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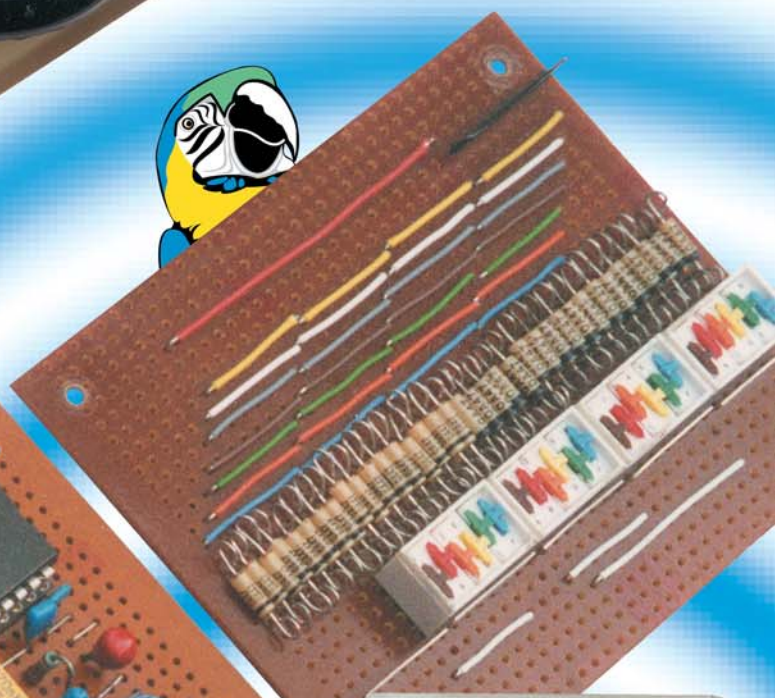
RadCom

Volume 77 No 2 ♦ February 2001 The Radio Society of Great Britain Members' Magazine

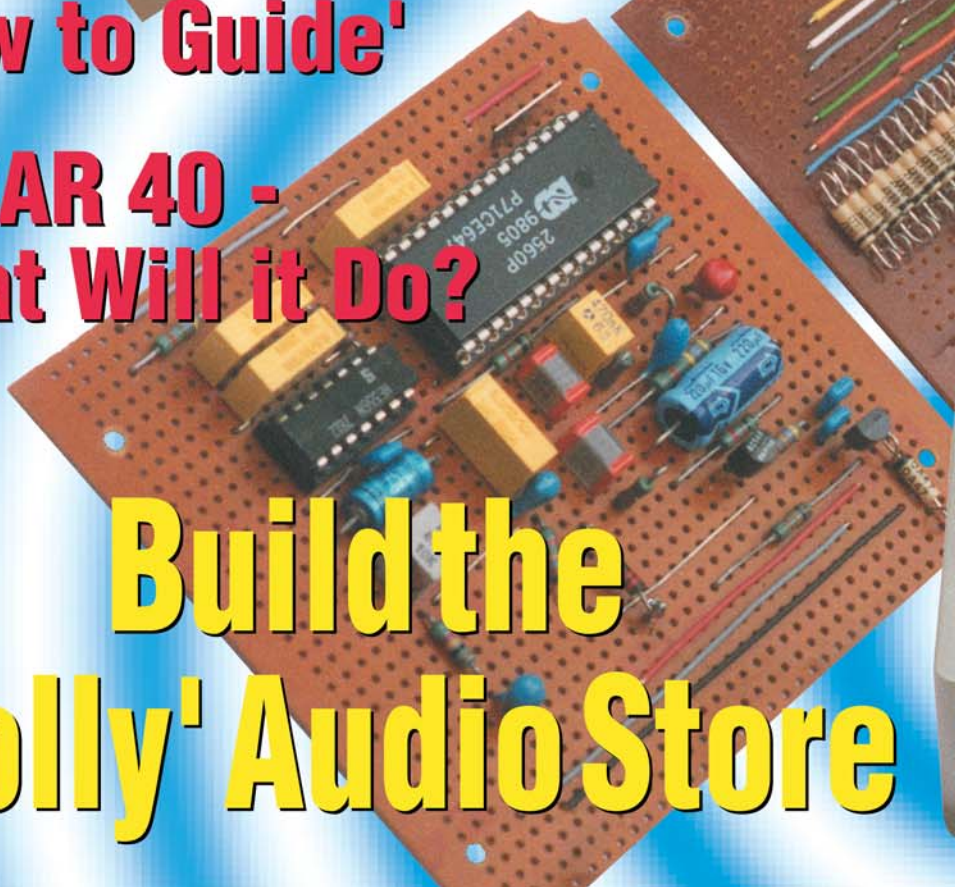
Win! Yaesu FT-817

Kit Building - Undergoing a Renaissance?



Working the D68C DXpedition - a 'How to Guide'

OSCAR 40 - What Will it Do?



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YAESU
Choice of the World's top DX'ers

ANY BAND, ANY MODE, ANYWHERE

FT-817

£ PHONE

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

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

You're Never Alone with an FT-817!

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

Matching FNB-72 Nicad pack & NC-72C charger availiable soon. Other accessories planned.

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

£2799
Plus £7.50 Carr.

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

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

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

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

SAVE

£1799
Plus £7.50 Carr.

19.4% APR Available

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

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

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

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

£1395
Plus £7.50 Carr.

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

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

ICOM IC-756PRO 1.8 - 52MHz 100W

£1895
Plus £7.50 Carr.

Free desk mic

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

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

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

SAVE

£1099
Plus £7.50 Carr.

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

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

YAESU FT-847
160m - 70cm All Mode

SAVE

£1329 with switch mode power supply

£1199
Plus £7.50 Carr.

SCOOP!

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

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

KENWOOD TS-570DG
160 - 10m All Mode

£849
Plus £7.50 Carr.

19.4% APR Available

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

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

WATERS & STANTON @ LOWE

CHESTERFIELD RD
MATLOCK
DERBYSHIRE
DE4 5LE
01629 582380

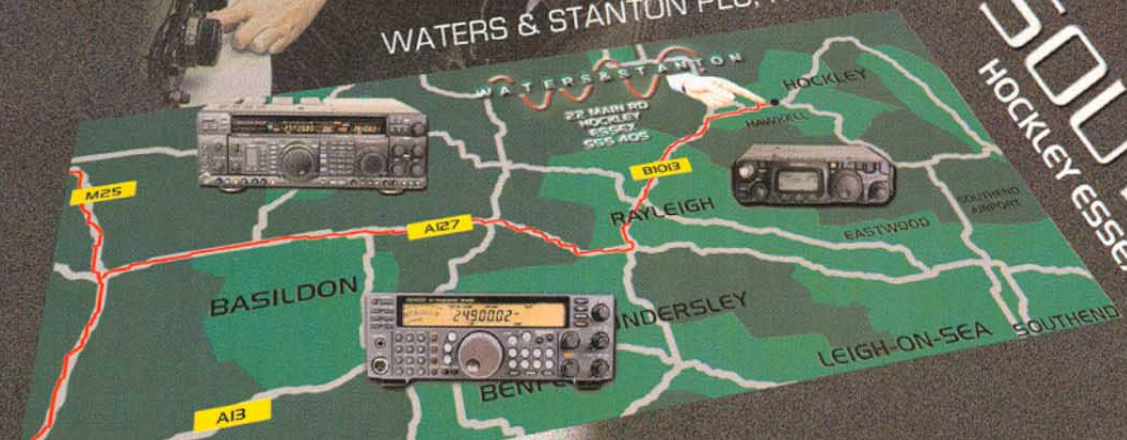
Great news for customers in the Midlands and North of England!

NORTH
MATLOCK DERBYSHIRE

Waters & Stanton have opened a showroom and retail counter at the premises of Lowe Electronics in Matlock, Derbyshire.

&

SOUTH
HOCKLEY ESSEX



In Matlock, Derbyshire, we aim to offer the same super prices, deals and personal over-the-counter service that customers in the south have enjoyed for many years. Customers wishing to see, operate, purchase or just talk about the latest amateur radio products now have the option of visiting us at Hockley in Essex, or at Matlock in Derbyshire. Both stores will carry our usual very comprehensive stocks of equipment and accessories. Mail order business will continue to be handled at our Hockley premises in Essex, from where we aim to get goods to customers within 48 hours; often less than 24 hours!

With the very wide range of equipment now available on the amateur radio market, Waters & Stanton PLC is probably the only company with sufficient resources to be able to carry comprehensive off-the-shelf stocks.

MasterCard

WATERS & STANTON

wsplc.com

ICOM IC-706IIG 160 - 70cm All Mode

£1099 Plus £7.50 Carr.

SCOOP!

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

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

TS-2000 Multi Band/Mode Transceiver - Coming Soon!

Kenwood promise a top performance 160m - 23cms transceiver. Full details are in our latest catalogue and product release is expected fairly shortly.

£1599 APPROX. Plus £6.00 Carr.

KENWOOD TM-D700E 2m / 70cm Data Mobile

£429 Plus £7.50 Carr.

SAVE

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

WMM-3 Data Modes

£69.95 Plus £6.00 Carr.

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

£269 Plus £6.00 Carr.

YAESU VX-5R

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

YAESU FT-50R

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

£179 Plus £6.00 Carr.

IC-910 VHF/UHF Transceiver - Coming Soon

Appox. £1300

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

Optional 23cms + £400

YAESU FT-11R 2-Metre Handheld

SCOOP!

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

£119 Plus £6.00 Carr.

NEW

Optoelectronics CD-100 MULTICOUNTER

Reads Frequency & Codes

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

£379.95 Plus £6.00 Carr.

KENWOOD TH-D7E

£259 Plus £6.00 Carr.

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

YAESU Choice of the World's top DX'ers

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

SAVE £289 Plus £7.50 Carr.

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

ADI AR-147

AM Airband Receive

£199 Plus £6.00 Carr.

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

C-150 144MHz (2m)FM Handheld Transceiver

Scoop Purchase!

The C-150 offers full coverage of 2m with up to 5W output when used with 13.8V supply. Supplied with a 6 x AA battery box, it can be used with dry or ni-cad cells. 20 memories and tone burst, plus extended receive coverage, make this an ideal radio to have in the car or brief case. And at our new low price it represents amazing value. Price includes carry strap and antenna plus instruction manual and 12 months warranty.

£69.95 Plus £6.00 Carr.

ICOM IC-2800H In Full Colour!

£395 Plus £7.50 Carr.

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

Includes FREE Remote head cable.

ICOM IC-207H

£259 Plus £7.50 Carr.

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

KENWOOD TM-G707E

£259 Plus £7.50 Carr.

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

YAESU FT-8100R

£349 Plus £7.50 Carr.

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

KENWOOD TM-V7E

£339 Plus £7.50 Carr.

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

Order Details on inside Front Cover

MFJ-969 300W ATU

£169.95 Plus £7.50 Carr.

160 - 6m Wire, Coax or Balanced

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

1.8 - 30MHz ATUs

MFJ-989C	3kW roller coaster - metered	£329.95 C
MFJ-986	3kW Differential - metered	£299.95 C
MFJ-962D	1.5kW T-match - metered	£239.95 C
MFJ-949E	300W + load - metered	£139.95 B
MFJ-948	300W - metered	£119.95 B
MFJ-934	ATU + artificial ground	£139.95 B
MFJ-941E	300W compact - metered	£89.95 B
MFH-945	1.8 - 50MHz mobile	£99.95 B
MFJ-901B	300W no meters	£75.95 B
MFJ-16010	200W random wire - no meter	£49.95 B

VHF Models

MFJ-921	144MHz 200W - metered	£69.95 B
MFJ-924	430MHz 200W - metered	£69.95 B
MFJ-903	50MHz 200W no meters	£49.95 B
MFJ-906	50MHz 200W - metered	£79.95 B

Carriage charges: B = £6.00 C = £7.50

SGC-230 Smart Tuner

£359.95 Plus £7.50 Carr.

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

Microset Amplifiers

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

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

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

Speaker Mics. QS-112

Including Yaesu and Icom 4-way jack.

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

Phone if in doubt about suitable model.

£16.95 Plus £2.00 Carr.

Hands-Free Mobile Mics.

£42.95 Plus £2.20 Carr.

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

MFJ-269 Analyser

160m - 70cm On-site Antenna Analyser.

£299.95 Plus £6.00 Carr.

MFJ-259B 1.8 - 170MHz £229.95

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

Heil Audio

Appointed by Heil as UK Distributor

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

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

KH-WS1 "World Space digital receiver"

NEW IN STOCK

KH-ANT external antenna kit in stock £49.95

£99.95 Plus £6.00 Carr.

Avair AV-600

£59.95 Plus £6.00 Carr.

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

The Toughest Japanese Rotators

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

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

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

MC-2 Lower mast clamps £49.95 B

LINEAR AMP UK Amplifiers

British made Amplifiers with a Pedigree

Full Range Stocked

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

Cushcraft Ham Radio Antennas

MA5B Mini-Beam

£299 Plus £7.50 Carr.

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

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

Phone for catalogue.

NEW MFJ-Cub QRPers

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

Kit £89.95 Built £139.95

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

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

Carolina Windoms

CW-80 Special

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

£89.95 Plus £7.50 Carr.

Other Models (all with low angle radiator stub)

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

Plus £7.50 Carr.

80-40-20m Mini Dipole

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

Power Supplies

SEC-1223 13.8V PSU

23 Amps - 3.2lbs!

£99.95 Plus £6.00 Carr.

Back In Stock

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

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

WATSON

UK's top selling power supplies.

£89.95 Plus £7.50 Carr.

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

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

Plus £6.00Carr. Plus £7.50 Carr.

Compact 10 Amp Switch Mode PSU

£49.95 Plus £6.00 Carr.

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

NEW W-40SM 40 Amp Switch Mode

£149.95 Plus £6.00 Carr.

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

ML&S martin lynch & sons

Suppliers of Communications Equipment

WE ARE PLEASED TO ANNOUNCE THE RSGB MORSE CAMPAIGN 2001

SUBSIDISED COURSES FOR YOU TO GET YOUR M5 CALL

31 March / 1 April	RSGB HQ, Potters Bar, Herts
26/27 May	Harrogate Ladies' College, Yorks
9/10 June	RSGB HQ, Potters Bar, Herts
27/28 October	Harrogate Ladies' College, Yorks

The Complete package includes:

- 5WPM self-assessment tape, pre-event practice and tips
- Group and individual tuition from expert instructors
- Free tea and coffee

ONLY £20 for the whole weekend + test fee

There are only 30 places at each venue and the fee for the weekend is £20. Each Sunday, Morse examinations will be provided on demand, for the standard fee of £15 for the 5WPM test. If you are interested, please contact AR Department at RSGB HQ for an application form or book online www.rsgb.org/shop - Tel: 0870 904 7373. E-mail: ar.dept@rsgb.org.uk

5WPM Morse

Morse Campaign's 100th Graduate

Laura Russell, the 100th graduate of the morse campaign, with her father David, the 101st graduate, now M5IGE

10 things you didn't know about the M5 Licence

1) M5 equals VHF licence plus 5WPM
2) M5 equals amateur radio excitement
3) M5 fastest growing licence
4) M5 gives access to all HF bands with 100 watts
5) M5 gives access to all VHF bands with 400 watts
6) M5 call letters are your choice
7) RSGB can provide all the paperwork for your M5
8) Why not learn 5WPM Morse at a Morse Camp
9) M5 plus 12WPM equals a full licence
10) M5 is a RSGB/RA initiative

Also sponsored by: YAESU The First-Class CW Operators' Club, The Chiltern DX Club

Front Cover:

The 'Polly' digital audio store is our Lead Feature on page 17. Plus amateur radio kits - we look at three receivers and a transceiver ranging from the very simple to the moderately complex. See page 28.

RadCom
Radio Communication

Publications Manager
Mike Dennison, G3XDV

Editor
Steve Telenius-Lowe, G4JVG

Technical Editor
George Brown, M5ACN

Technical Illustrator
Cover Design
Bob Ryan, 2E1EKS

Advertising Design
Annie McVicar

Secretarial
Pauline Reid

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

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

Tel: 0870 904 7373
Fax: 0870 904 7374

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

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

Tel: 0870 904 7377
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Fax: 0870 904 7378
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All material in RadCom is subject to editing for length, clarity, style, punctuation, grammar, legality and taste.

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

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THIS MONTH
WIN!
A Yaesu FT-817 HF / VHF / UHF Miniature Transceiver
(2nd prize: MFJ Cub QRP transceiver)
See Page 24.

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Down To Earth - Amateur Radio From The Ground Up

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RSGB Matters

AMATEUR RADIO FORUM EDINBURGH

SOME 130 PEOPLE attended the Radiocommunications Agency's 'Amateur Radio Forum' in Edinburgh on 7 December 2000. Most were from Scotland, but a number had made the trip from Northern England to join in the discussions. The RSGB was represented on the platform by Society President Don Beattie, G3OZF (now G3BJ).

After a brief introduction from Martin Cain, the head of Specialist Sectors Unit at the RA (which handles amateur licence issues) a lively discussion took place, lasting nearly three hours. Main topics discussed were the future shape of amateur licensing, the need to reach out more effectively to attract newcomers into amateur radio (especially young people), EMC matters, calls for a high-power licence, log keeping and licence renewal issues.

By far the most comments were on the new licence structure. The vast majority agreed on the need for action now, and most also supported a simple, limited-privilege, HF-access licence as a 'taster' for the full licence.

The RA was at pains to emphasise its commitment to a healthy future for amateur radio. Martin Cain confirmed that all ideas and comments on the future shape of licensing, both in the immediate future and after WRC 2003 when the international requirement for Morse as a pre-requisite for an HF licence is likely to end, would be carefully considered: nothing was 'cast in stone'.

THE PRESIDENT FORMERLY KNOWN AS . . .

RSGB PRESIDENT Don Beattie has changed his callsign from G3OZF to G3BJ. He recently discovered the existence of a deceased relative that had held the pre-WWII callsign. Don commented that, after nearly 40 years as G3OZF, G3BJ was already proving to be a much better callsign to send on Morse code!

FREE LICENCES FOR THE OVER-75s

A RECENT PRESS release from the Radiocommunications Agency says that with effect from 1 April 2001, Amateur and Citizen's Band Radio Licences will be issued free to those aged 75 years and over.

New licence applications received on or after 1 April will be issued free of charge to any person aged 75 or over at the time of issue. Existing licence-holders whose licence renewal is due on or after the 1 April, and who are 75 years of age or over at that time, will have their licence renewed at no charge. Licences will still need to be renewed each year, but no licence fee will be required.

RSGB STAFF MEMBER MARRIES IN GRETNA GREEN

PETER KIRBY, G0TWW, the General Manager, had the pleasure of presenting on behalf of the Society and the HQ staff a number of gifts to his eldest daughter Faye before her marriage in early December to David Millward. Faye, who is an accounts administrator, has been a member of staff at HQ for the past 12 months. In accepting the gifts, Faye said that she was looking forward to answering the telephone using her married name of Mrs Millward, thus avoiding the inevitable question "Oh! Are you related to the GM?"

The marriage service took place in Gretna Green, after which the happy couple spent their honeymoon in the Canary Islands.

Peter Kirby, G0TWW, presents his daughter Faye with a wedding present on behalf of the Society and the HQ staff.

RSGB REGIONAL MANAGERS

THREE NEW RSGB Regional Managers (RRMs) have been appointed to cover the North West Region, London and Central Region, and South West and Channel Islands Region. They are Kath Wilson, M1CNY; Roger Piper, G3MEH; and Richard Atterbury, G4NQI, respectively.

There are still vacancies for RRMs in the Scotland West & the Islands Region, North Wales Region, South & South East Region and East & East Anglia Region (see page 73 of the January 2001 RadCom for a detailed breakdown of all the Regions). If you wish to be considered for any of these vacancies and live in the region, please contact General Manager Peter Kirby, G0TWW, at RSGB HQ in the first instance.

THINKING DAY ON THE AIR

THE ANNUAL Thinking Day on the Air (TDOTA) takes place over the weekend of **24 / 25 February**. A pack is available from RSGB HQ consisting of a list of participating special event stations and details of the countries that permit third party greetings messages during the event. Groups using a GX or similar prefix instead of a GB call are asked to inform HQ.

SCHOOL RADIO CLUBS: FREE AFFILIATION

THE RSGB BOARD has agreed with immediate effect that the Society affiliation fee be waived for primary and secondary education institutions, and that the need for rigorous adherance to the model constitution is no longer required.

This decision was based on the need to encourage school radio clubs to flourish and grow without financial or administrative constraints being placed on them.

G5RV MEMORIAL SHIELD

RSGB PRESIDENT Don Beattie recently visited the Chelmsford Amateur Radio Society (CARS) to give a presentation on the past, present and future work of the Society.

Following his talk, Don was presented with the G5RV Memorial Shield by Harry Heap, G5HF, the President of CARS. The Shield is to be presented to an RSGB contest winner in which a high proportion of the contestants are new to the hobby of amateur radio. Louis Varney, G5RV, was a founder members of CARS and the Memorial Shield was donated to the RSGB in his honour.

Don was also given a gavel - to enable him to keep order during his second year in office as President of the RSGB! The gavel was made by Ralph Polley, G3NAA, a woodturning craftsman who is a member of the Chelmsford society.

The G5RV Memorial Shield.

RSGB President Don Beattie receives the G5RV Memorial Shield on behalf of the RSGB from Harry Heap, G5HF, President of the Chelmsford Amateur Radio Society.

SCIENCE WEEK 2001

UNDER THE banner of "Pass on the Knowledge", the Society has initiated a project in partnership with the British Association and Marconi Communications to coincide with National Science Week, **27 March - 1 April 2001**. The Society has written to all its affiliated clubs asking them to put on special events, school lectures and amateur radio demonstrations with the view of inceasing the general public's awareness of amateur radio. At the time of going to press, over 50 clubs up and down the country have joined the project. If you wish your club to take part in this exciting project, please contact Mark Allgar at RSGB HQ.

RELAXATION IN UNATTENDED OPERATION

THE SOCIETY IS aware of the disquiet felt by radio amateurs with the announcement in a recent Gazette Notice of restrictions put in place by the RA on unattended operation. The Society has raised the matter with the Agency and has been informed that the restrictions were put in place at the request of other users of the radio spectrum. However, following a review of the decision, it may be possible to reduce or to lift some of these restrictions in the future. For example, the 50km restriction relating to NGR TA012869 will be reduced to a 10km restriction when the licence is next updated. The Society will continue to monitor the situation closely and will continue to press the RA to lift or reduce the restrictions wherever possible.

RSGB QSL BUREAU NEWS

THERE IS A new RSGB QSL Bureau Sub-Manager for the G4A and G4H series of callsigns. He is Mr S R Harwood, G4OWT, 24 Firle Cres, Lewes, E Sussex BN7 1QG.

Two QSL Sub-Managers have moved house recently. The new address for D L Hughes, G0RVW, the Sub-Manager for the G0U series of callsigns, is 10 Seaford Cl, Norton, Runcorn WA7 6QT. The M5 series Sub-Manager, Graham Ridgeway, G8UYD, also has a new address: 37 Highfield Gdns, Blackburn, Lancs BB2 3SN.

The QSL bureau sub-manager for the Abbreviated Contest Callsigns, Mike Graseley, M0CKX, now has an e-mail address: m0ckx@ic24.net Mike would be grateful if the holders of this type of callsign would inform him of the callsigns currently in use, in order to help him clear up some of the large backlog of cards that has built up over the past few months. His address is correct in the *RSGB Yearbook*, or he can be contacted on tel: 01709 542619; Mobile: 07867 584149, or by the e-mail address above.

COUNCIL MEMBER RETIRES

WITH THE introduction of the new Regional Organisation Dave McQue, G4NJU, Zonal Council member for Zone D for the last two years, has decided it is time to step down to allow some fresh blood the opportunity to represent the South West. Dave, who is in his mid-seventies, remains very enthusiastic and active in support of the Society and its work and will continue to serve on the Society's Management Committee.

RadCom NEWS

Students Link Up with ISS by Ham Radio

SCHOOL STUDENTS in Virginia, USA, interviewed International Space Station (ISS) commander William 'Shep' Shepherd, KD5GSL, by amateur radio on 5 January. The contact was the second successful Amateur Radio on the International Space Station (ARISS) school contact. Around 10 students posed questions to Shepherd, who was using the ISS's special NA1SS callsign. Control operator Wally Carter, K4OGT, linked up with the ISS about four minutes into the 10-minute pass. Signals were somewhat noisy but readable.

According to the *ARRL Letter*, the schoolchildren seemed fascinated with the effects of launch and space flight. Being launched from earth into space felt like "someone standing on your chest," Shepherd told one questioner. See page 11 of the January 2001 *RadCom* for information on how school radio clubs can set up a contact with the ISS.

Prince William Learns HF / VHF Radio Theory

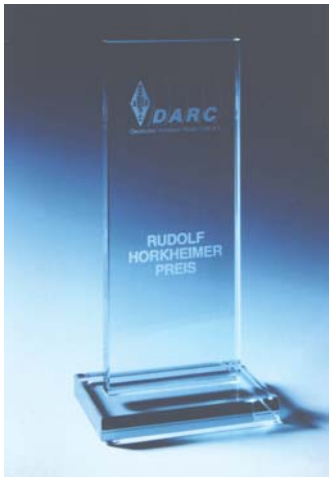
HRH PRINCE William received intensive HF and VHF radio theory and practical training during his recent stay in Patagonia, Chile. The Prince spent 10 weeks in Patagonia, working as a volunteer Venturer for Raleigh International during his 'gap year' between school and university. Prince William, known as 'Will' to his Raleigh colleagues, was trained by RSGB member Laurence 'Flo' Howell, GM4DMA, who was working as a staff member for Raleigh International.

All the Raleigh Venturers (17 - 25 year olds) and staff were trained by Laurence on HF / VHF radio techniques, including ionospheric and line of sight / diffraction propagation, NVIS (Near Vertical-Incidence Skywave) propagation using dipoles just a few metres above ground, dipole and wire / counterpoise antenna theory, practical HF radio operation, hand-chargers, solar chargers, on-site repairs, safety of non-ionising radiation, NATO voice procedures, report preparation, using mobile HF systems etc. The training is intense and carried out over just two days, which includes examinations and field training exercises. Last year alone Laurence trained around 600 Raleigh staff and Venturers in Mongolia, Ghana, Brunei and Chile.

Laurence was introduced to the world of Raleigh International by RSGB HQ staff back in 1996, when Raleigh contacted RSGB headquarters with an urgent requirement for a radio communications officer. They needed a suitably-qualified radio expert to fly out to Uganda *within three days*! Although this sounded an impossible task, Laurence was contacted because of his known experience on polar expeditions, working with, among others, Sir Ranulph Fiennes. Laurence was able to arrange sufficient leave to fly out to Entebbe at the short notice required - and the rest is history.

Now Laurence is moving to Anchorage, Alaska, with his main job working for Phillips Petroleum. Volunteers have dismantled some 7.5 acres of antennas and "what seemed like kilometres" of Andrews heliax cable at his private long-range HF expedition support station. For the past 20 years radio station 2AZT has provided HF radio support for charitable, emergency and polar expeditions.

Horkheimer Prize 2001



THE GERMAN national amateur radio society, DARC, has requested nominations for the Horkheimer Prize 2001. The prize is awarded by DARC "for merits of amateur radio, its further development and the targets of DARC". The prize can be awarded to one or more persons or institutions and self-nomination is allowed. Nominees need not be members of the DARC but must be a member of an amateur radio society in the IARU. The prize consists of an etched glass trophy and a monetary award for non-personal use, which should be spent on the promotion of amateur radio. The prize is awarded at the Friedrichshafen Ham Radio 2001 exhibition in June. Nominations must be submitted by 28 February to DARC, Lindenallee 6, 34225 Baunatal, Germany. They should list the name and address of the proposed amateur, a short substantiation, and further information if required. The decision of the jury is final. If there is no fitting proposal the prize will not be awarded. The prize is named after Rudolf Horkheimer, one of the first radio amateurs in Germany.

Nevada Open Day a Big Success

NEVADA HELD its first 'Open Day' in its new 12,000sq ft warehouse near Portsmouth in December last year. Nearly five hundred people visited the warehouse, some travelling from as far as Wales and Doncaster.

Representatives of Icom, Kenwood, Yaesu and AOR supported the event, providing demonstrations of their latest models and answering customers' queries. The huge warehouse proved an ideal setting for such an event and a 'hamburger' van outside provided free tea and coffee to visitors.

The doors open at the warehouse on Nevada's first open day.

W&S@Lowe

WATERS & STANTON PLC have announced that as from the beginning of February they will have a new showroom and retail counter at the premises of Lowe Electronics Ltd in Matlock. Peter Waters, G3OJV, said this will give customers in the Midlands and North the opportunity of seeing and purchasing the same wide range of products that customers in the South have enjoyed for many years when visiting Waters & Stanton's main premises in Hockley, Essex. Richard McLachlan, G3OQT, managing director of Lowe Electronics Ltd, explained that his company had recently been concentrating on developing its commercial business. The new showroom, to be known as W&S@Lowe, is at Chesterfield Road, Matlock, Derbyshire, tel: 01629 582380. Waters & Stanton mail order and web ordering service will continue to be handled at Hockley.

Millecom 2001

FOLLOWING THE success of Millecom stations in 2000, the RA has given permission for the event to cover 2001 as well. M2000Y stations and other groups involved are being permitted to operate as M2001Y / their military callsign. More details soon on the Millecom web site at www.millecom.fsnet.co.uk

AO-40 Recovery Continues

OSCAR 40 (AO-40), the satellite formerly known as Phase 3-D, has suffered a series of problems since its launch last year. It now seems unlikely that the satellite will be able to function precisely as had been hoped, although there is still a lot that can be done with AO-40. The latest news was that a small fuel leak was causing propulsion and small changes to the orbit, but it was hoped to address this soon. The situation is changing day by day and the latest update, as of going to press, is reported by AMSAT-UK's Richard Limebear, G3RWL, in a special feature article on page 45 this month.

DL Morse Test Speed Reduced

GERMANY IS the latest country to lower the Morse code test speed required for an HF licence. It is now only necessary to pass the equivalent of the RAE and a 5WPM Morse code test in order to gain an HF licence in Germany. According to the DARC's Hans Berg, DJ6TJ, the new regulation came into effect on 22 December last year.

Stolen Equipment

THE FOLLOWING equipment has been reported stolen: Icom IC-706 MkIIG serial number 02575; SEC 1223 PSU serial number 990702750; Alinco DJ-120E. Any information would be welcomed; please contact PC 725 Kevin Walker, tel: 01636 605999 ext 7947.

OE Society's 75th Birthday

THE YEAR 2001 is the 75th anniversary of the founding of Austria's IARU member society, the OEVSV. Amateur radio operators in Austria have been given permission to use the special prefix OE75 for the whole of 2001.

Countdown to possibly the biggest DXpedition ever continues

UK Expedition Group Makes DXing Easy for Beginners

WHAT IS probably the biggest-ever DXpedition in the history of amateur radio is about to hit the airwaves as this issue of *RadCom* is received. The UK-based Five Star DXers Association's operation from the Comoros will be on the air from about 8 to 28 February. Operating as D68C, the group will be active with at least six high-power Yaesu stations around the clock for nearly three weeks. All bands, from 160m to 70cm, and all main modes including CW, SSB, RTTY, PSK31, 10m FM and the main satellites will be catered for. On 6m, D68C will run a beacon on 50.090MHz but will move to 50.102MHz CW or 50.145MHz SSB during openings.

One of the intentions of this operation is to encourage newcomers to DXing to 'take the plunge' and experience the thrill of making contacts with DX stations. To this end, the group will be making every effort to make it as easy as possible for beginners to make contact with them [a 'how-to' guide is published in *Down to Earth* on page 34 this month - *Ed*].

At the final planning session for D68C. Left to right: Mike Devereux, G3SED; Don Beattie, G3BJ; Neville Cheadle, G3NUG; John Linford, G3WGV; Don Field, G3XTT; Tony Canning, G0OPB.

As an encouragement to both newcomers and established DXers, Nevada is sponsoring 15 trophies to be known as the Nevada Comoros Trophies. Details appear on page 35. In the event of a tie, awards will go to those 'first past the post'. Applications should be sent by 30 April 2001 to FSDXA, c/o Neville Cheadle, Further Felden, Longcroft Lane, Felden, Hemel Hempstead, Herts HP3 0BN.

D68C will pioneer a number of technical innovations, mainly based on server software developed by John Linford, G3WGV. All operating positions will be connected by Ethernet to a central server, providing each operator with information not normally available in a DXpedition situation. The logging software, which is part of the total system, also has full RTTY (including PSK) and CW facilities integrated into it.

For this major DXpedition the Five Star DXers Association has received sponsorship from numerous companies and groups throughout the world. From this country these include Yaesu (UK), Nevada, Martin Lynch & Sons, the RA, Linear Amp UK, CDXC (Chiltern DX Club), and the GM DX Group, as well as a number of local radio clubs and individual amateurs. Further details about this operation can be found on the DXpedition web site at www.dxbands.com/comoros

D68C will be located on the north coast of the island of Grande Comore.

Amateur Radio Day at Boat Show

MONDAY 8 January was 'Amateur Radio Day' at the 47th London Boat Show at Earls Court Exhibition Centre. Icom (UK), who have had a stand at the Boat Show for many years in order to display their marine radio equipment, invited representatives from Martin Lynch & Sons and the RSGB on to their stand for the day. Each year they receive many enquiries about amateur radio from users of marine radio equipment and so this year advertised the first Monday of the Show as their amateur radio day. General Manager Peter Kirby, G0TWW; *RadCom* editor Steve Telenius-Lowe, G4JVG; and Chris Taylor, G0WTZ, from ML&S gave advice to would-be amateurs and handed out information leaflets about our hobby.

The Icom stand at this year's Boat Show.

Please Help TDOTA Station

THE AVON VALLEY ARA and other clubs in the Worcestershire area are planning to organise a major amateur radio event for the Thinking Day on the Air on 24 / 25 February. Several hundred Guides, Brownies, Rainbows and Scouts are expected to attend and the Guides are publicising the event with a vengeance. The clubs have received the loan of several HF and VHF / UHF transceivers from Kenwood (UK), but are looking to borrow suitable HF, VHF and UHF antennas for the duration of the event. They would also like to put on demonstration stations for satellite communications and ATV and are looking for local expertise in these areas of amateur radio. If you can help with either of these requests for help, please contact Pete Badham, G0WXJ (QTHR), or e-mail: pete@thenetwerx.co.uk A website (www.tdota.co.uk/) is being set up for the event and this is planned to go 'live' by the beginning of February.

VHF Award News

RSGB VHF Awards Manager Tony Jarvis, G6TTL, comments, "My postman was not overly taxed by award mail for this month, as it furnished just a solitary claim. This was from Ian Cornes, G4OUT (ST), one of a number of regular claimants for the 70MHz band. Ian's claim was for 25 squares / 6 countries. 70MHz is a band that, although activated by many regular enthusiasts, is difficult to acquire the necessary confirmations. Many of the contacts are made during contests and there is a strong following for CW. Perhaps for 2001 those of us who have been thinking about acquiring another band should look more seriously at 4 metres. Congratulations to Ian on his achievement."

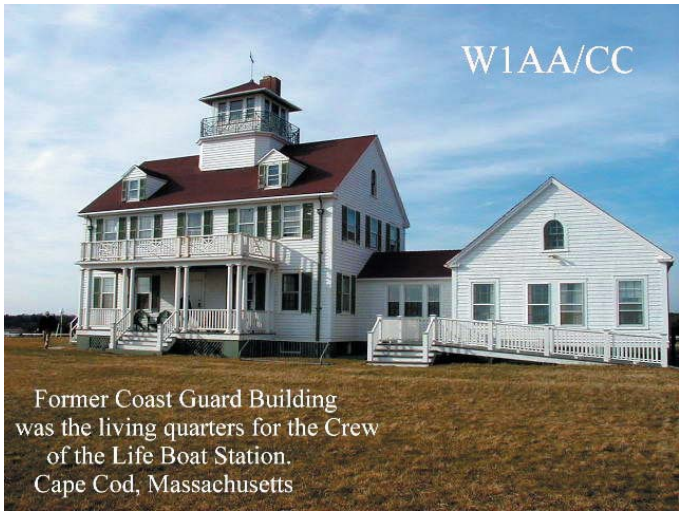
Details on all VHF, UHF and microwave awards can be obtained on receipt of an A4 or A5 SASE sent to Tony Jarvis, G6TTL, Dovecote Farm, Patmans Lane, Friskney, Boston, Lincs PE22 8QJ (e-mail: vhf.awards@rsgb.org.uk) or from www.argonet.co.uk/users/tonyg6ttl/awards/awards.htm

Inventor of Walkie-Talkie Dies

AL GROSS, W8PAL, died in Arizona just before Christmas at the age of 82. Al Gross pioneered the development of radio transmission on frequencies above 100MHz. He obtained his amateur radio licence in 1934 at the age of 16 and his early interest in amateur radio set his career choice while he was still a teenager. In 1938, while still at college, he invented the first handheld radio transceiver, which he called a 'walkie-talkie'. Gross was recruited by the OSS, forerunner of the CIA, where he developed two-way air-to-ground communications used behind enemy lines during WWII. It is humbling to think that every mobile phone or handheld transceiver in use in the world is based on technology developed by this man over 60 years ago.

George Lee, M1BTG, married Lesa, M0BQD, in November last year. They are the former Chairman and Vice Chairperson respectively of the Tynemouth Amateur Radio Club. Other members of the club present at the wedding and who appear in this picture are: M1BCN, G0AIO, G7VTJ, G0TAP, G3PGC and G3YSL.

More Marconi Anniversaries



THE MARCONI RADIO Club, W1AA, was planning to celebrate the 98th anniversary of Marconi's first trans-Atlantic radio transmission between Cape Cod, Massachusetts, and England on 18 January. The club was to operate from Cape Cod using the call sign W1AA/CC. 'CC' was Marconi's first callsign long before the American FCC started issuing callsigns. Operation was to be organised from a former Coast Guard Life Boat Station close to the original 1903 Marconi trans-Atlantic radio station site within the National Sea Shore Park. Almost all of the original 1903 Marconi station site has since been carried away by beach erosion.

Meanwhile, on this side of the Atlantic, the centenary of Marconi's "first little miracle" was to be celebrated on 23 January with special event station GB100LD at the Lizard in Cornwall and GB100GBI at Niton on the Isle of Wight. See *RadCom* January 2001 page 47 for more details or take a look at the web site: www.needlesradio.org.uk/

● IT IS NOW understood that the Marconi £2 coin will be released for general circulation later in the year. At present, it is available only in a special gift pack or in sterling silver and 22 carat gold proofs. These can be ordered from RSGB Sales at discounted prices to members - see the advertisement on page 60.

G0UNF Says. . .

GAIL TAYLOR, G0UNF, sends the following message: "I would like to thank all radio amateurs and especially the RAIBC for all their help and kindness throughout the year and wish them a very happy and healthy new year and may all their dreams comes true. 73 and 88, Gail Taylor, G0UNF."

Although blind, confined to a wheelchair and with limited use of her hands, Gail wrote her autobiography, *My World*, in 1997 (reviewed in Jan 1998 *RadCom*).

CRACA AGM

THE NEWLY-FORMED Christian Radio and Computer Association (CRACA) has held its first AGM. The association is a registered charity (1084068). Despite being formed only recently, the club already has over 500 members. For further details contact CRACA at: 52 Wellfield Road, Alrewas, Staffs DE13 7EZ; tel: 01283 791213; e-mail g4ujw@qsl.net or take a look at their web site at: www.craca.org.uk

QTI Back in Production

QTI, THE AUDIO cassette magazine for blind radio enthusiasts, is back in production. *QTI*, which stands for *Quotations of Technical Interest*, has an initial cost of £8 to cover new tapes and wallets, but no further charges will be made until stocks run down. The cassettes include readings from a wide range of scientific, technological, engineering, computer and radio publications. For further details please contact Alan Lovegreen, GM4FLX, 16 Grahams Ave, Lochwinnoch PA12 4EG, tel: 01505 843524 or e-mail: alangm4flx@aol.com

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18MHz	2	1.45	6.3	£123.95
21MHz	4	6.4	11.4	£182.00
24MHz	2	1.1	6.3	£99.25
28MHz	2	0.9	6.3	£98.00
28MHz	3	3	9.1	£115.95
28MHz	4	5	11.4	£149.00
50MHz	2	0.6	6.2	£48.95
50MHz	3	1.75	9.1	£81.95
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The 'Polly' Audio Store

Save your throat during the next contest - let Polly do the talking!

by Keith Orchard, G3TTC *

POLLY IS DESIGNED to store 60 seconds of audio, and has numerous applications, not the least of which is avoiding throat problems during phone contests! It affords easy recording and playback, and the 60 seconds total time is divisible into smaller segments if needed. It operates from a single 5-volt supply.

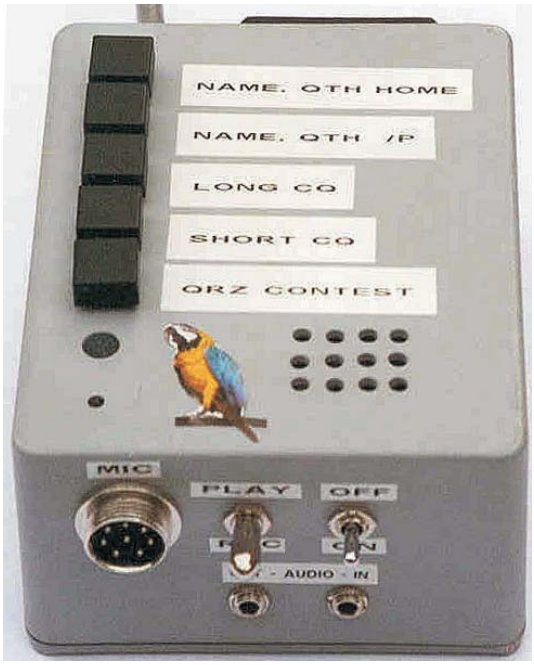
INTRODUCTION

THE HEART OF THE UNIT is an ISD2560 chip which records and plays back audio with a minimum of external circuitry. This particular chip has an audio bandwidth of 3.4kHz and a recording duration of 60 seconds.

Each chip has a microphone preamplifier, AGC, anti-aliasing and smoothing filters, a high-density multi-level storage array, speaker driver, control interface and an internal precision reference clock, see **Fig 1**.

The advantage of using an EEPROM (Electrically-Erasable Programmable Read-Only Memory) is that it is non-volatile, ie data are retained in the chip when power is removed. Other impressive claims by the manufacturer include 100-year message retention and 100,000 record cycles (typical figures).

* 32 Myton Crescent, Warwick CV34 6QA.



It never tires of talking: the Polly prototype.

The speech samples are stored directly into the on-chip non-volatile memory without the digitisation and compression associated with other methods of processing. Chips can be cascaded if required. The pin connections are described in the sidebar on p19 and illustrated in Fig 1.

DESCRIPTION

THE UNIT IS CONSTRUCTED in a small diecast box containing two PCBs. On board 1 are mounted the programming diodes, while board 2 has three ICs - IC1, IC2 and IC3. The circuits of the two PCBs are shown in **Fig 2** and **Fig 3**.

IC2 is used as a pulse-stretcher for the Overflow LED. The OVF output from IC1 is a 6.5µs pulse, which is stretched to 120ms, a value suitable for driving the LED. When on *Record*, the LED flashes when the memory is completely full; on *Playback*, the LED pulses once at the end of each recording. The NE556N is a dual timer, though only one half is used. It was originally intended to use the other half as another pulse stretcher, but in the end was not used. The NE556N could quite easily be replaced by an NE555N, an eight-pin DIL device, with appropriate changes to the connections.

The voltage regulator used for IC3 could be any 5V output device capable of supplying 50mA. The advantage of using the HT7250 device is that it will operate satisfactorily with its input as low as 5.1V.

D36 protects the ICs against reverse connection of the battery. RV1 allows the output audio level to be adjusted. The loudspeaker impedance can be 16 to 40Ω. R12 is used to adjust the volume to a suitable level. The minimum load impedance presented across pins 14 and 15, according to the ISD2560 specification, should be 16Ω. The *Audio In* jack is used where an external audio signal is

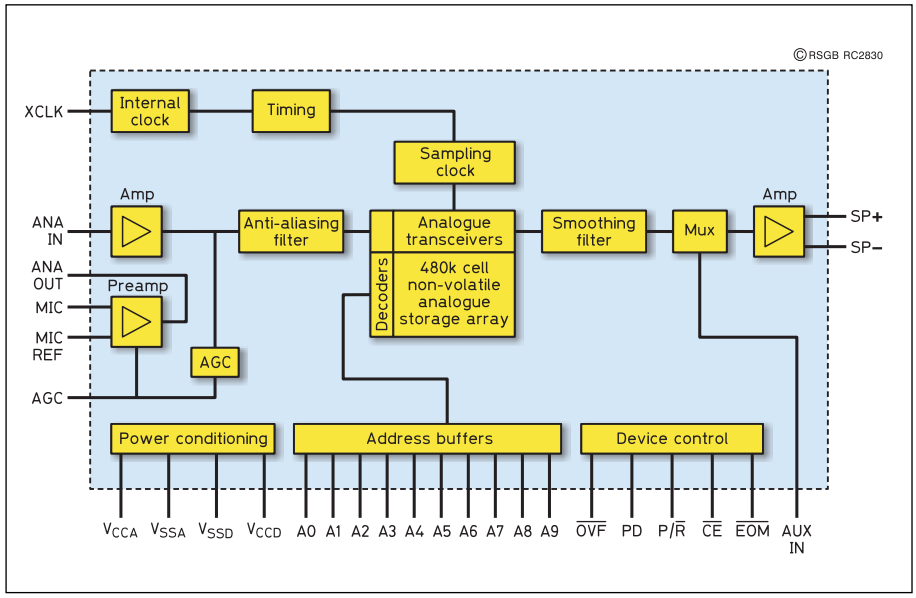


Fig 1: The ISD2560 block diagram.

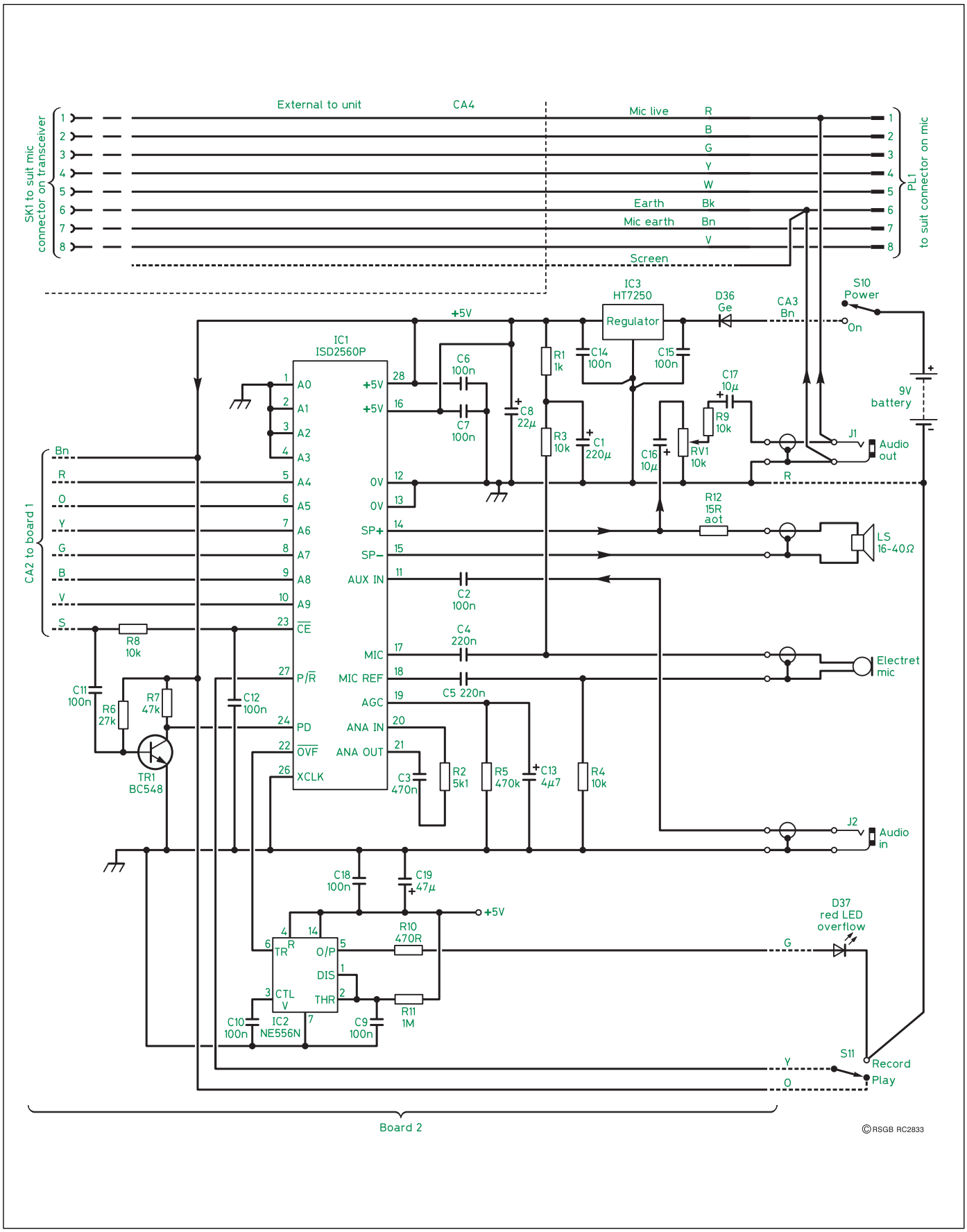


Fig 2: The circuit diagram of board 2.

