Ten-Tec 1320 and Station Logkeeping Software reviewed

RadCom

www.rsgb.org

£3.95 Volume 76 No 8 ♦ August 2000 Journal of The Radio Society of Great Britain

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We've created the UK's most spacious amateur radio showroom, with comfortable surroundings and plenty of space to sit down and try any radio of your choice. There are no compromises. Imagine sitting in comfort, with coffee and tea on call, and being able to play with whatever rig takes your fancy. Experience the widest range of accessories ever displayed. Browse through an amazing variety of items dedicated to radio communicatoions.There's only one truly dedicated Ham Store!

YAESU FT-100

£799 Plus £7.50 Carr.

This diminutive HF transceiver will pump out 100 Watts of RF power from 1.8 - 50MHz ham bands. It will also give you 50 Watts on 2m and 20 Watts on 70cm. The removable head makes it easy for car installation, yet it is just as much at home when used for base station operation. There's a choice of extra CW filters and a front-end performance that matches many rigs costing much more.

Modes: SSB CW FM AM
Receive Range: 100kHz - 970MHz
Power HF & 6m : 100 Watts
Power 2m: 50 Watts
Power 70cm: 20 Watts
Memories: 300
Head Unit: Remote option
Bandwidths: 6kHz to 60Hz
Output 1: HF - 6m
Output 2: 2m - 70cm
Size: 160 x 54 x 205mm
Weight: 3kg.

YAESU FT-840 160-10m

£589 Plus £7.50 Carr.

A firm favourite, this 100W radio is an ideal rig for those on a budget. Impossible to fault, it just goes on and on!

24-Month FREE Warranty on Yaesu

ICOM IC-756PRO 1.8 - 52MHz 100W

£1959 Plus £7.50 Carr.

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.

YAESU FT-847 SAVE

160m - 70cm All Mode

£1329 with switch mode power supply

PRICE MATCH

£1199 Plus £7.50 Carr.

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!!

YAESU FT-1000MP AC

160 - 10m All Mode

SAVE

£1795 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.

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.

ICOM IC-746

160m - 2m All-mode

£1049 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.

ICOM IC-706IIG 160 - 70cm All Mode

£Phone Plus £7.50 Carr.

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

KENWOOD TS-570DG

160 - 10m All Mode

£825 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.

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First in Amateur Radio

MasterCard VISA

ADI AT-600
Dual Bander Airband Rx

£199 Plus £6.00 Carr.

* 2m & 70cm Handheld
* 5W Output on 13.8V DC
* Full CTCSS & 12.5/25kHz Steps
* 110 Alphanumeric Memories
* 29 Programmable Functions
* DTMF Keypad & AM Airband
* Ni-cads & AC charger

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!

HOKA Software
The Secret's out!

We are now the UK distributors. As used by governments, it can decode just about any form of data transmission on HF and VHF. Simply connect between PC and RX audio. Can be loaded on any number of PCS. This is a very advanced programme.

£349.95 Plus £6.00 Carr.

C-150 2m Handy

£99.95 Plus £6.00 Carr.

* 2m Handheld
* 5W Output on 13.8V DC
* 1750Hz Tone Included
* 25 / 12.5kHz Steps
* 20 Memory Channels
* Wideband Receive
* Uses 6 x AA cells (not inc.)

£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

£199 Plus £6.00 Carr.

SAVE

C-408 70cm Handy

Previously £89.95

£69.95 Plus £6.00 Carr.

CTCSS
Repeater Shift
Digital Display
12.5 / 25kHz Step
20 Memories
230mW Output
Uses 2 x AA

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

SAVE

£309 Plus £7.50 Carr.

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

ADI AR-147
AM Airband Receive

£199 Plus £6.00 Carr.

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

SPECIAL

2m Handheld
2 Watts out

£29 Plus £6.00 Carr.

This is a 2 - channel crystal controlled radio working on S-20 and S-22 found in a warehouse in an unopened crate! Includes battery box for 6 x AA (not supplied) and BNC telescopic antenna. These are for simplex use only. Great value at this silly price.
Order code: ComTalk-2

GARMIN GPS-III Plus

Last Batch at Old Price!

£319 Plus £6.00 Carr.

Detailed maps of UK and Europe plus street data upload feature via PC. Great value. Sits easily on the dash board and gives extremely comprehensive data including GB national Grid. Powered by AA cells or external 13.8V.

ICOM IC-2800H
In Full Colour!

£310 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

£245 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

£239 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

£299 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

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FREE MFJ Catalogue - Just Phone!
BEWARE of grey imports. All MFJ products should have serial numbers and UK Warranty cards issued by us.

MFJ
FREE CATALOGUE

Every Model Stocked

MFJ-969 300W

£169.95 Plus £7.50 Carr.
160 - 6m Wire, Coax or Balanced
Includes VSWR / Power Meter, Ant. Selector, PEP feature, Roller Coaster Tuning

MFJ-949E 300W ATU

£139.95 Plus £6.00 Carr.
160 - 10m Wire, Coax or Balanced
Includes VSWR / Power Meter, Ant. Selector, PEP feature, Built-in Dummy Load

MFJ-948 300W ATU

£119.95 Plus £6.00 Carr.
160 - 10m Wire, Coax or Balanced
Includes VSWR / Power Meter, Ant. Selector, PEP feature, Built-in Balun, 12v Illumination

MFJ-901B 300W ATU

£75.95 Plus £6.00 Carr.
160 - 10m Wire, Coax or Balanced

MFJ-962D 1.5kW ATU

£239.95 Plus £7.50 Carr.
160 - 10m Wire, Coax or Balanced
Includes VSWR / Power Meter, Ant. Selector, PEP feature, Roller Coaster Tuning, T-Network

MFJ-986 3kW ATU

£289.95 Plus £7.50 Carr.
160 - 10m Wire, Coax or Balanced
Includes VSWR / Power Meter, Ant. Selector, PEP feature, Roller Coaster Tuning, Differential Tuning.

MFJ-989C 3kW ATU

£299.95 Plus £7.50 Carr.
160 - 10m Wire, Coax or Balanced
Includes VSWR / Power Meter, Ant. Selector, PEP feature, Roller Coaster Tuning, T-Network

MFJ CUB QRP Transceivers
NEW

Ready Built or Kit
Models for 80m, 40m, 30m, 20m, & 15m

Kits	**£89.95**
Built	**£139.95**

Everything you need to build these lovely little 1 Watt CW rigs. Includes direct sidetone monitoring and QSK. Surface mounted components pre-installed on board, so building is very fast. Can't wait? Purchase a ready-built and tested model.

MFJ-910 Mobile Matcher

£24.95 Plus £2.00 Carr.

Get your VSWR down

Radiate more Power

HF mobile whips have very low impedances, particularly on 160m, 80m and 40m. Feeding direct with 50 Ohm cable results in high VSWR with poor power delivery from solid state radios. Insert this matcher and get low VSWR and maximum transfer. Our own Peter Waters, G3OJV/M, uses one. Works like magic!

MFJ-269 Analyser

160m - 70cm On-site Antenna Analyser.
£299.95 Plus £6.00 Carr.

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!

NEW WBB-3 Wideband Mobile Antenna
3.5 - 30MHz No Gaps!
Remote Tuning - Low WSWR
Rated to 400W

Change band without leaving the car seat.

The WBB-3 antenna will tune anywhere between 3.5 - 30MHz making it ideal for ham and commercial use. Rugged, and with large diameter centre loading inductor, this will beat the pants of any "thin" whip. The up/down control box and cable is included as is the base impedance transformer. We supply a 5ft whip, but you can use a longer whip if you wish for even better signals. Or you can park up and hang a wire inverted L fashion for 40m and 80m. All you need do is adjust the tuning via the remote controller. You need to mount it on a flat plate (like the WUMB) which you then attach to the car chassis - a job that any garage could do. The necessary 3/8" bolt and all washers and insulators are supplied.

- *Max Height Approx 2.7m*
- *Single 3/8" bolt fixing*
- *Impedance transformer*
- *Remote control box*
- *Cable harness*
- *50 Ohm Feed*

WBB-3	Antenna	£295.00
WUMB	Chassis bracket	£15.95
WC-160	160m coil	£44.95

Carriage £7.50


2" Variable inductor shown with weather casing removed.

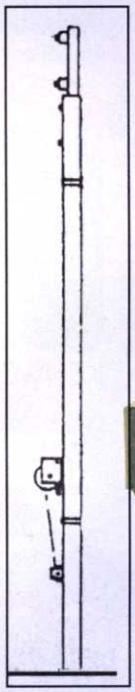
Kachina 100W HF Transceiver Offer

A chance to purchase one of these lovely computer controlled 100W HF transceivers. These have been upgraded with the latest software from the USA factory.

505-DSP Normally £1699	**£1299**
With Auto ATU normally £1899	**£1499**

Carriage £7.50

Telescopic Masts
Much Stronger than Alloy Poles!
NEW



We are now able to supply a range of telescopic tiltover masts, galvanised to BS729. These masts are extensively used for commercial purposes and built to a very high standard. Heights available from 7.6m to 12m extended. Models for wall mounting or post mounting are included. The post mounted versions tilt-over and are supplied with a socket for mounting in concrete. Models are available to support antennas from VHF to HF tribanders.

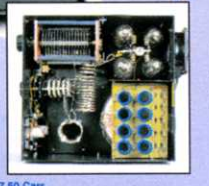
AAM	**7.6m** Wall mount (VHF & Mini HF)	**£250 (£30)**
AAM	**10m** Wall mount (VHF & Mini HF)	**£295 (£35)**
TML	**7.6m** Self supporting (VHF & Mini HF)	**£340 (£35)**
TML	**9.2m** Self supporting (VHF & Mini HF)	**£415 (£40)**
TMS	**10.7m** Self supporting (HF 3 el beams)	**£579 (£52)**
TMS	**12m** Self supporting (HF 3 el beams)	**£659 (£57.50)**
TMS	**10.5m** (3 section) (HF 3 el beams)	**£659 (£52.50)**

Price in brackets are carriage charges. Delivery is normally 3 - 5 days from date of order. We suggest you discuss your requirements with us by phone to make sure that you choose the right model for your needs.

Phone or write for full information and drawings

LINEAR AMP UK Amplifiers


£895 Plus £7.50 Carr.



UK Ranger 811H (illustrated) £895
* 1.8 - 30 MHz. 800 watts output
* Drive: - 10-100W * Built in Power Supply

UK Discovery-Two Amplifier £1395 Plus £7.50 Carr.
* 144 - 146MHz *400 - 1KW Output
* Drive:-10-25W *Built-in Power Supply

UK Explorer 1200 Amplifier £1595 Plus £7.50 Carr.
* 1.8-30MHz x 100W-1300W Output
* Drive:-10-120W *Built-in Power Supply

British made Amplifiers with a Pedigree

GREAT VALUE

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.
Just 66ft Long!

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.

PacComm TNCs from USA


Tiny-2 1200bps	£149.95
PicoPacket 1200bps	£139.95
Spirit-2 9600bps	£259.95

Plus £6.00 Carr.

The lovely little PicoPacket even permits APRS with your mobile transceiver. Phone for leaflet.

Power Supplies


£99.95 Plus £6.00 Carr.

SEC-1223
13.8V PSU
23 Amps - 3.2lbs!
Back In Stock

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	Plus £5.00Carr. £29.95
W-10AM	10 Amp variable supply	£59.95
W-25AM	25 Amp variable supply	£89.95
W-30AM	30 Amp variable supply	Plus £7.50 Carr. £119.95

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.

wsplc.com

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Waters & Stantons PLC

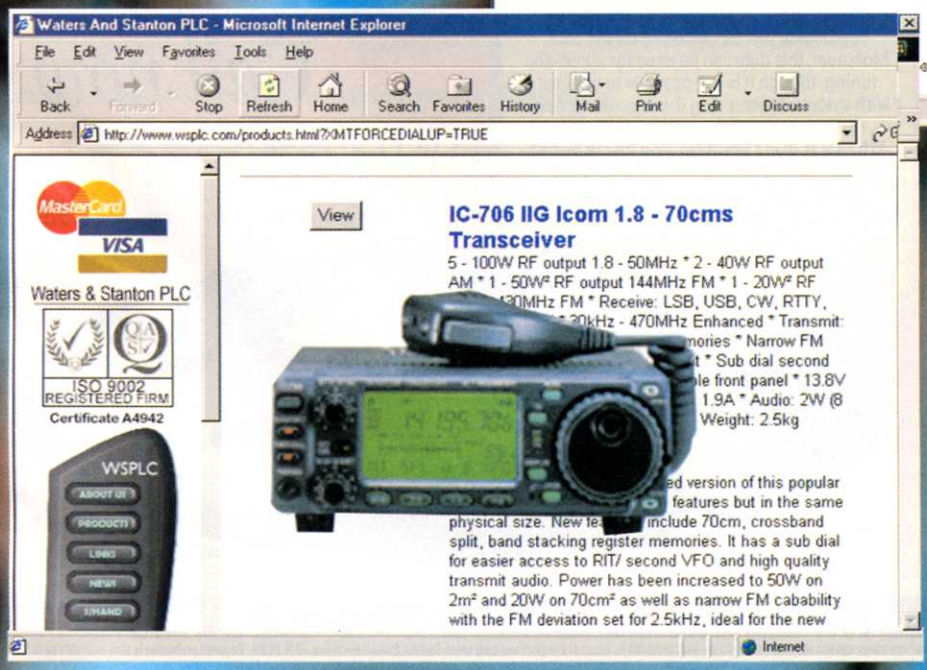
SECURE SAFE & FAST

JUST A CLICK AWAY

LARGEST ONLINE

COMMUNICATION CATALOGUE

WSPLC.COM



22 MAIN ROAD, HOCKLEY, ESSEX, SS5 4QS

Lynchy Summer Specials

KENWOOD

KENWOOD TH-D7EMkII with KISS mode

- VHF/UHF dual-band operation
- Dual RX on 144Mhz
- Data Communicator 1200/9k6 TNC built in
- APRS (Auto packet/positioning reporting system)
- Large dot matrix LCD
- 16 backlit, multi scroll menu
- 200 channel memory
- 8 character memory name input
- Built in CTCSS & 1750Hz
- 16 digit 10 channel DTMF
- Mil standard 810C/D/E water resistance
- High AF output

In a class on its own, the new TH-D7E is the only handie capable of operation on 2 & 70 with a built in RF modem. Now available with the all-important KISS mode of operation.

Make sure you don't get sold the mkI !!

NOW AVAILABLE FROM ML&S AT ONLY

£249

Also available on finance with no deposit & 24 payments of £12.67. APR 21.9%

KENWOOD all-band, all-mode transceiver

BREAKING NEWS

Kenwood Developing an All-Band, All-Mode Transceiver

Kenwood is currently developing an all-band all-Mode transceiver that features a smart metallic-grey design with large LCD and represents a breakthrough in HF performance. It creates an immediate impression of being sophisticated, solidly reliable and superbly suited for the new millenium.

This one transceiver covers the HF/50MHz/144MHz/440MHz/1200MHz bands (SSB, CW, FSK, FM and AM modes), with output of up to 100 watts (440MHz: 50 watts, 1200MHz: 10 watts). Since it is equipped with independent 144/440MHz sub-band reception (AM/FM modes only), simultaneous reception on two bands is possible!

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.

Packet cluster information, so vital for HF operations, can be displayed on the LCD. Moreover, this data can be used for automatic tuning, though it is not possible to connect with a node station using the internal modem.

When's it due? We'll let you know soon!

For more information, call today or see our web site **WWW.hamradio.co.uk**

KENWOOD TM-D700E

Save £60

At last! Stock! Apologies for the delay. You know what these distributors are like. For full details of the first part of the Kenwood new range for 2000, see our web site or call for a brochure.

NOW AVAILABLE FROM ML&S AT ONLY

£469 RRP £529

Also available on finance with no deposit & 36 payments of £17.43. APR 21.9%

KENWOOD TS-870S

Save a massive £500!

It started the DSP trend going and is still one of the finest HF transceivers available today. Reliability? Once again, Kenwood set the rules here.

NOW AVAILABLE FROM ML&S AT ONLY

£1399 RRP £1999

Also available on finance with no deposit & 36 payments of £52.00. APR 21.9%

Call now

0208 566 1120

or see our Web Site for more details

MARTIN LYNCH & SONS

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

FAX: 0208 - 566 1207 WEB SITE: WWW. www.hamradio.co.uk E-MAIL: sales@MLandS.co.uk

Martin Lynch can also offer finance terms up to 48 months with no deposit. We welcome your part exchange against any new (or used!) product, provided its clean and in good working order. Call the Sales Desk today. APR: 21.9%. Payment protection is also available up to 36 months. All units are brand new and boxed and offered with full manufacturers RTB warranty. All prices quoted for cash/cheque or Switch/Delta card. No additional charges for credit cards. Martin Lynch is a licensed credit broker. Full written details are available on request. Finance is subject to status. E&OE. £10 p&p on all major items.

Front Cover:

Now that's what you call a shack! The first DXpedition of the Far East Islands DX Club, to Moneron Island, RK3FWL/P. IOTA Annual Report & Honour Roll (p28). Insets: Dry battery tester (p42) and the new *Operating Manual* (p13). '250,000 books' caption: Members' discount scheme (p94).

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Radio Communication

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Don't forget
RSGB HAMFEST
Sunday 30 July
Hatfield House, Herts.

August 2000

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Down To Earth - Amateur Radio From The Ground Up

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Regulars

RADIO SOCIETY OF GREAT BRITAIN

THE NATIONAL SOCIETY WHICH REPRESENTS UK RADIO AMATEURS

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

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Telephone 01707 659015
Fax 01707 645105
Website www.rsgb.org

Activity Aplenty

I AM GOING to take this opportunity to bring you up to date on a number of activities and projects which the Society is currently undertaking.

I am pleased to be able to report a good response to the request for input into the proposed new structure for the Society. We have received a lot of input, which will be taken into account when Council meets to discuss the next moves shortly. The general opinion from the inputs received is most positive, especially for the proposed restructuring at the regional level. A trial of the new regional structure is planned for Zone A and Northern Ireland, and this is expected to be introduced in September.

To permit the new organisation to be introduced in full has required a complete review of the Society's Memorandum, Articles of Association and Bylaws. It is anticipated that members will be asked to vote for the changes at this year's AGM and you can expect a larger than normal edition of *RadCom* in November enclosing the new Memorandum, Articles of Association and Bylaws.

Earlier this year we launched the RSGB-sponsored club test centre scheme. Initially twelve clubs were registered. This figure will rise to 42 in time for the September NRAE, which is extremely encouraging news. It is anticipated that by the turn of the year around 70 clubs will have entered the scheme. This means 70 new venues at which candidates can sit the RAE/NRAE. Most of the clubs involved run courses as well. These clubs are located right across the UK, which gives much greater accessibility to both RAE/NRAE courses and places to sit the examination. Good news indeed. To go with this, 'examinations on demand' is just around the corner. We do not have a start date as yet, but we expect them to be available some time in the New Year.

'Council on the March' continues apace. To date, Council members and myself have visited 21 clubs across the UK and regional meetings have been held in Northern Ireland, the Northwest of England and Yorkshire. A further 14 club visits are booked, with more invitations coming in daily. It is planned to hold a further regional meeting in the Southwest in the late autumn, but this may have to be moved to early next year.

A venue and date has been confirmed for this year's AGM – Harrogate, on Saturday 2 December. This year it is planned to hold a full day event, with the AGM/EGM in the late morning. The afternoon will be taken-up with an open forum and in the evening there will be an amateur radio dinner. The event is taking place at Harrogate Ladies' College. More details will be published later in the year.

And finally… expect some changes in the format of *RadCom* over the coming months. The editorial team is carrying-out a fundamental review of the publication, which will see more space being allocated to Society and club news. These changes are designed to keep you in touch with what is going on both locally in your area and the detailed work being done on your behalf at the very heart of the Society.

Peter A Kirby, G0TWW, General Manager

RadCom NEWS

New-Look Cover

IN THE JULY edition we broadened the use of colour in '*RadCom* News' and introduced an expanded 'Club News' section. This month we introduce our new-look front cover. We hope you like the changes, which are all part of the process that Peter Kirby refers to opposite. Look out for more changes in the coming months!

Steve White, G3ZVW, Editor

Sponsored Pennine Walk

ANDY, G4WWG, AND Paul, G1JVA, are currently organising a long-distance walk along the Pennine Way, 275 miles over some of the wildest upland parts of England and Scotland. The walk is planned to take place between the 5th and the 26th of August, and is intended as a fund-raiser for the UK FM Group (Western), all the proceeds to be used for the maintenance and site expenses of amateur radio repeaters.

Throughout the walk, Andy and Paul intend to keep in contact with other amateurs and listeners by hand-portable operation via the 2m and 70cm FM repeaters whose service areas lie on the route. The callsign used will be Andy's – G4WWG, because mobile special event operation is not allowed.

Teaching Radio?

ESDE TYLER, G0AEC, is Editor of the STELAR magazine *AMRED* (**AM**ateur **R**adio in **ED**ucation). She is putting together an up-to-date list of teachers who are *actively* promoting (or would *like* to promote) amateur radio in schools. If you have information that would be of help to her, she can be contacted by writing to her address in the *RSGB Yearbook*, or by telephoning her on 01422 882038.

D-Day veteran assists school's wartime project

Schoolchildren Relive D-Day

THE FOURTH YEAR class at Embley Park Junior School in Romsey, Hampshire, has been engaged in a project concerning D-Day and the Normandy invasion. David, G0OZD, took part in the 1944 landings, and was asked to give a talk to the children, which he did willingly. He was impressed by the questions that were asked and the obvious interest the children had in the subject.

The school project culminated in a visit to *HMS Belfast*, moored on the Thames. Before that visit took place, David contacted Bob, G0FER, the operator of the GB2RN amateur radio station aboard the ship, and arranged a QSO with the class while they were there.

As soon as a willing parent had phoned the frequency through to Bob, he contacted GB2RN and was overwhelmed to receive greetings from the whole class in turn! Bob explained that each child had received a GB2RN D-Day anniversary QSL card, and David told them of the incident when "we had called down fire support from *Belfast* on the afternoon of 6 June 1944". Everyone was impressed by his first-hand account, and it is unlikely that the fourth year class will ever forget the experience. David and Bob hope that some of them may take up amateur radio now that they have seen it in action.

Bob, G0FER, supervising George Allan as he sends a greetings message to David, G0OZD, in Romsey.

New Novice Contest

NUNSFIELD HOUSE Amateur Radio Group is re-vamping its Annual Novice Contest. The group hopes that this will raise the contest profile and increase the number of contestants. A copy of the rules and conditions is available from the Novice Contest Manager, M1AFB, QTHR.

The contest will take place on 26/27 August, and is being sponsored by Martin Lynch and Sons, Waters and Stanton, and RadioWorld. There are several valuable prizes on offer, besides the attractive certificate (right).

Lake Catalogue

THE LATEST illustrated catalogue from Lake Electronics is now available. Containing the full Lake range, it includes the new novice receivers and amplifier, essential for aspiring students of the NRAE.

A 10% discount voucher for all orders placed before the end of August 2000 is enclosed with the free catalogue, which can be ordered by sending a stamped, addressed A5 envelope to Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Alternatively, you can telephone 0115 938 2509.

