter in a future 'TT'.

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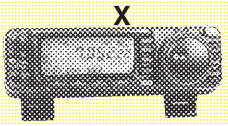
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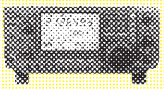
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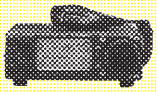
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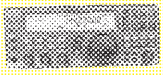

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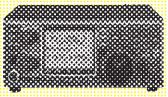

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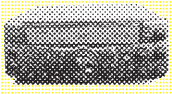

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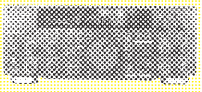

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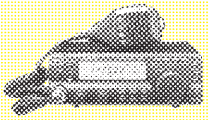

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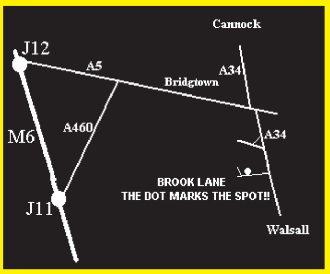

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SGC	SGC-2020	HF TRANSCEIVER	£450.00
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SONY	ICF-SW77	FM/SW/MW/LW PORTABLE AS NEW!	£250.00
SONY	SW-100E	FM/SW/MW/LW PORTABLE	£90.00
ST3 HEADPHONES		DELUXE HEADPHONES	£45.00
SYNCRON	PS-1220VU	20 AMP POWER SUPPLY	£60.00
TAGRA		22AMP POWER SUPPLY	£70.00
TENTEC		SCOUT + MODULES	£350.00
TIMEWAVE	DSP-9+		£125.00
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TOKYO HY-POWER	HL-37V	LINEAR AMPLIFIER	£60.00
TONNA	7000E	TERMINAL	£130.00
TRIO	R-2000	RECEIVER + CONVERTER	£300.00
TRIO	TR-9130	2M ALL MODE TRANSCEIVER	£250.00
TRIO	TRIO 9130	2M MOBILE MULITMODE TRANSCEIVER	£250.00
TRIO	TS-780	DUAL BAND BASE TRANSCEIVER	£275.00
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
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YAESU	FRG-100	HF RECEIVER	£300.00
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YAESU	FRT-7700	ATU MINT!	£75.00
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YAESU	FT-101ZDmk111	HF TRANSCEIVER inc FM	£375.00
YAESU	FT-225RD	2M BASE MULTIMODE CLASSIC!	£399.00
YAESU	FT-23R	HANDY TRANSCEIVER	£180.00
YAESU	FT-2500M	MOBILE TRANSCEIVER	£190.00
YAESU	FT-290RMK1	2M ALL MODE TRANSCEIVER	£180.00
YAESU	FT-290RMK11	MOBILE 2M MULTIMODE TRANSCEIVER	£275.00
YAESU	FT-411E	2M HANDY TRANSCEIVER	£99.00
YAESU	FT-41R	HANDY TRANSCEIVER	£120.00
YAESU	FT-470	2/70CM HANDY TRANSCEIVER	£140.00
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YAESU	FT-736R	2m/70cm/6m TRANSCEIVER	£750.00
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YAESU	FT-767GX	HF BASE 100watt built-in ATU	£599.00
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YAESU	FT-790R	70CM MULTIMODE MOBILE TRANSCEIVER	£225.00
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YAESU	FT-80C	0-30MHz COMMERCIAL TRANSCEIVER	£375.00
YAESU	FT-8100	2/70cm MOBILE TRANSCEIVER	£249.00
YAESU	FT-811E	70CM HANDY TRANSCEIVER	£99.00
YAESU	FT-847	HF / 2 / 6 / 70cm BASE TRANSCEIVER	£999.00
YAESU	FT-900	HF TRANSCEIVER	£550.00
YAESU	FT-902DM	HF BASE TRANSCEIVER	£400.00
YAESU	FT-920AF	HF/6M BASE WITH DSP	£899.00
YAESU	FT-980	HF TRANSCEIVER	£495.00
YAESU	FT-990AC	HF BASE STATION TRANSCEIVER	£750.00
YAESU	FT-ONE	HF BASE TRANSCEIVER	£450.00
YAESU	FTV-901	TRANSVERTER Inc 2m Mod	£165.00
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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
YUPITERU	MVT-7000	HANDY SCANNER	£99.00
ZETAGI	B-132	10 / 11m LINEAR AMPLIFIER, MAINS	£60.00

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Members' Advertisements

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

FOR SALE

BUTTERNUT HF9V 9-band vertical, cost £300 new, accept £100 ovno. Watson W-220 SWR/power meter, 1.6 - 200MHz, £20. Kent Morse tutor, almost new, £10, prefer buyer inspect and collect Butternut due to size. Jim, M0MAC/M1CUC, QTHR, 01708 340 304 (Romford).

TEN-TEC Argosy SSB/CW tcvr with ATU and PSU, £225. Ten-Tec Century 22 CW tcvr, £120. Yaesu FT-101E SSB/CW tcvr, £25. Prefer buyer collects. Jim, G3ZQC, QTHR, 023 8076 0960 (Southampton).
E-mail: jim_smith@chelway.prestel.co.uk

YAESU FT-847 160m - 70cm, all modes fitted, Collins SSB filter and 400Hz CW filter, boxed, mint, cost £1400, accept £1050 ovno. Diamond GSV-3000 30A linear PSU, mint, £99. MFJ-949E tuner, mint, £89 or £1200 the lot. 024 7641 5815 (Coventry).
E-mail: m5fra@btinternet.com

23cm tvtr/amplifier. Tvtr 2m IF, 2x2C39 cavity amplifier, PSU, aluminium case. Professionally built. Please call for details. 01953 456 101(Attleborough).
E-mail: r.greengrass@virgin.net

BUNGALOW nr Tintagel, Cornwall, indoor loops LF & HF bands 2m Cushcraft 17-ele Yagi 13-ele Cushcraft Yagi 2m new 70cm vertical, 2 x 10m FM rigs 10-15-20m vertical, 5-ele 6m Yagi. Telephone for prices, 07974 892 179.

BUSH model IBX-202 Internet unit with keyboard, PSU, all leads, instructions, complete, £30. G3IJL, QTHR, 020 8749 1454 (London).

CARAVAN: ideal portable shack or family caravan. Used in last VHF NFD. High specification: 15ft, 5-berth, tables at each end, hook-up lead, new battery, four mains sockets, central heating and cooling system, double-glazed, fly nets, sun-screens, 3-burner hob, fridge, separate shower/toilet room, Porta Potti, good tyres, spare wheel, security device, all original mans, extras, £1800 ono. 01953 456 101 (Attleborough).
E-mail: r.greengrass@virgin.net

DRAKE TR7 and PS7 PSU c/w AM and CW filters, £350. MS7 spkr, £35. MN7 ATU, £100. Kenwood TS-711E 2m multimode base station, boxed, £375. Kenwood TS-811E 70cm multimode base station, boxed, £375 both in exc cond. Trio 9R59DE, £60. Yaesu FT-101ZD FM, £250. Yaesu FT-One c/w FM board, filters, £450. Paul, G4CCZ, 01932 342 927 (Woodham).
E-mail: g4ccz@6metres.com

EDDYSTONE EC10 rcvr, £50. Yaesu YH-55 phones, £10. Microset 13.5V 24A PSU, mint, £45. Cushcraft R7000 vertical exc cond, £150. 023 9226 5101 (Waterlooville).
E-mail: lears@tesco.net

FT-101ZD, AT-230, good condition, seen working, £275, will split. G3PQC, 01252 664 694 (Farnborough).
E-mail: dougturkey@aol.com

HEIL HC5 headset with Kenwood or Yaesu adapter, 8ft, switch, cost £160, sell £85. Exchange for 4m SSB tcvr or tvtr or buy either outright. Icom T8E 6m/2m/70cm, £160. 01462 435 248 (Hitchin).
E-mail: tm.rose@thersgb.net

ICOM 706 II DSP unit, SSB narrow filter. Voice synthesiser, mobile kit, £600. Heatherlite Explorer HF linear 80-40, 20-15, 10m bands, £550. Alan, G4YYD, 0161 797 7893 (Bury).

ICOM 706 MkIIG with mic, man in original box used 6 months on listening only, 1 year old. MFJ-1798 multiband aerial, 1 year old (buyer dismantles). Fibreglass vertical 2m-6m-70cm, 1 year old. Watson W-25A variable power unit, 1 year old. NATO 2000, 200ch tcvr on 10m with 2 mics & man, old but in gwo. Also 3 2½in diameter steel poles, various lengths & other bits and pieces, all go for £950 ono. Phone 07956 092 594 10am - 6pm or 01376 552 490 after 6pm (Braintree).

ICOM 821H 2/70 multimode as new, boxed, man, £695. Swan Astro 103BX HF tcvr, 100W, dual VFO, mint, £325. Oscar 40 downlink converter and dish, unused, £200. Mast P40 with ground post, good usable condition, can arrange delivery, £250. Wanted Icom 756PRO, must be as new and boxed. Wanted Ten-Tec RX-340, if you have bought one and changed your mind, cash waiting. 01708 374 043 (Romford).
E-mail: g3rcq@supanet.com

ICOM IC-T81E quadband h/held FM tcvr, with Nicad, charger, hand strap, belt clip, antenna and soft case, boxed, 6m whip, man, vgc, £230. 01202 460 174 (Poole). g0faj@freenet.co.uk

ICOM R-100 rcvr, boxed with mobile mount, superb portable rcvr, 12V DC only, £275 ono. phone Nick, G0SMI. 01280 847 980 (Buckingham).

KENWOOD R-1000 with man, £100, good cond. Kenwood station monitor SM220, £100, never used. 01557 330 048 (Kirkcudbright).

KENWOOD TS-50 HF tcvr, AT-50 auto ATU, switch-mode PSU, £690. Yaesu FT-530 VHF / UHF h/held, £175, good cond, boxed. G3TSO, 01451 821 955 (Bourton on the Water).
E-mail: g3tso@aol.com

KENWOOD TS-530SP, excellent condition with external spkr SP-230, mic MC-35, man, in original cartons. Can arrange demo if required, £350 ono. Kenwood SM-220 station monitor scope with man, £100 ono. 023 8040 3451 (Southampton).
E-mail: pete-g3emf@bigfoot.com

LIFEBOAT radio, modern solid-state, three channels, Skanti (Denmark) 'Marinetta', £60. Mizuho 20m h/held, £110. Kenwood R-600 general coverage SWL rx (no h/book), £100, all gwo. All plus p&p, sell or exchange military gear - see 'wanted'. John, G3GTJ, 01963 240 319 (Castle Cary).

MICROSET power amplifier pre-amplifier 1 - 7W in, 50W out, brand new, boxed, never used, £65, to include post. Model R-50 solid state, new price is £89.95. Instruction man for FT-101ZD, as new, £6.50, to include postage. Datong D70 Morse tutor exc cond, £35 inc post. Ferrell's Frequency Guide, brand new, unwanted gift, 12th edition, £12.50 inc of post, was £22.49. 01443 437 345 (Rhondda).

RACAL RA-17L, restored with full set of valves and spare VFO unit, h/book, rack mounting, £250. 01276 513 450 (Camberley).

TRANSFORMERS, various voltages, 12V - 60V, all rated at 40A, SAE for details, G3VYN, QTHR, 01508 499 423 (Hempnall).
E-mail: mell8866028@aol.com

TS-430S vgc, filters, h/book, MC-60 desk mic, pwr lead, £325, buyer collects. TB3 good cond, a gift at £100, buyer collects. 01234 824 741 (Bedford).

YAESU FT-290 II 2m portable £250, FL-2020 matching amplifier, £40. FT-690 II 6m portable, £250. FL-2060 matching amplifier £40. FT-790 II 70cm portable, £250. FL-2020 matching amplifier £40. FT-767GX c/w 2m and 70cm modules as new, £550, all in original boxes. Paul, G4CCZ, 01932 342 927 (Woodham).
E-mail: g4ccz@6metres.com

YAESU FT-290R Mk1 2m multimode, vgc, man, charger £125. 01284 755 333 (Bury St Edmunds).

YAESU FT-290R2, charger etc, £210. FT-102 HF tcvr, £180. Kenwood TH-22E 2m h/held, dual charger, £85. Phil, M0AYB, 01900 825 207 (Cockermouth).
E-mail: xenophon@ukonline.co.uk

YAESU FT-7, QRP tcvr, 80-10m with Yaesu FL-110 linear amplifier. Good cond, £225 ono. 01179 640 809 (Bristol).
E-mail: apeter55@hotmail.com

YAESU FT-726R 2/6/70, boxed, mans, £350. FRG-8800 HF rcvr, man, £125. Both good cond. G1PXM, QTHR, 01252 650 494 (Aldershot).
E-mail: roger.blakeway@btopenworld.com

YAESU linear FL-7000, £600. R107, working order, lots of info, £100. Panda Cub, extremely good condition, works, £100. Eddystone 830/7, works very well, condition like new, with plinth spkr, original man, £300. Mains PSU for Eddystone 40A, £50. Heavy items, prefer buyer inspects and collects. 01269 871 382 (Llanelli).

WANTED

ALL SOE WWII suitcase radio sets wanted by private collector. I am also interested in similar items from the 1950s / 60s. Bill, 020 8505 0838 (London)

CENTRAL Electronics 200V tx in gwo and cond, but will consider anything. Good home offered and will collect. 01434 633 913 (Hexham).
E-mail: simon@nomis.co.uk

EARLY crystal and one-valve sets wanted, all early valve equipment is of interest including valves, speakers, components and catalogues. Very keen for early Marconi items, still want a good Hallicrafters SX42 or similar top-end valve comms rcvr. G4ERU, QTHR, 01202 510 400 (Bournemouth).

23cm equipment SSB Electronic masthead preamp, coax, relay, homebrew amp, please contact John, 020 8561 3837 (Hayes).
E-mail: john@pepps.demon.co.uk

70cm mode FEX-767-7 for FT-767GX tcvr. Phone 01237 476 794 (Bideford) preferably evenings.

AIR band rcvr model R-532 circuit diagram or man required. TNC-320 Kantronics modem. PacComm fitted with enhancement board, software required, will supply floppy discs. 01904 400 394 (York).

COLLINS S-line equipment wanted, 75S-3B or C, 32S-3, 312B-4, 312B-5, 516F, KWM2-A or any other good-condition equipment. Paul, G4CCZ, 01932 342 927 (Woodham).
E-mail: g4ccz@6metres.com

DISABLED fan of old days seeks QSLs, log books, etc, also British magazines pre-1960, *QST* pre-1951, *CQ* 1945-1970. Any recordings of short-wave pre-1960. Mike, 8 Windsor Road, Reydon, Southwold, Suffolk IP18 6PQ.

DRAKE TR-7A extender boards urgently required to repair my rig. Borrow or buy. GM3NIG, QTHR, 0141 639 7700 (Glasgow).
E-mail: dennis@gm3mig.fsnet.co.uk

HANDBOOK for Pye UHF pocketfone PF-5004, xtal units for Pye PF9 and/or complete PF9 rx, also other Pye pocketfones. WHY? 01206 842 435 (Colchester).
E-mail: johnbryancook@hotmail.com

KENWOOD SW-2100 SWR/power meter, Kenwood TH-28E both must be mint condition and boxed, cash waiting, will collect, call John, M5JON. 01454 326 869 (Bristol).
E-mail: jedmunds@tinyworld.co.uk

KENWOOD UT-10 1200MHz unit for TS-790. 01276 475 338 (Bagshot).
E-mail: pfhutchinson@ntlworld.com

MUTEK front end with fitting instructions also helical rubber duck antenna wanted for Yaesu FT-290 Mk1. 01455 449 602 (Hinckley).

OPERATING h/book for Kenwood 940 tcvr £20 + postage offered. Phone anytime between 9am and 9pm excluding Sunday morning. G4KPB, 01204 575 345 (Nr Bolton).

PARTS to complete a resurrected homebrew project. A 9MHz crystal filter with matching crystals, IQD IOXF 90H2.4 or similar. An HF linear amplifier, Cirkit 41-00903 (15W) or similar, or sources of supply. G3SRM, QTHR, 0116 277 4276 (Leicester).
E-mail: stan.hulme@btinternet.com

RACAL R1772 remote rcvr chassis, must be complete. G3LBA, 01865 821503 (Abingdon).
E-mail: robin@g3lba.freeserve.co.uk

RACAL TA-944 HF amplifier and PSU, also Racal manpack radios Squadcal Mk2, Comcal or similar and related equipment. John, G3GTJ, 01963 240 319 (Castle Cary).

RESLO ribbon mic. In good cond, sensible price please. Also pre-amp for Reslo mic. Mike, G4MJA, 0191 389 2822 (Chester-le-Street).

CONGRATULATIONS

to the following
whom our records show as having reached
50 or 60 years' continuous RSGB membership this month:

50 years		*60 years*	
G3IEW	Mr S J Heard	G2HKU	Mr E H Trowell
G3JTJ	Mr T Jones	G3BWX	Maj A L Fayerman
		G3DRN	Mr E G Allen
		G3GYE	Mr P T Pitts
		G3HYJ	Mr O F Simkin
		G8LOK	Mr L E Currington

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

TX that goes with Trio JR-310 rcvr, also circuit diag or man for rcvr, beg, borrow or steal. G3JJU, 01252 615 831 (Fleet).

WANTED h/book or service man for Trio 9R59D5 general coverage rcvr. All costs reimbursed, please contact Tony, G0MQG, 01603 744 197 (Norwich).
E-mail: g0mqg@talk21.com

Rallies & Events

3 FEBRUARY 2002

SOUTH ESSEX ARS Rally - The Paddocks, Long Road, Canvey Island, Essex (at the southern extremity of the A130). OT 10.30am. Radio, computer and electronics, CP free, DF, C (home-made), MT, but book before midday, please. Brian, G7IIO, 01268 756 331. [www.southessex.ars.btinternet.co.uk]

10 FEBRUARY 2002

CAMBRIDGE & DISTRICT ARC Annual Radio & Computer Rally - Lordsbridge Arena, Wimpole Road, Barton, near Cambridge. From M11 jn 12 (A603) follow signs. OT 10am, £2, disabled £1.50, with concessions. CBS, B&B, C, LB, CP free. John, G0GKP, 01954 200 072 or j.bonner@ntlworld.com

HARWELL ARS Radio and Computer Rally - Didcot Leisure Centre, Mereland Road, Didcot, signposted from A34. OT 10.15 / 10.30am, £1.50. TI on S22, CP, TS, B&B, SIG, LB, C, DF. Ann, G8NVI, 01235 816 379 or ann.stevens@btinternet.com

NORTHERN CROSS Radio Rally - Thornes Park Athletics Stadium, Wakefield, W Yorkshire. Just out of town on the Horbury Road. Easy access from M1 jns 39 and 40 - well signposted. OT 10.15/10.30am. TI on 2m and 70cm, B&B, MT. John, G7JTH, 01924 251 822 or g7jth@wdrs.org.uk [www.wdrs.org.uk]

24 FEBRUARY 2002

SWANSEA ARS Amateur Radio & Computer Show - Swansea Leisure Centre, on the Swansea-Mumbles A4067 coast road. OT 10.30am. TS, B&B, TI on S22 via GC4CC, LB, C. Roger, GW4HSH, 01792 404 422.

6 MARCH 2002

SURREY IEE MEETING - 7pm, free admission. 'History of the Croydon Tramlink', by Jim Snowdon, Tramlink. John Stevens, jstevens@iee.org

9 MARCH 2002

CRYSTAL PALACE & DARC Spring Fair - St John's Hall, Sylvan Road, London SE19. OT 10.30am, £1 (inc free drink), under 16s free. C. Bob, G3OOU, 01737 552 170.

10 MARCH 2002

WYTHALL RADIO CLUB 17th Radio & Computer Rally - Wythall Park, Silver Street, Wythall, on the A435 2 miles from M42 jn 3. OT 10am, £1.50. TS, LB, C, B&B, TI on S22, free park-and-ride. Martin, G8VXX, 0121 474 2077 (eve), fax 0121 742 3471 (oh), or enquiries@wrcrally.co.uk [www.wrcrally.co.uk]

17 MARCH 2002

BREDHURST R & TS Rainham Radio Rally - Rainham School for Girls, Derwent Way, Rainham, Kent. OT 9.30/10am, £2. TS, SIG, C, Microwave ATV, TI on S22. Martin, M0AAK, 01634 365 980 or martinm0aak@yahoo.co.uk [www.the-brats.com]

NORBRECK Amateur Radio, Electronics & Computing Exhibition - Norbreck Castle Exhibition Centre, Blackpool. OT 10.45/11am, £3, OAPs £1.50, under 14s free. TS, B&B, RSGB, CP free, DF. TI on S22. MT. Peter, G6CGF, 0151 630 5790.

20 MARCH 2002

SURREY IEE MEETING - Visit to Surrey Satellite Centre, University of Surrey. Pre-registration required through Abhaya Sumanasena, abhaya@iee.org

23 / 24 MARCH 2002

LONDON COMMUNICATION & 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). RadioSport 01923 893 929. [www.radiosport.co.uk]

7 APRIL 2002

45th NORTHERN MOBILE RADIO & COMPUTER FAIR - Sports Hall, Harrogate Ladies' College, Clarence Drive, Harrogate. Gerald, G0UFI, 01765 640 695. [www.harrogaterally.co.uk]

14 APRIL 2002

LOUGH ERNE ARC Annual Rally - Killyhevlin Hotel, Dublin Road, Enniskillen. OT 12 noon. Herbie, 028 6638 7761 or Frank, 028 6632 9507.

18 APRIL 2002

WORLD AMATEUR RADIO DAY 2002 - theme 'Amateur Radio: continuing innovation in communications technology'.

21 APRIL 2002

YEOVIL & DARC 18th QRP CONVENTION – Digby Hall, Hound Street, Sherborne, Dorset. OT 10am. LEC, C, TS, B&B, TI on S22 by GB2LOW. Derek, M1WOB, 01935 414 452, m1wob@tiscali.co.uk

26 - 28 APRIL 2002

53rd INTERNATIONAL DX CONVENTION - Visalia, California. [www.qsl.net/visalia2002]

27 APRIL 2002

CORNISH RAC International Marconi Day - John, G4LJY, QTHR.

28 APRIL 2002

ALDRIDGE & BARR BEACON ARC Surplus Radio & Electrical Sale - Aldridge Community Centre, Anchor Meadow, Middlemore Lane, Aldridge, Walsall. OT 10.30am. John, G0SWZ, 01922 548 014.

6 MAY 2002

DARTMOOR RADIO CLUB Radio Rally - Ron, G7LLG, 01822 852 586.

MID-CHESHIRE ARS Rally - David, G4XUV, 01606 77787.