PIN CONNECTIONS for the ISD2560P

- **Pins 1-10** carry memory address lines A0 to A9. These lines can access six hundred cells each of 0.1 second duration, totalling 60 seconds. However, in other applications, if address lines A8 and A9 are held high, representing an address of 768 (decimal), the remaining address signals are interpreted as mode bits instead of address bits. Further information on these operational modes can be found in the ISD Data Book [1].
- **Pin 11 (Auxiliary Input, AUX IN)** is multiplexed through to the output amplifier and speaker output pins when $\overline{CE}$ is high, P/R is high, and Playback is currently not active or if the device is in Playback Overflow. When cascading devices for longer durations, the speaker output from one device can feed the auxiliary input of the following device.
- **Pins 12 and 13 (Vssd and Vssa**) are the 0V supply rails for the digital and analogue circuits, respectively.
- **Pins 14 and 15 (Speaker Outputs, SP+ and SP-)** - a differential speaker driver output capable of dissipating 50mW in a 16Ω load.
- **Pin 16 (Vcca)** is the analogue positive supply pin, +4.5v to +5.5v.
- **Pins 17 and 18 (Microphone and Microphone Reference, MIC and MIC REF)** are two input pins. The mic input feeds an on-chip pre-amplifier with AGC producing a gain of –15 to +24dB. AC coupling should be used on both input pins, and the capacitor value used determines the low-frequency roll-off. The Mic Ref input is the inverting input to the microphone pre-ampifier, for use in conjunction with a differential microphone.
- **Pin 19 (AGC)**. The AGC dynamically adjusts the pre-amplifier gain for a wide range of microphone input levels, with minimal distortion. External components connected between this pin and earth determine the AGC attack and release time constants.
- **Pin 20 (Analogue In, ANA IN)**. See pin 21.
- **Pin 21 (Analogue Out, ANA OUT)** is the pre-ampifier output, normally connected via external components to the Analogue Input (pin 20) for recording. The value of the capacitor is selected to give additional LF roll-off.
- **Pin 22 (Overflow Output, $\overline{OVF}$)**. The signal on this pin pulses low when the last message has filled the memory and starts to overflow. As each pulse is only 6.5µs long, a pulse stretcher is required to drive an LED.
- **Pin 23 (Chip Enable Input, $\overline{CE}$)**. When this pin is taken low, the falling edge latches the address inputs and Playback/Record input P/$\overline{R}$.
- **Pin 24 (Power Down Input, PD)**. When not recording or playing back, this pin should be held high to place the device in the low consumption mode, 1µA typical.
- **Pin 25 (End-of-Message Output, $\overline{EOM}$)**. A marker is automatically inserted at the end of each message. It remains there until the message is recorded over. The $\overline{EOM}$ output pulses low for 12ms at the end of each message.
- **Pin 26 (External Clock Input, Xclk)**. When not required for precision applications, this pin is earthed.
- **Pin 27 (Playback/Record Input, P/$\overline{R}$)**. This input is latched by the falling edge of the $\overline{CE}$ pin. A high level selects a Playback cycle whereas a low selects a Record cycle. For a Playback cycle, the address inputs provide the starting address and the device will play until an EOM marker is encountered. For a Record cycle, the address inputs provide a starting address and recording continues until PD or $\overline{CE}$ is pulled high or an overflow is detected.
- **Pin 28 (Vccd)** is the digital positive supply pin, +4.5 to +5.5V.

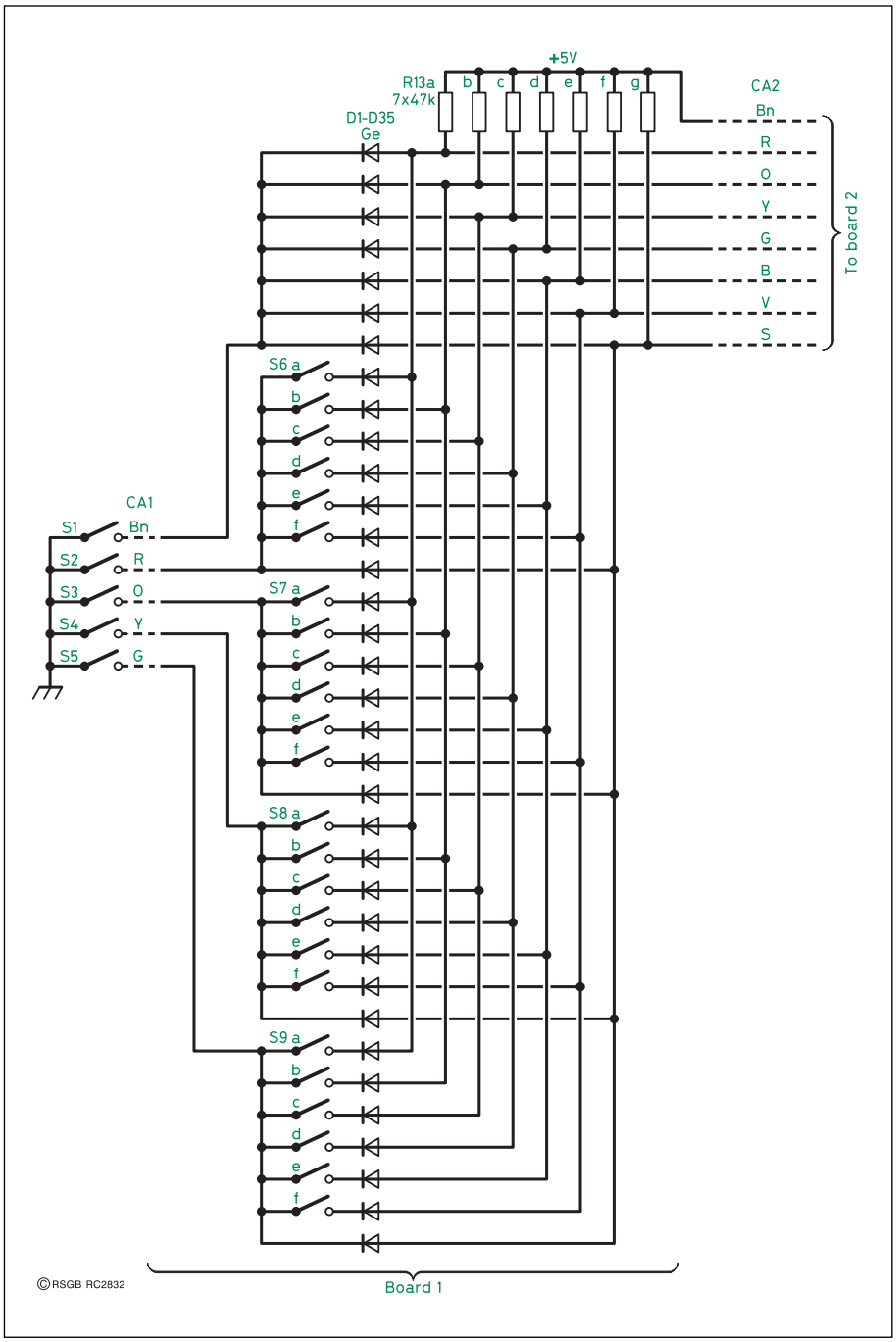


Fig 3: The circuit of board 1.

to be recorded. If the audio output is required to drive an amplifier, it can be taken from the *Audio Out* jack. As made, the unit is intended to be used with an IC-735 transceiver. It could, however, be wired using appropriate microphone connectors to suit other transceivers. Alternatively, the audio could just be available on the *Audio Out* jack for connecting to a transceiver. It would be necessary to wire a jack in parallel with the transceiver microphone connector to receive the audio, unless this connection is already accessible on another connector on the rear of the transceiver.

MEMORY

THE 60-SECOND total storage time of the device can be subdivided into a number of shorter periods, as desired, five periods seeming to be a reasonable figure.

There are 10 address lines, A0 to A9, see Figs 1 and 2. By grounding the four least significant lines, A0 to A3, this leaves six to be connected to addressing switches, giving a resolution of 1.6 seconds, which is quite adequate for most needs. This means that the recording lengths of the five periods can each be adjusted in 1.6-second increments.

The first recording period, initiated by S1, always starts at time 0 (zero) seconds. The second recording period, initiated by S2, starts at a time as set on the DIL switch S6a-f. Subsequent periods, initiated by S3, S4 and S5 start at times as set by the DIL switches S7a-f, S8a-f and S9a-f respectively. **Table 1** shows how the DIL switches should be set for particular start times.

COMPONENTS

Resistors (all 5%, 0.25W minimum)

R1	1k
R2	5k1
R3,4,8,9	10k
R5	470k
R6	27k
R7	47k
R10	470R
R11	1M
R12	15R Adjust on test (wired between Veropins)
R13a-g	7 x 47k SIL resistor array or use separate resistors. See text.
RV1	Preset potentiometer, side adjust, PCB vertical mounting, 10k

Capacitors

C1	220µF electrolytic
C2, 6, 7, 9, 10, 11, 12, 14, 15, 18	0.1µF
C3	0.47µF
C4,5	0.22µF
C8	22µF tantalum
C13	4.7µF tantalum
C16,17	10µF tantalum
C19	47µF

Semiconductors

IC1	ISD 2560P	NM52G
IC2	NE556N.	QH67X
IC3	5V 100mA regulator, general purpose, or use HT7250	LE79L
TR1	Silicon NPN general purpose transistor, BC548, 2N2222 or similar	
D1 – D36	Germanium diode, general purpose, OA47 or similar	
D37	Red LED, sub-miniature	

Miscellaneous

CA1	Cable, ribbon, multi-coloured, 5 way, 200mm long	XR06G
CA2	Cable, ribbon, multi-coloured, 8 way, 150mm long	XR06G
CA3	Cable, ribbon, multi-coloured, 5 way, 250mm long	XR06G
CA4	Cable, multi-core, 8 way, flexible, 400-600mm long	
J1, J2	3.5mm mono jack socket, panel mounting	
JS1-JS6	PCB jumper strip (optional) or wire links	
LS	16-40Ω loudspeaker, 50mm dia	
Mic	Ultra-miniature electret insert, both connections isolated from earth	QY62S
PL1	Locking 8-way plug, panel mounting, as required to suit mic	FK29G
SK1	Locking 8-way socket, cable mounting as required to suit transceiver	FK30H
S1 – S5	Miniature push-button switch, SPST, panel mounting	
S6 – S9	Miniature dual-in-line switch (6), SPST or SPDT, PCB mounting	
S10, S11	Miniature toggle switch, SPDT (S11 optional locking type)	
Board 1	Veroboard, 0.1in matrix, 95mm wide, track 76mm long. See text	
Board 2	Veroboard, 0.1in matrix, 95mm wide, track 86mm long. See text	
	Diecast aluminium box, 119 x 93 x 55mm or similar	
	PP3 battery and holder	
	Hardware: Screws, 5 and 12mm spacers, Veropins, single screened cable, etc	
	IC sockets: 28-pin and 14-pin.	

Maplin codes are given where specific components are useful in the construction.

CONSTRUCTION

THE PROTOTYPE WAS HOUSED in a 119mm long x 93mm wide x 55mm high diecast aluminium box, with very little spare space. Most components were mounted on two stacked pieces of Veroboard fixed to the lid of the box. On board 1 were mounted the programming diodes and dual-in-line switches, while the ISD2560P, NE556N and the remaining components were on board 2. The two boards were interconnected by a ribbon cable. Board 2 was mounted closest to the lid because access was not required after assembly, apart from adjustment of RV1, a side-adjustable preset potentiometer. Board 1 was fully accessible to enable the four DIL switches to be operated. The slightly smaller size of board 1 was to aid soldering to the Veropins along one edge of board 2.

A number of arrangements of the controls on the diecast box is possible. The arrangement used in the prototype can be surmised from the photograph. A battery holder and cable to the transceiver were fixed to one end, two 3.5mm audio jacks and two toggle switches were fitted to the opposite end. On the base of the box were five push-button switches for triggering the messages, an electret microphone for making recordings, an *Overflow* LED and a group of holes to allow a small internal loudspeaker to be heard.

The Veroboard layouts for the two PCBs are shown in **Fig 4** and **Fig 5**. As the unit was constructed mainly using junk box components, 3.75in-wide Veroboard was used. This width appears to have been superseded by 100mm-wide material, available from Maplin as a 100mm-long piece under code JP49D. If the old size board is to be used, it will be necessary to drill five 1mm holes in the undrilled border track for D35 etc at the bottom of board 1, see Fig 4.

For R13, a 7 x 47kΩ single-in-line (SIL) resistor array is used which has seven 47kΩ resistors, all connected to a common pin at one end, usually marked with a dot. If one of these is not available, the more common eight-resistor version (Maplin RA31J) can be utilised with the appropriate end pin removed. Alternatively, use separate resistors. ♦

REFERENCE

[1] ISD Chipcorder Data Book. Information Storage Devices, Inc, 2045 Hamilton Avenue, San José, California 95125, USA. www.isd.com tel: 408-369-2400. UK agents: Sequoia Technology Ltd, Tekelec House, Back Lane, Spencers Wood, Reading, Berks RG7 1PW, tel: 0118 925 8000.

PROGRAMMING

FIRSTLY, DECIDE ROUGHLY what your announcements are going to be, and determine the duration of each, rounded up to the next 1.6 second step. Set the DIL switches S6 to S9 accordingly.

As an example, assume message 1 is going to be 20 seconds long. The first message always starts at time zero seconds. Message 2 can therefore start at time 20.8 seconds, the next multiple of 1.6 seconds. Using Table 1 set S6 to 20.8 seconds. Assume message 2 will be 10 seconds long, taking us to 30.8 seconds. The next step after 30.8 is 32 so set S7 to 32 seconds. Continue and set S8 and S9 similarly.

After setting the DIL switches, the recordings can be made. Find a quiet location. Put S11 in the *Record* position. Press and hold S1 while speaking clearly into the electret microphone, keeping an eye on the seconds hand of your watch. Release S1 when you have finished speaking, hopefully before the time you have chosen for your next recording to start. Recording will continue *for as long as you press S1*, even if you overrun into the next recording period. You can play back your recording straight away by putting S11 in the *Playback* position and momentarily pressing S1.

To record message 2, put S11 in the *Record* position, then press and hold S2 while talking into the microphone. To play back, put S11 in the *Playback* position and momentarily press S2.

The remaining messages can be recorded in a similar manner.

DIL switch	a	b	c	d	e	f
Step (s)	1.6	3.2	6.4	12.8	25.6	51.2
Time (s)						
0.0	C	C	C	C	C	C
1.6	O	C	C	C	C	C
3.2	C	O	C	C	C	C
4.8	O	O	C	C	C	C
6.4	C	C	O	C	C	C
8.0	O	C	O	C	C	C
9.6	C	O	O	C	C	C
11.2	O	O	O	C	C	C
12.8	C	C	C	O	C	C
14.4	O	C	C	O	C	C
16.0	C	O	C	O	C	C
17.6	O	O	C	O	C	C
19.2	C	C	O	O	C	C
20.8	O	C	O	O	C	C
22.4	C	O	O	O	C	C
24.0	O	O	O	O	C	C
25.6	C	C	C	C	O	C
27.2	O	C	C	C	O	C
28.8	C	O	C	C	O	C
30.4	O	O	C	C	O	C
32.0	C	C	O	C	O	C
33.6	O	C	O	C	O	C
35.2	C	O	O	C	O	C
36.8	O	O	O	C	O	C
38.4	C	C	C	O	O	C
40.0	O	C	C	O	O	C
41.6	C	O	C	O	O	C
43.2	O	O	C	O	O	C
44.8	C	C	O	O	O	C
46.4	O	C	O	O	O	C
48.0	C	O	O	O	O	C
49.6	O	O	O	O	O	C
51.2	C	C	C	C	C	O
52.8	O	C	C	C	C	O
54.4	C	O	C	C	C	O
56.0	O	O	C	C	C	O
57.6	C	C	O	C	C	O
59.2	O	C	O	C	C	O

O - switch open C - switch closed

Table 1: Setting the DIL switches S6 - S9.

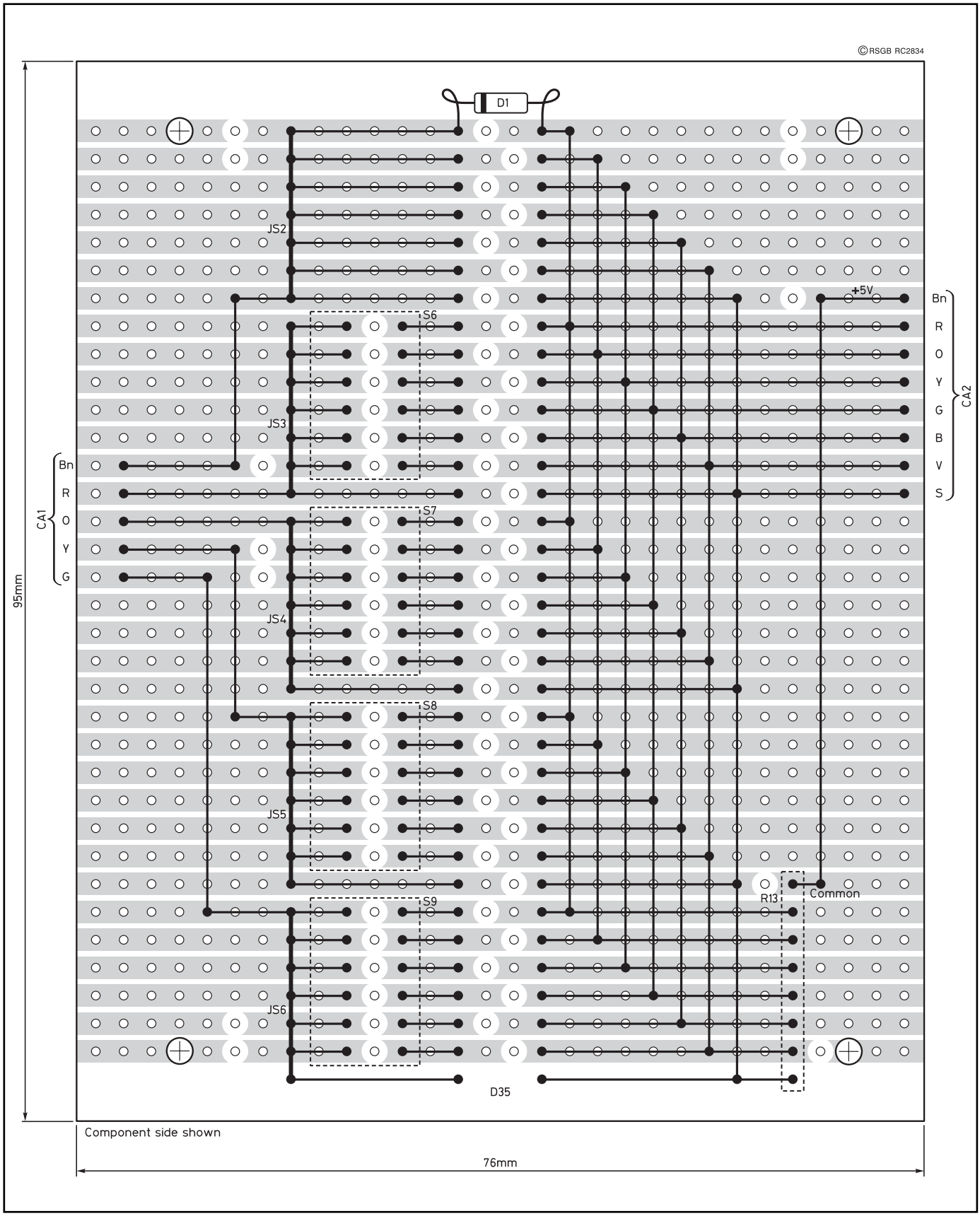


Fig 4: Layout of board 1.

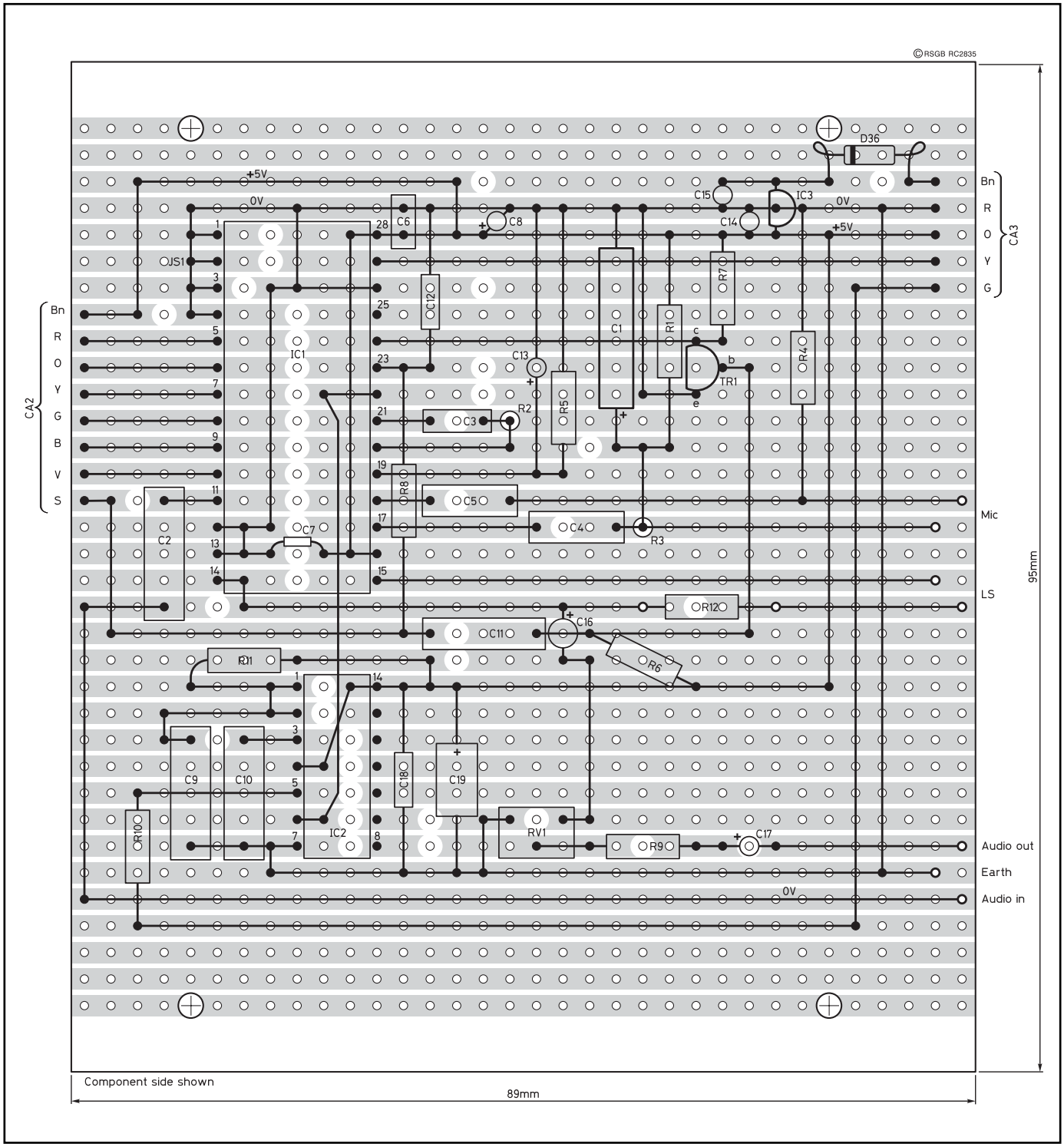


Fig 5: Layout of board 2.

Gone are the men in blue...

M:B

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- **Email**: sales@mlands.co.uk
- **Web**: HamRadio.co.uk

128 & 140-142 NORTHFIELD AVENUE, EALING, LONDON W13 9SB

The telephone numbers and email address stay the same, along with all the helpful and knowledgable staff. Martin will be in the new store full time, having employed new staff to run his ever increasing Scooter business.

WIN!

Bletchley Leisure Centre, venue of RSGB Spring Show and VHF Convention

A YAESU FT-817 TRANSCEIVER

Tiny, All-Band (HF / VHF / UHF) All-Mode Transceiver worth nearly £800, courtesy of Yaesu (UK)

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

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At just 2.6lb in weight (including alkaline batteries) you can even use it while walking to the shops! Now, Yaesu (UK) will kindly donate an FT-817 for us to give away in our free competition in connection with the new RSGB Spring Show and VHF Convention.

A second prize winner will take away a completed MFJ Cub 15m QRP transceiver - as reviewed by Roger Lapthorn, G3XBM, and Richard Newstead, G3CWI, in this issue - courtesy of Waters & Stanton PLC.

The star prize: a Yaesu FT-817.

The second prize MFJ Cub 15m transceiver.

THE BLETCHLEY SHOW

THE RSGB SPRING Show and VHF Convention is a major new event that will take place at the Bletchley Leisure Centre, located very close to historic Bletchley Park, on **7 / 8 April 2001** - the weekend before Easter. It combines the best of the RSGB VHF Convention (which until last year took place in February at Sandown Park) with the summer Hatfield Hamfest. The new venue allows all traders to be in one large hall, with the VHF / UHF / microwave lectures of the VHF Convention and the annual convention of the UK 6 Metre Group at the same site. Guided tours of nearby Bletchley Park are also available. We'll be presenting the winners of this competition with their prizes at the show. The event is sponsored by Yaesu (UK), Kenwood and Martin Lynch & Sons.

ADVENTURE RADIO

THE BEST THING about rigs such as the FT-817 and the MFJ Cub is that they can be used in The Great Outdoors. In the USA, this has led to the development of what is known as 'Adventure Radio' - going on a hike with your backpack and operating from a remote location using low power, battery-operated transceivers and simple, 'throw-out' antennas.

The concept of Adventure Radio is now catching on in Europe and here in the UK - and rigs like the Yaesu FT-817 and MFJ Cub seem set to accelerate this trend. For more details see Richard Newstead's web site at www.qsl.net/g3cwi or the Adventure Radio Society's site at www.natworld.com/ars

COMPETITION TIME

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

Questions

1) Where is the new RSGB Spring Show and VHF Convention to be held in 2001?
   a) Sandown Park b) Hatfield House c) Bletchley, Bucks
2) When is the RSGB Spring Show and VHF Convention to be held?
   a) Easter weekend b) the weekend before Easter c) The weekend after Easter
3) For an 'Adventure Radio' operation is the most important feature for a transceiver. . .
   a) Its power output? b) Its weight? c) Its receive sensitivity?

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

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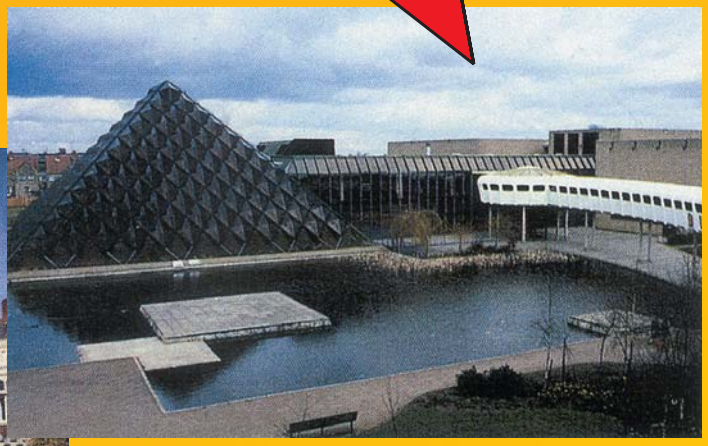
SANDOWN



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Kit Buying and Building

Once upon a time kit building was virtually an essential part of amateur radio. There was hardly an amateur who had not built a piece of Heathkit equipment of some description. For a while, kit building seemed to have gone out of fashion, but now it appears to be going through something of a renaissance. No fewer than four articles about kits and kit building have landed on the Editor's desk in recent weeks. They each have something different and interesting to say about this increasingly popular aspect of amateur radio construction - *Ed*

LAKE AND WALFORD KITS FOR NOVICES

By Steve Hartley, G0FUW*

BUILDING A RECEIVER is probably one of the most rewarding projects that any newcomer to amateur radio can undertake. Hearing the first sounds coming from a circuit you have constructed yourself gives a terrific sense of achievement and self satisfaction. I guess this is one of the reasons that construction of a simple receiver was included in the syllabus for the Novice Radio Amateur Examination training course.

LIFE AFTER ZN414?

AS REPORTED in *Newcomers' News* and elsewhere, the 'official' Novice medium wave receiver project appeared doomed with the demise of the ZN414 integrated circuit. However, some Novice instructors have found alternative receiver projects readily available from the kit suppliers that regularly advertise in *RadCom*. In this article I look at two relatively new kits; the *Radio Today* Chedzoy from Tim Walford's [1] *Somerset* range of radio kits, and the 'Novice' Medium Wave Receiver by Alan Lake of Lake Electronics [2].

Whilst I would not count myself as a construction expert, I have put together a fair number of receivers, transmitters and accessories over the last 17 years. So, in order to give the kits a fair test with their target audience, both were built as 'first ever' radio projects by two newcomers: David Frise, a 'mature' NRAE student, built the *RT* Chedzoy as part of his training and nine-year old Jacob Howarth, G0FUW junior operator number three, put together the Lake 'Novice' kit. I then bench tested the completed projects for comparison.

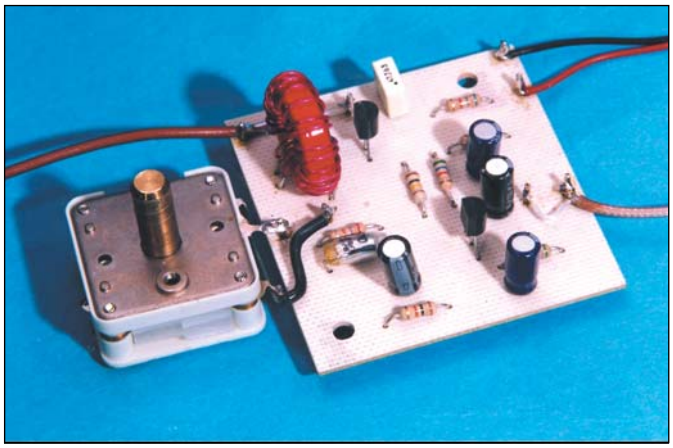
* *5 Sydenham Buildings, Lower Bristol Road, Bath, BA2 3BS.*

BASIC CIRCUITS

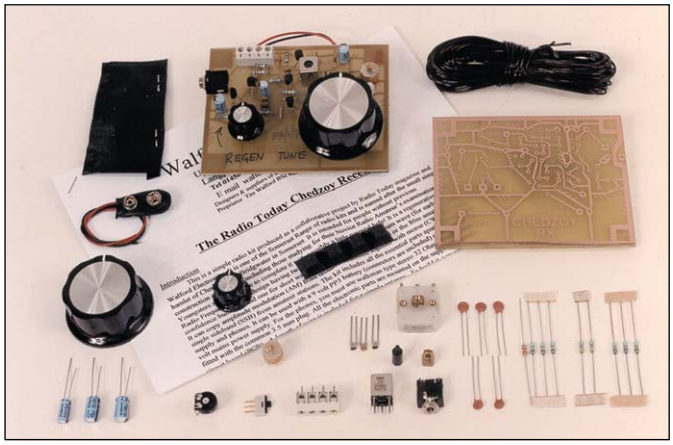
BOTH RECEIVERS use basic tuned radio frequency circuits with 'infinite impedance' detectors and both are capable of receiving medium wave AM broadcast stations. The *RT* Chedzoy also has a band switch to enable reception on the 3.5MHz band and the regeneration circuit allows amateur CW (Morse code) and SSB (voice) signals to be resolved. A second version of Alan Lake's kit is available for short-wave reception but both versions are limited to AM reception.

The Lake receiver comprises two transistors, seven resistors, eight capacitors and two coils wound on a single toroid former. A crystal earpiece is supplied with the kit. The first stage is a simple tuned circuit to select the wanted station. Then comes the detector, a field effect transistor (FET), followed by an NPN bipolar transistor audio amplifier. Those studying for the NRAE will recognise this arrangement from the block diagram of the TRF receiver in the *Novice Licence Student's Notebook*.

The *RT* Chedzoy is slightly more complex. This circuit includes five transistors, two diodes, 10 resistors, 13 capacitors and two pre-wound inductors (coils). The audio frequencies are reproduced using 32-ohm stereo earphones, the type used with most portable cassette players. The first stage is an FET radio frequency amplifier to boost the strength of weak signals. This is followed by two switched tuned circuits to select the band of the wanted station. A bipolar transistor regenerative amplifier is



The Lake Electronics Novice receiver kit.



The Walford Electronics *'Radio Today* Chedzoy' receiver kit.

connected to the tuned circuits to improve the selectivity and readability of the received signals. Then comes the detector, another FET, followed by two more FETs forming an audio amplifier. This arrangement is slightly different from the block diagram of the 'TRF Receiver with Reaction' in the *Novice Licence Student's Notebook* but the principle of operation is the same.

THE LAKE RECEIVER

FIRST IMPRESSIONS are always important and when I received the 'Novice' kit I was very pleased to find all the components neatly packaged together with the instructions on two sides of A4. The instructions include a brief description of how the receiver works, the tools required for construction, step-by-step assembly details and a short section on the types of antenna and earth required for operation. Within the assembly details is a parts list that identifies the colour coding of the resistors, but there is no other help in component identification. However, if the kit is being built as part of the NRAE training this should pose no difficulties as the topic is well covered in the course.

As this was Jacob's first attempt at soldering, the receiver was put together over a number of sessions; a more experienced constructor could probably finish the project in one sitting. In general the construction was very straightforward and the instructions were easy to follow. The insertion of PCB pins proved a little tricky and the winding of the toroid coil was probably the most difficult part. However, Jacob wound the coil himself with only a couple of interventions from me to ensure the wire was not tangled and that the windings were not overlapping.

We mounted the review kit on a small piece of softwood with front and back panels made from PCB material. A phono socket was also added for use as an antenna connector. The receiver worked straight away and Jacob was soon very pleased to be listening to the sports report on Radio 5 Live on a radio he built himself.

THE *RT* CHEDZOY

THE INSTRUCTIONS for the *Radio Today* Chedzoy are far more comprehensive than those for the Lake kit, but as the kit is slightly more complex that is to be expected. There are a total of nine sides of A4 which include a brief outline of the circuit together with a technical description for the more competent kit builder, a full page of general construction advice (including resistor colour coding and capacitor markings), step-by-step assembly and testing details and hints and tips on operating the completed receiver. David confessed to being a little over-awed by the technical description at first but found the assembly details logical and easy to follow.

The completed *'Radio Today* Chedzoy' receiver.

The kit was completed over a couple of evenings and worked first time. The parts layout diagram took a little getting used to, but no problems were encountered in putting the kit together. This was put down to all the coils being pre-wound and all components fitting perfectly in their PCB positions.

This kit is supplied with two knobs, one for tuning and the other for the regeneration control and, as the completed PCB sits on its own rubber feet, there is no need for an enclosure to be made. A length of hook-up wire is included for use as an antenna, which is attached to the PCB using a screw terminal connection. You do need to provide a pair of medium-impedance stereo headphones. If you have a pair on a portable tape player they can be borrowed for use with the receiver.

Even without the antenna connected Radio 5 Live could be picked up and a couple of local medium wave stations were also loud and clear. With the antenna in place many more stations could be heard. The regeneration control proved to be very smooth and easy to use. Switching to the 3.5MHz position did not bring in many amateur signals but checks with my signal generator proved that the receiver can pick up strong signals in this band. Better results were obtained after dark with an LY station (Lithuania) copied on CW.

COMPARISONS

IT IS DIFFICULT to draw direct comparisons from the construction of these two kits; although they are quite similar they do have some significant differences. The Lake 'Novice' receiver is the cheaper of the two at just £8 but the need to wind a toroid coil makes it a little more tricky and you do have to provide some form of base or enclosure and a tuning knob. The *RT* Chedzoy is a more complex design and costs more than twice the price of the 'Novice' at £19 but there is no coil winding and it can be used for amateur reception.

Neither receiver produces enough audio to drive a speaker but the 'Novice' can be linked to the NRAE course audio amplifier. Indeed, Alan Lake offers a kit for the amplifier at the same price as the receiver kit, making a total price of £16.

As a first project the *RT* Chedzoy can seem a little daunting compared with the simpler circuit of Alan Lake's kit. That said, the instructions for the Chedzoy provide a fair bit of general construction advice and technical detail when set against those for the 'Novice'.

In terms of quality there is little to separate the two kits. Both were delivered promptly and both came well packaged with good quality components.

Both the kit constructors were building radios for the first time and some euphoria at hearing the first signals is to be expected but it is clear that both kits provide excellent introductions to basic construction. After some initial feelings of trepidation, David said that he really enjoyed building his kit. His initial comments about the completed Chedzoy included words like "excellent" and "great value for money". His only criticism was that it was difficult to visualise the completed project without a photograph or drawing; nevertheless, he went on to say that he intended to buy his son a kit and do it all over again!

Jacob said that he had been "a bit scared" of using a soldering iron but that he had enjoyed building the radio and is now looking forward to doing the NRAE course.

At the end of the day it boils down to the old saying "you pays your money and takes your choice". Both of the kits do exactly what they claim and will provide the newcomer with valuable construction experience and a great sense of satisfaction from actually building a radio. If you want something to receive amateur signals, the *RT* Chedzoy will fit the bill, but if you just want to build a simple receiver for the experience and the fun of it, you could do a lot worse than the Lake 'Novice'.

SUPPLIERS RESPONSES

THE KIT SUPPLIERS were shown a copy of the review and asked for their comments. Both were quite content and neither asked for any significant changes to be made. They did have one or two additional points and those are set out below.

Tim Walford asked me to mention that the short-wave coil on the Chedzoy can be tuned to cover the 4MHz broadcast band as well as the 3.5MHz amateur band and to let clubs know that he can offer a small discount for 'bulk' purchases. Further details of the *Somerset* range of radio kits can be found on the Walford Electronics web site or by sending an A5 SASE to Walford Electronics [1].

Alan Lake points out that the simplicity of the Novice receiver stems from his design brief; to provide an alternative project to the ZN414 in the NRAE handbook, to keep it as simple as possible and to kept it in the 'pocket money' category. The winding of the coil was deliberately included as it helps newcomers understand what a coil is and so that students could experiment by reducing the numbers of turns: apparently, one example of the 'short wave' version has even been used on 70MHz! Further details can be received by sending an SASE to Lake Electronics [2].

THE MFJ CUB 9315K 15M QRP TRANSCEIVER

By Roger Lapthorn, G3XBM*

THE MFJ CUB is a compact QRP CW 'semi-kit' available in bands from 80m through to 15m. A mixer VFO allows 50 - 60kHz tuning range in any single band. Power output is about 2W on 80m reducing to 1W on the 15m version.

In order to make the built unit small and portable, extensive use is made of surface-mount components. These are supplied ready-placed on a small PCB so all the builder has to do is add the conventional components and hardware such as knobs, controls and a few screws. All casework is pre-drilled and labelled.

BUILDING THE KIT

THE KIT CAME with several plastic bags containing common parts, banded parts and the hardware. The assembly manual reminded me of the Heathkit manuals of old: it had just the right amount of information to ensure parts could be identified, the circuit understood, and the unit assembled and aligned with minimum effort. A separate operating manual contained helpful advice on using the rig. Both manuals contained circuits, PCB component placement diagrams and notes on test point measurements to aid fault finding.

The first stage was to make sure all the parts were there. MFJ had provided a checklist so this could be done quickly and easily. Assembly proper started with placing the common parts on the PCB followed by the banded parts. These stages took about an hour. Building the complete transceiver took about two hours with alignment another hour. Even a novice builder should have little difficulty in completing the kit in under four hours if the instructions are followed with care.

TESTING & FINAL ASSEMBLY

TESTING AND ALIGNMENT involved a minimum of test equipment: a general coverage receiver, a small QRP power meter (resistors and an LED) and a multimeter were all that were needed. The instructions were clear and helpful but needed to be carried out carefully. Initial alignment was carried out on the PCB before assembly into the case. The only problem encountered was finding the VFO signal on the general coverage receiver, as the slug tuning was sharper than expected. A fault was suspected so a check was made of the various test points suggested in the assembly manual. All proved to be spot-on, so a repeat of the VFO alignment, taking a bit more care, showed the problem to be finger trouble! The rest of the alignment was trouble-free. In the final stage of testing, and with the PCB still loose on the worktop, an antenna was connected and a QSO immediately resulted with a UA (Russian) station at 529 so results were already promising.

Getting the built and tested PCB into the metal case was very easy and the overall result was an attractive, highly compact QRP CW transceiver that had taken just a few hours to build and test.

RESULTS ON AIR

WITH JUST A wire dipole hastily erected in the back garden at a maximum height of 25ft the first few hours of operating could not have been more impressive. Over a dozen contacts were made with reports averaging 559, including three trans-Atlantic QSOs, the best being 579 from a VE (Canadian) station.

The receiver is sensitive and free from any noticeable IF breakthrough or spurious responses. The little crystal ladder and audio filters are remarkably selective. The transmitted signal is clean and stable measuring a little over 1W out with the sidetone monitoring the actual off-air signal. The rig has full electronic QSK (full break-in) operation.

Subjectively, apart from the lower power, this little beauty performs as well as my Japanese 'black box' transceiver costing about 15 times more. In the first day of operating it had given me more fun than I could obtain in a month of normal operating. Overall, the transceiver performs really well and truly exceeds my wildest expectations.

CONCLUSIONS

THE MFJ CUB is a well engineered and well thought out kit that will prove to be very popular with the QRP fraternity. It is so small that it is ideal for backpacking with a small battery and throw-out dipole, but it is also the basis for a simple, no frills, QRP station for home use. Unlike the 'black box', you have the pleasure of building it and aligning it; if it ever goes wrong in the future it will be easy to fix.

Incidentally, the night I completed the rig I tried to access some web pages in the USA via the Internet. After several attempts I eventually managed to connect and get through. This was with a state-of-the-art computer, and no doubt a trans-Atlantic satellite or cable and a few million pounds of networking hardware and software on the way. An hour before I had managed to get a digital (QRP CW) signal across to the USA with a piece of wire down the garden and a handful of bits in a tiny box producing just enough power to light a small bulb. That, my friends, is the true magic and fun of QRP and amateur radio.

The MFJ cub series is available in kit form from Waters and Stanton PLC [3] for £89.95. It is also available ready built. I'd like to thank W&S for their prompt delivery and MFJ for designing such a great little radio!

The completed MFJ Cub 15m QRP transceiver.

** 37 Spring Cl, Burwell, Cambridge CB5 0HF.*

THE MFJ CUB - A DIFFERENT PERSPECTIVE

By Richard Newstead, G3CWI*

BY COINCIDENCE, at the same time that Roger was writing his review, I was also writing a review of the Cub, so we thought that it might be interesting to get two slightly different perspectives on the same item.

I wondered how appropriate the Cub might be as an entry-level radio for the newcomer to amateur radio. Certainly the construction was easy and no-one should find it at all difficult to build the Cub, even as a first real project. The alignment is rather a different matter, though.

As Roger indicates, it's not without its pitfalls and I fell into exactly the same one he did. The alignment is quite critical and newcomers would probably find it more rewarding to do it with someone who has more experience in construction and who might be able to impart a tip or two at the same time.

As the whole kit takes only a short while to construct, it would make a great club project. Two or three evening meetings would see these rigs built and on the air. Mine took 150 minutes from starting to the first QSO (I would not recommend racing through the process though!)

One point to note is that the alignment requires a special hexagonal tool to adjust the tuning cores, and this is not supplied as part of the kit. These cores are very fragile and the temptation to adjust them with other than the correct tool *must* be resisted. In my opinion, MFJ should have supplied the tool as part of the kit. I was lucky as I already had one, but Roger didn't, which delayed him getting the radio finished. The mechanical part of the construction is also very easy, the circuit board slides into the box and that's about all there is to it.

I set up my Cub to cover the Novice section of 15 metres. It covers just over 50kHz, so it easily manages to cover the whole Novice section. Like Roger, I had no problem in making QSOs. I didn't have an antenna for 15 metres, so just used my 80-metre dipole. Even with this rather poor set-up, I was easily able to work all around Europe. There is less activity in the Novice section than lower down the band, but nevertheless I never had an operating session where I didn't manage to make a contact. There was most activity at the weekends and reports varied from 559 to 599.

* 89 Victoria Road, Macclesfield, Cheshire SK10 3JA.

The MFJ Cub: wiring done, now just to put it in its box.

Like Roger, I was amazed at how well this simple radio works. The filters are excellent and the automatic gain control (AGC) is better than any other QRP radio I have ever built. The whole circuit seems well thought out. It would make a good radio for taking out and about on walking trips and the like.

'Adventure Radio', which is operating radio as part of an outdoor adventure trip, is well established in the USA and is gathering support here. The Cub would be ideal for this application as being so small it could easily be carried in a backpack together with a battery, key, dipole and headphones.

There have been some comments on the Internet suggesting that the Cub drifts (ie that the frequency alters slowly over a period of time). While mine does drift slightly at switch-on it soon stabilises and after a minute or so it stops drifting.

The only grumble I have is the quality of the paint work on the case. It is poor and tends to flake off. A pretty minor grumble!

So, is it worth the money? Yes, I think that it is well worth it. I'm told that many people are buying them ready-built. This seems a pity as they are effectively paying someone £25 per hour to build the kit and missing out on part of the fun of getting to grips with some 'real' amateur radio.

I would like to thank Jeff Stanton of Waters & Stanton for providing the Cub kit for me to review.