SUNDAY 30 JULY

RSGB VHF AWARDS

Summary of Award Recipients for May

50MHz:

50 squares: G8GNI, G8BTK
75 squares: GU6AJE
100 squares: GU6AJE

10 countries (2-way): M1DUD
20 countries: G8BTK
30 countries: GU6AJE

144MHz:

100 squares / 20 countries: G6FQZ

Summary of Award Recipients for June

50MHz:

25 squares: ..... G7NBE, 2E1BRT, M1DUD (QRP first year)
50 squares: 2E1BRT

10 countries (2-way): M1DVT, G3UFS
20 countries: G3UFS
30 countries: G3UFS

Details of all VHF, UHF and Microwave awards can be obtained from Tony Jarvis, G6TTL, Dovecote Farm, Patman's Lane, Friskney, Boston, Lincolnshire PE22 8QJ (new address), or from www.argonet.co.uk/users/tonyg6ttl/awards/awards.htm

First Radio-Controlled Boat

The first radio-controlled boat: *Bat*, who steamed around Windermere in 1904 under radio control. (Photo courtesy Windermere Steamboat Museum)

THE SPECIAL Event station GB0DBP, held at the Windermere Steamboat Museum in mid-June, was a great success. It celebrated the 150th anniversary of the steam launch *Dolly* (see June *RadCom* p10). Three operating positions were established - in and above the ice cream kiosk, in the 'wet dock' and over the bookshop. The public had free access to view all the positions, and loudspeakers relayed the sound.

The museum is very radio-orientated. One of their exhibits, the steam launch *Bat*, was involved in one of the earliest experiments in radio control by Isaac Storey and Jack Kitchen. In 1904, she was steered by radio control from a wireless mast on Queen Adelaide's Hill while she steamed around Windermere north lake with only a stoker on board. Compared with *Dolly*, *Bat* is a mere stripling at 109 years old.

80 Years of Stockport Radio

ON 4 JUNE 1920, a small group of amateur wireless experimenters held an inaugural meeting in the Foresters' Hall close to Stockport Marketplace, and the Stockport Wireless Society was formed.

Today, renamed the Stockport Radio Society, it is more active than at any time in its history, and is proud to be one of the country's oldest radio societies - older, in fact, than the BBC!

John Hrycan, M0BEX, and Christopher Simcock, RS182113, operating GB0SRS on the Sunday morning 80m net.

To commemorate the event, two Special Event callsigns, GB0SRS and GB8SRS, were activated on 4 June, using SSB, CW and PSK31 on HF, and FM and SSB on VHF. A special QSL card will be available soon. Information about the society can be found on www.stockportradiosociety.co.uk

The Bells are Ringing

THE BRICKFIELDS Amateur Radio Society on the Isle of Wight is helping to preserve the traditional sound of village church bells by operating a series of Special Event Stations from three bell towers during the summer, in support of the Isle of Wight Church Bell Preservation Society. Each station is being sponsored locally, based on the number of radio contacts made. An award certificate will be available.

The three stations will use the callsigns GB4BP, GB6BP and GB8BP, one of which operates on the first Saturday of each month until October, in callsign sequence. Each bell-tower station will be on the air for six hours and the award may be secured for 2-way logged contacts and SWL reports involving all three stations. Contacts will also provide points for the Isle of Wight County Award, the RSGB Islands on the Air awards programme as EU-120, and Worked All Britain SZ48 and SZ58 squares.

The QSL cards incorporate pictures of all three bell towers and will be sent via the bureau. Return cards are not specifically requested, but may be sent to the club callsign GX0BAR.

- The *Daily Telegraph* reported on 19 June that British paratroopers serving in Sierra Leone were using Morse code for communications, because the commanders believed that it was more secure that voice transmissions made via Clansman, the 30-year-old standard radio system of the British Army.

Off the Air

THE JERSEY voice repeater, GB3GJ, on 145.650MHz has been closed down for maintenance and re-siting. It will be off the air until further notice, as will the Bedford voice repeater GB3BF, whose transmitter failed in mid-June.

- "In a recent Press Release, Ultimate Aerials stated that they had won the Main Dealerships for Yaesu and Icom equipment. Although they supply Yaesu and Icom equipment, the Main Dealerships are held by another company, not Ultimate Aerials. The initial Press Release has caused anguish and upset for other Yaesu and Icom dealers, and especially the Scottish Main Dealer. For this, Ultimate Aerials offers its total and unequivocal apology."

Small Ships Remembered

60 YEARS AGO, *HMS Watchful* rescued over 900 troops from the beaches of Dunkirk. Recently, for one day, she again became the centre of attention. As *MV Coronia*, she sailed from Scarborough to Whitby under the callsign GB6SS/MM, a call granted exceptionally by the Radiocommunications Agency for the single commemorative voyage, organised by the Scarborough Special Events Group.

The Group was besieged by members of the local Press in both ports, and was accompanied on the voyage by a BBC TV crew and a sound recording unit from BBC Radio York. This extensive coverage gave an insight into amateur radio to tens of thousands of viewers and listeners in the north of England.

Steeped in history: *MV Coronia* in Scarborough Harbour, with members of the Scarborough Special Events Group. As *HMS Watchful*, she was one of the flotilla of 'small ships' at Dunkirk in 1940.

Pickett's Lock Show to Move

RADIOSPORT, ORGANISERS of the London Amateur Radio and Computer Show (LARCS) has announced that its highly-successful event will be moving to Alexandra Palace next year. The first LARCS to take place at the new venue will be during the weekend of 21/22 April 2001.

The move has been precipitated by the impending demolition of the Lee Valley Leisure Centre at Pickett's Lock, which is making way for the athletics stadium that will host the 2005 World Athletic Championships.

Alexandra Palace, largely destroyed by fire in 1980, was rebuilt as an exhibition and conference venue. It has extensive free car parking, two large halls, and a nearby railway station. LARCS will be held in the 3000sq m West Hall, its new venue undoubtedly attracting more exhibitors and visitors.

A popular event: the crowds at Pickett's Lock last March.

RSGB Council Elections for 2001

COUNCIL IS the governing body of the Society and, although much of the Society's work is delegated to subordinate committees, the overall responsibility for the formulation and conduct of Society's policy rests with Council.

It meets, on average, six times a year, and all Council members are expected to attend. In addition, Council members undertake to deal with individual members' queries promptly and efficiently, represent the Society at various functions, and deal with various aspects of Society business on behalf of Council. Elected members are expected to support publicly the democratically-taken decisions of Council, whatever their own opinions on a particular matter. Council Members will regularly be called upon to take responsibility for major decisions having significant implications on the work of the Society and the amateur radio community within the United Kingdom.

Being elected to Council is not an easy ride and the work of a Council Member requires considerable commitment - often at weekends. It is not a job for the faint-hearted or the indolent.

Because the Society is an extremely complex organisation, it needs Council Members that are not just enthusiastic and willing to participate, but who possess considerable financial or management experience. A successful candidate will also need significant inter-personal skills in order to progress the work of the Society and the interest of its members.

The initial indications are that there will be ***two Ordinary*** vacancies and ***two Zonal*** vacancies on Council in 2001. A definitive list of vacancies will be published in the September 2000 issue of *RadCom*.

Qualifications for Election to Council

1. Candidates must have been Corporate Members of the Society for at least THREE years at the time of nomination.
2. Candidates must submit:
   - written consent to accept office if elected and
   - a declaration of any commercial interest in amateur radio.

Nomination Procedure

Each candidate must be nominated by at least TEN fully paid-up Corporate Members. In the case of Zone candidates, ALL nominators AND the candidate must reside in the relevant Zone.

Nominators may nominate one member for election on a zonal basis and one member for election otherwise than on a zonal basis. In other words, you may if you wish nominate a Zonal *and* an Ordinary Member.

Nominations may be made on forms supplied by the Society.

Additional Information

a) Candidates:

To assist the membership in voting, candidates may supply a statement of not more than 100 words, covering their experience and qualifications in support of their candidature. This should stress any involvement in amateur radio. In addition, candidates may wish to supply a *separate* personal statement, again of not more than 100 words, stating why he or she wishes to stand for Council and what he or she hopes to achieve if elected. Outrageous or unattainable objectives will be edited out. Council is a team and elected members are expected to serve as part of a corporate body.

b) Nominators:

Nominators may find it helpful to supply details of how long they have known the candidate and furnish any other relevant information in support of their nominee.

c) Vacancies:

A list of those Council Members who retire and create vacancies at the end of 2000 will appear in the September issue of *RadCom*. However, those seeking election may apply to Headquarters now for the necessary nomination forms. Applications should be addressed to: 2001 Council Elections, Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE.

Peter A Kirby, G0TWW
General Manager and Company Secretary

DON'T FORGET!

LF Awards 2000

Nevada Cup

The RSGB HF Committee is delighted to announce that this year the RSGB LF Experimenter's Award is again sponsored by Nevada. It is now time to submit nominations for this award. The Cup will be presented at the LF Forum at the RSGB International HF & IOTA Convention in October.

This annual award is for the most significant contribution, by any RSGB member, towards scientific or engineering development of receiver and/or transmitter design, modulation technique, aerial design or propagation on the 73kHz or 136kHz UK amateur allocations.

The HF Committee will make the award in consultation, as required, with the sponsor Nevada. The submission for the award must come either from a holder of a UK Amateur Licence or a person who is a member of the RSGB. The sponsor must not be the potential recipient of the award or a close relative. The submission must contain either a full description of relevant work or references of published work. The submission must state which part of the work is original.

The HF Committee reserves the right to nominate candidates alongside or in the absence of any individually-sponsored nominees. The RSGB HF Committee's view is final

Send nominations: by post to the Publications Dept., RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE; by fax to 01707 645105, or by email to publications@rsgb.org.uk to arrive by Friday 15 September 2000.

Peter Bobeck Awards

As part of the Transatlantic Challenge set up in memory of the late Peter Bobeck, DJ8WL, certificates will be issued for the holders of the 136kHz distance record between 1 October 1999 and 31 March 2000 in the following categories:

(a) 2-way QSO, with callsign and signal report exchange using receiving and transmitting equipment and communication modes common on the HF bands, eg normal speed CW, PSK31, etc

(b) 2-way QSO, with callsign and signal report exchange using receiving and/or transmitting equipment where low-information rate techniques are used which require something in excess of 30 minutes to complete a QSO

(c) A reception report verified by the transmitting amateur station.

The first certificates will be presented at the RSGB HF & IOTA Convention, 13 – 15 October 2000. For these and subsequent claims for the winter period, send details to RSGB HF Awards Manager Fred Handscombe, G4BWP, Sandholm, Bridge End Road, Red Lodge, Bury St Edmunds, Suffolk IP28 8LQ England, or e-mail hf.awards@rsgb.org.uk

The complete rules can be seen at http://www.g3wkl.freeserve.co.uk/awards/136_trans_challenge.html

● On 1 July, the Special Event station GX6CW at Wollaton Park, Nottingham was visited by none other than the Sheriff of Nottingham, who expressed much interest, both in the station and in the hobby itself. The station was that of the Amateur Radio Club of Nottingham, whose logo features the Sheriff's old adversary, Robin Hood.

● The web site for the Radio Amateurs' Invalid and Blind Club has been re-designed, now including details of the Club's various nets. The site can be found at www.raibc.freeserve.co.uk or via a link from the official RSGB site. Comments are welcomed, and clubs who want to link to the site can do so by sending an e-mail.

Get Mobile!

IN ORDER TO fly the flag for amateur radio, members of the Hilderstone Amateur Radio Society bought an old caravan from a scrapyard for a few pounds. They smartened it up and turned it into a comprehensive mobile shack.

Its livery is garish, but that is intentional – it has to be seen wherever it goes, making people come to see just what it is. Then, having made the effort, they go in to find out what is going on.

The caravan can be seen at many amateur radio events, country fairs and fêtes. The aerials are mounted on an extendable mast welded to the towing bracket.

Inside there is room for two visitors at a time to sit and watch the operation of G0HRS, as well as to chat about the club and amateur radio.

Ken, G3JIX, is President of the society and is also Senior Novice Instructor for Kent. He says that the caravan-cum-shack is proving ideal as a mobile demonstration area for introducing prospective new blood to the hobby.

Left: Ken, G3JIX, at the operating position. Right: Ken, Alan, G7IUV, and Ron, G3TAJ, with their eye-catching caravan, a roving advertisement for amateur radio.

Gold-Plated Paddle Won

THERE'S NOTHING like taking your hobby seriously. Why have an ordinary paddle key when you can have a gold-plated Millennium Key? At the Second Mid-Hampshire Radio Rally, such a key (donated by the RSGB) was won by Dave Foster, G4IPI. Other prizes were donated by Ebay and Icom (UK).

Dave Foster, G4IPI (left), receiving the gold-plated RSGB Millennium Paddle Key from Derek Gilbert, G0NFA.

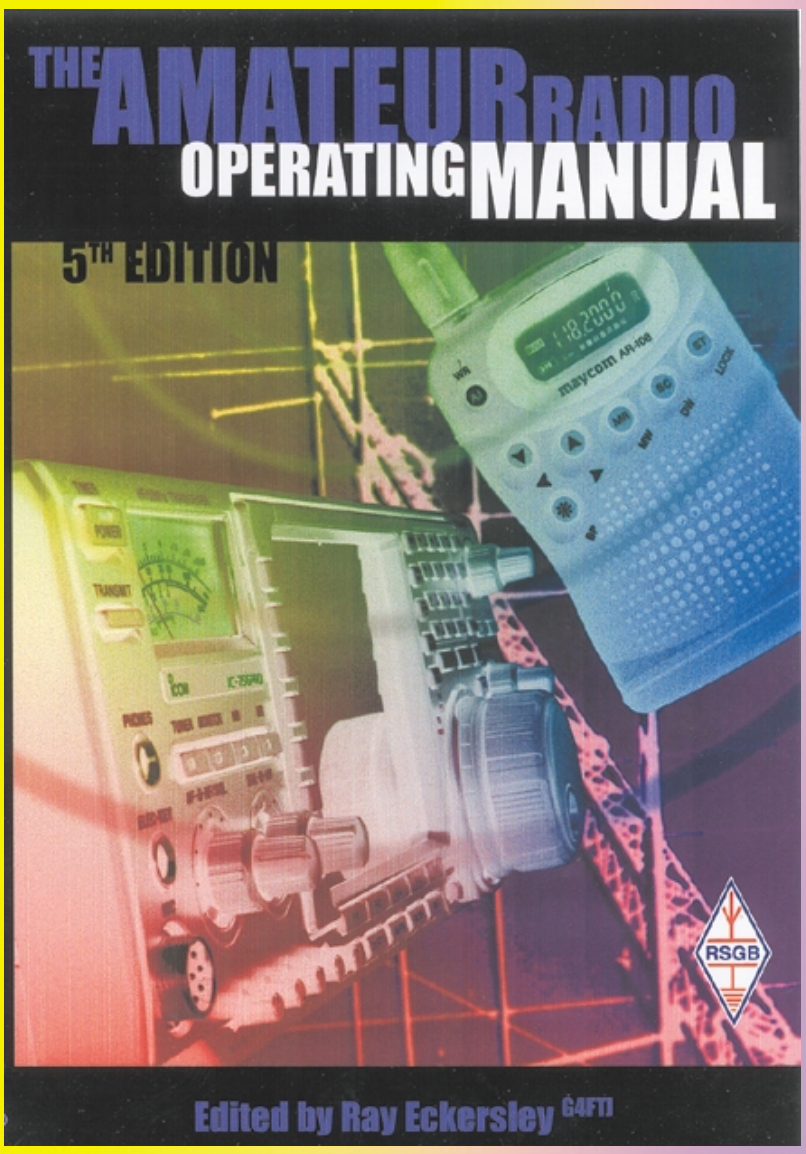
The rally was organised by the Bentley Radio Club, and the £180 proceeds from its raffle went to the Radio Amateurs' Invalid and Blind Club. An alternative venue is now being sought for next year's really, the only surviving rally in Hampshire. More information can be found at http://come.to/bentley

SUNDAY 30 JULY RSGB HAMFEST

DON'T FORGET!

NEW

WHO NEEDS THIS BOOK? - ANYONE IN AMATEUR RADIO DOES!



The Amateur Radio Operating Manual

Edited by Ray Eckersley G4FTJ

This fifth edition has been extensively revised and enlarged. It features a completely new section on organising a DXpedition station.

This book is essential reading for any amateur radio operator. It describes operating techniques invaluable for enjoying amateur radio to the full. The reader is taken through the principles of basic contacts, up to the secrets of working DX and winning contests. More specialised topics such as data communications, mobile operation, television and talk-in stations are included, and the book features a comprehensive set of operating aids and reference information.

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Lead Feature

Amateur Radio Comes to the Kingdom of Bhutan

By Jim Smith, A52JS *

IN MARCH THIS YEAR the final part of the Bhutan Telecommunications Act 2000 was put in place. This last (but not least) section of the Act covered the legislation to permit the introduction of the Amateur Radio Service in Bhutan. Licensing, band allocations, band usage, call sign structure, etc, were finally in place. The legislation uses the existing Tourist Visa structure in a special form for visiting radio amateurs and the normal US$ 200/250 (seasonal) daily tourist rate applies.

EARLY DAYS

IN 1990 I WAS privileged to receive an invitation to Bhutan for 'amateur radio purposes' and in February/March operated from the capital Thimphu signing A51JS. The operation was subsequently accepted for DXCC credit at ARRL. Many DXers were happy with their QSO, as Bhutan was also rare in those days.

That 1990 visit to Bhutan had (and still has) a profound effect on me. This magnificent country with a Monarchy firmly in place and a solid government had no provisions for the amateur radio service. During my extensive travels in Bhutan I saw a highly effective point-to-point HF station network handling the internal traffic of the country. The station operators were proficient CW operators (with SSB skills) and managed their stations on a daily basis, ideally suited as future licensed A5 radio amateurs. Through my rose-coloured spectacles I saw the problem as one of assisting with amateur radio equipment. In addition, the provision of the outlines of an amateur radio administration package as a possible guideline to get things started. I was very familiar with the subject and had also taught the UK RAE syllabus for many years, but it was an over-simplistic view.

* Box 90, Norfolk Island, 2899 Australia

BHUTAN, 1999

BACKTRACKING FOR a moment, last October (just after the RSGB HF Convention) I left Heathrow on my way home to Norfolk Island and on route visited Bhutan by invitation. I carried the mandatory 80kg of amateur radio gear and in due course landed at Paro. I was carrying a Kenwood TS-690S (with built in antenna tuner), a 13.8V DC switched mode power supply, a Cushcraft HF6V multi-band vertical, coaxial cable, wire, log book, etc. This was to be the basics of the station for Yonten, A51TY, ready for that legislation.

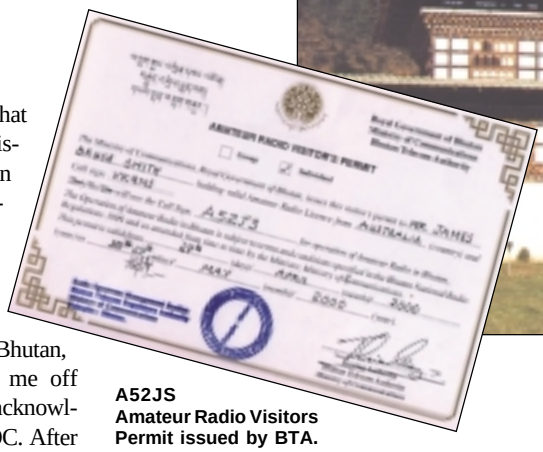
In discussion at the MOC [Ministry of Communications - *Ed*], there was no problem with the idea of setting up a station for Yonten, so the equipment was registered at the MOC. Over the course of a few days we set up the rig, built a 20m dipole and assembled the HF6V vertical into two completed parts, ready for future use. No transmissions were made, but 20m sounded great and over the next few days we both listened around. Yonten was given a daily crash course on the TS-690S and an idea of the general activity on the various bands. He checked his CW ability with a key using the sidetone of the TS-690S and he had not lost his skill.

The HF6V on the front lawn of the hotel – a superb take off. I also had a large wire antenna which worked very well.

BACK ON NORFOLK ISLAND

I RETURNED TO Norfolk Island with a 'Draft Copy' of the Bhutan Telecommunications Act 2000 and the task of writing further material as suggested guidelines for amendments. The various papers were faxed direct to MOC/BTA [Bhutan Telecom Authority -*Ed*] a few weeks later. In early January 2000 invitation visas to Bhutan were issued for my wife Kirsti, VK9NL, and myself and we lodged formal licensing applications with BTA.

My final location in Paro, the Hotel Gangtey Palace, an ideal place for amateur radio.



A52JS
Amateur Radio Visitors Permit issued by BTA.

We could be in Bhutan at the drop of a hat - or the passing of that vital piece of legislation. The legislation was accepted (on schedule) and I phoned Deputy Minister Dasho Leki Dorji, giving him my congratulations and the promise of a bottle of champagne in celebration.

On 1 April a 'DX Release' on plans for a major DXpedition to A5, Bhutan, appeared internationally and caught me off balance. It carried not a single word acknowledging what had been achieved by MOC. After considerable deliberation a call was made to MOC, Dasho Leki, and another to BTA. I then felt free to travel to Bhutan as our call signs of A52JS and A52NL were assured and would be available on arrival. Other administrative matters were cleared by fax. However, my problems were not quite over, as Kirsti refused to go to Bhutan. She had made a decision (in light of the Release) to opt out completely from DXCC, her perception being that DXpeditioning had sunk to a new low.

AUTHORISATIONS ISSUED

MY ARRIVAL AT Paro a few days later on the 26 April was with 80kg of luggage (an Icom IC-756, the usual coaxial, Bencher paddle, headset/mic, antenna etc. I brought my heavy duty Kenwood transformer type 13.8V DC PSU and everything but the kitchen sink.

I was met at Paro airport and then headed for Thimphu, a couple of hours away. Yonten and myself visited MOC and BTA later that afternoon and by 9am the next morning, as promised, both of our authorisation certificates for A51TY and A52JS were available.

As a rather nice touch, the Director of BTA, Thinly Dorji, personally presented our certificates - and they are things of beauty. Writing this today, some 10 years later down that A5 track, the reality of what has been achieved by MOC/BTA in Bhutan has struck home. These were in fact the first amateur radio authorisations to be actually used as a result of the legislation.

It was a special moment for Yonten, A51TY, and my own view was that it was important that a Bhutanese national should be the first to benefit. He is our link with amateur radio in A5, Bhutan, and 30 years ago A51TY was a well-known call sign with a wide circle of international amateur radio friends. In my own case it was also a special moment, 10 years had just passed by in front of my very eyes.

A51TY ON AIR

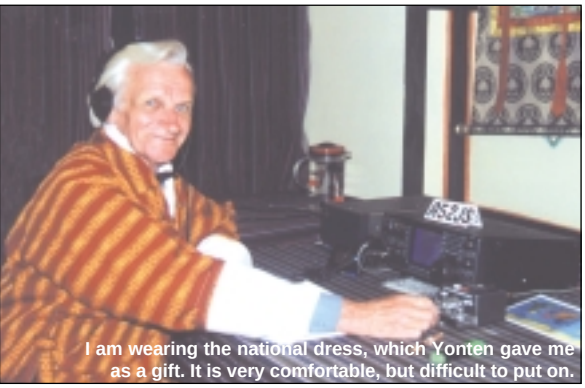
YONTEN AND I headed back to his home, where the TS-690S (left on my last visit) was fired-up in earnest. A suitably loud CW station, Pavel, RW0JR, was chosen, and after his CQ Yonten called him using A51TY. A solid QSO resulted, report, name, QTH, rig, antenna and queries from Pavel – where is Thimphu?, what is A51? Then all hell let loose!