WEST WALES AMATEUR RADIO & COMPUTER RALLY - Ray, GW7AGG, 01686 628 778, fax 01686 621 880 or mwmg01@aber.ac.uk

11 MAY 2002

YORKSHIRE DX CLUSTER SUPPORT GROUP Rally - John, G3LZQ, g3lzq@john-dunnington.freeserve.co.uk

19 MAY 2002

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

22 MAY 2002

SURREY IEE MEETING - R Longman, rlongman@iee.org

26 MAY 2002

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

WEST MANCHESTER RC 6th Red Rose QRP Festival - Les, 01942 870 634 or g4hzj@btinternet.com

5 JUNE 2002

SURREY IEE MEETING - John Stevens, jstevens@iee.org

15 / 16 JUNE 2002

INTERNATIONAL MUSEUMS WEEKEND - Harry, M1BYT, 0113 286 6897 or harry_m1byt@ntlworld.com

16 JUNE 2002

EPSOM Radio & Electronics Fair - Paul, M0CJX, m0cjx@lineone.net

NEWBURY & DARS Boot Sale - Mark, M0CUK, 01635 36444. [www.nadars.org.uk]

23 JUNE 2002

MID-LANARK ARS Scottish Convention - Elvin, GM8BBA, 01698 748 616 or elvin8bba@blueyonder.co.uk

30 JUNE 2002

CITY OF BRISTOL RSGB GROUP Longleat Amateur Radio & Computer Rally - Ron, G4GTD, 0117 985 6253 or ronford@g4gtd.freeserve.co.uk [www.longleatrally.co.uk]

13 JULY 2002

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

21 JULY 2002

HULL & DARS 9th Humber Bridge Radio Rally - Leigh, G0UBY, leigh@sydney.karoo.co.uk

McMICHAEL RALLY & BOOT SALE - Dave, G4XDU, 01628 625 720 or g4xdu@amsat.org [http://go.to/mcmichaelrally]

26 - 28 JULY 2002

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

28 JULY 2002

COLCHESTER RA Amateur Radio Rally & Computer Fair - Ron, G4JIE, 01206 826 387 or ron@g4jie.freeserve.co.uk [www.g3co.ccom.co.uk]

11 AUGUST 2002

FLIGHT REFUELLING ARS Hamfest - Keith, G1VHG, 01202 577 937 or keithg1vhg@netscapeonline.co.uk [www.qsl.net/g4rfr]

8 SEPTEMBER 2002

LINCOLN SWC Hamfest - Dave, 07961 961 494.

14 / 15 SEPTEMBER 2002

TRANSMISSION 2002 - John 01634 832 501.

15 SEPTEMBER 2002

BARRY ARS Welsh Amateur Radio Show - Richard, GW4BVJ, 01656 658 830 or 07971 017 148.

20 / 21 SEPTEMBER 2002

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

13 OCTOBER 2002

NORTH WAKEFIELD RC Radio Rally & Computer Fair - 01924 824 451. [www.nwrc.org]

23 / 24 NOVEMBER 2002

LONDON COMMUNICATION & COMPUTER SHOW - RadioSport 01923 893 929. [www.radiosport.co.uk]

1 DECEMBER 2002

BISHOP AUCKLAND RAC - Mark, G0GFG, 01388 745 353 or Brian, G7OCK, 01388 762 678.

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.

SILENT KEYS

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

G0HES	Mr P Bowers	08/12/01
G0UHN	Mr R Seabourne	06/12/01
G0WSL	Mr J W Sharp	27/11/01
G1ORD	Mr W J Roberts	
G2VJ	Mr R A Wybrow	
G3GRX	Mr E Simpson	27/11/01
G3NQE	Mr E G Jones	
G3TZP	Mr I E Rodwell	08/12/01
G3YVO	Mr R Hodges	23/11/01
G4AHF	Mr R Ashall	
G4ENQ	Mr F C Grant	
G4VKA	Mr K P Kozma	16/11/01
G4WGL	Mr P Whitehouse	14/11/01
G6EJS	Mr W M Bond	07/05/01
G6GWV	Mr J Hopkinson	27/03/01
GM4CUB	Mr R H Paterson	14/10/01
GW3JAZ	Mr B Poole	23/11/01
GW4DEX	Mr F N Howard	06/10/01
M1TED	Mr E J Roberts	07/11/01
MW0CFL	Mr A Foxall	20/11/01
RS94569	Mr T W Foster	27/11/01
RS94963	Mr I Harrison	27/05/01

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?

9 Feb	GB2RAF: Royal Air Force. Norfolk. LH2 (G4PSH) GB5TT: Contest C/S easy to send. Ingatestone, Essex. LH (G4UHM)
22 Feb	GB0GCH: Global Connections Hautbois. Norwich, Norfolk. LH2 (G4ARN)

Club & Regional NEWS

Region 1: Scotland West & Western Isles

No club details submitted.

Region 2: Scotland East & the Highlands

COCKENZIE & PORT SETON ARC

15, Radio check night, John, GM7OLQ. Bob, GM4UYZ, 01875 811723.

Region 3: North West

MID CHESHIRE ARS

6, Activity night & committee meeting. 13, Digital modes demo, Peter, G8HAV. 20, VHF on air. 27, HF on air. Niall, G0VOK, 01606 871413.

STOCKPORT RS

5, VHF demo, inc participation in UK 2m Activity Contest. 19, The G3FYE Lecture: Adventure Radio, Richard Newstead, G3CWI. David, M1ANT, 0161 4567832.

THORNTON CLEVELEYS ARS

4, Guards Traditions. 11, Technical open forum. 18, Discussion on NARSA Rally stand & organisation. 25, Introduction to ATV, G8KBH. Jack, G4BFH, jack@jduddington.fsnet.co.uk

Region 4: North East

BISHOP AUCKLAND RAC

7, 14, 21, 28 details TBC. RAE, NRAE and Foundation Licence courses available. Details Mark, G0GFG, 01388 745353.

DENBY DALE ARS

6, New licensing conditions, Gerald, G3SDY. Tony, G4LLZ, 01484 318 750.

GRIMSBY ARS

7, Royal International Air Tattoo. 21, PSK night. Brian, G4DXB, 01472 231383.

HALIFAX & DARS

19, Members' short talks. R E Nolson, G0PMU, 01274 600297.

HORNSEA ARS

6, The PIC microcontroller, G3RMX. 13, Switch mode power supplies, G1YVL. 20, Activity night. Andy, G0VRM, 07050 287279.

NORTH WAKEFIELD RC

7, AGM. Jim, G3YDL, 01924 824451.

Region 5: Midlands

ALDRIDGE & BARR BEACON ARC

18, 'Underwater Treasures Collected from Oceans around the World', Alan Booth, G3NEQ. Charles, G0NOL, tel: 01922 636162.

BROMSGROVE ARS

1, DXing, Don Field, G3XTT. 8, On air. 12, 'Now like last year let's make it work!' 26, Any suggestions? Preparations for the year's DF hunts. Angus, G8DEC, 01257 875573.

CAMBRIDGE & DARC

1, Electrolytic ESR and other test meters, Ron, G3KBR. 8, Foundation Licence Morse Assessment session. 15, Hints and Kinks evening. 22, Informal. Ron, G3KBR, 01223 501712.

CHELTENHAM ARS

1, Valves past and present, Tom Morgan, G3XMM. Derek, G3NKS, 01242 241099.

GLOUCESTER AR & ES

4, Stealth radio. 11, Visit by Waters & Stanton. 18, Book / magazine evening. 25, HF on air. Tony, 01452 618930, office hours.

HEREFORD ARS

1, AGM. Mike, G0WZY, 01981 251743.

KIDDERMINSTER & DARS

5, Operating as UA4HJA in the USSR, John, G4CVU. Tony, G1OZB, 01299 400172.

LINCOLN SW CLUB

6, On air. 13, Committee meeting. 20, 'Last Gasp on Everest', Anita Wright. 27, Visit to Odeon cinema complex. John, G1TSL, 01522 793751.

LOUGHBOROUGH & DARC

5, Internet & e-mails at the college. 12, On air - try the Internet gateway. 19, 'Working with weak signals', part 11. Art, G3KWY. 26, On air. Chris, G1ETZ, 01509 504319.

MELTON MOWBRAY ARS

15, Packet radio, Jim Andrews, G1HUL. Geoff, G3STG, 01664 480733.

MID-WARWICKSHIRE ARS

26, The TS-2000 in Exile, Rod, G0FBY. Bernard, M1AUK, 01926 420913.

RAF WADDINGTON ARC

7, 21, 28, RAE course. Bob, G3VCA, 01522 528708.

SANDWELL RC

22, Morse tests. John, G4AAL, QTHR.

SHEFFORD & DARS

21, Rope, halyards, strings and stakes, Paul, G1GSN. 28, Amateur Radio Observation Service, Barry Scarisbrick, G4ACK, RSGB AROS Coordinator. Derek, G4JLP, 01462 851722.

SOLIHULL ARS

21, Vehicle navigation equipment, Andy, G4KOR. Roger, G4BBT, r_a.hancock@which.net

SOUTH NOTTS ARC

6, On air. 20, Construction project. 27, On air. Tel: 01509 569679.

STRATFORD UPON AVON & DRS

11, 'The Build-it Team Challenge', Terry, G3MXH. 25, On air. David, 01926 642858 or 07816 550075.

TELFORD & DARS

6, On air. 13, Military radio, Ben Nock, G4BXD. 20, Under £5 construction competition. 27, Shropshire Fire Brigade communications, G3YFK. Mike, G3JKX, 01952 299677.

Region 6: North Wales

No club details submitted.

Region 7: South Wales

No club details submitted.

Region 8: Northern Ireland

No club details submitted.

Region 9: London & Thames Valley

AYLESBURY VALE RS

13, Discussion evening. Roger, G3MEH, 01442 826651.

CHESHUNT & DARC

6, Members' forum. 20, Worldwide APRS / *UI-View* on HF, Jim, G0JXN. Jim, G0JXN, 01992 468204.

CRYSTAL PALACE & DRS

6, SWR bridge project. 15, AGM and construction contest. Bob, G3OOU, 01737 552170 or Victor, 020 86532946.

ECHELFORD ARS

28, Construction contest. Robin, G3TDR, 01784 456513.

EDGWARE & DARS

14, Talk by RSGB DRRM Ryan Pike, G5CL. 28, Web design round table. David, G5HY, 01923 655284 (days) / 0208 954 9180 (eve).

MAIDENHEAD & DARC

7, 100 Years of Amateur Radio, Ian Poole, G3YWX. 19, The PicATUne, Paul Berkeley, M0CJX. John, G3TWG, 01628 525275.

RADIO SOCIETY OF HARROW

1, Book evening: bring along and talk about your favourite book, radio-related or otherwise. Jim, G0AOT, 01895 476933 / 020 7 2786421.

READING & DARC

14, On air. Pete, G8FRC, 0118 969 5697.

SILVERTHORN RADIO CLUB

8, Construction contest. 15, PicATUne, Paul Berkeley, M0CJX. 22, On air. David, G0KHC, 020 85042831.

SOUTHGATE ARC

14, TBA. 28, 4m AM / FM demo, Nick. Brian, G0MEE, 01707 257534.

SUDBURY & DRS

5, A mystery non-radio evening, Mike Marsh, G4GGC. Bryan, G1TWY, 01787 247893.

SURREY RADIO CONTACT CLUB

4, PicATUne, Paul Berkeley, M0CJX. Ray, G4FFY, 0208 6447589.

SUTTON & CHEAM RS

21, The Internet gateway, Terry Giles, G4CDY. John, G0BWV, 020 86449945.

VERULAM ARC

11, AGM. Walter, G3PMF, 01923 262180.

Region 10: South & South East

CRAWLEY RC

20, Photo quiz, where nothing is what it seems, G4LRP. Details from Derek Atter, G3GRO, tel: 01293 520 424.

HASTINGS ELECTRONICS & RC

20, AGM. R C Gornall, G7DME, 01424 444466.

HORNDEAN & DARC

5, Social evening. 26, Annual bring & buy sale. Stuart, G0FYX, 023 92472846.

THE RSGB REGIONS AND DISTRICTS

Region 1: Scotland West and the Western Isles
- District 1 – Central, City of Glasgow
- District 2 – Lanarkshire, Renfrewshire
- District 3 – Ayrshire, Dumfries & Galloway
- District 4 – Dumbartonshire, Argyll & Bute, Western Islands

Region 2: Scotland East and the Highlands
- District 5 – Highlands and the Orkney and Shetland Islands
- District 6 – Moray, Aberdeenshire
- District 7 – Perth & Kinross, Angus
- District 8 – Fife, Lothian, Borders

Region 3: North West
- District 9 – Cumbria
- District 10 – Lancashire, Isle of Man
- District 11 – Greater Manchester
- District 12 – Cheshire, Merseyside

Region 4: North East
- District 13 – Northumberland, Tyne and Wear, Cleveland, County Durham
- District 14 – North Yorkshire, East Yorkshire
- District 15 – West Yorkshire
- District 16 – South Yorkshire, NE Lincs

Region 5: Midlands
- District 17 – Shropshire, Staffordshire, West Midlands
- District 18 – Derbyshire, Lincolnshire, Nottinghamshire, Rutland
- District 19 – Bedfordshire, Leicestershire, Northamptonshire
- District 20 – Gloucestershire, Herefordshire, Warwickshire, Worcestershire

Region 6: North Wales
- District 21 – Wrexham, Flintshire
- District 22 – Conwy, Denbighshire
- District 23 – Gwynedd, Ynys Môn (Anglesey)
- District 24 – Powys

Region 7: South Wales
- District 25 – Pembrokeshire
- District 26 – Ceredigion
- District 27 – Carmarthenshire
- District 28 – Vale of Glamorgan, Cardiff, Newport

Region 8: Northern Ireland
- District 29 – North Belfast, Co Antrim
- District 30 – South Belfast, Co Down
- District 31 – Co Armagh, Co Fermanagh
- District 32 – Co Londonderry, Co Tyrone

The RSGB Regional Representation Scheme is designed to allow changes to the district boundaries as required in order to support the membership most effectively, therefore some changes to the districts shown above may take place in the future.

Region 9: London & Thames Valley
- District 33 – London Postal Districts
- District 34 – South Buckinghamshire and former county of Berkshire
- District 35 – Hertfordshire, North Buckinghamshire
- District 36 – Surrey

Region 10: South & South East
- District 37 – Oxfordshire
- District 38 – Wiltshire
- District 39 – East Sussex, West Sussex
- District 40 – Hampshire, Isle of Wight

Region 11: South West & Channel Islands
- District 41 – Cornwall & Channel Islands
- District 42 – Devon
- District 43 – Somerset & Bristol
- District 44 – Dorset

Region 12: East & East Anglia
- District 45 – Cambridgeshire
- District 46 – Norfolk, Suffolk
- District 47 – Essex
- District 48 – Kent

Region 13: Overseas Regions
- District 49 - IARU Region 1
- District 50 - IARU Region 2
- District 51 - IARU Region 3

Breakdown of the RSGB Regions and Districts.

OXFORD & DARS
28, AGM. Dave, G3BLS, 01865 247311.

SOUTHDOWN ARS
4, Club AFS results + 'Power Surges', Jim, G4DRV. John, G3DQY, 01424 428064.

WORTHING & DARC
6, Video evening. 13, Discussion. 20, 'Early power distribution in Brighton'. 27, Discussion. Roy, G4GPX, 01903 753893.

Region 11: South West & Channel Islands

CORNISH RADIO AMATEUR CLUB
7, Illustrated lecture on a special antenna, Mike, G4WQL. 11, Computer section, Tony Bevington. John G4LJY, 01872 863849.

EXMOUTH ARC
6, AGM. 20, Members' forum. Alec, G8GON, 01395 264872.

POOLE RADIO SOCIETY
1, Operating (shack). 8, RNLI communications - saving lives at sea, Alex Marshall, AIIE. 15, Construction (shack). Details from Phil Mayer, G0KKL, tel: 01202 700903.

SOUTH BRISTOL ARC
6, Winter bring & buy sale. 13, Video cassette exchange. 20, QRP operation for M3 licensees. 27, Fast Morse session, over 24WPM. Len, G4RZY, 01275 834282.

YEOVIL ARC
7, RSGB Matters, G5CL. 14, Telescopes, G1PZK. 21, Submarine communications, G4KHY. 28, Committee meeting + on air. Derek, M1WOB, 01935 414452.

Region 12: East & East Anglia

BROMLEY & DARS
19, Local Crime Prevention Officer (TBC). Alan, G0TLK, alangm2@clara.net

BURY ST EDMUNDS ARS
5, *PW*, Rob Mannion. George, G3LPT, 01359 259518.

CHELMSFORD ARS
5, PSK31, I Moffat, G0OZS. David Bradley, M0BQC, 01245 602838.

HARWICH AMATEUR RADIO INTEREST GROUP
13, Mobile phones, Bev Clues. Eugene, G4FTP, 01206 826633.

LEISTON ARC
5, The development of Leiston and Garretts Stephen Mael Longshop Museum. David, G1YRF, 01728 833202.

LOUGHTON & EPPING FOREST ARS
8, HF data night on air. 22, VHF data night on air. Marc, G0TOC, 07803 023501.

MAIDSTONE YMCA ARS
1, 8, RAE antennas. 15, RAE licence conditions. Andy, M0CST, 01622 661035.

NORFOLK ARC
6, MFJ Antenna Analyser, Stuart, G3XYO. 13, Informal Morse practice and instruction. 20, Lady Luck's role in solving of the Enigma, Peter, G3ASQ. 27, Informal Morse practice and instruction. Peter Ives, G3ASQ, 21 Riverside Close, Lower Hellesdon, Norwich NR6 5AU.

Region	RSGB Regional Manager
1. Scotland West & Western Isles	Vacant
2. Scotland East & the Highlands	Vacant
3. North West	Kath Wilson, M1CNY
4. North East	Geoff Darby, G7GJU
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	Vacant
11. South West & Channel Islands	Vacant
12. East & East Anglia	Malcolm Salmon, G3XVV

RSGB Regional Managers as of 14 January 2002.

THE RSGB UNDER THE MICROSCOPE

. . . WAS THE SUBJECT of a recent meeting of the Norfolk Amateur Radio Club which was addressed by the Deputy RSGB Regional Manager, Phil Brooks, G4NZQ. After an informative presentation on the past, present and future of the Society, and amateur radio in general, a lively discussion followed, during which Phil fielded about 45 minutes of questions, criticisms and ideas. These ranged from the content of *RadCom*, through problems of generating interest in the hobby, to the new licensing structure and other important issues.

The club wishes to convey its thanks to Phil for a most stimulating evening, and it looks forward to a further visit after he has had an opportunity to discuss with his colleagues in the Society the many points raised during the evening.

MANY CLUBS OFFERING FOUNDATION LICENCE COURSES / MORSE ASSESSMENTS

The first group of successful candidates at the Frodsham, Cheshire, Morse Assessment session, with Pat and John, two of the Morse Assessors.

THE RECENT Foundation Licence course at the Chelmsford Amateur Radio Society proved very popular and was 50% oversubscribed. It is hoped to hold another course later this year. The Chelmsford Amateur Radio Society meets at 7.30pm on the first Tuesday of each month at the Marconi Social Club, Beehive Lane, Great Baddow, Chelmsford. Further details from David, M0BQC, tel: 01245 602838, e-mail: DavidWBradley1@activemail.co.uk or visit the club's website: at www.g0mwt.free-online.co.uk/

● 24 VHF LICENSEES participated in the Foundation Licence Morse Assessment at the Keighley ARS on 16 December 2001. Gerald, G3SDY, officiated, with Dorothy, 2E1GDD, providing constant tea / coffee and biscuits, and lunches for all.

● THE RSGB Regional Manager for the North West, Kath Wilson, M1CNY, has already organised two Morse Assessment sessions at the Beacons in Frodsham, Cheshire. On the first day, 39 people completed the Morse Assessments - it would have been 40, but one candidate was in hospital. He was planning to take part in the second session. The reaction from all those that took the Assessment was very positive and they were all looking forward to being able to operate on HF from 1 January. The Morse Assessors, Pat, M0PAT; John, M5HFJ, and Ernie, G4YYB, commented that they enjoyed the day and were looking forward to future sessions.

● IN ADDITION to the extensive list of clubs offering Foundation Licence courses published on page 6 of the January 2002 *RadCom*, several more clubs have now announced that they too will be offering courses. These are listed in 'RSGB Matters' on pages 5 / 6 this month. (This listing includes a couple of corrections to the details published in January).

SOUTH DORSET RS'S 40TH BIRTHDAY

THE SOUTH DORSET Radio Society celebrated its 40th anniversary on 8 January. It was formed by 21 people at the Bugler's Cafe, in Dorchester, Dorset, and over the years of has achieved many of its aims. Here are some highlights from the club's CV:

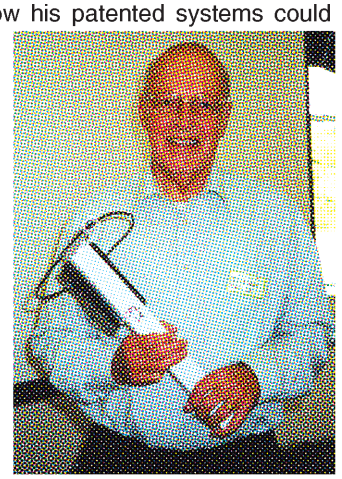
1963 SDRS operates G3SDS/A at the Weymouth Model Engineers' Exhibition
1975 Decides to sponsor a repeater.
1976 GB3SD born at Connaught Gardens, Wyke Hill, Weymouth
1978 SDRS takes a trip to Alderney
1990 GB0WNF put on air from the Nothes Fort, Weymouth
1994 GB0OD for the 50th D-Day anniversary
1997 GB0IMD International Marconi Day at the Marconi Beaming station, Dorchester
2000 SDRS comes top in their area in QRP contest.

These are just some of the things that SDRS has done over the 40 years. More details from the secretary Pat, G1XJH, e-mail: g1xjh@g3sds.org.uk or check the club's website at www.g3sds.org.uk

WACRAL CONFERENCE 2001

THE WACRAL (World Association of Christian Radio Amateurs and Listeners) - an RSGB Affiliated Society - Conference was held in October last year in Bournemouth. Maurice Hateley, GM3HAT, was the principal guest and speaker at the Conference. His lecture on Cross-Field Antennas, given before an appreciative audience, was enlivened with amusing anecdotes from the world of commercial broadcasting. Demonstrating his unique loops for 80 and 10 metres, Maurice showed how his patented systems could benefit amateurs with restricted space. Phyl Fanning, G6UFI, the Vice- President and a Methodist minister, gave an insight into his work as an Army Chaplin, which was of particular relevance owing to the involvement of our military in the present international situation.

For its 2002 event, WACRAL will be returning to Brunel Manor in Torquay over the weekend of **4 - 6 October**. Call the new conference organiser, Geoff, G4YJW, tel: 01323 721352 or e-mail: geoff@g4yjw.freeserve.co.uk for more information.