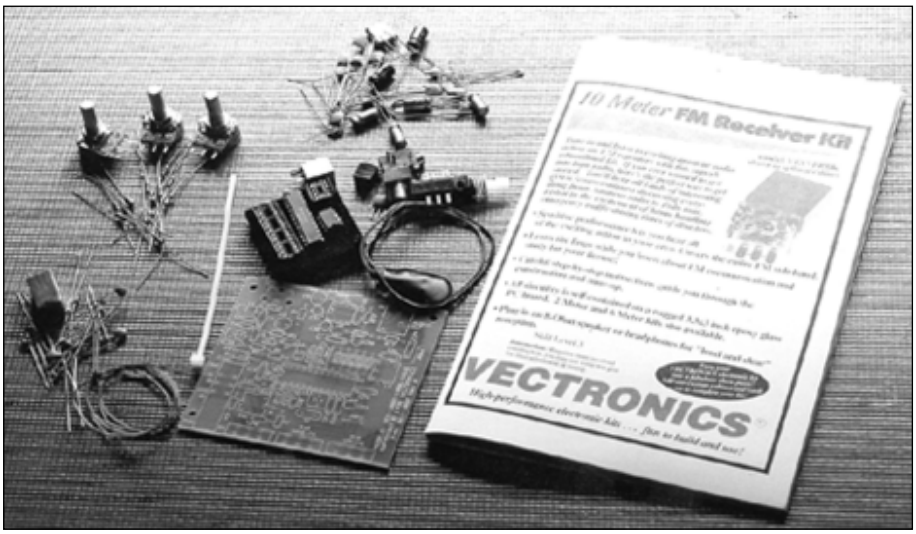
THE VECTRONICS 1010K AND BUYING OVER THE INTERNET

By Ian Liston-Smith, G4JQT*

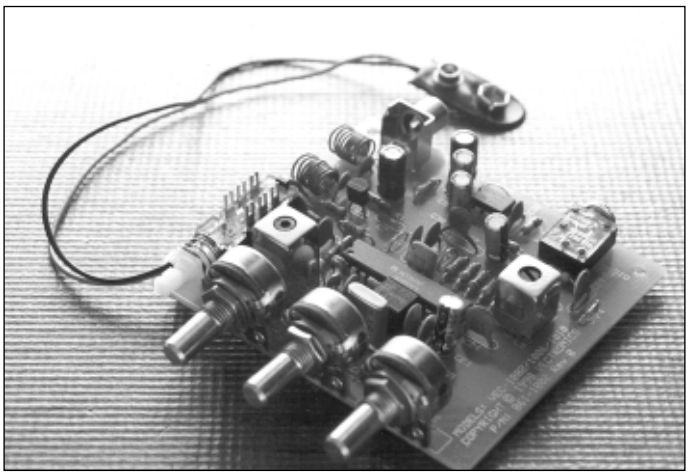
MOST OF US have now heard of the so-called bargains said to be available via the Internet, and more and more of us are finding that it is often true. Having bought a number of items this way recently, and saved up to 25% (even when post and packing is taken into account) I thought I'd see what amateur radio kits could be purchased. In particular I was looking for a 10 metre FM receiver that would be a companion for the 10 metre FM transmitter I designed and built (see *RadCom* February and March 2000).

I eventually found a kit that looked appropriate. It was available from Vectronics for $34.95 plus $18.00 postage and insurance, so I decided to buy it. The purchase accurately appeared on my credit card as a total of £34.49. I later found it available in the UK by a well known supplier for £35.95 plus £3.00 post and packing. So buying direct from the USA I saved about 11.5%. Not a huge amount, but surely worth having? I'm sure there are completely valid reasons why a UK distributor must charge more than if one had bought it direct from the country of origin, but that doesn't mean we have to pay it!

* 48 Swansea Road, Reading RG1 8HA.



This is how the Vectronics 1010K kit arrives.



The completed Vectronics kit.

There are pitfalls buying this way as will be described later, so would-be kit constructors will have to weigh up the pros and cons beforehand.

THE VECTRONICS KIT

THE PURCHASED KIT was a Vectronics 1010k and only took about a week to arrive, packed in a strong cardboard box. The 30-page manual is well written and gives clear step-by-step instructions. It shows how to make good soldered joints, explains the colour coding for resistors and how to identify capacitors and their values. The components all appeared to be good quality and came with a screen printed circuit board.

However, on checking the components against the list, three 0.01µF disc ceramic capacitors were missing, but six extra 0.001µF were included. I had suitable 0.01µF types so just added them during construction. Another minor problem was the capacitor lead spacing of some of those supplied - they were too close to fit the holes without carefully bending them - a common bugbear of kit construction in my experience.

Later I also found that one of the screened inductors was assembled in such a way that it wouldn't fit the holes in the PCB. Another discrepancy showed some capacitors being labelled as 0.01µF in the parts list and 0.001µF on the circuit diagram. Time for an e-mail to Vectronics. . .

To cut a long story short, the inductor simply needed pushing out of its screening can and re-orientating - literally a 20 second job. The parts list is correct to show the 0.01µF capacitors and some replacements were sent to me, with a few extra and an apology.

The parts list also shows the 455kHz ceramic filter as either a '55D' or '55F'. Mine came with a 55D which, when the receiver was finished proved to be far too wide for 10 metre FM signals, so I changed it for a 55F.

The rest of the kit assembly went well. The text and alignment instructions are clear, with a table of voltages to help fault finding.

The VEC-1010K runs from a 9-volt battery and drives an 8Ω speaker (not supplied). Tuning is via a 10kΩ pot and the tuning range is approximately 29.3 - 29.9MHz. There are also the usual squelch and volume controls.

Once the input bandpass filter was correctly adjusted, sensitivity was measured as about 0.5µV for 12 dB SINAD. This is very respectable for such a simple design, and close to what you would obtain from a commercial CB receiver.

WAS IT WORTH IT?

SO, DID I gain anything by buying direct from the USA? Well, only the £5, I guess! Unfortunately, kit building often requires communication with the suppliers when one comes across the kind of 'undocumented features' described above. If I'd bought the kit from the UK supplier, they would no doubt have cleared any problems, though presumably by contacting the US suppliers on my behalf. This extra stage would inevitably have caused some delay.

If you buy via the Internet, then you'll have access to e-mail. You can therefore deal with the supplier directly to resolve any problems. The disadvantage of course is that with a major problem you might need to return the kit. This will cost a lot more if buying from abroad, and it can't be assumed the cost of shipping will be refunded.

However, despite the minor but annoying problems I experienced, I will definitely be buying more amateur radio equipment this way. There is a huge range of kits available out there that never appears in the UK amateur radio press (see web sites box below). But a word of caution: check that any import duty [or VAT - *Ed*] does not negate the savings. In my case Customs and Excise [4] required nothing and they told me that currently no duty is payable on radio telegraphy or radio telephony apparatus, although I do know of at least one person who paid duty plus a £10 'handling charge' recently on amateur radio equipment.

Thanks to Mark Palmer, G0OIW, for carrying out the RF tests with this kit.

UK DISTRIBUTOR'S COMMENTS

SINCE THE ABOVE could be seen as damaging the legitimate business of a UK distributor, I felt it was only fair to allow Jeff Stanton of Waters & Stanton PLC to make a comment - *Ed*.

"I was interested to preview Ian Liston-Smith's experiences buying a Vectronics kit from the USA, especially as Waters & Stanton distribute these kits in the UK. Ian made a small saving of about £5 on the transaction but, with the deteriorating dollar exchange rate, when I made the calculation it was only £3. Our prices have not changed although they might need to increase later in the year.

"Ian questions why buy from a UK distributor when you can buy direct from the manufacturer and of course he discovered one of the answers when he found he had parts missing. We offer back-up service where we generally 'rob' a kit for parts needed to send to the customer who is probably in mid-construction and then replace them later. This happens rarely and also rarely we get kits going for customers if they have built one and cannot get it going.

"If you buy direct from an overseas supplier there is generally a Post Office handling charge in addition to postage and still some items attract import duty.

"Of course at Waters & Stanton we have a comprehensive web site and so receive many orders from the UK and abroad using the Internet ourselves."

REFERENCES

[1] Walford Electronics, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ.

[2] Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX.

[3] Waters and Stanton PLC, Spa House, 22 Main Road, Hockley, Essex SS5 4QS; tel: 01702 206835.

[4] Customs and Excise general enquiries, tel: 01702 366077 (although Ian Liston-Smith says "be warned, getting any useful information from them can be a convoluted process!") ♦

Waters and Stanton plc	www.wsplc.com
HM Customs and Excise	www.hmce.gov.uk
QRP Kit links	www.qrparci.org/links.html
Walford Electronics	www.users.globalnet.co.uk/~walfor
Lake Electronics	http://ourworld.compuserve.com/homepages/radkit

NOW TURN TO PAGE 24 TO FIND OUT HOW TO WIN THE MFJ CUB TRANSCEIVER!

Newcomers' News

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

DONALD Lamb, G0ACK, wrote to say that no-one should forget how to wire a mains plug - regular readers will know that I have reported continued problems with Novice Radio Amateur Examination (NRAE) questions on this topic. Don sent in a little *aide mémoire* that may help others to get it right.

Don points out that the bLue wire should go to the Left terminal and the bRown wire to the Right terminal, the green and yellow earth going to the centre pin. He goes on to say that writing this in nice big letters has proved to be very effective in his classes. Thanks for that tip Don.

SISTERS ON AIR

FOLLOWING TRAINING at the South Normanton Amateur Radio Club in Derbyshire, Elizabeth and Sarah Greatorex sat the NRAE at their local school and passed with flying colours. Last summer Elizabeth, 2E1LIZ, and Sarah, 2E1SAZ, both attended PEAK2000, Derbyshire's International Scout and Guide camp in the grounds of Chatsworth House. Proud father, Keith, G0THF, told me that over 7000 people attended the event. Many of the visitors passed greetings messages via the special event call GB2PIC which was run by the South Notts ARC. Lowe Electronics, whose headquarters are nearby, loaned much of the radio equipment used.

During August the girls took part in the Nunsfield House Amateur Radio Group's Novice contest and were placed joint third. Keep it up!

MORE SUCCESSES

ALTHOUGH HE hasn't been instructing the NRAE under his own steam for very long, John Adlington, M1DVT, has a 100% pass rate. John instructs three or four students at a time, and all three from his last course who sat the September exam, Nicky, 2E1NIK; Graham, 2E1STO; and Derek, 2E1SOT, are now up and running and active on the air, all with great enjoyment.

Ably assisted by Peter, M1ELF, John has four students on his present course all doing extremely well. Peter and John will be starting a new course in February aimed at the June exam. The courses are run in the Stoke on Trent area in a relaxed and friendly atmosphere. If anyone is keen to get in on the act they should contact John who is in the *RSGB Yearbook* (QTHR).

STILL GOING STRONG

THE NOVICE SCHEME was set up to encourage Youth into Electronics via Amateur Radio (Project YEAR) and Richmond School is able to confirm that the initiative is having the desired effect. Back in 1991, Martyn, G3RLV, Head of Chemistry & GCSE Sciences, was asked by a student if he would run a course for the new Novice licence. As he couldn't think of a good excuse, and the keen youngster persuaded three friends that they also wanted to be trained, he agreed! With help from three older students with an interest in electronics, the course was duly started. The three helpers decided that as they were doing most of the work anyway they might as well have a go at the exam themselves, and then went on to take the full RAE.

Having passed the exams, the group wanted to set up a radio club. With the support of the Head and Governors, and some generous financial help from the school's trustees, Richmond School Amateur Radio Society was born and affiliated to the RSGB. It is now a flourishing club with its own room, and is open to students most school days at lunchtime. In all, a total of 25 students have completed the Novice course, and eight have taken the full RAE with 100% pass rate to date in both.

The club station, GX0RYS, is often on the air from about 1315 - 1355 local time. Activity is mainly on the HF bands with single sideband (SSB), but radio teletype (RTTY), packet, slow scan television (SSTV) and FM on VHF are also available. There is a club net on Monday evenings on 145MHz which helps students who have left but still live locally to keep in touch.

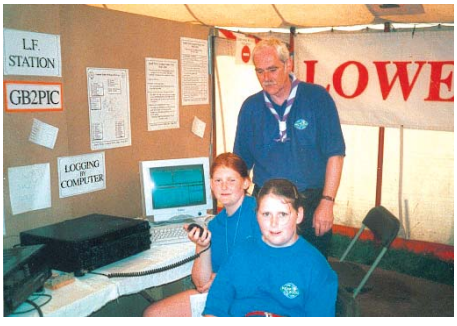
One of the original three 'helpers', John, has since completed a degree in Electronics and Communications at Hull University and is now a senior engineer with a company specialising in radio frequency (RF) and electro-magnetic compatibility (EMC) investigations. Chris studied Physics at Oxford University and is now doing research in avionics and sensors and Phil read Physics at Durham. If you read this, Phil, please get in touch with the school as they have lost track of you. Andrew, one of the original students, studied Natural Sciences at Durham University and has just started work with an international software-engineering firm. Danny and Dale have also gone into the electronics / communications industry and many others are still at university.

I think that Richmond School is justified in its pride over these successes and I hope this news will encourage other schools to use amateur radio as a stepping stone to careers in radio and electronics. Well done all! The school club can be contacted via e-mail at MVann@richmondschool.n-yorks.sch.uk

DXCC AWARDS

DID YOU WORK 100 counties in 2000? If so you can claim the Millennium DXCC award without submitting QSL cards. The award is available from the American Radio Relay League, details on their website at www.arrl.org/awards/dxcc

Fred Handscombe, G4BWP, has also reminded me that you can have QSL cards for the standard DXCC awards checked in the UK. The approved DXCC 'Field Checkers' for the UK are Jim Kellaway, G3RTE; Rob Ferguson, GM3YTS; and Fred himself. Good DX! ♦



Elizabeth, 2E1LIZ; Sarah, 2E1SAZ; and father Keith, G0THF, at PEAK2000 (see Sisters on Air).

James Dodds, 2E0JAM aged 12; Amy Dodds, 2E0TAM, aged 10; and 14 year-old Lee Tunstall, 2E0LEE, who all took and passed the 12WPM RSGB Morse code test at the London Amateur Radio Show in November. They are all members of the Bromsgrove and District Amateur Radio Club, where they have been encouraged and taught Morse by John, G4OAZ, and Ernie, G0BAM.

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

Working D68C - a 'How To' Guide

By Neville Cheadle, G3NUG* and Don Field, G3XTT**

THE UK-BASED Five Star DXers Association (FSDXA) is mounting a major DXpedition to the Comoro Islands in the Indian Ocean this month. The team expects to be on the air as D68C by late 8 February and operations will continue for three weeks, including three full week-ends.

The founder members of FSDXA comprise the UK-based core team that organised the February 1998 9M0C Spratly DXpedition (see *RadCom* April 98). The Association now owns the assets left over from Spratly. FSDXA is very closely associated with CDXC (Chiltern DX Club) - The UK DX Foundation.

The D68C operation will cover all HF bands and modes, plus 6m and satellite. There are 27 operators from 11 countries, making this one of the biggest DXpeditions of all time. Our objectives are:

- To provide the possibility for every amateur radio station in the world - even those running QRP or a very simple antenna - to make at least one contact with D68C;
- To enable top DXers to put D68C in their logs on as many bands and modes as possible. It should be possible for top DXers active on all bands and on all main modes to work D68C on at least 18 band / mode slots.

It is in the light of the first of these objectives that this article has been written. We want to encourage *everyone* with HF kit to try to make a contact with us. This is a great opportunity to hone your skills at chasing DX, while putting a station in your log which counts towards both the ARRL DX Century Club awards and to the RSGB's own Islands on the Air awards. What's more, we have our own awards on offer for individuals and clubs who make contacts with D68C.

In 1998, 9M0C made over 65,000 contacts in 12 days, including 1851 contacts with UK stations. Despite this, we became aware that a significant number of UK operators were unable to contact us. This came to light at numerous presentations to UK clubs after the DXpedition when many reported that they did not feel that they could break the pile-ups to get through. This was a disappointment to us, so this time we will try to do better! We hope that many more UK stations will get through to D68C and some of the ideas in this article may be helpful.

Although the Comoros and the Spratlys are both reasonably rare and therefore attract great interest in the DXing community, there are several factors in favour of the less strong UK stations on this occasion.

- In February 1998 the sunspot cycle had only just passed its minimum so conditions were not that good, with 28MHz and 24MHz being rarely open to Western Europe from the Far East. In February 2001, we expect excellent conditions, with the sunspot cycle just past its maximum, so there should be openings from D68 to the UK on all HF bands from 1.8 to 28MHz, with some significant activity on 50MHz too.
- The North-South path between the UK and the Comoros is generally much more reliable than the East-West path between Spratly and the UK.
- We will have six high-power stations active from the Comoros all utilising the new Yaesu FT-1000MP MkV transceivers and VL-1000 Quadra amplifiers, along with directional antennas (monoband Yagis on the high bands, four-square phased arrays on 40 and 80). In addition we may have the capability of operating further stations as and when the opportunity arises. This is a substantial increase on the capability we had at 9M0C. On occasions expect to hear two simultaneous signals on a single wide band such as 10, 15 or 20m; one on CW or RTTY and one on SSB. Of course, getting all the stations on the air at the same time is a major challenge given the potential inter-station interference!
- We will be active from the Comoros for a long period that includes three week-ends, so this will give many UK stations much greater opportunity to contact us than in the case of 9M0C or, indeed, the vast majority of DXpeditions, which are usually on the air for 10 to 12 days maximum, sometimes only covering a single week-end.

We really do want to work as many UK stations as we can and generally to build an interest in chasing DX amongst those who have HF kit.

PLANNED FREQUENCIES

THE PLANNED transmit frequencies are shown in **Table 1**. We will nearly always work split frequency and will regularly announce the frequencies on which we are listening. We will only make contacts on our transmitting frequency during the last few days of the DXpedition if the pile-ups have disappeared. Regarding the frequencies in Table 1, note that we expect at least two other DXpeditions to be active in February, so we may decide to change our transmitting frequencies to avoid confusion. Typically, a DXpedition SSB station transmitting on 14195kHz will listen up in the range 14200 - 14220kHz. If we find we are operating on the same transmit frequency as another DXpedition we will move down around 5kHz, typically to 14190kHz and we will then listen *down*, say between 14165 and 14185kHz, so as to avoid confusion.

MHz	CW	SSB	RTTY	PSK31
1.8	1822	1842	N/A	N/A
3.5	3502	3795	3570	N/A
7	7002	7052	7035	N/A
10.1	10102	N/A	N/A	N/A
14	14022	14195	14085	14071
18	18072	18145	N/A	N/A
21	21022	21295	21085	21071
24.9	24892	24945	N/A	N/A
28	28022	28495	28075	28071
50	50102	50145	N/A	N/A

Table 1: The D68C planned transmitting frequencies.

Listen to the operator carefully. Each has been briefed to give the D68C callsign at least after every two QSOs and to announce the listening frequencies every five QSOs. Incidentally, we will not work by numbers; we feel that with good ears and equipment this is quite unnecessary.

BEST TIMES / BANDS

FIGS 1 TO 5 show the optimum times and frequencies for UK stations to work the Comoros on the HF bands. According to our research, medium strong to strong signals should be received at the times shown on the charts. See also the propagation predictions prepared by G4FKH on page 81. On 7 and 10MHz it should also be possible to work the Comoros from the UK for about 12 hours each day, from around 1600 to 0400UTC. However, our view is that weaker UK stations should opt for 24.9MHz. This band is likely to be more reliable than

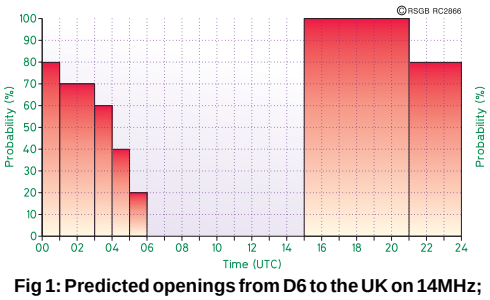


Fig 1: Predicted openings from D6 to the UK on 14MHz;

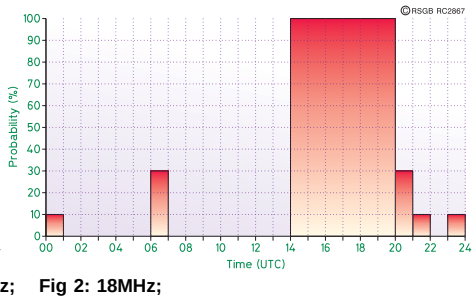


Fig 2: 18MHz;

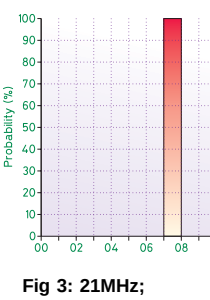


Fig 3: 21MHz;

*Further Felden, Longcroft Lane, Felden, Hemel Hempstead, Herts HP3 0BN.

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

28MHz and there is much less competition here since fewer stations have beam antennas compared with the other HF bands. The best opening is around 0900 - 1600UTC during working hours but, as an alternative, try 18MHz as this should be open at 1400 - 2000UTC just as people are arriving home from work.

SUITABLE BUT SIMPLE ANTENNAS

FIG 6 shows a half-wave sloping dipole and measurements for seven of the HF bands are given in **Table 2**. This is a centre-fed antenna and one end should be sited as high as is practical with a slope of around 30 - 45° (not critical). The antenna should point in a south-easterly direction (the actual bearing to the Comoros from the UK is 136°). As can be seen from the table, total length of a half-wave dipole for 24.9MHz is only 5.7m, so it should be a relatively simple antenna for most UK amateurs to erect by attaching the top end to a chimney or gutter. Feed with 50Ω or 75Ω coax, with the centre conductor to the higher half and the outer to the lower half. Seal the feedpoint to keep out moisture (eg by moulding Blu-Tac around it) and hey presto, an effective single-band antenna.

Believe us, you *will* be able to work D68C with an antenna like this! For simplicity and effectiveness, we do recommend single-band antennas over many multi-band designs which are often a compromise solution.

WORKING SPLIT

ALL well-organised DXpeditions nowadays work split frequency. What does this mean? DXpeditions transmit on one frequency and listen on a different frequency. For example they will transmit on 28495kHz and listen between 28500 and 28520kHz. Why? There are two reasons:

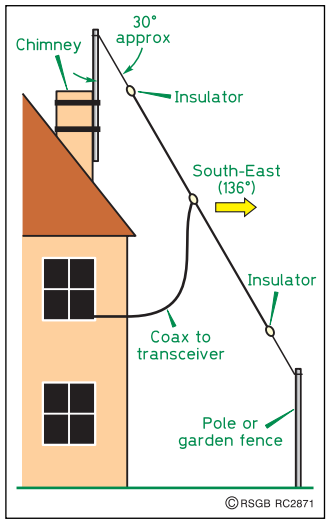


Fig 6: Sloping half-wave dipole.

- If the DXpedition station listens on the frequency on which it is transmitting, it will not be heard by those calling because of the pile-up on that frequency.
- The DXpedition operator will be faced with a huge barrage of calls and will not be able to differentiate between them if they all call on the same frequency.

Experienced DXpeditioners will tune slowly up and down their listening band. Listen to the stations working the DXpedition and establish the operator's tuning pattern. Work out where he is likely to be listening next and then call - bingo! Never, *ever*, transmit on the DXpedition's transmitting frequency *unless* the DXpedition says "Listening this frequency".

Of course, you may have a transceiver which doesn't allow split-frequency operation. In this case you may have to wait until later in the operation, or perhaps you can borrow a friend's rig. All transceivers built in the last 10 years or so allow split-frequency operation. On CW, generally all you will need to do is set your receiver to the D68C frequency and then use XIT (transmitter incremental tuning) to offset your transmitter by the necessary split (see your transceiver manual if you haven't had occasion to do this before). Activating RIT (receiver incremental tuning) will allow you to hear the calling stations, while leaving your main receive frequency on D68C.

RIT and XIT usually only work for splits of up to 10kHz, which may not be sufficient for SSB operation. In this case you need to bring your second VFO into operation. Set, say, the 'A' VFO on the D68C frequency. Set the 'B' VFO on the frequency where D68C is listening, and activate "Transmit on B, receive on A". Again, your transceiver's manual will explain how to do this.

When D68C responds to your call, the exchange will consist simply of an exchange of signal reports. Make sure the D68C operator has your callsign correctly. The reason for the short, contest-style exchange is simple: the expedition operators want to maximise the number of people who get a chance to work D68C, so contacts are kept as short as possible. There will be a log look-up facility on the D68C web page so you can be sure that you are in our log. If not, do feel free to have a second attempt. If your contact is indeed OK, please try to work us on other bands/modes.

NEVADA TROPHIES

AS A FURTHER encouragement, Nevada is sponsoring the 'Nevada Comoros Trophies'. Several are available to UK stations and clubs:

- To the leading three high-power UK stations who work D68C on the highest number of bands and modes. The bands are all bands 1.8MHz to 50MHz and the modes are CW, FM, PSK31, RTTY and SSB.
- To the top three low-power UK stations, with single-element antennas (eg dipole or vertical) working D68C on the highest number of bands, regardless of mode. We will use the *CQ* World Wide contest definition of low power, ie 100 watts or less.
- To local UK clubs whose members work D68C on the highest number of bands and modes. There is no limit to the number of club members who can participate. Members of a club can claim for contacts on the same band-mode combination as other members; thus an active club may score several hundred qualifying contacts. To simplify administration of this, we encourage clubs to drop us a line beforehand to request a record sheet.

SPONSORSHIP

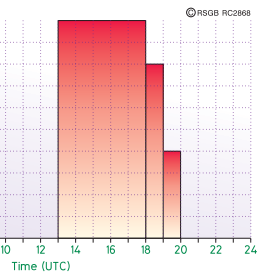
A SIGNIFICANT number of sponsors, including Yaesu (UK) Ltd and Nevada, is already supporting this DXpedition. A colour brochure has been prepared about the project and this has recently been circulated to DX clubs throughout the world. If any UK club is interested in sponsoring us, please contact Steve Telenius-Lowe, G4JVG (QTHR), or e-mail g4jvg@cwcom.net

We very much hope this article has inspired those of you who are inexperienced in DXing to have a go and work D68C. You could be pleasantly surprised at what's possible. We look forward to putting your call in the log.

FURTHER READING

DXpeditioning - Behind the Scenes, edited by Neville Cheadle, G3NUG, and Steve Telenius-Lowe, G4JVG, is "by far the most complete 'how to' reference available" (N7NG). It is available from RSGB Sales - for details of how to order see pages 66 / 67. ♦

D68C DXpedition:	www.dxbands.com/comoros
CDXC (Chiltern DX Club):	www.cdxc.org.uk



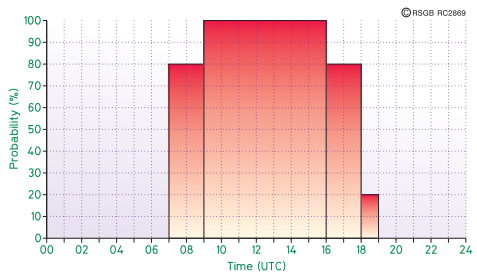
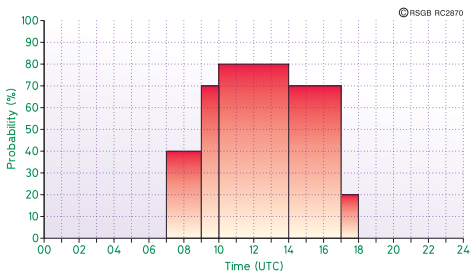


Fig 4: 24.9MHz;



and Fig 5: 28MHz.

BAND	DIPOLE LENGTH	
MHz	feet	metres
7	66.0	20.1
10.1	46.3	14.1
14	33.0	10.0
18	25.8	7.86
21	22.0	6.70
24.9	18.8	5.73
28	16.5	5.00

Table 2: Lengths of half-wave dipole antennas (see Fig 6).

Down To Earth

The Voices

Part Eight, by Gordon L Adams, G3LEQ *

LAST MONTH, in Part Seven of 'The Voices', I dealt with some of the political broadcasting that has taken place in the Near East over the years, and I described the rather unusual machinations involving the Sharq al-Adna radio station.

So far in this series I have considered only high-power 'Voices', employing broadcast transmitters in the 10kW to 500kW range. However, there are many radio voices emanating from point-to-point transmitters, which have power outputs of somewhat less than 10kW.

The rather forbidding aspect of Creslow Manor House.

NUMBERS STATIONS

THESE INCLUDE a mysterious group of short wave 'broadcasters' commonly known to listeners as 'Numbers Stations'. What especially intrigues the casual listener is the fact that these stations never publish their schedules, they generally pop up in Fixed and Land Mobile service frequency bands using non-attributable callsigns, and they appear to spend their time transmitting coded messages or putting out test transmissions.

Others are heard 'speaking' inappropriate callsigns such as 'Charlie India Oscar Two' over and over again, without any apparent purpose. The CI series of callsigns is part of the ITU assignment for Canada, whereas it is generally believed that this signal comes from the British Sovereign Base area of Cyprus!

Some of the antennas at Edlesborough: a log periodic Yagi (top) and masts supporting rhombics (below).

WHY AND HOW?

SUCH STATIONS have been especially active during the Cold War years from 1948 to 1989. This, then, is the key to their function. The majority of them are operated by government or military organisations in various parts of the world. Think of a political hot-spot - and there are probably 'Numbers Stations' directing messages there, albeit with the transmitters located safely behind high-security fences well away from the trouble spot in question. They are making use of one of the prime benefits of wireless communication, the fact that information may be directed to anywhere in the world across all political boundaries, and can then be gathered up by the intended recipients in a highly discreet manner. The simplest way of doing this is to employ radio frequencies in the range 1.8 to 27MHz and let the ionosphere carry the signals to their intended destinations. Some people have heard such signals in the range 27 to 35MHz, but these are usually harmonics of the intended transmission frequency. Having said that, frequencies in the range from 30 to 40MHz are not used much for general communications in most countries because they cover TV set intermediate frequencies. For this reason counter intelligence 'watchers' sometimes use low-power radio equipment in this range, where few people are likely to be listening, assuming that the 'spooks' do not break through on local TV sets!

The recipients of the messages are indeed agents or, if you prefer, spies, working for the various intelligence services involved. However, not all of the five-figure group messages commonly heard in the HF spectrum actually contain any information. One might assume that this is a simple ruse to waste the time of the target country's intelligence service: trying to crack a non-existent code. In fact, messages sent using the well-known one-time pad system are theoretically uncrackable unless the decoding pad of random figures or letters has been captured by the 'other side'. Rather than use the silk squares hidden in the linings of coats by the wartime SOE, it is now more convenient to print the key five-figure groups in miniature on a stick of chewing gum. Then the agent can have a quick spearmint chew if he hears someone breaking his door down! The main reason for running dummy traffic is to prove the radio circuit, and provide a constant stream of data that *could* be live. Then in the event of real information being passed, the counter intelligence service of the target country will not be alerted, since the regular pattern of messages does not change suddenly in length or duration. Unfortunately,

The entrance to the former radio station at Gawcott as it is today.

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

due to human frailties, listeners sometimes hear the same message going out several days later, and in some cases even being sent backwards. This usually means that the sending operator has made a loading error, or has not prepared enough dummy material.

Some intelligence services still employ punched or magnetic tape to send their messages (see **Fig 6**). In the 1960s an agent could send a 100-word message in less than 25 seconds using a miniature magnetic tape player and a compact frequency shift keyed mode F1B transmitter. His initial identification could be a simple square wave burst lasting no longer than five seconds, and he would be on and off the air in half-a-minute. To receive a message at a similar 250 words per minute, he would record the signal on magnetic tape, and then sprinkle iron filings on the used tape to 'read' the dots and dashes.

If the point-to-point transmitter carrying the agent's traffic happens to be co-located with the source country's short wave broadcast senders, cross-modulation may occur, and the agent might hear Radio Havana or Radio Pyongyang superimposed on his messages.

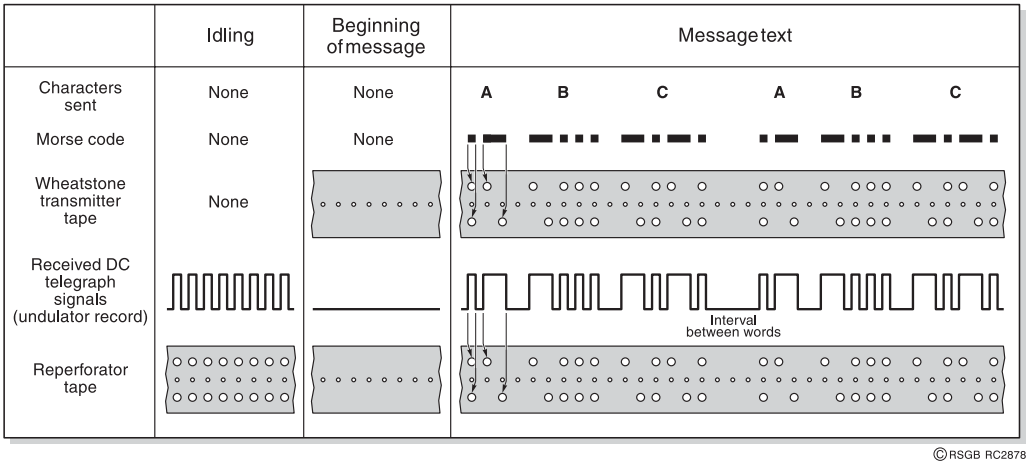
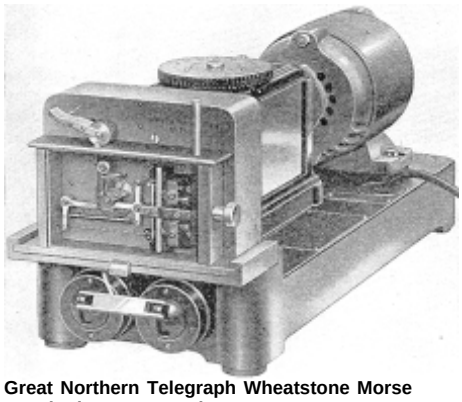


Fig 6: Punched tape format in automated transmission of Morse code.

WHERE AND WHO?

MOST OF US know that the BBC carried messages to the resistance in the countries occupied by Germany during WWII. However, there was also a variety of radio stations set up in the UK during the war purely for the use of the intelligence services. These were operated variously by SIS, SOE, RSS, and the Admiralty, Army and Air Force 'Y' intercept services at such places as Hanslope Park, Whaddon Hall, Windy Ridge, Nash, Gawcott, and Creslow in Buckinghamshire, Grendon Underwood, Poundon (also American OSS) and Thame Park in Oxfordshire, Thurso in Caithness, Forfar in Angus, Gilnahirk near Belfast, St Erth in Cornwall, Cheadle in Staffordshire, Chicksands Priory in Bedfordshire, Waddington in Lincolnshire and Irton Moor near Scarborough.

Perhaps the most well-known is Hanslope Park, which contains sophisticated research and development laboratories as well as a receiving station for the Diplomatic Wireless Service (DWS). Its log periodic antennas can be seen from the M1 motorway not far south of the greater and grander Rugby antenna masts. Gawcott and Creslow were active until the end of the Cold War. The Gawcott Signal Hill site just south of Buckingham was selected by Harold Robin, the Chief Engineer of the DWS, as a transmission site early on in the war. Poundon Signal Hill served as its associated receiving location, whilst the nearby Poundon House was used by both SOE and OSS throughout the war. Once the war was over, SOE was wound down and merged into the SIS / DWS whilst the American OSS was replaced by the CIA. SIS continued to use Gawcott and Poundon for transmission and reception respectively, until the end of the Cold War in the early 1990s. Not only did Gawcott accommodate a fine selection of Marconi HF SWB-series point-to-point transmitters, but in the late 1950s a certain medium wave black and chrome panelled American Gates transmitter travelled back from the Eastern Mediterranean to find a home there! (See Part Seven of 'The Voices').



Great Northern Telegraph Wheatstone Morse punched tape transmitter.

After the war the Royal Signals operated COMCAN, the Commonwealth Communications Army Network, and Army signallers sporting No 1 Special Communications Regiment shoulder flashes could often be seen training at Poundon House and also up at Forfar in Scotland. They too employed Marconi SWB-11 transmitters. It is interesting to recall that many radio amateurs used to listen in to the slow Morse five-letter group transmissions from callsign P8K on 3750kHz. Most assumed that the source was Dutch, but they were wrong: the signals came from Forfar. Later on in the 1960s the No 1 SCR changed its name to the 65th Signal Regiment, and finished up as the 39th Signal Regiment. Their London HQ is based in Worship Street, close to Liverpool Street railway station. The civilian and military links between these sites must be obvious without me spelling them out further.

Gawcott was closed down in the early 1990s, and is now a highly fortified home for Quicksharp Services (who maintain commercial mowers) and Lovemore Music (who wholesale musical instruments). Poundon still has a large lattice tower, but its microwave dishes have gone, and it appears to be in a state of hibernation. The magnificent antenna farm at Creslow Manor was also dismantled at the same time as the rhombic and log periodic antennas at Gawcott, where the circular transmitter building is but a blob in the landscape of Little Oaks Farm. Creslow Manor is now part of a working farm too.

During the 1960s Grendon Hall became an open prison and Gilnahirk was closed completely. That leaves several other site names that will ring a few bells with readers. However, if you want to find locations where RF and coded 'Voices' are still being radiated you will have to try Edlesborough (south of Leighton Buzzard) or Barford St John (south of Banbury). The latter is an American operated facility. A British numbers station has been using the 'Lincolnshire Poacher' as its tuning signal: I wonder why? A similar-sounding source uses 'Cherry Ripe', but this appears to emanate from Guam in the Pacific basin. Obviously there is a degree of UK and USA co-operation involved.

Gordon Adams continues his exposé of the Numbers Stations in Part 9 of 'The Voices' next month.

In particular, he will highlight American and Eastern Bloc sources. He takes a look also at Cold War activity in the Baltic States - a part of Europe that many of use tend to overlook. ♦

Book Choice

RSGB TECHNICAL COMPENDIUM - RSGB 2000

Described by RSGB Staff

THE APPEARANCE of this book should help to placate those members and non-members who have long been requesting a collection of some of the best technical articles having appeared in *RadCom*.

The book represents a collection of all the technical features from *RadCom* in 1999, together with one from December 1998, and one from January 2000, these being introduced to ensure that all articles were complete, even if they ran over the year-end. In addition, the compilation includes all 'Eurotek', 'In Practice' and 'Technical Topics' columns. As if this weren't enough, the best of the technical content of 'Down to Earth' is there, too.

Let me whet your appetite by mentioning just some of the articles, invidious though it may be; these are my particular favourites - you may have other ideas.

The book is dominated by the 'Pic 'n' Mix Digital Injection System', written by Peter Rhodes, G3XJP. His mammoth five-parter describes the design and construction of a PIC-based direct-digital-synthesis (DDS) circuit which can be used to feed the required injection frequencies into the signal frequency mixer of your transceiver. It can be made to suit your requirements (hence Pic 'n' Mix), good stability and low phase noise being amongst its principal characteristics. Find out how it's done and read Peter's article in its entirety.

A worthy second comes a description, by its inventor, of the mode that has taken the world's HF data community by storm - PSK31. Peter Martinez, G3PLX, already with the invention of AmTOR under his belt, explains his new system, designed to be a higher-tech version of Radio Teletype (RTTY), exploiting modern technology and being simple to implement on the omnipotent PC. Now that the mode is well-established, re-reading Peter's article provides valuable insight into its development.

If antennas are your principal interest, there are several articles to capture your imagination. Will it be the 'Electrically-Tuned Six-Band HF Beam' of Tony Preedy, G3LNP? Or perhaps PA3BTN and PD0NCF's ''Screwdriver' Rapid-QRV Antenna', is more to your liking?

If not, there are others that, no doubt, will be. Of these, there are 'Erecting Portable Masts' and 'The 'Skymiser' HF Antenna'. No collection of antenna articles would be complete these days without one for the new LF bands; here a design entitled 'A Sensitive Loop Antenna for 136kHz' fits the bill.

Perhaps you're looking for a PIC-based project to fill the long winter evenings? If so, there are three for you to choose from. Pic 'n' Mix has already been mentioned, but there is the 'PIC-based Morse Decoder', which will decode well-sent Morse or Morse sent mechanically or by computer.

The principles of digital voice communication are explained in an article of the same name by Andy Talbot, G4JNT, and, while not being a constructional article as such, gives a good idea of the flexibility offered by PIC controllers.

The 'Technical Topics', 'In Practice' and 'Eurotek' columns need no introduction, other than to say that a comprehensive index of the subjects is given, making the location of that elusive circuit much easier to find.

The 'Down to Earth' articles also speak for themselves. Many of the subjects covered are from the 'An Introduction to…' series, and include digital signal processing (DSP), the cathode-ray oscilloscope, solar indices, speech processing, noise and gamma matching.

This is indeed a book for all tastes, something for everyone; it will soon find a place on my bookshelves, as it should on yours.

RSGB paperback,
272 x 198mm. 290 pages,
ISBN: 1-872309-71-2.

Non-Members' price £17.99
Members' price £15.29

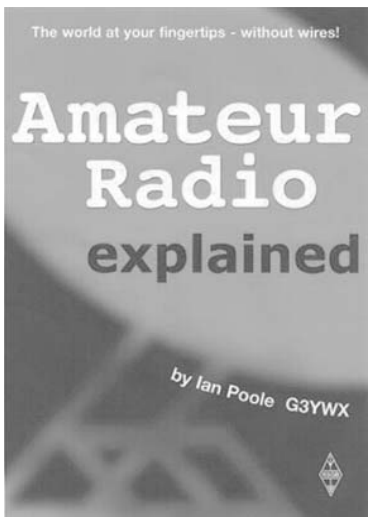
AMATEUR RADIO EXPLAINED BY IAN POOLE, G3YWX - RSGB 2000

Described by RSGB Staff

THIS NEW publication replaces *Amateur Radio for Beginners*, a best-seller of the 80s and early 90s that had become out of date, as *the* first RSGB book for anyone coming into amateur radio 'cold'. It gives a logical, step-by-step, introduction to most of the myriad aspects of this hobby. Indeed, the author, in his Preface, says, "despite the time I have been interested in amateur radio, I still find new areas of interest. . ." This hints at the wide variety of subjects covered by this book.

Ian Poole, G3YWX, is well known to *RadCom* readers, having written countless articles over the years, most recently contributing a number of the 'An Introduction to. . .' features that have been published in the 'Down to Earth' section of this magazine. He is therefore ideally placed to write an introduction to amateur radio itself.

Ian starts by explaining what amateur radio is all about. He then looks at the different aspects of the hobby before describing the different types of licence and touching on the history of amateur radio. Chapter 2 explains the differences between the various modes of modulation used these days and then Chapter 3



looks at receiving signals - amateur, broadcast and CB.

Amateur radio wouldn't be amateur radio without its jargon and, since this can be somewhat off-putting to many beginners, 'ham radio speak' is covered in some detail in Chapter 4. This chapter also covers Morse code and its abbreviations, including the Q code, the international phonetic alphabet, the RST code and so on.

A newcomer to amateur radio, if s/he has been listening for long enough to have started hearing Q codes, RST reports and amateur radio jargon, will also have started to learn a little about radio wave propagation. This is the subject covered in the next chapter of *Amateur Radio Explained* and, again, Ian Poole proves to be an expert guide to this often confusing and misunderstood topic.

The next chapter builds on the reader's new knowledge of propagation and explains how it works in practice, by looking at each of the amateur bands from 136kHz to 430MHz in turn and describing in simple terms the type of propagation to be expected on each.

By the time the reader comes to Chapter 7, s/he will be ready to learn how contacts are conducted on the air and to find out about QSL cards and operating awards. This is followed by a chapter devoted to receivers: their controls, and the meaning of terms such as sensitivity and selectivity. Such a book would be incomplete without a section on antennas, and the basics of antenna systems (including feeders and earthing) are covered in Chapter 9. Simple HF antennas (random wires, dipoles, verticals) and VHF / UHF antennas (discones and Yagis) are described.

Naturally, equipment construction is an important part of the hobby, although it is true to say that these days most beginners do not start by building their own equipment. Nevertheless, for beginners that wish to learn more about how radio equipment works it is an invaluable method of learning, and *Amateur Radio Explained* describes how to get started with this aspect of the hobby.

By now, it is to be hoped that most readers will be well and truly 'hooked' and will want to know how to get on the air themselves. The book therefore concludes with a helpful chapter entitled 'Getting your own licence'. For those of us who measure the length of time we have been involved with amateur radio in decades, it can be hard to recall what was needed when we were first introduced to amateur radio. Thinking back, I wish there had been a book like *Amateur Radio Explained* when I first became interested in the hobby. In those days, there was the *Radiocommunications Handbook*, the *RAE Manual* and that was about it! A lot of amateur radio seemed unfathomable to this teenage schoolboy and a book written in clear simple language for absolute beginners would have been a godsend. *Amateur Radio Explained* is precisely that sort of book and it ought to be available in every school library in the country.

RSGB paperback,
210 x 148mm. 156 pages,
ISBN: 1-87-230970-4.

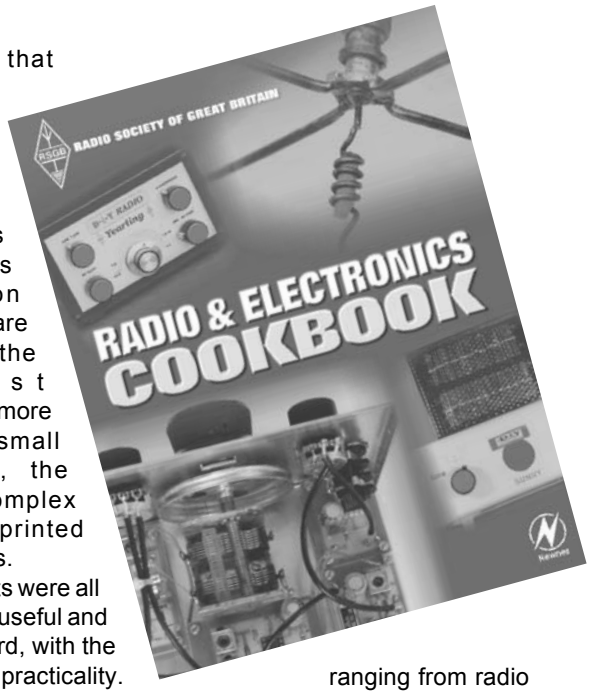
Non-Members' price £9.99
Members' price £8.49

RADIO & ELECTRONICS COOKBOOK
EDITED BY GEORGE BROWN, M5ACN
- RSGB / NEWNES 2001

Described by RSGB Staff

ALTHOUGH WE are surrounded by sophisticated computerised gadgets these days, there is still a fascination in putting together a few resistors, capacitors and the odd transistor to make a simple electronic circuit. It is really surprising how a handful of components can perform a useful function, and the satisfaction of having built it yourself is incalculable.

The *Radio and Electronics Cookbook* aims to provide a wide variety of radio and electronic projects, from something that will take a few minutes to a more ambitious weekend's worth. Various construction techniques are described, the simplest requiring no more than a small screwdriver, the most complex involving printed circuit boards.



The projects were all chosen to be useful and straightforward, with the emphasis on practicality. In most cases the workings of the circuit are described, and the projects are backed up by short tutorials on the components and concepts employed. In the 21st century it may seem strange that few of the circuits use integrated circuits (chips). The Preface says this is intentional, as it is much easier to understand how the circuit works when using discrete components.

The projects described in the *Radio and Electronics Cookbook* have all been previously published in the now-defunct *D-i-Y Radio* magazine. Although widely praised by those that received it, *D-i-Y Radio* had a small circulation, thus the *Radio and Electronics Cookbook* will enable these projects to be brought to a much wider audience than hitherto. Fans of *D-i-Y Radio* will also find that the *Radio and Electronics Cookbook* provides a useful means of finding all their favourite projects in one handy volume. Although only a basic acquaintance with electronics construction is assumed, the sheer variety of simple constructional projects means that this book is likely to appeal to those with many years involvement in radio and electronics as well as to beginners.

The circuits themselves provide a wealth of quick, rewarding construction projects ranging from radio receivers and amplifiers, to test equipment, a moisture meter, a desk microphone, a water level alarm, Christmas tree LEDs, and several low-power (QRP) transmitters. Quite properly, since this book may well be bought by many who are not already radio amateurs, there is a warning in the Preface that it is necessary to obtain an amateur radio transmitting licence before any of the transmitter circuits in the book are used!

Clear step-by-step instructions and numerous illustrations are supplied throughout. The result is a book ideal for DIY enthusiasts and radio amateurs who are seeking to build up their electronics skills and knowledge. The projects are also supported with features on the electronics involved. The book is ideal for all electronics enthusiasts and experimenters.

Anyone buying the *Radio and Electronics Cookbook* will find that it will lead to hours of enjoyment, some very useful and entertaining gadgets, and increased knowledge of how and why electronics circuits work and a great deal of satisfaction. Beware, electronic construction is addictive!