Yonten then moved up to 14222kHz to make his first SSB QSO with Kirsti, VK9NL. This was a tough and marginal QSO, due to QRM from another huge pile up. Yonten was caught just a bit off guard and I asked him to say "go ahead the VU station". In replying, Ram, VU2BK, said in perfect English "How nice to hear you back on the air again Yonten after all these years. Is it 30 years?" In all honesty 'it made my day' as the saying goes, what a turn up for the books! Yonten was grinning from ear to ear - he had been remembered after all those years. A solid QSO followed and another of my dreams had come true, amateur radio for the Bhutanese. Often foreigners can operate from a country and yet there is no sign of a national on air. Later I made many CW and SSB QSOs from Yonten's house using A52JS and my own IC-756.

FIRING-UP FROM PARO

IT WAS TIME for me to move to Paro for two reasons. Firstly, the A52A operation would start up in a few days and I would be just across the street! Secondly, based on my earlier experience as A51JS in Thimphu, I knew Paro to be the better radio location. Several hours later my A52JS station was set up ready to start on the inevitable pile-ups.

My IC-756 was run barefoot, performing



I am wearing the national dress, which Yonten gave me as a gift. It is very comfortable, but difficult to put on.

Yonten, taken during the SSB QSO with Ram, VU2BK. This was his third QSO as A51TY.

The proud holders of Bhutanese amateur radio licences A51TY and A52JS.

without a glitch. There was never any shortage of takers and over the next few days I logged several thousand QSOs. Then the A52A team fired-up, occupying every available DX slot! Still, these days, with the Packet Cluster system, one is quickly spotted and a few kHz either way makes no difference.

BAND CONDITIONS

IT IS REMARKABLE what can be done with 100 watts, a reasonable antenna and location. On DXpeditions I always use my secret weapon, those two hi-tech pieces of plastic called the 'DX Edge'. It puts me completely in touch with the world at any time of day or night, alerting me to daylight, darkness, sunrise and sunset. It comes as no surprise when those PYs call in the JA pile up – I have been expecting them, and those East and West Coast openings with those distinctive signals. That simple DX Edge makes you a better DXpeditioner, all for the price of those pieces of plastic. Magic indeed!

A52JS station at Paro during first few days.

On occasions 10m was almost unusable due to CB interference. In Asia it has to be heard to be believed, and confirms just how much of this band has been hijacked, but many QSOs were made on 10m and 15m was a fine band. 40m was also good, but 80m was often very noisy. In addition, I operated on all the WARC bands.

I often felt tired, had to have a break, take a walk, etc. However, best of all, it was great to take a few moments to say 'hello' to Bhutan and look over the magnificent Paro valley. It leaves me breathless - and not only because of the 2,000m altitude - when I stop and reflect for a moment on this superb country.

BACK IN THIMPHU

MEANWHILE, in Thimphu, Yonten, A51TY, had also been busy making QSOs and we had a couple of skeds on 20m SSB. Yonten will get more organised and will soon get further equipment in the form of a beam, rotator, etc. This will improve his signal and provide some much-needed discrimination from the QRM areas. Yonten will once again leave his unique mark on the bands in coming months.

My son, Stuart (ex Reading) joined me in Paro for the last week. I had to show him around, so my operating time dropped somewhat. It was great to have him with me, sharing my feelings about Bhutan. My own four weeks had passed so quickly. My logs shows a total of some 20,300 A52JS QSOs, so I am satisfied.

Dasho Tuji Yonten, A51TY, at the station of Jim, A52JS, at Paro. (Note courtesy change of station ident to A51TY)

THE FUTURE IN A5

THE BHUTAN Telecommunications Act 2000 sets the country firmly on the road of looking after its youngsters, with provisions for Novice-style licensing and getting schoolchildren interested in amateur radio. English is the major language in schools, and many kids will embrace the idea with open minds and enthusiasm. Later this year we hope to help implement the section covering club stations. Schoolchildren will 'learn the ropes' along the lines of JOTA, to help keep our hobby alive.

I am proud to have been a tiny part of this great story of the start of amateur radio in Bhutan. It is for all qualified Bhutanese, old and young, and ditto for foreigners.

I acknowledge here with gratitude the courtesy and friendship shown by MOC Deputy Minister, Dasho Leki Dorji; Dasho Tuji Yonten, A51TY, the Director of BTA; Thinly Dorji and Phub Tshering, Head of Frequency Management BTA. To my extended family in Bhutan, thanks for the fun and having me back! Tashi Dalek (may your journey be a safe one). ♦

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THE AMATEUR RADIO OPERATING MANUAL – RSGB 5th edition

Described by RSGB staff

THIS IS THE FIFTH edition of the *Amateur Radio Operating Manual*, and its aim, as with the previous editions, is to present a detailed guide to good operating practice on the amateur bands, combined with a comprehensive set of operating aids. It is not intended to be a technical book, so where necessary it refers the reader to appropriate sources of information.

In the interval since the last edition was published, some five years ago, the Internet has become the principal source of up-to-date amateur radio information worldwide. The new edition reflects this revolution, with many references to web pages – even to its own page on the RSGB web site! It also includes for the first time, advice on organising a DXpedition, which will be of great interest to those contemplating operation abroad.

It is essential fare for any amateur radio operator, describing operating techniques which are invaluable if full enjoyment is to be gained from the hobby.

The reader is taken through the principles of choosing equipment for the station the pros and cons of basic equipment versus the top-flight models discussed, and information given on the type of aerial to use.

Siting the shack is a decision which is often taken arbitrarily. If you want to do the job properly, there are several criteria to be met, and these are set out clearly.

The minefield which is the combination of mast siting and planning permission is given careful coverage, as is the best way to set out the equipment in your shack.

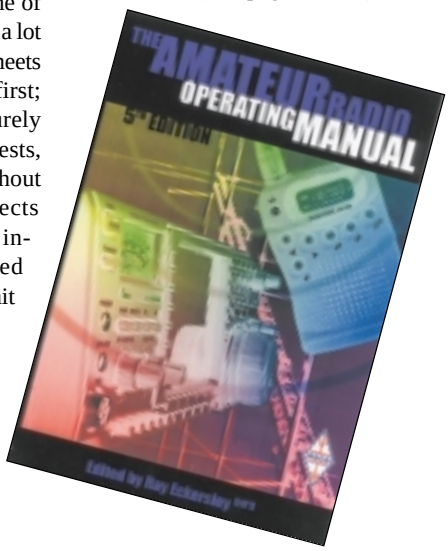
When all the foregoing is complete, the time comes for the first contact. Detailed information is given of the four distinct parts of a radio contact – preparing to transmit, establishing contact, conducting the contact, and concluding it.

A whole chapter is devoted to DX, what it is, the equipment you need and how to work DX. Everything is covered, even the unwelcome advice that if you want to work rare DX, never go on holiday or, if you do, make sure it doesn't clash with the next DXpedition!

The subject of contests polarises the amateur community completely. You either love them or hate them. Reading the chapter on contests may help to turn some of the haters into lovers. There is a lot more to a contest than at first meets the ear. Try a VHF contest first; these are much more leisurely and friendly than HF contests, but don't attempt either without some preparation. All aspects of contesting are covered, including using computerised logging and how to submit your entry.

More specialised topics, such as satellites, data communications, mobile operation, television and running a talk-in station are included, and the book features a comprehensive set of operating aids and reference information, in the form of 10 appendices. Don't be caught without your copy!

Published by RSGB
ISBN 1-872309-63-1
260 pages, 272 x 199mm
Members' price: £21.24 + p&p
Non-members' price: £24.99 + p&p
Available from the RSGB Shop (see pages 66/67).



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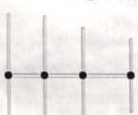

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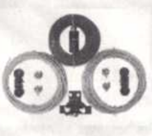

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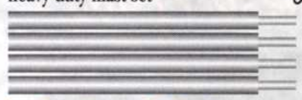

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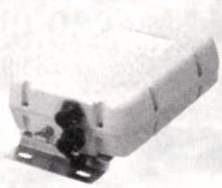

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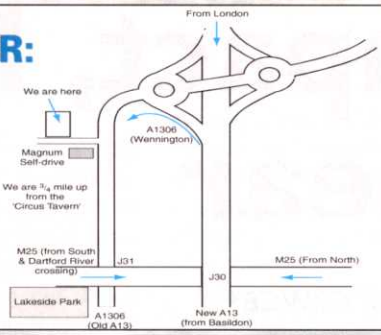

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A Compact, Modern HF Linear

Part three, by Bruce Edwards, G3WCE*

IN THE FIRST two parts, the design criteria were discussed and the circuit was described in detail. Now we move on to discuss the process of turning the design into reality.

CONSTRUCTION

THIS IS LARGELY down to the individual constructor. Anyone undertaking a project such as this is almost certain to have some metalworking experience and ideas about the best way to approach it. How the job is tackled will also depend on the facilities available. For these reasons, extensive detail is not given.

Fig 7 shows as exploded view of the case. The front and rear panels were made first, then the chassis made to fit between the fold-downs. Material is 1.6mm-thick aluminium. The folding was done with a Maplin sheet metal bending tool. For long bends, some support must be given to the clamp bar, and this can be provided by small G-cramps. The end result, when assembled, is quite rigid.

The front panel is shown in **Fig 8**. As before, much depends on the constructor's preferences. The exact position of the main controls will depend on the components used. The band switch I used was supplied by Linear Amp UK and consists of four ceramic wafers mounted on a steel frame. This is ideal, but will increase the overall cost of the project considerably, so should be treated as an option. The two variable capacitors are fitted with slow motion drives and pointers made from aluminium off-cuts. **Fig 9** shows the rear panel. No comment is needed here. ♦

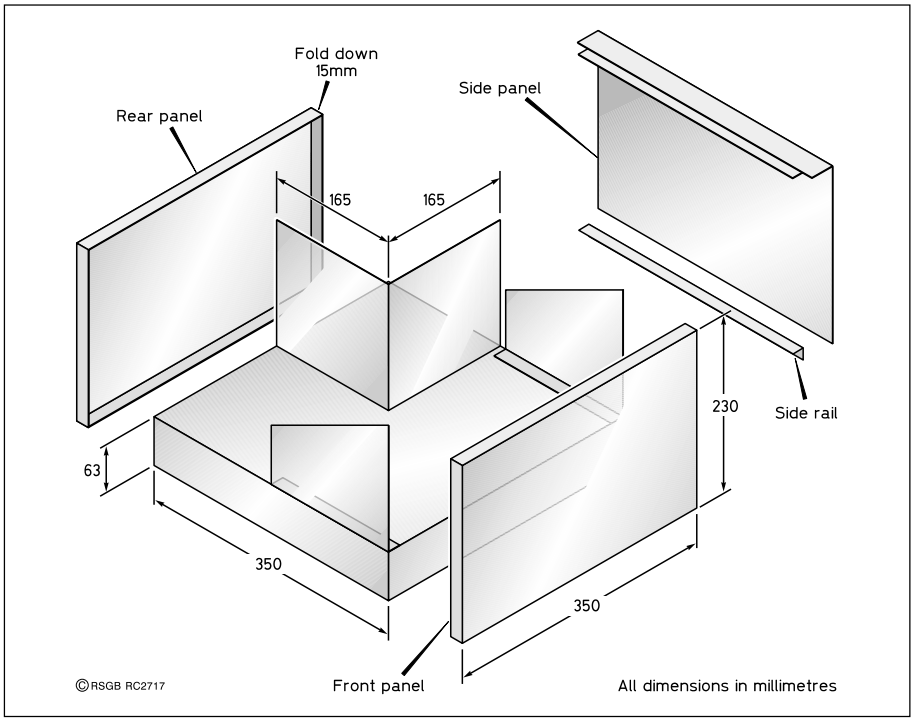
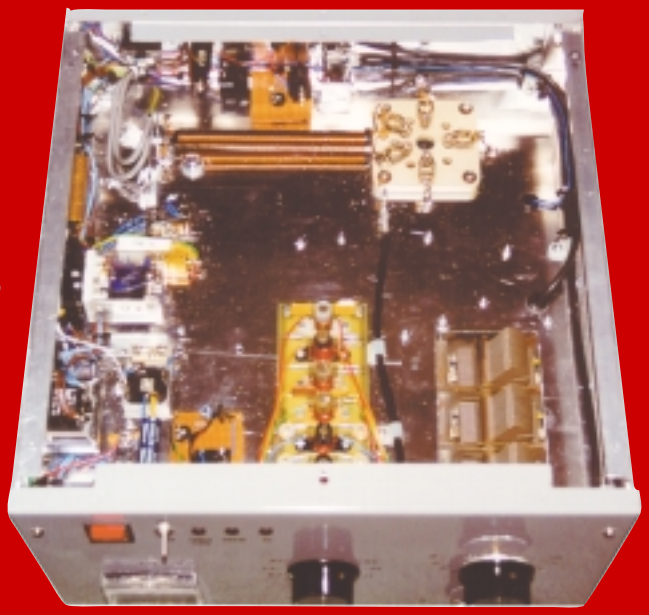


Fig 7: Exploded view of the case and chassis. All the components are 1.6mm-thick aluminium.

*232 Earlham Road, Norwich, NR2 3RH



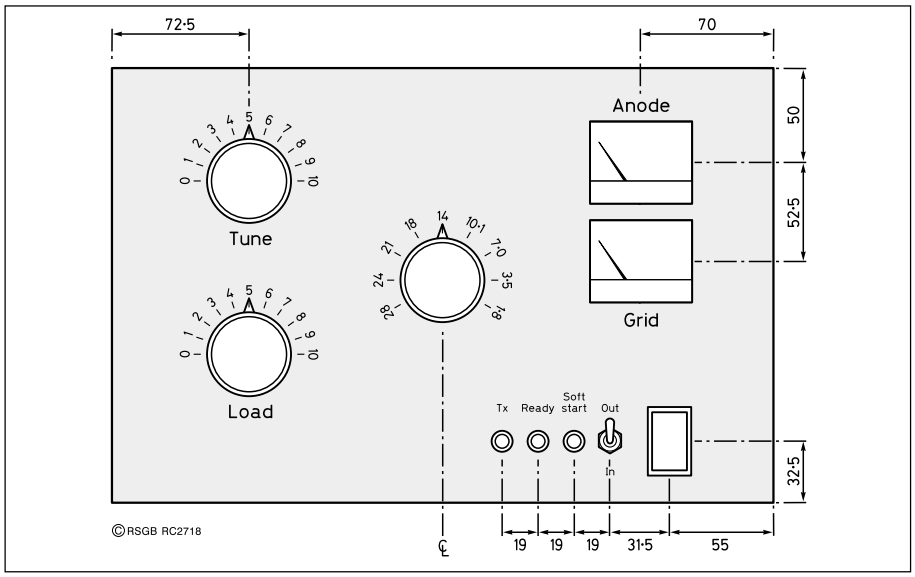


Fig 8: Front panel layout of the amplifier.

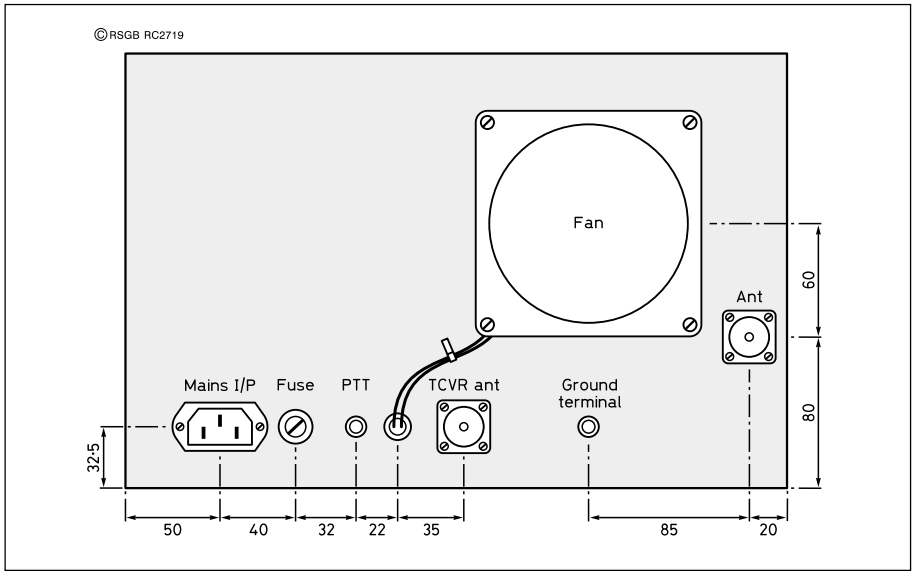
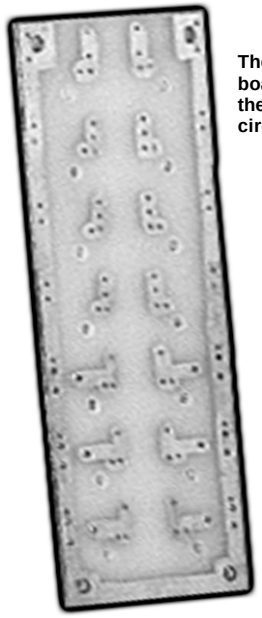


Fig 9: Rear panel layout of the amplifier.



The printed circuit board which carries the input matching circuits.

In the final part we will look at the placement of components above and below chassis, the construction of the EHT board and how to commission the amplifier.

RAE, Novice and Morse Courses

● Pete Pennington, G4EGQ, offers a **correspondence course** for the **RAE**, either by post, e-mail, or a mixture of these. The course is aimed at those who, for whatever reason, are unable to attend courses run by their local clubs or colleges. There is no formal start time; enrolment and commencement can be at any time of year. Contact Pete, QTHR, for details. Phone him on 01303 220010 between 11am and 8pm, or e-mail peter.pennington@btinternet.com

South West

● **University of Plymouth Electronics ARS** will be holding an **RAE** course in Room 312, Smeaton Building, Drake Circus, from early September for the May examination. Enrolment will be on the first and third Thursdays of August in Room 312. For more details contact Bob Griffiths, G7NHB, on 01752 343177.

● **Flight Refuelling ARS** will be running an **RAE** course in **Wimborne** this year, starting in September. Contact Tony, G3PFM, on 01202 622262 for details.

● **Newbury Technical College** will be running an **RAE** course from Thursday 9 September, 7-9pm. A **Morse** course begins on Tuesday 9 January 2001. Contact the college on 01635 845215.

● **North Bristol ARC** is holding a 'rolling' **RAE** class, which runs throughout the year. All are welcome on Friday nights at SHE7, Braemar Avenue, Northville, Bristol. For additional details contact Dick, G0XAY, on 01454 218362.

● **Swindon Technical College** will be running an **RAE** course, starting in September. Contact the tutor, Ray Oliver, G3NDS, on 01672 870892 for further details.

● **Trowbridge & DARS** is organising courses aimed at the March **NRAE** and the May **RAE**. The location will be **Trowbridge** or **Bath**, depending on demand. There is no charge for the training, but students are expected to pay for their books and for the exam. For details contact Steve Hartley, G0FUW, on 01225 464394 (Bath) or Ian Carter, G0GRI, on 01225 864698 (Trowbridge).

South East and East Anglia

● **Bexley College** is running an **RAE** course from 12 September for the may 2001 examination. A **Morse** course will run from May 2001. Contact the Guidance and Admissions Centre on 01322 404000.

● **Brighton College ARC** will run an **RAE** course on Tuesday evenings from 5 September from 7-9pm. The college is also an examination centre, so candidates may sit the exam at the college, as may external candidates. For more details contact the college on 01273 704200, fax 01273 704204.

● **Farnborough College of Technology** is offering an **RAE** course starting 21 September at 7pm, running for 30 weeks. A **Morse** course commences at 7pm on 9 September for 15 weeks. Contact the Information Centre on 01252 407040.

● **Felixstowe & DARS** is running an **RAE** course from September 2000 and an **NRAE** course from January 2001. Details and application forms are available from Paul Whiting, G4YQC, QTHR, or from www.btinternet.com/~pjw/rae.htm

● Given sufficient interest, the 'Hilderstone' **RAE** course will be held in the **Sandwich** area of East Kent, starting in September. Contact Ken Smith, G3JIX, for details on 01304 813175 or e-mail ken.smith@saqnet.co.uk

● **Maidstone YMCA ARS** is holding **RAE**, **NRAE** and **Morse** classes and examinations at the YMCA Centre on Wednesdays, starting in September. Telephone John Belling, G0RHO, on 01622 832259, or e-mail: belj99@aol.com

● **Radio Society of Harrow** will be starting an **NRAE** course on Monday, 18 September. For details contact Don Lamb, G0ACK, on 020 8845 9575.

Midlands

● Brian Smith, G4EQC, intends to run another **RAE** class in **South Staffordshire**, starting in September. The Rugeley venue is no longer available, but it is hoped to find a new one in the **Lichfield/Burtwood/Cannock** area. Anyone interested in the course, or knowing of suitable premises, should contact Brian by e-mail: g4eqc@qsl.net or by telephone on 01543 683030 between 6pm and 9pm.

● **Bromsgrove & DARC** are holding **RAE**, **NRAE** and **Morse** classes at the Avonscorft Arts Centre, **Bromsgrove**, starting in September. Details are available from John Burford, G4OAZ, on 01527 871903.

● **Bedford & DA**RC will be running an **NRAE** course in **Ravensden Village**, just north of **Bedford**, starting in September. It will last until June 2001. Details from Steve Down, G3USE on 01234 270738 or by e-mail to steve.down@btinternet.com

● **High Peak College, Buxton**, will be running an **RAE** course on Mondays from 7 until 9pm for 30 weeks. Enrolment for the course is on 6 September. For more details contact Clive, G4FZH, on 01298 74097

Wales

● **Mid-Glamorgan ARC** will be holding **NRAE** and **Morse** courses starting in early September at the Aberkenfig Social Club, near **Bridgend**. For more details contact Tom Beedie, GW0TOM, on 01656 736954.

North of England

● **Bishop Auckland RAC** will be running **RAE** and **NRAE** courses, starting at the beginning of September. These will be held at the club, which meets every Thursday evening at the **Stanley Crook Village Hall**. Those interested should call Tim Bevan, M0ACV, on 01833 832 948.

● **East Cleveland ARC** is offering an **NRAE** course on Friday evenings in the Committee Room of the New Marske Institute Club, Gurney Street, **New Marske**. Enrolment is on 8 September. For more details contact Alistair, G4OLK, on 01642 475671.

● **Great Lumley AR & ES** will be holding a course for the **RAE** starting in September. Their next **NRAE** course will start in January 2001. For details contact Mike Stott on 01661 832020.

● **Halton RC** starts an **NRAE** course in September in **Runcorn**. Details from Sam, G0SBI, on 01928 714231.

● **Morecambe Bay ARS** will be running a course for the **NRAE** starting in September at the Trimpell Sports and Social Club. Contact Brian, G0RDH, on 01524 424522 for more details.

● **Rossendale ARS** is again running **RAE**, **NRAE** and **Morse** courses. For details contact Ken on 01706 830306.

● **Huntington School**, Huntington Road, **York** is again to be the venue for an **RAE** course starting on 12 September at 7pm and running for 28 weeks. For details contact Shirley Duff on 01904 752102 or e-mail s.duff@huntington-ed.org.uk

● **Oldham ARC** is running an **RAE** course again this year, starting on Thursday 14 September at 7.30pm at the Moorside Conservative Club, 633 Ripponden Road, Moorside, Oldham. The club is fully registered for RAE and NRAE examinations, but no NRAE course is being offered this year. For details contact Geoff, G0BJR, on 01616 524164.

● **Rother Valley College** is holding an **RAE** course starting in September at the School of Technology in **Dinnington**, South Yorkshire. Contact Student Services on 0800 3288008 for further information.