Maurice Hately, GM3HAT, with one of his 14MHz CFL antennas.

Items for club news should be sent to the *RadCom* Office at HQ to arrive by the 26th of the month, ie approximately a month before publication (eg 26 January for the March issue). News items should be sent in writing (fax, letter or e-mail gb2rs@rsgb.org.uk) by the club secretary or the person responsible for publicity. Post cards for this purpose are available from RSGB HQ. A database of all meetings is shared between *RadCom* and GB2RS, so information only needs to be sent once.

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

SOLIHULL ARS CELEBRATES MARCONI CENTENARY

Senior Library Assistant Sheila Parsons receives three radio books from Frank Bridges, G3WPM, Joint Chairman of Solihull ARS, to mark the centenary of the first trans-Atlantic radio transmission by Marconi on 12 December 1901.

MEMBERS OF THE Solihull Amateur Radio Society celebrated the centenary of the first trans-Atlantic wireless transmission made by Guglielmo Marconi on 12 December 1901. The club station, GX3GEI, was operated at the Shirley Centre, Stratford Road, Solihull during the afternoon of 12 December 2001 to work stations 'across the pond'. Contacts included commemorative stations VO1S and K1M.

In order to mark the centenary in a more permanent way, the society presented three books to Shirley Public Library, two on the hobby of amateur radio and one for children, describing Marconi's achievement. For further information on the Solihull ARS, please contact Frank Bridges, G3WPM, tel: 0121 745 2915, or Roger Hancock, G4BBT, tel: 0121 743 7277, the Joint Chairmen of Solihull ARS.

SAME PLACE, DIFFERENT TIME

At the 2001 Welsh Amateur Radio Show at the Memorial Hall, Barry.

DUE TO LAST YEAR'S foot and mouth disease, the Welsh Amateur Radio Show was postponed from its normal date in March until September 2001. The organisers thank the RSGB for the assistance given in re-scheduling the event. They are now planning the 2002 show and have decided to stick to the new September slot on a permanent basis. The 2002 Welsh Amateur Radio Show will therefore be at the same venue, the Memorial Hall in Barry, South Wales, on **Sunday 15 September**.

The organisers say, "We would like to thank all those that helped make the 2001 show a success and very much look forward to seeing you all again in 2002. We have a reputation for putting on state-of-the-art presentations as well as a pure mix of amateur radio dealers, so you can be sure that the 2002 show will be just as creative and even more interesting and enjoyable".

VHF/UHF

NORMAN FITCH, G3FPK
40 Eskdale Gardens,
Purley, Surrey CR8 1EZ.
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YOU THOUGHT that last month was good? Well, propagation in the past four weeks has been a columnist's dream, with a superb Leonids meteor shower, auroral and tropospheric openings and on 50MHz winter Sporadic E and world-wide F_2 events to die for!

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, (NN), (TS) etc refers to the postcode area and (KO04), for example, is the Maidenhead grid.

GEOMAGNETIC AND SOLAR ACTIVITY

IN THE 27-day period to 3 December there were 24 days when the middle latitude A-index at Fredericksburg was 'quiet', ie 10 or less. It was 11 on 7 and 23 November and the only really disturbed day was the 24th when it reached a 'storm' value of 76 and a K-index of 8.

The 10.7cm radio flux remained high throughout, peaking at 271 units on 9 November. The minimum was 170 on the 25th giving a daily average of 211.7. The SESC sunspot count peaked at 258 on 10 November with a minimum of 102 on the 25th, which averaged out at 187 per day. 37 new sunspot regions were recorded. Thanks to Neil Clarke, G0CAS, for the copy of the October issue of *Sunmag* and I acknowledge receipt of the September edition of *The Six and Ten Report*, an activity of the RSGB Propagation Studies Committee (PSC) - see the list for website details.

MOONBOUNCE

ACCORDING TO the December issue of the *432 and Above EME Newsletter*, conditions during the second leg of the ARRL International EME Contest over the 10/11 November weekend last year were mediocre to poor on 70cm but generally good on 23cm. Preliminary data on 70cm indicate that DL9KR could be on top spot with 106x36, while OH2PO (104x34) was second. N2IQ (110x32) who made more QSOs but with a lower multiplier came third. DJ5NV, DF3RU, DL7APV and VK3UM also did well. On 23cm it was a close race between OE9XXI (80x33) and Howard Ling, G4CCH (77x34). Other high scorers were HB9Q and HB9BBD.

Peter Blair, G3LTF (IO91), found it hard work on 70cm in the contest with Faraday changing very quickly at times. He lost about two hours at moonrise due to tree blockage and worked just six stations in three hours on the 11th. On 23cm on the 10th he completed with 20 stations and with seven more the next day. His final scores over the two legs were 2m 2x2, 70cm 38x25, 23cm 56x28 and 13cm 5x5 for a total of 606,000 points.

It seems that Ian White, G3SEK (IO91), might soon run into RFI problems due to new houses built just 30ft from his antennas. He says, "That's goodbye to my moonrise window." He is considering taking down his 12-Yagi array for 70cm and installing a 10ft dish for 23cm. He was QRV on 70cm on 10 November from 0700 and worked about 25 stations in highly unstable conditions.

Roy Reed, G3ZIG (JO02), was QRV on 2m in both legs of the contest and completed 99 QSOs in the first leg in good conditions. In less favourable conditions in the second session he added another 31 stations for a total of 130 with 38 multipliers. The event produced another 22 initials. He is now

METEOR SCATTER: THE LEONIDS

AFTER SEVERAL YEARS of the 'experts' predicting a Leonids storm, the 2001 shower was the best MS event for years. Although not a patch on the fabulous storm of 1966, when the zenithal hourly rate (ZHR) was a phenomenal 100,000, preliminary data suggest rates up to 8000, depending upon the location. In practice, this meant that the E-layer was continuously ionised for a long period in the morning of 18 November resulting in propagation very similar to an extensive Es opening.

On 2m in the 0400 - 1100 period Claudio Maracci, I4XCC (JN63GV), completed 143 SSB QSOs with 138 different stations in DL, EA, EI, ES, EW, F, G, GI, GM, GW, LA, LY, LZ, OH, ON, OZ, PA, SM, SP, RX, YO and UT. ODX was OH8K (KP23IA) at 2268km and six other contacts were over 2000km.

Ian McCabe, G0FYD (FY), worked about 15 stations in the 0500 - 1100 period and SP7EXY (KO00) and TK5EP (JN41) were new grids. His station comprises a TS-2000, running 100W to a 9-ele Yagi on a 17ft boom. Philip Town, G0ISW (IO84), found the band wide open to the Balkans, France and Italy so he made SSB QSOs with S57EA (JN76), I4XCC and F6FHP (IN94). He runs an FT-847 to a log-periodic antenna on a 10m mast.

In the 0147 - 1105 period Matthew Cabban, G0XDI (WD), completed 76 SSB QSOs and from 2325 through 0241 on the 19th another six. Three new countries and 15 new grids were the result of this effort. Contacts over 2000km were OH4EA (KP32), RX1AS (KO59) ODX at 2121km, OH8NXE (KP25) and RU1AA (KP40). The shower seemed to peak between 0600 and 0800.

Between 0447 and 1126 David Butler, G4ASR (IO81), made 81 SSB QSOs with stations in 17 countries, DL, EA, F, HA, I, LA, LY, OE, OK, OM, S5, SM, T9, TK, US, YU and 9A. ODX was US5WU (KO20DI) at 1900km and reflections were best in the 0700 - 1000 period. He kept well away from 144.200MHz, CW and WSJT. He runs a TS-790E, Henry amplifier, 0.3dB preamp and 18-ele DL6WU Yagi.

Martyn Jones, G4TIF (CV), was amazed to hear so many strong DX signals spread all over the SSB section of the 2m band. Many reflections were over a minute long. His most memorable contacts were with S57O (JN86), when there was time to exchange contest data, and at 1103 when he worked RU1AA (KP40) at over 2000km for a new country and grid.

David Hilton-Jones, G4YTL (MK), asks when were the standard Region 1 MS reporting procedures for SSB abandoned? '59' reports were heard, which means a burst lasting *over two minutes*. John Lemay, G4ZTR (CO), agrees with David's comment but says he wasn't going to hang around long enough to decide if he could give such a report! I think that some operators, perhaps new to MS, didn't really appreciate it was an intense meteor shower, as it sounded more like an Es opening.

John made 53 random QSOs on SSB between 0650 and 1030. RX1AS, SM1A, I4YNO, HA0MK, US5WU and LY2BIL, from whom he hopes to get QSLs, provided new grids and distances. However, he didn't hear *one* locator exchanged. He writes, "Working DX in the Leonids was like waiting for a bus - nothing happened for a few minutes then three or four stations called at once." He uses a 3CX800 PA, MGF1302 preamp and a 12-ele M^2 Yagi.

Going back to the Perseids last August, G0RUZ completed 23 SSB QSOs during the peak, the most notable being with SV/DL9AN (KM09AK) on random at 2273km. Conrad was astonished to hear him, let alone work him on random, when long distance skeds were disappointing. Only five QSOs were over 1800km.

Photo copyright John Pane, AF3B, and reproduced with permission (http://leonids.johnpane.com)

John Pane, AF3B, took this photograph during the Leonids meteor storm on 18 November from Laurel Mountain State Park near Ligonier, Pennsylvania.

using a 'Suffolk' converter - the G4DDK design in the *VHF/UHF DX Book* (available from the RSGB Book Shop) - with a W5UN/VE7BQH MGF1302 preamp, both at the masthead.

G4CCH (IO93) worked two more initials on 23cm by the end of the contest, these being GM4ISM* and W4OP* taking Howard to 164. At 0325 on the 11th he completed with VK5MC*, 12 years since their last QSO, and his final score was 261,800 points. His PA uses six 2C39A water-cooled valves feeding a 5.4m dish antenna with a 0.31dB noise figure preamp.

Mark Hughes, GM4ISM (IO85), is now QRV on 23cm running 125W to a 2.4m dish with 0.75dB preamp. In the contest he completed on CW with G4CCH, HB9BBD, OZ4MM and K5JL to bring his initials total to six. He thinks all these QSOs were 'firsts' from Scotland on 23cm. Any challengers?

Stuart Jones, GW3XYW (IO71), was QRV on 23cm in both legs of the contest and ended with 41 QSOs and 20 multipliers for a total of 82,000 points. He was also on in the previous sked weekend and on 3 November worked JA6AHB, IK2MMB, HB9SV, G4CCH and Graham Daubney, F/G8MBI. Graham was still running only 50W to a 4m dish in JN04 and, in the contest worked only on random for a few hours each day. During the two legs he copied 71 different stations but his score for the event was 27x15.

The best lunar weekend for February will be 23/24 when London latitude stations will have 31.8 hours of Moon time. The declination reaches a maximum of +24.43º falling to +22.59º at the end. The 144/432MHz sky temperature range is 542/42K to 248/18K and the signal degradation, referred to perigee, varies from -0.67dB to -0.29dB. The Sun offset at Saturday midnight is +133º.

Sincere apologies to Conrad Farlow, G0RUZ, who wrote way back in last September and who is QRV on 2m EME. He operates from the same location as the North Wakefield Radio Club, GX4NOK (IO93), which is about 10 miles north of his home, and has continuous access to the site. He writes, "It is an extremely successful and vibrant club and the other members have been very accommodating and made it possible for me to operate".

Photo copyright John Pane, AF3B, and reproduced with permission

Another of the excellent series of photographs taken by John Pane, AF3B, of the Leonids meteor storm on 18 November. More pictures can be seen on his website at http://leonids.johnpane.com

He uses a home-built valve PA feeding four home-built, cross-polarised DJ9BV Opt2 Yagis at 60ft AGL. The preamp is an MGF1802 cavity design followed by a 4-pole band-pass filter to deal with pager QRM from a site two miles away. He has been using SM5BSZ's *Linrad* software - more of that later - which he finds excellent for weak signal detection. He completed 86 QSOs in the ARRL Contest with 37 multipliers.

BAND REPORTS

50MHz

G0ISW sets the tone with, "What a month! F_2 propagation daily all over the place." On 30 October Philip reports that VU2ZAP (MK82TE) was spotted on the *DXCluster* working Gs for five hours non-stop. By 1324 he was in 'ragchew mode' and went QRT, so he missed him. DX worked on SSB in the 29 October to 17 November period included OD5/OK1MU (KM73), 4Z5AO (KM72), 9G5AN (IJ95), VE1YX (FN74), WA1ECF (FN41), W3EP (FN31), VE2DFO (FN25), K3KYR (FN24) and 5B4FL (KM64). He runs 50W to a log periodic antenna.

G0RUZ has been working lots of DX and at 17 November had 159 DXCC countries in the log. Derek Gilbert, G0NFA (GU), reports that UX0FF is *not* in Asiatic Russia although some callbooks suggest he is. His QRA is Nikolay Lavreka, PO Box 3, Izmail, 68000, Ukraine.

Welcome to Dave Gynn, G3SBP (PL), located on the Devon/Cornwall border. He is ex-VS6VU and 8Q7BN and runs 300W to a 4-ele Quad at 50ft AGL. At 0833 on 30 October he worked VU2ZAP, quickly followed by 9G5AN, D44TD, D44TC, UN5PR, J28FF, E30NA, HP2CWB, YS1RR, TI5KD, TI5BX and WA4NJP at 1408 when the band faded out. Next day brought XW0X and on 4 November from 1630 he contacted 45 US stations in 17 states from Maine to California. After the W6 opening he was called by XE2EED. From 10-16 November he added another 131 US stations and now has 31 states worked.

Bryn Llewellyn, G4DEZ (JO03), chalked up his 400th grid with UN6P (MO60LC) on 3 December. Recent F_2 DX includes HC, HC8, VR2, XE and XW. Clive Davies, G4FVP (DL), comments how northerly the F_2 propagation is reaching, citing the QSO between EA7KW and JX7DFA in the morning of 12 November.

Since 29 October G4TIF has worked 18 more grids and eight new countries - E3, PY0, UN, VR2, VU, XE, YS and 9G on SSB. Pete Weller, GM3XOQ (AB), is QRV again after a few years absence. Between 8 and 15 November he worked 33 Ws and VEs in EN and FN fields. On the 17th he contacted JY9NX (KM71) and 4X1RF (KM72), while the 19th brought HP2CWB, HP1AC and HC8N (EI59), all worked with just 15W to a 2-ele Yagi at 20ft AGL.

Jim Rabbitts, GM8LFB (IO88), lists new countries worked as OD5UT, 5B4AZ, 4X6ON, 9G5AN, VU2ZAP, VK8TM - nice one Jim - LY2SA, N1RZ, VE1YX, OY9JD, UN6P, OH0JFP, JX7DFA and EA8/DJ1OJ . Auroras on 6 and 24 November, plus an auroral-E event to Scandinavia on the 19th filled in some gaps on the European map. There was a short Es opening to Spain on the 27th and to OH3BHL (KP10) and SM5CZK (JO89) next day. He runs just 10W from an FT-736R to a 3-ele Yagi.

As usual, Jamie Ashford, GW7SMV (NP), has been working the good DX throughout November starting on the 7th with HZ1MD (LL34) for a possible first GW - HZ? Next day brought ET3VFC (KJ99), VE2DIV (FN35) and N1RZ* (FN44). In a North American opening on the 11th he contacted 28 stations in FM and FN fields. On the 12th VR2XMT was a new DXCC country, followed by VR2ZXP, VR2IL and VR2LC, BG7OH, another new country, all in OL72. Nine stations in FN field were worked in the afternoon.

The 13th - 15th period saw more QSOs with stations in FM, FN and GN fields, one of the best contacts being with VY0HL (FP53) on Baffin Island, which sounds quite rare. The 16th was very productive with VP5/K5CM (FL41), TI5KD (EJ79), YS1RR (EK53) and XE1KK (EK09) all new countries. Other DX included UN5PR (MO60), WP4G, KP4EIT, TI5BX (EK70) and lots more Ws in EL98, EM75, 86 and 88, etc, 43 QSOs in all.

On the 19th Jamie worked W6JKV/5 (EM10), W3XO/5 (EM00) and KW5USA (EL09), next day bringing N4HGZ (FM14) and HC2FG (FI07). On the 24th K2KW/6Y5 (FK18) was another new country, then W4OV (EL96), WA4LOX (EL87), ZF1DC and K2RTH (EL95). Up popped OA4DJW (FH17) for yet another new country on the 27th. 9G5FH* (IJ95) was contacted on the 29th and on the 30th he worked six Ws in FN and GN fields.

Robin Burrows-Ellis, M1DUD (IP), is a QRP station running just 2W. Nevertheless he has

LOCATOR SQUARES TABLE

Starting date: 1-1-1979

Callsign	50	70	144	430	1296	Total
G4YTL	-	53	524	111	-	688
G1SWH	350	42	240	81	30	743
G3XDY	-	34	251	175	123	583
G8TOK	351	32	135	56	29	603
G3FIJ	268	29	107	50	23	477
G4TIF	509	28	235	112	-	884
G0JHC	940	26	48	4	-	1018
G4OUT	-	23	107	-	-	130
G3IMV	744	20	616	125	53	1558
G4FUJ	68	18	23	5	5	119
G0EVT	506	14	309	77	16	922
G4DEZ	400	14	86	21	8	529
GU6AJE	338	13	32	-	-	383
G4ZHI	86	10	256	32	-	384
GJ4ICD	780	1	267	121	79	1248
G0FYD	609	1	283	20	-	913
G0ISW	215	1	85	22	-	323
M1DUD	196	1	31	1	-	229
GW7SMV	606	-	205	-	-	811
GW6VZW	488	-	146	6	-	640
G0XDI	228	-	254	67	-	549
G7CLY	244	-	248	16	-	508
G8HGN	270	-	163	58	-	491
G6TTL	220	-	133	90	27	470
G7KHF	434	-	-	-	-	434
G1UGH	280	-	130	17	-	427
MM5AJN	316	-	76	32	-	424
G4OBK	318	-	57	-	-	375
G1EFL	230	-	67	2	-	299
GM4VVX	186	-	100	-	-	286
G3FPK	30	-	246	-	-	276
GW3EJR	260	-	-	-	-	260
G4APJ	168	-	44	22	-	234
GM6MEN	166	-	-	-	-	166
M5PLY	120	-	-	-	-	120
M1DRK	113	-	-	-	-	113
EA7IT	-	-	102	-	-	102

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Next deadline is 12 February. Band of the month 70MHz.

worked some remarkable DX. On 30 October he worked EH6TC (JM08) for a new grid and next day S57AC, E30NA - ODX so far at 5250km and his first station outside Europe. From the island of Fyn (JO45) on 2 November, while giving a demonstration of QRP operation to his host Lars, OZ4CQ, using 10W he contacted XW0X. Back home, at 1500 on 17 November the band "erupted like a volcano" and was full of North Americans. He called lots of them without success until around 1600 when he worked VE1YX (FN74) on 50.300MHz bringing his grids total to 196, not bad for a very QRP station.

Ted Collins, G4UPS (EX), November report runs to six A4 pages. In his 'Information' section he writes, "The openings during November have been a great improvement over the past couple of years. I have never noted so many US and Canadian beacons on 6m before, and on several days the activity was spread over the spectrum from 50.075 to 50.240MHz." He mentions the confusion with the US callsigns with newcomers to the hobby not realising that AA6TT and W0MHK weren't in California and the mid-West respectively, but are on the East Coast.

He reports that in an e-mail of 13 November Charlie, VR2XMT (OL72), said he had worked over 60 Gs the previous day. Direct QSLs should be sent to Mr Charlie C M Ho, PO Box 80424, Cheung Sha Wanpo, Hong Kong, China. VR2KW's route is Mr Kai Hung Wong, PO Box 438, Tsuen Wan Post Office, Hong Kong, China.

A daily summary of what Ted heard/worked in November will give the broad picture. 6th; an aurora 1728 - 1815, with G, GI, GM, GW and PA stations. 7th; East Coast Ws 1336 - 1505. 9th; 9V and 9M6 working into IO70 and 91 and from 1359 a 20-minute opening to East Coast W. 10th; 9V1UV working all over Europe until 0910 but only S4 at G4UPS and from 1319 - 1530 Ws were working mainly into Scandinavia.

11th; Ws and VEs in FM and FN fields from 1217 until a dramatic fade-out at 1445 - he looked to see if someone had disconnected his antenna. 12th;from 1118, QSOs with VR2KW* and VR2XMT and from 1222 - 1409 Ws and VEs in FN field. 13th; Es to SP until 1000, then 1255 - 1435 Ws and VEs in EN and FN fields. 14th; from 1200 VEs and Ws working northern stations giving strong reports. At 1543 he copied beacon VE8BY (FP53) at S6 for the first time ever and at 1558 he contacted K5AM* (DM62) in New Mexico.

15th; Ws and VEs in FN field from 1218, W9GT* (EN71) worked at 1416. At 1625 K0EU (DM79) in Colorado was calling a DL2. 16th; UN5PR (MO60) worked for a new grid and field. 1242 - 1725 big opening to EM, FM and FN fields. XE1KK (EK09) worked at 1539 for DXCC country 173. 17th; 1433 - 1734 Ws and VEs in FN field and at 1731 W6XI (DM42) worked for a new grid, followed by K7JE (DM33) and W7USA (DM43), another new grid and all in Arizona.

Ted completed QSOs with Europeans during the Leonids shower in the morning of the 18th then at 0843 he worked XV3AA (OK45) for country number 174. From switch-on at 1445 to 1640 there were W1-4 stations with XE1KK heard again. 19th; more North Americans 1248 - 1700 in FN field and QSOs with K8ZES (FN02), W9ZR* (EN80), K5TR* (EM00), W9JN* (EN54), W6JKV/5* (EM10) for a new grid, W3XO/5 (EM00), KE6USA (EL09) for a new Texan grid, K9HMB, K0FF* (EM49) in Missouri for a new state and grid and N5WS* (EL09).

More East Coast Ws and VEs on the 20th 1345 - 1710. From 1250 on the 22nd mostly the same till 1632 when W7CI* (DM41) was worked. 23rd; weak Ws 1430 - 1600. 27th; from 0935 Es to LY, SP and YL till 1212 and at 1335 OA4DJW peaked to S5.29th; 1333 - 1640 another opening to East Coast North America. 30th; same time frame and areas heard/worked.

70MHz

John Desmond, EI7GL, reports that Dave Court, EI3IO (IO63WF), worked 5B/G1JJE (KM64ES) on 29 July 2001 at 1149. The claimed QRB is 3646km but the definitive G4JNT *Distbear* program came up with 3634km. Anyway, it exceeds the 1981 record achieved by GW4ASR/P and 5B4AZ by a decent margin and is a new world record for the 4m band. Dave used 50W to a 4-ele Yagi 70ft AGL and the Cyprus station was running 20W to a dipole. Congratulations both.