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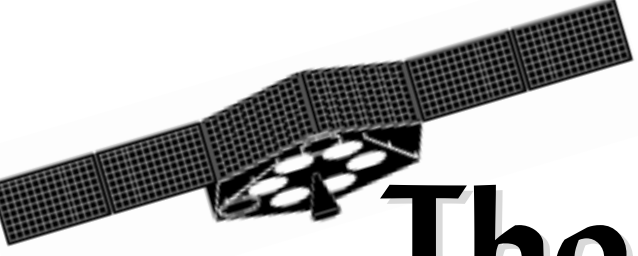


The AMSAT OSCAR 40 Satellite

Amateur Radio's newest satellite, AMSAT OSCAR 40, was finally launched in October last year on an Ariane-5 rocket. Unfortunately, all is not well on board the spacecraft. As we go to press the situation is still very fluid and things could change between now and the time *RadCom* is received. Richard Limebear, G3RWL,* tells us what went wrong, what is being done, and what it is hoped AO-40 should do in the future

AMATEUR RADIO'S latest spacecraft, known to most as 'Phase 3-D', was renamed AMSAT OSCAR 40, or AO-40 for short, after launch.

Shortly after the launch it was discovered that all was not well with the spacecraft: the expected 70cm transmission had not appeared. The 2m transmitter was switched on and used to prepare AO-40 for its first propulsion manoeuvre. This took place on 11 December and took AO-40 into a 370 x 59,000km orbit, still at an inclination of about 6º. Perigee at that height gets people a bit 'twitchy' but the experts say that it's nothing to worry about - even if there were no more orbit changes they reckoned that AO-40 would stay around longer than all of us. In fact, gravitational perturbations would make it cycle between about 270km and 700km over the years.

The motor firing did not go as expected. AMSAT had been aiming for a 50,000km apogee but the motor fired for an extra three minutes lifting AO-40's apogee to 59,000km. In itself, this is not a problem. But on the morning of 13 December, telemetry transmissions from AO-40 stopped. The computer (on AO-40 it's called an Integrated Housekeeping Unit or IHU) appeared to have crashed so, finally, on Christmas Day Ian, ZL1AOX, sent a RESET command on L-band and AO-40 came back to life on its 2400MHz beacon.

All was not well on board. For reasons yet to be determined several parts of AO-40 were not working. At the time of writing (mid-January) it looks like something went wrong with the main propulsion system, causing a fuel leak. The command team is showing extraordinary determination to recover the spacecraft and, so far, the 2m, 70cm, and 23cm receivers, along with the 2400MHz transmitter, all on the high-gain antennas, have been proven to work. Other transmitters have not yet been tried, but the 70cm and 23cm omni-directional antennas do not work (2m hasn't been tried yet).

It gets worse, though. It looks like the fuel leak is providing a small amount of propulsion, causing the perigee altitude to decrease. Current thinking is that they will probably try to turn the spacecraft in the opposite direction to reverse this trend. They may even use the Arcjet, if it is found to work (we are optimistic about this). Just to make life even more interesting, the command station operators all have 'proper' jobs, and there are only a few hours per day when the communications links are optimum.

It will take some time to evaluate the status of the various other systems and experiments. This will certainly include the Arcjet and the wheels as early as possible. Once this is completed and we have a complete overview, we will be able to say whether the spacecraft will work normally and perhaps think about re-defining its mission. Certainly future use of the main propulsion system seems unlikely, but the Arcjet, once proved operable, could, perhaps, be used to change the altitude of apogee and / or perigee. The promised 16-hour orbit now seems out of reach but much can still be done with AO-40. Watch *RadCom* and other amateur radio media for further news.

This article will try to tell you what to expect from amateur radio's newest venture. For in-depth information about using amateur radio satellites the reader is referred to the Satellite chapter in the latest *Radio Communication Handbook* [1].

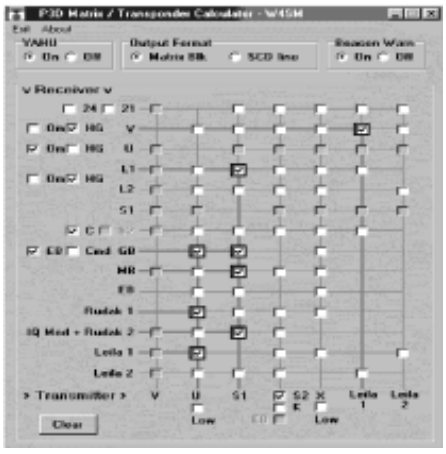


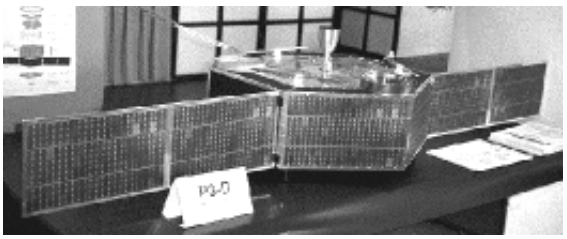
Fig 1: The OSCAR 40 matrix control screen.

EXPECTATIONS

THE FOREMOST thing to be aware of is that AO-40 won't be available for everyone to use for a while yet. Once the final orbit is achieved it will then be up to the command stations to check it out before we, the users, are let loose on it; this will take a few months.

Now, what do we have to do to make QSOs? Do we need several kilowatts and Jodrell Bank in the back garden? *No.* We shouldn't expect to work AO-40 with a handheld, but 50W and small beams, preferably with a receive pre-amplifier, should be OK most of the time - it's designed for the *average* user, not the kilowatt gang. But AO-40 has a lot of microwave equipment aboard and, while traditional 2m and 70cm users will be catered for, we expect to make much more usage of the higher bands up to 24GHz. There has never been so much equipment available for *easy* use of microwaves - check it out. I'm mainly a CW operator with an HF background and scared of the higher tech-

* *60 Willow Road, Enfield, Middx EN1 3NQ.*



Scale model of the satellite on display in Germany.

nology . . . but even *I* am planning to use 1260 and 2400MHz.

TRACKING

FIRST OF ALL we need to know about AO-40's orbit; the main question being "where do I point my antenna, and when?"

Satellites move, so if we want to use them we need to know *where* to point the beams . . . and *when*. Orbital data (called *Keplerian elements* or more commonly *Keplers*) are published and used by computer software that is readily available from various sources including AMSAT-UK and the other AMSAT organisations. This certainly takes the slog out of predicting where the satellite will be at any given time.

For the greatest DX opportunities, we need to move the beam around. But satellite signals don't just come from out on the horizon: AO-40 will sometimes be overhead, so it is beneficial to be able to point the antennas upwards to varying extents (the jargon phrase is *in elevation*) as well as the traditional compass (*azimuth*) directions. Without some means of elevation there will be times when AO-40 is out of an ordinary antenna's beamwidth. However, the best DX will often occur with the beam pointing within 10° of the horizon, so don't let the lack of upwards-pointing put you off; you can always add it later if the bug really bites.

EQUIPMENT

SIMPLE BEAMS, medium power, and a fairly sensitive receive set-up are the order of the day. Transmitters on 2m and 70cm will need to put about 50W into the antenna system. But AO-40 has microwave equipment as well, here lower powers combined with higher gain antennas will be usable. The bottom line will generally be that 50 to 100W ERP, once antenna gain and feeder loss has been taken into account, is what's required.

Antennas need not be gigantic, but don't expect too much from ground planes. A minimum requirement for everyday use would be roughly six elements on 2m and 10 elements on 70cm. Of course, on the higher bands we can get quite a lot of gain from fairly small dish antennas, so there will be no need to fill the garden with aluminium.

Reception is the most critical part of working any satellite. AO-40 carries beams and dishes, but there will be times when they aren't pointing directly at us. A receive pre-amplifier, while not mandatory, could make the difference between working the satellite and hearing nothing. Penny for penny, the best investment in any satellite station is in reducing feedline losses and improving reception. Don't expect the signals to push the S-meter off the scale, the usual target is to get the beacon at about S6.

Recommended operating modes for the analogue parts of AO-40 are CW and SSB. FM is not very friendly to the on-board power budget, so please do not use this mode on AO-40.

OPERATION

SATELLITE OPERATION is generally full duplex; we listen to our own signals coming back from space, and this is facilitated by having the transmit and receive links (called *uplink* and *downlink*) on different frequency bands. **Table 1** shows AO-40's uplink and downlink frequencies. Note, though, that not all the transmitters and receivers will be switched through all of the time. Apart from the problem of transmitting and receiving on the same band, which will desensitise the receiver, the available power is not sufficient to have everything switched on at once, so operations will run to a timetable. **Fig 1** on

Some of the project's 'movers and shakers' at a meeting in Marburg, Germany. From left to right: James Miller, G3RUH; Peter Gülzow, DB2OS; Karl Meinzer, DJ4ZC; Viktor Kudielka, OE1VKW.

Uplink Frequencies

Uplink	Band Letter	Digital Passband	Analogue Passband
15m	T	none	21.210 - 21.250MHz
12m	H	none	24.920-24.960MHz
2m	V	145.800 - 145.840MHz	145.840 - 145.990MHz
70cm	U	435.300 - 435.550MHz	435.550 - 435.800MHz
23cm (1)	L	1269.000 - 1269.250MHz	1269.250 - 1269.500MHz
23cm (2)	L	1268.075 - 1268.325MHz	1268.325 - 1268.575MHz
13cm (1)	S	2400.100 - 2400.350MHz	2400.350 - 2400.600MHz
13cm (2)	S	2446.200 - 2446.450MHz	2446.450 - 2446.700MHz
6cm	C	5668.300 - 5668.550MHz	5668.550 - 5668.800MHz

Downlink Frequencies

Band	Band Letter	Digital Passband	Analogue Passband
2m	V	Same as analogue	145.800 - 145.990MHz
70cm	U	435.900 - 436.200MHz	435.475 - 435.725MHz
13cm (1)	S	2400.650 - 2400.950MHz	2400.225 - 2400.475MHz
13cm (2)	S	2401.650 - 2401.950MHz	2401.225 - 2401.475MHz
3cm	X	10451.450 - 10451.750MHz	10451.025 - 10451.275MHz
1.5cm	Ka	24048.450 - 24048.750MHz	24048.025 - 24048.275MHz

All Receivers are inverting.

Telemetry Beacons (IHU)

Band	General Beacon (GB)	Middle Beacon (MB)	Engineering Beacon (EB)
2m	none	145.880 MHz	none
70cm	435.450 MHz	435.600 MHz	435.850 MHz
13cm (1)	2400.200 MHz	2400.350 MHz	2400.600 MHz
13cm (2)	2401.200 MHz	2401.350 MHz	2401.600 MHz
3cm	10451.000 MHz	10451.150 MHz	10451.400 MHz
1.5cm	24048.000 MHz	24048.150 MHz	24048.400 MHz

Notes: Telemetry beacons are for command purposes and are modulated in 400 Bit/s BPSK, AMSAT format.
Middle Beacon (MB): IHU-2 OFF: MB carries normal IHU-1 400 psk telemetry. However, IHU-2 can also monitor the IHU-1 telemetry stream, and retransmit that if required.

Table 1: AO-40 frequency tables.

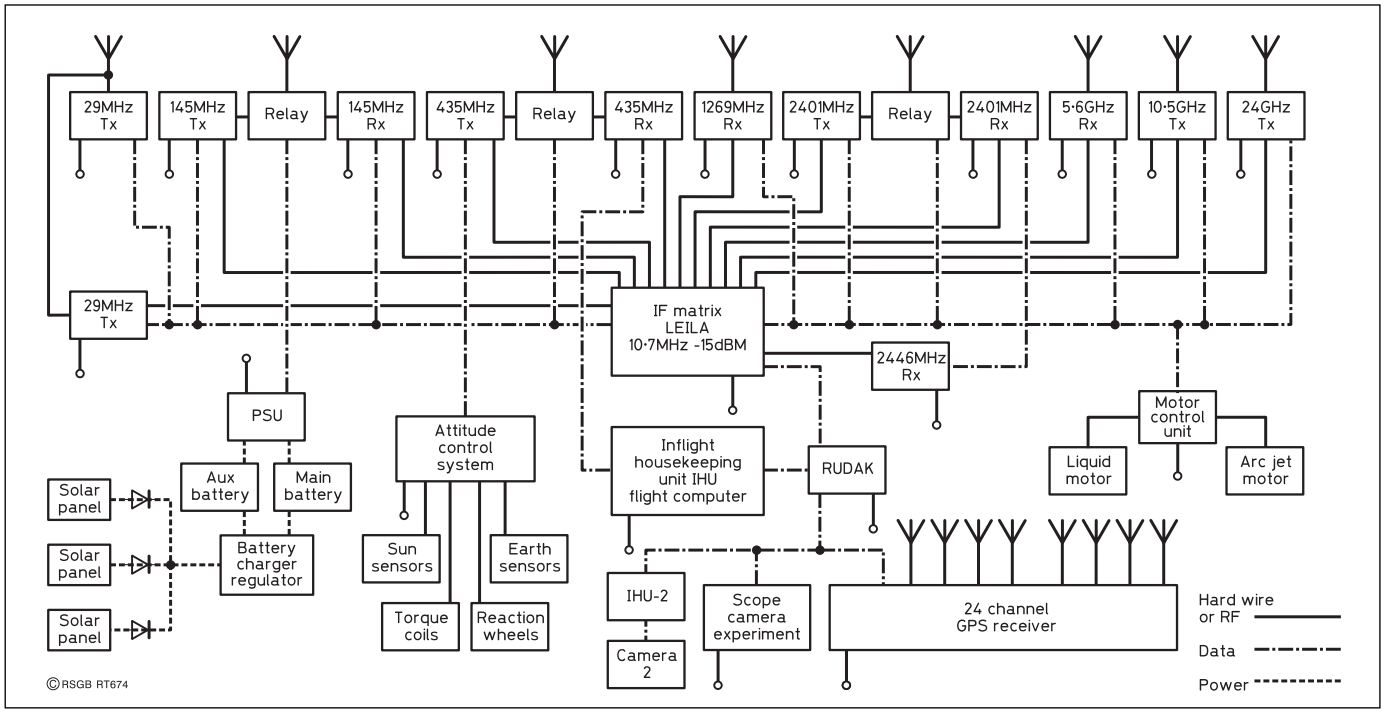


Fig 2: Block diagram of the AMSAT OSCAR 40 spacecraft.

page 45 shows the matrix control screen.

Once AO-40 has been tested in orbit, the spacecraft will be loaded with a schedule telling it which matrix connections to make and these will often depend on several factors. For instance, the use of microwaves during perigee passes will result in a high value of *Doppler shift* (a rapid change of frequency), so these bands will usually only be operational around apogee, where the Doppler shift is much reduced. Another factor can be the availability of electrical power; if AO-40 goes into eclipse then we don't want to flatten the batteries etc. The timetable will be relative to orbit position (sometimes called *phase*).

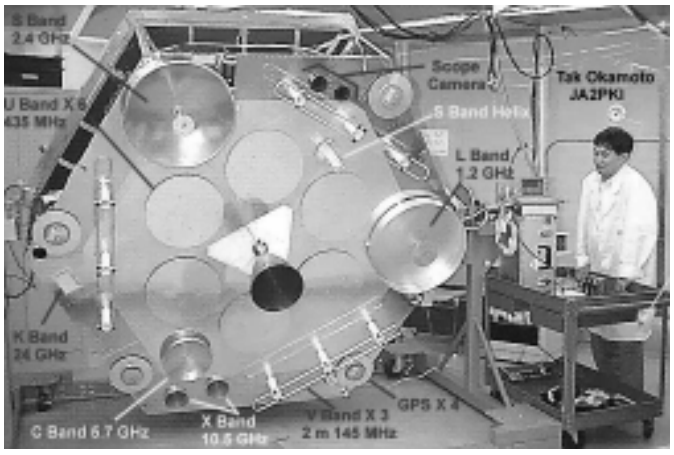
The combination of a receiver on one band feeding a transmitter on another band was generally called a *transponder* and particular connections are called *modes*. Since AO-40 does not carry transponders, merely separate receivers and transmitters which can be interconnected, the existing mode classification (mode-A, mode-J etc) will cease and will be replaced by a designation of interconnection according to band.

So a 435MHz receiver connected to a 145MHz transmitter (which was 'Mode-B') will be called mode UV, and a 1.2GHz receiver connected to a 2.4GHz transmitter will be called mode LS etc. The *first* letter(s) denote(s) the uplink.

The old nomenclature had to be changed because there are so many combinations possible with AO-40's connection matrix, including multiple receivers connected to multiple transmitters.

DIGITAL MODES

AS WELL AS THE traditional (*analogue*) links, AO-40 will carry equipment for the digital modes; a device called 'Rudak'. RUDAK stands for *Regenerative Umsetzer für Digitale Amateur Kommunikation* (in English: Regenerating Transponder for Digital Amateur Communications). This contains two CPUs, DSP modems, and frequency synthesis equipment so it is configurable for many (often simultaneous) digital modes. The Rudak module supports 4 x 9600bps FSK hardware modems, 2 x 153.6Kbps PSK hardware modems and 8 x uncommitted DSP modems.



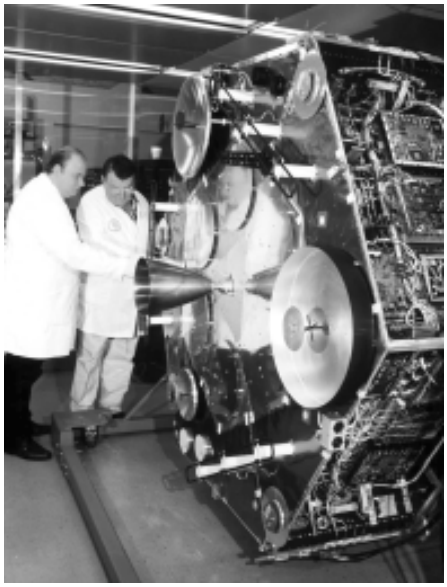
Annotated image from the Phase 3-D lab web pages.

This hardware line-up means we will have a *very* versatile digital package that, in addition to traditional modes, will be software-configurable for any modulation method that may appear during the satellite's lifetime. The opportunity is also there for people to write software for the modems; we need volunteers to work on this - but DSP experience is a must. The satellite will have up to 250 watts PEP output, or about 60 watts continuous. Of that 60W, the digital equipment will have about 20 watts allocated to it. Of course, there ain't no such thing as a free lunch, every digital downlink will need its own slice of the RF power available so it is unlikely that the full digital capability will be exploited because we want to keep the downlink signals strong enough on the ground.

Since AO-40 is much farther away than a low earth orbit (LEO) satellite, the path loss is also much greater. The increased path loss, in fact, just about wipes out the advantage of the higher power, so digital users should expect signal strengths similar to current LEO digital satellites.

BBS operation will use the regular PacSat protocols as currently used on other 9600bps satellites but with more memory, more file system entries and more files kept on board. Users of current digital satellites should be able to work AO-40 with their existing equipment. We currently have no specific plans for the 153Kbps equipment; possible applications are international wormholes and packet forwarding.

In addition to digital operations, Rudak's processor unit acts as the interface for



Phase 3-D is nearly finished. Peter Gülzow, DB2OS (left) and the late Werner Haas, DJ5KQ (right), in the Phase 3-D lab at Orlando.

several onboard experiments. It can also listen to the main beacon output and process that data, probably making it available as files to download from the BBS. But this is just one module on a fairly busy spacecraft and it is likely that commissioning will not occur until some time after launch.

OTHER PAYLOADS

A BLOCK DIAGRAM showing the complexity of AO-40 is given in **Fig 2**. In addition to the communication and support equipment, AO-40 carries some other experiments: cameras, radiation and spectrum monitoring, a new type of computer, and GPS.

The SCOPE unit (Spacecraft Camera for Observation of Planets and Earth) will transmit colour pictures to earth taken with two cameras. One delivers wide-angle pictures of the earth and sky and the other has a telescopic lens for pictures with more detail. This module was built by the Japanese AMSAT organisation. The digital pictures will probably be compressed using the JPEG technique and stored in Rudak for later downloading. Users may later be given the chance to communicate directly with the experiment to take pictures on demand.

A second camera unit is carried as a technology demonstrator for future experiments. It is not intended to, nor can it, compete with the SCOPE experiment. This will produce black and white images with a slightly wider field of view than the SCOPE narrow-angle camera. Later it might be used as a navigation instrument for earth or star sensing.

The CEDEX (Cosmic-ray Energy Deposition Experiment) unit examines radiation in space and comes from the UoSat Group at the University of Surrey. It consists of two parts, a Total Dose Experiment (TDE) and a Cosmic Particle Experiment (CPE), which are designed for the varying regions of the orbit.

The TDE picks up the total accumulated doses of ionised radiation inside the satellite. The CPE should measure the effect of particle radiation inside the satellite while close to the earth on its Molniya orbit. These measurements are also interesting in examining radiation effects on the satellite's electronics.

The MONITOR Experiment scans the short-wave spectrum from 0.5 to 30MHz, but there is not much extra information about what this data will be used for.

The experimental AMSAT flight computer technology demonstrator, IHU-2, is an Intel SA-1100 CPU clocked at 133MHz. This system supports a three-axis accelerometer, microphone, DSP modem and the black and white CMOS camera previously mentioned. Camera, microphone and accelerometer ran during separation from the rocket, data being downloaded soon after.

GPS receivers are also carried in addition to the regular navigation systems, this allows on-board processing of orbital data. The primary aim of this equipment is to demonstrate that it is possible to generate the position and attitude of an AMSAT satellite by analysing the GPS data.

CONCLUSION

ONE THING we in AMSAT-UK have been very pleased about in the past is the support of *all* the radio amateurs in the country. Whether or not they are interested in satellite communications, most recognise that a lot of hard work is put in by many unsung heroes and they wish us well; we seem to be doing something right.

AMSAT-UK is just one of many international groups working together to keep trends in amateur radio up-to-date. If you would like to give us more than just *verbal* support, why not join and / or contribute directly?

Your money will not be wasted (AO-40's cost of several million dollars mostly came from voluntary donations). See the AMSAT-UK web page at www.uk.amsat.org or write to AMSAT-UK, Badgers, Letton Close, Blandford Dorset DT11 7SS (please note new address), enclosing a large SASE for membership information.

ACKNOWLEDGEMENTS

The AMSAT Phase-3D Project, Norbert Notthoff PhD, DF5DP (seven-part series in *CQ DL*, 1997). Translated from German by DG1EFR and WB8IFM.

Thanks also to AMSAT workers too numerous to mention, and James Miller, G3RUH, and Peter Gülzow, DB2OS, for proof checking and suggestions.

FURTHER READING

[1] *Radio Communication Handbook*, 7th edition, edited by Dick Biddulph, M0CGN, and Chris Lorek, G4HCL. Published by RSGB. Available from RSGB Sales, see pages 66 / 67 for details of how to order. ♦

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www.amsat.org/amsat/sats/phase3d.html
www.amsat.org/amsat/articles/g3ruh/124.html
www.amsat-dl.org/p3dqrg.html (for updated frequencies)

Three Apogees: over Africa, America, and the Pacific. This is the sort of visibility expected in the new orbit. These images are screen-grabs from the AMSAT tracking program *InstantTrack*.

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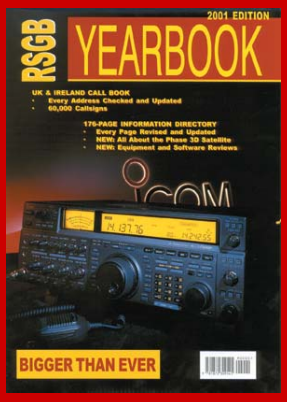

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New Year

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The transceiver is equipped with an IF DSP for main-band use (AF DSP for sub-bands). TS 870 technology has thus been adopted for all-mode applications - VHF and UHF as well as HF.

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The new TS-2000 will be available from ML&S, the largest retailer of Kenwood in the UK.

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TS-2000 *'The Millennium Communicator'*

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Power Output:	5 Watts SSB/CW/FM with 13.8V External DC: 1.5W AM Carrier 2.5 watts SSB/CW/FM with 9.6V NiCad or 8 "AA" batteries (AM: 0.7W)
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Case Size:	5.31"x1.5"x6.5" (WHD)
Weight:	2.6lb (with alkaline batteries, aerial but without microphone).

Estimated RRP:
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Yaesu VR-500

Whilst this tiny product is a scanner, its so good we thought it suitable to offer as a pocket receiver for use by Radio Amateurs. The added bonus is that itís so small you really can sneak it on holiday with you without the beloved noticing!

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- Modes NFM,WFM,AM,USB,LSB,CW
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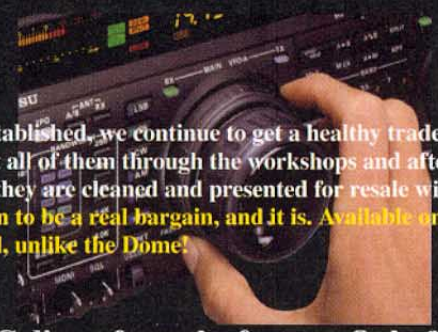

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Icom IC-746 The best HF, 6M and 2M base station available today. Built in PSU and large LCD display ensures it stays in the top ten purchases at ML&S.
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ONE MAKE OF receiver that enthusiastic listeners seldom seem to have a bad word to say about is Grundig. Its range of 'Satellit' receivers has been with us for some years, and now there is a new one in the shape of the 'Grundig Satellit 800EU Millennium Receiver'.

The first thing that ought to be mentioned about the 800EU is its size, because it certainly isn't the kind of receiver that you would throw in your suitcase to take on holiday. Measuring 520 x 228 x 203mm (20.5 x 9 x 8in) and weighing-in at 6.6kg (14.5lb), it is most definitely the kind of receiver that would stay in the shack. The most interesting thing about this new receiver, however, is what's inside it.

The development of the 800EU was in fact a collaboration between Grundig and R L Drake - a name that will be familiar to many (for all the right reasons) - brought about by US company Lextronics. The result is that the 800EU is actually heavily based on the Drake SW8.

According to Nevada, Grundig didn't consider it worthwhile importing the 800EU into Europe on the grounds of it being so specialist, so Nevada obtained the necessary agreement to do it themselves.

DIGITAL RADIO: LW - µW

THERE ARE A number of interesting developments taking place in the world of digital broadcasting, many of them being driven along by the fact that the radio spectrum is now seen as an extremely valuable 'commodity'. As with all things, though, not all countries (initially, at least) want to adopt the same standard, with the 'not invented here' syndrome sometimes rearing its ugly head. Also, a standard that is appropriate for one part of the spectrum isn't necessarily so for another part of it, so it may well be the case that there is no ultimate victor in the battle of the digital radio formats.

LW-SW

A new wave of broadcasting is about to reach the marketplace, with the recent adoption by the ITU of a *world-wide* standard on digital sound broadcasting. The technology breakthrough promises to open up a new era of quality sound broadcasting for long, medium and short wave transmissions. For consumers, the decision means additional sources of programmes at FM-like quality with low-cost, simple to use receivers.

Because the same frequency bands based on the same channels will be used and receivers will continue to be available in the same range of choices, the changeover to the new system is intended to be completely transparent. What will be noticeable, however, will be the improved quality.

For manufacturers, Digital Radio Mondiale (DRM) seems set to bring a bonanza, because with potentially some 2.5 billion radio receivers that will ultimately be candidates for replacement (of which some 700 million are short wave), combined with an estimated 1000 transmitters worldwide, the benefit for equipment and semiconductor manufacturers is clear.

For broadcasters, the new technology means that they will be able to bring FM quality to AM bands at substantially lower costs.

Because the new technology will use existing frequency plans, they will be able to modify and continue to use their existing transmitters, provided they are fairly modern.

Digital AM will also be much more spectrum-efficient, making it possible to reduce the power of transmitters while maintaining the same coverage area. Broadcasters will also be able to transmit programmes in two languages, a plus in bilingual countries or in border zones between countries that use different languages.

Digital AM radio is expected to reach mass market by 2003. In the transition period, transmitters and receivers will handle both analogue and digital signals, thus enabling broadcasters who have large operations in the AM bands to opt for simulcast to continue serving their customers while building a new market. Manufacturers are expected to provide the market with multi-standard receivers to enable the simultaneous reception of analogue AM and FM as well as digital AM stations. Broadcasters will be able to launch full digital AM on vacant AM channels, as the receivers will recognize both analogue and digital signals.

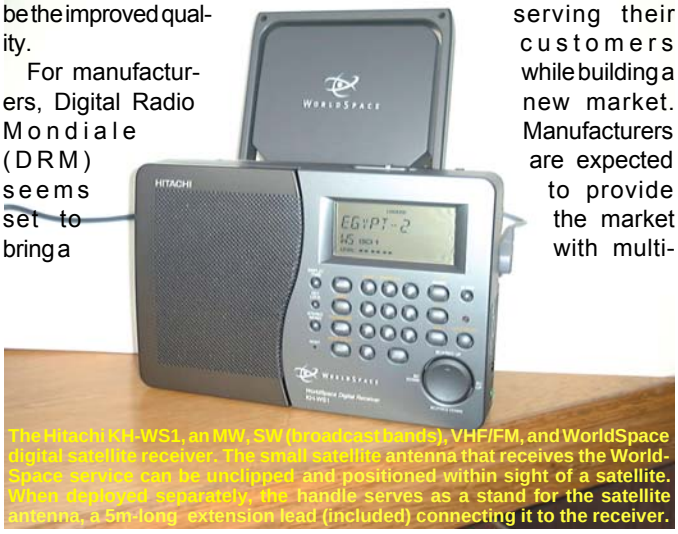
VHF

RadioScape, a UK company based in London, and Texas instruments have signed a technology licensing agreement that should substantially reduce the cost of Digital Audio Broadcasting (DAB) receivers to consumers. To date, DAB (Eureka-147 standard) receivers have been more expensive than analogue due in part to their low production volumes, which in turn has held back the roll out of the digital infrastructure globally. However, the agreement between Texas Instruments and RadioScape will enable digital radio manufacturers to give consumers affordable, portable receivers.

TI also said it has invested an undisclosed amount in the London-based technology company which is focused on providing software solutions for the Eureka digital radio standard. Europe, parts of Asia and Canada have all adopted the Eureka standard.

Meanwhile, it is reported that UK-based Psion PLC is currently using TI DSP products and RadioScape software in its recently-launched 'Wavefinder' digital radio. The Wavefinder is a DAB receiver for the PC platform that makes full use of the new audio and data services that can be broadcast with dig-

The new Satellit 800EU Millennium Receiver. Grundig on the outside, Drake on the inside, made in China.



The Hitachi KH-WS1, an MW, SW (broadcast bands), VHF/FM, and WorldSpace digital satellite receiver. The small satellite antenna that receives the WorldSpace service can be unclipped and positioned within sight of a satellite. When deployed separately, the handle serves as a stand for the satellite antenna, a 5m-long extension lead (included) connecting it to the receiver.

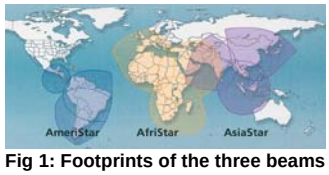


Fig 1: Footprints of the three beams of the Afristar, Asiastar and Ameristar satellites. The beams carry differing program contents to different areas of the globe.

ital radio… and the broadcasting of data is seen as a huge growth area.

µW

Needless to say, radio is already being broadcast digitally from the Astra satellite (and others). However, as these services require an accurately-aligned dish antenna to receive them they are also eminently unsuited to operation whilst on the move. Neither are they suited to countries where finances don't permit people to equip themselves or where the satellite doesn't provide a signal.

An alternative digital radio service is however being provided by the WorldSpace Corporation, which transmits digital radio on around 1.5GHz (L-band) and which can been received in most parts of Europe, Africa, Central and South America, and the Far East (see **Fig 1**). Where WorldSpace seem to have carved out a market niche for themselves is by getting companies such as Hitachi, JVC, Panasonic and Sanyo to adopt their standard and produce affordable receivers.

The WorldSpace service is received via a small antenna, which has to be deployed within sight of one of the beams from one of three geostationary satellites. Sufficient signal passes through glass, so the antenna can be deployed indoors. Orientation of the antenna is not critical, so it is possible to walk along while listening to digital radio from the satellite. Soon it will be possible to drive along too, as a car radio is under development that will receive WorldSpace transmissions. This is expected to be available later in the year. Most of the currently available WorldSpace receivers also receive conventional analogue broadcasts, so users are not restricted to listening to transmissions from satellite.

At the moment about 25 stations are being broadcast to Europe on beam 1 (the west facing beam) of the Afristar satellite, which accounts for about 50% of the capacity of the beam. Other beams of Afristar (and the beams of Ameristar and Asiastar) contain different mixes of stations, according to the agreements between WorldSpace and the owners of the stations concerned.

As and when more stations sign-up, listeners will simply be able to scan through more broadcasts.

BUTTON-FREE ZONE

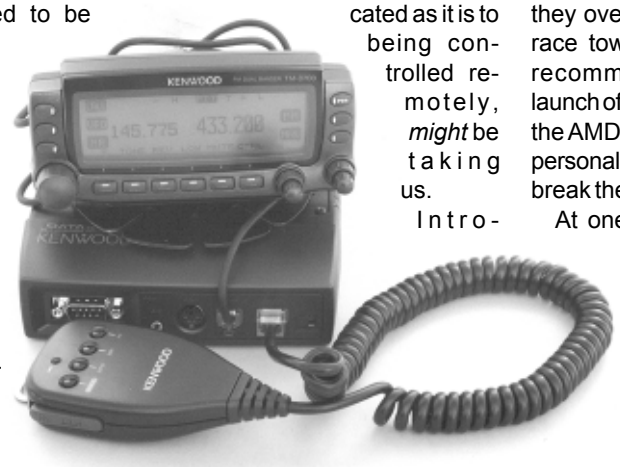
READERS WILL HAVE seen advertisements now for the new all-band all-mode Kenwood TS-2000. What wasn't mentioned in the initial advertising was that there will soon be a second version of the TS-2000, the TS-B2000. So what will be the differences between the two models?

The main difference will be that, except for an on / off switch, the TS-B2000 ('B' standing for 'blank'?) will have no controls on the front panel. So how will you control it? In fact there will be two methods. . .

(1) Software for MS Windows® will be included in the package, so when you're in the shack you'll be able to drive it from your PC via a cable.

(2) For mobile operation, a small, neat control head, the RC-2000 (similar in style to the head of the TM-D700 - see the photo below) will be available as an optional extra.

At this point it might be useful to step back and take a look at where the TS-B2000, dedicated as it is to being controlled remotely, *might* be taking us.



Kenwood TM-D700 and control head. Expect the RC-2000 control head to look similar.

Introduced a couple of years ago, the Kachina was the first commercial amateur HF transceiver that didn't feature a conventional front panel. Now one of the major manufacturers has decided to go down the same route. How soon will it be before others follow? How soon will it be before the remote-controlled version of a transceiver becomes available *before* the version with a conventional front panel? How soon will it be before a transceiver is *not* available with a conventional front panel? And how soon will it be before someone produces a QRP transceiver on a card that fits inside your PC?

HOW FAST?

SINCE THE LAUNCH of personal computers, the speeds at which they run have been increasing, but the rate of increase hasn't always been steady. In the days of the 386, clock speeds would creep up a few megahertz at a time, and sometimes it would be several months between any apparent progress in technology. More recently, the progress of Intel's Pentium and AMD's rival, the Athlon, have been similarly erratic. For a while there seemed to be a speed plateau around 500MHz, caused by the manufacturers not being able to etch components any smaller. However, as soon as they overcame the hurdle, the race towards the 1GHz CPU recommenced. The recent launch of the Intel Pentium 4 and the AMD Thunderbird has seen personal computer CPU speeds break the 1GHz barrier.

At one time the microwave region was exclusively the domain of the expert, but the CPU running at microwave speeds is now with us. The question is, how much faster are these things set to go? Well, by the end of this year, I'm told that a 3GHz CPU should be available. As for 2002, that seems to be anyone's guess.

JUST AN IDEA

WE ARE ALL familiar with the fact that car radios fit into a standard mounting in the dashboard. The models from manufacturer X might differ in features from those of manufacturer Y, but not the size.

Wouldn't it be good if an amateur radio equipment manufacturer produced a transceiver and broadcast receiver combined that fitted into one of these standard sized holes?

TODAY'S PRICE IS . . .

THESE DAYS WE live in a stable economy, where the prices of most things (except petrol, it seems) don't change much from day to day. However, if you shop for computer components on the Internet, the opposite is now the case. The development of e-commerce and the constant march of technology have led to web sites being created where the prices of components etc change dynamically (or so it seems).

An example of something that had an extremely volatile price (a couple of months ago, at least) is computer memory, which was literally changing price daily. Some days it would go up and some days it would go down, so it is clear that supply and demand were dictating the price.

The moral of all this seems to be that it is more important than ever to shop around. Today this means visiting web sites such as PC Index frequently, to see how the prices are moving. Keep a careful eye on how the prices of the goods you need are changing, and buy at the time when you think they are at their best. ♦

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in practice

Ian White, G3SEK *

http://www.ifwtech.com/g3sek

E-mail: g3sek@ifwtech.com

VHF/UHF 'NOISE FLOOR'

HOW MUCH SENSITIVITY can you really 'use' on the VHF and UHF bands, before you are limited by external noise?

THIS IS A COMPLEX topic, but you have already understood the main point: when a receiver is connected to an antenna, the signal-to-noise ratio is limited by the amount of external noise that accompanies the incoming signal. With a very low-noise receiver you can approach that fundamental limit, but there are other penalties involved as we shall see.

This discussion is condensed from Chapter 4 of *The VHF/UHF DX Book* [1] which begins by introducing the concept of noise temperature. Any electrical conductor contains electrons which are more or less free to move around. At temperatures above absolute zero (-273°C) these electrons are in random motion, rushing back and forth but, on average, getting nowhere. A random movement of electrons constitutes a fluctuating current, which can be detected as random electrical noise. Converted to audio frequencies, this is the rushing sound you hear on an empty frequency on a VHF receiver. FM operators tend to call it 'smooth noise' as distinct from ignition noise or other man-made pops and crackles. At any temperature above absolute zero the thermal noise power generated in a conductor is proportional to its physical temperature, measured on the 'Absolute' scale in units of kelvin (K). Thermal noise is spread evenly over the entire electromagnetic spectrum, so the noise power detected by a receiver is proportional to the bandwidth across which the noise is being received.

With a sensitive VHF/UHF receiver in the SSB/CW position, you can easily hear the noise from a 50Ω resistor at the input - **Fig 1(a)**. At room temperature it is equivalent to about 20nV. That's right, *nano*volts - that's what we mean by 'small' signals in modern VHF/UHF receivers! Heat the resistor up, and you hear more noise; cool it down, and you hear less. However, resistors are not the only electronic devices that generate noise. Imagine a preamplifier connected between the 50Ω resistor and the receiver. Now you hear more noise, and this has two parts: the amplified noise from the resistor; and extra noise from the preamp itself, **Fig 1(b**). Now imagine a third situation, shown in **Fig 1(c**) - a noise-free preamplifier, with the input resistor heated up to a higher temperature so that you hear the same amount of noise as in Fig 1(b). The noise temperature of the preamplifier is basically the increase in temperature of the input resistor between Fig 1(b) and Fig 1(c).

In fact, the noise that the preamp generates is not totally thermal in origin. There are many sources of noise in real-world electronic devices, but they can all be described and measured as an equivalent amount of thermal noise. Any practical receiver adds some noise of its own, so we can talk about the receiver's *equivalent noise temperature* as a measure of its internal noise.

Likewise, there are many sources of noise picked up by your antenna - these too can be measured as equivalent levels of thermal noise, so we can talk about an 'antenna noise temperature'. A matched antenna with a noise temperature of, say, 1000K delivers the same noise power as a resistor cooked up to 1000K. The advantage of thinking in terms of equivalent noise temperature is that it forms a common basis for measuring random noise from just about anything, from a GaAsFET to a galaxy.

When we connect an antenna to a receiver, we now have a receiving system, **Fig 2**, the total noise temperature of which is the sum of the receiver noise temperature and the antenna noise temperature. This is the most important fact: when you're receiving signals, they are always accompanied by noise from both the receiver and the antenna. You can't have one without the other, and if you want to optimise your whole receiving system, you have to think how the antenna and receiver noise levels work together.

The noise temperature of the antenna is determined by the RF environment that it can 'see', not by its physical temperature. For example, a 144MHz beam pointed at the sky for satellite working may be picking up only a small amount of galactic noise, so its noise temperature can be as low as 150 - 200K. On the other hand, if the antenna is picking up thermal noise from its own earthly surroundings, the local temperature of 270 - 300K will also be the noise temperature of the antenna. However, if the antenna is also picking up man-made noise (or noise from the Milky Way in satellite applications) its noise temperature can be much higher. We also have to consider the effects of ground reflection. At VHF, flat ground is a fairly good reflector of RF at shallow angles, and a correspondingly poor emitter of thermal noise - in other words, the ground acts mostly as a mirror. Therefore, in some circumstances, a beam aimed horizontally is effectively seeing cold sky above the horizon and also cold sky reflected from the ground, so its noise temperature can be quite low. This situation gives about 200K as an estimate of the minimum possible 144MHz antenna noise temperature in terrestrial use, except in very special situations where the antenna is aiming out over the sea. However, if the antenna is also picking up man-made noise - which it almost always will be - then its noise temperature can be much higher. Values for 144MHz in cities can easily exceed 1000K - and that's just noise, before we start to consider discrete sources of interference such as spurious emissions from digital electronic equipment.

On 432MHz and above, sky temperatures decrease, but the ground becomes a progressively poorer reflector and better thermal emitter. As a result, a horizontal beam will tend to see about half cold sky and about

* *52 Abingdon Road, Drayton, Abingdon, Oxon OX14 4HP.*

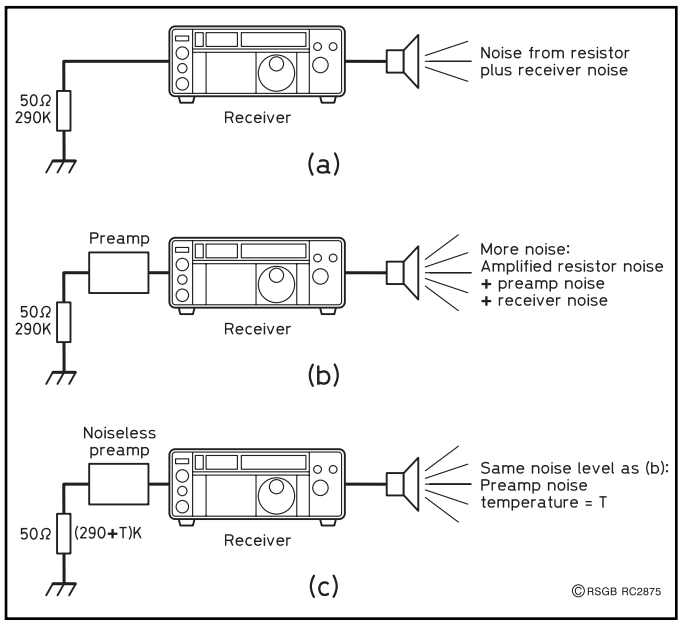

Fig 1: (a) Even a resistor generates thermal noise. (b) Adding a preamplifier generates two components of noise: amplified noise from the input resistor, and noise generated by the preamp itself. (c) The equivalent noise temperature of the preamp is the temperature rise required in the input resistor, to generate the same amount of noise if the preamp itself was noise-free.

half warm ground, so its noise temperature is probably about 150K - except, once again, when aiming out over the sea. This simple picture can, of course, be complicated by pickup of ground and man-made noise on sidelobes of the beam pattern, but we're looking here for *minimum* values of antenna noise temperature as a basis for designing a sensitive receiver.

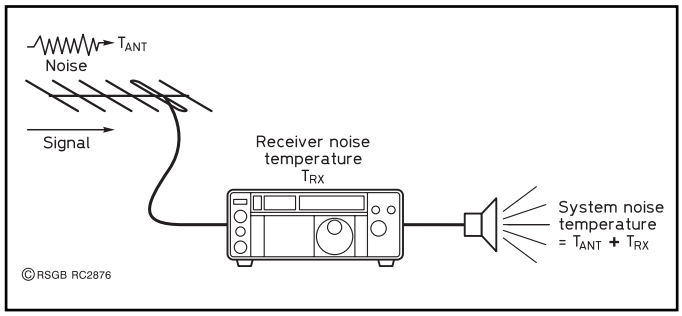

Fig 2: All signals are accompanied by noise picked up by the antenna, which limits the achievable signal/noise ratio. System noise temperature is the sum of the antenna noise temperature and the receiver noise temperature.

At lower VHF frequencies, man-made and atmospheric noise levels become considerably higher than at 144MHz and above. The lightning flashes, pops and crackles from many different sources tend to merge together into something approaching 'smooth noise', but a good noise blanker can be very useful in removing the worst excesses at 50MHz and 70MHz. At 50MHz the minimum galactic noise level that your antenna can possibly see, either directly or mirrored in the ground, is about 4000K, and suburban man-made noise can easily bring this value up to 300,000K. At 70MHz typical figures would be about 300K minimum, ranging up to 150,000K including man-made noise.

So what does all this mean for receiver sensitivity? With modern GaAsFETs we have the capability to design VHF/UHF receivers with noise temperatures of well under 50K… but what's the point, if your antenna noise temperature is 1000K? Your system noise temperature would be 1050K, so your signal/noise ratio would be totally dominated by antenna noise. In most applications we cannot afford to aim for the highest possible receiver sensitivity, because that usually also involves high front-end gain and vulnerability to overload by strong signals. In order to obtain the widest possible dynamic range between the weakest and the strongest signals, we have to compromise. The optimum balance point depends on the band is question, and also on the technology in use. With a typical transceiver front-end, a good design target is to make the receiver noise temperature equal to the minimum antenna noise temperatures derived above. With good design, this can be achieved along with high immunity to strong signals. Translating receiver noise temperature into noise figure [1, 2], gives the recommended design targets for terrestrial use, which are shown in Table 1.

Band (MHz)	Temp (K)	Rx NF (dB)
50	4000	12
70	3000	10
144	200	2.2
432 and above	150	1.8

Table 1: Design targets for receiver noise figure.

If your receiver noise temperature is equal to the antenna noise temperature, this implies a reduction in signal/noise ratio of 3dB compared with an ideal noiseless receiver. However, note that the recommendations are based on the *minimum* likely values of antenna noise. In more typical environments, the signal/noise degradation will be much less. If you're an ambitious VHF/UHF contester, who wants the best possible weak-signal performance and also uses very quiet sites, you can aim for lower receiver noise temperatures. However, this requires care in design, and the use of low-noise devices that can also handle high signal levels. A good alternative, implemented in several modern transceivers, is to be able to switch preamps to change the front-end gain according to the actual operating conditions.

This has been a very condensed summary of a large subject - for much more information, see [1].

REFERENCES

[1] *The VHF/UHF DX Book* - available from the RSGB Bookshop.

[2] For information on converting between noise figure and sensitivity quoted in microvolts, see 'In Practice' for October 1999.

'IN PRACTICE' ON THE WEB

HERE'S AN UPDATE on the status of 'In Practice' resources on the World-Wide Web.

FIRST, THE 'IN PRACTICE' archives are in process of being transferred to the RSGB members-only *WebPlus* site. The complete archive will take some time to appear, because the layout conversion from page to Web is quite labour-intensive.

To help you identify older 'In Practice' articles that might be helpful, I have prepared a detailed and cross-referenced subject index, now covering nine years. This cumulative index is held and updated at my own 'In Practice' site (URL at the head of this column) and there is, of course, a link from the RSGB *WebPlus* site. Eventually, when all the archives are online, I hope we can convert all the index references into hyperlinks, so you can go straight to the article you need. There are already some hyperlinks from the index, mainly to existing areas of my own site such as the 'VHF/UHF Long Yagi Workshop' that include and expand upon 'In Practice' articles.

I try to maintain a policy of not publishing anything on the Web before it appears in *RadCom*, unless it's a correction or something safety-related. However, that policy will become harder and harder to maintain as time goes by, because there are some things you can do easily on the Web that you just cannot do in print - for example, publishing large items like the cumulative index. Of course, only the Web can provide direct links to the indexed resources.

It's those direct links that are the huge strength of the Web. If you don't have Web access, you may not realise what that implies. Almost every component manufacturer's data library is now available on the Web for free download, along with the full catalogues of many distributors.

The Internet and the Web have already transformed amateur radio, for those who have and use them. Certainly they take up some time that we used to spend on the air, but the art of experimentation and self-training in all areas of amateur radio is advancing faster than ever before. We now have e-mail access to people all over the world who share our own particular interests within amateur radio, and they are putting many of their best ideas and projects on their personal Web sites.