Scotland

● **Moray Firth ARS** will run **RAE** and **NRAE** courses on demand. Contact Geoff Crowley, MM5AHO, gcrowley@cwcom.net

More course information will be included in the September *RadCom*.

Chirps: a New Way to Study HF Propagation

Final part, by Peter Martinez, G3PLX *

IN PART ONE I outlined how existing sweeping ionospheric sounder ('Chirpsounder') signals could be received using an SSB receiver and a novel chirp filter.

FIRST RESULTS ON SCREEN

A TYPICAL TRACE of the local sounder, taken on 10MHz in March 2000, is shown in **Fig 5**. The line at zero propagation delay is the direct groundwave. In the middle of the day, when there is no skip zone, the vertical skywave reflection can be seen very strongly at 2ms delay, with characteristic turned-up ends. Before and after this a fainter, more diffuse trace is visible at 4ms or more. This is the backscatter path, reflected from the ionosphere then scattered back from the ground beyond the skip zone. The varying backscatter delay shows the varying skip distance.

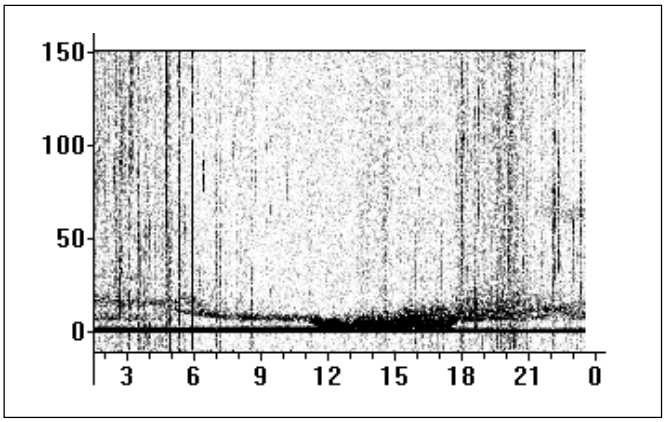


Fig 5: Waterfall of local UK sounder at 10MHz, showing groundwave, midday skywave and backscatter from the edge of the skip zone in the morning and evening.

This was a promising start. I went on to monitor other sounders and found that the chirp filter was far better at detecting chirps than I could by ear. Many signals showed multipath, scatter, and other interesting propagation effects. In particular on the higher bands many signals showed a weaker echo after the main signal, delayed by up to 150ms. This was clearly the long path, but it seemed to be present far more often than I had expected. Even the local sounder produced a 'long path' at a delay of 139ms on some occasions, having travelled one complete circuit of the globe. We are normally only aware of a long path if it's open when the short path is not, but evidently both paths are often present

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together. **Fig 6** shows a trace of an Australian sounder, showing the well-known morning long path and afternoon short path, while **Fig 7** shows a south-east USA sounder with a less well known longpath across the Pacific. **Fig 8** shows a sounder in Cyprus received direct and briefly via an even longer path across the Indian and Pacific oceans and North America.

IDENTIFYING THE SOUNDERS

THE TIMING OF the sounders and the receiving system was stable enough to be able to follow the same one from day to day. I had a list of sweep sounder locations, but no way of relating the names in this list to the sounders I could hear. I was not able to find any published information which linked the location of the sounder to its timing, so how did I know that the signals in Figs 6, 7, and 8 came from Australia, USA, and Cyprus?

This leads on to phase two of the project. I realised that I already had enough information to find the distance to those sounders that I could hear by both short and long paths. If my local sounder gave a direct signal at one instant and a round-the-world echo 139ms later, I could work out the propagation delay from other sounders by measuring the interval between the received longpath and shortpath chirps, subtracting that from 139ms and dividing the result by two. If I could do this from two places in the world, I could find the sounder.

ZL1BPU JOINS THE PROJECT

TO TEST THIS idea I sent the DSP software and the associated PC program to Murray Greenman, ZL1BPU, near Auckland. He has the same DSP kit and was keen to join the project. By this time I had established that the sweepsounder transmitters operate by starting their sweep at a specific number of seconds past the hour, and at five minute intervals thereafter, with a sweep rate of 100kHz per second. To identify each chirp we heard, we noted the time at which we heard it and subtracted the received frequency divided by the sweep rate. This effectively gave the time at which it started sweeping from zero MHz. We called this the chirptime and it meant that we didn't need to co-ordinate the frequencies on which we were both listening. Because the sounders repeated every 5 minutes we didn't need to synchronise our listening periods either, just record the chirptime as a number of seconds between 0 and 300.

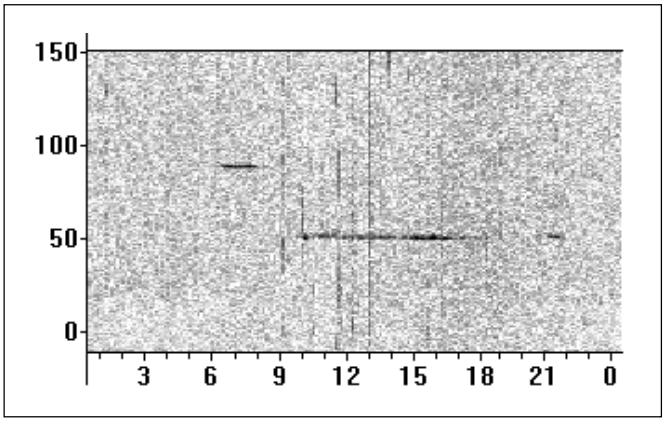

Fig 6: Waterfall of sounder in Northern Australia received in UK on 16MHz, showing morning longpath at 89ms and afternoon shortpath at 50ms.

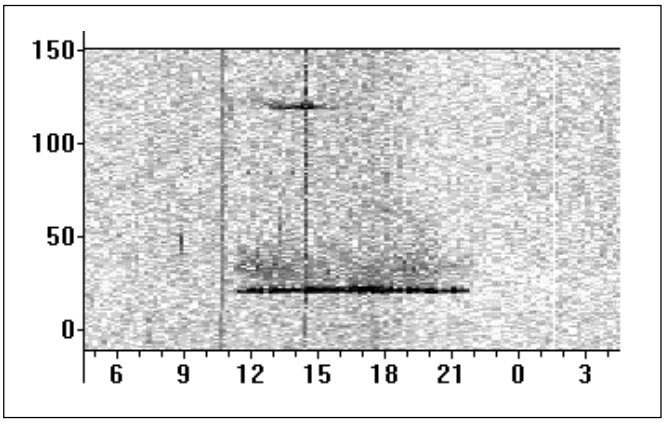

Fig 7: Waterfall of sounder in the Eastern USA received in UK on 21MHz, showing the direct path during the day at 21ms with simultaneous long path at 118ms in the afternoon.

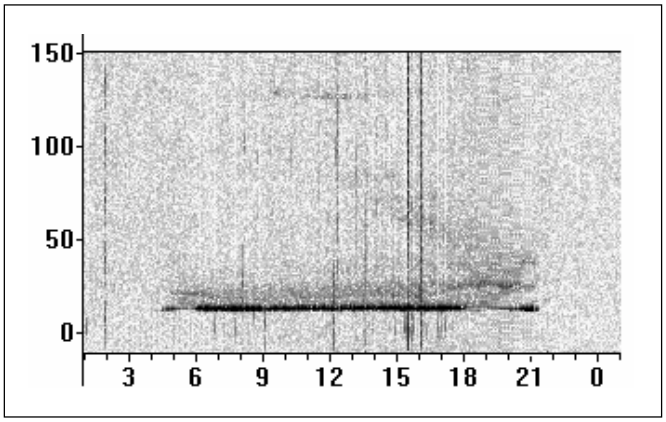

Fig 8: Waterfall of Cyprus sounder received in UK on 29MHz, with the direct path at 12ms, some sidescatter paths, and brief traces of longpath at 127ms.

We found about 15 sounders that we could both hear and we could measure longpath-minus-shortpath delays on some of these and hence work out the distances from each of our respective locations to the unknown transmitter. We then plotted these as lines of constant distance on a map and found the points of intersection. Some of these lines crossed close to islands that we already knew were the locations of sounders. One of these was Cyprus and other crossing points indicated locations in Australia, USA and other parts of the world.

By this time I had calibrated the chirp measurement system so that we could not only get stable traces of the received chirps and read off the interval between longpath and shortpath, but we could also measure the actual received chirptime to a resolution limited only by the DSP sample-rate. This was possible because the GPS units we were using as frequency-standards not only gave us stable 1Hz pulses but these pulses were accurately aligned to universal time: the GPS manufacturers could assure us that the leading edge of the 1Hz pulse from my GPS was within 1µs of the leading edge of the 1Hz pulse at ZL1BPU. We even devised a way to measure and compensate for the delay (about 1.2ms) through the filters in our SSB receivers.

TIME-DIFFERENCE METHOD

WE COULD NOW extend our ability to locate sounders to those which we could not both hear by long and short paths. We did this by measuring the chirptime at both stations, subtracting one from the other and then plotting a 'line of constant time-difference' on the map. Another chirptime observation from a third station gave a second time-difference line and the unknown transmitter would lie at the intersection of the two. This is the same process as used in hyperbolic navigation systems such as Decca, Loran and GPS.

PY3CRX and KC7WW were recruited to the project and several more sounder locations were added to the collection. As an example, **Fig 9** shows the position-lines for one set of observed chirptimes, 224.154 at ZL1BPU, 224.166 at KC7WW, and 224.168 at G3PLX. The time-difference line for G3PLX-KC7WW=2ms is shown in red and that for KC7WW-ZL1BPU=12ms in green. Note that these lines cross in two places, not one - an annoying side effect of the earth being round rather than flat! In this case we knew from the times that we could hear this sounder that it was probably at the Falkland Islands rather than the Philippines, but we confirmed it when PY3CRX reported a chirptime of 224.134 so that we could also plot the blue KC7WW-PY3CRX=32ms position line.

ABSOLUTE TIME METHOD

ONCE WE HAD the location of a sounder we could calculate back to find the chirptime at the transmitter. It soon became apparent that many

sounders started their sweeps exactly on a one-second mark and we noted that these were also the sounders which remained absolutely stable in their timing from day to day, while others drifted slightly to the extent that one would expect from a crystal-controlled clock. It seemed reasonable to suppose that the stable ones were using the 1Hz pulse from GPS for their timing too, and we later verified this from manufacturer's information gleaned from the Internet. This gave us a third method of measuring the distance to a GPS-locked sounder, by simply using the decimal part of the received chirptime. Thus a stable sounder with a chirptime of XXX.001 was probably 1ms away (300km), one with a chirptime of XXX.0695 was exactly halfway round the globe, and if it was later than that it was longpath. We located a few more this way and also cross-checked some of the previous observations.

AUTOMATING THE SEARCH

I THEN WENT ON to refine the PC software further so that it would detect and log chirptimes automatically and sort them into their correct periods, because by this time we could see that there were sounders with periods of 5, 7.5, 8, 10, 12, 15, and 30 minutes. Typically between 100 and 300 individual chirps per hour are detected during daylight at G3PLX, using a 6m vertical whip antenna. The software sorts out regularly occurring chirps to find the period and chirptime and usually logs about 30 - 50 different sounders over a 24-hour period. This automation made it possible to expand the network of observers to include EA2BAJ, DF7YC, and G4JNT. The lists of received chirptimes were saved to file and e-mailed to me for analysis. As a result some 40 sounders have been located so far in all corners of the globe, but there are many more that have not yet been heard in three places. It became clear later that there are more sounders with sweep-rates other than 100kHz/sec, although I have not so far written software to process these.

THE WAY FORWARD: ALL-BAND BEACONS?

THERE ARE SEVERAL directions that the chirp project could now take. At the simplest level, anyone listening with just a conventional HF SSB receiver can hear the stronger sounders and identify them with the help of a clock. You may like to try this yourself: the Cyprus sounder is easily audible by ear in the UK most days. It starts its sweep (from zero MHz) at 250 seconds past the hour and sweeps at 100kHz/sec, so if you tune to 21.0MHz during the daytime, you may hear it at 250+210=460 seconds past the hour and every 5 minutes thereafter. The sounder near G3PLX will also be audible around the UK on the LF bands. It starts at 78 seconds, so if you tune to 3500kHz you should hear a chirp at 78+35=113 secs past the hour and every 5 minutes thereafter. You may then find that you can hear many more once you know what they sound like. These could be useful additions to the existing HF amateur beacons, with the advantage that they are far more numerous and operate over the entire HF spectrum and not just on spot frequencies. Incidentally, none of these sounders actually starts sweeping at zero MHz: they are silent until they get to about 2MHz, and sometimes they are also muted around distress and safety channels. More sounders are listed in **Table 1** and there is a full list on the Chirps Project web site.

There is clearly scope for automatic beacon monitoring and it is possible that chirp-detecting software could be written to use a low-cost PC sound card rather than the DSP card that we have used so far. Of course, all these ideas for using sweepsounders as beacons depend on the availability of accurate and up-to-date information about their locations and operating schedules. We may even be able to generate and maintain this information ourselves by using the triangulation methods I have described.

Location	Period (mins)	Chirptime (secs)
S England	5	44
NW England	5	78
Italy	15	118
Spain	15	138
SE Australia	15	178
Ascension Is	5	222
Falkland Is	5	224
Cyprus	5	250
Caribbean	15	342
Indonesia	15	390
N Australia	7.5	436
New Zealand	15	500
N Scotland	15	662
Iceland	15	680

Table 1: A selection of sweep sounders logged in April 2000. You will hear a sounder with a chirptime C on a frequency F (MHz) at C+F/10 seconds past the hour, repeated at the appropriate interval.

Another possible application suggested is to add GPS-locked chirps at regular intervals to the emissions from existing amateur beacons. Not over the whole HF spectrum, but just over a 3kHz sweep. It would only need a 30ms chirp every 5 minutes to give propagation traces similar to those shown in this feature. Although this would take up 3kHz of the band, the duration of the chirp is only that of a single Morse-code dot at 40WPM.

THE WAY FORWARD: PROPAGATION RESEARCH?

EVEN WITHOUT THIS extra infrastructure and development work, this project has now opened-up the possibility for using the signals from existing swept-frequency sounders for amateur HF propagation research in a variety of areas. It would be interesting to study long-path propagation more extensively now that we have a way to see it clearly. Other topics such as trans-equatorial propagation, long-delayed echoes, non-great-circle paths, and aurora come to mind.

I would like to thank Marcus Ramos, PY3CRX; Johan Forrer, KC7WW; Andreas Gawron, DF7YC; Eduardo Jacob, EA2BAJ; Andy Talbot, G4JNT; and in particular Murray Greenman, ZL1BPU. The Chirps project would not have been possible without their help.

Further information about the Chirps project, including an up-to-date list of sounders and more examples of received chirp traces, together with links to related sources of information can be seen at the Chirps project website at www.qsl.net/zl1bpu/chirp/chirps.html ♦

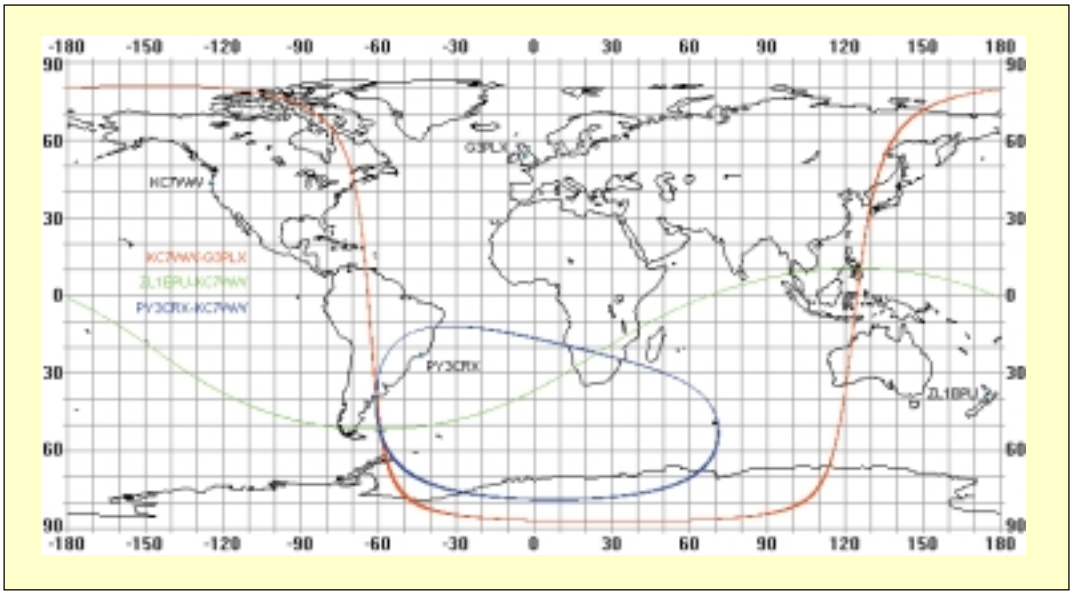

Fig 9: World map showing time-difference lines from KC7WW, PY3CRX, ZL1BPU and G3PLX crossing at the Falkland Islands.

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LIMITED OFFER

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- 4W RF out (12V) 2W RF out (9V)
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RS-730	...Hatch/Trunk Mount fully adjustable	£18.50
TBR	.....Hatch/Trunk Mount standard model	£14.95

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HF 200W All Mode Transceiver

After 36 years on the air, I have become pretty fussy about the HF radio's I use. I used the new MARK IV FT1000mp recently on a big antenna system, and was impressed!
The new VRF control is smooth and easy to use, it enabled me to work alongside S9 plus 40 signals on 40 mtrs without a hint of strain. I frequently change between CW and SSB operation chasing rare DX. The new IDBT ensured that the DSP system tracked my receiver IF bandwidth settings automatically giving me the best opportunity to "grab" that rare one before the pile up got to him. With the Class A SSB mode, the audio quality was unbeatable and I know that I'm not causing interference to others, even on 160 Mtrs where I have a strong signal.
All in all this is a radio I can fully recommend, to the serious DX enthusiast !

Mike Devereux - G3SED *Managing Director*

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NEW!

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SAMLEX 23A PSU

13.8 VOLT SWITCH MODE POWER SUPPLY 23 AMPS 13.8V

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- 3 - 15V adjustable
- 25/30A max
- Voltage current meter
- 10mV RMS noise & ripple

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A heavy duty, wide frequency range HF & VHF power meter.

- 300 & 3000W • 1.8-150MHz
- Measures average or peak power

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ANTENNA TUNER

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- Peak/Av power reading

Housed in a larger heavy duty cabinet with many improved features - this has to be one of the best antenna tuners on the market!

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PALSTAR PS 50

50 Amp heavy duty supply with meters
13.8V DC 40/50 Amp

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- 0.03 -60MHz • Twin PBT built-in
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COVERS 50KHZ - 30MHZ FM OPTION + LOTS MORE!

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AOR AR5000
10kH - 2.6GHz All mode top class receiver & scanner

~~£1445~~ **£1395** £8 p&p

FAIRHAVEN RD500 VX
NEW! LATEST SUPER RECEIVER COVERING 20KHZ-30MHZ

£799.95 £8 p&p

PALSTAR AT300 Antenna Tuner
150W STANDARD MODEL

- Matches dipoles, centre fed doublets, G5RV's, Balanced feeders, Verticals, Single wires, Delta loops, Beams, Windoms and Inverted V's.
- Built in 4:1 Balun
- 8 position antenna selector switching
- Built in dummy load.
- Average power reading to 200W
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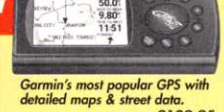

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SPECIAL TWIN PACK
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Outbacker Antennas

OUTBACKER - rugged commercial grade mobile antennas from Australia. Now on **SPECIALPROMOTION** for the *summer mobile season!*

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OUTBACKER OBS8 *6ft long (split in 2)* 80 - 10 mtrs	~~£199.50~~	**£169**
OUTBACKER Outrunner *9ft long* 160 - 10 mtrs 150W	~~£199.95~~	**£169**
HEAVY DUTY SPRING BASE		**£59.95**

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- Simply divide the price (including carriage) into 3 equal payments.
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- Write your telephone number, cheque card No & expiry date on the back of each cheque.
- Post them to us, enclosing your name & address & we will (subject to status) send your goods immediately.

RSGB IOTA Annual Listings 2000

*By Roger Balister, G3KMA, RSGB IOTA Manager**

THIS YEAR SAW the fifteenth anniversary of the day in March 1985 when Geoff Watts, IOTA's founder, asked RSGB to take over management of the programme. Geoff had conceived the idea of an island programme in 1964 as an alternative to the ever-popular DXCC Programme - it was never meant to compete. Possibly, he had in mind its appeal to those who wanted to pursue their on-air activity at a more leisurely pace, but with some specific, albeit different, achievement target. Anyway, it instantly attracted a small band of determined followers.

Every year since 1964 has confirmed Geoff's flash of inspiration. In some ways this came at least ten years too early. IOTA stations at the time were mainly island residents. DXpeditioners to islands without a special DXCC attraction were few.

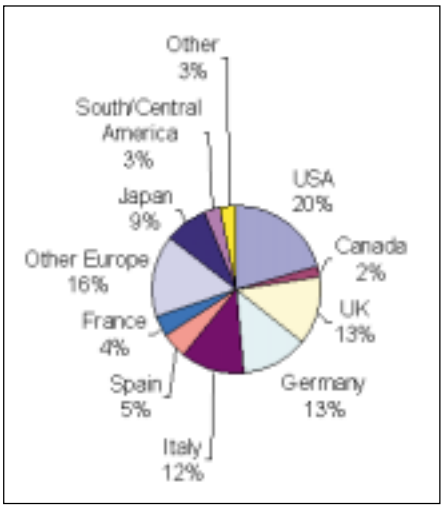
* *La Quinta, Mimbridge, Chobham, Woking, Surrey GU24 8AR.*

IOTA Clubs Listing - 2000

Pos.	Call Sign	Score	6	YU7JDE	402
1	UT7WZA	753	7	DL0TU	376
2	YL1XZ	714	8	9A1BHI	257
3	SK6PJ	624	8	DL0IOA	257
4	DL0BMW	545	10	G3CSR	167
5	HA3KNA	451	11	RZ3AZO	118

Equipment was bulky and not very user-friendly when intended for single-handed field day operations, so few thought it worth the effort to pile it onto a boat and then an island. It was only later that advances in equipment technology made mounting portable island operations much more feasible.

From the outset there were the aficionados who combed the bands for an island contact and then, having entrapped one into a contact, pressed Geoff to recognise it as a 'New One'. The programme had started with some 300-400 groups listed in the first *IOTA Directory*. In the early years new ones were few and far between.



IOTA participation by main geographical area.

Pile-ups were non-existent, unless the island station was attractive DX as well, because all who wanted a contact could be worked within twenty minutes or so. This was in the days before the Packet Cluster and live-time DX Reflectors. If the truth be known, growing one's IOTA score was a kind of personal, rather lonely, crusade. It was not the kind of thing you boasted

G4BWP, G3OCA and local helpers on Abokwa Island, 9G5MD (AF-084).