144MHz

Derek Hilleard, G4CQM (PL), enjoyed the good tropo on 2 November and worked many stations in JO21, 31, 32, 42, 43, 45, 51, 54, 55 and 65. G4TIF was also QRV that day and Martyn's best DX on SSB were OK1DTC and OK2KKW in JO60. Bob Harrison, G8HGN (CM), was QRV in the RSGB AFS Contest on 2 December and made 74 QSOs with stations in seven countries and 29 grids for a claimed score of 20,022 points. Five QSOs were over 600km and ODX was DK1FG (JN59) at 789km. GW7SMV was QRV in an aurora on 24 November and Jamie made 20 contacts with DL, EI, G, PA and SP stations. Best DX, all on SSB, were DL5WG (JO52), EI3EBB (IO54) and SP1FPG (JO73).

430MHz AND UP

John Quarmby, G3XDY (IP), was QRV on 70cm in the 3 November tropo lift and his best DX was LY2BAW* (KO25) at 1589km followed by LY2SA (KO14). The former is his ODX on tropo on the band. Other notable QSOs were with SP2OFW (JO93), SP3JMZ (JO82), OK1VMS and OK1AIY/P (JO70), OK1DFC (JO60), SP9CP and SP9EWU (JO98). G4CQM has a website concerning 23cm Yagis with a link to his other site - see the list.

SOFTWARE

IN THE MOONBOUNCE section I referred to SM5BSZ's *Linrad* (LINux RADio) software. Leif is still developing *Linrad*, which is primarily designed for 2m weak signal mode for those running the Linux operating system. There is no room to go into detail here but he suggests you look at the Nitehawk and G7RAU websites. The program can be downloaded from either of the two last sites in the WWW list.

DEADLINES

A VERY FULL month and, even with three pages, I've had to omit the Publications section. The April deadline is **12 February** and the May date, when we start the Annual Table again, is **12 March**. My CompuServe ID is g3fpk and the telephone answering/fax machine is on 020 8763 9457. ♦

WWW.

G0HGA 2m CW	http://www.qsl.net/g0hga/2mCW.htm (correction to January)
G0CAS (*SunMag*)	http://www.g0cas.demon.co.uk
PSC	http://www.keele.ac.uk/depts/por/psc.htm
G4CQM (23cm Yagis)	http://www.btinternet.com/~g4cqm
Leonids (AF3B)	http://leonids.johnpane.com
Linrad	http://nitehawk.com/sm5bsz/linuxdsp/blanker/leonids.htm
Demonstrations	http://www.g7rau.co.uk/sm5bsz/linuxdsp/blanker/leonids.htm
Linux	http://nitehawk.com/sm5bsz/linuxdsp/linrad.htm
Download	http://www.g7rau.co.uk/sm5bsz/linuxdsp/linrad.htm

CONTEST

TIM KIRBY, G4VXE
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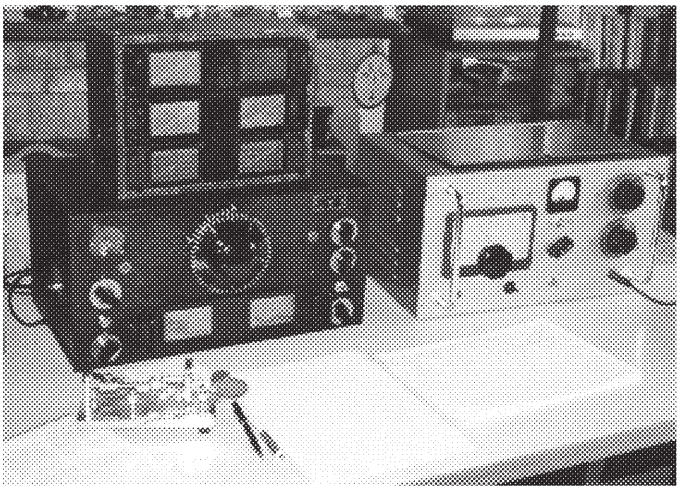
E-mail:tim@ukgateway.net

ONCE AGAIN, we have plenty of results to publish this month, so editorial space is kept to a minimum. Particular thanks, though, this month to Peter Chadwick, G3RZP, who sent in some pictures of his station for the RSGB Low Power Contest 2001. It features a rebuilt HRO, with a home-brew 807 PA transmitter. The Morse key is a 1915 Double Current telegraphy key. Peter says, "Not a Computer in sight!" Well, I know what I'd rather use for 48 hours! Seriously though, it's an interesting station. Don't forget that if you would like to see a picture of you and your contest station in *RadCom*, drop me a photo and I'll do my best to include it.



The G3RZP station for the 2001 RSGB Low Power contest: an HRO receiver and homebrew 807 PA transmitter.

March 144/432MHz 2001

THIS CONTEST traditionally suffers from appalling portable conditions. However, this year's event was the first victim of the foot and mouth outbreak with portable activity being suspended just before the event. A number of regular portable entrants commented on the advantages of creature comforts at their home locations such as warm beds.

The event still produced a healthy crop of 25 entrants. Conditions were generally described as poor, with deep fading, though a number of stations still managed to work some quite reasonable DX.

The Scottish and Welsh alliance were caught out by the lack of portables to work from their remote locations. A number of stations resorted to using 144MHz to arrange contacts on 432MHz to overcome the lack of activity.

The six-hour single operator section on 144MHz was an extremely close fight between G8ZRE and G8VYK. After scrutiny, both stations emerged with perfect logs and G8ZRE emerged as the winner by just 0.3%.

Congratulations go to: the Five Bells who risked TVI to repeat their overall win in 2000 as well as winning both bands; Roger, G3MEH, for repeating his win in the single operator section, though it was a closely fought battle with John, G4ZTR; John, G3XDY, for repeating his overall win in the six-hour single operator section; and the South Birmingham Radio Club and G7ULL for their joint win in the six-hour multi operator section.

These stations together with those marked (*) will receive certificates. A very useful check log is acknowledged from G4IJE/P who stresses that he was operating from a fixed location well away from farm land.

Roger Dixon, G4BVY

March 144/432MHz, 2001

144MHz Multi Operator

	Callsign	Locator	QSOs	Score	Best DX	Best DX Loc	km	Power	Ant
1*	G4ODA	IO92WS	265	69489	DK0OA	JO41XX	690	400	4*12 ele
2*	G8SAD	IO91WV	98	15253	DL7AJA	JO40AQ	583	100	4*6 ele
3	M5FUN	JO00DX	80	12073	PI4GN	JO33KK	525	50	9 ele
4	GM4VVX	IO78TA	1	136	GM0HTT	IO89IC	136	400	10 ele

144MHz Single Operator, Fixed

	Callsign	Locator	QSOs	Score	Best DX	Best DX Loc	km	Power	Ant
1*	G4ZTR	JO01KW	178	44965	DF0ET	JN59IV	725	400	2*7 ele
2*	G3MEH	IO91QS	210	42308	F8KKV/P	IN26WO	743	400	2*10 ele
3	G0HAS	IO81VH	118	26060	DK0HN	JO31PP	659	300	4*13 ele
4 *	PE1EWR	JO11SL	46	23382	F5SGT/P	IN87KW	620	80	10 ele
5*	G4HGI	IO83PL	92	16922	F5SGT/P	IN87KW	617	25	17 ele
6*	M1DUD	JO02QC	33	7809	DL0PVD	JN49BO	549	2	7 ele
7	M1MOD	JO01KT	42	7778	DL0PVD	JN49BO	566	25	7 ele
8	G3FII	JO01KV	22	6414	DL0PVD	JN49BO	570	15	10 ele
9*	2E1GUA	JO01FS	35	6361	DL7AJA	JO40AQ	541	10	13 ele
10	G6FFB	IO81TM	31	2882	PI4ZLD	JO11WM	432	25	5 ele

144MHz 6h Single Operator

	Callsign	Locator	QSOs	Score	Best DX	Best DX Loc	km	Power	Ant
1*	G8ZRE	IO83NE	54	10794	F5SGT/P	IN87KW	384	25	8 ele
2*	G8VYK	IO01FO	60	10758	DI9UV/P	JO41SN	627	80	17 ele
3*	G0TPH	IO92IO	51	7051	DL7AJA	JO40AQ	678	25	9 ele
4	G3YJR	IO93EJ	31	4179	ON4LDP	JO10UM	481	70	9 ele
5	G1TWS	IO01HO	37	3445	LX/PA1TK/P	JO30BB	406	25	11 ele
6	G3XDY	JO02QB	9	3262	DL0PVD	JN49BO	557	400	12 ele
7	G4APJ	IO83UP	16	2634	F8BRK/P	IN98SW	539	25	9 ele
8	G4XPE	IO92GU	13	2350	ON4AMX	JO20KV	486	25	10 ele

144MHz 6h Other

Pos	Callsign	Locator	QSOs	Score	Best DX	Best DX Loc	km	Power	Ant
1*	G7ULL	IO01AK	104	18416	DG0FEQ	JO40RV	659	150	11 ele
2*	G7RIH	IO91RR	45	3823	GI6ATZ	IO74AJ	468	50	17 ele

432MHz Multi-Operator

Pos	Callsign	Locator	QSOs	Score	Best DX	Best DX Loc	km	Power	Ant
1*	G4ODA	IO92WS	114	35428	DF4UE	JN48RR	809	400	4x28 ele
2*	G8SAD	IO91WV	25	2962	PI4GN	JO33KK	502	100	2x19 ele

432MHz Single Operator, Fixed

Pos	Callsign	Locator	QSOs	Score	Best DX	Best DX Loc	km	Power	Ant
1*	PE1EWR	JO11SL	33	8167	DL1GBQ/P	JN47RU	586	13	2x21 ele
2*	G3MEH	IO91QS	63	7150	DF2VT	JN39LI	399	250	2x23 ele
3	G4ZTR	IO01KW	33	5396	GI6ATZ	IO74AJ	531	45	21 ele
4	G0HAS	IO81VH	27	4257	PA6NL	JO21BX	443	50	4x21 ele
5 *	G4HGI	IO83PL	24	1403	G0HAS	IO81VH	243	10	19 ele

432MHz 6h Single Operator

Pos	Callsign	Locator	QSOs	Score	Best DX	Best DX Loc	km	Power	Ant
1*	G3XDY	JO02QB	19	6723	DI9KH/P	JO42OX	551	250	28 ele
2*	G3YJR	IO93EJ	8	997	GI6ATZ	IO74AJ	310	10	9 ele
3*	G4APJ	IO83UP	5	556	G0HAS	IO81VH	260	25	19 ele
4	G8VYK	JO01FO	5	530	G8OHM	IO92AJ	187	50	Yagi
5	G4XPE	IO92GU	1	90	G4ODA	IO92WS	90	25	10 ele

432MHz 6h Other

Pos	Callsign	Locator	QSOs	Score	Best DX	Best DX Loc	km	Power	Ant
1 *	G8OHM	IO92AJ	38	8495	DL9EBF	JO31FH	390	400	4x19 ele

Overall Results

Multi Operator

Pos	144MHz	432MHz	Total	Call/Group
1*	1000	1000	2000	Five Bells
2*	220	84	304	Stevenage and DARS CG
3	174	0	174	M5FUN
4	1	0	1	Scottish and Welsh Alliance

Single Operator Fixed

Pos	144MHz	432MHz	Total	Call/Group
1*	941	875	1816	G3MEH
2*	1000	661	1661	ColchesterCG
3	524	1000	1524	PE1EWR
4	580	521	1101	G0HAS
5	376	172	548	G4HGI
6	174	0	174	M1DUD
7	173	0	173	M1MOD
8	143	0	143	G3FII
9	141	0	141	2E1GUA
10	64	0	64	G6FFB

6h Single Operator

Pos	144MHz	432MHz	Total	Call/Group
1*	303	1000	1303	G3XDY
2*	997	79	1076	G8VYK
3	1000	0	1000	G8ZRE
4	653	0	653	G0TPH
5	386	148	534	G3YJR
6	244	83	327	G4APJ
7	319	0	319	G1TWS
8	218	13	232	G4XPE

6h Other

Pos	144MHz	432MHz	Total	Call/Group
1=*	1000	0	1000	G7ULL
1=*	0	1000	1000	South Birmingham Radio Society
3	208	0	208	DacorumARS

1st 144MHz Cumulative, 2001

THIS YEAR'S event sees multiple entries in the multi operator category with some welcome competition taking place, and some new callsigns in the single operator category. Entries overall are down, which may be a consequence of the increased number of cumulative events in the calendar, and also the restrictions on portable operation. The Aylesbury Vale RS, G4VRS, take the top slot in the multi operator category, with the Mid Cheshire ARS, G8ZTT, as runners-up. Congratulations to Reg Woolley, G8VHI, who wins the single operator low power category first time out, and to Peter Craig, G7ULL, who wins the single operator high power category, having steadily improved his score year on year. Thanks for your entries and see you next year.

Steve Redfern G4AEQ

1st 144MHz Cumulative, 2001

Multi Operator

Pos	Call	Loc	Pwr	Ant	27.3.00 QSOs	27.3.00 Mults	27.3.00 Score	27.3.00 Norm	4.4.00 QSOs	4.4.00 Mults	4.4.00 Score	4.4.00 Norm	12.4.99 QSOs	12.4.99 Mults	12.4.99 Score	12.4.99 Norm	Total Norm
1	G4VRS*	IO91QS	400	2x10Y	55	17	935	1000	55	15	825	1000	55	18	990	1000	2000
2	G8ZTT*	IO83QE	400	17Y	0	0	0	0	32	12	384	465	0	0	0	0	465
3	G1WAC	IO92BI	400	18Y	21	7	147	157	0	0	0	0	0	0	0	0	157

Single Operator Low Power

Pos	Call	Loc	Pwr	Ant	27.3.00 QSOs	27.3.00 Mults	27.3.00 Score	27.3.00 Norm	4.4.00 QSOs	4.4.00 Mults	4.4.00 Score	4.4.00 Norm	12.4.99 QSOs	12.4.99 Mults	12.4.99 Score	12.4.99 Norm	Total Norm
1	G8VHI*	IO92FM	25	2x14Y	44	14	616	1000	0	0	0	0	53	19	1007	1000	2000
2	G0GCI*	IO01ED	25	9Y	37	13	481	781	32	11	352	739	21	8	168	167	1520
3	M5FUN	IO00DX	25	9Y	30	10	300	487	34	14	476	1000	35	11	385	382	1487
4	G1TWS	IO01HO	25	11Y	19	7	133	216	28	7	196	412	23	7	161	160	628
5	G8ZRL	IO83NE	25	8XY	24	8	192	312	18	7	126	263	26	9	234	232	577
6	G0DVJ	IO01MX	25	5Y	12	8	96	156	11	8	88	185	13	9	117	116	341
7	2E1GUA*	IO01FS	10	13Y	11	6	66	107	12	6	72	151	13	6	78	77	258
8	G4XPE	IO92GU	25	10Y	12	7	84	136	3	3	9	19	8	6	48	48	184

Single Operator High Power

Pos	Call	Loc	Pwr	Ant	27.3.00 QSOs	27.3.00 Mults	27.3.00 Score	27.3.00 Norm	4.4.00 QSOs	4.4.00 Mults	4.4.00 Score	4.4.00 Norm	12.4.99 QSOs	12.4.99 Mults	12.4.99 Score	12.4.99 Norm	Total Norm
1	G7ULL*	IO01AK	150	11Y	39	11	429	830	48	20	960	1000	59	24	1416	1000	2000
2	G4ZAP*	IO81SG	400	2x12Y+17Y	47	11	517	1000	0	0	0	0	53	14	742	524	1524
3	G0HAS	IO81VH	300	4x13Y	38	11	418	808	40	14	560	383	42	16	672	474	1391
4	G7NBE	IO92GS	250	9Y	13	6	78	151	8	6	48	50	15	7	105	74	201
5	PE1EWR*	JO11SL	80	10Y	0	0	0	0	12	5	60	62	0	0	0	0	62

*Certificate winner

1.3 / 2.3GHz Contests, April 2001

GENERALLY POOR band conditions and the absence of portable stations caused a decrease in the level of activity seen last year, despite this some stations managed to work reasonable DX.

Congratulations to Andrew, G6SPS, for winning 23cm and to Roger, G3MEH, for winning 13cm. The winners and runners-up in each section will receive certificates.

Matthew Jeffery, G7ORR

1.3 / 2.3GHz Contests, April 2001

23cm Single Operator, Fixed Station

Pos	Call	Loc	QSO	Points	Power	Antenna	Best DX	km	Rig
1*	G6SPS	IO01IT	18	2467	120	23ele	DG1KJG	459	TS711+TVTR
2*	G3MEH	IO91QS	17	2149	30	4x35ele	DC9KU	482	IC275E+TVTR
3	M0GHZ	IO81VK	12	1130	200	55ele	G6SPS	206	Transverter
4	G7LRQ	IO91TQ	13	622	5	4x55ele	M0GHZ	130	FT736
5	G4GFI	IO91VH	7	453	20	28ele	G4LDR	101	Transverter
6	G4ITH	IO93HD	5	451	100	35ele	G6SPS	205	FT736

13cm Single Operator, Fixed Station

Pos	Call	Loc	QSO	Points	Power	Antenna	Best DX	km	Rig
1*	G3MEH	IO91QS	4	647	10	67ele	PA0WWM	352	FT290+TVTR
2*	G6SPS	IO01IT	4	534	40	25ele	PA0WWM	360	FT290+TVTR
3	M0GHZ	IO81VK	1	115	30	44ele	G3MEH	115	Transverter
4	G4ITH	IO93HD	1	66	4	25ele	G8ZQB	66	FT290+TVTR

*Certificate winners

1st 70MHz, 2001

ACTIVITY LEVELS in this event were well down on the previous year with only 52 stations appearing in the logs. The number of entrants was slightly down and a number of stations with reasonable scores failed to submit entries. Conditions were poor and many logging errors occurred on the longer distance contacts. One meteor scatter contact took place between the Isle of Man and Slovenia.

Congratulations go to: Robert, GD4GNH, who repeated his overwhelming victory in the single operator section; David, G1OGY, who triumphed in a closely-fought battle for the runner-up slot in the single operator section; the Flight Refuelling ARS, who won the multi operator section; Ian, G4OUT, who was the leading station running less than 25 watts into a single antenna. These stations together with those marked (*) will receive certificates.

Very useful checklogs are acknowledged from GW3HWR and G0WJR/M.

Roger Dixon, G4BVY

1st 70MHz, 2001

Single Operator Fixed (SF)

Pos	Callsign	QSOs	Score	Locator	Power	Ant	ODX Call	ODX km
1*	GD4GNH	35	11842	IO74QD	160	5 ele	S51DI	1673
2*	G1OGY	24	3740	IO01GR	120	5 ele	GD4GNH	438
3	G3MEH	32	3528	IO91QS	100	2 x 5 ele	GD4GNH	377
4	G0GCI	15	2481	IO01ED	100	4 ele	GD4GNH	474
5	G0ODQ	19	2196	IO91NQ	40	5 ele	GD4GNH	371
6	G4SJH	16	1908	IO91PL	50	3 ele	GD4GNH	407
7*	S51DI	1	1673	JN76VL	100	8 ele	GD4GNH	1673
8	G3XPU	16	1646	IO92HM	45	3 ele	GD4GNH	281
9*	G4OUT	9	1077	IO92AT	10	3 ele	GD4GNH	230
10	GM4DIJ	2	360	IO85IW	50	4 ele	G3UKV	360

Multi Operator Fixed (M)

Pos	Callsign	QSOs	Score	Locator	Power	Ant	ODX Call	ODX km
1*	G4RFR	33	5886	IO90AS	100	2 x 9 ele	G4CAY	432
2*	GW5NF	23	3265	IO81KQ	100	5 ele	GD4GNH	291

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest	Bands	Exchange
9/10 Feb	*0000-2400*	*RTTY*	*CQ/RJWW WPX RTTY*	*3.5-28*	*RST+Serial*
9/10 Feb	2100-0100	CW	RSGB 1st 1.8MHz	1.8	RST+Serial+District
16/17 Feb	*0000-2400*	*CW*	*ARRL DX*	*1.8-28*	*RST+Power*
22/24 Feb	*2200-1600*	*SSB*	*CQ 1.8MHz*	*1.8*	*RST+Country*
23/24 Feb	*0600-1800*	*SSB*	*REF SSB*	*3.5-28*	*RST+Serial*

VHF Contests

Date	Time	Mode	Contest	Bands	Exchange
3 Feb	0900-1500	ALL	RSGB 432MHz AFS	432	RST+Serial+Locator
5 Feb	2000-2230	ALL	RSGB 144MHz Activity	144	RST+Serial+Locator
10 Feb	1000-1200	ALL	RSGB 70MHz Cum #3	70	RST+Serial+Locator+QTH
12 Feb	2000-2230	ALL	RSGB 432MHz Activity	432	RST+Serial+Locator
19 Feb	2000-2230	ALL	RSGB 1.3/2.3GHz Activity	1.3/2.3	RST+Serial+Locator
24 Feb	1000-1200	ALL	RSGB 70MHz Cum #4	70	RST+Serial+Locator+QTH
26 Feb	2000-2230	ALL	RSGB 50MHz Activity	50	RST+Serial+Locator

Microwave Contests

Date	Time	Mode	Contest	Bands	Exchange
24 Feb	0900-2000	ALL	All-Band Activity Day	All	Non-competitive

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

More contest results over the page

50MHz Trophy Contest, 2001

CONDITIONS during the contest were poor relative to the week prior to the event, which saw good Sporadic E openings. Despite this, most stations were able to take advantage of short Sporadic E openings, the timing and duration of which varied from one end of the country to another.

Several stations that normally operate from portable locations were not deterred by the foot and mouth disease restrictions and managed to make use of club stations or alternative fixed stations.

Congratulations to the Northern Lights for winning the Multi-operator section (and the Telford Trophy); Howard, M0XXX, for winning the single operator fixed station section (and the Six Metre Cup); the Flight Refuelling ARS for winning the multi operator six hour section; Tim, G4DBL, for winning the single operator fixed six hour section, and Simon, RS177448, for winning the SWL section.