Even if you don't have access to the Internet and the Web, you are still benefitting from them in *RadCom* indirectly, although even the best of magazines lacks the immediacy which is unique to the Internet. ♦

'IN PRACTICE' WEB SITE CLOSED

Thought that might get your attention... in fact, only the old site at **demon.co.uk** has closed. As shown at the head of this column for several months, the 'In Practice' pages are now at **www.ifwtech.com/g3sek** Likewise G3SEK's e-mail address is **g3sek@ifwtech.com** - the old **demon.co.uk** address no longer works. If you haven't already updated your bookmarks and address lists, please do so now.

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

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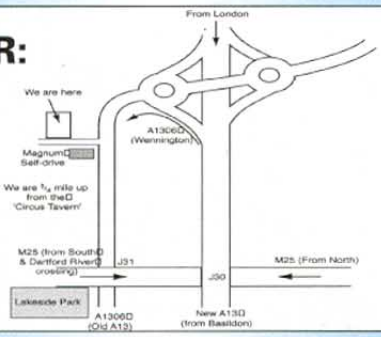

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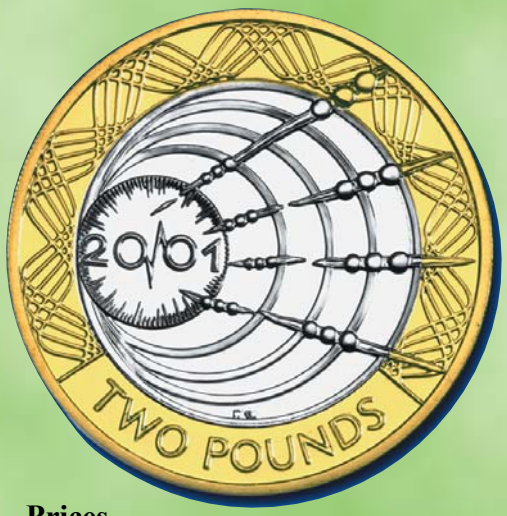

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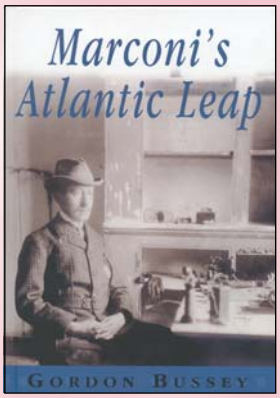

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Technical Topics

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LOOPS, HALF-LOOPS, FRAMES & NVIS

DURING THE PAST few years 'TT' has reported and discussed the controversial views first put forward by Professor Mike Underhill, G3LHZ, and M J Blewett, G4VRN, of the University of Surrey at the 1997 IEE Conference on HF Radio Systems and Techniques (*IEE Conference Book No 411*) in their paper 'Magnetic Loop or Small Folded Dipole'. This argued that the recognised good performance of small 'magnetic loop' antennas could be explained provided that the dominant mode of radiation was accepted to be that of a small folded dipole. This paper was noted in 'TT' in November 1997 and resulted in comments by Dr John Belrose, VE2CV; Alan Boswell, G3NOQ; John Crabtree, KC0GGH; Tony Henk, G4XVF, and several other readers ('TT' February and July, 1998, February and May 1999).

The impression I gained from this controversy was that, while a small HF loop does radiate both as a loop and as a small folded dipole, the overall radiation efficiency is still only of the order of 10 per cent or less, with the contribution of the dipole mode relatively small at HF. This does not mean that the compact transmitting loop does not provide a useful and reasonably effective antenna in locations where it is impracticable to erect a more conventional transmitting antenna.

This topic emerged again at the July 2000 conference (*IEE Conference Publication No 474*) in two professional papers. One was from Alan Boswell, G3NOQ, of the Marconi Research Centre, 'Loop Antennas in the 3-30MHz Band', the other from M J Underhill, G3LHZ, and M J Blewett, G4VRN.

Alan Boswell demonstrates with the aid of NEC-4 simulations that the two lowest-order modes correspond to the true loop-mode (magnetic dipole) as a zero-order mode and to the folded-dipole as a first order mode. He shows that at the frequency at which the circumference of the loop is one-eighth wavelength, the loop mode produces 11dB more radiated field than the folded-dipole mode. The latter becomes relatively more significant at the rate of 6dB per octave in the frequency range of interest. For an 833mm-diameter loop, the fields from the two modes are of equal significance at about 40MHz, but at 14MHz the dipole-mode is some 12dB down on the loop mode, and at 7MHz some 18dB down.

As an example of the use of a loop antenna in the HF band, he considers the performance of an 833mm-diameter, 32mm-diameter conductor loop at 14MHz. He writes: "Its computed radiation resistance at this frequency is 0.05Ω, so that to radiate a power of 100W the loop requires an RF current of 44A. However, the antenna's computed reactance of 160Ω then leads to the rather high terminal voltage of 7kV. Series or parallel tuning would be necessary to isolate the reactance from the driving circuit, and this would lead to a tuned-circuit Q-factor (again ignoring losses) of 3200, and a 3dB bandwidth of 4.4kHz.

"The above illustrates the difficulties associated with using small loop antennas for transmitting in the HF band. However, for certain applications such as near-vertical incidence skywave (NVIS) propagation over ranges up to 400km, the radiated power requirements are modest [particularly since most of the loop-mode radiation will be directed upwards - G3VA]. In addition, the zero-order mode produces a relatively weak electric field in the near-field region of the antenna, thus reducing the electromagnetic interference (EMI) properties of small loops (provided the loop is sufficiently small for the zero-order mode to predominate).

"In practice, the AC resistance of the conductors, and eddy currents induced in the surrounding structures, result in a substantially smaller Q than the lossless value quoted above. This leads to an increase in bandwidth and a reduction in radiation efficiency, both in the same ratio as the reduction in Q-factor. Since eddy-current losses are virtually impossible to predict for a practical environment, the equivalent loss-resistance is best established from a measurement of the Q-factor of the tuned loop… Another source of loss is any impedance-matching circuit that may be in use."

Several of these points are well illustrated in the October, 1991 *RadCom* article 'Loop Antennas – Fact Not Fiction' by Tony Henks, G4XVF. He was one of the first to contradict the idea that, in practice, a small loop can radiate overall as efficiently as a half-wave dipole, a claim commonly found in early – and some recent – articles on small transmitting loops for amateurs.

WHIP- OR LOOP-RECEIVING?

Alan Boswell stresses that, for receiving, small tuned loops can be very effective because, with proper design, losses in the antenna can be offset against the expected value of external noise, without detriment to the system noise figure. "At lower frequencies, with greater external noise levels, this effect allows the loop size in wavelengths to be reduced markedly, so that a 1m diameter tuned loop is probably adequate (in the sense that it can hear down to the external noise level) for all frequencies below 1MHz, depending on the instantaneous bandwidth required. In addition, the zero-order mode has the advantage of weak coupling to the electric field in the near-field region. In some cases a loop receiving antenna can provide considerable improvements to the signal-to-noise ratio when the noise is being generated within a distance of about one-tenth of a wavelength of the antenna."

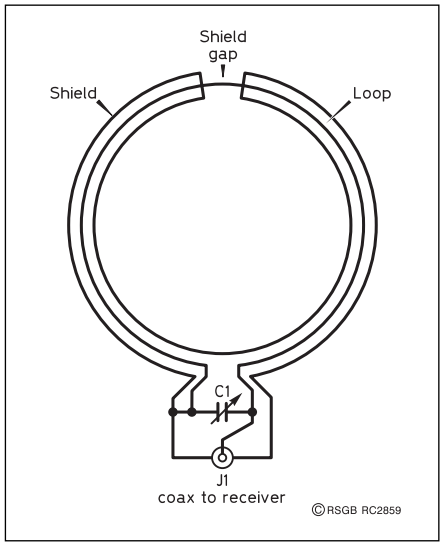

Fig 1: K4IPV points out that one way of overcoming the problems of a loop receiving antenna interacting with structures and its surroundings is to shield it. This works because a small loop antenna responds to the magnetic field component of the incoming signal, and not to the electric field.

On the receiving side, John Wilson ('JW'), G3PCY, in 'Whip, Loops & a Bit of Feedback' (*Short Wave Magazine,* November 2000), provides some interesting comparisons between active whip and active loop antennas with particular reference to the Wellbrook ALA-1530 loop antenna used in connection with the Lowe (badged) AA-150 receiver. He provides detailed comparisons between this loop antenna and high-cost professional active whip antennas. His conclusion is that, given the choice between an active whip and an active loop antenna, "I would take the loop every time. It is infinitely better than the whip in terms of E-field noise rejection. It performs every bit as well if not better than the classic end-fed wire. It has very useful nulls for rejecting unwanted signals (although you need to rotate it) and is much less likely to suffer damage from electrostatic charges when used as the listener is likely to use it. It's a magic device and works particularly well

with the HF-350."

A long article on 'Small-Loop Receiving Antennas', by the late Joe Carr, K4IPV, in *Electronics World* (November 2000, pp846-51), is sub-headed 'Small-loop receiving antennas are invaluable for receiving difficult signals anywhere up to VHF. Their strong [null] directivity also makes them ideal for locating transmitters. Joe Carr explains how easy it is to develop your own'. The article includes suggestions for making many of the standard small-loop antennas, including the shielded-loop antenna that can minimise interaction with the ground and nearby structures such as trees, buildings etc - **Fig 1.**

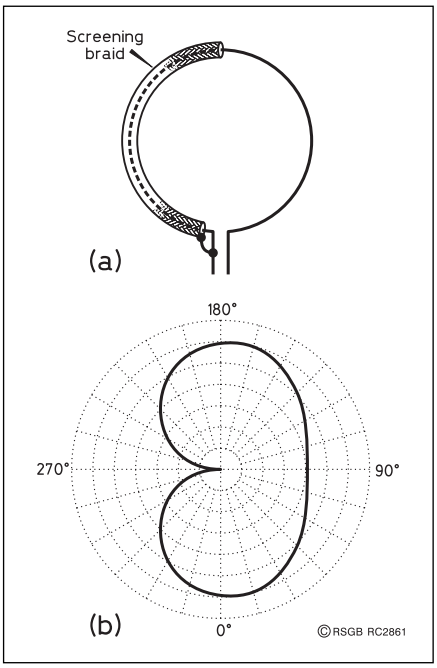

Fig 3: (a) The Canadian 'precision VHF D/F loop' as described in 'TT' June 1991, which integrated a quarter-wave monopole (unshielded section) with a half-wave loop to provide a unidirectional pattern, (b). However, some readers reported difficulties in achieving a consistent pattern.

UNIDIRECTIONAL LOOPS

Reverting to the IEE conference, the paper by Mike Underhill and M J Blewett describes a 'Unidirectional Tuned Loop Antenna Using Combined Loop and Dipole Modes' (*IEE Conference Publication, No 474*, pp37-41). This presents a computer simulation that assumes that both the loop and dipole radiation modes can exist simultaneously. The authors comment on the controversy in 'TT' stemming from their 1997 paper. They now accept that, for the circular loop tuned by a single capacitor, the loop mode is usually stronger than the dipole mode over the typical operating band of frequencies (even if the loop geometry is varied from long-thin through circular to short-fat). Optimum unidirectional characteristics would require a good balance between the loop and dipole modes.

"The best front-to-back ratio (greater than 10dB) has been obtained with one side of the loop tuning capacitor connected to a ground-plane and with the loop extending vertically above the capacitor - **Fig 2**. In this arrangement, the horizontally-polarised dipole mode is, in effect, converted into a vertically-polarised monopole-above-ground mode. Preliminary measurements at 3.7MHz on an (indoor) vertical 1.7m loop-monopole with a minimal ground-plane, 5m above ground, have indicated a pattern having a front-to-back ratio in excess of 10dB. This is found to imply a free-space directivity of 4.37dBi. In practice, the pattern of the loop-dipole is found to be very sensitive both to the local environment and to the presence of multipath propagation. Null depth and direction can vary considerably for small changes in antenna position."

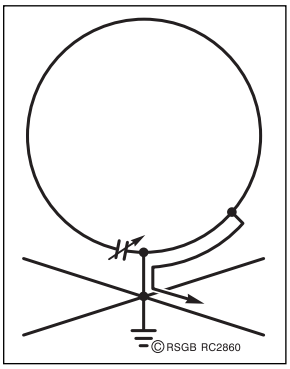

Fig 2: Grounded monopole-loop antenna with gamma feed as described at the IEE Conference by G3LHZ and G4VRN.

I cannot help feeling that, in exploring the effects of a combination of vertical and loop antenna to produce unidirectional characteristics, G3LHZ and G4VRN are in some danger of re-inventing a variant of the VHF D/F loop with integral sensing that was described by Canadian engineers in *IEEE Trans on Consumer Electronics,* November 1990 (see 'TT', June 1991 or *TTS 1990-1994,* p88). In this case, a loop of half-wave circumference was formed from coaxial cable, but with the shielding removed from one half to form a quarter-wave monopole as an integrated sensing antenna - **Fig 3**. Although such antennas had apparently been used successfully in Canada and were commercially available, the feedback I received suggested that readers found it difficult to reproduce the smooth pattern shown.

This is not the case where the loop and sensing antennas are separate as in the German Telefunken P57N portable (mobile) HF direction-finder as produced from 1935 to 1942. The P57N was used, at times all-too-successfully, to hunt down Allied wartime clandestine transmitters - **Fig 4.**

FRENCH HALF-LOOP

Another paper presented at the July 2000 IEE HF Conference reported on a French development of 'HF 125W Half-Loop Antennas in ALE and ECCM for Land Mobile, Navy and Helicopter Use', by J F Gouin *et al* of Chelton Antennas (*IEE Conference Publication No 474*, pp49-52). This describes a small-sized mobile HF half-loop antenna (**Fig 5)** with an integrated agile coupler suitable for 'frequency hopping (FH)' and 'automatic link establishment (ALE)' in conjunction with a 125W HF transceiver with 50Ω RF output.

The authors note that the basic concept of small-sized loop antennas comes from the 'tuned frame' of Guglielmo Marconi in 1896 at the very beginnings of radio communications. The half-loop configuration is suitable for mobile applications with the folded radiating element short-circuited on a metal support that can act both as a counterpoise and the missing part of a full loop. It is pointed out that loop and half-loop techniques have been drastically improved in the last five years to comply with ALE and FH modes, using powerful microprocessors, fast vacuum relays, and the latest commercially-available linear amplifiers. The design includes a proprietary improvement to enhance the usable frequency range to 2-30MHz

The paper does not provide exact details of the construction of this proprietary tunable half-loop**.** The mobile antenna is a 'half-loop' set up vertically on a metal surface (truck or shelter, ship's cabin, etc) which achieves a performance equivalent to a full loop but is only half the size, making possible operation on small vehicles on the move. The half-loop is folded and joined at each end to the platform's 'earth'. The other 'end' is loaded by a variable capacitor. A

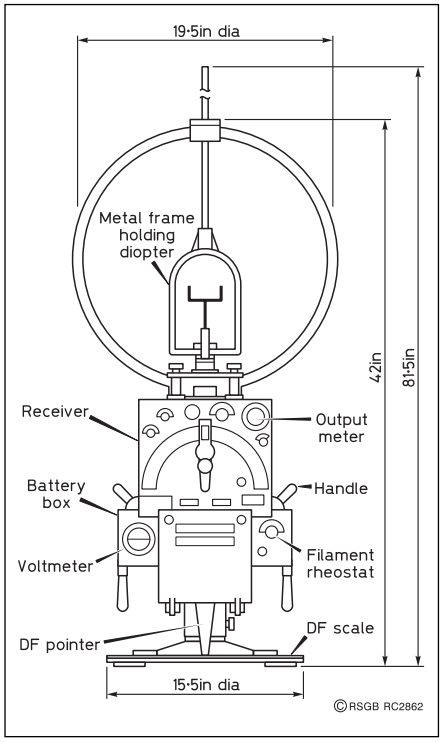

Fig 4: The wartime Telefunken P57N 'portable' HF direction-finder as produced from 1935 to 1942. This equipment was widely used in wooden-sided 'delivery vans' by the Funkabwehr in their pursuit of the wartime clandestine radios in occupied countries.

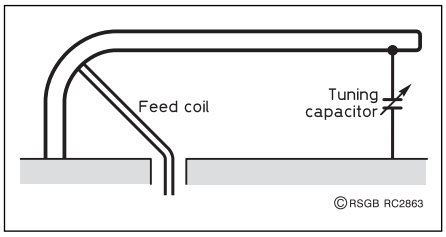

Fig 5: The French half-loop antennas for NVIS propagation for land mobile, navy and helicopter use. The half-loop is folded and joined at each end to the platform's earth. One end is loaded by a variable capacitor. A feed rod (the 'feed coil') links the radio-set RF access to a precise point on the half-loop.

feed rod (the 'feed coil') links the RF to a precise point on the half-loop, making it equivalent to a fixed reactive element; the whole system acts as a loss-free auto-transformer whose primary circuit can be set to 50Ω.

The test antenna covered a range of 2-12MHz with a minimum of 3.5kHz instantaneous bandwidth independent of the environment. With a 2.2m^2 radiating surface, the half-loop reactance was 2μH at 2MHz and 3.5μH at 12MHz. The tuning principle uses switching capacitors in parallel to create a series of bandwidths with mutual covering at a VSWR of less than 2.5:1. The high-voltage fixed capacitors needed to tune the antenna reactance are scaled from 3300pF at 2MHz to 60pF at 12MHz - **Fig 6**.

A 2-24MHz half-loop was then built with acceptable dimensions for land mobile applications (height 90cm, length 2.4m, width 30cm). This antenna is intended for use over ranges of 0-1200km, making use of NVIS propagation effectively to eliminate the skip zone. It is part of the policy that aims to provide radio communications at relatively low power rather than the previous policy of increasing the power of mobile transmitters using whip antennas to 400W or even to 1kW.

Although the radiating efficiency of the half-loop is relatively low, a 1994 field trial run by Thomson-CSF for the French Army reported: "From 0 to 600km all Q/S and

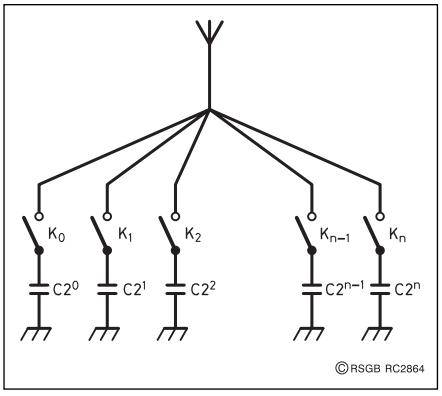

Fig 6: Tuning principle of the half-loop using microprocessor-controlled switches, with a series of capacitors that can provide a capacitance variable between 60pF and 3300pF.

(S+N)/N measurements confirmed faultless behaviour. It always gave results much higher than that of the guyed 5m whip, whatever the climatic conditions. We tried to use the station in the most extreme environment conditions, noting the link results while driving under rain, under high voltage cables either parallel or perpendicular to the road, measuring signal/noise in highly industrialised towns, on country roads, through forests etc. Results were independent of these environmental conditions… Other field trials were successfully conducted in France and several foreign countries in the Middle East and America."

For typical amateur mobile operation, the system could be simplified by the omission of the microprocessor-controlled, fast-switching, frequency-hopping facility, etc.

WARTIME NVIS

The development at Liverpool University, by Dr Brian Austin, G0GSF, and colleagues, of the British Army mobile rectangular half-loop antenna has been discussed in 'TT' on a number of occasions. This was specifically designed to exploit near-vertical incidence skywave (NVIS) propagation. This interest in NVIS is reflected in a paper Dr Austin presented at the IEE Conference (*Conference Publication No 474*, pp225-29): 'Near-Vertical Incidence Skywaves in World War II: an Historical Perspective.' Although the term NVIS did not come into use until the Vietnam war in the 1960s, he shows that NVIS was used by both American and British forces in WW2. However, the British Army, with its dependence on HF for short distance tactical communications, suffered severe shortcomings stemming from the use of short whip (rod) antennas with their pronounced null in their vertical radiation patterns. This was particularly true in some environments which provided only extremely limited ground-wave propagation when using standard low-power portable and even with the more powerful vehicle sets.

He shows that, by 1943, the many failures of British Army radio communications were investigated by the Army Operational Research Group (AORG), under the command of Brigadier B F J Schonland FRS, whose specialist AORS3 section was charged with monitoring the performance of 'Signals in the Field'.

[AORS3 by then included Major E W B (Walter) Gill, an Oxford academic who, in 1940, had rescued the Radio Security Service with its amateur VIs, GPO intercept operators and mobile D/F units. Early in 1940 he had pointed out its proven and potential value as an active branch of Intelligence at a time when the War Office controllers of MI8 wanted to close it down and poach its operators for the Y service. The result of Gill's efforts, supported by Hugh Trevor-Roper (Lord Dacre), was that RSS survived. It was then expanded and achieved most valuable results under the control of MI6/SIS Section VIII from May 1941. – G3VA]

In 1943, AORG3 produced two trenchant reports, written by Major Gill and endorsed by Brig Schonland. The first concluded that the ground-wave range of even the most powerful Army sets could be reduced to a mere mile or two under conditions of adverse ground and high noise level. It strongly advocated the use of low horizontal antennas at HF instead of vertical whips and rods. The second, following a series of field tests, strongly recommended that the British Army should follow the United States (and the Wehrmacht) in using the low-VHF spectrum (ie 30-40MHz) in forward areas.

The failure of the War Office to implement these recommendations until the post-war period undoubtedly led directly to further tragic failures, including the communications shambles of the Market Garden (Arnhem) disaster in September 1944.

CW PSEUDO-STEREO ADAPTOR

OVER THE YEARS, several methods - both simple and complex - of creating a sound-stage for CW signals have been noted in 'TT'. The start was when the late 'Dud' Charman, G6CJ, in a 'TT' item 'Subjective Selectivity - or More Cocktail Parties' (November 1973) disclosed that, in January 1958, application had been made by EMI (naming him as the inventor) for a British patent (No 916,543 *Improvements relating to radio telegraph receivers*). The Patent described the arrangements necessary to assist a radio operator to separate wanted CW signals from unwanted transmissions around the same frequency by means of 'psychological or subjective' effects.

G6CJ had been prompted to disclose his early work in this field by my report ('TT', August 1973) of a 'frequency scissors' (*frequentieschaar*) detector developed (also in 1958) by Hans Evers, PA0CX, and brought to my notice by Dick Rollema, PA0SE. This item included a suggestion by Richard Harris, G3OTK, that stereo-like effects could be achieved by means of all-pass filters. Later, G6CJ and G3OTK collaborated in producing a detailed article 'Subjective Selectivity and Stereocode' (*Radio Communication,* September 1975, pp674-81). This included full constructional details of a 'stereocoder' using six 741 op-amps and two LM380N audio amplifiers.

This was a fairly complex constructional project and does not appear to have been widely taken up, although I recall that one

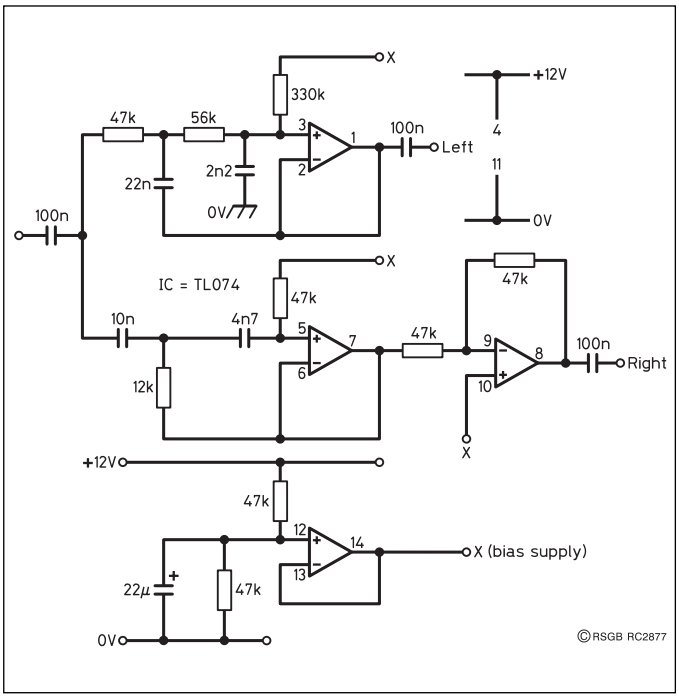

Fig 7: G3DXZ's pseudo-stereo adaptor for use with self-powered loudspeakers using a 600Hz centre-frequency.

firm offered a complete kit of parts. The later availability of several op-amps packaged in a single IC (eg TL074) makes it possible to provide effective pseudo-stereo effects in a markedly easier-to-construct unit.

Chas Fletcher, G3DXZ, writes: "Since 'TT' featured 'Pseudo-Stereo' as an aid to CW reception, albeit some time ago, I wonder if readers might find my recent experiments of interest. Having come by a pair of small, ex-computer, self-powered stereo loudspeakers, I have fitted a small PCB holding the circuitry shown in **Fig 7**. The results are quite interesting and a definite spatial movement occurs when the frequency of the CW changes. I use a centre frequency of 600Hz and this results in a centre-stage position for this frequency.

"Listening on a crowded band with a fairly broad receiver passband, say 2.7kHz, gives a spread of stations in the space between the loudspeakers. Stereo headphones of course would also produce good results. One can easily point to the direction from which a station comes. I used a standard stereo set-up with the speakers placed at two of the corners of a three-foot equilateral triangle with my head at the third corner.

"The circuit of Fig 7 is based on a pair of Sallen-Key filters, one low-pass and the other high-pass, the turn-over frequency being 600Hz. A second inverting amplifier is needed in one side in order to cause the 600Hz tones from the two filters to add together. Without this amplifier there is a hole (null) at the centre! A single TL074 amplifier is used and consumes little current. I used the active loudspeaker supply, about 12V, as a power source. A PCB layout is available should any reader require one (£1 from Chas Fletcher, G3DXZ, 12 Park Crescent, Retford DN22 6UF).

"Incidentally, these little active loudspeakers, which are normally supplied for computer sound output, represent extremely good value even though their technical description often falls in the 'damned lies' category of statistics. Those I purchased, priced £6.50, were said to be '200 watt' models, even though powered by a transformer rated 9V, 0.2A! I confess to finding it difficult to reconcile these figures! [Possibly 200mW has emerged as 200W? – G3VA.] They certainly do not give hi-fi reproduction but they do produce acceptable sound quality for communications purposes."

FUNCTIONAL SAFETY AND EMC

DAVE WILLIAMS, G3CCO, draws attention to an article 'EMC and Functional Safety' in *IEE Review* (November 2000, pp34-37). This warns manufacturers that meeting the European Electromagnetic Compatibility Directive (EMCD) may not in itself be sufficient to ensure the immunity from RFI of equipment where failures or malfunctions could present safety hazards. It is by Keith Armstrong, chairman of an IEE Working Group that has produced a new *IEE Guidance Document on EMC and Functional Safety* which is freely available via the web from www.iee.org.uk/PAB/EMC/core.htm

The article stresses that electromagnetic disturbances can have serious consequences on functional safety even with full EMCD compliance. The EMCD requires most computers and light industrial equipment to carry a declaration that they will function adequately in RF fields of up to 3V/m. As **Table 1** shows, some commonplace situations can easily result in this limit being exceeded. It also requires computers and equipment for use in industrial plant to declare that they will function adequately in RF fields up to 10V/m – implying a three-fold reduction for the distances given in Table 1. Clearly, people should not use cellphones or PMRs if they are within range of such items unless they have been appropriately 'EMC hardened' or unless errors or malfunctions are acceptable. Large computer systems are often found to fail EMC tolerance tests at field strengths as low as 1V/m, despite being constructed from products that individually meet 3V/m. So, for large computer systems, the distances in Table 1 should be multiplied by three to obtain the 'safe' operating range for the various mobile transmitters.

Source	RF power (W)	3V/m range* (m)
Cellphone	0.8	1.5 - 3
Cellphone	2.0	2.5 - 5
PMR	4.0	3.5 - 7
Vehicle mobile	100	18 - 38

Table 1: 3V/m sources.
*** In practice, range depends on the proximity of metal objects and surfaces.**

Apart from hand-held transmitters, potential sources of 'non-standard' fields include microwave ovens and dryers, wireless LANs, industrial, scientific, or medical equipment that uses RF energy for its primary function (plastic welding, medical diathermy, induction heating, butter-softening, etc), base stations (for pagers, cellphones, PMR), radio and TV broadcast, vehicle mobile transmitters (on cars, trucks, aeroplanes, boats and ships), radars (civilian, military, marine, aircraft, etc). No mention is made in the article of mobile or fixed amateur radio transmitters although their powers may be significantly higher than those shown in Table 1.

For the amateur, a particular concern must be the effect of his mobile transmitter on the electronic systems in his own or in passing vehicles. Some of the up-market manufacturers now include advice in their users' manuals, stressing the importance of achieving a good SWR on the feeder cables to external antennas.

HERE & THERE

VALENTIN TRAINOTTI, author of the *IEEE Trans Broadcasting* paper on the MF AM grounded dipole on which the item 'New Life for the Skirted Dipole' ('TT', July 2000, p53) was based, writes from Buenos Aires to express appreciation at the interest shown in his antenna. He found an error in Fig 1, where the tower height seems to be a wavelength and the skirt tower connection near the middle a half wavelength. These values should be: tower height about a half-wavelength (as stated in the text), and the skirt tower connection a quarter-wavelength. ♦

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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-989 ATU OUR PRICE £329.95

3kW 1.8 - 30MHz "T" Match carr. £7.50

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

MFJ-986 ATU OUR PRICE £299.95

3kW Differential 1.8 - 30MHz carr. £7.50

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

MFJ-962D ATU OUR PRICE £239.95

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

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

MFJ-949E ATU OUR PRICE £139.95

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

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

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

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

MFJ-969E ATU OUR PRICE £169.95

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

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

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MFJ-1786 £349.95
MFJ-1788 £389.95

carr. £7.50

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

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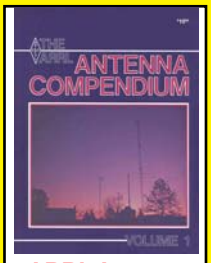

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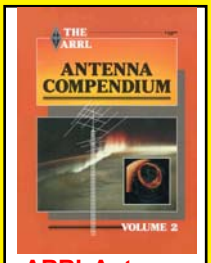

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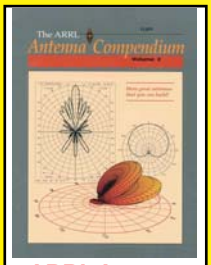

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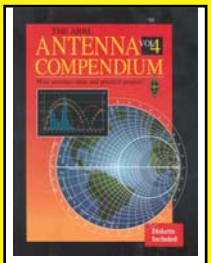

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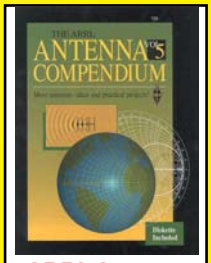

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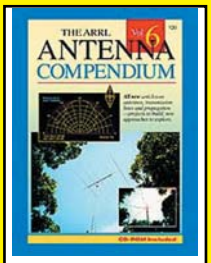

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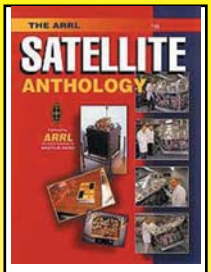

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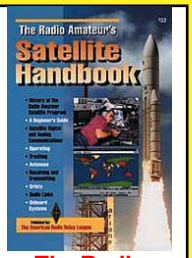

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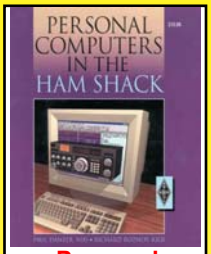

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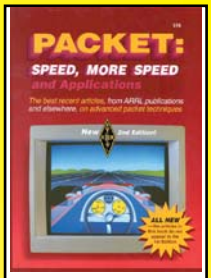

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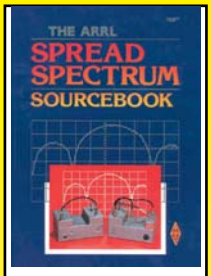

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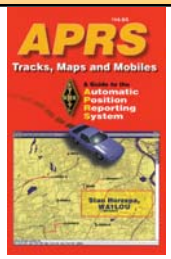

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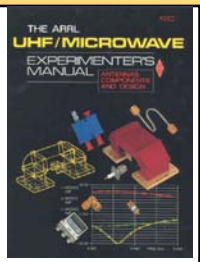

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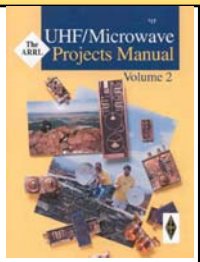

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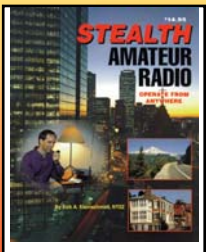

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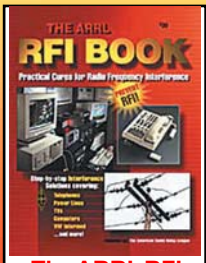

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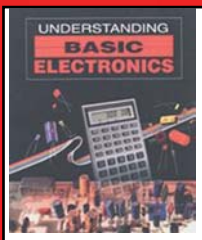

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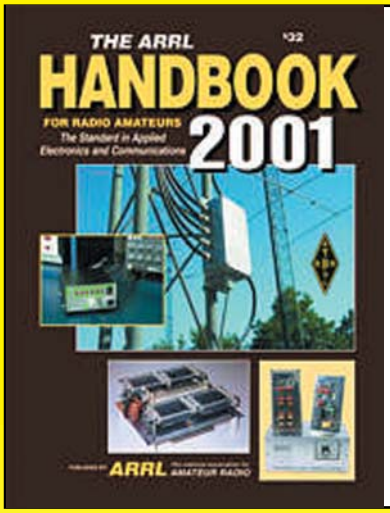

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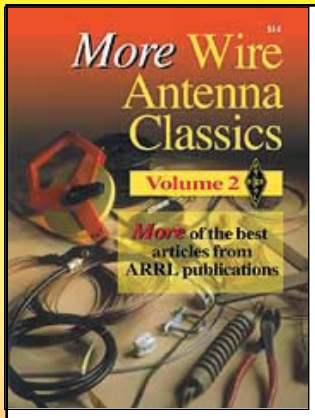

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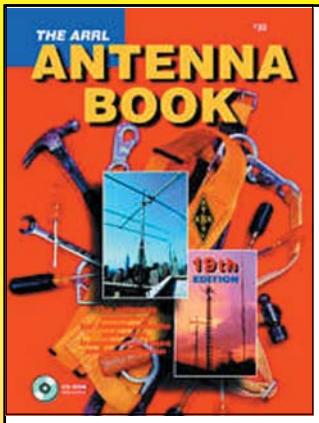

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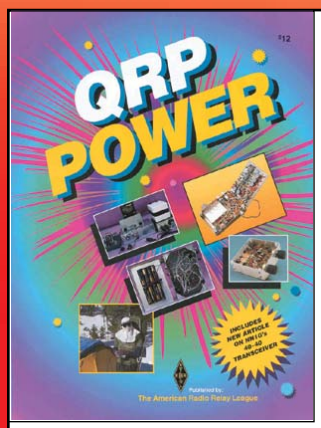

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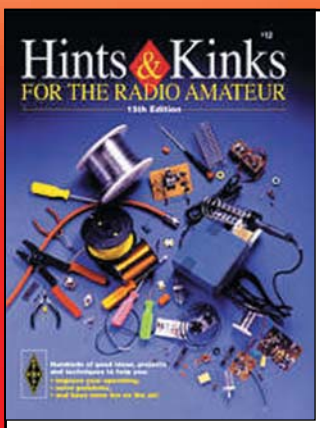

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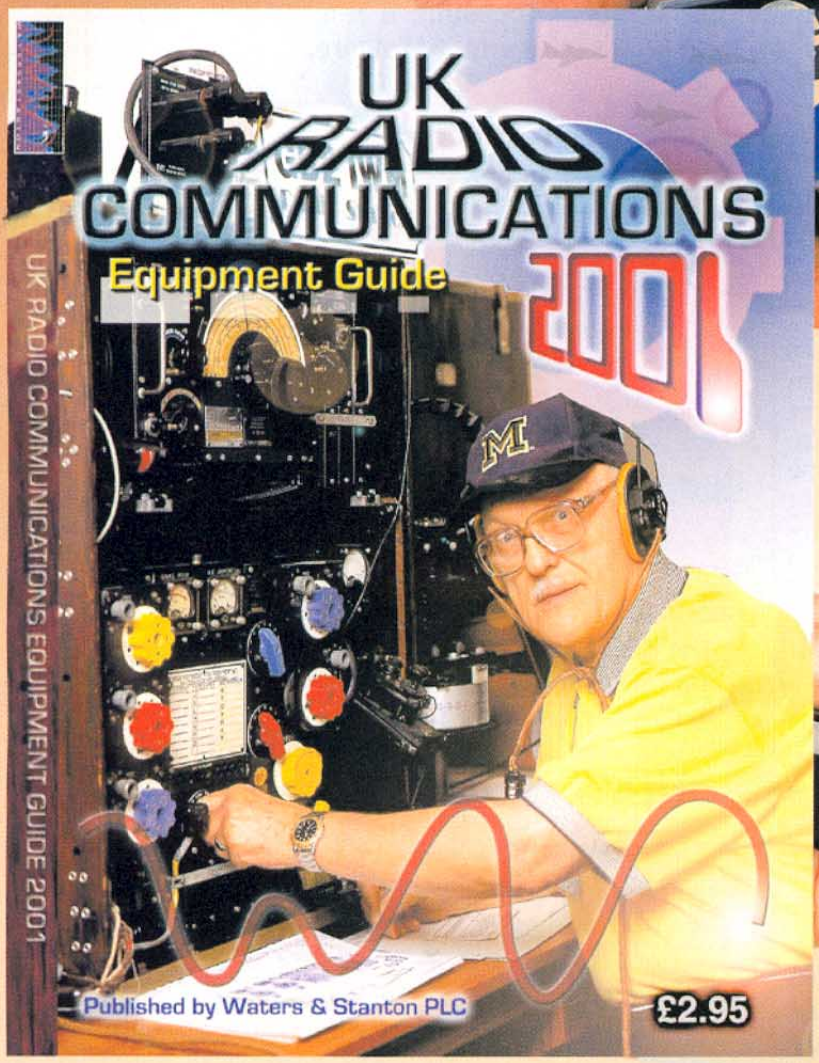

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Members' Advertisements

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

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

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

FOR SALE

FT-902DM, £250. FC-902, £90. FT-102, £130. All gwo. Tektronix 7603 scope with 7B53A timebase and two 7A18 100MHz BW dual amps. Plug-ins OK, but main-frame has a fault in the x-deflection amp, hence only £50 with man. Softy 53 PROM programmer with MCS51 module and 15 x 8752 and 3 x 8751FB, £150. 2.7kW/3.4kVA generator, Harrington VSF27, 10 minutes' running only, cost £640 new, accept £350. 07771 688 836 (Oxfordshire).
E-mail: g0myx@btinternet.com

JST-245 CW filter, vgc, £1,200. TS-530 CW filter, £300. Pair TH-42E h/helds £120. Pair Welz SP15M SWR/pwr 1.8-150MHz, £30. Timewave DSP-9+E audio filter, vgc, £90. KAM all-mode TNC, h/books, vgc, £100. Ian. 01304 821 588 (Dover).
E-mail: g3roo@gqrp.com

KENWOOD TS-950S 150W HF tcvr, very rare rig, dual frequency receive with sub-VFO, auto-ATU, 500Hz CW filter fitted, scanning FIST mic, in exc cond, £950 ono. 07976 241 521 (Wakefield).
E-mail: jm@nwrc.org

1 only Polyskop SWOB 1, 0-400MHz. 1 only Polyskop SWOB 2, 0-1000MHz. No reasonable offer refused. EI6AI. 00353 733 7017 (Co Donegal).
2-10GHz slotted line measuring system, £60. 40ft heavy square tube mast, £45. 2m Yagi, £5. Rittal weatherproof cabinet 38 x 60 x 21cm, £19. H100 feeders, £7-£10. Noise figure system 100-2,300MHz, £45. Digital multimeter, £35. Marconi sig gen 10-470MHz, £99. WG16 bits, transformers, relays etc. G4NVA, QTHR. 01477 533 011 (Holmes Chapel).
E-mail: roger@zczc.demon.co.uk

SILENT KEYS

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

2E1BND	Mr D Witham	26/12/00
2E1HDE	Mr L W Burgess	15/12/00
EA7BA	Mr A M Mills	21/11/00
G1DMJ	Mr D M Jones	30/11/00
G1HCX	Mr F J Hart	14/11/00
G2CXO	Mr G Miles, OBE	
G3DTA	Mr G F Nottingham	19/11/00
G3KWP	Mr P G Lynch	15/11/00
G3NOB	Mrs R G Shepherd	12/12/00
G3XKF	Mr J Sharratt	24/08/00
G3YCC	Mr F W Lee	31/05/00
G4FLL	Mr J M Trotter	22/12/00
G4JT	Mr DAW Clark	
G4PIF	Mr G Tynemouth	06/11/00
G4ZQD	Mr J Hamer	11/00
GW3OKM	Mr J R Mitchell	
ON4RY	Mr M R Bonnivert	02/03/00
RS95641	Mr F M Leslie	
VK7AZ	Mr D Parish	30/10/00

AEA PK-232MBX, EPROM issue 7.1, includes PACtor, mans, cables, £110. G3UGL, QTHR. 01234 750 050 (Cranfield).
E-mail: 0100704.302@compuserve.com
AMERICAN HF bands tcvr, SSB and CW, 200W PEP, very small, £165, please no offers, man included. Geoff. 01634 253 056 eves (Medway).
AOR AR-8000 scanner. Unmodded, vgc, case, charger, CU8232 interface, PC-manager software, all mans, £275 ono. Watson super searcher £75. G8PRR. 020 8340 4139 (North London).
E-mail:hcorn@cix.co.uk
AR88 gc, £50. HRO, unfinished re-build project, free to good home. G3VNI, NOT QTHR. 01947 895 895 (Whitby).
CLASSIC books list, mostly valve era. Send SAE (A4) for list. Richard Marris, 35 Kingswood House, Farnham Road, Slough, SL2 1DA.
COLLECTORS' items: Commodore PET computers. 8032SK with 8050 FDD. Also Commodore PET 8096. 01767 316 294 between 6pm & 9pm (Biggleswade).
DRAKE R8A HF rcvr, £500 ono. Fairhaven RD500VX rcvr 20kHz-1.75GHz, all modes, 2MB RAM, £500 ono. Drake MN2700 2kW ATU, £200 ono. Datong ASP speech processor, £30 ono. Datong FL1 audio filter, £20 ono. All with mans except FL1, carriage paid. G8PPR. 01274 651 486 (Bradford).
DRAKE tcvr TR7, power supply PS7. CT1AUR, Waldemar Da Cunha Porto. Boite Postal 61 - PT, 2675-901 Estoril.
E-mail: cporto@mail.telepac.pt
DRAKE TR4C with MS4 speaker, PSU and RV4C sep VFO, exc, £325. 01379 783 657 (nr Diss).
E-mail: tmunro@ukonline.co.uk
DX394 communications rcvr, 0-30MHz, AM/SSB/CW, gwo, £75. Realistic PRO30 h/held scanner, 68-512MHz with gaps, gwo, £35. New and boxed Midland LMR 70-152B VHF 4-channel h/held with nicad battery pack, aerial and charger, ideal for 2m, £30. New SMC 31746 6-channel VHF h/held without battery pack, £15. Hansen UBI 430-440MHz directional coupler (new), £15. 01243 586 838 (Bognor Regis).
E-mail: dfall@btinternet.com
ELECRAFT K2 tcvr, with SSB, NB, and mic preamp modules. Fully built and aligned, £490. Down east microwave 144-28 transverter, high dynamic range, low NF, 25W output, £90. Icom IC-746, 500Hz CW filter fitted, £850. All exc cond, postage extra. 01522 878 784 (Lincoln).
E-mail: bradbeerfamily@aol.com
FIFTY years of *RadCom*s and *Bulletin*s in small boxes to fill boot, collect only, £10. GW4KVJ, QTHR. 01443 813 100 (Ystrad Mynach).
E-mail: yblanfa@easicom.com
FOR sale, Yaesu FT-290RII with 28W amplifier clip-on type battery pack, charger and light power supply, £230. Lowe HF-225 rcvr with Datong active antenna, £125. 01256 473 508 (Basingstoke).
FT-1000MP (mint) inc 2kHz filter and noise reduction module, MD-100 mic, SP-8 speaker, all complete for £1,200. 01530 412 628 (Ashby-de-la-Zouch).
E-mail: ron@tucker9.freeserve.co.uk
FT-101ZD, £150. AMT1 AMTOR RTTY CW VIC20 CPU, £100. Linear FL-1000, £240. NCR CPU Deskjet 520 printer, £160 carriage extra. 01202 666 299 (Poole).
FT-50R 2m/70cm h/held, 5W o/p, nicads, charger, speaker mic, box & man, £150. FT-8000 2m/70cm mobile 50W/35W o/p box & man, £170. TR-2300 handie, nicads & man, no charger, £45.MFJ-16010 ATU, £25. RA17 rcvr & man, £100. All plus postage except RA17, buyer must arrange collection. Terry, G4OXD. 01462 435 248 (Hitchin).
HAMEG digital storage oscilloscope, 2ch, 20MHz, £150. Yaesu FRG-7700 with memory, £175. Kenwood TS-820S, £200. Baycom USCC4, 1200 & 9600 baud, software, man, £50. Fluke 8022A multimeter 0.25% acc, £35. G3ZUE, QTHR. 01297 489 239 (Bridport).
E-mail: anick@cwcom.net
HEATHKIT SB200 linear plus spare valves. PK-232 data controller, reasonable offers. 01932 254 329 (Walton-on-Thames).
E-mail: g3xhk@aol.com
HENRY Radio 2506A 1.5kW 6m linear amplifier (for spec see www.radiodan.com under VHF amplifiers), as new, few hours use, £1,600. Icom 756, as new, £900. Yaesu FT-51R drop-in charger, 2 batts, speaker, mic, £150. 020 8441 7129 (North London).
HEWLETT Packard 1715A dual 200MHz scope with digital voltage pod and probes in lovely cond, £250. 01503 240 432 (Liskeard).
E-mail: g4mpq@diver34.freeserve.co.uk
IC-735, £300. FT-101ZD, £200. Collectors' items: Labgear LG300 (no PSU). £60; KW202/204, £100; Marconi B1064, £100. All ono. Chris, GM3WOJ. 01862 842 762 (Invergordon).
E-mail: gm3woj@talk21.com
IC-756 as new, man, £850. IC-2KL amp, £800 ono. IC-PS15, £60, prefer buyers collect because of weight. G4OWV. 01493 444 181 (Gt Yarmouth).
E-mail:
georgedavies@davies70.freeserve.co.uk
ICOM 735 HF tcvr CW, filter, mic, boxed with man, matching PSU, both exc, £300. G4GRN. 01992 631 698 (Waltham Cross).
ICOM IC-735, £425 matching auto ATU AH2, £175, together £575. G4NJU, QTHR. 01908 378 277 (Milton Keynes).
E-mail: g4nju@compuserve.com
ICOM IC-746 HF/6/2m tcvr, UT-102, £850 Icom PS-85 matched mains PSU, £155. Icom 8500 comms rcvr with UT-102, remote software pack, £735. All boxed with mans, virtually unused and as new. 01582 670 592 (Dunstable).
JRC NRD-535 HF rcvr with all Lowe modifications, bandwidth control and RTTY boards, man, immac cond, £800. Yaesu FT-77 mobile HF tcvr 100W 3.5-30MHz incl WARC bands, FM board (not fitted), man, gwo, £200 ono. David, G8PPR. 01274 651 486 (Bradford).
KENWOOD 850SAT, vgc, boxed, man, hardly used, second rig, £575. The rig has been thoroughly checked over. Jack. 01306 887 057 (Dorking, Surrey).
KENWOOD TM-D700E data communicator dual band FM tcvr, never used, boxed, mans etc, £330. 01582 670 592 (Dunstable, Beds).
KENWOOD TS-440SAT HF all-band 100W tcvr with auto-ATU, narrow filter, gc with box & man, £440 ovno. G3TCO, QTHR. 0117 968 1068 (Bristol).
E-mail: a.w.preece@bristol.ac.uk
KENWOOD TS-450S HF tcvr, boxed, h/mic, man, owned from new, £550. G0JJG. 01449 678 515 / 07980 845 059 (Stowmarket).
E-mail: joe@g0jjg.freeserve.co.uk
KENWOOD TS-680S HF+6m exc, boxed, mic, leads, man, fitted with narrow CW filter, £400. TS-140/680S mobile bracket, £15. G3IBI, QTHR. 0771 273 8534 (Fareham, Hants).
E-mail: pascutt@tcp.co.uk
KENWOOD TW-4100E mobile dual-band VHF/UHF 45W, £200 ono. ADI 200 handie VHF, £60. ADI 400 UHF handie, £60. G1OPZ, QTHR. 01373 834 483 (Frome, Somerset).
KENWOOD UHF tcvr TS-780 base station 2m 70cm SSB FM on both modes, vgc, £480 ono. 01372 811 651 (Epsom).
MAST section triangular lattice, 21ft, 7in x 7in x 7in to convert 40ft to 60ft, £50. 1950s aircraft 4-channel VHF, 100-156MHz transmitter, rcvr TR5043, collector's piece, harness required, £50. 110A/826 mains PSU, £30 or £75 both, buyer collects. 01302 365 472 (Doncaster).
NEARLY new equipment. Yaesu FT-840 tcvr 0-100W, fitted FM board with fist mic & instructions etc, £420. Electric desk mic for above, £30. MFJ-949E ATU power/SWR meter & dummy load with book, £65. Palstar PS-30M 30A twin meter PSU, £55. All above under one year old and mint cond, would accept £550 for lot. Datong FL3 audio filter-auto notch with PSU & instructions, £45. AKD Target HF3 rcvr with PSU &instructions, £55. G2DYM 1:1 balun, £15. G2DYM 7MHz traps (used), pair £15. Icom IC-Q7E mini dualband 2m/70cm h/held nearly new with box & instructions, £65. ADI sender 450 h/held 70cm with box & instructions, £40. Mini speaker/mic for above, £10. Triband 6/2/70cm base vertical antenna, £20. Kenwood LF-30A low-pass filter, £25.Unused foot switch, £5. Knife blade DP switch, £5. Magnetic long wire rcvr balun, £10. Unused mobile cased speaker, £5. DeeComm 70cm base vertical antenna, £15. Variable voltage 1.2A PSU, £10. Sony TCM-939 cassette recorder, £15. Carriage/insurance at cost, or demo and collect. Could deliver if not too far. Mick, M5AED. 01536 763 637 (Desborough)
NEED full power on 160m? Buy my Nevada TM-1000 ATU. Bomb-proof, £90. 50MHz 3-ele Yagi, £30. Q-Tek vertical, £100. 01474 534 694 (Gravesend).
E-mail: lbelger@aol.com
NEW 20m monoband Yagi 203BA, £200. Heavy duty 3-ele quad 20-15-10, £300. New 70cm vertical, £40. Yaesu high power 2m FM, £160 ono. Cannot use in nursing home. 07974 892 179 (Newquay, Cornwall).
RACAL equipment RA1771 HF comms rcvr, mint, £550. RA17 rcvr, £175. RA905 tactical 1kW HF wideband antenna with MA675 9m mast, as new, £500. MA1966 antenna rotator interface unit, £60. Plessey rcvr multicoupler PV14C, £50. Granger commercial HF log periodic antenna, type 2004 with 10m self-supporting articulated tower. Can ship any item. Nigel, G0UGD. 01327 357 824 (W), 01323 486 822 (H). (Eastbourne).
RACAL RA17L, £150. Yaesu FT-101, £150. Yaesu FT-757DX, £300. KDK 2m mobile, £30. SX200 scanner, £50. 023 8086 8426 (Southampton).
RCA model AR88D table model, working, £100. S-meter not original, otherwise perfect original, buyer collects, it's heavy! 01322 862 082 (Farningham).
REMAINING G0FMK silent key items. PK-232MBX with man and packet guide, £115. Delcom 6016 2m tcvr, like IC2, £20. G0RYR. 01285 655 613 (Cirencester).
E-mail: tim@ballinger9.freeserve.co.uk
RN Electronics 2/50 tvtr, £150 ono. RN Electronics 2/70MHz tvtr, £125 ono. Alex, GM8BDX. 01890 830 294 (Coldstream).
SCANNERS and rcvrs. Realistic DX-394, £100. Realistic 2024, £130. Uniden UBC9000XLT, £150. Commtel 215, £150.Kenwood THG-71 handie, dual-band, boxed, speaker mic, £125. 01952 415 451 (Telford).
E-mail: xtc99@madasafish.com
SCANNERS AOR5000 as new, £995. Sony HF scanning rcvr ICF SW77, as new, £250, silent key sale. 0191 528 8079 (Sunderland).
E-mail: nigelmarston@tinyworld.co.uk
SILENT key sale, G3SOI. Drake MO2000 ATU, Heathkit SB200 linear, TAU SPC ATU, KW160, BC221, key collection, offers, info. G3KMG. 01207 504 198 (Consett).
E-mail: g3kmg@thersgb.net
SILENT key sale. FDK Multi 750E 2m multimode mobile, £50. Trio TR-2200G 2m FM portable, £35. Yaesu FR-50B HF comms rcvr, £50. Eddystone S640 HF comms rcvr, £40 or £160 for complete clearance. M0CTC, QTHR. 0411 093 390 (Northants).
E-mail: m0ctc@qsl.net
SILENT key. Kenwood TS-440S, £400. Kenwood MC-80, £50. SP-230, £25. Kenwood TH-25E, £125, Trio AT-230, £120. Yaesu FT-780R, £300. Yaesu FT-480R, £200. Altai multi-meter HM102BZ, £15. Brass key kit, £50. German aircraft key (collectors' item), £100. Stabilised power supply, £35. DG Electronics power supply, £35. Two SWR meters SML25 SMCT3 170L, £10 each, all ono. 01782 268 322 (Hanley, Stoke-On-Trent).
TENNAMAST 35ft, £350 ono. Former property of silent key GI0EZS. Contact GI4PCY. 028 6632 4993 (Enniskillen).
E-mail: asammon@aol.com
TOSHIBA TR-100 laptop, Olivetti ET Compact 60 typewriter with printer interface, both in first class cond. All offers considered. 01726 832 320 (Fowey).
E-mail: teamone@rya-online.net

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CONGRATULATIONS

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

50 years		*60 years*	
G3GGO	Mr C N Wridgway	G2BDV	Mr I D Brotherton
G3IJA	Mr J Allan	GU4GG	Mr CDS Wintle
G3KXT	Mr R I Richardson	GW2HFR	Mr A Ellis
G3VRB	Mr J D Nias		

We would like to correct an omission - that of Mr W G Hall, G8JM, who joined the Society in November 1934, and has now completed 66 full years of membership.