IOTA Honour Roll - May 2000

(minimum qualification = confirmed QSOs with half of activated IOTA Island Groups)

Pos.	Call Sign	Score
1	F9RM	930
2	I1ZL	920
3	I1SNW	912
4	9A2AA	910
5	EA4MY	906
6	I2YDX	905
7	G3AAE	904
7	ON6HE	904
7	VE3XN	904
7	W9DC	904
11	GM3ITN	903
11	I1HYW	903
11	I8KNT	903
14	I8XTX	902
15	ON5KL	900
16	I8ACB	899
17	IK1JJB	897
18	I2MWZ	891
18	IK1AIG	891
20	DL8NU	890
20	F2BS	890
22	G3GIQ	885
22	K9PPY	885
24	F6AJA	881
24	IT9GAI	881
24	ON4AAC	881
24	W4BAA	881
28	ON7EM	880
29	OH2QQ	879
30	VE6VK	878
31	G4WFZ	876
31	IK1GPG	876
33	I0OLK	875
34	CT1ZW	874
35	9A2TW	869
36	WD8MGQ	868
37	DK6NP	865
38	G3ZAY	864
39	ON4XL	863
40	K8DYZ	860
41	DK1RV	859
41	N7TZ	859
43	F9GL	857
44	IK2MLY	856
45	OM3JW	855
46	EA5AT	853
46	OE3WWB	853
48	F6AXP	852
48	F6BFH	852
48	K7SO	852
51	G3ALI	849
51	I4LCK	849
53	I2FUG	848
54	OZ4RT	846
55	4Z4DX	844
55	EA8AKN	844
57	ON4FU	843
58	K6DT	842
59	W5BOS	841
60	IK4CWP	840
61	F6DLM	839
61	I2VDX	839
63	IK8DDN	834
64	F6ELE	826
65	VE7IG	823
66	OE6MKG	822
67	ON5NT	821
68	WB9EEE	820
69	N8JV	815
69	W1NG	815
71	G3VJP	813
72	N5JR	811
73	VE7IU	807
74	F6CYV	804
75	HA0DU	803
75	W4DKS	803
77	ZL1ARY	802
78	VK9NS	801
79	HB9AFI	798
80	DF2NS	788
80	DL1SDN	788
80	KB8O	788
83	I1WFF	787
83	W3KH	787
85	G3NUG	786
86	KH6WU	785
87	G4LVQ	783
88	DK6NJ	779
88	G3XTT	779
90	F6DZU	777
90	ON4QP	777
92	IK2EUY	776
92	VE3LDT	776
94	N5UR	775
95	W1DIG	773
96	F6CUK	772
96	GW3ARS	772
98	CT1UD	771
99	EI7CC	768
100	W2FXA	766
101	ZL2VS	765
102	EA7DUD	762
102	G8JM	762
102	HB9RG	762
105	SM0DJZ	761
106	DL8MAG	760
107	OK1JKM	759
108	G4RFV	758
109	SM0AJU	756
110	IK8PGC	754
111	SM6CVX	751
112	KC8PG	750
113	I8YRK	748
114	G3OCA	745
115	EA3KB	743
116	G4BWP	742
117	G4SOZ	740
117	GM0AGN	740
119	VE7YL	738
120	I1TBE	736
121	G3TJW	733
121	K5MK	733
123	I1EEW	731
124	W9HA	728
125	IK1ADH	727
126	DL2SCQ	723
126	EA7ABW	723
128	CT4NH	720
129	SM6CAS	719
130	I2YWR	716
130	I8YZP	716
132	VE3MDQ	714
133	G3MLX	712
133	OZ5MJ	712
135	HB9BVV	711
135	K8NA	711
135	W5KN	711
138	EA5KB	709
138	GJ3LFJ	709
140	K3FN	708
141	F6CKH	707
142	I5ZJK	706
142	N6AWD	706
144	W9NZM	705
145	EA1KK	704
145	N6PYN	704
147	CT1EEB	703
147	I5DCE	703
147	N6BOI	703
150	K2VV	702
151	DJ4XA	701
151	DL8DSL	701
151	IK2IGX	701
151	WT2O	701
155	AA7AV	699
156	DL8FL	698
157	G3ZBA	696
157	VE3NSZ	696
159	G0APV	695
160	ON4IZ	693
161	DK6AO	692
161	I1CAW	692
163	UY5XE	691
164	G3TOK	690
164	JE1DXC	690
166	KD1CT	689
167	OE3SGA	687
167	OH2BLD	687
169	G3RUV	686
170	VK7BC	685
171	G3YAA	684
172	KA5TQF	682
173	G0MYC	679
173	GM0KCY	679
175	F9MD	675
176	DK2PR	674
177	G0LRJ	673
178	DK2UA	672
178	DL8USA	672
178	N4QQ	672
181	DL7CW	665
181	JF1SEK	665
183	AD5A	661
184	F6FHO	660
185	N5FW	659
186	KA1DIG	657
186	W1ENE	657
188	DL1SCQ	656
189	G3SMP	655
190	N6VR	654
191	W9HAO	653
192	DL5MU	651
193	W6ED	646
194	ON4ON	645
195	S52KM	643
196	VE3PRU	639
197	AA9DX	634
198	N5XG	631
199	I2JSB	630
199	PY5PS	630
201	DJ8QP	629
202	K1HTV	628
203	AA5AT	626
203	I8LEL	626
205	DL6DK	622
206	G3HTA	620
206	UR5LCV	620
208	I1ZXT	615
209	IK8TWV	613
209	W1CU	613
211	IK1QFM	612
211	VO1XC	612
213	VE6PW	611
214	HK3JJH	610
214	ON5TW	610
214	W0BBT	610
217	N5ET	609
217	SM6TEU	609
217	WD0FTD	609
220	HA1AG	607
221	GI0TJJ	604
221	I4EAT	604
221	SM7CNA	604
221	W2JZK	604
221	WF1N	604
221	WW1V	604
227	W7OF	602
228	EA5OL	600
229	CT1AHU	599
229	I2LXA	599
229	IK2WAL	599
232	DL5ZG	594
233	DL5SBA	593
234	G3PMR	592
234	N6JM	592
236	CT1EEN	591
237	G3UAS	589
238	EA9PB	587
239	G3HSR	585
240	CT1BY	584
241	PA3EXX	583
242	I4UDV	582
242	N3ERM	582
244	DL6MST	579
245	NN2C	578
246	S51TE	576
247	G3SJX	574
247	ON4ADN	574
249	OH5PA	573
250	PY2DBU	570
251	IK2ILH	569
252	IK2PZG	567
253	WF5E	566
254	N5OUE	560
255	N6JV	558
256	UA4SKW	557
257	G0ANH	556
257	K8AJK	556
257	N7RO	556
260	OZ1ACB	554
261	JA9IFF	553
262	DL8DXL	552
262	IK1NEG	552
264	W1OX	551
265	G0KIK	550
265	JA7JI	550
267	DK8UH	549
268	KM4RX	548
269	F5HNQ	547
269	IK4HLU	547
269	KH7RS	547
272	DL6ATM	546
273	AB5EB	545
274	F2YT	544
274	IK2UEC	544
276	N3CWP	541
277	JH2AYB	540
277	OE1MEW	540
279	I4CSP	539
279	I4GAS	539
279	KQ4YI	539
282	G3XON	537
282	JA1QXY	537
282	JO1WKO	537
285	EA3BT	536
285	G3KYF	536
285	OZ7DN	536
288	DL5MX	534
289	DL3ECK	533
290	PA2JHO	531
290	VE3JV	531
292	IK0AZG	530
293	F5IL	528
294	DL1BKK	527
294	I0ZYA	527
294	IK8JWA	527
294	SM5JE	527
298	F5PAC	526
298	W0GAX	526
300	DL6KVA	525
301	DL8MLD	524
301	EA3JL	524
303	IK4SDY	523
303	KC5E	523
305	HB9BMY	521
306	K8LJG	519
306	SM7TE	519
306	WB2YQH	519
309	K5FNR	517
310	F8PX	516
311	IT9YRE	515
311	JA8RJE	515
311	RW4HW	515
314	G4DUW	514
314	IK7MXB	514
316	WB3DNA	513
317	AB5C	512
317	IK1AOD	512
317	PY4OY	512
320	SM5CZY	511
321	I2MQP	510
322	DJ9HX	509
322	HA5DA	509
324	VE2NW	508
325	OH3MIG	507
325	UA6AF	507
327	DJ4GJ	506
327	G3AEZ	506
329	I1FY	505
329	JH1QVW	505
329	VK3UY	505
332	CT1DIZ	504
332	DK1FW	504
332	HB9CEX	504
332	IK8CVZ	504
332	K2XF	504
332	S51RU	504
332	W1KSZ	504
339	G3EZZ	503
339	IK4HPU	503
339	IT9FXY	503
342	DL2NES	502
342	SP5TZC	502
342	WA3HUP	502
345	DL2MEV	501
345	N4AH	501
345	W9CZI	501
348	4X4RE	500
348	DL9JH	500
348	F5NLY	500
348	WB1BVQ	500
352	W7MO	499
353	G4XRX	495
353	WD9FEN	495
355	DK6IP	494
356	I2PQW	491
356	IK4PMA	491
358	ON7FK	490
359	G3PFS	488
360	DL2DXA	487
360	EI2HY	487
360	LA2PA	487
363	JA8IYI	486
363	OE6GRG	486
365	JA5IU	481
366	DL8YR	480
367	G3OAG	479
367	HB9BIN	479
367	JA1GRM	479
367	W8WFN	479
371	OE2KGM	475
372	DL1XE	473
372	IK0APR	473
374	W5WP	472
375	G0RCI	471
376	HA0HW	470
376	IK4IDF	470

about at the club meeting - it certainly did not have the same crowd appeal as working the latest Pacific DXpedition on 10 metres.

INCREASING POPULARITY

LATER, MUCH LATER, in the early 80s, the programme began to take off. This was largely due to the efforts of a number of individual island chasers who, having maintained close telephone contact with each other over many years (a kind of jungle telegraph), decided to meet on air on a regular basis to exchange island news and gossip. This is how the nets and list operations started, which characterised IOTA ten years or more ago. The number of people who wanted a contact could still be accommodated by two or three sessions on the air with the island station. It seemed an effective way of maximising the use of the island station's available time and battery power. Later, as IOTA and DXCC operations moved progressively closer in terms of the amount of interest generated and size of pile-up, net, and subsequently list, operations died out. The advent of the Packet Cluster and then the Internet, and access to instant information from DX bulletins and web-sites also drew away a significant proportion of the island chasers who tended to monitor IOTA frequencies.

Parallel with the growth in popularity of the programme during the 1980s came a growing pressure for dozens of new IOTA groups to be created. Many were added within a new framework of rules introduced in the mid to late 1980s. However, by 1990 it had become clear that a wholesale revision of the rules and the island list was required, to give it the structure required to ensure more consistent and less stressful decision-taking. This was completed in time for the first IOTA Convention in Loano, Italy, in Spring 1991. The resulting *Directory* listed some 1150 IOTA groups, double the size of the 1985 list. The story however is not finished, because during the 1990s the enormous growth of interest in the

programme pointed-up the need for further major work on the *Directory*, to expand the island listings and make it more user-friendly for applicants and IOTA checkpoints alike. This has taken a year and has now resulted in *Directory 2000* (see page 57 for details of availability). The island list is now capped at 1200 groups and it is unlikely that any further significant work will be required.

THE HONOURS

THE HONOUR ROLL (later Honour Roll/Annual Listing) was a regular feature of IOTA from earliest days. In spring 1985, calls listed numbered 57 in 18 DXCC entities. By May 1995 this had grown to 672 in 55 entities and has now, five years later, reached 1620 participants in 78 entities. Bearing in mind that IOTA Directories have now found their way to amateurs in more than 160 DXCC entities in all 40 CQ Zones, we have to acknowledge that there is some way to go to convert these Directories into applications! Of the 57 stalwarts in 1985, almost two thirds appear in the 2000 listings… and Jean-Pierre Guillou, F9RM, still holds Number One position! This growth would not have been possible without the computerised HQ database system. Equally it would have been out of the question without the strong support and commitment to the programme of our checkpoints. We owe all involved a big vote of thanks.

The 2001 Honour Roll will make interesting reading. The new *Directory* lists 58 new groups and other changes which could reshuffle the top positions. Much will depend on the speed at which QSLs are received from the new operations. Programme participants should not rely on past contacts prior to the *Directory's* Start Date (19 June 2000) being automatically accepted, as there is no certainty that these will meet the Committee's requirements within the timescale set for the Honour Roll. As always, the Committee will try to manage the programme in as fair and impartial a way as possible, and without prejudice to its integrity. ♦

Participation by DXCC Entity

W	325	KL	5	BY	1
DL	204	LA	5	C2	1
I	194	PA	5	CT3	1
G	176	9A	4	EA6	1
JA	138	EA8	4	FR	1
EA	73	EI	4	GJ	1
F	63	LU	4	GU	1
VE	35	OM	4	H4	1
HA	33	S5	4	HK	1
PY	32	SP	4	HS	1
ON	29	YU	4	KH2	1
SM	29	CO	3	KH8	1
UA	25	GI	3	LY	1
HB	22	IS	3	P2	1
CT	19	LX	3	T7	1
OE	18	SV	3	TI	1
GM	16	CE	2	UN	1
UR	14	CU	2	VK9N	1
GW	11	EA9	2	VR2	1
VK	10	EU	2	XE	1
OK	9	HC	2	YL	1
OH	8	HL	2	YO	1
OZ	7	ZC4	2	ZK1	1
ZL	7	ZP	2	ZS	1
4X	6	5B	1		
KH6	6	9V	1	Total:	1620
UA9	6	A9	1		

IOTA Annual Listing - May 2000 (RSGB members)

(minimum qualification = confirmed QSOs with 100 IOTA Island Groups)

Pos.	Call Sign	Score	706	G0TYV	283	964	GW4TSG	203	1205	G4BGW	131
379	G0MSM	468	714	GM0OYU	278	973	G0AHC	202	1205	GM4ELV	131
384	G3ZQQ	464	727	G3DEF	273	973	G3JUL	202	1205	GW0IWD	131
408	G3KAA	438	732	GW4BYA	271	986	G0SWG	201	1205	SM6CZU	131
410	G3RTE	436	735	G4FAM	269	993	G3DCC	200	1214	G3XLF	130
412	G3SWH	435	738	G3VQO	267	998	GM4SID	199	1226	G4ZME	127
420	I1BUP	431	754	G0MUR	260	1003	G4DJC	198	1233	G0SJC	126
442	GM0PKX	412	756	G3GHY	259	1010	G0WRE	196	1233	G3WRD	126
445	G4DQW	411	756	G3VOF	259	1022	G4FVK	188	1245	G8FF	124
445	GW0VMZ	411	759	G0PHN	258	1023	G3SBP	187	1261	G0OOF	123
458	G3DZS	407	761	G3TLG	257	1024	G3JYP	186	1261	G3ASG	123
461	G4CMT	406	764	M0ADG	256	1028	G4POF	184	1269	G0KEY	122
464	G4GIR	405	771	G0GKY	251	1031	G0EAA	183	1275	MM0BQI	121
467	GW3NXR	404	779	G3NKC	248	1031	G3ECS	183	1286	G0UWW	120
470	G4VXT	403	785	GW0ANA	246	1037	GI0KVQ	177	1286	G3PJT	120
481	G3LAS	400	787	G4KGT	245	1051	GM4CHX	171	1354	GW0PUP	117
491	G4NXG/M	395	790	G2FFO	244	1053	G3PSY	170	1381	G0PPK	116
495	GM3BCL	391	795	G3DPX	242	1064	G8GG	167	1381	G3VPO	116
513	G0VBD	368	795	G4RTO	242	1068	G3ZJF	166	1401	G3IZD	115
513	G3KWK	368	810	G0SBQ	236	1068	GU4WQP	166	1401	MM0ABJ	115
520	G4KBX	363	814	G3HQH	234	1071	G3JTO	165	1413	G4ZOY	114
528	AB5EU	360	821	G3NOH	232	1078	G0MTN	162	1413	G5MY	114
530	G3LUW	359	832	G8DR	228	1096	G3LIV	157	1438	G3DNF	112
551	G4OBK	344	836	G0REP	227	1110	G3LCG	152	1438	GI0VJV	112
555	5B4AFB	341	845	G0ARF	225	1116	G4YYR	150	1450	GW0HUT	111
558	G0CGL	339	859	G0PCF	220	1122	G3HQX	149	1474	G0ABY	109
558	G3GMY	339	859	G3VDL	220	1129	G3IMK	147	1474	GM0VRP	109
577	G3NDC	327	865	G4ZYP	219	1129	G4NAQ	147	1474	M0BRK	109
582	G4UZN	325	872	9V1RH	218	1132	G0DNV	146	1494	G0KRL	108
601	G4JFS	318	882	G3EKJ	216	1132	GW0SLM	146	1506	G4ASL	107
603	G3LHJ	317	882	G3OLY	216	1145	G2HDR	144	1518	G3FIC	106
606	G3MDH	316	900	GM4KHE	212	1150	GM0LVI	142	1518	G4PZQ	106
613	G0PAJ	314	906	G4SSH	211	1155	G0DEZ	141	1532	G0AEV	105
622	G3XPO	312	906	G4ZKJ	211	1155	G3CWW	141	1532	G6QQ	105
622	G4XOP	312	912	G3LSW	210	1167	G2FQR	138	1547	G0HXN	104
645	G0FYX	307	918	G0VLK	209	1176	G3KDE	136	1562	G4EHT	103
684	G4YRR	300	941	G0PSE	205	1182	G3KNU	135	1577	G3RGD	102
692	G2ATM	298	941	G0UKX	205	1190	G3IZM	133	1588	ZC4IW	101
698	G3YEC	292	941	G3GZJ	205	1201	G4TGK	132			
701	G3LPS	289	951	G2ART	204	1205	G3JQJ	131			

The full IOTA Annual Listing may be seen on the official IOTA web site: www/rsgbiota.org/

IOTA SWL Listing - 2000

Pos.	Call Sign	Score	18	JA1-20784	380	36	I2-66508	169
1	DE0MST	914	19	UA6-150-1367	323	37	ONL-4234	168
2	BRS-8841	847	20	EI-1260	319	38	UA0-124-451	166
3	DL-SWL P Sinke	802	21	BRS-94436	314	39	F-10371	163
4	I1-21171	673	22	F-10255	307	40	PS7-54418	157
5	DL-9286	660	23	DE0RFR	302	41	F-10437	154
6	I1-12387	619	24	DE7KKB	292	42	EA-1033	122
7	ONL-7681	618	25	RS-96462	288	43	DE0RFE	120
8	BRS-47426	601	26	F-10046	258	44	DG3YGT	119
9	NL-4276	557	27	F-14368	232	45	BRS-30493	118
10	DL-312WW	511	28	ONL-5923	213	46	DE1ABL	117
10	F-16332	511	29	DE1JSH	210	47	DE0KAY	116
12	DL-20064	506	30	DE0THM	207	47	DE3HLA	116
13	BRS-94761	496	30	DE1ABM	207	47	OH3-911	116
13	UA3-147-412	496	32	JH8GAU	206	50	DE9DIG	109
15	WDX3JFH	476	33	EI-982/G	197	51	HE9RFF	101
16	W0-20276	469	34	DE0OLL	187	52	PY1-13332	100
17	WDX2TAU	405	35	OM3-28013	170			

eurotek

edited and translated by **Erwin David,** G4LQI*

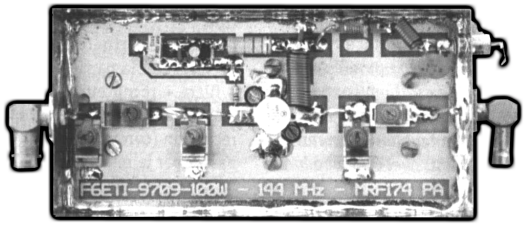
FOR A LONG TIME I have been tempted by the characteristics and the application note [1] of the Motorola MRF174 MOS transistor: 120W dissipation, 12dB gain at 144MHz, perfect linearity for SSB operation, and the simplest of biasing circuits, as shown in **Fig 1**.

Yes, I know, as much as 300W can be had from twin MOSFETs such as the SF141G, but their application is not nearly as simple and they are very expensive [2].

CONSTRUCTION

THE LAYOUT of the PCB, **Fig 2**, was derived from the Motorola test circuit. It is mounted, through a tin-plate shielded box, on a heat sink measuring 200 x 175mm, with 40mm fins. A blower is required. The edges of the PCB (earth) are soldered to the box, which fits tightly around it.

*A SIMPLE **100W 144MHz MOSFET linear amplifier** was built and described in Radio-REF 2/99 by **Philippe Martin, F6ETI**.*



COMMISSIONING

TO START, APPLY power from a 13.6V DC supply, preferably current-limited to 10A. Set RV1 for a standing drain current of 1A. Connect a 100W metered 50Ω VHF dummy load to the output connector. Apply RF input and adjust C1, C2 and C3 for the best match to the driver. C4 and C5 are then adjusted for maximum output. On 13.6V, a gain of 8dB can be expected. On 28V, a gain of 13dB was obtained and the amplifier is loafing at 100W pep SSB. No 28V in your shack? The approximate 18V available ahead of the regulator in your 13.6V supply will go a long way, provided there is approximately 10A capacity. Do not forget to insert a harmonic filter [3] between the amplifier and the antenna. As the antenna, through this filter, is unlikely to have exactly the same impedance as the dummy load, C4 and C5 can be adjusted for maximum output.

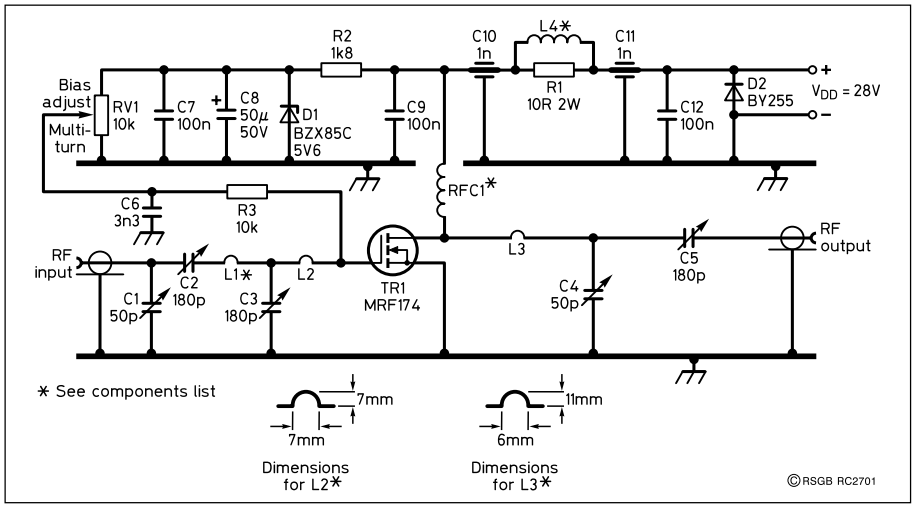


Fig 1: F6ETI's 100W 144MHz MOSFET linear amplifier.