Matthew Jeffery, G7ORR

50MHz Trophy, 2001

Multi Operator Section, 24 Hour

Pos	Group	Call	Locator	QSO	Score	Mult	Total	Best DX	km	Ant	Power	Rig
1*	Northern Lights CG	MD6V	IO74QD	521	308929	133	41087557	9H0O	2499	2x7+2x7+2x6	400	FT650
2*	Five Bells CG G4SIV	IO92WS	287	120588	92	11094096	9H0O	2189	4x5 + 6el	400	TS950+tvtr+TS850+tvtr	
3	Blacksheep C&DXG	G8T	IN79IX	209	118237	90	10641330	9H0O	2218	6el	400	IST245
4	Colchester CG G7HCO	IO01GN	238	79167	69	5462523	9H0O	2055	8el	300	FT847	
5	Stevenage DARS	MJS	IO91WV	165	66953	59	3950227	LZ6T	2144	7el	100	FT847
6	Harwich ARS G0RGH	IO01NU	52	20566	31	637546	9H0O	2057	5el	100	FT100	
7	Dacorum ARS G7RIH	IO91RR	103	18136	28	507808	SP8PAI/8	1713	5el	100	FT847	

Single Operator Section, 24 Hour

Pos	Call	Locator	QSO	Score	Mult	Total	Best DX	km	Ant	Power	Rig
1*	M0XXX	IO81UP	222	67112	65	4362280	9H0O	2189	7el	400	FT847
2*	G0AEV	IO81WL	141	46683	47	2194101	YT1AD	1941	7el	100	IC706
3	GW3MFY	IO81FL	144	37868	47	1779796	IG9SIX	2196	5el	400	IC706
4	G3MEH	IO91QS	109	36842	46	1694732	LZ6T	2173	5el	60	IC736
5	G1KTZ	IO70TM	60	23024	34	782816	9H0O	2210	4el	50	FT726
6*	PE1EWR	IO11SL	35	21342	33	704286	YO4KBI/P	1903	3el	20	TS680S
7	GM6NX	IO86BC	22	25543	20	510860	YU0B	2154	6el	400	FT920
8	G3FIJ	IO01KV	30	11261	24	270264	ID9S	1829	4el	10	FT736
9	M1DUD	IO02OC	20	4449	17	75633	SQ8FHG/9	1382	5el	2	FTH90
10	MU0FAL	IN89RL	10	1388	11	15268	MD6V	588	5el	200	FTV1000

Multi Operator, 6 Hour

Pos	Group	Call	Locator	QSO	Score	Mult	Total	Best DX	km	Ant	Power	Rig
1*	Flight Refuelling ARS	G4RFR	IO90AS	87	19743	30	592290	SP8PAI/8	1824	11el	100	IC746
2*	Newquay & DARS	G4ADV	IO70LK	19	1667	9	15003	G4SIV	427	4el	100	DX-70

Single Operator Fixed, 6 Hour

Pos	Call	Locator	QSO	Score	Mult	Total	Best DX	km	Ant	Power	Rig
1*	G4DBL	IO91HC	51	24060	31	745860	LZ3DP	2288	5el	350	IC746
2*	G4HLX	IO91FP	45	16812	25	420300	SP8PAI/8	1782	5el	100	FT847
3	MW1TYO	IO81AO	48	11004	23	253092	IG9SIX	2225	5el	400	FT847
4	G1KHX	IO81MI	45	11327	20	226540	SP8AWL	1764	5el	90	FT101+FTV901
5	M0COP	IO92BK	31	3772	13	49036	OK1TO	1106	5el	100	IC746
6*	G4APJ	IO92WS	3	344	5	1720	G4SIV	174	5el	15	FT736R

SWL

Pos	Call	Locator	QSO	Score	Mult	Total	Best DX	km	Ant	Rig
1*	RS177448	IO01AL	92	19662	34	668508	YT1AS	1800	5el	IC-R75
2*	BRS32525	IO01AL	61	10705	24	256920	LZ6T	2119	Dipoles	IC-R70

*Certificate winners

5th 144MHz Backpackers Contest, 2001

The FIFTH 144MHz Backpackers contest of 2001 was the only Backpacker event not to be cancelled due to the foot and mouth disease restrictions. The majority of the competitors remarked that it was good to be able to operate /P again – even though band conditions were not very favourable and activity was low.

Congratulations to the 'One Man and His Dog' Contest Group, G8NWM/P, for winning the multi-operator 10W section, to GW8ZRE/P for winning the single operator 10W section and finally to GW0PZO/P for winning the single operator 3W section. The section winners and runners-up will all receive certificates.

The 144MHz Backpackers Trophy for 2001 is awarded to the 'One Man and His Dog' Contest Group, G8NWM/P. This team submitted the only perfect log out of all of the section winners.

Ian Pawson, G0FCT

5th 144MHz Backpackers Contest, 2001

Multi Operator 10W

Pos	Group name	Call sign	Loc	QSO	Multi	Points	Total	Best DX	km	Power	Ant	Eqpt
1*#	One Man & His Dog CG	G8NWM/P	IO92TR	58	38	18149	689662	DK0FY	744	10	2x10EL	FT736R
2*	-	GW5NF/P	IO81PR	46	30	10778	323340	F1DLT	750	10	2x9EL	FT290

Multi Operator 3W

No entries

Single Operator 10W

Pos	Callsign	Loc	QSO	Multi	Points	Total	Best DX	km	Power	Ant	Eqpt
1*	GW8ZRE/P	IO83IA	60	35	15465	541275	DL2KK	709	10	7EL	TR751E
2*	G4RQI/P	IO94MI	51	28	13706	383768	F5CUA	581	10	2x10EL	IC746
3	M0BAO/P	IO80LV	37	23	8506	195638	GM4ZUK/P	673	10	17EL	IC706
4	G4WVD/P	IO70NL	22	19	6457	122683	GM4ZUK/P	734	10	10EL	FT480R

Single Operator 3W

Pos	Callsign	Loc	QSO	Multi	Points	Total	Best DX	km	Power	Ant	Eqpt
1*	GW0PZO/P	IO83ID	56	26	9728	252928	PA6C	637	2.5	5Q	FT290R
2*	GW7LQD/P	IO82KW	48	23	10937	251551	PE1AHX	580	3	2x9EL	IC275E
3	G1ATZ/P	IO82KV	31	20	7991	159820	LX/PE1NET	713	2	17EL	FT290R

*Certificate winner. # Trophy winner

2nd Slow Speed Cumulative, 2001

CONGRATULATIONS to the following winners of the sections. Leading Class A/B Licensee to Peter Herbert, M5ABN, with his Icom IC-746 at 10 watts into a G5RV.

Leading A Class was Dick Sellen, G3YAJ, using a Ten-Tec Corsair and 8 watts into a doublet antenna. A 'First Time Entry Certificate' goes to the Midland Contest Group, M5HDF. It's their first time entering a CW contest. The operators were Mark, M0BLT, and John, M0CDL, and they used an FT-920 at 10 watts into a G5RV.

Many thanks for to GM3UM for the checklog.

Derrick Webber, G3LHJ

2nd Slow Speed Cumulative, 2001

Pos	Call	4 Sep	12 Sep	20 Sep	Total
1*	M5ABN	580	541	CKL	1121
2*	G3YAJ	265	220	CKL	485
3*	G3ZGC	215	-	225	440
4	G4BLI	CKL	225	210	435
5	G4BIM	225	185	CKL	410
6	G3LIK	205	201	-	406
6	G3TTB	-	213	193	406
7	G3ISR	-	188	193	381
8	G0VYR	215	-	160	375
9	GW4LZP	200	160	-	360
10	G2HLU	173	180	-	353
11	G4CVA	CKL	127	165	292
12	G3SZS	CKL	140	145	285
12	G3ZDD	CKL	137	148	285
13	G4KEW	145	CKL	125	270
14	G0FYX	-	125	130	255
15+	M5HDF/P	134	CKL	115	250
16	G4GSA	75	CKL	87	162
17	G0UHM	-	38	110	148
18	G4XPE	-	-	138	138
19	G0WHO	128	-	-	128

* = Certificate of Merit. + = 1st time entrant in RSGB Contest.

HF HF HF HF

DON FIELD, G3XTT
105 Shiplake Bottom, Peppard Common, Henley on Thames, RG9 5HJ.
e-mail: hf.radcom@rsgb.org.uk

DURING November and early December the main topic of conversation among DXers centred on the two rarest DXCC entities. No longer does **North Korea** (P5) have the status of being the rarest. 4L4FN/P5 has continued to be active, appearing almost daily, and a number of UK stations are in the log. It is still not clear whether Ed's activity will count for DXCC (there is no paperwork so far), but he is certainly in Pyongyang and, given the tensions in that country, it is unlikely that he is operating without at least the tacit agreement of the authorities. But even without Ed's activity, P5 is no longer top of the heap as far as rare ones are concerned. That spot has now been taken by **Ducie Island** (see my November and January columns) for the simple reason that the planned operation never took place. Bad weather prevented a landing on the island, so this one will have to wait until a later date [a new operation is scheduled for the end of March - *Ed*].

The other news, perhaps to have been expected, was of activity from **Afghanistan** by various military and UN personnel. The status of some of these operations is unclear, but the callsign YA5T has been allocated to Peter Casier, ON6TT, and has already been cleared by DXCC for operations after 20 November. The documentation covers the use of the callsign not only by Peter, but also by his UN World Food Programme colleagues Robert, S53R; Mats, SM7PKK; and Mark, ON4WW. KU9C (QTH Corner, November) is handling the QSLs. When local circumstances allow, the team hopes to mount a large-scale operation under the YA5T callsign, but current activity is, for very obvious reasons, somewhat limited.

DX NEWS

DL2SL AND SP6IXF will be active from **Namibia** from 15 February to 8 March. They will sign V51/homecall on all bands with a TS-450, TS-50, and IC-706MkII. Antennas will include a 3-element delta on 40 and 80, TH3, slopers for WARC bands, and dedicated receiving antennas for 160m.

A Scandinavian team plans to sign S9LA from **Sao Tome** (S9) from 4 to 10 February. They will operate on 10 - 160 on CW, SSB, PSK31, RTTY and possibly SSTV. Two complete stations will be used around the clock, with an emphasis on LF and the WARC bands. Team members will include LA5QKA, LA5UF, LA6EIA, LA6FJA, LA7THA, LA7WCA, LC3EAT, LC6ZBT, SM5COP and SM5IMO.

Karl, W9XK, will be active (mostly on 14260 - 14270, 21370 - 21400 and 28500kHz) as 3W2XK from near Saigon, **Vietnam** until 9 April. QSL via W9XK.

Geoff, G0UVX, writes that he is in **Cyprus** and has been issued the call ZC4VG for use from the Sovereign Base areas. He will be active mainly on CW using a Butternut vertical antenna. QSLs can be sent via the RSGB bureau to his home callsign.

Kyle Harris, P29KH, says he has returned to a house in the jungle in **Papua New Guinea** after being away for seven years. He operates almost entirely CW, but gets on for phone contests too. He's using a multiband dipole but plans to put up a tower and tribander, plus a vertical for 40 and 80. He likes to operate 0900 - 1200 and 2000 - 2300, mostly weekends, and typically 40kHz up from the bottom of the band, split frequency if there's a pileup. He plans to try to load his tower for 160m. QSL to WD9DZV.

Members of the Diamond DX Club will be heading to **Sonsorol Island** (OC-NEW), with activity expected from 9 to 11 February. They expect to use the callsign T88SI, and focus on the IOTA frequencies on 10, 15 and 20m with two stations active round the clock. Team members include Nando, IT9YRE; Maury, IZ1CRR; Yuki, JI6KVR, and Silvano, KB5GL.

Veteran IOTA DXpeditioner Bernhard, DL2GAC, is on his travels again. By the time this appears he will be in the **Solomon Islands** and no doubt appearing from various of the qualifying island groups. In the past he has used the callsign H44MS.

John, G4RCG, writes that he was due to be staying on **North Caicos** at the holiday home of K4ISV, arriving 20 January and leaving 2 February. He says "There is a full shack there with super antennas for every band, it's set up for 'real radio hols'. I am going with Bruce, KI7VR, and Ray, VK4BRC, (a boys-only trip) and we will sign VP5/home call." John will make an entry in the CQWW 160 contest which is on the last full weekend of January, and otherwise will focus on his favourite bands, 17 and 30m. QSLs go the various home calls.

The Splendide Hotel, Ouagadougou, Burkina Faso, enhanced with the XT2DX Voodoo Contest Group's HF Yagis!

Hans, DL7CM; Mike, DL2OE, and Dietmar, DL3DXX, will be active from **Nicaragua** from 18 February to 8 March. They will probably operate as YN/home call and will be active on all bands and modes, with emphasis on the low bands, CW and RTTY. Antennas will include a V80 and LP5 and they will have an amplifier. QSL via home calls.

A team of 12 highly-experienced operators was due to activate **South Georgia** (IOTA AN-007) and **South Sandwich** (AN-009) in January and February. Unfortunately this will almost certainly appear too late for the South Georgia operation, but South Sandwich is likely to take place around 28 January to 3 February. The team are sailing in the New Zealand registered *Braveheart*, of ZL9CI fame. Given the extreme environmental situation on these islands, the focus will be on survival and on giving out a new DXCC entity to as many DXers as possible. The team is taking lightweight generators and simple antennas to make life as straightforward as possible, so don't expect huge signals. Neither will there be a website, on-line logs or promises of any given bands or modes. However, propagation to those areas from the UK tends to be extremely reliable, and I would expect the team to be workable on most bands.

e-QSL AND LOTW

FOLLOWING MY PIECE in December about 'Logbook of the World', I have been in correspondence with Tim Kirby,

Results of ARRL International DX Phone Contest 2000

A=QRP, B=Low Power, C=High Power

Call	Score	Category	
G3FNM	67,832	A	
GM4ELV	3,312	A	
GI0KVQ	360,315	B	
MW5EPA	161,928	B	
G4NXG/M	137,808	B	
MU0FAL	83,325	B	
GW0AJI	78,174	B	
MM0LEO	63,936	B	
G3NDC	56,196	B	
G4REH	52,488	B	
GM4UYZ	45,990	B	
GW3WWN	34,452	B	
G3RSD	34,293	B	
G6QQ	10,962	B	
G0/N9LYE	4,200	B	
G3YTU	1,914	B	
M6T (G4PIQ op)	3,261,087	C	
GM4YXI	1,696,785	C	
G4BUO	1,067,475	C	
GM7V (GM3WOJ op)	990,720	C	
G3TMA	393,579	C	
GM3BCL	250,200	C	
G4IUF	245,016	C	
G3MXJ	114,180	C	
GW4BLE	328,140	C	10
G4OJH	255,474	C	10
M0SDX	246,384	C	10
G0VSN	65,283	C	10
GW3NJW	12,705	B	15
G0NWY	42,504	B	10
M4T (G0VQR op)	10,752	B	10
Single-op Assisted			
GW0GEI	112,671	C	
Multi-op Single Tx			
GJ2A (AB2E GJ0NYG ops)	1,468,236	C	

G4VXE who, as well as being *RadCom's* 'Contest' columnist, has probably forgotten more about software than I will ever know! Tim pointed out to me that the popular e-QSL service actually has the capability for authenticating logs before they are submitted, although currently only about 10% of the users have done so.

To gain AG (Authenticity Guaranteed) status, the user has to scan a copy of his log and forward it for validation. Unless logs are so validated, while they may be of interest to users, they are not valid for award purposes.

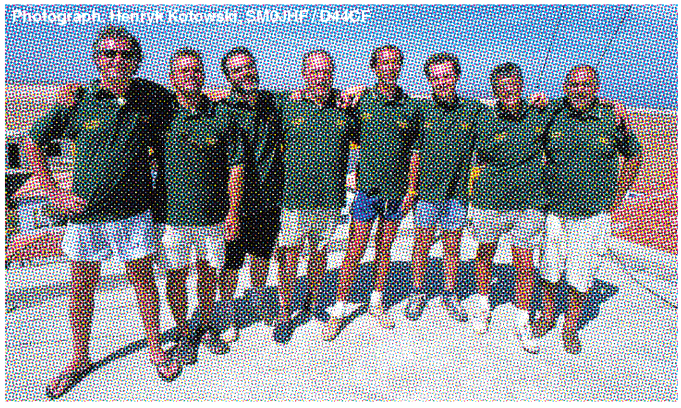
QTH Corner

4L4FN/P5	Bruce Paige, KK5DO, PO Box 310, Alief, TX 77411, USA.
E29AL	Cherdchai Yiwlek, HS0GBI, PO Box 1090, Kasetsart, Bangkok 10903, Thailand.
K4JDJ	Bob Young, 556 Babbtown Road, Suffolk, VA 23434, USA.
S9LA	Sore Sunnmore Gruppa av NRRL, c/o Otto Norhagen, LA2N, NO-6143 Fiskaabygd, Norway.
T88SI	Ferdinando Rubino, IT9YRE, PO Box 30, 96012 Avola SR, Italy.

AG logs are valid, and contacts in these logs count towards e-QSL's own range of awards and a handful of other (relatively minor, it has to be said) awards programmes. Contacts are 'matched' between logs on the database. Any which fall outside the given criteria (time fails to match within so many minutes, etc) are referred via the web page to the person who uploaded the log(s) concerned, who can then accept or reject the 'QSL request'.

Although 'QSL cards' can be printed to decorate the shack or whatever, any awards based on e-QSL gather their data directly from the database for the simple reason that printed cards obviously cannot be authenticated in any way. Despite the limitations, I believe that several hundred UK amateurs already subscribe to e-QSL, and the web page boasts some 8.8m QSO records from 228 countries on the database.

While there is obviously a long way to go, it does look as though e-QSL has potential, but I suspect the sheer momentum which the ARRL will eventually bring to LOTW, along with the fact that DXCC remains the pre-eminent international award for DX chasers, mean that LOTW will eventually hold sway. No doubt there will be a lot more to say on the subject in a year or so's time once LOTW is up and running.



Photograph Henryk Kotowski, SM0RJF / D44CF

The D44TC team in Cape Verde, November 2001: left to right Matteo, IK2SGC; Xara, CT1EKF/D44TD; Vittorio, I4YSS; Fabio, I4UFH/D44TB; Alberto, IV3TAN/D44TC; Gabrielo, IK4UPB/D44TA; Franco, I4LCK; and Santos, CT1DVV/CT8T.

AWARDS

IN RECOGNITION OF the popularity of QRP (low power operation), the ARRL is now offering a new operating award - the QRP DX Century Club, or QRP DXCC. The award is available to amateurs who have contacted at least 100 DXCC entities using 5 watts or less. QSL cards are not required; applicants must certify the authenticity of log information. See the ARRL website for further details.

A special award has been created to coincide with the 125th Carnival of Viareggio in Italy. Between 27 January (from 0600) and 17 February (2200), collect points by working Viareggio amateurs on 10, 15, 20, 40 and 80m. One point per QSO, and the same station may be contacted on several bands and modes and, indeed, on the same band / mode combination on different days. A special event ('Jolly') station will also be operating (I don't have details of the callsign), and contacts with this station will be worth five points. UK amateurs need a total of 25 points to qualify. Applications, to be received by 30 April, require you to send log details, one of your QSL cards, and 8 Euros (or equivalent). The award manager is IK5DND, c/o Versilia ARI Section, PO Box 200, I-55049 Viareggio LU, Italy. Whether you apply for the award or not, participating stations will have special QSL cards with the Carnival logo, which can be requested via the bureau in the usual way. Any funds remaining, after admin costs, will be donated to the E Mayer Children's Hospital in Florence.

DXING BOOKS AND VIDEOS

FROM TIME TO time I get asked for recommendations regarding source books on the art of DXing. One of the classics was *The Complete DXer* by W9KNI (1989), but sadly that has long been out of print. The books put out by major expeditions such as *DX-Aku* (XR0Y and XR0Z, 1995), and *VK0IR* (Heard Island 1997) give some interesting insights into what is involved in putting on such a trip, and *DXing on the Edge, The Thrill of 160 Meters* is a fascinating account of the history and challenges involved in topband DXing. You would have to look to sources in the USA for most of these.

A modern, and welcome, trend has been the production of excellent videos following a number of the bigger DXpeditions. Those for A52A, FO0AAA, ZL9CI and VK0IR, all produced to professional standards, are available from EI6FR.

Finally, the RSGB now has a new stock of *DXpeditioning, Behind the Scenes*, edited by Neville Cheadle, G3NUG, and Steve Telenius-Lowe, G4JVG, which is a must-have, not only for potential expeditioners but also for those of you who want to know how best to get through the pile-ups.

COUNTRIES WORKED, 2001

(sorted this month by CW totals)

CALL	CW	SSB	RTTY	MIX
G0NXX	257	0	0	257
G4OBK	241	142	88	271
G3SXW	232	0	0	232
G3IGW	220	0	0	220
G3TXF	217	141	3	226
G4EDG QRP	209	0	0	209
G0TSM	208	202	105	259
G3LHJ	200	107	78	213
G4DUW	195	228	0	270
G3JFS	184	171	134	211
ZC4DW	170	100	106	188
G3YVH	169	124	2	217
G3XTT	164	91	2	180
ZC4BS	150	200	52	217
MU0FAL	149	157	0	179
GM0VIT	141	134	2	196
GM4OBK	110	10	0	116
G3WP	108	0	0	108
G4IRN	91	85	0	119
MM0BQI	89	117	119	165
G4DDL	54	35	23	67
G4FVK	50	122	0	128
M0CTQ	40	250	0	273
M0BZQ	38	218	0	246
G0MSM	35	203	37	206
M5AEF QRP	22	85	0	88
M0ASJ	14	66	0	66
G0ARF	0	0	165	165
G0VHI	0	240	0	240
G3MDH	0	103	0	103
G3URA	0	0	53	53
G4MUW	0	84	0	84
G4YWY/M	0	85	0	85
GI0NQC	0	49	47	71
GW4SKA	0	0	66	66
M0AWX	0	256	0	256
M0CAL	0	121	0	121
M0LLW	0	181	0	181
M5PLY	0	181	0	181
G0CAS	-	-	-	180
GM4ELV	-	-	-	107
GM4FAM	-	-	-	102
GU0SUP	-	-	122	122
M0BIB	-	-	-	231
M0CNP	-	-	-	145

QSL VIA W4FRU

WELL-KNOWN QSL manager John, W4FRU, passed away late last year at the age of 79. Bob Young, K4JDJ, has picked up John's QSL chores. He can now confirm QSOs with the following stations:
8R1ZG, 9M0S, BS7H (1997 no JAs), E30GA, FM5WE (logs from 1994 to 2000), TO0R, VK0IR (Heard Island), VP8CBC, VP8CRB, VP8CRC, VP8SGP, 1S0XV, 1S1RR, 3W0A (op RN6BY), 3W100HCM, 3W1A (op RN6BY), 3W1PZ, 3W3RR, 3W4KZ (op RN6BY), 3W7A, 3W8AA, 3X1Z, 5A0RR, 5N0DOG, 5N0RMJ, 5N2DOG, 5N4ROF, 5T5AY, 5T5S, 5T5ZZ, 5X5AA, 5Z4BI (op KG0ZI), 5Z4BX, 9G1KU, 9X5AA (1988/89), A61AA, A61AB, CE1CI, ED8HH, F5WE (1994 to 2000), FM5WS, HL0X/3, J28EH, J28EM, K0AX/KH2, KA9YDK/HI8, KB4ATV/4S7, S21A, S21B (logs 92 to 4/2000), S21NQ (op WZ6C), S21ZG, TX0K, TY0ABD, TZ1AZ, TZ2ZZ, TZ6ZZ, V21ZC, V21ZZ, V29A, VK4NIC/3X, VP8CWN (op ZD7BJ), VP8TBD, W3IVP/5N1, W4LZZ/6W, W4LZZ/6W8, W4LZZ/TZ, W4LZZ/V2, W4LZZ/V21, WZ6C/S2, WZ6C/S21, WZ6C/ST2, WZ6C/ST4, XV0SU (Aug 90), XV100HCM, XV100HCM/3W, YB1AQC, YJ8M, ZD7BJ, ZD7HH, ZD7LM, ZD7WA, ZD7XX, ZD7XY, ZD8CK, ZD8HH, ZD8XX, ZD9BV (logs 1993 to 2000), ZD9CD, ZD9CH, ZD9CK, ZD9CL, ZD9CN, ZD9DV, ZD9JR, ZD9PV, ZD9WCY, ZD9YL, ZK1SH, ZL7LM, ZS1EDR, ZS1USA, 5N20DOG, A4XJF, A4XRF, A4XYS, ET3USE, FB8WJ, FB8ZM, FB8ZN, FR7BE, KX6PO (op VK4NIC), ZD2XY.