TRIO 930S, ATU, CW filters, matching speaker, nice cond, £430. Minimax 3-ele Yagi Jaybeam, £190 for 10-15-20m. Over 100 boxed unused valves, ex government CV nos, offers? 01743 245 896 (Shrewsbury).

TRIO TS-520 HF tcvr gwo, c/w mic, CW filter, mans, spare valves, £95. 01789 267 430 (Stratford-Upon-Avon). E-mail: 101465.1071@compuserve.com

TS-850SAT with PSU, very little use, £650. TS-680S exc cond, £450. FT-102 exc cond, new switches & relays, £225. FC-102 gwo, £100. GAP vertical, as new, £275. WARC 3-band vertical, £50. HF 5-band, £75. All gwo, ono. 01865 371 670 (Oxford). E-mail: boblimehouse@lucent.com

YAESU FL-2100Z, vgc but needs new PA valves, £225. Icom IC-271E with Mutek front end, 144-146 all-mode tcvr, £275. 01527 459 354 (Redditch). E-mail: webheath@aol.com

YAESU FT-101ZD MkIII, fan, narrow CW filter, service man, mint cond, £295. FT-101Z as above, AM, £270. FV-101Z including WARC, £340. Massive ATU roller coaster, at least 3kW, £110. FT-780R £150. MFJ-784B DSP, £125. Maplin GDO, full coil set, £40. Storno 700 25W 12.5kHz FM Xtal tcvr, Xtals 144.650MHz, S16, R4 available, offers? 01908 649 138 (Leighton Buzzard).

YAESU FT-290II, amp, batt pack, nicads, charger, partially-sighted and can't see controls, £175. M1CZX. 01622 872 994 (Tonbridge). E-mail: tandrr@btinternet.com

YAESU FT-290R multimode, matching FL-2010 10W linear, £150 ono. KPC3 TNC, 128K RAM, mans, boxed, £85, carr paid. G4DJC, QTHR. 01245 256 416 (Chelmsford).

YAESU FT-736 2/70, new cond, £650, plus offers on the following antennas: portable 2m 12-ele ZL special; 9-ele 2m Tonna; 18-ele 70cm. Dudley. 0117 924 9208 (Bristol).

YAESU FT-990 mint cond, AC, 500Hz ,2kHz, 2.4kHz filters, MH-1 hand mic, man, boxed, £550 no offers, buyer collects. 01706 645 553 (Rochdale). E-mail: andrew.shone@btinternet.com

YAESU G-5400B Az/el heavy duty rotator, 60ft 6-ply cable, £280. Kenwood R-1000 HF rcvr with h/book, £175. BNOS 432MHz 50W linear amp, £150. Navico AMR100S 2m FM mobile, ATU, h/book, £120. 2 x 88-ele Jaybeam antennas 432MHz, £50 each. KLM 14-ele crossed-Yagi antenna 144MHz, includes reverse polarising facility, £70. BNOS power supply 12/20E, £30. R107 WW2 reception set, original h/book, £75. 01763 262 443 (Royston, Herts).

YAESU G-5400B Az/el rotator including computer facility control plus 60ft 6-ply cable, absolute bargain, £280. Kenwood R-1000 HF rcvr, £175. Navico AMR1000S 2m FM mobile, bargain, only £90. BNOS LPM 432-10-50 linear amp + preamp, immac, only £150. Jaybeam 88-ele crossed Yagi 70cm antennas (2), bargain, £50 each. KLM 12-ele crossed Yagi 2m antenna incl phase changing facility, bargain, £70. Delivery possible up to 100 miles. 01763 262 443 (Royston, Herts).

WANTED

COLLINS, Drake or KW valve tcvr in working order, can travel to collect. 01226 288 718 eves (South Yorkshire).

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

DEAD or alive FT-102 also AM/FM filter and AM/FM board, what have you 102 range? Ian, 01304 821 588 (Dover). E-mail: g3roo@gqrp.com

***POPULAR** Wireless* magazine, 1930 to 1938. Copies from this era sought, nostalgically, by old-timer who cut his teeth on Scott-Taggart. Glad to meet reasonable charges. Ted, G4NDF. 01454 415 768 (Thornbury). E-mail: ted@g4ndf.freeserve.co.uk

144MHz or 432MHz Tonna Yagis. 432MHz masthead preamp. Telescopic portable mast. Pole-mounted rotator cage. Light/med duty rotator. Can collect. Steve, M0BPQ. 020 8291 2859 after 6pm (London). E-mail: stephen.bunting@kcl.ac.uk

AF-AVR unit for Kenwood TS-830S tcvr, must be in gwo. Collins KWS-1 transmitter with or without PSU, cash or part exchange other Collins gear; also want Collins SC101 station control. 01379 783 657 (nr Diss). E-mail: tmunro@ukonline.co.uk

ATLAS 215X plus any Atlas bits, base AC PSU mobile matcher etc. Drake MN4 speaker, AC4 PSU any cond. Dave, G3RCQ. 01708 374 043 (Romford). E-mail: g3rcq@supanet.com

AVO CT160 valve tester wanted, faulty or scrap for parts for restoration project. Kevin, G4CJT. 01483 268 604 (nr Guildford). Email; kevin.j.hughes@tesco.net

CABINET. Bench cabinet for standard rack-mounting rcvr, 19in wide 5¼in high, depth 13in or more, any cond. G0OGN, QTHR. 01789 293 375 (Stratford-Upon-Avon). E-mail: g0ogn@aol.com

CAN someone sell me a tcvr with digital display, also a PSU? £250 layout. Pensioner with renewed interest in radio. 01536 522 007 (Northants).

CIRCUIT diagram for Marconi TF2952 test set, EI6AI. 00353 733 7017 (Co Donegal).

COLLINS KWS-1 transmitter with or without PSU, also SC-101 station control. Cash or part exchange other Collins equipment. G3GBB. 01379 783 657 (Nr Diss). E-mail: tmunro@ukonline.co.uk

DRAKE acessories. Electronic keyer CW75, tuner MN2700, remote VFO RV7, desk mic 7077, speaker MS7, rcvr R7 and linear L7. CT1AUR, Waldemar Da Cunha Porto. Boite Postal 61 – PT. 2675-901 Estoril. E-mail: cporto@mail.telepac.pt

EDDYSTONE rcvrs EA12, EB37. Eddystone panadaptors, any model. Eddystone loudspeakers and Eddystone Morse key, any cond considered, will collect. G8EBM, QTHR. 01335 360 755 (Derby). E-mail: g8ebm@compuserve.com

ELECTRONIC weather monitor by R&D Instromet type WM/BDSTR or WS-R or WS-plus. Tom, G4AEB, QTHR. 01255 870 215 (Clacton-On-Sea).

KENPRO pair of mast clamps and bolts for KR-250 rotator. G0RQO. 0121 421 3207 (Halesowen). E-mail: david.hillyer@lapal29.freeserve.co.uk

KENWOOD MC-50 desk mic, must be in working order, will pay postage. John, 2E0ASG, QTHR. 01909 550 762 (Dinnington).

MAG loop antenna for 160m band. 01380 725 075 (Devizes). E-mail: ray.wright@newscientist.net

P60 or P40 tower sections base post not required or rotator cage. Midland area, no silly prices. 01527 541 502 (Redditch). E-mail: g3kwkroger@aol.com

QSL collections wanted by collector/researcher, singles or accumulations, pre-1970 preferred. Please phone with details and prices. 01674 676 480 (Montrose). E-mail: ferryden@btinternet.com

SILENT key clearout or just not needed. Wanted for research project - QSL accumulations, old call books, etc. Can collect. G4UZN. 0113 269 3892 (Leeds). E-mail: g4uzn@qsl.net

WANTED electronic keyer suit FT-200, homebrew OK. John, GW4LPB. 01633 896 197 eves (Newport).

Rallies & Events

28 JANUARY 2001

HORNCASTLE Amateur Radio, Electronics & Computer Fair - The Old School, Cagthorpe, Horncastle, Lincolnshire. OT 10.30am, 50p. C, MT (two photos required). 01526 860 320 or 07778 274 535.

LANCASTRIAN Rally - CANCELLED for this year only. G0GVA, 01772 621 954.

4 FEBRUARY 2001

SOUTH ESSEX ARS 16th Mobile Rally – The Paddocks, Long Road, Canvey Island (at the southern extremity of the A130). OT 10.30am. C, CP free, DF, MT (two photos required). Brian, G7IIO, 01268 756 331 or e-mail briang7iio@yahoo.com

11 FEBRUARY 2001

10th 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 10.30/11am. TI on 2m and 70cm, B&B, MT (two photos required). John, G7JTH, 01924 251 822 or e-mail rally@sandalmagna.demon.co.uk or www.sandalmagna.demon.co.uk/rally/

CAMBRIDGE & DARC Radio Rally & Car Boot Sale – New venue: Lordsbridge Arena, Wimpole Road, Barton. M11 jn 12, A603, follow signs. OT 10/10.30am, £1.50 (£1 for OAP/disabled) children free. CP free, C, B&B, CBS under cover, TI on S22. G0GKP, 01954 200 072 or e-mail radham@johnsmail.com.

HARWELL ARS Radio & Computer Rally - Didcot Leisure Centre, Mereland Road, Didcot, signposted from the A34. OT 10.15/10.30am, £1. CP, TS, B&B, SIG, LB, C, DF, TI on S22. Ann, G8NVI, 01235 816 379 or e-mail AnnStevens@compuserve.com

17 FEBRUARY 2001

THE REDDISH RALLY - St Mary's Parish Hall, Reddish, Stockport. OT 10am. John, G4ILA, 0161 477 6702.

25 FEBRUARY 2001

CENTRAL COAST AMATEUR RADIO FIELD DAY - Wyong Racecourse, about 90 minutes by road or rail north of Sydney city. This is the largest amateur radio event in Australia, if not in the southern hemisphere. OT 8.30am, A$10 for adults and A$5 for concessions. TS, FM, B&B, LEC, TI, club and emergency service displays and foxhunts. www.ccarc.org.au/

SWANSEA ARS Radio & Computer Show – Swansea Leisure Centre on the A4067 Swansea to Mumbles coast road. OT 10.30am, £1.50, children 50p. TS, B&B, SIG, C, LB. Roger, GW4HSH, 01792 404 422.

11 MARCH 2001

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

17 MARCH 2001

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

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

18 MARCH 2001

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

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

NORBRECK Amateur Radio, Electronics & Computing Exhibition – Norbreck Castle Hotel Exhibition Centre, Queen's Promenade, North Shore, Blackpool. The largest single-day exhibition in the country. MT (two photos required). Peter, G6CGF, 0151 630 5790.

25 MARCH 2001

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

7/8 APRIL 2001

RSGB Spring Radio & Computer Show (incorporating **RSGB National VHF Convention**) - Bletchley Leisure Centre. £2.50, under-14s free. Recruitment fair, LEC, 6m Group AGM, TS, CP free, DF, LB, C. Jan, 0870 904 7377. See p25.

8 APRIL 2001

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

18 APRIL 2001

WORLD AMATEUR RADIO DAY - Theme "Providing Disaster Communications: Amateur Radio in the 21st Century"

21/22 APRIL 2001

LONDON Amateur Radio & Computer Show - Radiosport Ltd, 01923 893 929.

22 APRIL 2001

HARROGATE Radio, Computer & Electronics Rally – Harrogate Ladies' College. Gerald, G0UFI, 01765 640 229 or e-mail g0ufi@qsl.net

LOUGH ERNE ARC Rally - Killyhevlin Hotel, Dublin Road, Enniskillen, Co Fermanagh. OT 12 noon. Frank, GI3ZMX, 028 6632 9507.

YEOVIL & DARC 17th QRP CONVENTION – Digby Hall, Sherborne, Dorset. OT 10am. TI on S22 (GB2LOW), TS, LEC, MT (two photos needed), C, DF, CP free, SIG. D Bowden, M1WOB, 01935 414 452.

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.

Regional and Club News

An Overview of the North East RSGB Group

by Peter R Sheppard, G4EJP, RSGB Regional Manager

AS PART OF the development of the new RSGB regional representation scheme, a pilot project was carried out in the North of England. This allowed pre-launch adjustments to the scheme that was implemented at the AGM in December.

The most important changes have been by using e-mail for the majority of contacts within the region. This has allowed many more members to take part in discussions and be better informed on day-to-day issues. This has been achieved by the creation of a web site as a regional focal point. Members in the North East can point their browsers at www.peter-sheppard.co.uk and obtain regional club and event information, calendar details and general information of interest to the North East. The site also supports an open forum for all radio amateurs, wherever they are located.

The RSGB North East Team in the bright sunshine at Harrogate.

The division of the old Zone A into two separate regions was a fairly simple task as the Greater Manchester border has always created support problems for a Council Member located in Humberside.

Who are the team players and how have we divided the North East? Council decided that each Region can be divided in up to four districts. Within the North East there are just over 50 groups, which gives each Deputy RSGB Regional Manager about 12 clubs to support.

District 13 covers Cleveland, County Durham, Northumberland and Tyne & Wear and is headed by Geoff Darby, G7GJU, who also manages the Regional bookstall. District 14 covers East and North Yorkshire and is run by Andy Russell, G0VRM, who is also the Regional webmaster. District 15 covers West Yorkshire and is managed by Derek Allan, G3WYP. Finally, District 16 covers South Yorkshire and NE Lincolnshire and is run by Des Critchlow, G3PTV.

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

RSGB Regional Managers (as of 7 January).

As the North East was chosen to be the pilot for the scheme, we are a little further on with its implementation than the other regions. We already have 20-plus RSGB affiliated club contacts on line and are looking at having our RSGB Group fully formed before April this year. We are also currently setting up a regional web ring.

If you would like more information about the North East Region or the scheme, please give any member of the North East RSGB Group a call or download the Regional Handbook which covers all aspects of the scheme from the Regional web site. Paper copies are also available from the author, G4EJP QTHR. Please support this scheme: it gives every RSGB member a chance to shape the future of amateur radio in the UK.

RALLIES & EVENTS, Cont

29 APRIL 2001

ANDOVER RAC New Radio & Computer Boot Sale - Village Hall, Wildhern. OT 10am, £1 per visitor car. DF, C, TI on S22. Jack, G0UJW, 01264 391 383.

CAMBRIDGESHIRE RG Annual Rally - Change of Date - Bottisham Village College, Bottisham, access via A14 and A1303, 6 miles east of Cambridge. OT 10.30am, £1.50. TS, B&B, A, CBS, CP, C, TI on S22. Paul, G0LUC, 01462 683 574.

MORSE ENTHUSIASTS GROUP SCOTLAND Samuel Morse Birthday Party - Bandeath Industrial Estate, Stirling (courtesy of Stirling & DARC). George, GM4HYF, 0141 634 4567.

7 MAY 2001

DARTMOOR RC Rally - Ron, G7LLG, 01822 852 586.

MID-CHESHIRE ARS Rally - David, G4XUV, 01606 777 87.

13 MAY 2001

MAIDSTONE YMCA ARS Maidstone Mobile Rally 2001 - John, G3RHO, 01622 832 259 or http://website.lineone.net/~g3trf or e-mail g3trf@lineone.net

THREE COUNTIES Radio & Computer Rally - John, 01527 545 823.

20 MAY 2001

DRAYTON MANOR Radio & Computer Rally - Peter, G6DRN, 0121 443 1189 (eve).

3 JUNE 2001

WEST MANCHESTER RC Red Rose QRP Festival - Les, G4HZJ, 01942 870 634.

10 JUNE 2001

NUNSFIELD HOUSE ARG Elvaston Castle National Radio Rally - Les, G4CWD, 01332 559 965 or e-mail rally@g4cwd.demon.co.uk

24 JUNE 2001

CITY OF BRISTOL RSGB GROUP Longleat Amateur Radio & Computer Rally - Ron, G4GTD, 0117 9856 253 or www.longleatrally.co.uk

29 JUNE - 1 JULY 2001

HAM RADIO 2001 EXHIBITION - Friedrichshafen, Germany. Coach trip organised by Ernie, G4LUE, 01226 716 339 or 07787 546 515, or www.syrg.co.uk

5 - 8 JULY 2001

FINNISH RADIO AMATEUR LEAGUE Annual Summer Camp - http://oh8ta.oulu.fi/hietahami/en/ or e-mail hietahami@sik.oulu.fi

8 JULY 2001

SUSSEX Amateur Radio & Computer Fair - Ron, G8VEH, 01903 763 978 or 01273 417 756 (office hours).

21 JULY 2001

CORNISH RAC Radio Rally & Computer Fair - Robin, 01209 820 118.

27 - 29 JULY 2001

AMSAT-UK COLLOQUIUM - University of Surrey, Guildford. www.uk.amsat.org/colloquium.htm

10 AUGUST 2001

COCKENZIE & PORT SETON ARC 8th Annual Radio Junk Night - Bob, GM4UYZ, 01875 811 723 or GM4UYZ@GB7EDN or e-mail bob.gm4uyz@btinternet.com

2 SEPTEMBER 2001

TELFORD ARRG Telford Radio Rally - Bob, M0RJS, 01952 770 922 or e-mail bob@somrob.u-net.com

9 SEPTEMBER 2001

LINCOLN SWC Hamfest - John, G8VGF, 01522 525 760 or 07968 050 318.

21/22 SEPTEMBER 2001

LEICESTER Amateur Radio Show - Geoff, G4AFJ, 01455 823344, fax 01455 828273 or e-mail g4afj@argonet.co.uk

7 OCTOBER 2001

NORTH WAKEFIELD RC 18th Amateur Radio & Computer Rally - 01924 824 451 or www.nwrc.mcmail.com

12 - 14 OCTOBER 2001

WACRAL 2001 Conference - G4EZU, QTHR or 01474 533 686.

13 OCTOBER 2001

THE G QRP CLUB MINI-CONVENTION - George, G3RJV, g3rjv@gqrp.com

3/4 NOVEMBER 2001

NORTH WALES RRC Rally 2001 - Muriel, GW7NFY, 01745 591 704 or www.nwrrcw.org.uk

6/7 NOVEMBER 2001

LOW POWER RADIO ASSOCIATION Radio Solutions 2001 - 01422 886 463 or www.lpra.org or e-mail info@lpra.org

GB call

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.

10 Feb	GB5TT: Contest Callsign. Ingatestone, Essex. LH (G4UHM)

Club NEWS

Scotland West and the Islands Region

No club details submitted.

Scotland East and the Highlands Region

DUNDEE ARC

13, Illustrated lecture 'Twenty years of VHF National Field Day', by Allan Duncan, GM4ZUK; 27, Illustrated lecture 'GB7DXP Cluster', by Gavin, GM0GAV. Donald, GM0PIV, 01382 455 771.

LOTHIANS RS

14, Talk 'Project X', by Lawrence Calder, GM1BKF; 28, Talk 'IOTA', by Tom Wylie. John, GM7REG.

North West Region

ISLE OF MAN ARS

13, Bring and buy jumble sale. David, MD0BXX, 01624 816308.

STOCKPORT RS

14, General Knowledge Quiz with David, M1ANQ; 28, The G3FYE Memorial Lecture - 'Living with an Amateur'. David, M1ANT, 0161 456 7832.

North East Region

GRIMSBY ARS

1, Design a club Emblem and bring to the club; 1, HF night on the air; 23, Club Dinner. Brian, G4DXB.

HALIFAX & DARS

20, Talk 'The Ultra Secret', by Ron Challen. Ray, G0PMU, 01274 600 297.

HAMBLETON ARS

7, Night on the air; 21, Talk. John, G0VXH, 01845 537 547.

HORNSEA ARS

7, PIC projects by G0VRM; 14, 13cm TV, by G3ZTR; 21, Impressions of the Novice course, by Edward; 28, Activity night. John, G0TPS, 01964 562 258.

WAKEFIELD & DARS

6, Rally final preparation; 11, Northern Cross Radio Rally; 13, Rally debrief; 20, Talk by Derek Allen, G3WYP, RSGB Deputy Regional Manager; 24, Annual Dinner; 27, Night on the air. John, G7JTH, 01924 251 822.

Midlands Region

BROMSGROVE ARC

13, Component testing. Discussion on licence conditions; 27, Talk - subject and speaker TBA. B Taylor, G0TPG, 01527 542 266.

CAMBRIDGE & DARC

2, Talk 'Global Positioning systems', by Graham, G0UUS; 9, Preparation and briefing for the club's rally on Sunday; 11, Cambridge & DARC's Rally, Lordsbridge Arena, Wimpole Rd, Barton, nr Cambridge; 16, Project evening: "Here's one I made that doesn't work either," by Handy Tip; 23, Talk 'Contesting', by Steve of the Mimram Contest Group. Bob, G0GVZ, 01223 413 401.

COVENTRY ARS

2, Indoor DF hunt; 9, Night on the Air, Novice class, CW practice; 16, Outdoor event - TBA; 23, Night on the Air, Novice class, CW practice. John, G8SEQ, 024 7627 3190.

DENBY DALE (PIE HALL) ARS

7, Constuction night with Dennis Mott. Philip, G4FSQ, 01484 644 827.

GLOUCESTER AR & ES

5, On the air - 160/80m; 12, Talk 'RF Connectors'; 19, On the air - 160/80m; 26, Morse practice 5WPM. Tony, 01452 618 930, office hours.

KIDDERMINSTER & DARS

6, Talk & Demo 'Repeaters and Internet Gateways' with Wyre Forest and Malvern Hills Repeater Groups; 20, WyrePAK, the Wyre Forest Packet Radio Support Group. Phil, G4SPZ, 01299 403 025.

LINCOLN SHORT WAVE CLUB

7, G5FZ on the air; 9, 80th Birthday Dinner; 21, Visit to Wyman Gordon Forge. John, G1TSL, 01522 793 751.

LOUGHBOROUGH & DARC

6, Talk 'Air Traffic Control', by Peter Stephens; 13, On-the-air evening - try RTTY, SSTV or FAX; 20, Open Forum - Aerials, Feeders, SWR & Impedance, with Art, G3KWY; 27, Annual Club Dinner. Chris, G1ETZ, 01509 504 319.

MID-WARWICKSHIRE ARS

13, 'Technical Topics', by members; 27, Talk 'The Perils of PMR Conversion', by Van, G0IZZ. Bernard, M1AUK, 01926 420 913.

SOUTH NORMANTON, ALFRETON & DARC

5, In the hall - Video: 'Empire Radio'; 12, Club shack activities; 1, Junk sale in the hall; 26, Club shack - night on the air. Dave Warren, M5RST.

STRATFORD UPON AVON & DRS

12, Film night; 26, Talk '*Practical Wireless*', by Rob, G3XFD, Editor. David, G6FEO, 07970 148 204.

NEW MERCIAN REGIONAL AFFILIATION

THE ASSOCIATION of Mercian Affiliated Radio Societies (AMARS) held its first open meeting in October last year at Bushbury Community Centre, Wolverhampton, when amateurs from a wide area came to hear RSGB Zone B Council member John Layton's, G4AAL, presentation of his journey across the Pacific Ocean as a radio operator with Expedition Raleigh.

The formation of AMARS was tentatively proposed by Charles Baker, G0NEQ, at an open meeting held after the Cannock Chase ARS's AGM in October 1999, and was inaugurated in April the following year. AMARS is not a radio society in the accepted sense because it is an association of amateur radio societies and does not accept individual members. Its object is to provide links between the individual societies by obtaining details of their activities and circulating them to the others. It is hoped that this will give support to the weaker ones and hopefully ensure their survival in the present time of falling numbers. It is not intended to hold open meetings more than twice-yearly, but it is intended that the larger meetings will enable us to attract well-known speakers.

The work of the Association is done by a committee of two delegates nominated from each member society, which meets quarterly, although much work is done by e-mail. Member societies must be affiliated to RSGB - indeed the formation of AMARS preceded the new RSGB Representation scheme!

AMARS committee members (l to r): Arnold Matthews, G3FZW (Chairman); Alec Mitchell, G4ICE; Bill Moorwood, G3CAQ (Secretary / Treasurer); Doug Withers, G0HUD; SWL Mr Moseley.

It has already been found that such organisations will only function within a limited radius, but there are many parts of the country where they can function to the benefit of amateur radio.

North Wales Region

No club details submitted.

South Wales Region

PEMBROKESHIRE RADIO SOCIETY

Meets 8.00 - 10.00pm every Friday at Furzy Community Centre, Haverfordwest. Registered as satellite centre for the RAE, NRAE / RAE / Morse courses available subject to demand. Ian, MW0CAB, 01437 763028 or e-mail: mw0cab@lineone.net

Northern Ireland Region

BANGOR & DARS

7, Talk 'Packet' by Ken, GI0YEW (sysop of GB7HMI). Mike, GI4XSF, 028 4277 2383.

London & Central Region

AYLESBURY VALE RS

7, Night on the air. Roger, G3MEH, 01442 826 651.

BRACKNELL ARC

14, Invited speaker. Baugh @compuserve.com

CRYSTAL PALACE & DRC
7, Transverter project, construction class, computing and Internet; 17, Annual General Meeting and construction contest. Bob, G3OOU, 01737 552 170.
ECHELFORD ARS
8, IOTA, by Roger Balister, G3KMA, RSGB IOTA Manager; 22, Construction contest. Robin, G3TDR, 01784 456 513.
EDGWARE & DARS
8, Talk 'The Air Training Corps', by Malcolm Wood; 22, Talk 'History of Morse', by Wayne, G0JJQ. David, G5HY, 01923 655 284 (day), 020 89549180 (eve).
HODDESDON RC
13, Talk 'A Magistrates Day', by John Jackson, JP; 27, Visit to Martin Lynch & Sons. Don, G3JNJ, 020 8292 3678.
MAIDENHEAD & DARC
1, Talk 'Your Rights When You Buy Gear'; 20, Talk - TBA. John, G3TWG, 01628 525 275.
SILVERTHORN RC
9, Construction contest; 23, On-the-air night. David, G0KHC, 020 8504 2831.
SOUTHGATE ARC
8, Nick Earl's Quiz Night - a social event, so bring along your partner. Brian, G0MEE, 01707 257 534.
SURREY RADIO CONTACT CLUB
5, Talk 'Ropes & Knots', by Jim, G4WYJ; 19, Fix It & Advice, Move it on. Berni, G8TB, 020 8660 7517.
VERULAM ARC
26, Annual General Meeting. Walter, G3PMF, 01923 262 180.

South & South East Region

ANDOVER RC
6, Talk 'Wiring Regulations', by Andy, G6JRS; 20, Workshop and operating night. Terry, M0BVO, 01980 629 346 eves.
BASINGSTOKE ARC
5, EMC; 25, Fox hunt - find Peter, M1DGQ. Bob, M0CJJ, 01256 461 306.
CROWBOROUGH & DARS
22, Talk 'The B2 Spy Net', by Mike, G3GWD. Margaret, G6UIF, 01892 663 666.
HASTINGS ELECTRONICS & RC
21, Annual General Meeting. R C Gornall, G7DME, 01424 444 466.
HORNDEAN & DARC
6, Club social evening; 27, Annual bring & buy sale. Stuart, G0FYX, 023 9247 2846.
HORSHAM ARC
1, Talk 'Down to Earth', by David, G4JHI. David, G4JHI, 01403 750 228.
ITCHEN VALLEY ARC
9, Talk 'The Internet and Radio', by Nobby, G0OPD; 23, PSK31/SSTV demo with Alan, M0BKU. Pete, M0CFQ, 023 8034 5052.
OXFORD & DARS
8, Annual General Meeting. Dave, G3BLS, 01865 247 311.
QRZ AR GROUP OF SUSSEX
9, Talk 'An Introduction to Digital Electronics', by James, G8AJP; 23, Construction evening. Stuart, M0CHW, 01435 863 020.
WATERSIDE (NEW FOREST) ARS
6, Surplus equipment sale; 20, Practical evening. A Horton, G0LKG, 02380 844 316.
WORTHING & DARC
7, Talk 'QRP', by Peter Dodd, G3LDO; 14, Discussion evening; 21, Talk 'Commercial Direction Finding', by G4UDU; 28, Discussion evening. Roy, G4GPX, 01903 753 893.

South West & Channel Islands Region

APPLEDORE & DARC
19, Talk 'Weather Sats', by Dave, G3YGJ. Brian, 01237 473 251.
BLACKMORE VALE ARS
6, VHF on the air & club project; 13, Talk 'The Bristol Kit', by Tim, G3PCJ; 20, HF on the air - please book; 27, Visit Blandford Royal Signals Army Camp. Tony, G0GFL, 01258 860 741.
CORNISH RAC
1, Talk by Paul Lock; 12, Computer Section Talk - 'Development of Processors', by John Baldock. Robin, G0MYR, 01209 820 118.
SOUTH BRISTOL ARC
7, Computer software exchange with Len, G4RZY; 14, Bring & buy sale with Len, G4RZY; 21, On-the-air night; 28, How to make a 2m 'J Pole'. Len, G4RZY, 01275 834 282.
SWINDON & DARC
1, Talk 'Air band & Air Traffic Control', by Mike, M5CBS; 15, Talk 'Computer Logging', by Den, M0ACM. Den, M0ACM.
TROWBRIDGE & DARC
7, Digital mode demonstration - PSK & SSTV - by club members. Ian, G0GRI, 01225 864 698 (e/w).
YEOVIL ARC
1, Talk 'WAB and Locator Systems', by G3ICO; 8, Hints and Kinks 3, with G3KSK; 15, Talk 'Flintlock to the Modern Day', by M1DGP; 22, HF on-the-air night. Roger, M1SAN, 01963 362 934.

East & East Anglia Region

BRAINTREE & DARS
19, Braintree library. Keith, M0CLO, 01376 347 736.
CHELMSFORD ARS
6, World Radio Conference - Les Barclay, G3HTF. David Bradley, M0BQC, 01245 602 838.
HARWICH AMATEUR RADIO INTEREST GROUP
14, Talk 'Solar Buoys', by Rob, G4WHK. Eugene, G4FTP, 01206 826 633.
IPSWICH RADIO CLUB
7, Talk 'Satellites', by Neil, G7FNN; 21, Construction competition; 28, Morse practice with G4BAV. Keith, G7CIY, 01394 420 226.
LEISTON ARC
6, Talk 'Cave Radio' by John, G3PAI. John, G0FSP, 01728 604 621.
MAIDSTONE YMCA ARS
2, RAE syllabus - Antennas; 9, RAE syllabus - Antennas; 16, RAE syllabus - 'Do You Know Your Licence Conditions?'; 23, Club evening. John, G0RHO, 01622 832 259.
NORFOLK ARC
7, New Year's Party - John, G0VZD; 14, Morse practice; 21, Talks 'How I Became Involved in Ham Radio' - members' recollections; 28, Morse Practice. John, G0VZD, 01953 604 769.

CHILDREN IN NEED

ON 17 / 18 November, members of the Worthing and District Amateur Radio Club operated a special event station in the foyer of the Holmbush Centre, Shoreham, West Sussex. The special event station was organised by Chris Delhaye, G3NDJ, to raise money for the BBC Children In Need appeal. The club used the call sign GB2KIN, 'KIN' standing for Kids In Need.

Members of the public watched the station operators in action using CW and phone. Special certificates were issued to children who sent their name in Morse code. Two Pudsey bears were raffled, one on each day, to raise even more money. The total raised was over £1500.

Operation was on 40 metres and the station made over 250 contacts mainly in the British Isles and Europe. Special GB2KIN QSL cards will be issued via the bureau.

Terry Belton, Chairman of Worthing & District Amateur Radio Club, M1DTB, on 40 metres.

Worthing and District Amateur Radio Club meets every Wednesday at the Parish Hall, South Street Lancing, West Sussex. For more details please contact Roy, G4GPX, tel: 01903 753893, write to WADARC, PO Box 599, Worthing, BN13 1PZ, or visit the web site: www.wadarc.clara.net

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*.

HF HF HF HF

DON FIELD, G3XTT
105 Shiplake Bottom, Peppard Common, Henley on Thames, RG9 5HJ.
E-mail: hf.radcom@rsgb.org.uk

THE YEAR 2000 was certainly an exciting year in the world of DX. By the year-end, no less than six of the top 10 DXCC entities (BQ9P, A5, 7O, E3, FR/T, 3Y0C) had been on the air. And some, like K5K (Kingman Reef), while not especially rare in the USA, were very much welcome here in Europe, especially at the sunspot peak when we were able to work them on most bands.

This coming month should also be a great one for those who you who chase HF DX. As well as the UK-led D68C operation, (see previous months' 'HF' and also the 'Down to Earth' article on page 34 in this issue), there are three other rare ones expected; YK9A Syria (see below), plus CE0XT San Felix and San Ambrosio, and 3D2 Conway Reef (both featured in last month's column). Four different parts of the world, and therefore four different sets of propagation. So even if you don't intend to chase them (and I hope you will), it will be educational comparing the band openings to each of these spots.

DX NEWS

MIKE MU5MUF/MM IS active when in international waters from the South Pacific off the coast of South America. He is a trainee radio operator on a Greenpeace ship.

From 1 January to 31 December Austrian amateurs are able to use the OE75 prefix to celebrate the 75th anniversary of the OEVSV (Austrian IARU society). Several awards will be issued. For more information you can check out www.edu.uni-klu.ac.at/~cirrasch

Mike, DL2OE, and Hans, DL7CM, will be active from 20 February to 5 March from the Gambia, signing C56/home call. Activity will be on all bands and modes, using 150 watts. QSL to their respective home calls.

Harry, G0JMU, will be activating his 7Q7HB (Malawi) call again for most of the month. His past SSTV, PSK31 and WARC band operations proved very popular and once again he will try to satisfy demand on the bands and modes that people need.

The Cinco Nueve Contest Group (CNCG) and the Willamette Valley DX Club (WVDXC) are sponsoring a DXpedition to Syria, to take place between 3 and 12 February. The group, consisting of Ron, WJ7R; Dick, N7RO; Bob, W4DR; Rosalie, N4CFL; Carl, K9LA; Vicky, AE9YL; Jim, W4PRO and team leader Al, K7AR, hopes to sign YK9A on all bands and modes from the Syrian Telecommunications building in Damascus. They will have three stations active simultaneously, using Icom transceivers and AL-811H amplifiers. The DX Syria 2001 web site can be found at www.qsl.net/k7ar and will include pre-trip news, set-up news, propagation conditions, updated daily on-line logs and suggested operating frequencies.

Steve, ZC4BS (also G4KIV, ZD8SB, N5ZFR), reports that the ZC4 club station should once again be up and running as ZC4ESB (Eastern Sovereign Base). The station will be operated by Steve, ZC4BS; Des, ZC4DW; and Graham, ZC4GK. They will be active for the next three years or so on all HF bands and modes. Des and Steve are also keen contesters and will be participating in most contests.

Chuck Brady, N4BQW / 3Y0C, is standing in front of the mast supporting the G5RV multiband dipole which was his first operational antenna on Bouvet Island. The radio shack is in the background, against a landscape which does not look very friendly. The image was captured by one of the expedition scientists with Chuck's digital camera.

The planned January operation from North Korea (P5), due to coincide with the opening of the new Educational Centre (see last month), appears to have been scrapped due to the refusal of the North Korean Organisation for Army Support to allow transmitting equipment to be used at the event. So those waiting for this, the rarest of DXCC entities, to be activated will simply have to hold their breath for a little (or a lot!) longer.

Don, K6IPV, and Dave, W6AQ, will operate from the Hillview Gardens Resort club station, 9M6AAC, a few days before the ARRL CW DX Contest. This venue is becoming increasingly popular as a DXpedition location (the 9M0C team, of which I was a member, spent a few days R&R there in 1998. Details are available on the Hillview Website at www.qsl.net/9m6aac/).

The new radio shack at the Hillview Gardens Amateur Radio Club, 9M6AAC.

Due to local floods in Bangladesh, Carl, SM6CPY, had to postpone his December / January trip. He now plans to be there from 12 to 19 February signing S21YD.

Hans, WA1LWS, plans another operation as 3W2LWS in Vietnam. The trip is set to cover both modes of the ARRL DX contests 17 February through 6 March. He likes CW and can often be found on 14027 and 21027.

Floyd, N5FG, reports that the Magnolia DX Association will operate from Dauphin Island, Alaska, (a new IOTA) in late February. There will be at least two stations active, signing the special call W4D. Check around the usual IOTA frequencies, all bands and modes. The operation will be over a weekend (Friday to Sunday). QSL via W5UE direct or bureau.

Klaus, DJ4SO, will be active from Hopkins Village in the south of Belize until 12 February. He will sign V31SN and operate mostly on CW, RTTY, PSK31 with some SSB. Look for him on all HF bands with an emphasis on 12, 17 and 30. 80 and 160 will depend on the antenna possibilities. QSL via his home call.

Art, N2NB, and Woody, K2UU, plan to be active from Montserrat

QTH Corner

DL3APO	Peter Kohde, Wurgwitzer Str 36, 01187 Dresden, Germany
DL1AWI	Wolfgang Ziegler, Arno-Schlothauer-Str 15, 99842 Ruhla, Germany
EP4PTT	c/o Directorate of Telecommunications, Box 11365 - 931, Tehran, Iran
S21YH	Kazunori Abe, 7M4PTE, 7-12, Kagura, Ashhikawa 070-8007, Japan
SY2A	Monk Apollo, SV2ASP/A, Monastery Dochiariou, GR-63087 Mt Athos, Greece
VK6BSI	Alan Roocroft, VK4AAR, POB 421, Gatton 4343, Australia
YK9A	Carl Luetzelschwab, K9LA, 1227 Pion Road, Fort Wayne, IN 46845, USA

from 22 February to 1 March. Art will sign VP2MDY. Their operation will include the *CQ* WW 160 SSB Contest. QSL via NW8F.

Hrane, YT1AD, reports that plans are firm for a major expedition to Conway Reef (3D2) to take place from 18 to 27 February. The operators will be YT1AD, YU1RL, YU1NR, YU7AV, YS1RR, Z32AU and Z32ZM. Activity will be on all bands and modes.

Three operators from the Central German Contest Group (CGCG) were due to be active, all bands and modes, from the Marquesas Islands and French Polynesia in January and February. They are Wulf, DL1AWI; Mat, DL5XU; and Peter, DL3APO. They start with French Polynesia (Rangiroa, Tuamotu, OC-066) 27 January to 10 February, then Nuku Hiva, Marquesas Islands (OC-027), 11 to 28 February. QSL Rangoroa via DL3APO and Nuku Hiva via DL1AWI, either bureau or direct in both cases (direct addresses appear in QTH Corner). Logs will be available after their trip at the following Web page: http://www.radioklub.de/cgcg

Angelo, I6BQI, will tour the Pacific for six weeks starting in February and hopes to operate all bands as A35BQ, Tonga, then ZK2BQI, Niue, with the additional possibilities of YJ, 5W, C2 and T3, if licences can be obtained.

The surprise news during December was of the appearance on the bands of 3Y0C from Bouvet Island. Early reports suggested this was a pirate, as operations from such a rare spot don't often happen without prior notice. However, in this case the story is rather different. Chuck, N4BQW, is there as part of a scientific team which is working on the island for at least three months (ie until sometime in March). He has an Icom transceiver and solid-state amplifier, and a variety of antennas. Although he will be involved several hours a day in scientific work, he hopes to spend his off-duty time handing out contacts. At the time of writing he had yet to find his Morse key, and only had some of the antennas up, but by the time this appears he should be well established on the bands. In any case, you can get the latest news from www.qsl.net/zr1dq QSLs will be handled by WA4FFW, but hold on until a mailing address is published. The logs are not expected to reach the USA until April.

Alan, VK0MM, closed down his operations from Macquarie Island as of 16 December. Alan thanks everyone who has worked or e-mailed him during his posting on the island. The QSL address was due to be announced in January on: www.geocities.com/vk0ld/qslinfoX.html All proceeds from the VK0MM QSL process will be donated to Camp Quality, an Australian charity that provides care for children with cancer and other terminal illnesses.

CONTESTS

THE BIG CONTEST this month is the ARRL CW event on 17 / 18 February. This is a 48-hour event, with many categories, but the main thing you need to know is that you work mainland US and Canadian stations only, and give RST plus power as your contest exchange (and receive RST plus state / province). I can provide further details if required or, of course, you can get them off the ARRL Web page at www.arrl.org

The Mexican RTTY Contest takes place between 1800 on 3 February and 2400 on the 4th. Mexican stations give signal report and state, others give signal report and serial number. Everyone works everyone.

In last year's autumn ON Contest, UK scores included (SSB) G0AOZ 5829 (leading non-ON station), G0BMS 2904, G4OGB 2109 and (CW) G0BMS 3510, G4FDC 2829, G4OGB 2760 (tnx G4OGB and ON5WL).

In the SEAnet Contest 2000, HS0/G3NOM was second in the Multi-Band, Multi-Mode category with 9760 points. G3VAO was second in the single-op SSB section with 480 points.

In the October EU Sprint contest, UK scores were (position, callsign, score) SSB: 7 G0IVZ 122, 20 M0CKE 58, 22 G0MTN 52, 24 GW3NJW 51, 33 G6QQ 29; CW: 2 G4BUO 163, 14 G0CKP 135, 23 GW3NJW 103, 26 G3TJE 90, 27 G0WHO 89, 31 G4OGB 76, 39 G6QQ 41, 50 GW0ETF 27.