COMPONENTS

Resistors

R1	10R 2W
R2	1k8 ½W
R3	10k ¼W
RV1	10k 10-turn

Capacitors

C1, 4	50pF mica preset
C2, 3, 5	180pF mica preset
C6	3.3nF chip
C7, 9, 12	0.1µF ceramic
C8	50µF 50V electrolytic
C10, 11	1nF feed-thru

Inductors

L1	1¼ turns, 5.5mm dia, 0.8mm silver plated wire
L2	Hairpin, 0.8mm silver plated wire
L3	Hairpin, 1mm silver plated wire
L4	10 turns, 6mm dia, 0.8mm Cu-enam, wound on top of R1
RFC1	18 turns, 0.8mm Cu-enam, close-wound, 8mm ID

Semiconductors

TR1	MRF174
D1	BZX85C 5V6
D2	BY255

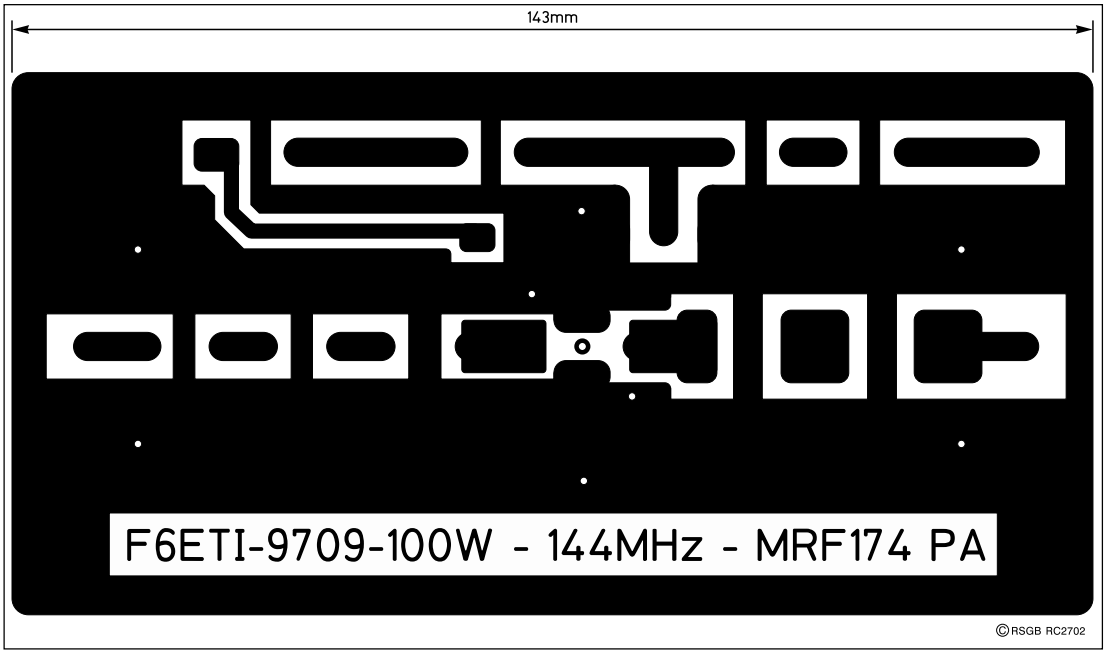


Fig 2: PCB for F6ETI's 100W 144MHz linear amplifier.

NOTES

[1] Download from http:/www.mot.com

[2] MRF-174 is cheap only by comparison: £47.45 ex VAT from Arrow, Harlow. Tel: 01279 626777.

[3] See G3SEK's *VHF/UHF DX Book*, pp12-34. ♦

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Ten-Tec 1320 14MHz Transceiver Kit

*Reviewed by Mark Palmer, G0OIW**

THE AMERICAN company of Ten-Tec is a well-established manufacturer of equipment for the amateur market, with a particular reputation for high-quality QRP transceivers. Less well-known is the company's extensive range of T-Kits, which includes receivers, HF and VHF transceivers, transverters, keyers, preamps and other accessories. Some are simple PCB-only modules, others are complete projects with cases and all hardware.

Being a keen QRP operator, my attention was drawn to the family of single-band CW transceivers available for 20, 30 or 40m. Versions for 15, 17 and 80m are promised for this year. These feature a nominal 3 watts output, superhet receiver with crystal filtering, RIT and full break-in, at the modest price of £89.95. I opted for the 20m T-Kit 1320.

EXPERIENCES WITH KITS

I HAVE LONG been partial to kits, despite traumatic experiences as a schoolboy with some of the very dodgy wares peddled in the pages of electronics magazines of the 1960s and 1970s. These promised much, but delivered little more than a handful of tag strips and poor quality components, some germanium transistors whose manufacturers had disowned them, and vague instructions that bore little resemblance to what was actually in front of you on the bench. Advertisers' claims to "become a radio expert for 39s 6d" had to be treated with considerable suspicion.

Happily, both advertising regulations and the kits themselves have improved enormously since then, and first impressions of the 1320 were very good indeed. The kit was delivered promptly, safely packed in polystyrene chippings, with all the appropriate paperwork. The entire kit, with the exception of the manual, comes packed inside the radio's metal case. This is a complete project, with all metalwork, hardware, nuts and bolts, hook-up wire and even an Allen key for securing the knobs. You will, however, need to provide solder, leads and plugs for the Morse key and PSU, and a nice shade of nail-varnish for securing the coils. All listed parts were present and correct.

OVERALL QUALITY

THE OVERALL quality seemed excellent. The transceiver is housed in a very solid black 'clamshell' style case, that should offer considerable protection against knocks and vibration. This fact, coupled with its compact size and modest power consumption, makes it particularly suitable for portable operations. The professional quality of the PCB is quite remarkable - double-sided fibreglass, pre-tinned tracks, green solder-resist and screen-printed component outlines. This is by far the best I have ever encountered in a kit, even beating Heathkit.

Equally impressive is the A5-sized manual. Besides detailed step-by-step assembly instructions and copious illustrations, it contains full component lists, detailed circuit descriptions (block diagram shown in **Fig 1**) and operating instructions, a glossary of unfamiliar terms, and even a dial calibration chart to fill in. A helpful thought is a separate sheet, duplicating part locations and circuit diagrams from the book. It is suggested that you mark off the parts on this as you install them.

The manual divides construction into eight phases, testing each as you go along. This method simplifies diagnosis of any problems, enabling them to be resolved before progressing to the next step.

ASSEMBLY & ALIGNMENT

THE FIRST SEVEN phases consist largely of assembling the single printed circuit board. This is a relatively simple matter of identifying the components and soldering them into the correct place, helped by the step-by-step instructions and the clearly printed outlines on the board itself. As an added refinement, the correct alignment of electrolytic capacitors is also indicated by the shape of the PCB pad - round for negative, square for positive (though this nice touch is not mentioned in the book).

Selecting components was reasonably straightforward, although the colour codes on the axial chokes were a little tricky to read. Many of the parts are supplied on paper bandoliers, and it helps to write the component values on these. It is also a good idea to select the required components for each step in advance, which helps avoid errors. Component density is high, with more than 200 parts crammed onto a board measuring only 3.5in x 5in, so quite a bit of care is required.

The hardest part of the procedure was setting up the VFO coverage. Any 50kHz section of the band can be selected, though you'd want to include the 14060kHz QRP frequency. A toroidal coil is wound, not too tricky, but then the fun really starts. To select the required tuning range it is necessary to fiddle with the spacing of the turns - and fiddle it is!

I found the best technique was to get the frequency approximately right, secure most of the turns with nail varnish, then adjust the others to

** 28 Westfield Road, Caversham, Reading RG4 8HH*

	Claimed	Measured
Sensitivity	0.25µV	Better than 0.3µV for 10dB S+N/N
Output Power	3W 'nominal'	3.1W into 50Ω (12V DC)
		4.1W into 50Ω (13.8V DC)
Harmonics	-	2nd: -51.3dB; 3rd: -66.7dB; 4th: -67.3dB

Ten-Tec T-Kit 1320 specifications and performance as measured on 14050kHz

All the bits and pieces, laid out on the bench.

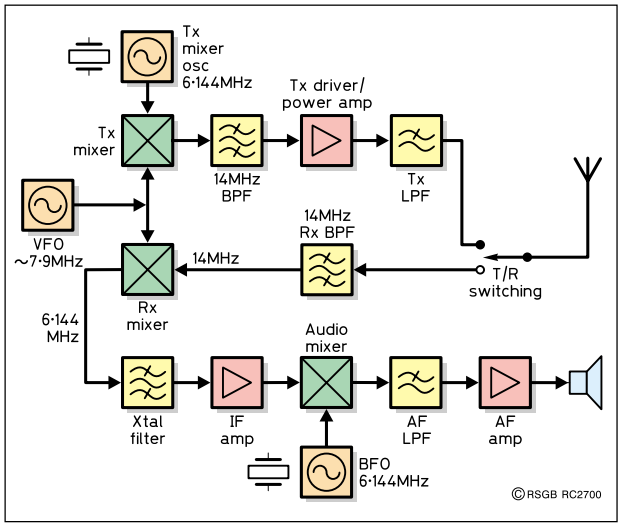


Fig 1: Block diagram of the Ten-Tec 1320.

get it spot on. Finally, secure the remaining turns with varnish and fix the toroid to the board with hot-melt glue or wax. Mechanical soundness is essential to avoid frequency drift. Altering the values of the associated capacitances is not only cheating, but will adversely affect the stability and/or the tuning range. There are four more coils to wind, but they're a doddle after this and don't require adjusting.

Apart from this, alignment was quite straightforward. You will need a power or SWR meter for the transmit stages. Ideally, a signal generator should be used for alignment of the RF and IF stages, although doing it this way seemed to give no better results than tuning 'by ear' on background noise. Slightly more tricky was setting-up the BFO and transmitter offset stages, which requires a separate receiver. Follow the instructions carefully, or you will find (as I did) that your transmit and receive frequencies are several kHz apart. No wonder nobody replied!

Phase Eight consists of final assembly and testing, which was mostly straightforward. The loudspeaker, mounted on the top half of the clamshell case, is a potential dust trap, so a piece of proper speaker cloth was added. More important, the radio has no protection against reverse polarity - an unforgivable omission, though easily cured with a big diode across the DC input socket. A similar hazard exists from the Americans' love of phono plugs - the power lead and Morse key use identical connectors, so it would be easy to put 13.8 volts across the key socket! In total, assembly took about eighteen hours.

ON THE AIR

SO, WAS IT worth all that effort? Most certainly! RF output (see **Table 1**) was a clean 4 watts, with good keying characteristics. The PA transistor is rated at 12 watts, so should be fairly tolerant of antenna mismatches.

There was, however, one significant receiver problem. The IF, 6.144MHz, was presumably chosen to use inexpensive 'off the shelf' crystals. Unfortunately, this frequency is slap-bang in the middle of the 49m broadcast band. The operators here regard anything less than 250kW as QRP! Particularly at night, a background of mush and whistles breaks directly into the IF stages (removing the antenna makes no difference). Happily, soldering the crystal cans in the IF filter together *and to earth* gave a considerable improvement, though not a total cure.

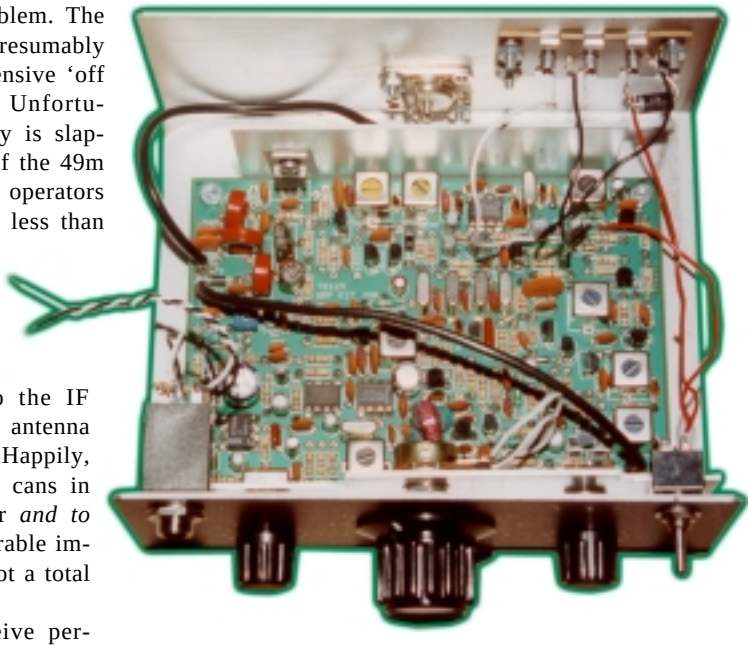
Don't expect receive performance to equal an expensive commercial set - after all, you are getting a whole transceiver for the price of a good crystal filter. However, results were very pleasing. Sensitivity was equal to any 'black box' and stability was also good. Selectivity is quoted as nominally 1kHz, but varies with BFO setting, so was not measured. Certainly, it was more than adequate, though could be improved further with a simple audio filter (eg the Howes ASL5).

The radio is both easy and pleasant to use. Sidetone is achieved by monitoring the radiated signal - you hear what's actually going out. The set functions only in full QSK mode - you hear what's on the channel in between characters. This works well, though it sounds a bit 'clunky', which you may find tedious after a while. Bandspread is good, though not linear (a function of the Varactor diode used). There is RIT for tuning ±1.5kHz, but no means of altering power output. With only a modest dipole, stations all over Europe were worked under average conditions. This is, however, only a fraction of the set's potential - given patience and a good antenna, worldwide contacts are doubtless possible.

Although a bit too complicated for the totally inexperienced, this splendid little project is everything a kit should be - good value, educational, satisfying to build and more fun than a warehouse full of black boxes.

The T-Kit 1320 was supplied by Adur Communications of Belmont Buildings, The Street, Bramber, Steyning, BN44 3WE (tel: 01903 879526). The price is £89.95 + £5.88 P&P.

Further details on the Ten-Tec Website: http://www.tentec.com ♦



A look inside the completed transceiver.

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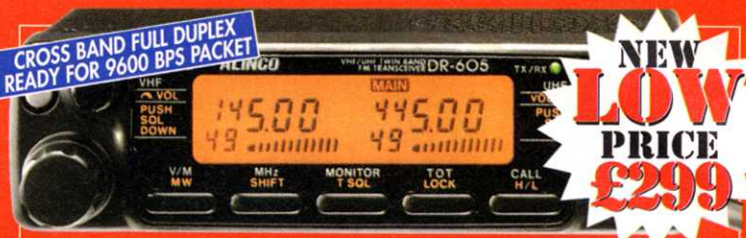

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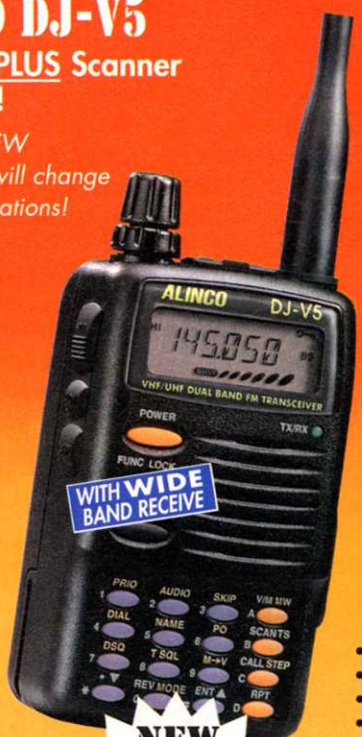

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  1.6 - 30MHz *(Min. 12 mtrs wire/whip)*
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An automatic antenna tuner that matches your transceiver to a random wire, mobile whip, vertical, inverted L or dipole antenna.

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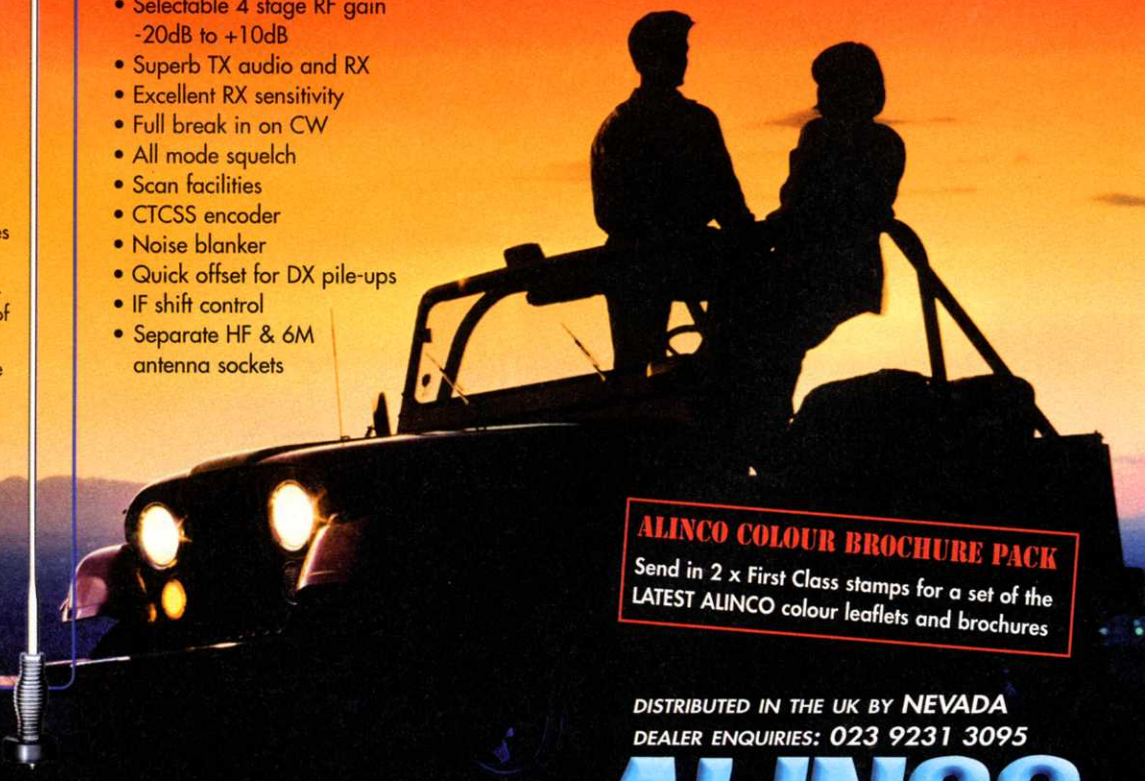

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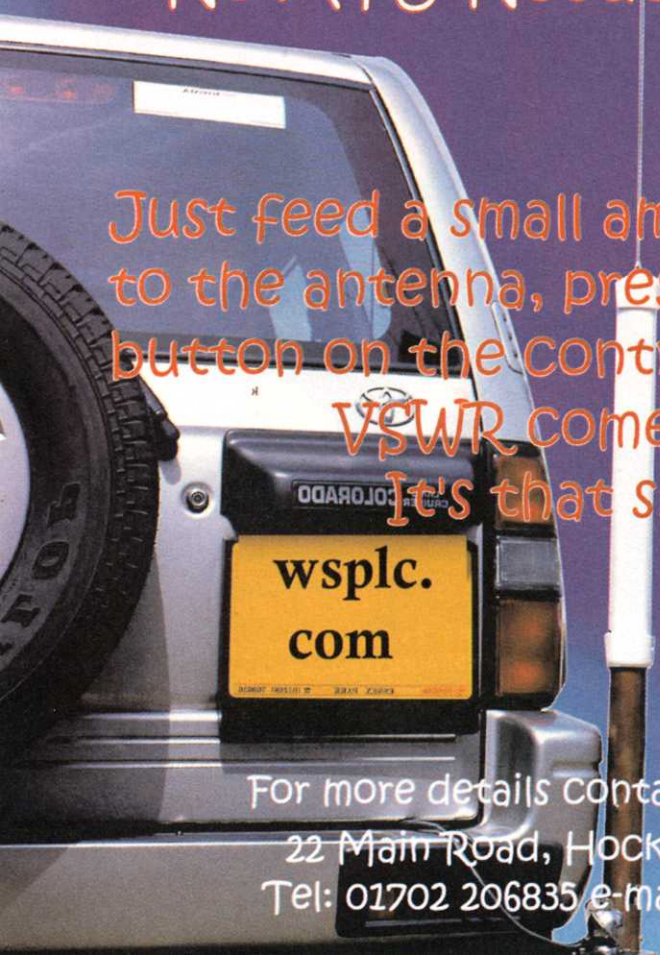

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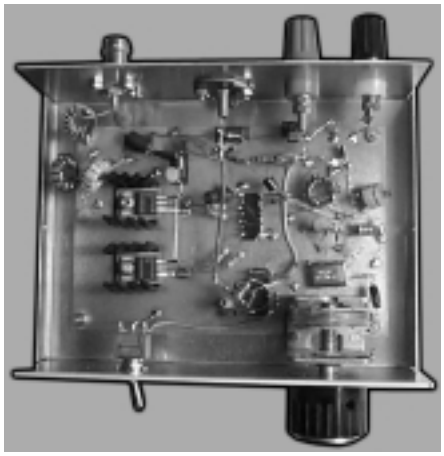
A 5-Watt 18MHz CW Transmitter

*By Ian Braithwaite, G4COL**

HAVING NO EQUIPMENT for the 18MHz (17m) band, I designed and built this transmitter for my own use. The merits of CW have been much debated in *RadCom*, but the fact remains that it provides the lowest-cost means of getting active on the HF bands. The combination of home-brew transmitter and commercial or ex-military receiver was common 30 years or more ago, and although largely superseded by the transceiver is still a perfectly practical option, especially for the newly-licensed former short wave listener.

The most noteworthy feature of this design is the attention given to the Variable-frequency Crystal Oscillator (VXO). On the higher HF bands, the VXO offers a combination of good stability, useful frequency coverage, and simplicity. The frequency range of the design shown here is 18.074MHz to 18.099MHz, and the output power is around 5W into a 50Ω load.



Internal view of the transmitter.

VXO DESIGN - THE CRYSTAL

WHEN DESIGNING a Variable Frequency Oscillator (VFO) using inductors and capacitors, you start with the tuned (or 'tank') circuit. The required frequency range has to be covered using, most commonly, a variable capacitor or variable capacitance diodes. Given the capacitance swing, the fixed capacitance follows, and then the inductance to set the frequency.

In amateur radio literature, the VXO tends to be dealt with in terms of the active circuit, the crystal itself having been fished out of the junk box or obtained at a rally. This concentration on the active circuit is unfortunate, since, as with the VFO, the pulling performance depends crucially on the parameters of the crystal itself. These can differ considerably between crystals with the same marked frequency, so without knowing something about the crystal, the results are largely a matter of luck.

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

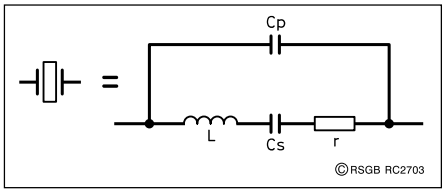


Fig 1: Crystal equivalent circuit.

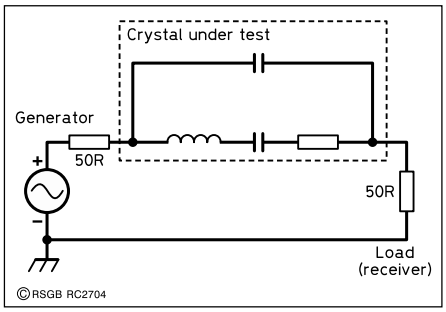


Fig 2: Test circuit for crystal measurement.

If only we could specify the crystal parameters, we could end up with a repeatable design. Well, it turns out we can, with a modest investment, if we talk to the right manufacturer. I arrived there after a bit of trawling around, with the help of the Internet. This means that we can focus again on the resonator. **Fig 1** shows the classical electrical equivalent circuit of a quartz crystal. This circuit is all we need to model the behaviour of a vibrating plate of quartz, *close to a main resonance*, such as the fundamental. This is very fortunate, since a real crystal has many vibration modes besides the fundamental and overtones.

At series resonance, the reactances of L and C_s are equal and opposite, so the series impedance of the crystal becomes r, which in this case is a few ohms. The circuit offers its highest impedance at the parallel resonance. At this point, the inductive reactance is equal and opposite to the net capacitive reactance. The net capacitance is given by C_s and C_p in series, which is slightly less than C_s (C_p is much higher than C_s as will be seen).