CONTESTS

AS PROMISED, UK results from last year's ARRL International DX Contest Phone appear in the table. Top ten finishers include G3FNM (DX 10th, QRP), GW0GEI (Europe 8th, single-op assisted) and GJ2A (Europe 9th, multi-single).

And here's one for the specialist. The NSA Parish Contests (linked to the Swedish *Diplom Sverige* Award) takes place on 2 - 3 February, 0800 - 1100 and 3 - 4 August 0700 - 1000. Frequencies are: SSB 1840 - 1850, 3740 - 3790, 7040 - 7090, 14250 - 14280; CW 1810 - 1825, 3510 - 3550, 7010 - 7040, 14030 - 14060. Send RS(T) plus serial, and receive same plus Parish number (eg D418). A record book, detailing the 2500+ parishes, is available for $10, 13 IRCs or 11 Euros from the Contest and Diploma Manager, SM5BDY. I can provide further details of both contest and diploma on request.

TABLES

AS WE DRAW near to the end of the year, scores continue to increase, aided by the major contests. For example, the XT2DX operation in CQWW CW (of which I was a part) made 16,000 contacts in the contest (and several hundred more outside the contest), including very many UK stations. Robin, M5AEF, reports that his efforts with just 1 watt have brought him recent contacts with VU2PAI (India), E30NA (Eritrea), P40B (Aruba) and various other DX including many US and Canadian stations. As he says, the big question is whether 100 countries will be achievable by year-end. Watch this space!

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 **April** issue (including your year-end table scores) by **16 February.** ♦

WWW.

4L4FN/P5 news and photos:	www.amsatnet.com
e-QSL:	www.qslcard.com/qslcard/
International DX Convention Visalia:	http://www.qsl.net/visalia2002/
QRP DXCC:	www.arrl.org/awards/dxcc/qrp/index.html
QSL routes for CQWW CW:	www.arrakis.es/~ea5eyj/cqcw01.htm
Swedish Parishes:	www.qsl.net/sk5be
T88SI:	www.425dxn.org/dxped/t88si/
VP5 holidays:	http://qth.com/vp5/index.html
YA5T:	www.qsl.net/ya5t/
YN expedition:	http://www.qsl.net/dl7cm

HF F-Layer **Propagation Predictions** for **February 2002**

	3.5MHz	7.0MHz	10.1MHz	14.0MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe							
Moscow	88.....47888	866...189888	2.7432688423	..4777897...	..3999996...	...68885....	...38873....
*** Asia							
Yakutsk	.........122.	2.....26664	4.5224789887	..2787667422	...784......	...462......	...24.......
Tokyo	.........11..	.......3644.	......15532.	....1.122...	...2........	...3........	....
Singapore	....	56432	277322	......686...	.....478....	...12567....	....2335....
Hyderabad	....	2222	3......57663	......27721.	..2567996...	..2889994...	...89999....
Tel Aviv	77.....17777	866....79888	9782..289799	5228678992 56	...77787....	...57776....	...36564....
*** Oceania							
Wellington	.........12...	.......288...	...166898...	...588997...	...58886....	...27773....	....665.....
Perth	....	.......1333.	.......6622.	.....375...	.....5773...	...45777....	...55666....
Sydney	....	.......342..	......5751..	.....2782...	....6798....	...57888....	...67786....
Honolulu	....	..13........	...73112....	...412.12...	....	....	....
W. Samoa	....	...1...1....	...64346....	...377862...	....577.....	....266.....	.....44.....
*** Africa							
Mauritius	....	4.........213	3.......13322	1.......45211	.......163...	.......25....	.......23....
Johannesburg	67.........54	99.......1899	88.......7999	641....39987	..2655799 72.	...7788983..	...7888 87...
Ibadan	.1...........	674.....4566	887.....7888	52451.14876 4	...9989996 2.	...9999986 2.	...9999984..
Nairobi	....	32......2212	55.....14444	722....46777	..5545687 52.	...7667882..	...7777 84...
Canary Isles	666.....5666	8882....8888	8886...28888	6528644688 86	...9999898 3.	...5888883..	...3888 87...
*** S. America							
Buenos Aires	122.........1	7775.......47	5527.......34	11.7.......21	...7521255..	...4554563..	....46555...
Rio de Janeiro	....	222........12	2311.....122	11.4.....211	...6742577 2.	...3765675..	....76566...
Lima	....	21.3.......1	11.6.......1	...5........	...4.6334 3..	.....6655...	.....6654...
Caracas	....	333........13	4514.......34	1..21....131	.....3224 2..	.....8778 3..	.....8778...
*** N. America							
Guatemala	....	3215.......1	21.6.......1	...3........	....	......543...	......542...
New Orleans	....	3221.......3	42.5.......14	...4........	.....2888 5..	......8984..	......8882..
Washington	211.........1	7774.......66	7817 3....287	22.2.3112773	.....8888 6..	.....3888 3..	......887...
Quebec	677.......176	8846.....898	1..5.....761	...1431236..	....7899 94..	....6799 93..	....5699 82..
Anchorage	.54........	7772....1113	3.......12221	.........43..	.........2...	....	....
Vancouver	....	332........	2.........1	....	.....37...	.....37...	.....6...
San Francisco	....	2212.......	1..1.......	....	.....44...	.....34...	.....2...

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 December 2001 issued by the Sunspot Data Centre, Brussels, was 131.8. The maximum daily sunspot number was 167 on 26 December and the minimum was 99 on 19 December. The predicted smoothed sunspot numbers for February, March and April are respectively: (SIDC classical method – Waldmeier's standard) 108, 106, 104 (combined method) 91, 90, 89.

Antennas

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RADIO AMATEURS, unlike most commercial stations, normally use the same antenna for HF transmitting and receiving. While this is good practice on the upper frequency bands when using a beam antenna, it may not be the best solution on the lower bands. Vertical and loop antennas close to the house are liable to pick up electrical interference together with television line and switched-mode PSU noise. There are low-noise antennas for the LF bands, such as the Beverage; however, this antenna needs to be at least one-wavelength long on its lowest operating frequency, which rules it out for most suburban gardens.

Another solution to reducing receiver noise is to use a small loop antenna, orientated so that the null is in the direction of the QRM source.

The latest weapon in the QRM battle is the 'EWE' antenna, which was first described by Floyd Koonz, WA2WVL [1, 2]. The general configuration of the antenna is shown in **Fig 1**.

Stewart Cameron, GM4UTP, suffered QRM from a neighbour's television set. In the course of seeking a solution he came across the EWE antenna. [3]. GM4UTP notes "I cannot recommend it highly enough as a receiving antenna. It has put paid to the Bush TV EMC problems. The noise level is cut by two-thirds on a noisy 80m band and the signal-to-noise level has been improved by one S-point."

Provided that the antenna is electrically small it will produce a directivity pattern similar to that shown in **Fig 2**. The GM4UTP EWE antenna for the 3.7MHz band has a total length of 12.08m; 3m vertical (L1) at each end with 6.08m horizontal (L2). The antenna is terminated with a 600Ω non-inductive resister (carbon or metal film) at one end to ground connection. The diagrams shown in Fig 2 are for the GM4UTP antenna.

A similar antenna has been constructed by Jim Smith, VK9NS [4]. His antenna is designed for 160m; the length of L1 is 3.1m (10.1ft) and L2, 21m (68.9ft). The lengths were chosen so that they are supported with the poles of his 40m four-square array. I should mention that Jim has four EWE antennas that can be switched to provide 360 degrees of coverage. The antennas are terminated using with two 2.2k resistors in parallel (1.1k). He also uses a pre-amplifier to overcome the loss of the EWE antenna.

Laurie Mayhead, G3AQC, also uses the EWE antenna to good effect on 136kHz. On the south coast of the UK there is considerable interference from the Loran station at Lessay in northern France, which is less than 100km away from Laurie's QTH. Spectral lines from this station seriously degraded reception when he uses his large omni-directional inverted-L transmitting antenna on receive.

By using an EWE antenna G3AQC is able to orientate the antenna with the null in the direction of Lessay and he reports that a deep null can be obtained by adjusting the values of the terminating resistor. A variable capacitor in series with the terminating resistor has also proved beneficial in this respect. His antenna is orientated NE / SW with its maximum response towards northern Europe and Scandinavia. Signals have been received on 136kHz from OH1TN at 579. The G3AQC EWE antenna dimensions are L1 6.1m (20ft) and L2 106m (350ft). This antenna has a front-to-back ratio of over 13dB. When the dimensions of this antenna are scaled into the 160m band they are L1 just 460mm and L2 8m!

The EWE antenna is reported to have a feed impedance of between 600 and 2000Ω. Most of the antennas I looked at were about 800 -jX400. Matching is not all that critical on receive and the standard method seems to be to use a 3:1 transformer, which gives a 9:1 impedance ratio, ie 450Ω to 50Ω or 75Ω to 675Ω.

The transformer can be wound on a toroid core as shown in **Fig 3** using enamelled covered wire or even thin plastic covered wire, which allows colour coding. VK9NS wound his transformer on a short length of ferrite rod.

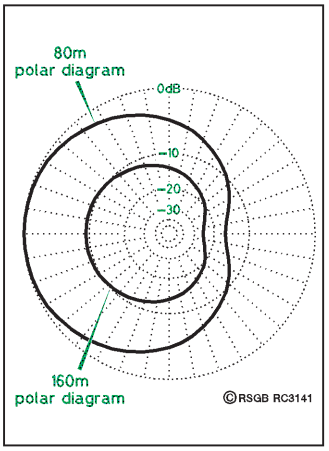

Fig 2: Polar diagrams for the EWE antenna at 80m and 160m. The zero dB scale is around -22dBi. The polar diagram is remarkably similar over a wide range of frequencies with an increase in gain and loss of directivity as the frequency is increased.

FURTHER READING

[1] 'Is this EWE for You', Floyd Koonz, WA2WVL, *QST*, February 1995.
[2] 'More EWEs for you', Floyd Koonz, WA2WVL, *QST*, January 1996.
[3] *Antenna Toolkit* (pages 83 to 86), Joe Carr. Available from RSGB Sales, price £21.24 (members) inc free CD-ROM.
[4] 'EWE "four" me', James Smith, VK9NS, *The ARRL Antenna Compendium, Vol 5*. Available from RSGB Sales, price £15.29 (members). ♦

WWW.
http://web.ukonline.co.uk/g3ldo

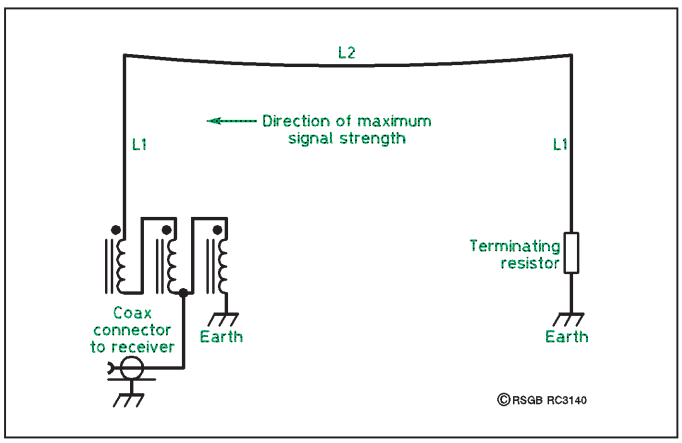

Fig 1: The EWE antenna. The terminating resistor value is not critical and any value from 700 to 2000Ω seems to work although different values affect the front-to-back ratio but not the gain. For dimensions L1 and L2 see text. Maximum directivity is away from the termination.

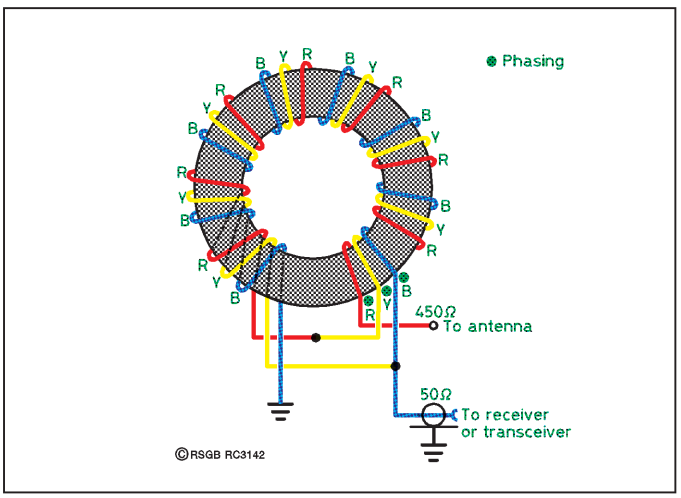

Fig 3: Suitable matching transformer for the EWE antenna. In practice around 12 turns trifilar-wound on a T50 core are required. The wires are shown colour-coded to clarify the connections.

BOB TREACHER, BRS32525
93 Elibank Road, Eltham, SE9 1QJ.
E-Mail: brs32525@compuserve.com

DAVID BORNE, G4CYW, the RSGB QSL Bureau sub-manager for SWLs, was prompted to contact me as, in a recent batch of SWL cards that were sent to him for distribution, he received quite a few that were returned from GB stations stamped "Not Required". In addition, there were a number of cards that had obviously not reached their destination because the organiser of the special event station had clearly failed to deposit envelopes with the respective Society special event QSL Manager.

For each special event station, the organiser should nominate a QSL manager who should ensure that SASEs are deposited with the correct RSGB special event QSL bureau manager [Michael Evans, MW0CNA, for GBxAAA-GBxMZZ stations, or Graham Ridgeway, G8UYD, for GBxNAA-GBxZZZ stations - *Ed*]. I am unhappy at GB stations indicating that they do not "require" SWL cards. I accept that the reports may not be particularly useful - especially if they report on QSOs made on 7MHz when the special event station has worked a couple of hundred stations around Britain during the event. However, if the event was a 'special' event, SWLs should not be precluded from sharing in it. If special QSL cards are printed, organisers should always assume that they are going to receive 20 SWL reports, and should plan to have a sufficient number printed to cater for licensed *and* SWL requests.

CQ 160m

JUST IN TIME for this year's *CQ* 160 metre contests come the 2000 results. As 160 metre DX conditions are at their best at the bottom of the solar cycle, it is not too surprising to find a low entry for both the SSB and CW sections of this contest. As an exercise for adding new European countries to your 'all-time' list, it was great. Every year, whether there is good DX activity or not, the Europeans are out in force – and some have very potent signals which makes it relatively easy for SWLs with modest topband antennas to pick up some new ones. Congratulations to the winners. The rules for this year's contests appear in the column this month. I would not expect too much DX activity, but, again, the Europeans will be there to make the contests interesting. If you take a look at 160 metres during the contests, send in an entry or a check log to show that there is still interest.

CQ 160m SWL Contest Results 2000

SSB

Pos	SWL	Stns hrd	Mult	Score
1	BRS91529	431	58	121,674
2	BRS31976	261	53	68,688
3	LYR-794	174	40	35,880
4	NL-455	30	16	2,304
5	OE-20272	7	5	175

Checklogs: BRS25429, BRS32525, RS177448.

CW

1	LYR-794	839	86	400,588
2	DH2URF	310	44	61,644
3	I3-325/VE	120	32	18,976
4	UA3-155-28	42	42	10,500
5	BRS87799	35	27	4,725

SWL RULES FOR THE 2002 *CQ* WORLD WIDE 160 METER DX CONTEST

Short Wave Listeners around the world are invited to take part in the 2002 *CQ* World Wide 160 meter DX Contests. The objective is to hear as many countries, US states and Canadian provinces as possible on the 160 metre band.

When: **CW:** 2200UTC 25 January to 1600UTC 27 January.
SSB: 2200UTC 22 February to 1600UTC 24 February.

Sections: Single and multi-operator sections.

Scoring: Stations from the SWL's own country count 2 points. Stations from other countries in the same continent as the SWL count 5 points. Stations from countries in other continents count 10 points.

Multiplier: Each DXCC country (not W and VE), US state and Canadian Province heard counts as a multiplier. Countries are those on the current DXCC list plus additional countries from the WAE list (IT9, GM Shetland Is, etc).

Final Score: Total points multiplied by the total number of multipliers (DX countries, states and provinces).

Awards: Certificates of merit will be awarded at the Contest Director's discretion.

Logs: Logs should show Date, Time (UTC), station heard, RS(T) report and country prefix or country abbreviation, USA state or Canadian province given by station heard, RS(T) report of station heard [no report shall be less than 33(9) and reports are not expected to be 59(9) in every case], station worked, multiplier, points. Any unmarked duplicate will lose 10 times the logging value. A multiplier check list *must* be provided.

Entries: CW Logs *must* be postmarked no later than 25 February 2002; SSB logs *must* be postmarked no later than 25 March 2002. Entries to *CQ*160 SWL Contest Director, Bob Treacher, BRS32525, 93 Elibank Road, Eltham, London SE9 1QJ. Please enclose 2 IRC or $1 for a copy of the results.

SWL ACTIVITY

HF AND 6m news this time. Robert Small, BRS8841, provides his customary look at the HF bands, but there are some interesting additions from David Whitaker, BRS25429.

Robert was pleased to report some new ones, especially D44 and A92 on 1.8MHz. On 3.5MHz, 6Y8A was new. Robert considered that 14MHz had been at its best early and late in the day. He supports this with FO/HG9B, BD8HD/4, T88CC and FO0DEH, but 21MHz had been the best band. Robert's highlights were ZL75, BD4RAY, 5N41EAM, FS/AH8DX, XP1AB, J79AA, XT2DX and 5R8HD. On 24MHz he logged VK9KHE, VP5VAC and C98MR.

From here, HF conditions have been quite mixed, especially in view of the high solar flux numbers. There was also an aurora on 24 November which was great for 50MHz, but affected other parts of the spectrum - and it was also the *CQ* World Wide CW weekend. David shared my view about HF, but he did hear P5/4L4FN for the first time on 28MHz. Ed has been doing a great job, especially with some unsavoury European behaviour - and that has so far precluded DXCC entity No 333 appearing in your scribe's log! David also reported YA5T (21MHz), EZ8AQ, J6/G3TBK, VU3MCV, KG4AS, and FS/W2AZK all on 24MHz, and 9J2BO SU1SK and D44TD on 28MHz.

I mentioned QSL returns a few issues ago. David has received a QSL from AH2E (via N9AVY) for a 28MHz report going back as far as 22 March 1981!

There has been some exceptional DX on 50MHz again. David reports several 4X4s, JY5HX and OD5/OK1MU, and also caught numerous openings to W/VE. Simon, RS177448, has heard 53 QTH Locator squares in W/VE since early November, and since 17 November has heard XE, PY, KP4, 6Y5, YS and D44 as well as W and VE. I have added UN and P4 to my all-time DXCC count on 6m.

Looking forward, Maurizio, I1-21171, who is also IZ1CRR, will be one of the T88SI team who activate Sonsorol Island (a new island for IOTA) from 9 to 11 February, and there is promised activity from South Georgia and the South Shetland Islands at about the same time. A group is also planning to activate Cocos Is (TI9) from 4 to 19 February - make the most of these as there are few operations from these three DXCC entities.

D68C REPORTS GO ON AND ON . . .

WITH OVER 600 SWL reports now confirmed, I hope that most SWLs who sent cards direct to either myself or Phil, G3SWH, now have a D68C QSL card. At the time of penning this article, cards are beginning to arrive from the bureau. I am quite sure that the final number of SWL reports answered will be over the 1000 mark – giving the D68C operation another record – the most SWL reports received for any DXpedition! To give you an idea of the number of cards received, this month's photo shows the number of cards waiting to be answered when the D68C cards arrived from the printers. ♦

Just some of the incoming SWL reports for D68C (see text).

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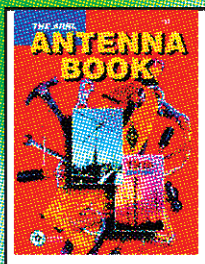

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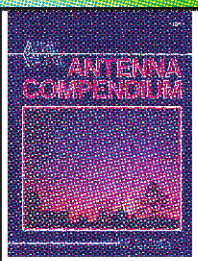

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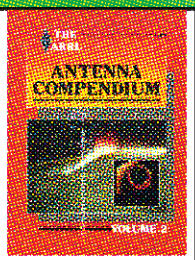

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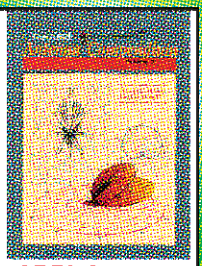

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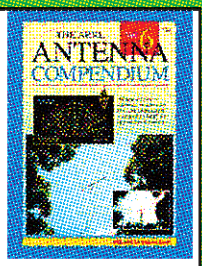

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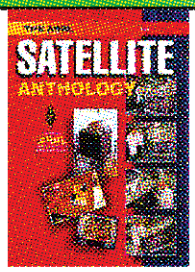

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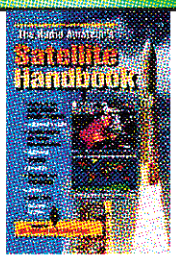

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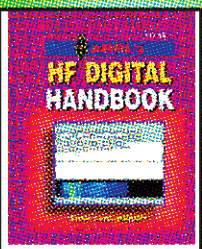

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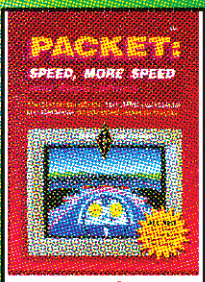

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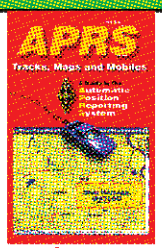

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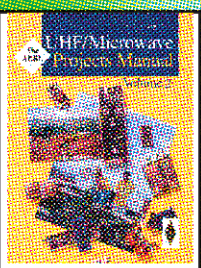

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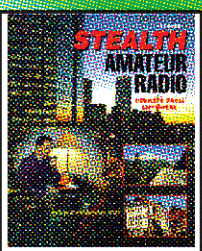

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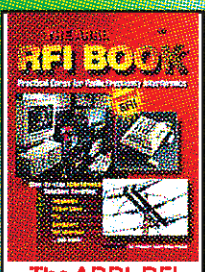

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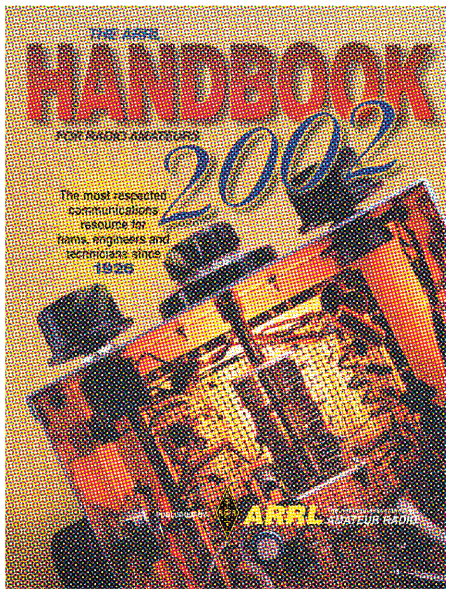

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REPEATERS

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THE UKFM Group (Western) is the largest repeater group in the country. It currently manages 19 voice repeaters on four bands, with two on 6m, four on 2m, 11 on 70cm and two on 23cm. The group's repeaters provide a useful service to amateurs in the north-west of England and north-east Wales.