AWARDS

TO COMMEMORATE THE beginning of the 21st Century, the Japanese Amateur Radio League (JARL) will issue the JARL-21st Century Dream Award to licensed amateurs and SWLs world-wide. This will be for contacts with more than 21 different* amateur stations on a single band (including satellite communications) or single mode. (*Contacts with the same station on different bands will not qualify). To apply, send a list of contacts (receiving a QSL card is not necessary) with the callsigns of stations worked (heard), dates, bands and modes. The fee is eight IRCs. Only contacts (receptions, in the case of SWLs) during the year 2001 will be acceptable. Applicants can request a maximum of three of the following five endorsements: Bands (including satellite communications), Modes, QRP, QRPp, Custom endorsement (a custom endorsement is for up to 16 letters for the same working method, eg Home Shack, US stations only, Groundplane). All correspondence should go to Japan Amateur Radio League - Award Desk, 1-14-5 Sugamo, Toshima, Tokyo 170-8073, Japan, e-mail: oper@jarl.or.jp and intl@jarl.or.jp

Gil, F5NOD, CW operator for the FR/F6KDF/Tromelin Island 2000 expedition, reports that the French Overseas Island Award (DIFO) Web site has been updated and now has some QSL pictures available on the site. You can find it at: http://f5nod.waika9.com/difo.html

PREFIX LIST

ROD, AC6V, HAS finished updating and expanding a Prefix List at www.ac6v.com/prefixes.html It includes ITU

28MHz COUNTRIES TABLE, 2000

(sorted this month by Mixed totals)

	CW	SSB	Mixed
G4DUW	186	236	256
G0TSM	117	237	255
M0BZQ	28	230	252
G0VHI	0	250	250
M0CTQ	4	234	238
G3SXW	193	0	193
G0CAS	1	169	170
G3MDH	0	165	165
G0NXX	164	0	164
G4MUW	0	155	155
MM5AJN	0	139	139
G4UCJ	138	0	138
G3WGV	116	0	116
GI4XSF	0	109	109
G3YVH	-	-	108
G4IDL	100	0	100
GM4CHX	0	100	100
G0CGV	89	32	97
M0CAL	0	95	95
GU4YOX	52	82	95
MU0FAL	91	0	91
G0KDS/M	0	86	86
GM4OBK	34	71	85
GU0SUP	-	-	81 (RTTY)
G4OBK	65	15	80
MM0BQI	23	57	71
G4FVK	-	-	70
GW0VSW	38	45	67
M0CNP	0	66	66
G4ERP/M	0	60	60
G4YWY/M	-	-	56
G3WP	55	0	55
G0NCS	-	-	54 (PSK)
G0URR	-	-	53 (RTTY)
M0ASJ	-	-	50
GM0FNE	-	-	48 (RTTY)
G3ING	-	-	37
M5AFA	-	-	22

2000 WARC BANDS TABLE

(sorted this month by overall totals)

	10	18	24	Total
G3SXW	176	199	175	550
G0NXX	152	168	164	484
G4UCJ	103	118	106	327
G3WGV	84	119	77	280
MU0FAL	109	75	68	252
G3YVH	73	97	82	252
G4KHM	77	92	27	196
M0BIB	24	51	120	195
G4AFI	28	69	80	177
G3ING	41	57	45	143
GM4OBK	36	53	42	131
G3WP	50	42	34	126
GW0VSW	33	24	53	110
G4OBK	26	40	35	101
G4YWY/M	0	51	44	95
GM3IBU	0	0	85	85
G0VLC	24	37	21	82
G0TSM	21	18	32	71
G4ERP/M	0	68	0	68
M0CAL	0	29	37	66
MM0BQI	20	23	20	63
M0CNP	5	27	14	46
G4FVK	2	17	23	42
M5AFA	0	11	16	27

CONTINUED ON PAGE 81

CONTEST

TIM KIRBY, G4VXE
11a Vansittart Road,
Windsor SL4 5BZ
E-mail:tim@ukgateway.net

A NEW 144MHz antenna has gone up at the G4VXE station. As I'm in a flat, it is by necessity rather smaller (an HB9CV) than I would like, but at least it is an improvement on the makeshift wire or vertical antennas that I used before. During a recent 144MHz CW Contest, I decided to tune around and see how I could work. I worked all the usual suspects and then was quite surprised to hear GM4WLL/P, who I managed to work without any difficulty. I was then even more surprised to hear GM4AFF, located much further north, near Aberdeen. To start with, all went well and then the ubiquitous fading set in and Stewart vanished into the noise. I was not convinced that Stewart had all the requisite information, so I decided to wait on the frequency until signals came up again. They did after a few minutes and I dropped my call in. Stewart quickly responded "LOC?" That was soon done and the QSO completed. From my point of view, I was thrilled with the contact - with such a simple set-up at this end - all the work was being done at the other end of course! The contact showed the value, to both of us, of crisp operating and also of persistence. At VHF, if a contact fades out, do make a note of the frequency and try to come back in a few minutes. It benefits both parties - and be ready to make a quick exchange if necessary. If a path is only open for a few seconds, prevarication is a bad thing!

"WHAT'S YOUR CALL?"

DURING THE CQWW contests there is always a great variety of styles of operating to be heard. On both phone and CW, one of the things that always disappoints me is the station that does not identify frequently. You can listen to some pile-ups for seemingly an age without any identification. Don't tell me that all the people calling know who it is - I bet they don't! Quite apart from this being questionable regarding licence conditions, it's just plain rude! The argument is that it saves time and increases the QSO rate. True, perhaps. What else though? For one thing it increases confusion. You're soon going to have people calling that decide to call blind without knowing who the station is. What if you've had a QSO with them before? What a waste of effort, just to make a duplicate contact. The other thing that we've discussed before is that the act of giving your callsign actually helps the rhythm of the QSO. In other words, it indicates the end of a QSO and that you are available for another contact. A simple QRZ may not serve so well. So please, if you find yourself in a pile-up type situation, give your callsign frequently, preferably at the end of every QSO.

NEW VHF CONTEST

VHF CONTEST enthusiasts have a new contest to enjoy. On the first Tuesday of every month, between 2000 and 2300, there is a new 144MHz UK Activity Contest. There will be a multiplier on the number of locator squares worked in each session, so keep that beam turning! Essentially, the contest is a cumulative: at the end of the year, the best six sessions count towards the final score. You should submit your entry after each session rather than waiting for the end of the year.

RULES AND RESULTS

I GET quite a few e-mails asking for clarification on various contest rules and regulations. Please remember that although the results are published in this column, I am not the arbiter of the rules! If you have a question you should contact either the RSGB HF or VHF Contests Committee, depending on which part of the spectrum you are in. The HF Contests Committee can be reached at hfcc.chairman@rsgb.org.uk and the VHF Contests Committee at vhfcc.chairman@rsgb.org.uk I do always pass on any queries that I receive, but it may take a while depending on where I am at the time.

We've quite a few results to publish again this month, so enough from me and on with the results!

70MHz CW, 2000

COMPARED WITH the 1999 event the numbers of entrants and the number of stations active were significantly lower. A total of 28 different stations appeared in the logs. Conditions were poor, with deep QSB and high levels of rain static. Most entrants lost significant numbers of points and this is attributable to the poor conditions. There were brief Sporadic E openings and two Slovenian stations appeared to provide entrants with their best DX.

Congratulations to the section winners: Martin, G3UKV, who repeated his 1999 victory; MM0CPS/P operated by John MM0CCC; and G4RFR, the Flight Refuelling ARS. These, together with stations marked (*), will receive certificates.

Roger Dixon, G4BVY

70MHz CW, 2000

Single Operator Fixed

	Callsign	Locator	QSOs	Points	Mults	Total	Power	Ant	Best DX	Loc
1	G3UKV*	IO82RR	16	4073	16	65168	50	5 ele	S51DI	JN76VL
2	G3NKS*	IO81XU	17	3968	16	63488	100	6 ele	S51DI	JN76VL
3	S51DI*	JN76VL	4	5973	7	41811	8	4 ele	GM4AFF	IO86ST
4	G3TCU	IO91QE	18	2396	17	40732	150	6 ele	G3KPU	IO93MN
5	G3MEH	IO91QS	17	2209	18	39762	100	6 ele	GM4AFF	IO86ST
6	GM4UYZ	IO85MX	3	144	4	576	50	Yagi	GM4AFF	IO86ST

Single Operator Others

	Callsign	Locator	QSOs	Points	Mults	Total	Power	Ant	Best DX	Loc
1	MM0CPS/P*	IO85QU	8	1827	7	12789	15	5 ele	G4RFR	IO90AS

Multi Operator

	Callsign	Locator	QSOs	Points	Mults	Total	Power	Ant	Best DX	Loc
1	G4RFR*	IO90AS	18	4249	19	80731	90	12 ele	S9F	JN65TX

Another Backpacker! Here is the station of Niall, G0VOK/P.

2nd 50MHz Backpackers Contest, 2000

THE SECOND 50MHz Backpackers contest was blessed with excellent DX conditions. The conditions were so good that some entrants 'complained' that it was difficult to work any UK stations!

Congratulations to M0AFC/P for winning the 10W Single Operator section and to GW0PZO/P for winning the 3W Single Operator section. Congratulations to the One Man and His Dog Contest Group, G8NWM/P, for winning the Multi-operator 10W section and finally to G1WAC/P for winning the Multi-operator 3W section.

Ian Pawson, G0FCT

2nd 50MHz Backpackers Contest, 2000

Multi-operator 10W

Pos	Group Name	Call sign	Loc	QSO	Mult	Points	Total	Best DX	km	Power	Ant	Equipment
1*	One Man & His Dog CG	G8NWM/P	IO92TR	47	36	58182	2094552	IK2DOV/8	2006	10	5Y	FT736R
2*	Malvern Hills RAC 'B'	G4IDF/P	IO82TC	65	41	48276	1979316	LZ2CW	2191	10	5Y	FT690
3	Russell and Taff	G3XNI/P	IO90KU	24	23	24252	557796	IT9KSS	1819	10	3Y	FT690

Multi-operator 3W

Pos	Group Name	Call sign	Loc	QSO	Mult	Points	Total	Best DX	km	Power	Ant	Equipment
1*	Wythall CG	G1WAC/P	IO82XJ	38	46	38959	1792114	IK2DUV/8	2063	3	HB9CV	FT690
2*	Oldham RC	G1ORC/P	IO83XN	46	38	42025	1596950	YZ4ED	1699	2.5	4Y	FT690
3	G0FUW	G0FUW/P	IO81PH	30	34	19449	661266	IZ7CTE	1978	2.5	3Y	FT690

Single Operator 10W

Pos	Call sign	Loc	QSO	Mult	Points	Total	Best DX	km	Power	Ant	Equipment
1*	M0AFC/P	IO84SA	107	73	122116	8914468	YO7VJ	2177	10	5Y	IC706
2*	GW8ZRE/P	IO83JA	50	48	58009	2784432	IK2DUV/P8	2168	10	HB9CV	FT690
3	G8JAY/P	IO91AW	43	48	48898	2347104	IK2DUV/P8	2025	10	5Y	TS130+TVTR
4	M0BAO/P	IO80LV	32	33	27679	913407	IK8SEU	1725	10	4Y	IC706
5	G8ORG/P	IO93AD	16	17	17227	292859	YZ4ED	1673	10	Delta	IC251+TVTR

Single Operator 3W

Pos	Call sign	Loc	QSO	Mult	Points	Total	Best DX	km	Power	Ant	Equipment
1*	GW0PZO/P	IO83FC	61	55	74290	4085950	YO7VJ	2216	2.5	3Y	FT690
2*	G1WKS/P	JO01ED	29	32	31513	1008416	IZ7CTE	1785	3	3Y	IC505

* Certificate Winner

2nd 144MHz Backpackers Contest, 2000

OPINIONS ABOUT band conditions varied during this contest. Some stations judged conditions poor / flat with DX to be worked. The leading stations in each section generally held the opposite view. The number of QSO made by the leading stations certainly shows what can be done with relatively low power to a modest antenna when the station is well-sited.

Three stations managed to submit perfect logs for this contest: congratulations! However, some managed to lose a large proportion of their claimed score by inaccurate logging. The average points lost were 9.1% for this contest.

M0AFC/P wins the Single Operator 3W section with G4ERP/P achieving first place in the 10W section. In the Multi-operator sections, G0KYS/P claimed first place in the 10W section with the Oldham Radio Club, G1ORC/P claiming first place in the 3W section.

Ian Pawson, G0FCT

2nd 144MHz Backpackers Contest, 2000

Multi-operator 10W

Pos	Group	Callsign	Locator	QSOs	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1*	G0KYS	G0KYS/P	IO91GI	109	15960	27	430920	F1MJC	559	10	2x10Y	TS9130
2*	GW5NF	GW5NF/P	IO81PR	111	15349	25	383725	F1EJK/P	814	8.5	9Y	FT290
3	One Man & His Dog CG	G8NWM/P	IO92TR	91	13958	26	362908	DG6PY/P	569	10	2x10Y	FT736
4	Barpackers CG	M1BAR/P	IO83XG	89	10481	24	251544	EI5IZ/P	365	10	14Y	TR751E

Multi-operator 3W

Pos	Group Name	Callsign	Locator	QSOs	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1*	Oldham RC	G1ORC/P	IO93BJ	181	25762	35	901670	DF0WD	708	2.5	2x9Y	FT290
2*	Secret Weapon CG	GW7JYK/P	IO82KW	132	19722	31	611382	PA4VHF	645	3	2x9Y	IC275E
3	Malvern Hills RAC "B"	GW4IDF/P	IO81NV	87	13384	28	374752	DB8TA/P	888	3	19Y	IC202S
4	G0HDV	G0HDV/P	IO93UK	77	10909	28	305452	DF0WD	605	3	13Y	TR751E
5	Cockenzie & Port Seton ARC	MM0CCC/P	IO85VL	39	5960	19	113240	PE1AXM	592	3	10Y	TR751E
6	Wigan Douglas Valley RC	G3BPK/P	IO83PO	45	5537	19	105203	GM4LBV	343	3	17Y	FT290
7	Wythall CG	G1WAC/P	IO82XJ	79	6986	15	104790	GM4WLL/P	375	2.5	17Y	FT290
8	Stockport RS	G8SRS/P	IO83XH	65	5684	16	90944	GI3FFF/P	331	2.5	9Y	FT290

Single Operator 10W

Pos	Callsign	Locator	QSOs	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1*	G4ERP/P	IO81XW	142	18484	26	480584	PD0DHS	510	10	12Y	FT847
2*	G4RQI/P	IO93PW	97	16428	27	443556	PA4VHF	506	10	10Y	IC746
3	G8ORG/P	IO93AD	95	11694	23	268962	F1MJC	756	10	8Y	IC251E
4	G0GRI/P	IO81XG	89	10217	20	204340	GM4WLL/P	499	10	13Y	IC706
5	G4EDR/P	IO94RD	47	8607	19	163533	M0BAO/P	399	10	4Q	IC706
6	GI0OUM/P	IO74CN	12	1723	8	13784	G8VHI	361	5	5ZL	TR9130

Single Operator 3W

Pos	Callsign	Locator	QSOs	Score	Mult	Total	Best DX	km	Power	Ant	Equipment
1*	M0AFC/P	IO84SA	135	29686	36	1068696	F5JNX	974	3	13Y	IC706
2*	GW8ZRE/P	IO83JA	150	23844	36	858384	DL9OBD	847	3	12ZL	TR751E
3	GW0PZO/P	IO83ID	135	23542	36	847512	OZ2TF	875	2.5	5Q	FT290
4	GW0TPH/P	IO83JA	98	13677	25	341925	PA4VHF	651	2.5	4Y	FT290
5	GW4KVI/P	IO81LS	76	13222	20	264440	DB8TA/P	893	3	9Y	FT480
6	G8JAY/P	IO91AW	79	10432	25	260800	F1MJC	632	3	17Y	IC202S
7	G4HLX/P	IO91FN	72	10261	25	256525	GI3FFF/P	490	3	13Y	FT847
8	M0BAO/P	IO80LV	78	11261	19	213959	PE1EWR	463	3	17Y	IC706
9	G0BVW/P	IO92XA	60	7852	20	157040	GM4WLL/P	507	2.5	9Y	FT290
10	GM4IGS/P	IO75MB	38	7003	17	119051	G4WJS	467	2.5	9Y	FT290
11	G1WKS/P	JO01ED	51	5210	17	88570	2E0AUN/P	334	2.5	13Y	FT290
12	G1ATZ/P	IO82KV	57	5902	10	59020	G0RRC	297	2	11Y	FT290
13	G0WJR/P	IO81PH	36	3950	14	55300	G2CP/P	368	2.5	7ZL	IC202S
14	G3NKS/P	IO81XU	44	4457	12	53484	G1JDP/P	330	1	4Y	FT290
15	G0NFO/P	IO82RJ	44	3919	13	50947	F4ROV	312	2.5	7ZL	FT290
16	G7VHW/P	JO01HO	28	3057	13	39741	G0TOO/P	339	2.5	Y	FT290
17	G0WRT/P	IO93AX	30	1830	8	14640	G8AWO/P	266	3	14Y	FT290
18	G0VOK/P	IO83PE	20	1386	9	12474	GI3FFF/P	304	3	6Y	IC202S

* Certificate winner

70MHz Trophy, 2000

THIS YEAR'S contest again attracted a good batch of entries and around 150 stations were active during the day. Although most enjoyed the event, conditions being slightly above average, some were - as last year - affected by poor weather. Heavy rain (some of it causing static noise) was the main problem, especially if, like GW8ASA, you went out portable in your carpet slippers!

This year, the Five Bells CG made its more remote location pay off and received the VHF Manager's Trophy, operating from a slightly different part of the Mull of Kintyre. The Dartmoor Convicts took second spot in the Open section, relegating last year's winners to third place. G4AEQ continued his stranglehold on the Single Operator Fixed Section, with GM4CWH/P claiming the top spot amongst the single operator portables, a new section for this year. G0AEV returns to reclaim the certificate for the best-placed fixed station using 25W (or less in this case) and a single antenna. There were many interesting comments in the logs, all of which are included in the results on the VHFCC web site at www.rsgb.org/vhfcc

Pete Lindsay, G4CLA.

70MHz Trophy, 2000

Section O

Pos Group	Call	Loc	QSO	Mults	Score	Total	Best DX	Dist	Power	Ant
1* Five Bells CG	GM4SIV/P	IO75DH	90	75	35075	2,630,625	GJ3YHU	719	160	2x9,4
2* The Dartmoor Convicts	G4BVY/P	IO70XP	95	71	28114	1,996,094	GM4ZUK/P	706	160	2x7,7
3 Northern Lights CG	GD0EMG	IO74QD	73	61	19021	1,160,281	G4FUF	450	160	2x8,2x5
4 Kintyre Window Clnrs	G3TCU/P	IO70FD	57	49	18865	924,385	GM4ZUK/P	781	150	4x6
5 A1 CG	G4ZAP	IO81SG	65	56	12674	709,744	GM4ZUK	630	160	2x6
6 Cockenzie/Pt Seton ARC	MM0CPS/P	IO85RU	51	46	14868	683,928	G4ADV/P	614	50	8
7 Bracknell ARC	G4BRA/P	IO91PK	59	50	11054	552,700	GM4ZUK/P	623	80	6
8 Dave Austin	G1EHF/P	IO91GI	53	47	9572	449,884	GM4AFF	610	30	6
9 Newquay & DARS	G4ADV/P	IO70MM	40	34	10408	353,872	MM0CPS/P	614	80	2x7

Section SO

Pos	Call	Loc	QSO	Mults	Score	Total	Best DX	Dist	Power	Ant
1*	GM4CWH/P	IO74WV	66	55	18294	1,006,170	G3TCU/P	537	140	2x5
2*	GM4WLL/P	IO85NR	41	40	11340	453,600	G3TCU/P	646	90	6
3	M0AFC/P	IO84SA	45	41	9183	376,503	G3TCU/P	480	20	5
4	GM4ZUK/P	IO86RW	30	31	11457	355,167	G3TCU/P	781	75	5
5	G0PQF/P	JO02HV	20	23	5570	128,110	G3TCU/P	525	10	3
6	GW8ASA/P	IO81FP	35	26	4427	115,102	GM4SIV/P	433	5	3
7	G3IZD/P	IO84KD	21	20	4709	94,180	G3TCU/P	474	10	4
8	G0WJR/P	IO81QJ	23	24	3857	92,568	GM4AFF	602	15	2

Section SF

Pos	Call	Loc	QSO	Mults	Score	Total	Best DX	Dist	Power	Ant
1*	G4AEQ	IO93PE	74	65	16197	1,052,805	GM4WJA	507	160	2x6,3
2*	G3MEH	IO91QS	61	56	10773	603,288	GM4AFF	573	150	6
3	GM4AFF	IO86ST	39	38	15278	580,564	G3TCU/P	769	140	8
4	G3NKS	IO81XU	54	49	9433	462,217	GM4AFF	552	100	6
5*	G0AEV	IO81WL	47	44	9049	398,156	GM4ZUK/P	608	12	8
6	G3LVP	IO81WV	47	36	7148	257,328	GM4ZUK/P	561	25	7
7	G0GCI	JO01ED	35	31	6776	210,056	GM4SIV/P	615	100	4
8	G3BPM	IO80OV	33	27	5425	146,475	GM4SIV/P	528	50	8
9	G4YPC	IO91RH	29	27	4574	123,498	GM4SIV/P	561	60	4
10	G0API	IO80XS	20	24	4457	106,968	MM0CPS/P	566	15	5
11	G4OUT	IO92AT	20	21	3831	80,451	G3TCU/P	387	10	3
12	G1KHX	IO81MI	20	22	3213	70,686	GM4SIV/P	476	90	5
13	GM4DIJ	IO85IW	18	18	3230	58,140	G4BVY/P	591	160	4
14	G3FIJ	JO01KV	13	14	3155	44,170	GM4SIV/P	677	15	4
15	GU6AJE	IN89RL	11	13	2816	36,608	GM4SIV/P	683	10	2 delta

2nd Slow Speed Cumulatives, 2000

ENTRIES WERE up this year, and although no Novices were worked or heard, we were happy to receive two M5-call entries out of the 10 that were active. There was an average of 60 different callsigns logged each session.

Congratulations to Peter Herbert, M5ABN, for taking First Place for the Class A/B Licence with his Icom IC-746 and G5RV antenna, and to Andrew Gostomsig, M5ACR, for second place with an FT-1000MP and long wire antenna.

First place among the Full 'A' licensees goes to Mick Puttick, G3LIK, with his FT-101ZD and W3DZZ antenna, while second place goes to Terry Robinson, G3WUX, with his Ten-Tec Corsair 2 and doublet.

The leading 'First Time Entry' certificate goes to Peter, M5ABN, other first timers were M5ACR and G4CVA.

There were still a few comments that some of the CW speeds were a shade fast. Many thanks to G3EAO for his check log.

Derrick Webber, G3LHJ

2nd Slow Speed Cumulatives, 2000

Pos	Call	28 Aug	4 Oct	13 Oct	21 Oct	29 Oct	Total	Code
1*+	M5ABN	-	300	-	454	540	1294	2C1?
2*	G3LIK	CLK	-	250	225	265	740	2C13
3*	G3WUX	-	233	-	260	225	718	2C14
4	G3JSR	CKL	203	-	245	268	716	2W13
5	G3YAJ	195	240	CKL	250	-	685	2C1?
6+	M5ACR	-	-	240	220	213	673	2W1?
7	G3TTB	-	-	245	214	183	642	2W12
8	G0VQR	-	205	228	CKL	200	633	2C12
9	G0IGP	CKL	160	CKL	260	200	620	2C12
10	G2HLU	CKL	195	200	-	215	610	2W1?
11	G0RAF	205	CKL	-	210	193	608	2C17
12	G4BJM	-	140	215	210	-	565	2C1?
13	G4XPE	CKL	180	CKL	165	210	555	2C11
14	G4BLI	-	180	CKL	179	180	530	2C13
15	G3BPM	CKL	CKL	137	149	158	444	2C1?
16	G3ZDD	CKL	124	146	CKL	148	418	2C1?
17	G0VYR	86	135	-	CKL	185	406	2C12
18	G0VDZ	-	121	CKL	120	150	391	2Q1?
19	GW4LZP	140	CKL	CKL	110	110	360	2C11
20	G4KEW	CKL	CKL	118	118	120	356	2C1?
21	M0CUK	-	58	-	128	166	352	2C13
22	G0FYX	138	CKL	-	120	90	348	2C1?
23	G3ZGC	65	65	CKL	215	-	345	2W13
24	G4KNO	100	101	-	-	115	316	2W1?
25+	G4CVA	60	CKL	85	-	118	263	2C18
26	G4ELY	-	98	-	95	57	250	2C1?
27	G0VZC	45	20	CKL	53	-	148	2W1?

* = Certificate of Merit + = First time entrant in RSGB Contest

432MHz FM Contest, 2000

A VERY disappointing entry once again. Most entrants complained of low activity. The event clashed with the Elvaston Castle rally and the start of Euro 2000, which obviously didn't help. There is only a limited number of free weekends when the VHFCC can organise events, and this is one where it may be better to find another use for. Members opinions are always sought as to ways of improving not only the format of the contest but ways in which we can increase awareness to the stations who are QRV on this mode.

Martin Platt, G4XUM

432MHz FM Contest, 2000

Open

Pos	Callsign	Loc	QSO	Multi	Points	Best DX	km	Power	Ant
1	G1ATZ/P	93AD	37	18	36990	G6ODT	129	35	21ele(H)/Co-Lin
2	G0WJR/M	81QL	6	5	735	GW0GHF	41	4	3 x 5/8 Vert

Single Operator, Fixed

Pos	Callsign	Loc	QSO	Multi	Points	Best DX	km	Power	Ant
1	G0GZI	83RE	20	15	10290	G1PIE	51	10	Vert
2	2E0ATF	00DX	12	9	6174	G6ODT	161	10	10ele
3	G1WAC	92BJ	12	8	4296	M0DXR	153	70	21ele(H)/Co-Lin
4	G3ILO	81UR	4	3	537	M1CEL/M	107	25	4ele (2m Yagi)
5	2E0AUD	01BO	14	8	112	2E0ATF	70	10	12ZL

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest
3 – 4 Feb	*0001-2400*	*SSB*	*10-10 Winter Contest*
3 – 5 Feb	*1400-0200*	*CW*	*YL-OM Contest*
4 Feb	*0000-0400*	*SSB*	*North American Sprint*
10 – 11 Feb	*0000-2400*	*RTTY*	*CQ/RJ RTTY WPX*
10 – 11 Feb	2100-0100	CW	RSGB 1st 1.8MHz (Rules: see Dec 2000 *RadCom*, p82)
10 – 12 Feb	*1400-0200*	*SSB*	*YL-OM Contest*
11 Feb	*0000-0400*	*CW*	*North American Sprint*
11 Feb	*2000-2400*	*SSB*	*QRP ARCI Winter Fireside*
17 – 18 Feb	*0000-2359*	*CW*	*ARRL DX*
23 – 25 Feb	*2200-1600*	*SSB*	*CQ 160m Contest*
24 – 25 Feb	1500-0900	CW	RSGB 7MHz DX Contest
24 – 25 Feb	*0600-1800*	*SSB*	*REF (French) contest*
24 – 25 Feb	*1300-1300*	*CW*	*UBA (Belgian) contest*

VHF Contests

Date	Time	Mode	Contest
4 Feb	0900-1500	ALL	RSGB 432MHz AFS
6 Feb	2000-2300	ALL	RSGB 144MHz UK Activity
11 Feb	1000-1200	ALL	RSGB 70MHz Cumulative
25 Feb	1000-1200	ALL	RSGB 70MHz Cumulative

The full rules of RSGB HF and VHF/UHF contests were published in the RSGB Contesting Guide in October 2000 *RadCom*. Brief rules for non-RSGB contests, which are listed in italics above, can often be found in the 'HF' and 'VHF/UHF' columns. The HF and VHF Contest Committees both have web sites from which comprehensive details are available. These are www.g4tsh.demon.co.uk/HFCC/index.htm and www.blacksheep.org/vhfcc

CONTINUED FROM PAGE 77

Block Assignments, ITU Zones, *CQ* Zones, details (where known) of call districts and other information gathered over 20 years.

TABLES

THE FINAL YEAR 2000 tables will appear next month. In the meantime, do start sending me your 2001 scores. As I said in the November column, this year I will run a table for total DXCC entities worked (by mode), regardless of band. As always, no QSL cards are required. This is an honour system and, hopefully, a bit of fun.

The 2000 tables have certainly fulfilled that wish. While there is an almighty tussle at the top of the 10m table, I have also appreciated receiving entries from those of you having to make do with very modest stations, and obviously enjoying the chase.

Apropos 10m, the band has certainly produced some fine DX as the year has gone on. In the ARRL 10m contest, for example, I operated in the low power (100 watt) category, with my antenna confined to 30ft or so due to the high winds. My rotator was also refusing to function, again due to damage in the gales. Nevertheless I worked close to 60 countries in all continents, as well as all US call areas, in just a few hours of casual operation.

The A52FH team. Clockwise from left: Denise, F6HWU; Alain, F5LMJ; Vincent, G0LMX; Gérard, F2VX and Alain, F6ANA.

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 submit all items for the **April** 'HF' column by **24 February.** ♦

HF F-Layer **Propagation Predictions** for **February 2001**

	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz	28.0MHz
Time	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220	000011111220
(UTC)	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020	246802468020
*** Europe							
Moscow	999988899999	889999999999	..9999979854	..9999699...	..9999999...	..9999999...	..8999998...
*** Asia							
Yakutsk	69998	7.62.2498999	3.4889889766	...998667422	...886546...	...7863.3...	...586.....
Tokyo	.....69999.	....6689999.	...78789987.	...88.....	...88.....	...8.....	.....
Singapore	89887	799877	1999533	.....6998...	...127996...	...45778....	...45668....
Hyderabad	17677	6.....78877	.....5895..	.....2898...	...336896...	...77898....	...78898....
Tel Aviv	763....27877	115....78722	..1422687311	...556773...	...555672...	...26774....	....3332....
*** Oceania							
Wellington	.....66...	....12477...	...166775...	...26776....	....6664....	....554.....	....33.....
Perth	.....5878.	.....28976.	.....79842.	.....2897...	.....4785...	.....567....	.....445....
Sydney	.....787..	.....7986..	.....7997...	....48994...	....6898....	....6787....	...25676....
Honolulu	...1.....	...5.....	...4.....	.....	.....	.....	.....
W. Samoa	.....	...31.14....	...36676....	....456.....	.....12.....	.....	.....
*** Africa							
Mauritius	9.....49999	9.....99999	9.....99999	899987	...8889998..	...999999...	...999998...
Coromos - D68C	9.....49999	98....99999	98....99999	7.87.6899988	..89889998..	...999999...	...999999...
Johannesburg	99.....1899	99.....8999	862....39998	4.32..289875	...54468974.	...7677984..	...677888...
Ibadan	999.....9999	999....39999	98996..99999	6.899999976	...99999996.	...9999998..	...9999997..
Nairobi	98.....9999	99.....99999	999...799999	9899999999998	98999999987	8.9999999888	..899999998.
Canary Isles	75.....9997	.999....99..	999997799.99	98.798799999	87..9988.998	....985..98.	....76..99..
*** S. America							
Buenos Aires	9999.....99	9999.....99	99.9.....899	...9.....987	...98...897.	...9888898..	...889898...
Rio de Janeiro	9999.....899	9999.....999	9999.....999	99.99..99999	...99999999.	...9999999..	...9999999..
Lima	9989.....48	9969.....88	66.95....277	...844..4652	...7.755762.	...4.87775..	.....88772..
Caracas	999.....89	9989.....99	77.88....898	....97..797.	....798899..	.....99998..	.....9999...
*** N. America							
Guatemala	9999.....9	99999.....99	99.999...999	...9.999999.	.....99999..	.....99999..	.....999...
New Orleans	9986.....8	99592.....89	66.947...697	...5.788886.	.....69998..	.....9996..	.....9994..
Washington	9997.....89	99796....698	87.878315998	53.649999986	9999974	.....899985.	.....79998..
Quebec	9851.....998	52.9....6896	...78746894.	...5898897..	...3999996..	....789983..	....67997...
Anchorage	788.....1	83265.157467	1.....3881.	.....63..	.....3...	.....	.....
Vancouver	8873.....1	87374.....47	5..2...66644	.....7861.	.....684..	.....38...	.....7...
San Francisco	99881.....6	886861....17	63.65.323335	.....7762.	.....785..	.....77...	.....56...

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 2000 issued by the Sunspot Data Centre, Brussels, was 104.5. The maximum daily sunspot number was 153 on 15 December and the minimum was 58 on 9 December. The predicted smoothed sunspot numbers for February, March and April 2001 are respectively: (SIDC classical method – Waldmeier's standard) 112, 110, 109 (combined method) 124, 125, 126.

VHF/UHF

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

DUE TO THE continuous low pressure weather systems affecting the British Isles and much of Europe, tropospheric openings on the VHFs have been non-existent. Those with antennas still serviceable after all the gales and incessant rain have enjoyed some success on meteor scatter (MS) and some good ionospheric DX on 50MHz.

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, (AB), (SD) etc refers to the postcode area and (KO15), for example, is the Maidenhead grid.

BEACON NOTES

STEFAN HECK, LA0BY, reports that since early September 2000 the 6m beacon in Svalbard has been operating properly again. From the previous April it was probably very inefficient due to antenna damage and has since been repaired by LA1BI. JW7SIX (JQ78TF) is on 50.047MHz and many reception reports have been collected. Stefan has put the beacon log on his website - see the panel.

Tim Moore, ZL3VTV/ZL1, advises that ZL1VHF is operating (QRV) from its new 220m ASL site at Whitford, approximately 30km from the city of Auckland, but no grid reference was stated. It is on 50.043MHz and sends the message "ZL1VHF 6m Whitford". Reception reports can be e-mailed to tmoore@clear.net.nz

PUBLICATION

TOM RICHMOND, VE3IEY, has a wry sense of humour. When he edited the December issue of *The VHF Journal*, the monthly publication of the Rochester VHF Group in New York, the main news in the USA was the controversy over the allegedly confusing design of presidential election ballot papers in the state of Florida. So every page of the December issue is a 'butterfly' layout simulating the punch holes against candidates' names. Each year the RVHFG holds a VHF Academy, which includes a preamp and converter tune-up clinic. On 144MHz, K2OS's home-brew preamp, using an MGF1402 device, was best with a noise figure (NF) of 0.32dB and a gain of 23.8dB. There was only one entry for 432MHz and on 1296MHz, K2DH's commercial DEM 23LNAH preamp was best at 0.36dB NF and 16.9dB gain.

The original Maidenhead Grid locator system uses six characters, such as FN32SL for WA1MBA's home. A later version added a further two figures (FN32SL95) but Dick Knadle, K2RIW, of UHF amplifier fame, writes about the advantages of *12* Cipher Grid Squares, FN32SL95XA90: don't ask and no, it's *not* the April issue!

See last month's panel for the RVHFG's website details.

PROPAGATION

DATA FROM THE Internet Space Weather site suggests that solar activity, as measured by the 2.8GHz solar flux over 30-day periods, has flattened out, perhaps indicating that we are experiencing the peak of Sunspot Cycle 23. In the January column the reported figure was 172.7 units and in the period 5 November to 4 December it was 174.6. During this period the minimum was 144 on 13 November, the maximum being 205 on the 23rd.

The total area of sunspots on the visible disc is measured in millionths and in the period 20 - 30 November the value exceeded 1120, maximising at 1300 on the 29th. In the 30-day period 35 new regions were recorded.

The Space Environment Center (SEC) website gives a lot of interesting data including 27-day - ie one apparent solar rotation period - forecasts of solar flux and sunspot numbers. In the period from 6 December they were forecasting the flux varying from 145 to 200 units, averaging at 170.7. Anyone wanting to keep a record of these important parameters should log on to this site - see the panel on page 84.

In the September issue of *The Six and Ten Report*, Steve Reed, G0AEV, writes that, "Reports were fewer and shorter, reflecting the relative lack of 6m band openings that is characteristic of the lull between the summer Es and winter F_2 seasons." This is illustrated in tabular form and followed by similar tables for DX propagation via Es, F-layer and transequatorial (TEP) modes.

Auroral propagation was recorded on 12 days and Steve writes, " . . . the resulting radio auroras were not spectacular. However, there were several good auroral-E events, particularly on the evening of the 12th when propagation between GM and VE8 was reported".

There are the usual tables of daily solar and geomagnetic data and energetic events, plus several pages of reports of 6m activity from around the world. The *Report* is an activity of the RSGB Propagation Studies Committee (PSC), and is edited by G0AEV and Prof Martin Harrison, G3USF. Subscription inquiries should be addressed to Steve (QTHR) whose e-mail address is g0aev@explore.force9.co.uk

The ZD8SIX M² antenna with Cross Hill in the background.

The October edition of *SunMag* begins with an article about the then imminent Leonids meteor shower, which was expected to produce "modest outbursts" in 2000. David Asher of the Armagh Observatory is quoted as saying, "We're very, very confident of the storms coming in 2001 and 2002. Peak rates in those years should reach at least 10,000 meteors per hour as Earth passes through debris trails from comet Tempel-Tuttle".

The second article is devoted to the progress of the NASA Genesis spacecraft project, scheduled for lift-off shortly. One of its missions is to gather the first ever samples of the solar wind as the spacecraft floats in the oncoming solar stream outside Earth's magnetosphere. On its return to Earth in 2003, the collected samples will be retrieved in mid-air by helicopters for laboratory analysis.

There are two more articles about the 2000 Leonids shower. There is a page of histograms showing active regions recorded in Cycles 20 - 22 complete and 23 to date.

It is apparent that the total number of active regions so far this cycle - October 2000 was the 49th month - is less than for the corresponding months in the previous three. For example, in Cycle 21 the total was about 1775, but this cycle's figure is about 1240.

There are tables of daily solar, geomagnetic and particle data, seven pages of sunspot group data and a solar flare list. Subscription inquiries about *SunMag* should go to G0CAS (QTHR). Neil's e-mail address is neil@g0cas.demon.co.uk and he can be reached on packet via g0cas@gb7don.#19.gbr.eu

Chris Gare, G3WOS, at the ZD8SIX station on Ascension Island: all ready to go!

MOONBOUNCE

CONDITIONS IN THE second leg of the ARRL EME Contest, held over the 18 / 19 November weekend, were reported as good by some participants and poor by others. The following reports are compiled from direct input from readers and from the December 2000 *432 and Above EME News,* edited by Allen Katz, K2UYH. As the mode is rarely mentioned in these reports, I assume they are all CW.

Peter Blair, G3LTF (IO91), has been busy on his equipment installing a new VE4MA-style feed horn for 23cm and getting a new PA working on 70cm. The latter is a K2CBA design published in the July 1981 *Newsletter* and uses a DOD006 valve, which is similar to a 7213.

After working a couple of stations on 70cm on 18 November, the VFO in his transceiver started to jump around so he spent three hours rebuilding it. That done he completed with another 11 stations, PA4FP and F5KDK being new initials - stations worked for the first time - bringing his total to 355. Next day he worked two more stations but N2IQ, UT3LL and UA3PTW were called with no reply (CWNR). Also heard were K4EME, CT1DMK and JR9NWC.

On 23cm Peter completed with ON5RR, GW3XYW, F2TU, W7CS, DL6LAU (#165), OK1UWA (#166), VE6TA, OE9ERC, JA4BLC, HB9BBD, VK5MC, not worked since 1986, F5PAU, JF3HUC, EA3UM and JA6CZD. HA5SHF, JH3EAO and W7GBI were CWNR. He wonders where were all the US West Coast stations? He didn't hear one on any band. In summary he made his highest score since 1991 with 45x21 on 70cm, 55x28 on 23cm and 4x4 on 13cm.

Ian White, G3SEK (IO91), ended with 77x32 on 70cm for the two weekends but found it slow going in the second leg. He now has 311 initials on the band. He hopes that consideration will be given to EME QSO procedures and mentions that a draft for comment is available at DL4EBY's website - see the panel.

Roy Reed, G3ZIG (JO02), was one who found conditions on 2m poor at times in the November leg with signals very much in and out. He managed to complete with another 30 stations, bringing his total to 134. The 13 new initials were F6KCP, DD0VF, SM5IOT, JA5NNS, GD4IOM, 4U1ITU, VE3AX, VE1KG, F6FHP, WP4G, SM7WSG, I8TWK and WB0GGM. He thoroughly enjoyed the contest.

Howard Ling, G4CCH (IO93), found it difficult to find new stations to work on 23cm in the last session as there were many very loud stations crammed in the bottom 25kHz all calling CQ. He did work WA1JOF (529/539), VE4MA (O/O) and K4QI with 2° of elevation. Gotaways were JH3EAO and W0KJY, and K2UYH and VE9DW were heard along with his own echoes down to moonset. Three new initials bring his total to 139 for a final score of 84x32. His DXCC score is 28 countries in 22 US states and he has made Worked All Continents (WAC).

Stuart Jones, GW3XYW (IO71), reported American stations as quite active with 10 worked, the highest ever number in one weekend. His score for the weekend was 25x13. He was using a new G3WDG 026 preamp, which seems to work well.

The *Newsletter* is again sponsoring an SSB EME Contest on 23cm during the second pass of the Moon during the February sked weekend. I presume this is the 3 / 4 February period when there will be over 29 hours of Moon time for London latitude stations. The 'second pass' would be the one from around noon on the 3rd to about 0355 next morning giving a total contest time of almost 16 hours. During this time the declination varies from +18.71° to +20.57°, the 23cm sky temperature varies from 34K to 38K and the signal degradation, referred to perigee, ranges from -0.41dB to -0.30dB.

The dates for the European Worldwide EME Contest are confirmed as the 31March / 1 April weekend for the 432MHz and 2.3 to 5.7GHz bands and 28/29 April for the 144MHz, 1.3GHz and 10GHz bands. The rules will appear later.

BAND REPORTS

50MHz

During his brief trip to Ascension Island at the beginning of November, Chris Gare, G3WOS, worked 65 countries in six days using his call ZD8SIX (II22). He went up to the ZD8VHF beacon site on Green Mountain and found the installation to be in a rather poor state. He had a fabulous time and you can read his excellent account on a special website - see the panel.

Mike Johnson, GU6AJE, e-mailed from the high seas off South America. He is the second radio operator on the *MV Arctic Sunrise*. Shortly before the trip he passed his 5WPM Morse test at the Leicester show and now has the callsign MU5MUF. He has been listening on the band, mainly hearing Brazilian stations but is QRV on 10m as MU5MUF/MM when work and regulations allow. Short e-mails can be sent via ro2@mvas.greenpeace.org but no attachments please.

Ted Collins, G4UPS (EX), lists brief MS QSOs with SM, OZ and DL stations from 0831 on 18 November. At 1342 on the 23rd he worked HC8N* (EI59) for country number 158. Later some East Coast Ws and VEs were contacted and at 1553 N5WS was heard working Gs in JO01. There were afternoon openings to W1, 2 and 3 and VE1 and 2 during the next three days. On the 30th the OD5SIX beacon was copied from 0820 peaking to S9+40dB for a long period and he worked 5B4FL* (KM64).

John Armstrong, GW3EJR (SA), added another seven countries to his total this season but although being located in West Wales, doesn't seem to

METEOR SCATTER

THERE ARE A few reports on the 2000 Leonids shower and Gius Giunta, IT9VDQ, did not hear much activity. He runs 200W to a 9-ele Yagi on 2m from a noisy apartment in the middle of the town. He lists 10, one-burst SSB QSOs with DL, F, OE, YU and 9A stations. There were many short and strong reflections, but many were also very long, over a minute. He has recorded his QSOs and the .WAV files are on his website - see the panel. He noted three peaks, around 0730 on 17 November, 0300 and 0700 on the 18th, the latter two being the best. He says, "Many thanks for calling me, sorry if no answer!"

John Palfrey, EA7IT, was QRV on 18 November on the random SSB frequency, 144.200MHz, and completed with DG5GAG (JN48) and F1DUO (JN26) at 0533. Visually the shower was good, thanks to a clear sky, but it was nothing like the previous two years. During the August Perseids he completed with EI5FK (IO51) for a new country and his 101st grid.

Clive O'Hennessey, GM4VVX (IV), used to report when he lived in the Newport area in Gwent, but excessive interference there rendered his station almost inoperable. He now lives in Lairg in the Highland region (IO78TA), thus boosting the amateur radio fraternity in IO87 to seven. He runs 400W to a 9-ele Yagi on 2m and found the Leonids disappointing. Out of 10 skeds only the one with F6FHP* (IN94) was successful and nothing was heard from any other partners in OE, OK, RW and 9A. Random SSB QSOs were completed with DL, EA and F stations. He would welcome CW skeds and his e-mail address is ohennessy@madasafish.com

Paul Bradbeer e-mailed a report about 2m activity but omitted to give his callsign or location. On 18 November, running 400W to a pair of 7-ele Yagis, he completed a sked with IW2HAJ and 10 random QSOs with stations in DL, HA, I, S5, SP, T9, 9A and best of all LY2SA, in the period 0256 - 0629.

do all that well towards Ireland and North America. Jamie Ashford, GW7SMV (NP), comments on the very selective F_2 openings. He worked 3C5I (JJ43) on 21 November, HC8N* at 1408 on the 23rd and some W1s in the afternoon of the 26th. S92DX* (JJ31) was a rare one at 1151 on 1 December.

70MHz

Brian Williams, GW0GHF (CF), is trying to stir up interest on the band in his region and mentions the Activity Night every Tuesday from 1930. Stations call on 70.20MHz SSB or 70.45MHz FM. He also calls CQ daily on FM and SSB at 1400 and 2045. He uses a Delta-loop antenna hung off the rafters in the loft. It's fed at the bottom with 36in of bell wire into 50Ω RG58 coax formed into a six-turn 4in diameter choke balun taped up. He gets a 1:1.3 VSWR over the whole band.

144MHz

John Cannell, G7OAI (OL), writes that he and Phil MacKimm, G8HDS, also in Rochdale, run regular skeds from 0730 every weekday on 144.310MHz SSB with Gary Finch, G8WVR, near Minehead in Somerset. John only runs 50W to an old 8-ele Yagi and is surprised at the consistency of the sked, which rarely fails. He asks if others would like to publicise any similar skeds to generate more activity, which otherwise seems confined to contests these days.

DEADLINES

THE APRIL DATE is **13 February** and for May pencil in **20 March** in your diary. My telephone answering and fax machine is on 020 8763 9457 and the CompuServe ID is g3fpk ♦

RSGB	www.rsgb.org
DL4EBY (EME)	www.dl4eby.de
Space Environment Center	www.sec.noaa.gov
IT9VDQ	http://digilander.iol.it/it9vdq
JW7SIX beacon log	www.qsl.net/la0by/JW-log.htm
ZD8SIX story	www.uksmg.org/ascension-home.htm

LOCATOR SQUARES TABLE

Starting date: 1 Jan 79

Callsign	50	70	144	430	1296	Total
G4YTL	-	50	490	72	-	612
G3XDY	-	33	246	170	120	569
G8TOK	329	31	133	55	29	577
G3FIJ	236	29	105	50	23	443
G0JHC	797	25	48	4	-	874
G4OU	-	23	107	-	-	130
G3IMV	641	20	616	125	53	1455
G4DEZ	487	19	258	81	67	912
G8GCI	279	19	99	39	-	436
G4FUJ	57	17	19	4	5	102
G8GNI	139	15	46	18	-	218
G0EV	416	14	292	77	16	815
GU6AJE	311	13	32	-	-	356
GJ4ICD	780	1	267	121	79	1248
G0FYD	502	1	259	10	-	772
M0CNP	-	1	31	12	-	44
G4RGK	409	-	345	233	78	1065
G0FIG	460	-	385	94	-	939
GW7SMV	494	-	183	-	-	677
GW6VZW	488	-	146	6	-	640
GU7DHI	415	-	85	14	-	514
G7CLY	238	-	221	13	-	472
G6TTL	220	-	133	90	27	470
MM5AJN	316	-	76	32	-	424
G1UGH	270	-	130	16	-	416
G8XTJ	247	-	137	-	-	384
G4ZHI	39	-	238	32	-	309
G1EFL	219	-	64	-	-	283
G3FPK	30	-	246	-	-	276
G0ISW	170	-	80	22	-	272
2U0ARE	238	-	18	12	2	270
G0ISW	162	-	80	22	-	264
GW3EJR	252	-	-	-	-	252
GM1ZVJ	235	-	-	-	-	235
G4APJ	155	-	44	20	-	219
GM4VVX	62	-	60	-	-	122
EA7IT	-	-	101	-	-	101
MM0BQI	44	-	18	1	-	63

No satellite, repeater or packet radio QSOs. If no updates received for a year entries will be deleted. Band of the month is 70MHz. Next deadline is 15 February.