We can see this in action if we put the crystal in the test circuit of **Fig 2**, and measure the frequency response.

Fig 3 shows the response of one of the crystals produced for this design, obtained using a network analyser. The amount of signal appears in decibels relative to the signal level with the crystal shorted out, so the higher the trace on the graph, the more signal is coming through the crystal. Maximum signal occurs at series resonance, and minimum at parallel resonance, somewhat higher. Also seen on the trace are other wiggles, indicating other vibration modes (or resonances), as mentioned previously.

This is all very well, but where do we start on our quest for a VXO crystal? That proves to be quite straightforward. The resonant frequency is altered by adding external capacitance or inductance. The equivalent inductance of a crystal is very much larger than we would find in any coil we might wind for this frequency, and the capacitance Cs correspondingly very small. This means that practical values of inductance and capacitance have only a very small influence on the frequency of oscillation. It also means that the crystal to go for is the one with the lowest inductance.

Remarkably, by controlling such things as quartz plate dimensions, angle of cut, electrode plating area and thickness, the crystal manufacturer can produce a crystal with a given series and parallel resonance frequency, temperature coefficient and equivalent inductance. I requested a low

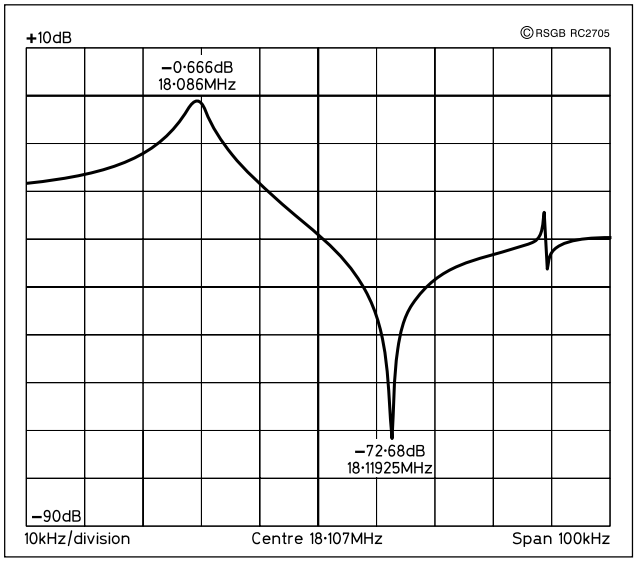


Fig 3: Frequency response of a crystal used in the transmitter.

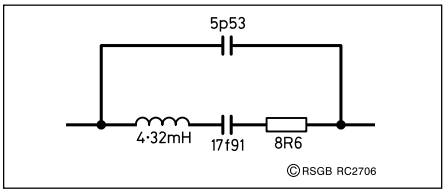


Fig 4: Equivalent circuit of the specially-manufactured crystal.

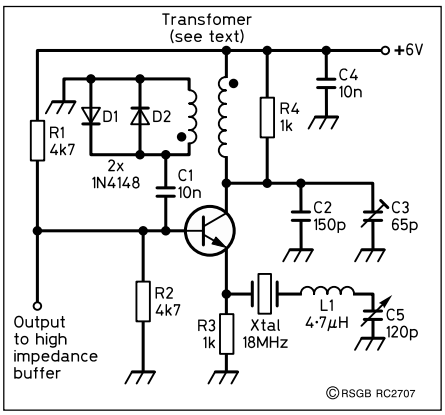


Fig 5: VXO circuit.

inductance crystal and with the manufacturer's help, converged on a design. I asked for too high a resonant frequency the first time round, but the second batch was successful. The crystal parameters were given by the manufacturer. I was able to check them, and a typical sample from the batch had the equivalent circuit of **Fig 4**. Note that the value of the series capacitance is in femtofarads (1 picofarad = 1000 femtofarad!). The values are rounded, so don't give the exactly the right frequencies.

It isn't too difficult to calculate the effect of external components, but I took the easy way out and played with component values using a circuit analysis package. This also let me see what would happen with the crystal in an oscillator circuit. I arrived at a series inductance and variable capacitor to tune the crystal below and above series resonance.

VXO DESIGN - THE OSCILLATOR

THE VXO CIRCUIT is shown in **Fig 5**. Positive feedback is by means of transformer coupling from collector to base of the bipolar transistor. The crystal plus its pulling components are placed in the emitter circuit. Impedance in series with the emitter produces negative feedback, so that there is only enough gain for oscillation at the series resonance frequency, where the crystal appears as a low resistance. The design allows the variable capacitor shaft to be connected directly to the chassis, so tuning is not susceptible to hand capacitance.

The collector circuit is tuned, which is unusual in a fundamental crystal oscillator. I started out with untuned designs, but these tended to oscillate at some wildly different frequency with the variable capacitor at minimum capacitance. The tuned circuit is damped with a resistor so that while there is enough gain for starting, the tuned circuit does not have too high a Q and so influence the oscillation frequency too much, which would degrade stability.

The diodes across the transformer base winding limit the oscillation amplitude, so each unit built has much the same output, around 1V peak-to-peak at room temperature.

The VXO tuning law is non-linear, in terms of frequency shift per degree of capacitor shaft rotation, the shift being most rapid at the low capacitance, high frequency end of the tuning range. In operation, this makes surprisingly little difference.

The oscillator stability is more than adequate for CW operation and sufficiently repeatable that the oscillator can be turned off while listening to the receiver, so as to avoid loud heterodyne whistles.

THE TRANSMITTER

THE COMPLETE transmitter circuit is shown in **Fig 6**. The VXO and its buffer, a 74HC series TTL inverter, are powered from a regulated supply of around 6V. This can be obtained from a 78L06 or (as shown), or a 5V regulator and a pair of diodes. A 5-volt rail will be found to produce less output power, due to the reduced drive to the power amplifier.

The VXO emitter current is provided by a simple control circuit based around IC3. R13 and R14 set the reference voltage for the two comparators IC3a and IC3b. These comparators have 'open-collector' outputs, which means that when either output is 'low', the output transistors are supplied internally with base current, so that their collectors can pass current. If either transistor is conducting, the oscillator has emitter current and turns on.

With S1 in the 'Tune' position, the oscillator is turned on so that the transmitter can be tuned ('netted') to the same frequency as the received signal. With S1 in the 'Tx only' position, the oscillator is turned on when the Morse key is depressed, after a delay of only a few milliseconds, set by R17 and C17 (C17 is discharged through R17). When the key is up, C17 charges through R15, the oscillator remains on for a time determined by R15 and C17. The values shown give a delay of around 0.5 seconds. To increase this, raise the value of

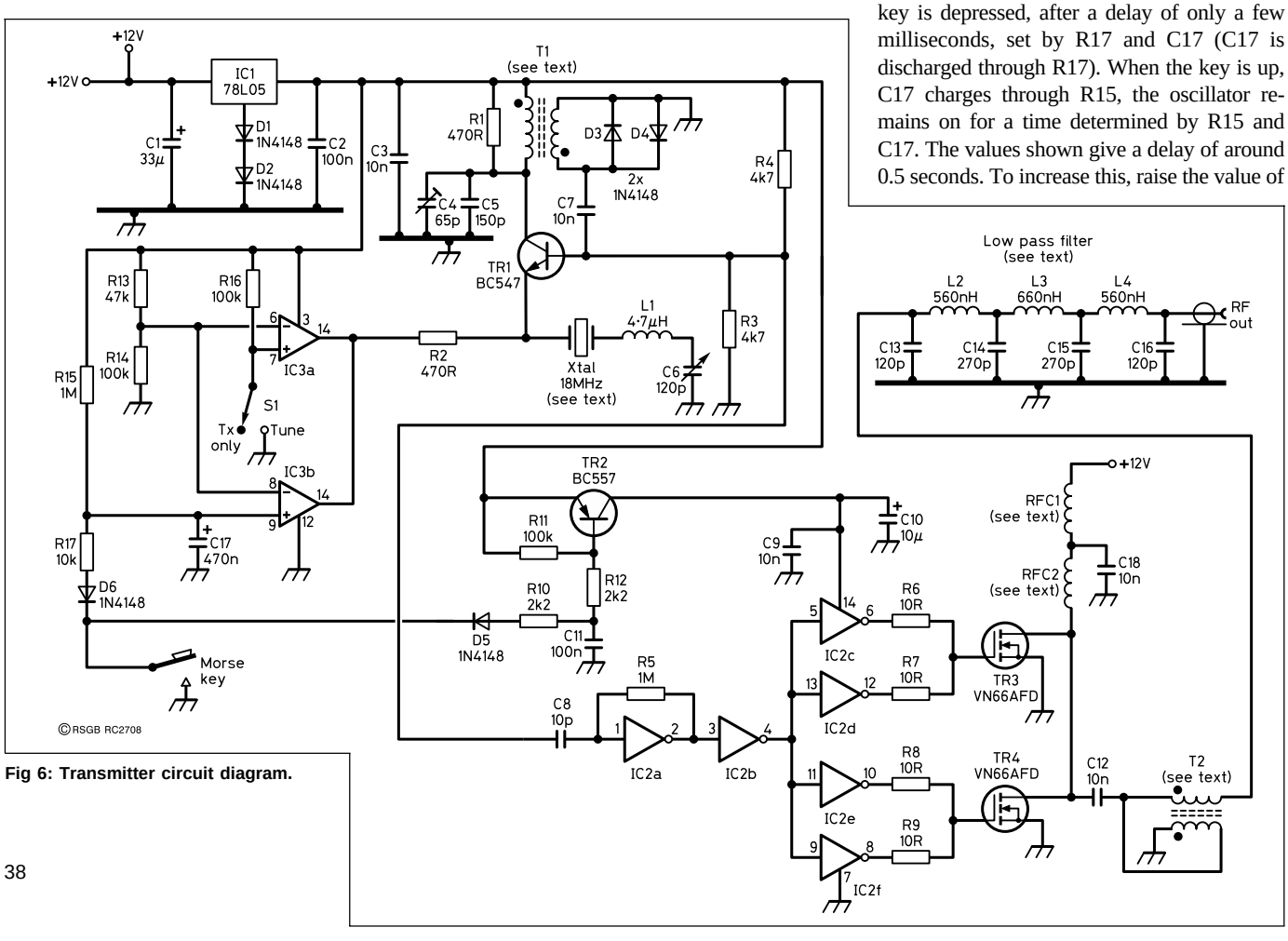
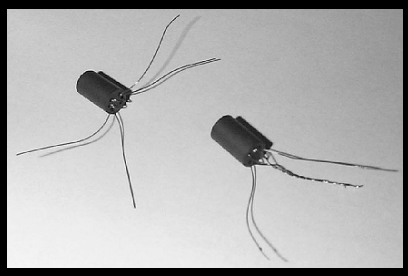
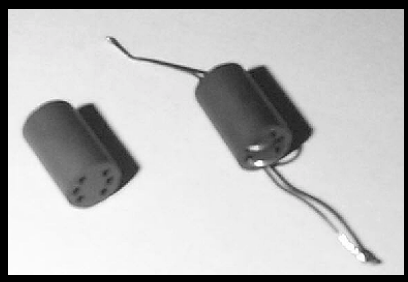


Fig 6: Transmitter circuit diagram.



How T2 is constructed.



How the RF chokes are constructed.

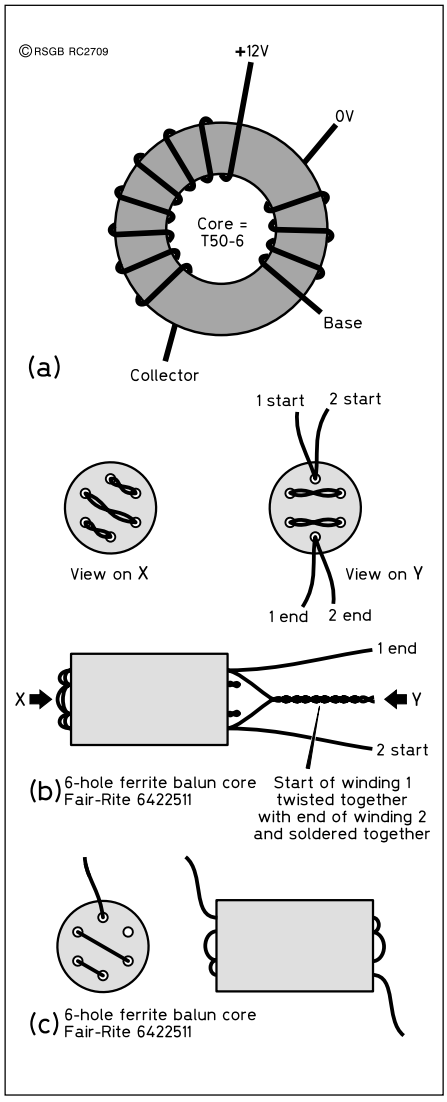


Fig 7: Winding details for (a) T1, (b) T2, (c) RF chokes.

Harmonic	dB relative to fundamental
2	-63
3	-59
4	-54
5	-57

Table 1: Harmonic content of the transmitter.

R15. If the key is depressed before the delay time has elapsed, the process is re-started.

Keying also turns on TR2, which supplies power to the buffer IC2. Note the use of a low value capacitor at C8. This is to isolate the buffer as far as possible. There is a very small but acceptable amount of chirp. The buffer outputs are wired in pairs, to produce enough drive for the two parallel VMOS FETs. The venerable VN66 has a considerably lower gate-source capacitance than many more recent devices, and so requires less drive power. Power at 12V is fed to the FETs via two RF chokes. T2 provides an impedance match to the 7-pole low pass filter. Note that in the components list, polystyrene capacitors are specified. These are low cost and have proved satisfactory in use with an antenna tuner at low VSWR. If you are prepared to spend a bit more, silver mica capacitors cope better with high RF voltages.

CONSTRUCTION & TESTING

AS SHOWN IN the photos, there is no PCB, 'ugly' or 'dead bug' construction having being used. A piece of copper-clad fibreglass board is secured to the base of the chassis with four screws, to form a ground plane. As a nicety, I cleaned the copper and tin plated it using plating crystals from Farnell [1]. This keeps the surface looking good, but is not absolutely necessary.

The main points to note are:

- IC ground pins are bent down and soldered directly to the ground plane.
- All decoupling capacitor leads are kept as short as possible.
- The crystal is secured to the board with a double-sided self-adhesive foam pad available from stationers. The photo below shows a closer view of the VXO area.
- The output FETs are bolted to heat sinks and isolated from the chassis using insulating bushes and a thermally-conductive, electrically-insulating pad.

Enclosures (mine is a type WB2, from Maplin [2]) and front panels tend to be a matter of personal choice. For my front panel I produced a paper layout that provided the markings and also acted as a drilling template. The paper was fixed to the front panel using Spray Mount® adhesive. After drilling, this was covered with a clear self-adhesive plastic film, and holes were cut in this with a scalpel [not unlike the suggestion in 'Handy Hints', *RadCom*, July 2000, p47 – *Ed*].

Winding details of the transformers and chokes are given in **Fig 7** and are illustrated by the photos above.

The only adjustment is to set trimmer capacitor C4 to give the greatest output from the VXO. This can be measured using a diode detector and a multimeter, or on an oscilloscope with a high impedance probe (if one is available). Set the switch to the 'Tune' position while doing this, so that the VXO is running.

Check the current consumption. From a 13.8V supply, it should be in the region of 5mA with the key up and 720mA with the switch in the Transmit position and the key down.

Connect a 50Ω dummy load to the output and key the transmitter, which should produce several watts. My low power dummy load consists of a set of parallel resistors, in series with a 2.4V 0.5A torch bulb to give a total of 50Ω, and this glows reasonably brightly. With the dummy load still connected, listen to the transmitter on a receiver and check the frequency range, stability and keying quality.

In this design no provision has been made for antenna change-over switching or receiver muting, so you will need to make your own arrangements. I use a homebrew RF-operated change-over switch which is a separate stand-alone unit.

PERFORMANCE

TUNING RANGE was measured with nine crystals and found to vary from 23.9 to 26.1kHz. The tuning range you achieve will depend, in addition to the crystal, on the inductor and variable capacitor in the oscillator.

On a spectrum analyser, no spurious signals were visible The harmonic content was also measured and is shown in **Table 1**. Peter Chadwick, G3RZP, advises that this meets the current ITU (International Telecommunications Union) standards for amateur radio equipment comfortably.

There is a barely perceptible chirp and a slight frequency shift in switching from Tune to Transmit, but this does not present an operating problem as it is common for two stations in communication to have a slight frequency offset.

On the air, this transmitter sounds much like any other 5 watt transmitter, as indeed it should – outstanding signals are made by outstanding antennas, not transmitters!

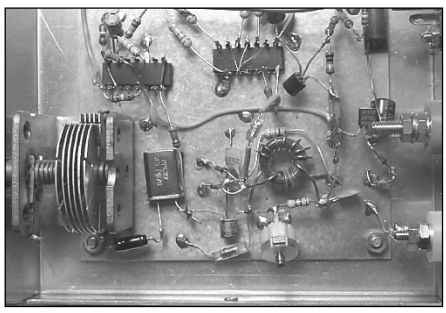
ACKNOWLEDGEMENTS

I WOULD LIKE to thank Gary Edwards, M1DHB, and Peter Chadwick, G3RZP, for their helpful suggestions during initial proof reading and subsequent review.

REFERENCES

[1] Farnell, Canal Road, Leeds LS12 2TU. Tel: 0870 120 0296. Fax: 0870 120 0297. Web site: www.farnell.co.uk

[2] Maplin Electronics, Valley Road, Wombwell, Barnsley, S Yorks S73 0BS. Tel: 0870 264 6000. Web site: www.maplin.co.uk



Close-up of the VXO area.

COMPONENTS

Resistors (0.25 watt, 5% or better)

R1	470R
R2	470R
R3	4k7
R4	4k7
R5	1M
R6	10R
R7	10R
R8	10R
R9	10R
R10	2k2
R11	100k
R12	2k2
R13	47k
R14	100k
R15	1M
R16	100k
R17	10k

Capacitors

C1	33µF 16V electrolytic
C2	100n ceramic
C3	10nF ceramic
C4	65pF trimmer
C5	150pF polystyrene
C6	120pF variable (or nearest available value)
C7	10nF ceramic
C8	10pF polystyrene or ceramic
C9	10nF ceramic
C10	10µF 16V electrolytic
C11	100nF ceramic
C12	10nF ceramic
C13	120pF polystyrene
C14	270pF polystyrene
C15	270pF polystyrene
C16	120pF polystyrene
C17	470nF 16V electrolytic
C18	10nF ceramic

Inductors (All ferrite and dust iron cores are obtainable from JAB [3])

L1	4.7µH axial
L2	560nH (10 turns on T50-6 toroid)
L3	660nH (12 turns on T50-6 toroid)
L4	560nH (10 turns on T50-6 toroid)
T1	see Fig 7a
T2	see Fig 7b and photo
RFC1	see Fig 7c and photo
RFC2	see Fig 7c and photo

Semiconductors

D1-D6	1N4148
TR1	BC547 or BC107
TR2	BC557
TR3	VN66AFD
TR4	VN66AFD
IC1	78L05
IC2	74HC04
IC3	LM339 or LP339

Miscellaneous

S1	Toggle switch
X1	18MHz crystal [4]

Copper clad board
Heat sinks (TO220)
Heat sink pads (TO220)
Knob
Coaxial socket (eg BNC)
Key socket (eg phono)
Power terminals (4mm)
Screws, nuts & washers
Wire
Double-sided self-adhesive pads (obtained from stationers)

[3] JAB Electronic Components, PO Box 5774, Birmingham B44 8PJ. Tel: 0121 682 7045. Fax: 0121 681 1329. E-mail: peter@jab.demon.co.uk

[4] The 18.086MHz series resonant crystal, part number PPC 312, is obtainable from SES Piezo Ltd, Unit A13, The Railway Triangle, Walton Road, Portsmouth, Hampshire PO6 1TN. Tel: 01705 327443. Fax: 01705 327446. E-mail: ses.piezo@dial.pipex.com There is a minimum order charge of £50, but I also have some of these crystals. Contact me for details. ♦

Newcomers' News

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

I HAVE JUST returned from the first 50MHz Backpacker Contest and was very pleased to work 2W1HUF, the only Novice operator heard all day. I was assisted by Jack, 2E0AUL, who has just had word to say that he has passed the May RAE and should have his M5 call by now. Our best DX was ID9/I2ADN at almost 2000km with just 2.5 watts and the 3-element yagi from the November 1998 *RadCom*. Newcomers to contests read on!

REVAMPED NOVICE CONTEST

THE NUNSFIELD House Amateur Radio Group, based in Derby, has re-launched the annual Novice contest with some major prizes to be won. The contest now has two sections, one for HF and one for VHF, and the winner of each section will receive a brand new Standard C108 hand-held. Other prizes include gift vouchers and a Hora C408 handheld.

The contest runs from 1300 UTC on 26 August to 1259 UTC the next day and each entrant can operate for any six *consecutive* hours between those times. Full details can be obtained from the Novice Contest Manager, Neil Davison, M1AFB, 1 Retford Close, Breadsall Estate, Derby DE21 4DX.

The last Novice contest I read about ended up with just a handful of entries so if you are new to contesting don't be shy, here's your chance to have a go and maybe win yourself a new rig!

KENYAN NOVICES

AS I REPORTED in the June column, the Radio Society of Kenya has had a superb response to its latest NRAE class, with 33 of the boys from the Starehe School in Nairobi taking the exam. The excellent news is that they all passed, four of them scoring 100%. They are now awaiting their licences. The process is a little more complex than over here in the UK, and rigorous security checks have to be negotiated before permission is given for a licence to be issued, so if you are waiting for POCM to issue your new call just be thankful it only takes weeks, not months!

Ted Alleyne, 5N4NU, has sent me pictures of the school and some of the boys are shown below. The school is apparently funded entirely by charity and started its life as nothing more than a few tin huts. However, the school is now recognised as one of the top schools in the country and I believe it is the first to have its own radio club. There is a promise of some money from STELAR. Ted says they have some older equipment to get the club on the air, but they will need to raise more funds for a Club Licence and any new kit. Any ideas out there?

RAE RESULTS

I HAVE HAD WORD from David Pratt, who compiles the examiners' reports, that the May RAE analysis is now available. It shows that around 63% of those who sat the exam passed. The RAE report is available on the Internet at www.kippax.demon.co.uk/c-and-g and copies can be obtained by sending an SASE to RSGB HQ marked 'May 2000 RAE Report'.

Well done to those who were successful and commiseration to those who dipped out. There is always the December exam.

Michael Clarke was one of the lucky ones and has been allocated the call MI1MTC, but not without a bit of a panic. On arriving at the exam centre, Michael was shocked to be told that he needed a ballpoint pen to complete the answer sheet, not the HB pencils he had with him. City and Guilds changed their rules a while ago and the RSGB *RAE Manual* has not yet caught up. So if any of you are preparing for the September NRAE or the December RAE take note - **ballpoints *not* HB pencils**!

Boys at the Starehe School in Nairobi (see 'Kenyan Novices').

LAYLA'S SUCCESS

THE LATEST newsletter from the Bromsgrove and District Amateur Radio Club includes details of a very successful young lady, Layla Noel, 2E1FPM. Layla was just 9 years old when she passed the Novice Radio Amateurs' Exam, following training in Telford. Layla's father Jon, M1DRW, says that she had been keen to attend a course for a long time and when she found out there was no age limit there was no stopping her!

She is now ambitious to pass the RAE and the Morse test to gain her full class A callsign.