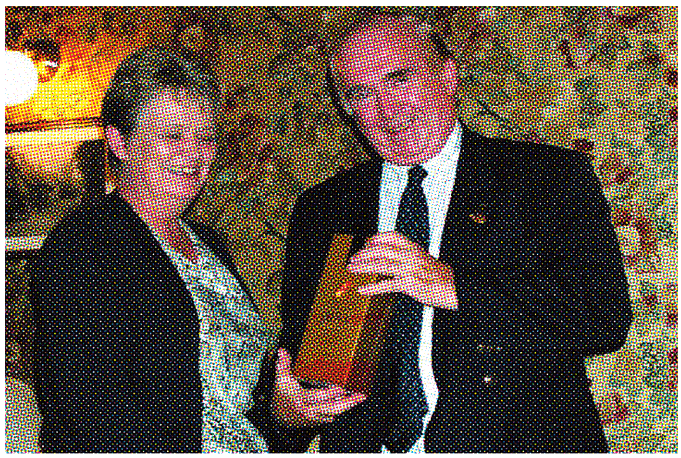
The group was formed in March 1975 after Gordon Adams, G3LEQ, and Brian Levett, G3TXH, called a meeting at the Mid-Cheshire Amateur Radio Society. By the time of its first AGM in September 1976 the group had four repeaters on the air: GB3ST, which came into service only eight weeks after the initial conception, GB3MP, GB3MR and GB3LL. Membership by that time was some 300, each subscribing £1. Today membership stands at approximately 600 with a membership fee per repeater which is actually less than that in 1976. Like all successful groups it has survived because of two things - the provision of good services and enthusiasm.

Repeater keepers / NoV holders with radio experience and motivation for the job are becoming more and more difficult to find. Just six keepers maintain the 19 repeaters from the engineering point of view. It's a credit to their skills that so few people can maintain so many repeaters - most of this is due to the fact that equipment dating from the mid '80s is still used: ie big, chunky - and repairable. Much of the administration is taken off the keepers' shoulders and is taken care of by committee members. With 19 repeaters and 11 sites the cost of maintaining the repeaters is quite significant. Typically they cost about £3000 per year to maintain, not including any new projects. The group's latest project is GB3PZ in Dukinfield, which is their 'Internet repeater', although a couple of other units have NoVs to allow Internet linking. Currently rebuilding work is underway for GB3MT at its new site in Blackrod and, following that, work will recommence on GB3UK, the 6m repeater at the same site.

The committee comprises Chairman Dave, G7OBW; Secretary Stephen, M1DDO; Treasurer Dave, 2E1EAP; Membership Secretary Kath, M1CNY; Property Officer Ian, 2E1CYS; and Newsletter Editor Martin, G1GYC. Gordon, G3LEQ, has been involved with the group from its birth in 1975 right through to the present day, holding the positions of Secretary and Chairman. At the 2001 AGM Gordon decided it was time to stand aside and let others take charge. The group is pleased to say that he has not departed totally from the scene and as a mark of gratitude he was elected President and, for the first time in the group's history, was elected an Honorary Member. To mark the event Kath, M1CNY, presented Gordon with a bottle of whisky. The group's current chairman, Dave, G7OBW, said that "without Gordon's enthusiasm the group wouldn't be what it is today".

I must also mention the hard work done by Kath, M1CNY, the Membership Secretary, and her willing bunch of helpers whom I met at the North Wales rally last November. They did a wonderful job of collecting membership fees from anyone who came *near* the group's stand - in the nicest possible way! It is this dedication that has built the group's membership to where it stands today.

The group can be found at all the rallies in the north-west of England. The stand is quite often a meeting point for people to meet their friends, join the group, purchase raffle tickets in support of the group, discuss their views on repeaters and other matters. They are always happy to welcome new members.



Gordon Adams, G3LEQ, receiving his bottle from Kath Wilson, M1CNY.

REPEATER NEWS

GB3RD

The Reading 2 metre repeater GB3RD (R3 / RV54), has been re-sited on the Berkshire Downs, north-west of Reading, close to where it was located from 1983 to 1996. Access is by 1750Hz toneburst or 118.8Hz CTCSS.

The coverage has proved to be very similar to that from the original site, providing a good service to mobiles in the Thames Valley corridor, as well as a useful link across the Chiltern Hills.

The repeater had been located in a less-than-ideal position at Aldermaston after the sudden loss of the original site. A number of attempts to find a good, suitably-priced alternative had failed, so the group was pleased when the latest succeeded.

The repeater is operated by the Thames Valley Repeater Group (formerly the Berkshire Downs Repeater Group) which also provides GB3BN, GB3AW and GB3BK. Details are on the group's website [1].

GB3NB

GB3NB was closed down at the end of 2001 due to rising costs from site owners. There are currently plans to move to a new site as soon as site clearance is received and it is hoped that the repeater will be back on air with the minimum of disruption. You can check progress on the group's website [2] where you can also find information on how to become a member.

GB3LD

In the last 'Repeaters' column my facts about GB3LD and GB3LF were not entirely accurate: the keeper of GB3LD is Dave, G7MCE. Thanks to Bob, G3VVT, for pointing this out.

Group Newsletter

Terry, G0UIO, has sent me the latest edition of the Cambridgeshire Repeater Group newsletter. There is a very interesting article about the Alice Spring Telegraph Repeater Station in Australia. Is this the forerunner of today's radio repeaters? Terry is QTHR or can be contacted by e-mail: g0uio@ntlworld.com.

Thanks To. . .

I have been asked by the Chairman of the RMC [3], Carlos, G0AKI, to pass on the committee's thanks to Dave Meakins, G4SCJ. Dave wrote a kind letter published in 'The Last Word' (*RadCom* July 2001), acknowledging the work the RMC did to help to get the Northampton 10m repeater on the air. ♦

WWW

[1] http://www.tvrg.org.uk.
[2] http://www.qsl.net/gb3nb
[3] http://www.coldal.org.uk/rmc

LATEST CLEARED REPEATERS

Call	Type	Channel	Keeper
GB3DV	Site change 70cm Maltby, South Yorkshire	RB1	G4LUE
GB3ES	Site change 2m Hastings, East Sussex	RV54	G7LEL
GB3HE	Site change 70cm Hastings, East Sussex	RB14	G7LEL
GB3HF	Site change 6m Hastings, East Sussex	R50-5	G7LEL
GB3HG	Site change 2m Ripon, North Yorkshire	RV50	G0RHI
GB3LR	Frequency change Newhaven, Sussex	TBA	G7PUV
GB3MD	Site & freq change 70cm, Mansfield, Notts	RU68 (7.6MHz split)	G0UYQ
GB3MX	Site change 2m, Mansfield, Notts	RV60	G0UYQ
GB3NK	Site change 70cm, Erith, Kent	RB4	G8JNZ

Outstanding voice repeater proposals submitted for licensing are:

Call	Type	Process Stage	Proposed Keeper
GB3LD	Site change 2m Lancaster, Lancs	NFAP	G7MCE
GB3LF	Site change 70m Kendal, Cumbria	NFAP	G3VVT

EMC

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

APOLOGIES if you have heard this before, but my full-time job has kept me very busy evenings and weekends during the autumn, leaving little time for voluntary RSGB EMC Committee work.

I do try to reply to all letters and e-mails in due course, but if you are waiting for a reply to a letter or e-mail, please send me an update if any circumstances have changed since the original communication.

EMC BASICS - WHAT IS EMC?

I WAS ONCE asked to give a talk to an amateur radio club on 'EMC and How to Avoid It'. I suggested that a more appropriate title would be 'EMC and How to Achieve It'. As most readers will know, 'Electromagnetic Compatibility' means the desirable situation where different types of electronic equipment are compatible with each other.

There are two aspects, emissions and immunity. In the context of amateur radio, 'immunity' means that electronic equipment operates as intended in the presence of signals from a nearby transmitter and 'emissions' refers to unwanted interference emitted by electronic equipment that may affect nearby radio receivers.

There have been many items in this column recently about emissions because of new developments that raise some important issues. Nevertheless, tackling immunity problems remains the priority and some general advice may be useful, particularly for new licensees.

ADVICE TO MEMBERS

FOR AN RSGB member who has an EMC problem, the first point of contact should be the nearest EMC Coordinator. There is a list in the *RSGB Yearbook* or on the EMC Committee website (see the panel).

In many cases, this person will be able to give all the necessary advice but, where this is not possible, the problem will be passed to an EMC Committee member who specialises in that particular type of problem.

Before you contact your EMC Coordinator, please:

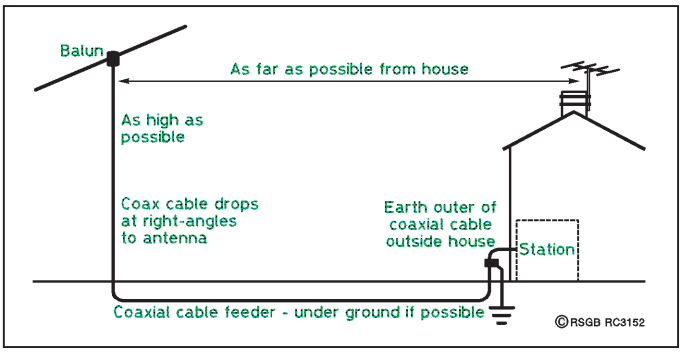


Fig 1: Good radio housekeeping - site your antenna and feeder system well away from the house.

- Make sure that you have done everything possible to solve the problems yourself.
- Collect as much information as possible which will be useful to the Coordinator, particularly makes and model numbers of affected equipment, if available.
- Remember that the Coordinator is a volunteer, so please ring at sociable times.
- Remember also that the scheme only offers telephone advice at present - no visits will be made.

INTERFERENCE QUESTIONNAIRE

THE RSGB has representatives on National and International EMC Standards Committees and on working groups concerned with emissions and immunity of a variety of consumer and industrial electronic products and systems. These include radio, TV, computers, hi-fi, telephones, power line telecommunications (PLT) and digital subscriber lines (DSL).

To support our work, our representatives need facts about the scale and detail of the radio-frequency interference problems that we face whilst operating in the domestic environment. If you have first-hand experience of any such problem, either immunity or emissions, please help secure the future of amateur radio by completing and submitting the on-line questionnaire on the 'Reporting Interference' page of the RSGB EMC Committee website.

EXCESSIVE FIELD STRENGTH?

FROM TIME TO TIME, the EMC Committee deals with cases where a member who holds a full Class 'A' or 'B' licence takes the view, "My licence allows me to transmit 400 watts", without noting some of the other licence conditions in *The Amateur Radio Licence (A) or (A/B) or (B) Terms, Conditions and Limitations Booklet BR68*.

This booklet, which is also available on-line (see below) contains a Note (l) [lower-case 'L']. This is particularly important for EMC and is quoted below in full:

"(l) Sub-clause 4(2) of the Licence requires that the apparatus in the station be so designed, constructed, maintained and used that the use of the Station does not cause any undue interference with any wireless telegraphy. In order to prevent interference due to close-coupling of antennas, the antenna used for the Station should be sited as far as possible from any existing television or other receiving antennas. This is particularly important in the case of the installation of an indoor transmitting antenna, eg in a loft, where transmissions may be conducted through the electricity supply wiring. In some circumstances it might not be possible to use an indoor antenna. In densely-populated areas, sufficient separation of the amateur equipment from surrounding transmitters, receivers and electronic equipment may not be possible to permit the amateur to operate with high power without the high probability of causing interference. Adjacent transmitters may produce inter-modulation products on other frequencies and excessive field strengths may cause breakthrough even in receivers which display an adequate level of immunity to unwanted transmissions. While owners of receivers should take steps to ensure that their apparatus has a reasonable standard of immunity, in some circumstances the amateur may need to modify his transmission practice to minimise a problem to neighbours. If an interference problem arises, this may indicate either that the affected equipment has inadequate immunity or has not been properly installed or maintained or that excessive field strengths are being generated. Each case needs to be considered on its merits, but regard will be had to the harmonised immunity standards introduced for the purposes of Council Directive 89/336/EEC on electromagnetic compatibility. In order to solve the problem, it may be necessary, depending on the circumstances, to take reasonable steps to improve the immunity of the affected receiving installation, to modify transmission

WWW.

RSGB EMC Committee: www.qsl.net/rsgb_emc
(Note the underscore character in rsgb_emc)
BR68 Amateur Radio Licence Conditions booklet: www.radio.gov.uk/publication/ra_info/br68/br68.htm

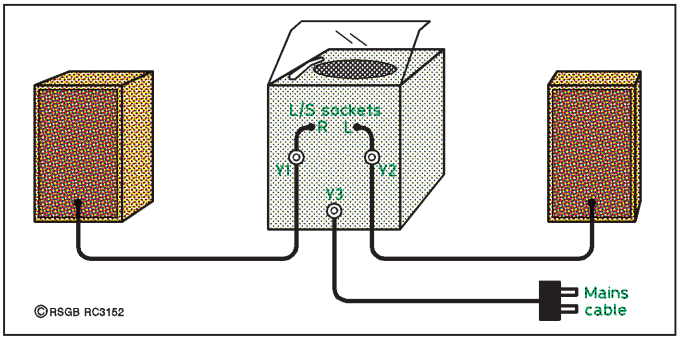


Fig 2: Fitting ferrite rings to an ordinary audio system.

practice or to impose restrictions on the licensee."

The key point is how much separation you can achieve between your transmitting aerials and the boundary of your property. If you can't achieve enough separation, then operating at high power is likely to cause problems.

In particular, if you transmit 400W PEP into an HF wire dipole, the theoretical 'free space' field strength at 10m distance is 14V/m, which is far higher than nearby electronic equipment can reasonably be expected to stand. In practice, there are various factors which affect this field strength such as losses, near-field effects and ground proximity. Nevertheless, in a typical suburban location, it is often difficult to get the antenna as much as 10m from the boundary which makes the situation even worse.

In the case of VHF/UHF, remember that a Yagi can have a gain of 10dBd or more, leading to 4kW or more effective radiated power (ERP) in the direction in which it is pointing.

In any case, it is best to be on good terms with your neighbours and help them to resolve any breakthrough problems. Clearly, this is not always possible, but if the RA becomes involved, it can measure your field strength and, as a last resort, it can issue a Notice of Variation to your licence to limit the power, for example, to 40W.

Members are advised to read the 'Good Radio Housekeeping' chapter in the *RSGB Guide to EMC* by Robin Page-Jones, G3JWI (available from RSGB Books). This information is also summarised in the 'EMC' section of the *RSGB Yearbook* (see **Fig 1**).

The EMC Committee will not support a member who fails to heed any advice that it may give about appropriate use of transmitted power for a particular location.

EMC BASICS - AUDIO SYSTEMS

A POINT THAT sometimes needs clarification is where to fit ferrite rings on audio systems. This has been somewhat complicated by the advent of computer multi-media speakers and active speakers.

With ferrite rings, use 12 - 14 turns for HF if possible. Clip-on ferrite cores are a suitable alternative, provided at least six turns can be accommodated for HF and the cores close together with absolutely no air gap. Unfortunately, the useful Maplin BZ34M clip-on ferrite core seems to have been discontinued.

In a standard hi-fi system with normal passive speakers, RF picked up in the speaker cables is fed into the output of the amplifier and can come back out again as audio. To reduce this effect, ferrite rings should be fitted at positions Y1 and Y2 in **Fig 2** and, if necessary, at Y3.

The only time when the ferrite rings should be at the speaker end of the cable is if the speakers are active, ie if they have a built-in amplifier, in which case they will also have a separate power connection.

Computer speakers normally have a stereo amplifier built into one speaker, usually the right hand channel, which has the volume control on the front. Ferrite rings or clip-on cores should be fitted as shown by Z1, Z2 and Z3 in **Fig 3**. It may be necessary to make up extension cables.

Curiously, computer speakers are classed as information technology equipment, not audio equipment and, like telephones, they now have to comply with EN 55024 which should result in improved immunity.

TELEPHONE FILTERS

EMC COORDINATOR Hugh, G7KET, has been trying to obtain a BT 'Freelance' telephone RFI filter type LJU10/14A (BT Item Code 877596).

Hugh visited the BT PhoneShop in Bristol where the assistant was completely flummoxed by Hugh's enquiries and called the manager who said that they didn't keep the Freelance and didn't think they ever had. He admitted he wasn't a 'technical expert', but suggested that Hugh should try a mains filter instead. Even though the phone wasn't connected to the mains, he thought one might help as they were often used to cure interference problems!

Hugh then called BT Residential Customer Services on 150. The operator did not appear to understand either the problem or the solution Hugh was seeking and said she'd ring him back. Her supervisor returned the call, having made extensive enquiries behind the scenes, but with no success. She suggested that Hugh should speak to 'Faults' on 151.

Hugh rang 151 and spoke to a lady engineer who said she knew just what he was talking about, but sadly couldn't help. She stated that BT had stopped selling the 'Freelance' some time ago. She was confident, however, that it was now available through Comet, Curry's and Dixon's.

Hugh made enquiries with his largest local branches of these stores which did not have any in stocks and stated that they had never stocked them.

We understand that BT are developing a new telephone RFI filter. If and when this becomes available, details will be published in a future 'EMC'.

In the meantime, possible solutions to a telephone with poor RF immunity are either to replace the telephone or try a ferrite ring on the cable between the phone and the phone socket, close to the phone. Use 10 or more turns for HF.

According to information received from BT and published in April 1997 'EMC', if a telephone has been sold by BT and suffers RF breakthrough while under warranty, the customer can return it to the point of sale. BT retail outlets will, if possible, replace such a telephone with another model offering higher RF immunity.

Alternatively, buy a telephone from a retailer such as Argos which offers an exchange or refund within 16 days if you are not satisfied for any reason. The Autumn / Winter 2001 Argos catalogue includes telephones from £6.99, less than the cost of a BT filter when available!

RF immunity is not necessarily related to price, but experience shows that anything such as a combined telephone and answering machine that has a mains power supply unit is likely to be less immune to RF.

All telephones manufactured since July 2001 should comply with the EN 55024 immunity standard. This requires testing with a modulated carrier, unlike the previous generic standard, EN 50082 : 1992 which allowed testing with an unmodulated carrier. ♦

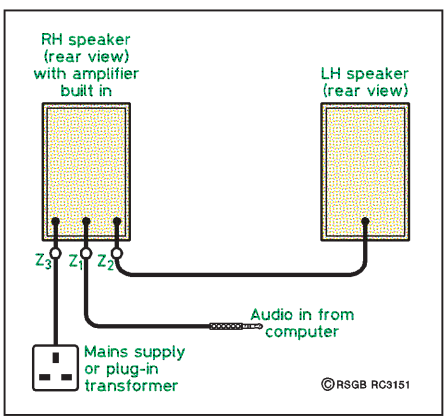


Fig 3: Fitting ferrite rings to computer multimedia speakers.

IARU

TIM HUGHES, G3GVV
10 Farm Lane, Tonbridge TN10 3DG.

THE ITU (International Telecommunication Union) has adopted new Recommendation ITU-R M.1544, 'Minimum qualifications of radio amateurs'. In consideration that certain minimum operational and technical qualifications are necessary for the proper operation of an amateur or amateur satellite station, the document recommends that, at minimum, any person seeking an amateur licence should demonstrate theoretical knowledge of specific topics in the areas of radio regulations, methods of communication, radio system theory, radio emission safety, electromagnetic compatibility, and avoidance and resolution of radio frequency interference.

"The international *Radio Regulations* have long required that administrations take such measures that they judge necessary to verify the operational and technical qualifications of any person wishing to operate an amateur station, " observed IARU Secretary David Sumner, K1ZZ. "In anticipation of changes that are likely to be made in the Amateur and Amateur Satellite Service regulations at the next World Radio Conference, the new Recommendation provides additional definition to these qualifications without reducing the prerogative of an administration to set its own standards".

M1544 represents part of a multi-year effort by the IARU to prepare for the 2003 World Radiocommunication Conference (WRC-2003) agenda item to consider possible revision of Article S25 of the international *Radio Regulations*. This work was begun in 1996 with the release for public comment of a discussion paper by the IARU Future of the Amateur Service Committee (FASC). The final report of FASC in 1998 recommended that the IARU Administrative Council plan the development of such a Recommendation. The first draft text was submitted by the RSGB to the 1998 Conference of IARU Region 1 in Lillehammer, Norway, and was subsequently refined by the Administrative Council and the 2000 Conference of IARU Region 3 in Darwin, Australia. IARU representatives guided the consideration of the Recommendation through ITU-R Working Party 8A, Study Group 8 and consultation with administrations, which resulted in additional refinements. The final version of the Recommendation was approved by the ITU administrations without objection.

"Having this Recommendation makes it possible to maintain an ITU document on amateur radio operator qualifications under cognisance of the ITU-R Study Group rather than the more cumbersome process of modifying Article S25 of the Radio Regulations," said IARU President Larry Price, W4RA. "The establishment of uniform minimum qualifications for amateur radio operators should help mutual recognition of amateur licences for international roaming and particularly for cross-border movement of amateur operators for disaster communications".

PITCAIRN ISLAND

VOTING HAS BEEN completed on a proposal to admit the Pitcairn Island Amateur Radio Association (PIARA) as a member of the International Amateur Radio Union. PIARA has been notified of its admission which is effective from 15 November 2001.