BOB TREACHER, BRS32525
93 Elibank Road, Eltham, SE9 1QJ.
E-Mail: brs32525@compuserve.com

SWL

I AM delighted to report that my son, Simon, RS177448, has picked up his first contesting trophy. He took part in the ARI DX Contest last April, finished 10th (out of 21 entrants) and was awarded the IN3ANE Memorial Plaque for the best log from an SWL aged under 18 years old. As well as this success, he won the 432MHz section in VHF NFD last year and was 20th (out of 28) in last year's Holyland DX contest.

D68C

SOON AFTER this issue is received, the Five Star DXers Association expedition to the Comoro Islands will be underway. D68 is relatively rare for SWLs as there are few DX trips to the island. The team hopes to redress the balance and it plans to be extremely active on all bands. No doubt most reports will be for 20m SSB, but some more established listeners will be out to catch them on 80 and 160m and the WARC bands.

As mentioned in an earlier column, I shall be handling all SWL reports. I will be delighted to confirm D68 for you all, but please make your reports accurate with regards to date, time and frequency, and try to send a QSL card that reports on more than one QSO. The team will be accumulating contacts very quickly indeed, so it should be easy to report on two or more QSOs. A few guidelines to follow will appear in next month's column.

DX NEWS

BAND CONDITIONS took a turn for the better in late November and accounted for some good DX on 28 and 24MHz. Robert Small, BRS8841, reported that most of his new countries were for loggings on 24MHz: TS7N, GJ4YWY/M, D44CF and J79GU. He had not heard too much on the low bands, but did catch C4W on 1.8MHz and AH2R on 7MHz during the CQWW contest. Away from the contest, AT0JH (India) was a new one on SSB. He had heard some interesting DX on 14MHz, mostly early and late in the day, including VP2EK, J80WW, 3V8DC, VP6TC, 9E1S, ZK1BQI, CE8/KD6WW (SA-050), S07U, EM1KY (Antarctica), TS7N, FO0DEA and YJ0PD. 18MHz provided him with one unlikely new one in the shape of SI75A (Sweden) on SSB, but A35YL and P29VPY were probably the pick from that band.

Robert felt that the best DX band this time around was 21MHz. He offered these to back up the theory: YB32MI (OC-237), YC8XTW/P (OC-236), 9K9X, A52B, A52W, ZK1YRE (OC-159), BD5RT, YC9WZJ/P, 3E1DX and YC9BU/P (OC-241).

Simon, RS177448, has now logged his 100th DXCC entity and is applying to join CDXC (Chiltern DX Club). His log since mid-November includes AH8A, BY1DX, FO5JV, TS7N, VP8DBR, 5H3RK on 14MHz; D2BB on 18MHz; A41MD/RD, VU2GMT, CN8RS, 5T5U on 21MHz; 5C8M on 24MHz; 5R8GT and SY2A on 28MHz (a country I still need!); FM5DN and 4L1TL on 7MHz, and 7J4AAL on 3.5MHz.

However, perhaps the most enjoyable listening stint of the period was the 50MHz Auroral-E conditions which brought Simon European DX in LA, SM and OH.

My own listening opportunities had been few and far between. Pick of the bunch was hearing N7UA on 3.5MHz at 1537UTC on 2 December. Propagation on the long path to W6/7 is normally at its best around the turn of the year so I was especially pleased to catch Bob before sunset here (before sunrise on the West Coast). The 2nd also saw BA4RF in the log on 3.5MHz SSB. The only new band countries during the period in question were YI and 3V8 on 24MHz and FO0 (French Polynesia) on 28MHz.

In answer to a query raised by one listener, there was no activity from Crozet Island (FT8Z) during November. Also, as far as I am aware all recent activity from FS has been from the island of St Martin itself.

With Millennium year into its final month as I write this column, it is interesting to see another flurry of activity from various stations using '2000' in their prefix. I am aware of fresh activity from LZ and ER, and further activity as we head towards 31 December cannot be discounted.

This special activity reminds me that the DARC are offering a special certificate for hearing six different special event stations which have '2000' as the prefix (not 'OOO' as the suffix). So, if you heard M2000A, ER2000D and LZ2000A, you only have to search your log for three other '2000' stations; that ought not to be too difficult! Applications, together with a fee of $10, should go to Horst Poelitz, Postfach 1213, D-68537 Heddesheim, Germany.

TABLES

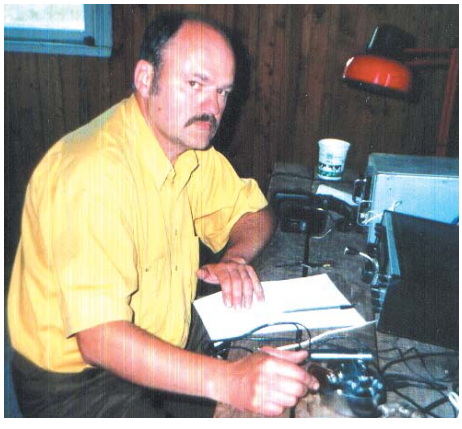
YAN BARBIER, F-11556, has started a DXCC Heard and Confirmed listing on the Internet at www.multimania.com/f11556 There are also listings for IOTA, prefixes etc. Yan will be pleased to accept entries from British SWLs: e-mail your latest totals to him at F11556@aol.com

CQ 160 SSB TEST

THE LACK OF publicity and poor conditions meant that last year's SWL contest was rather a non-event. After a bumper entry in 1999, there were only two entries for last year's contest when Mark Deacon, BRS46566, scored 6000 more points than Philip Davies, RS95258. I hope for a bigger entry this year. The rules were included in this column last month. They have also received greater publicity around Europe and have also been available on the SM3CER contest pages on the Internet. I cannot predict the level of DX activity as that will undoubtedly be affected by the better HF conditions, but I can guarantee an enormous interest from Europe. Contests on 160m now are very different from 20 years ago, when many countries in Europe did not have privileges to use the band. Now, there is great expectation to hear 30+ DXCC entities in the first hour of any contest.

If your 160m DXCC count is low, treat yourself to a couple of hours in the shack before bedtime on Friday 23 February and see how easy it is to log some new countries. ♦

The spectacularly colourful QSL of German SWL Joachim Dahl.



Lithuanian SWL Vilmantas Morkunas, LYR-794, otherwise known as LY3BY.

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GC-038G	Mast clamp (green)	**RWP £25.00**
GC-048	Mast clamp for G-2800SDX	**RWP £39.00**
GS-050	Stay bearing (small type)	**RWP £29.00**
GS-065	Stay bearing (medium type)	**RWP £45.00**

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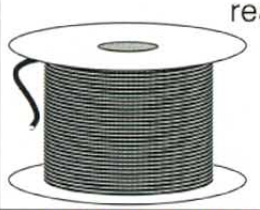

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ALINCO	DJ-G5EY 2/70/ WIDE BAND TRANSCEIVER	£200.00
ALINCO	DR-590 DUAL BAND MOBILE	£175.00
ALINCO	DR-605 DUAL BAND MOBILE TRANSCEIVER	£230.00
ALINCO	DX-70T 100W MOBILE / HF	£399.00
ALINCO	DX-70TH TRANSCEIVER	£475.00
ALPHA	87A FULLY AUTOMATIC AMP	£3,350.00
AMERITRON	QSK-5 2.5kw QSK SWITCH	£199.00
AOR	AR-2002 BASE SCANNER	£199.00
AOR	AR-3000A RECEIVER	£495.00
AOR	AR-5000 RECEIVER	£1,199.00
AOR	AR-7030 REMOTE CONTROL RECEIVER	£595.00
AOR	AR-8000 HANDY RECIEVER	£199.00
AOR	AR-8200 MK1 HANDY RECEIVER	£260.00
DAIWA	PS-120MK11 10amp PSU	£50.00
DAIWA	PS-304M11 20amp POWER SUPPLY	£85.00
DATONG	FL2 FILTER	£60.00
DIAMOND	GSV-3000 PSU	£100.00
DIAWA	CNW-518 2KW CROSS METER ATU	£199.00
DIAWA	ROTATOR MR-750U HEAVY DUTY	£250.00
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ATV

ROGER JONES, G3YMK
Millfield House, Alton Lane,
Four Marks, Alton, Hants GU34 5AL.
E-mail: G3YMK@aol.com

THERE ARE various 'hot-spots' of ATV activity around the country and one of those is North Wales. Even though the terrain is anything but kind to UHF and microwave operation, up to 20 stations are active using the two repeaters GB3GW and GB3TM. Brian Davies, GW4KAZ, has built a very neat mobile installation, finding sites where he can work through both repeaters using only 800mW output to an Alford slot antenna. Brian has modified a Maspro satellite receiver for 24cm 12V operation. This receiver is particularly popular with ATV enthusiasts as it has switchable IF bandwidths and seems particularly sensitive. A 5in monitor serves for viewing incoming signals and monitoring his transmissions. The passenger seat headrest is a steady support for the miniature video camera.

Brian says the results are very satisfying, especially the fantastic landscapes of Snowdonia enjoyed by his viewers!

Recently Brian and Dewi, GW0ABL, were operating a portable special event station, GB2VK, from the old Marconi site at Waunfawr (near Llanberis) and were delighted to receive P3 signals from the EI4DVR repeater near Dublin, under relatively flat conditions. This has led to thoughts of linking to other repeaters across the Irish Sea.

FEATURED REPEATER

DEREK Whitehead, GW3FDZ, describes the story behind GB3GW in *CQ-TV 192*, the journal of the BATC published in November 2000. Again, a modified Maspro receiver is used at the site at Pentrefelin, Criccieth (also the home of 2m voice repeater GB3DW and a number of packet links) fed by a G3JVL Alford slot antenna which is also used duplex for transmit. The aerial, mounted in its protective radome, (plastic drainage pipe), is fixed to the flat roof of the equipment building using a steel framework.

The frequency split for this repeater is unusual (only 30MHz), and the challenge of design and manufacturing of suitable filter-duplexers was taken up by GW4KAZ. The logic is software-controlled based on BATC hardware, and the programming was carried out by Chris Smith, G1FEF, and updated by Graham Denton, G8VAT.

The transmitter is a phase-locked-loop exciter feeding a chain of Mitsubishi 'brick' amplifiers to produce the 25W ERP allowed by the licence. Apart from mains power loss, the repeater has performed flawlessly since commissioning. The furthest regular user is GW0GZQ located in Moylegrove, south of Cardigan, a distance of 60 miles.

Derek also acknowledges the many amateurs in North Wales who have helped to get GB3GW operational; the whole project comes under the umbrella of the Arfon Repeater Group. Derek would be delighted to hear from potential users or anybody who would like to support this very active group.

REPEATER NEWS

FEEDBACK FROM readers asked for a regular update regarding the licensing progress of new and modified repeater proposals - see the box. This is intended to summarise the greater detail available on RMCWEB for those with Internet access (1).

Richard Parkes, G7MFO, on behalf of the East Yorkshire ATV Repeater Group, has submitted the first full application for a 13cm repeater. The proposed repeater would be co-sited with voice repeaters GB3HS and GB3HU, and the existing 10GHz TV unit GB3XY at Weedley, near Riplington in East Yorkshire. The aerial system will consist of two separate Alford slots for receive and transmit; a mast-mounted LNB will feed a modified Pace 9200 satellite receiver.

The transmitter will be a much-modified G1MFG exciter feeding a PCS 1900 amplifier. This combination produces some 40W which, by the time feeder losses are taken into account, will enable about 25W ERP to be radiated. The proposed input frequency is 2330MHz and the output 50MHz higher. Being the first application to be submitted to the RA, these frequencies are subject to change.

Stan Ellis, GD3LSF, keeper of voice repeater GB3GD, visited the RMC stand at the Llandudno rally early in November and, although there was little ATV activity on the Isle of Man, the repeater group might be prepared to host a unit at its Snaefell site if anybody was interested.

Ken Harper, G0EKH, reports that coverage tests carried out in Torbay for the GB3TB project have proved promising, with signals being received at P4 as far away as Portland. A full proposal is expected to be submitted soon.

Noel Matthews, G8GTZ, has been having great difficulty in obtaining a suitable affordable site for the proposed 13cm digital repeater in northern Hampshire. If anybody has any suggestions he would be delighted to hear from you via his website (2), where he also has details of an e-mail reflector dedicated to European ATV activities.

FINAL SNIPPETS

ON DISPLAY AT the Pickett's Lock show in November was a very elegant prototype of a new controller board being developed by G1MFG for the popular Comtech units he supplies. The board has an LCD display of both transmit and receive frequencies. A further most useful feature is that when in repeater mode, the frequency of the receiver is changed to that of the transmitter when on transmit so that local monitoring is available. Further details are available from Giles Read, G1MFG, l'Église, Durley Street, Durley, Hampshire SO32 2AA or on his Internet site (3). ♦

The GB3GW aerial mounted on its support frame prior to installation.

LATEST CLEARED ATV REPEATERS

No new ATV repeaters have been cleared as at 1 December 2000.

The outstanding repeater proposals submitted for licensing or modifications to NoVs are:

Call sign	Application type	Process stage	Proposer/ keeper
GB3PT	New 23cm, Isle of Wight	RA	G8CKN
GB3TX	New 23cm, Northern Ireland	RA	GI6AXD
GB3VW	New 13cm, East Yorkshire	RA	G7MFO
GB3VL	Power increase, Lincoln	Primary User	G7AVU

INTERNET SITES

(1)	RSGB RMC site	www.coldal.org.uk/rmc.htm
(2)	G8GTZ site ideas	www.qsl.net/g8gtz/
(3)	G1MFG controller	www.g1mfg.com/

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THE EMC Information Sheets listed in December 2000 'EMC' have proved popular and the EMC Committee Web site received a lot of 'hits' after the December 2000 *RadCom* was published. If you visited the EMC Committee Web site in December, you may have found a message stating that certain information sheets, such as EMC03 were soon to be updated and that EMC08 was to be added. This was all completed in December so please check the EMC Committee Web Site for the latest December 2000 editions.

OFCOM

ON 12 DECEMBER, Culture Secretary Chris Smith announced that the broadcast and telecommunications industries in the UK are to be regulated under a new unified regulator called OFCOM, the Office of Communications.

Full details are given in the DTI Communications White Paper. This is available at **www.communicationswhitepaper.gov.uk** After the White Paper proposals are implemented, OFCOM will combine the existing functions of the Broadcasting Standards Commission, Independent Television Commission, OFTEL, the Radio Authority and the Radiocommunications Agency (RA).

OFCOM will take on the Radiocommunications Agency's responsibility for spectrum management. This presumably includes EMC work currently handled by the RA, but I cannot find any specific reference to EMC in the White Paper. The proposed reorganisation would be the biggest since the Telecommunications Act 1984, and it raises two important issues about RA EMC work. This falls into two main areas, domestic interference cases and EMC research and enforcement work.

DOMESTIC INTERFERENCE CASES

Before 1984, domestic interference cases were handled by the Post Office Radio Investigation Service (RIS). The service was free and funded by the TV licence fee, the forms being available from main post offices. This meant that if a radio amateur could not resolve a neighbour's TV interference problem, or a neighbour would not accept a radio amateur's offer of assistance, all the neighbour had to do was to send off an RIS form. This was a satisfactory situation from the radio amateur's point of view.

The 1984 Telecommunications Act moved the RIS from the Post Office to the DTI and introduced a fee, which was £21 at first. The complainant is supposed to call his TV dealer out to investigate an interference problem and, if the dealer cannot solve it, he is supposed to stamp or sign the form RA179 to say that he cannot solve it. The complainant then has to send in the form RA179 to the RA Local Office with a fee, which is now £45.

From the radio amateur's point of view, there are several problems with the present procedure for dealing with breakthrough of amateur radio transmissions on neighbours' TV, radio, etc. First, most neighbours are not prepared to pay the £45 RA fee or, indeed, a dealer's call-out charge, which may be at least £30. This can lead to deadlock if a neighbour refuses to accept a radio amateur's offer of help, but also refuses to pay the RIS fee. Secondly, TV dealers and aerial installers may not have sufficient technical knowledge of interference problems. Thirdly, there is an increasing number of interference problem areas, such as satellite television, that the RA does not investigate even if the fee is paid.

All this can make amateur radio EMC problems much more difficult to resolve than they were when the service was free. Indeed, much of the current workload of the RSGB EMC Committee and the EMC Co-ordinators has arisen since the introduction of the fee.

The proposed introduction of OFCOM therefore appears to be an opportune moment to review and improve the procedure for dealing with domestic interference complaints.

RA EMC RESEARCH

The responsibilities of the RA include planning and managing radio services in the UK. In order to provide maximum value for money for spectrum use, the RA addresses various EMC issues such as identifying and measuring spectrum pollution from 'non-Wireless Telegraphy' sources. Some of this EMC work is done by RA/RTCG (Radio Technology and Compatibility Group) while other EMC research work is contracted to outside organisations. Some RA staff are members of various CISPR committees (CISPR is an international organisation whose publications form the basis of most international EMC standards).

OFCOM would bring the EMC 'gamekeepers' (RA) into the same organisation as those who support potential 'poachers' of the RF spectrum. It is to be hoped that decisions will not be swayed by commercial pressures, and that the RF spectrum will be adequately protected, particularly the HF amateur bands.

TV DISTRIBUTION AMPLIFIERS (Part 2)

PART 1 OF THIS item (December 2000 'EMC') gave some background information about home TV distribution amplifiers

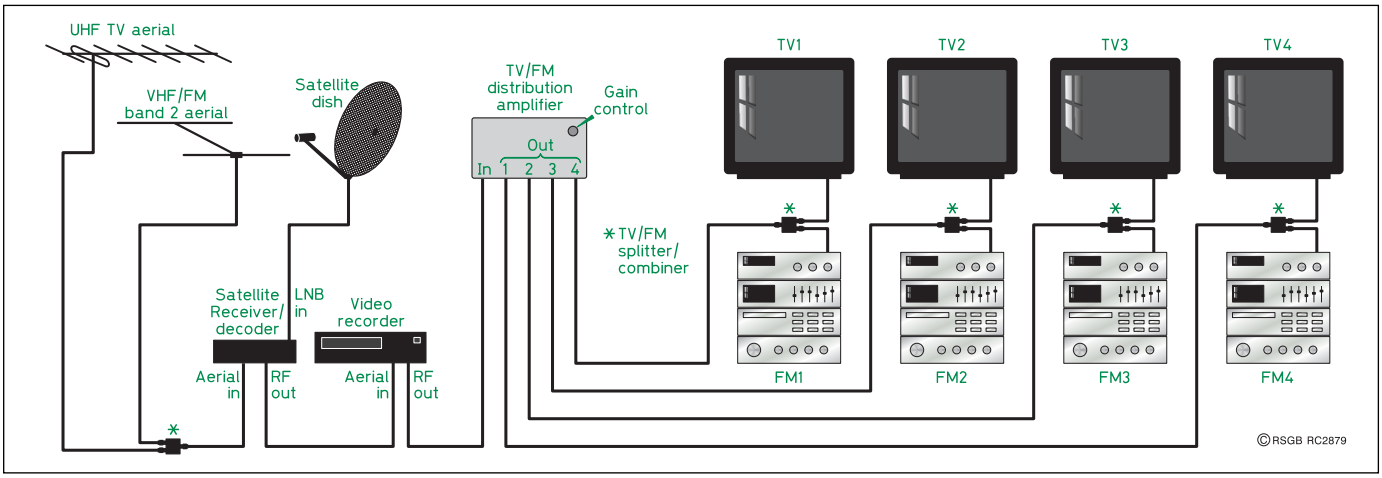


Fig 1: A potential EMC nightmare for the VHF amateur radio operator. This is a configuration recommended by a manufacturer of TV distribution amplifiers to distribute terrestrial TV, satellite TV and video playback to four TV sets together with FM radio to four hi-fi systems.

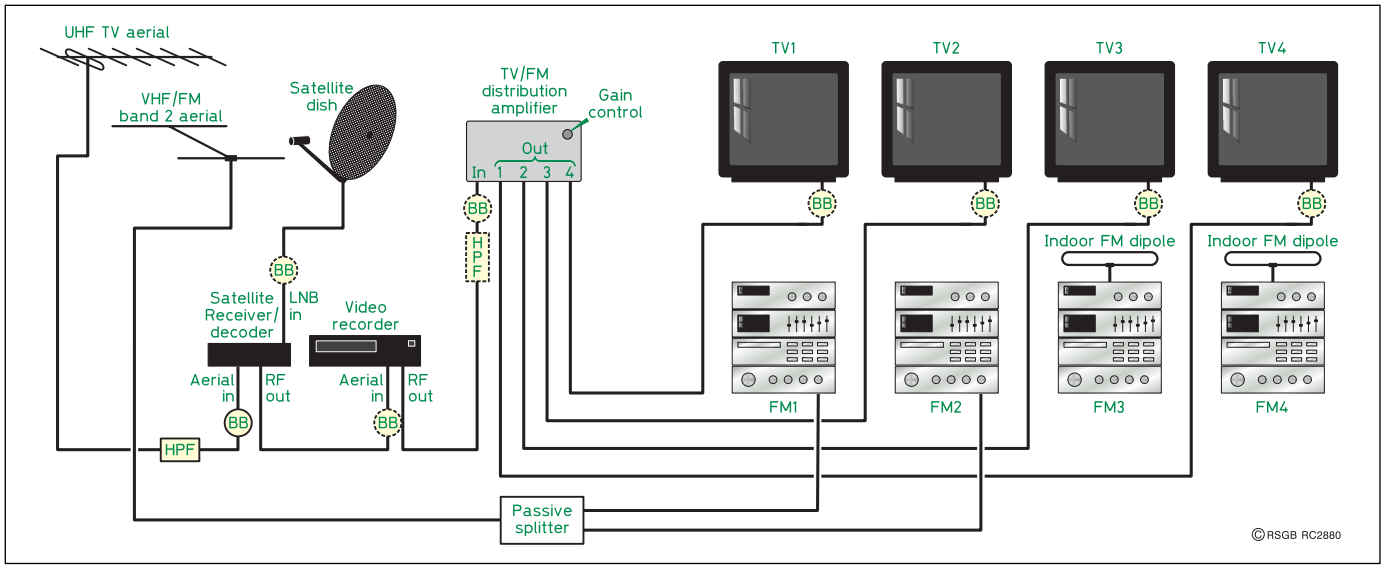


Fig 2: Taming a broad-band TV distribution amplifier. 'HPF' in a solid box indicates the recommended location for a high-pass filter (particularly for VHF amateur operation). 'BB' in a solid circle indicates the recommended location of a braid-breaker (particularly for HF operation). Dotted rectangles and circles indicate some locations where an HPF and/or braid-breaker *may* be required.

which are becoming more common nowadays. Many of these are broad-band VHF/UHF types with a passband of 40 - 860MHz. These can be susceptible to blocking by amateur transmissions, particularly on 50MHz or 144MHz.

Fig 1 shows a configuration recommended by Maxview Ltd, a manufacturer of TV distribution amplifiers. This distributes terrestrial TV, satellite TV and video playback to four TV sets together with FM radio to four hi-fi systems. The same setup can be found on the Wickes *Good Idea* leaflet No 43 from Wickes Building Supplies Ltd. It might not be such a good idea, however, for anyone who lives near to any VHF transmitter such as a radio paging base station, an emergency service or PBR (Private Business Radio) transmitter or a radio amateur who operates on the VHF bands.

Not only is the distribution amplifier a broad-band VHF/UHF type, but it is cascaded with broad-band VHF/UHF amplifiers in both the satellite receiver and video recorder. This can result in too much gain, so that it may be necessary to turn down the gain control (if any) on the distribution amplifier and/or the video recorder. Combining an FM Band 2 aerial at the input is likely to make matters worse at VHF, as it lets in more 50MHz and 144MHz amateur transmissions than a UHF TV aerial alone.

In practice however, few people seem to use the FM capability, but even without any FM aerial connected, such a system can still be quite susceptible to breakthrough of 144MHz or 50MHz amateur transmissions.

If a Band 2 FM aerial *is* connected, rejecting 144MHz signals in the Band 2 feeder requires a 144MHz notch filter. The AKD TNF2 type is *not* suitable for use at the input of a distribution amplifier, however. Suitable 144MHz notch filters are available commercially from companies such as Fringe Electronics who sell a VHF Rejection Filter. This must be ordered for a particular rejection frequency such as 144MHz, and is housed in an outdoor enclosure. To reject 50MHz or lower frequencies from an FM aerial feed, use an AKD HPF2, which is an 88MHz high-pass filter (RSGB Filter 2).

An alternative approach is to find out whether FM distribution is really needed in all rooms. Can the outdoor FM aerial be fed directly to the main hi-fi system only with the others running on indoor dipoles? Alternatively, a passive splitter could be used to feed two FM receivers from one aerial with only about 4dB loss, provided it is a low-loss splitter and not a resistive splitter.

Fig 2 shows the system in Fig 1 with the FM Band 2 distribution removed from the amplifier. Changing the distribution amplifier to a UHF-only type is a good way of rejecting frequencies of 144MHz and below, although it is unlikely to solve a 432MHz breakthrough problem. It should be possible to cure breakthrough on a broad-band amplifier by using suitable filters, however.

The most important point to note is that if strong amateur signals get into a distribution amplifier and cause blocking or cross modulation, this effect *cannot* be removed by filtering at the amplifier *output*. To avoid this problem, a 470MHz high-pass filter (HPF) is required at the *input* of the first amplifier in the chain, as shown by HPF in the solid box in Fig 2. The specific HPF requirements are as follows:

- To reject all bands 1.8 - 144MHz, use an AKD HPFS filter which includes a transformer type braid-breaker (RSGB Filter 3). This filter is not suitable in weak-signal areas, however, as the loss will degrade the picture noticeably.
- For weak signal areas, use a low-loss home-constructed high-pass filter with a ferrite ring braid-breaker, as described in the June 1997 and February 1998 'EMC' columns.
- To reject all bands 1.8 - 432MHz, a broad-band distribution amplifier needs an AKD HPF6 filter (RSGB Filter 8). This is a special high-performance high-pass filter with a sharp cut-off below 470MHz. It should give at least 40dB rejection at 440MHz and all frequencies below. It does not include a braid-breaker but, if one is required, for example for HF operation, a separate ferrite ring choke can be added.

A second HPF at the input to the distribution amplifier (shown dotted) may sometimes be required if there is a significant amount of VHF pickup in the cables and any amplifiers between the first HPF and the distribution amplifier.

The solid circle with BB in Fig 2 indicates the recommended location of a braid-breaker. This may be required for HF operation to reduce RF currents that flow via the braids of the coaxial cables and can also circulate via the mains cables of the various interconnected items. The braid-breaker can be combined with the HPF as mentioned above.

The dotted circles with BB show some locations where a braid-breaker *may* be required for HF operation. In practice, it is unlikely that a braid-breaker would be required at all the dotted circle locations. The dotted HPF and BB do not need to have low loss in the TV band if they have some gain in front of them. Consequently, an AKD HPFS should be suitable, even in a weak TV signal area. ♦

IARU

TIM HUGHES, G3GVV
10 Farm Lane, Tonbridge TN10 3DG

THERE APPEARS to be a predictable sequence in reporting of IARU events: a Regional Conference, followed by an Administrative Council (AC) meeting; an Executive Committee meeting; the IARU HF Championship, and ARDF Championships. In the December issue, the proceedings of the Region 3 Conference held in Darwin (28 August - 1 September) were outlined, and the article illustrated with a photograph of the AC. What, then is the *modus operandi* of the AC?

It consists of two members from each of the three Regions, together with the President, Vice President, and Secretary. President Price, W4RA, encourages these members to think of themselves as representing radio amateurs world-wide rather than as representatives of their regions. Second, it reviews reports on attendance by IARU representatives at international and regional meetings of the International Telecommunication Union and other professional bodies, noting the implication of issues raised there; with this can be coupled the reports received from coordinators, advisers and liaison officers. Third, policy has to be formulated to deal with potential problems or threats to the Amateur and Amateur Satellite Services, and decisions have to be taken as to whom may best represent our interests in the future.

From the Press Release of this AC meeting, the following points are extracted:

1. The Council thanked the IARU WRC2000 delegation for its diligent work in Istanbul on behalf of amateur radio.

2. The WRC2003 agenda items of relevance to the amateur and amateur satellite services were identified and reviewed. They include harmonisation of amateur and broadcasting allocations near 7MHz, possible revision of Article 25 of the International Radio Regulations, consequential changes to terms and definitions in Article S1, review of provisions concerning the formation of amateur callsigns, additional allocations for 'little LEO' satellites, study of a possible allocation to the earth exploration satellite service near 430MHz, and possible identification of globally-harmonised frequency bands for use by agencies and organisations dealing with public protection and disaster relief.

3. The ITU meetings at which IARU representation will be required for the coming year were identified and the recommendations of the President and International Secretariat with regard to representatives to attend these meetings were accepted.

4. The present and anticipated future requirements for radio spectrum allocations to the Amateur and Amateur Satellite Services were reviewed, updated and approved, with special emphasis on the frequencies in the upper part of the spectrum.

5. An updated action plan for the development of amateur radio in Africa was reviewed and approved. The plan includes several courses in amateur radio administration to be taught under the joint sponsorship of the ITU and the IARU.

6. A budget for 2001-03 was adopted as submitted by the International Secretariat. The budget includes provision for financial contributions from the three regional organisations to defray a portion of the expenses that are assumed by the International Secretariat. The Council expressed its appreciation to the IS for contributions well beyond its constitutional obligations in support of the IARU.

7. The IS was asked to prepare a document highlighting the need for radio amateurs to support the IARU through membership of their member society in order to protect the amateur spectrum and to maintain the vitality of the amateur services.

8. Thanks were expressed to the IARU Monitoring System International Coordinator, Bob Knowles, ZL1BAD, and his colleagues for their continued excellent service to the amateur community.

9. The theme for World Amateur Radio Day, 18 April 2001, was selected as 'Providing Disaster Communications: Amateur Radio in the 21st Century'. The selection of this theme was based on two considerations: to assist in dispelling the notion held by some members of the public that technological changes have bypassed and diminished the future role of the amateur services, and to reaffirm the importance of amateur radio as a resource to help mitigate the effects of disasters by providing communications to aid humanitarian efforts.

The late Alf Almedal, LA5QK.

ALF ALMEDAL, SK

WE WERE ALL saddened to hear of the death in October of Alf Almedal, LA5QK. In his own Society, the Norwegian Radio Relay League (NRRL) he had long been an active and valued member, serving on its Council, as its President, and as HF Manager. Within IARU Region 1 he was a member of the Executive Committee, and HF Manager. He was involved in preparations for the 1999 Region 1 Conference in Lillehammer, but was prevented by ill health from attending; his nomination for the G2BVN award was unanimously approved by delegates, this being presented to him later by LA2RR. Alf was generous, warm-hearted, sincere, hard-working; he will be sadly missed by his many friends. ♦

DATA DATA DATA

ANDY TALBOT, G4JNT
15, Noble Road, Hedge End, Southampton SO30 0PH.
E-mail: data.radcom@rsgb.org.uk

THIS MONTH, the column is devoted to notes on a data communications package aimed more at experimentation than at casual on-air use, although it can be used for this too, of course.

VE2IQ BPSK

ON THE 136kHz band there has recently been a resurgence of interest in a BPSK transmission system originally invented by Bill de Carle, VE2IQ, some years ago. This never gained much popularity in the UK and Europe as it involved constructing an interface between transceiver and computer. The need to build additional hardware in order to operate meant that usage stayed mainly in the US and Canada. However, with several Canadian stations transmitting high power LF beacon signals using BPSK, interest is awakening in Europe as to the possibility of receiving these.

The main component in the system is a unit to digitise the audio waveform and send it via the serial port to a PC, thus defining the system timing. Bill's original board, which he marketed as a kit, used several chips to make up an A/D converter using sigma-delta conversion techniques, sampling the signal centred on 800Hz to 8-bit resolution, at 7200 samples per second, and sending the data to the PC at 115,200b/s. An alternative is to refer to [1]. I have re-written the PIC software for this interface which, with a crystal change, can be used for the VE2IQ software.

Two pieces of driver software are available, and both run in the DOS environment only. The original programme, called *Coherent*, allows two-way BPSK communication at speeds from 25b/s down to very slow rates. This will run on any PC and, in fact, I press an ancient 10MHz 286 laptop into service.

An enhanced driver programme, called *Africa*, performs the same function, but with much-improved signalling and noise performance, with the ability to operate at centre frequencies different from 800Hz.

A disadvantage is the need for a Pentium (or just possibly a fast 486) running DOS. Several users have had to relearn about DOS and how to reboot PCs to get this operational! For transmission, either a separate BPSK modulator is needed or another kit design - a D/A converter, which reads data from the serial port and converts to an 800Hz tone. The former is especially useful as, with the latest generation of high-efficiency Class E switching transmitters used on LF, only hardware generation of the BPSK transmit signal is possible.

One stimulus behind the development of *Coherent* in the US and Canada has been for beacon monitoring in the very low power, un-licensed, 'Lowfer' band there at 160 - 190kHz, and development of *Coherent* has targeted propagation monitoring.

Of particular interest is a 'grab' facility; by entering the exact number of characters in the message string, the software can be set up to perform averaging over many repeat messages, and build up a pattern of characters sent repeatedly over a long period – hours if necessary!

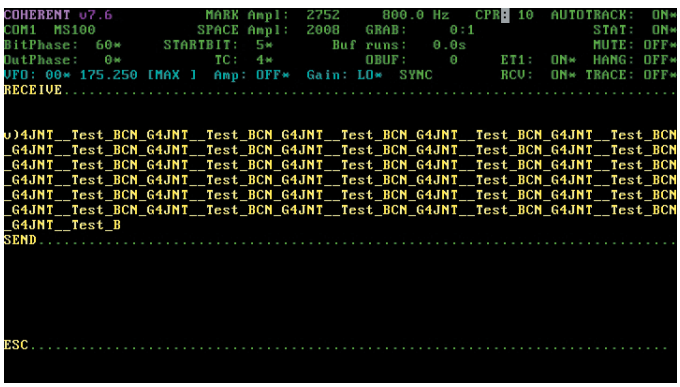
When first seen, this gives a very impressive demonstration of how signals can be pulled out of the noise. It is possible to set an alert on a particular string, so the software can be left continuously monitoring a frequency and, as soon as a set of particular characters appears out of the noise, a bell will sound.

Several error-correction schemes are available, the choice being between no-correction with transmission of plain ASCII characters at 10 bits per character, a 16-bit error-correcting code called ET1, and a heavily-coded 27-bit version called ET2. ET1 adopts a symbol set comprising 256 of the 65,536 maximum possible 16-bit codes, chosen so that each code is different from all others in at least six bits. This allows several bit errors to be corrected per character; more can be detected, with a coding efficiency of around 60%. ET2 carries this still further giving marginally better copy in poor conditions.

A disadvantage of the VE2IQ software is the need for considerable operator interaction, for example to achieve clock and frame synchronisation. Although both can be performed automatically, operator intervention can make the difference between lock up or no reception on noisy signals. Also, there is a need for high frequency and timing accuracies.

There is more flexibility in *Coherent* and *Africa* than in PSK31 with regard to data rates and error coding; they can also provide modulation other than by feeding audio to an SSB rig, but they are not as user-friendly. Furthermore, although Bill has tried a soundcard-based version, the timing inaccuracies at low data rates on many soundcards make this a non-viable hardware solution. It is much better to make the proper interface and operate at precisely known timings and frequencies. Therefore, for casual operating and ragchewing, my advice is to stick with the simplicity of PSK31 but, for real experimentation with BPSK over noisy channels, use *Coherent* and *Africa*, and make up the proper interface hardware. Furthermore, it allows use to be made of obsolete (slow) computers that would otherwise only be scrapped, rather than tying up the latest machine.

All the VE2IQ software is available from a number of websites – but possibly one of the easiest from which to download is that run by Ko Versteg, NL9222 (1). Documentation for *Coherent*, as well as circuit data for Bill's S-D interface is included. A lot of other amateur radio data communications packages are also available from Ko's site, which is well worth a visit.



A screen capture of the *Coherent* software receiving my 136kHz test beacon. The data rate is 10b/s with ET1 correction applied. The signal is being received off air and has been adjusted to give a signal level that is completely inaudible by ear and swamped by noise and QRM. As can be seen, copy is perfect in these conditions! The top of the screen gives set-up parameters and signal statistics, followed by a received data window, then an area for a type-ahead buffer when transmitting. A command line area is at the bottom.

REFERENCE

[1] 'Serial Port A/D Converter for DSP', by A Talbot, G4JNT, and L Wiltshire, G0IAY, *RadCom* April 1997, pp 37/38.

INTERNET SITE

(1) http://leden.tref.nl/~nl9222tv/software.htm

NO ROOM

THERE IS NO ROOM left this month for a 'Fundamentals' section, so I will resume next time and return to data modulation formats, in particular concentrating on coherent schemes such as PSK and QAM. ♦

the last Word

Future of Licensing

The proposed requirements for a Foundation and Full Licence as outlined in G3XWH's article (*RadCom*, December) appear to me altogether too complex and off-putting. I particularly dislike the requirement for operation under supervision and tutor assessment, which appear to aim at ensuring that all prospective licensees should joint the RSGB. I am pleased to have been a member for a very long time, but the RSGB must stand or fall by its services to members.

It should remain possible for any individual to study, sit the examination (or qualify by equivalent or higher grade achievement) and obtain a licence entirely under his or her own steam and I am sure that is how the Radiocommunications Agency will see it. That is not to say that the RSGB should not offer assistance.

On the matter of Morse capability: when satellites fail, as they may well do in the nicely balanced magnetic, electric, gravitational and gaseous atmosphere around our planet, worldwide communication may still be possible with simple low-power equipment and Morse. That alone I think is sufficiently good reason for keeping Morse skills alive amongst amateurs, if not amongst professionals.

R Gladwell, G3DXB

Richard Horton, G3XWH, in Part 2 of the article on The Future of Amateur Radio Examinations (*RadCom*, December 2000), asks for feedback. I write in the form of an open letter. . .

When I read the first of your articles I thought, "At last! Someone has taken a fresh look and is going to break the mould!" You did achieve something in that (yet another) committee was formed - formed of G3s and G0s but alas! No-one from the next generation. There are no Class Bs, no Novices and no CBers on your Committee - particularly the two latter groups who have supplied so many very welcome new entrants to the world of amateur radio and who will be the first in line for a Foundation licence.

Can I ask why Morse is mentioned in your Committee's deliberations? As with Latin and [Ancient] Greek, in general everyday life Morse is a dead language used only by academics, specialist researchers and the like. If, "a number of influential administrations", have already abandoned a Morse requirement, why is the UK still continuing with it?

Since drafting these notes I have received the Radiocommunications Agency's invitation to Edinburgh; which letter contains their current thinking. Sadly, I can't attend the meeting, but oh! what a breath of fresh air their letter is.

Richard, forget Morse! Get on with the rest of the proposed revision - which seems sound to me - but in your deliberations delete all references to Morse. It is serving to simply confuse the issue. Be forward looking! The code is no more, and indeed no less, than a communication medium such as plain speech. The code was devised to enable communication by land-line. Later on it was used by 'wireless' when speech transmission had not yet been made possible. Just in case one hasn't noticed speech transmission has now been achieved and we can, and do, now communicate by talking in the air.

Mike Sewell, G7PBO

The Cold Shoulder

For several years at my last QTH I had been able to be of service to local Guide and Brownie groups in connection with their radio communication badges, and have been glad to do so. However, in trying to contact young people outside these groups to engender an interest in amateur radio, my approaches to local schools have been less successful and I am wondering if my experience is unique.

I find that on initial contact with the Head Teacher, once I get passed the school secretary (an achievement in itself these days), I receive a guarded welcome. I explain as briefly as I can amateur radio and that I would be pleased to give a talk to the children and a subsequent demonstration. I am heard politely and before the Head Teacher's eyes start to glaze over I am usually asked if I am a qualified teacher. I reply no and immediately see the HT's eyes narrow.

The interview is then brought quickly to an end, my name and address are jotted down and I am given the theatrical auditioner's brush off - "Don't call us, we'll call you". Without exception I hear no more.

I am left with the distinct impression that as I am not a member of their profession I am being rather presumptuous to suggest that I may be able to teach the pupils something outside their curriculum.

Finally, during my most recent attempt to help by offering visits by pupils, accompanied by a teacher and / or a parent, to my shack to see amateur radio at first hand, I learned that present regulations are such that I, and presumably my wife and my home, be thoroughly checked and inspected by the police! I need hardly say that I will not be repeating my offer.

L J Smith, G3HJF

Improving Morse Capability

I was interested to read Colin Shaw's, M5FRA, letter regarding the need for a slow-speed CW net. I am wondering if there would be much demand from people like myself, who have passed the 12WPM Morse test, had a few QSOs, but never really 'got going' on CW, for a Morse Camp style refresher?

I reckon such a weekend of practice QSOs and simulated operating experience would be just the thing to get a few Class As back on CW.

Barry Lionel, MW0BUD / GW7RSJ

It's All in the Book!

Having restarted receiving *RadCom* after a lapse of a great many years, I was pleased to find that it still has the same friendly format with G3VA and Bob Treacher still going strong. However, I must pen to paper to alert you to what has struck me as a glaring discrepancy and that you may wish to address.

As an 'old boy' coming back, what is it that I need? Information - times of slow Morse transmissions and news bulletins. I am sure that readers could well add to the list of information regularly required. Could *RadCom* devote such a spot, such as part of a column, every month? Such a set column would contain much the same information but with a living update every month.

Cliff Ayling, G4HSU

[*The information required by G4HSU is published annually in the* RSGB Yearbook*, which these days is far more than 'just' a callbook. The 2001 edition has 150 pages of 'directory' information (plus 320 pages of callsign / address listings and article reprints). With 150 pages of information, it would be quite impractical to attempt to publish it every month in* RadCom*. Information about GB2RS and the news broadcast schedule alone take up two pages of the* Yearbook *and since details change only slightly over the course of a year, we feel this is the best place to publish this information. There are also many hundreds of pages of information published on the RSGB's Internet pages (www.rsgb.org) and these are being updated all the time* - Ed.]

Campaign was "Beyond Belief"

I just feel that I had to drop you a line. Last weekend (16 / 17 December) I attended the Morse Campaign at Harrogate and I just wanted to thank all of the RSGB instructors for the professional way the whole weekend was run and organised.

The people who were on hand to give training and guidance to help everyone behaved in the most courteous and encouraging way - it was beyond belief. I can only recommend that if any readers are thinking of having a go at either the 5 or 12WPM qualification this is the place to go. I myself was successful at the 5WPM test and am already arranging to attend the camp in May to have a go at 12WPM.

So once again thanks to everybody who was involved.

Ernie Coleby, M1ETS, soon to be M5

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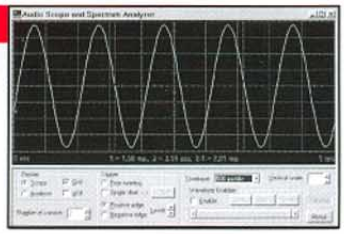

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Tuning resolution	100 Hz (5 Hz BFO)	10 Hz (1Hz for SSB and CW)	10 Hz (1Hz for SSB and CW)
IF bandwidths	6 kHz (AM/SSB), 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)
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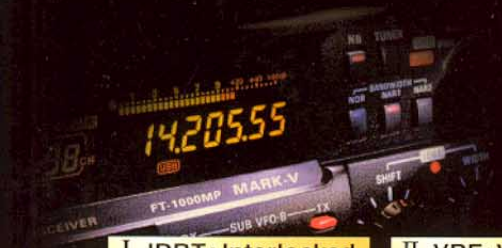
"Brick-Wall" Selectivity



Today's Premier class operators demand the best RF weaponry available. Yaesu's exciting new MARK-V FT-1000MP answers the call, with an expanded array of receiver filtering, 200 Watts of power output, and Class-A SSB operation capability for the cleanest signal on the band. Enhanced front-panel ergonomics saves you precious seconds in a DX or contest pile-up. Yaesu HF design and manufacturing know-how ensures that no short-cuts have been taken in our effort to bring you the best HF transceiver money can buy. For more QSOs in your log, and more awards on your wall, there is only one choice: the MARK-V FT-1000MP from Yaesu!

I. IDBT: Interlocked Digital Bandwidth Tracking System

The IDBT feature greatly simplifies operation by matching the bandwidth of the DSP (Digital Signal Processing) system to the net bandwidth of the 8.2 MHz and 455 kHz IF stages. The IDBT system monitors the settings of the SHIFT and WIDTH controls, and automatically sets the DSP bandwidth to match the user settings within the net bandwidth of the Analogue IF Filtering.

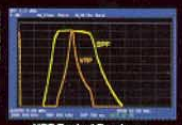
IDBT: A Breakthrough in Selectivity!

10-pole Collins® Mechanical SSB Filter

II. VRF: Variable RF Front-End Filter

Protecting the MARK-V's receiver components from strong out-of-band signals, the VRF system acts as a high-Q "Preselector," located between the antenna and the main bandpass filter networks, providing additional RF selectivity on the 160-20 meter Amateur bands for multi-operator contest teams, DX-peditions, or for operation near MW/SW broadcast stations.

VRF Features Large, High-Q Coils and High-Quality Relays



VRF Typical Bandpass Response (3.5 MHz)

III. 200 Watts of Transmitter Power Output

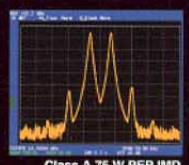
Utilising two Philips® BLF 147 Power MOSFETs in a 30 V push-pull configuration the MARK-V's Transmitter generates up to 200 Watts of the cleanest RF Power output available thanks to the conservative design of the PA Section.

Philips Power MOSFETs

High-Speed Automatic Antenna Tuner

IV. Class-A SSB Operation

Exclusively available on the MARK-V FT-1000MP , a press of a front-panel button engages Class-A SSB operation of the transmitter, at a power output level of 75 Watts. Class-A operation produces incredibly clean signal quality, with 3rd- order IMD suppressed 50 dB or more, and 5th- and higher-order products typically down 80 dB or more!



Class A 75 W PEP IMD

V. Multi-Function Shuttle Jog Tuning/ Control Ring

The immensely-popular Shuttle Jog tuning ring, which is concentric with the Main Tuning Knob, has a new look in the MARK-V: it now includes the activation switches for the VRF (left side) and IDBT (right side) features, so you don't have to move your hand position to activate these important circuits during contest or pile-up situations!

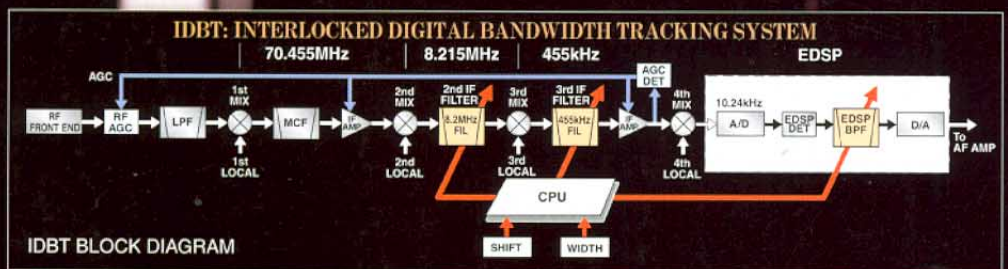
Access VRF and IDBT Features via Shuttle Jog Dial

DC 30 V / 13.8 V Power Supply FP-29

Photo shows optional MD-100A8X Deluxe Desk Microphone

HF 200 W All-Mode Transceiver

MARK-V FT-1000MP



IDBT BLOCK DIAGRAM

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