PIARA is an independent non-profit organisation to promote and develop amateur radio friendship, technical knowledge and communication technology, providing public service and furthering the public interest, plus fostering international goodwill. It has 10 members, representing the entire population of resident amateur operators. PIARA reports that there are 23 amateurs licensed to operate, including several temporary residents and visitors, plus one club station. Amateur radio has special significance on Pitcairn Island, as it continues to provide the main communications link to the outside world.

Pitcairn Island (comprising Pitcairn, Henderson, Ducie and Oeno islands) is an overseas territory of the United Kingdom. The application for IARU membership was supported by the RSGB. Due to transport difficulties to and from Pitcairn, PIARA has requested that RSGB continues to represent PIARA at IARU Region 3 Conferences.

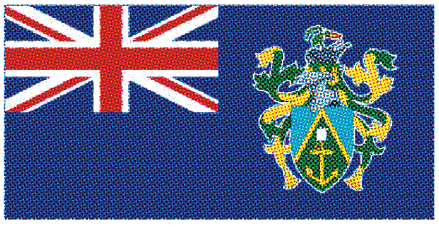
The official address of PIARA is PO Box 88, Adamstown, Pitcairn Island, South Pacific Ocean via New Zealand.

There are now 28 Member Societies in IARU Region 3.

ARDF IN MONGOLIA

THE REGION 3 Amateur Radio Direction Finding championships were held in Mongolia from 24 to 28 August 2001, 107 competitors from seven societies taking part. The Minister for Infrastructure, Mr B Jigid, opened the event, at which Y S Park, HL1IFM, a Director of Region 3 was present.

In recognition and appreciation of his personal contributions towards the advancement of communications in Mongolia, HL1IFM was awarded an honorary medal by the authorities of that country for Excellence in Telecommunications.



Pitcairn Island ARA has been admitted to the IARU.

MEETINGS ATTENDED

SUPPORTING, presenting and advancing the case for Amateur Radio is an ongoing process, involving volunteers who give their time over extended periods and in many locations. John Bazley, G3HCT, was at the October meeting of CEPT-WGRR (a working group dealing with *Radio Regulations*) held in Liege. CITEL has made application to participate in the CEPT arrangements for reciprocity of treatment of licences, and a Memorandum of Understanding (MOU) has been drafted. Thus IARU is directly involved in closer cooperation between the European and Inter-American organisations, and is helping radio amateurs to operate for short periods in other countries without having to obtain a temporary licence. The important matter of S25 and associated issues will be discussed at a future meeting.

Tafa Diop, 6W1KI, Vice-Chairman of IARU Region 1.

A meeting in Caracas, Venezuela, attended by Larry Price, W4RA, President of IARU, featured an issue dealing with our support for the Development Sector's initiative in disaster communications and human resource development. Reference has previously been made to the *Disaster Communications Handbook*, written by IARU. The demand for this publication has already exceeded expectations.

During the period between 14 October and 2 November, Ken Pulfer, VE3PU, attended meetings in Geneva, some on behalf of IARU. The IARU interests include, first, a proposed (WRC-2003) allocation of 6MHz to space-borne synthetic aperture radar in the range 420 to 470MHz, and, second, a proposed (WRC-2003) allocation of up to 3MHz to the space science services to tele-command links (earth-to-space) in the range of 100 to 1000MHz. ♦

DATA

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

A FEW WEEKS ago an e-mail arrived from RSGB HQ asking if I had heard about a new weak signal mode called WSJT - apparently several queries had been received asking about this. Well, I hadn't heard of it, but a quick web search soon revealed all at the home page given below. WSJT is a new data mode / computer software written by Joe Taylor, K1JT, and is primarily designed for meteor scatter communications at VHF, although plans include the eventual addition of several other weak-signal modes.

The abbreviation stands for 'Weak Signal communications by K1JT' and the website provides a full users' guide and reference manual, as well as the software itself which requires Windows 95 or higher. Shortly after I downloaded the software (approximately 5MB) and installed it, the December copy of the ARRL magazine, *QST*, arrived with a very comprehensive article about WSJT, giving a better description of the inner workings than that from the web download.

WSJT is a Frequency-Shift Keying system using four tone frequencies of 882, 1323, 1764 and 2205Hz. The 43 alphabetic characters consisting of capital letters, numbers, and some punctuation, are transmitted by sending three of the four tones sequentially – certain combinations of tones are not used, for reasons of code synchronisation; some other tone combinations are used for special signalling messages. Each tone (symbol) lasts for 1/441 seconds, so a complete character consisting of three tones is transmitted in 6.8ms at a rate of 147 per second. The 'strange' values of tone frequency and symbol rate are connected with the sampling rate on the PC soundcard of 11025Hz. All tones and symbol timings are phase-synchronous and do not require a linear transmitter, as is the case for the majority of the modern amateur data modes. In fact, an efficient Class-C power amplifier is quite adequate.

For meteor scatter contacts, the software alternately transmits and receives for precisely-timed periods. The text to transmit is entered into a box, and this is sent repeatedly for the defined transmit session. All 'pings' decoded within a receive session are printed, and can be saved to file. Statistics on the received signal timing and signal strengths are also calculated and shown with the results from each ping together with a graphical display of the signal received over the receive period, and a spectrum display.

Any standard type of soundcard-to-transceiver interface is used for this mode, such as those for PSK31, Hellschreiber etc, with transmit / receive switching being completely automatic and controlled from the WSJT software. The transceiver should to be operated in USB mode.

BARTG LATEST

THE LATEST (Autumn) edition of the BARTG magazine *Datacom* has articles on 'A New PSK Display'; 'A Low-Cost Portable RTTY Station', still under development, based around an LCD display and PC keyboard; the 'Hands Electronics DAT20 Data Transceiver', including its circuit diagram; an article on antenna noise, and a review of the Hitachi *WorldSpace* Receiver. The results of the BARTG RTTY 2001 and the Sprint 2001 contests are in this issue, along with the usual columns. For more details on BARTG see the address given below.

HF DATA TRANSCEIVER

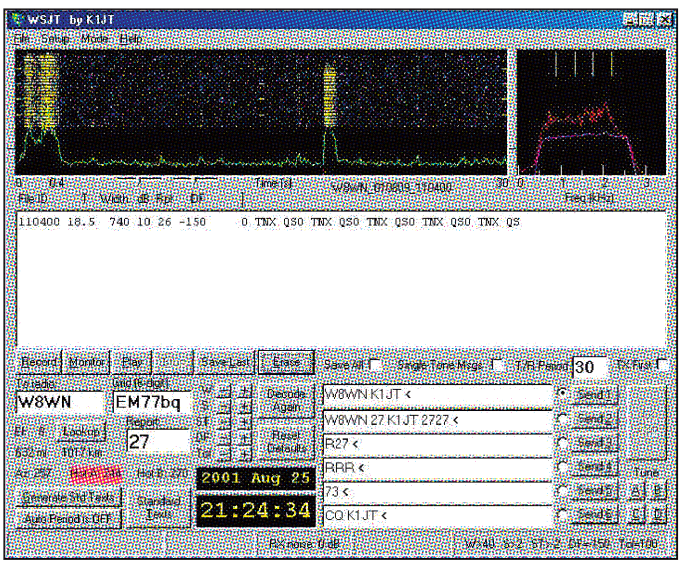
THE DAT20 Data Transceiver by Sheldon Hands, MW0ELR, of Hands Electronics, is a stripped mono-band HF SSB transceiver, designed for data modes in conjunction with a PC soundcard or a 56002EVM or similar DSP card, or a separate modem. Thus, no loudspeaker or microphone amplifier is provided, as would be the case for a normal SSB transceiver; T/R switching is controlled from the PC COM-port or similar. The frequency is defined by a single crystal, which can usually be pulled a few kHz either side. As supplied, the DAT20 is suitable for the 14MHz band but, by changing the output and bandpass filters, the unit can be used for any frequency within the 1.8 to 30MHz range. Instead of the crystal oscillator, it would be perfectly in order to use a (stable) VFO or better still, a synthesised local oscillator or DDS source such as the AD9850 module available from HF Instruments.

FUNDAMENTALS

OVER THE LAST two years, this regular fundamentals section has tried to give a simplified overview of the complex area of data communications over radio links. We have covered the various methods of modulating a carrier in order to transmit data using an RF signal, and have briefly explained some of the mechanics of what goes on inside a modem. The various trade-offs possible between modem complexity, noise, bandwidth, intersymbol interference and occupied spectrum have been covered; we have looked at the effects of noise and multipath on corruption of the data, with a brief foray into the error detection and correction techniques used to try to overcome the path deficiencies. To go deeper into any of these areas usually involves a lot of mathematics using strange symbols and matrix notation – what is occasionally referred to as 'squiggly maths'. I remain convinced that this *does* have to be the case; simple explanations of the complex techniques are possible, but few experts on the subject can do this.

Peter, G3PLX, can, and his description of convolutional coding used in the QPSK mode of PSK31 ought to go down as the best example yet of making this very complex encoding scheme easy to understand. Most text books take many pages of maths and use terms like 'generator polynomials' in every other sentence. There are one or two textbooks around that describe various aspects of data communications in a user-friendly, empirical, way but these are few and far between; any good ones will be mentioned here.

I intend from now on to apply the theory covered so far to the various data modes in use by amateurs and other users, and show how and why some are used, what makes one better in some circumstances, but worse in others. Also, I shall show why some combinations should not be used or are a waste of effort! ♦



A screen-shot of the WSJT software during a meteor-scatter contact between W8WN and K1JT. Static crashes from thunderstorms are visible at the start of the 30-second trace together with a strong meteor ping about 18 seconds into the record, containing the message shown in the display.
[Source: *QST*, with permission]

WWW.

WSJT http://pulsar.princeton.edu/~joe/k1jt
BARTG www.bartg.demon.co.uk
Hands Electronics www.rf-kits.demon.co.uk
HF Instruments (DDS source) www.HF-Inst.co.uk

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PROGRAMMED PROMS, PMR & MORE Details: www.atlantacomms.co.uk or S.A.E.: Atlanta Communications (RC), PO Box 5, Chatteris, Cambridgeshire PE16 6JT.

RESEARCHED AND WRITTEN by Austin Uden. DX Weather Forecasting Guide & The Barometer and DX. £7.50 each. £13.00 both titles. SAE details. Cheques/PO's: 12 Hampden Close, Aylesbury, HP21 8NS.

THE RF KIT CATALOGUE. Send 2 x 2nd class stamps or browse www.rf-kits.demon.co.uk. Hands Electronics, Tegryn, Llanfyrnach, Dyfed SA35 0BL Tel: 01239 698427.

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SHACKLOG 5.5 - Probably the most popular UK written and UK supported logging software. £32.00. With IOTA add-ons £42.50. SASE + disk for demo copy. Alan Jubb, G3PMR, 30 West St., Gt Gransden, Sandy SG19 3AU. 01767 677913. www.shacklog.co.uk

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Automotive EMC Legislation

With reference to the item in 'Technical Topics' about automotive legislation (*RadCom* January 2002), the topic of automotive EMC legislation has been fully understood by members of the RSGB EMC committee for many years. Hilary Claytonsmith, G4JKS; David Lauder, G0SNO, and Robin Page-Jones, G3JWI, each know me very well. I represent one of the few UK-appointed Technical Services for this directive (95/54/EC). Only the Technical Services appointed by the UK's Vehicle Certification Agency can provide correct advice on the directive.

A few facts:

The RA has been aware of this directive since 1995. Meetings occurred between the RA, DoT, VCA and MIRA throughout 1995/6 to discuss and agree interpretations.

It was referred to in MPT 1362 1997 with an explanation of its requirements.

RA staff have been involved with ETSI and the European motor industry since 1998 to discuss interpretations.

RA staff were involved in writing the R&TTE directive 1999/5/EC during 1998 and this directive identified the need for compliance with 95/54/EC.

Any equipment fitted to a modern motor vehicle may affect its safe operation, this has to include amateur equipment. This despite the modern vehicle already meeting the most stringent EMC specifications, significantly higher than industrial and even higher than any ETSi standards for radio equipment. The automotive approval of any equipment is to ensure that road safety is not affected when the equipment is fitted to a vehicle.

UK law from 1995 took all equipment intended for vehicle use out of 89/336/EEC and effectively identified that the CE mark was not the correct compliance mark (see UK SI 1995: 3180). The correct marking is a small letter 'e' or nothing.

Incidentally, I am aware of radio equipment that complies with the directive, and also that the number is slowly increasing. I do not believe that this directive will stop amateur radio mobile operation, but it will require better understanding and control of vehicle installations by all concerned.

An explanation of the vehicle EMC legislation can be found on the website at www.mira.co.uk/certification

Terry Beadman, M1BKQ, Certification and Inspection Manager, MIRA

[Any queries from members should be addressed to Hilary Claytonsmith, G4JKS, c/o RSGB HQ - Ed.]

Thumbs Up for Foundation Licence

On behalf of the group of trainee amateurs here at Richmond School Amateur Radio Society, we would like to congratulate you on a job well done. We were delighted to be chosen as one of the three schools in the pilot scheme. The Foundation training scheme is excellent. The idea that you can operate on VHF, UHF and HF whilst training (even though it is only speaking to people in the UK) is brilliant. We also like the way that you can be examined upon request, we are hoping to take the exam on 10 December 2001 and believe that we should receive our licences and callsigns in early January. Another good thing about this is that you get a straightforward pass or fail result declared to you by the person in charge of the examination (no more biting your nails in suspense!)

During the time we operated (under supervision of our tutor) we came across one person who didn't believe in the new changes, most did though. The main thing that we said to the objector was that when you take your driving tests, they are not going to let you pass if you haven't ever driven a car before. Taking this approach to amateur radio means that you can see if the person is competent on using transceivers and other items before you let them loose [on the air].

We found that the introduction of the new Foundation Licence has caused a lot of interest, eg when making a CQ call the other day we had numerous people calling. We would like to thank all the amateurs who helped us make our first contacts.

Paul, Andrew, Michael and Jamie
Richmond School.

Clubs to the Rescue

I read with sad feelings the letter of Bill Trenchard in the December *RadCom*. He tells how two elderly G4 operators for one reason or another were unable to carry out the necessary ladder work etc in erecting and maintaining antennas. So they simply gave up their hobby and resorted to working 'computer DX' on the Internet.

A simple call for help - a *cri du cœur* - could probably have brought help and rescue.

I myself am an 81-year old patient at a nursing home in Fulwood on the north side of Preston. I too was missing access to my equipment at home until my radio club - the Central Lancs Amateur Radio Club - heard of my predicament. Two members, Peter, G3UCA, and Bill, G3NQX, were soon on site and sizing up the situation.

The manager of the nursing home willingly gave his permission for antenna work to go ahead. His attitude was that any resident in the nursing home would benefit enormously if they were able to continue with the pursuit of their own home interests and hobbies during their stay in the home. The therapeutic effect could only be beneficial to their health.

My two fellow club members have put up a 40m dipole on a 20ft telescopic mast just outside my bungalow room. Atop the mast they have mounted a fibreglass dual-band collinear. Other antennas have not been considered due to possible TVI problems.

The result: First QSO to the Outer Hebrides with a 59-plus report. So I feel sure that many radio clubs would be willing to help a fellow ham in time of sickness. They need only to be asked.

Rev Peter McArdle, G0DAG/P

. . . And Thumbs Up for the AGM

I have to express my very grateful thanks to everyone who made the 2001 AGM such an enjoyable and pleasant event. It was extremely kind of the Strathclyde Fire Brigade to provide both an excellent venue and a free lunch.

I was very pleased to see such a good attendance from Scottish amateurs - I do hope this leads to another AGM in Scotland before too long.

Finally, I very much admired the way that Don Beattie, G3BJ, ran both the AGM and the informal meeting. I feel he presented the Society as one open to members' comments and ready to answer questions put by members. In my 20+ years of attending Society AGMs, I believe that the 2001 AGM was the most rewarding and enjoyable.

Ian Brothwell, G4EAN

Illegal Pirates

Is there any chance that the illegal operators on 3.45MHz and up, and those on 6.66MHz and other frequencies, will ever be caught and prosecuted? It seems ridiculous that as licensed amateurs we can be called to book, because our licences are registered, but those pirates can work willy-nilly whenever they feel like it and operate with impunity because no-one does anything about it. What's more, it's the amateurs that get the blame for most of the interference problems.

A dipole for 3.45MHz looks just like a dipole for 80 metres - it's only a little longer. I suppose the pirates think they will be taken for legitimate amateurs.

They need to be 'shopped and bopped' - hit with a heavy fine and confiscation of equipment.

So, come on lads, take a listen on those frequencies and see if the voices are those whom you may recognise. Why should they be allowed glibly to carry on their illegitimate activities, when we have to toe the line?

D Bedford, G4ABS

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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

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Appointed by Heil as UK Distributor

Proset-4	H'phone/boom mic	£129.95 B
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ESC-17L	Leather Case	£9.95 A

Coax Connector Kit £49.95

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The kit comprises a set of coax cable connector adaptors. Six threaded interconnectors enable any of the supplied plugs and sockets to be assembled back to back to form the adaptor of your choice. The centre pins of all the connectors are gold plated.

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DSP-Filter Analyser & Decoder Program

New! For Windows™ '95/'98/'ME/'2000 and NT 4.0

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Radiocom 5.1 (RCHAM)	£149.95 B
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PROFESIONAL QUALITY HF RECIEVER

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NEW

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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.

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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.

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£75.95 (KIT)
£99.95 (BUILT)carr. £8.00

Case etc. included.

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MFJ-941E HF 300W Budget ATU
£109.95 Plus £8.00 Carr.

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.

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2kW from 1.8 - 30MHz, use it to select up to 6 antennas and 6 transceivers in any combination. Unselected terminals are automatically grounded

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Carr. £8.00

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£59.95 Plus £8.00 Carr.

Match into that G5RV or similar

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MFJ-382 Amp + Speaker
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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.

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The easy way to learn CW

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.

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
£59.95 Plus £6.00 Carr.

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-392 Mono Padded Communications Earphones
£22.95 Plus £3.00 Carr.

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.

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MFJ-1025 "Local Noise" Canceller
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MFJ-1026 As MFJ-1025, but has active whip antenna for picking up noise signals (as illustrated above). £159.95 Carr. £8.00

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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-616 Speech Intelligibility Enhancer
£169.95 Plus £8.00 Carr.

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!

MFJ-461 MORSE CODE READER
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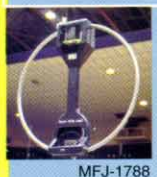
The MFJ-461 is a stand-alone pocket sized Morse code reader. Similar in size to the MFJ Morse tutors, all you do is hold it close to your receiver and it instantly displays CW on the 32 character high contrast LCD. It has automatic speed tracking, a serial port - if you wish to connect to a computer to display the text on a bigger screen. It can also be connected to your receivers audio if required. Truly pocket sized at 57 x 82.5 x 25.5mm and 156g.

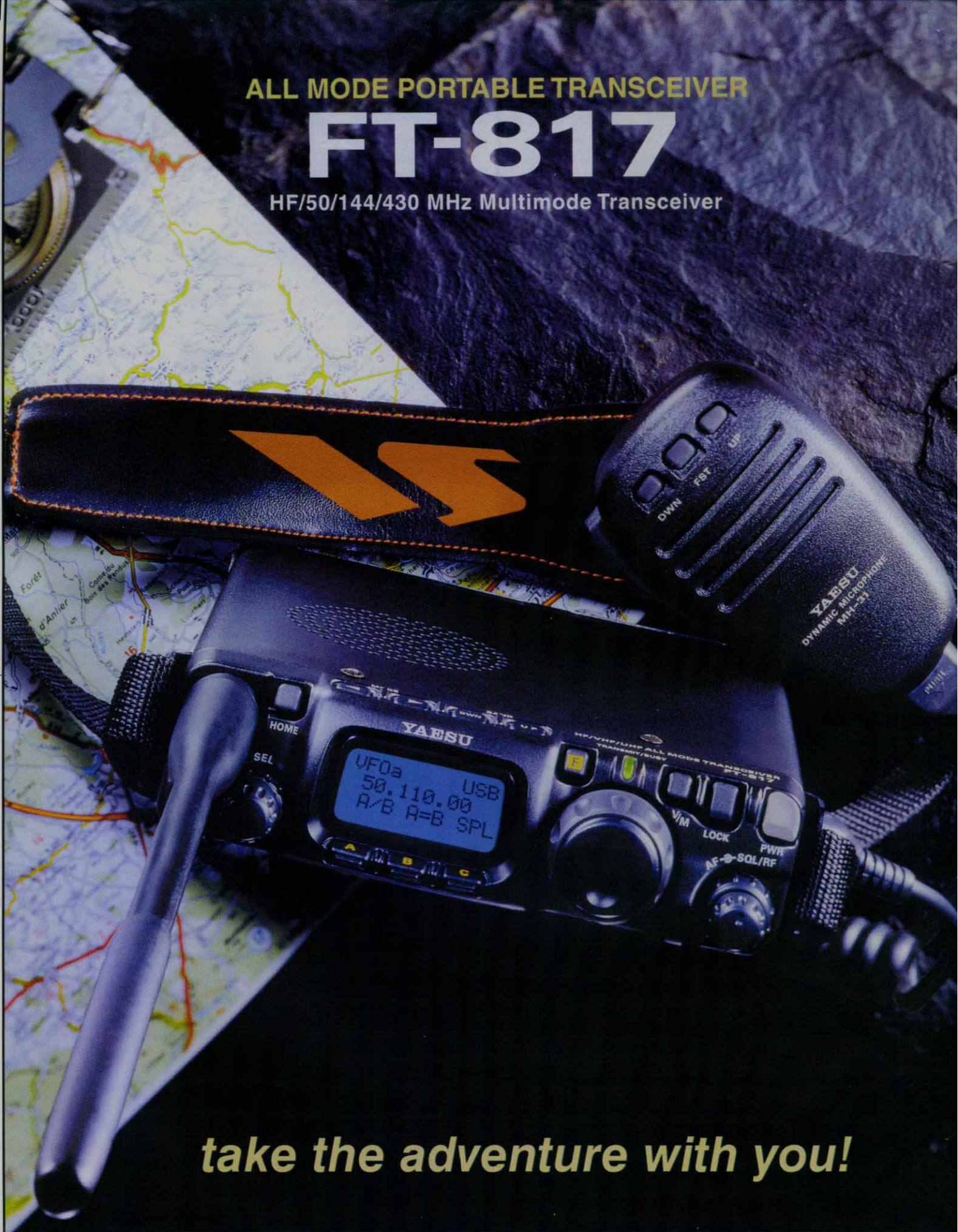
MFJ-1786-1788



MFJ-1788

MFJ-1786

MAGNETIC LOOP ANTENNAS
MFJ-1786 10-30MHz £369
MFJ-1788 7-21MHZ £419
Ideal for restricted space locations. Rugged all welded aluminium construction, they are fully weatherproof and don't require a separate control cable, the coax carries the signal and the DC control signals for tuning. You can remotely tune to the amateur bands. They have very narrow bandwidth



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