The Bromsgrove and District Amateur Radio Club meets on Friday evenings and newcomers are always welcome. Further details can be obtained from Roger Nolan, G3KWK, 6 Plymouth Close, Redditch, Worcs B97 4NP.

Layla Noel, 2E1FPM (see 'Layla's Success').

MILLENNIUM AWARD

DXCC IS AWARDED to stations who have worked 100 entities from the 'approved' DXCC list. The award scheme is run by the American Radio Relay League, ARRL, and normally requires QSL cards as proof of contacts.

In celebration of the new millennium, ARRL has made a special DXCC available to any station who works 100 countries in the year 2000. To speed things along, no QSL cards are required, but you must submit a certified log. So start counting your countries and see if you can make it 100 before the end of the year. Who will be the first UK Novice to receive the award?

Further details of the DXCC scheme and the Millennium Award can be obtained from ARRL at www.arrl.net/awards/dxcc or by post from ARRL, 225 Main Street, Newington, CT 06111, USA. ♦

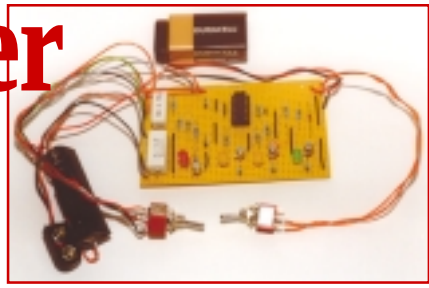
Spread The Word!

Send your news and colour photos to: Steve Hartley, G0FUW, QTHR.

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

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

Dry Battery Tester



By David Clark *

THE OUTPUT voltage of a dry battery with no load, as measured by a digital voltmeter for example, will give an indication of the state of the battery. However, that is only part of the story - even a spent battery can show quite a high voltage when out of circuit, but as soon as an attempt is made to draw current the voltage will fall dramatically.

You can check the current capability of a dry battery by connecting it directly across an ammeter, but as this is effectively short-circuiting it, so is not to be recommended. It not only wastes the energy of a good battery, but can also cause overheating and other permanent damage if the short-circuit lasts for more than a second or two. A better method is to connect the battery to a load similar to the one it would experience in normal use and measure the current the battery is capable of providing. The device described here uses this method and will test the current capability of the two most commonly used dry cells, the 1.5V and 9V types, and provide a visual indication of the state of the battery via a series of LEDs.

COMPONENTS

Resistors (all metal film, 0.6W, 1%, unless specified otherwise)

R1	1R, 5W (see text)
R2	4R7 5W (see text)
R3, R5	3k9
R4, R6, R7	1k
R8	8k2
R9	4k7
R10	3k
R11-R14	20k
R15-R18	470R

Semiconductors

IC1	LM 324
TR1-TR4	BC109C
D1	BZY 5V1 0.5W Zener
D2	TLG114A LED
D3, D4	TLY114A LED
D5	TLR114A LED

Miscellaneous

S1	SPST switch
S2	DPDT switch
Stripboard	
PP3 battery & clip	
Battery holders for test batteries, if required (see text)	
Case to suit	

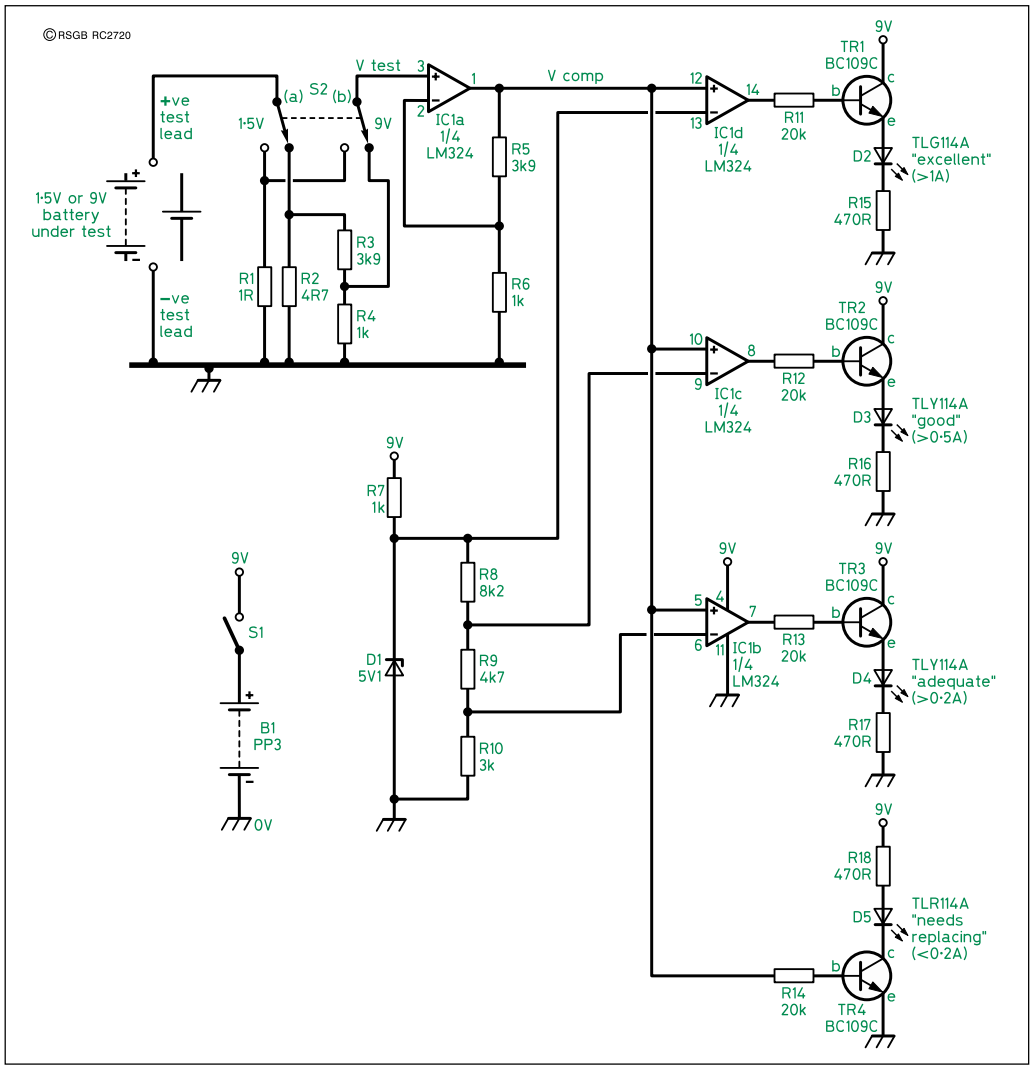


Fig 1: The unit works by checking the voltage that a battery is able to deliver when a substantial load is placed on it.

HOW IT WORKS

FOR THE TEST, the battery is connected to a load resistor capable of withstanding the current the battery can provide without 'burning out'. The voltage dropped across the resistor, which is proportional to the current (by Ohm's Law), is compared to a series of reference voltages chosen to represent the changeover points between the current ranges of interest. Where the generated voltage exceeds the particular reference voltage, one or more of a series of LEDs are caused to light to give an indication of how much current the battery is supplying and hence whether it is in an "excellent", "good", "adequate" or "needs replacing" state.

THE LOAD

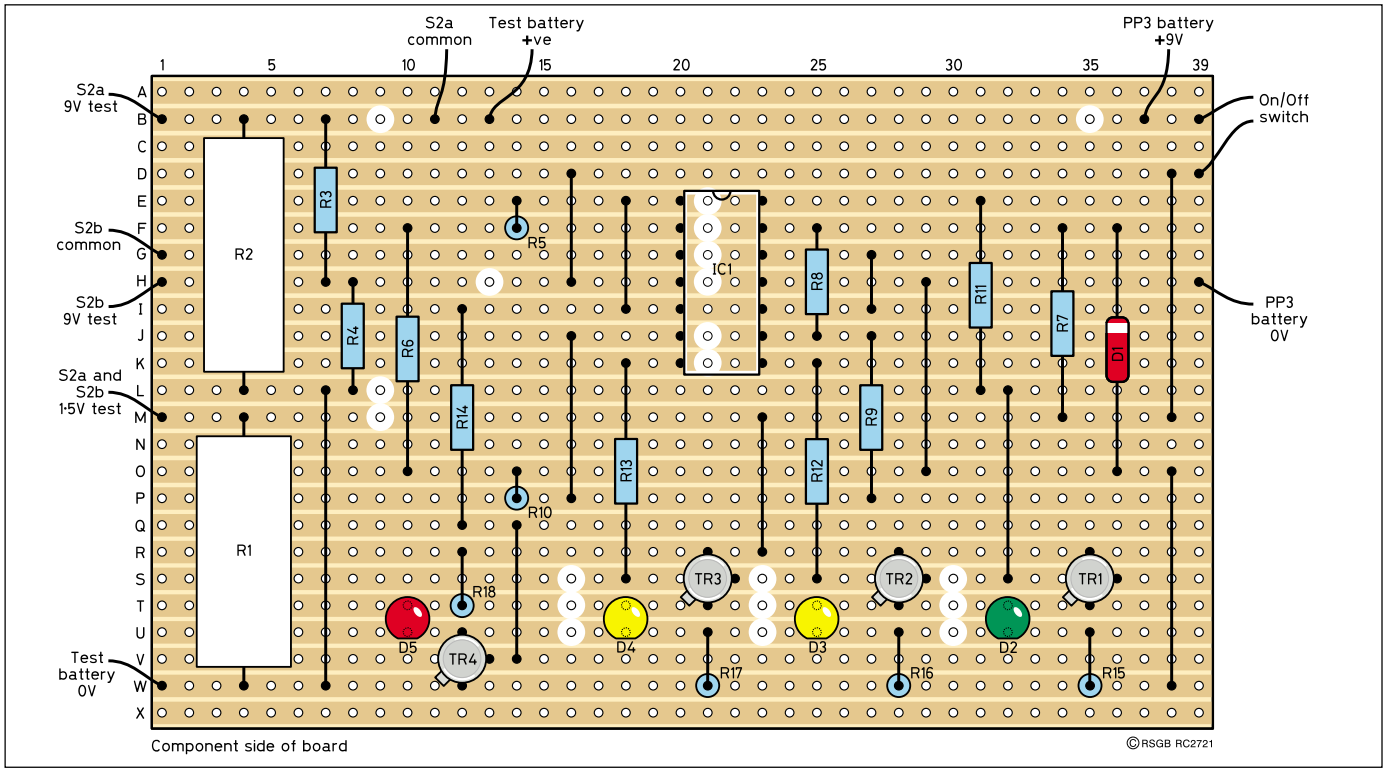
AA AND PP3 Duracell batteries will provide up to 2A for intermittent use. A suitable test load that draws sufficient current to test the battery's state without wasting too much of its power will be one that allows around 1A to flow.

THE CIRCUIT

THIS IS SHOWN in **Fig 1**. R1 and R2 are the load resistors for 1.5V and 9V batteries respectively, and switch S2(a) selects for whichever test is required. The same value of current pass-

* 58 Murray Road, Sheffield, S.Yorks S11 7GG.

Fig 2: Stripboard layout of the dry battery tester.



ing through a 1Ω and a 4.7Ω resistor will generate a different potential difference (PD) across each resistor of course, and so for the indicator part of the circuit to be common to both tests the PD across the 4.7Ω resistor is split by a potential divider consisting of R3 and R4. Using this method, the value of Vtest is nominally 1V/amp of current supplied by the battery under test for both types of battery. S2(b) selects between the non-divided and divided source voltage as appropriate.

Before passing to the comparator stage, Vtest is amplified by IC1a, connected as a non-inverting amplifier with a nominal gain of 5. This means that the voltage applied to the comparators (Vcomp) will range from 0V to around 6V, and give more predictable switching of the comparators by avoiding using voltages around or below the turn-on voltages of the IC's internal P-N junctions (about 0.7V).

The reference voltages against which Vcomp is compared are generated by a voltage divider network consisting of R8, R9 and R10 across a 5.1 volt Zener diode D1. The use of a Zener ensures that the reference voltages remain stable, even if the power supply battery voltage changes with use. R7 limits the current through D1 to its working value. Reference voltages of 1V, 2.5V and 5.1V are used to give changeover points at nominally 0.2A, 0.5A and 1A.

Indication of current values of less than 0.2A (but greater than approximately 0.14A) are given by the LED driven by TR4. This part of the circuit takes further advantage of the turn-on voltage of a P-N junction in that TR4 will not switch on until Vcomp is above around 0.7V. Hence there will be no false indication of a current of less than 0.2A when no battery is being tested, even if Vcomp is not exactly zero due to any small offset or bias currents associated with the Op-Amps.

IC1b, IC1c and IC1d are Op-Amps used to act as comparators by not employing any feedback. Due to the high gain of Op-Amps used in this way, their output will be around 0V when the non-inverting (+) input is less than the reference voltage on the inverting (-) input. In this state the transistor connected to its output (one of TR1 to TR3) will be 'off' and the associated LED (one of D2 to D4) will not light. As soon as Vcomp rises above the relevant reference voltage however, the Op-Amp output will immediately go to around 9V, switching 'on' the appropriate transistor and lighting the associated LED. R11 to R18 limit the current to the working values of the transistors and LEDs.

CONSTRUCTION

A SUGGESTED stripboard layout is shown in **Fig 2**. Construction is straightforward, the only particular point to mention being the correct orientation of the IC, transistors, Zener and LEDs. The markings that indicate their correct orientation are in **Fig 3**.

The components are all general purpose low power types, apart from the load resistors which ideally need to dissipate 5W (although 3W types should suffice, as the current to be carried only passes for short periods).

It is useful to use different colours for the positive and negative test leads, as the correct test battery polarity must be observed for the LEDs to light correctly. Alternatively, solder battery cell holders and clips permanently to the ends of the test leads (if this is done only one test battery should be connected to any holder or clip at a time, and it should be removed immediately after testing).

BATTERY TESTING

WITH S2, select the 1.5V or 9V battery test as appropriate, switch on, connect the battery to the test leads and note which LEDs light. ♦

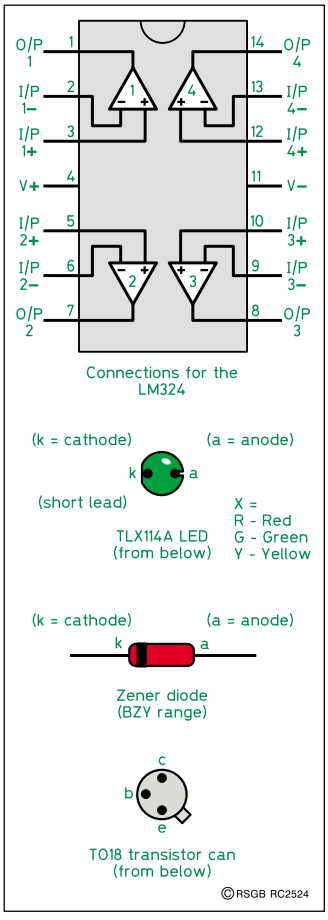


Fig 3: Orientation of the semiconductors.

Down To Earth

The Voices

Part three, by Gordon L Adams, G3LEQ *

THE 1950s represented a decade of ideological turmoil and political confrontation all over the World, and radio 'Voices' were being used to fire the opening shots in many of the hot spots. In October 1954 the Americans revealed that 85% of all Voice of America transmissions were directed behind the Iron Curtain. Since the end of the second World War, the BBC had been the leading international broadcaster in terms of transmission hours, but by 1955 its position was overtaken by the Soviet Union. British interests were being challenged too. On 4 March 1956 Jordan's 20-year old King Hussein (radio amateur callsign JY1) dismissed Lieutenant General Glubb 'Pasha' from his position as commander of the Arab Legion (Jordanian Army). His action was almost certainly precipitated by a torrent of abuse and misrepresentation put out by the Voice of the Arabs in Cairo. Five days later the British authorities deported the Greek Archbishop Makarios from the island of Cyprus. The British also started jamming the Voice of Greece, which was directing inflammatory broadcasts to Cyprus. On 26 July Egypt's President Nasser nationalised the Suez Canal Company. The end of October saw a major uprising in Hungary against Soviet control, whilst British, French and Israeli forces moved in on the Suez Canal.

THE CAVALRY VERSUS THE BEEB

BACK IN THE UK the greatest conflict ever between a British government and the BBC arose on 25 July 1956. The Foreign Secretary suggested that the Corporation should either be used as "an instrument of government policy" or that the government should make use of a different organisation and reduce the BBC's £5-million grant-in-aid for its overseas services. Although this cut-back did not take place, the Foreign Office organised a clandestine solution. Since 1951 there had been an intelligence service involvement with a supposed Arabic commercial radio station on the island of Cyprus called Sharq-al-Adna. This title translates as the Wise Old Man of the Ancient Near East, but it is also the name of a strip of land alongside the Suez Canal. In the Lebanon the station was known colloquially as the 'Cavalry of Saint George', so the wise old man had been rumbled!

King Hussein of Jordan, JY1

On 30 October the British government formally sequestered the station and set it up in opposition to the BBC. Unfortunately, the entire Arabic-speaking staff resigned, as they were not prepared to consort with anti-Nasser propagandists. The British director of the station wisely decided to return to England and become a clergyman. The result was that the Foreign Office had to appoint a whole new operations team within days. This new Voice of Britain was soon putting out some ten hours of Arabic broadcasting every day, which was nearly twice as long as the BBC's output, and slanted in a very different manner. The irony was that the same transmission facilities were being used, but whilst the Foreign Office employed the medium wave outlet, the BBC had to be content with the more variable short wave propagation to cover the Eastern end of the Mediterranean. It was about this time that rumours started to circulate about an MI6 presence in the BBC Overseas Service HQ at Bush House.

NIKITA'S REVENGE

IN THE JUNE edition of *RadCom*, I described the setting-up of the Voice of America high power long wave transmitter in Munich on 173kHz (the Russian assignment of this frequency was changed in 1989 to 171kHz as a result of the Geneva Plan drawn up 11 years earlier).

During the late 1950s and early 1960s the power of this Megawatt transmitter was turned up and down by the Americans, according to the level of Russian jamming of Western broadcasts. The Russians waxed and waned their jamming efforts in concert with their ever-changing political relations with the West. For instance, there was a relaxation in the level of jamming in September 1959, during Russian First Secretary Nikita Khrushchev's visit to the USA. However, a few months later on 1 May 1960, the Russians shot down an unmarked US U-2 spy plane over Sverdlovsk, which was on a photographic reconnaissance mission. Just before this incident, in October 1959, a US Marine Corps radar operator, who had been based at a U-2 airbase in Atsugi, Japan, had defected to the USSR, where he lived for two-and-a-half years. His name was Lee Harvey Oswald, and four years later he was to achieve notoriety as the alleged assassin of President Kennedy.

The successful shooting down of the spy plane resulted in a dramatic increase in the Russian jamming effort. The co-ordination and control of the jamming network, which eventually involved some 3000 transmitters with a total power of 600 Megawatts, was complex. It was ultimately the responsibility of the Russian State Security Committee or *Komitet Gosudarstvennoi Bezopasnosti (KGB).*

BABUSHKA BABUSHKA

A SECRET department of the Russian Ministry of Communications, called the Krestyaninova Section, controlled the jamming operations and employed some 5000 people. The name of the section came from the lady in charge, Natalya Krestyaninova (*not* Katya Bushka), who headed the department for more than 25 years. Because it was difficult to find enough radio engineers to run the jamming stations, old people were also employed to help

A rocky cove near Playa de Pals.

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

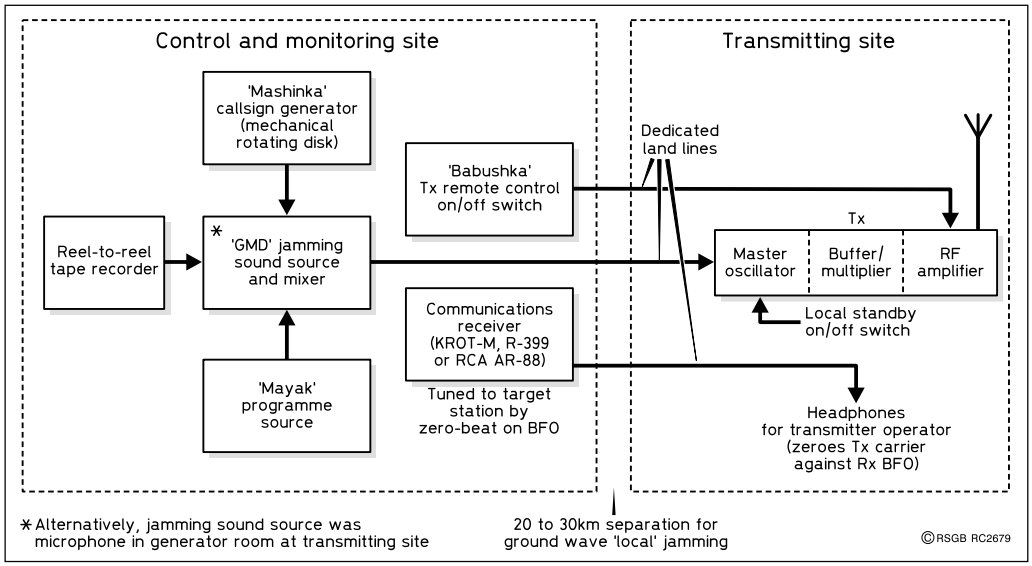


Fig 3: Layout of a Russian jamming operation.

with routine operations. It was not unknown for a Babushka (Russian for 'Grandma') to be put in charge of the switching on and off of the transmitters at the control centre, whilst filling in the lonely hours knitting.

Each transmitter site had an electrical power budget, the usage of which was monitored and logged. In this way it was thought that the jamming efficiency of the operating crew could be measured. Hence if their 'quarry' did not come on the air, or closed down earlier than expected, the jamming transmitter would be left on 'send' for the scheduled number of hours, and 'parked' on any convenient frequency – sometimes in an amateur band. Short wave listeners frequently reported hearing transmissions of distant voices sounding like people moving about in a workshop. These were in fact the voices of Russian engineers working on diesel generators which had been switched off whilst the transmitters were on mains supply. The microphones, which relayed the buzz-saw noise of the generators, had been left activated. **Fig 3** shows the monitoring and control system employed.

JAMMING TECHNIQUES

SEVERAL JAMMING techniques were employed, the simplest being to offset the jamming transmitter's carrier frequency from that of the target by about 800Hz to 1kHz. This would produce a heterodyne tone of the same pitch, which lies around the peak sensitivity of the human ear, thus causing the maximum discomfort to the listener. Besides the 'buzz saw' modulation, a more sophisticated method was to relay white noise. It is interesting to note that some of the Russian jammer transmitters were manufactured under the names 'Sneg', and 'Purga' or 'Vurga', which mean 'Snow' and 'Blizzard' respectively. The problem with white noise is that it tends to interfere with adjacent channel 'innocent' broadcasters as well.

In later years, the Russians used their domestic 'Radiostantsiya Mayak' (meaning 'Radio Station Lighthouse') as a jamming source. The 'Mayak' programme, or even continuous recorded music, was used to modulate HF NBFM transmitters with about 5kHz peak deviation. The technical benefit of FM is that the transmitter may deliver full output power continuously under modulation, whilst causing distorted audio jamming of the listeners' AM receivers. The only trouble was that the 5th, 4th and 3rd harmonics of the 5.9MHz, 7.25MHz and 9.7MHz band jammers fell in the amateur 29MHz band. During the last sunspot cycle peak, I installed a 29MHz NBFM transceiver in my car. On scan, it frequently locked up on a 'high quality' music broadcast (with 3 or 4 times 5kHz peak deviation) around 29.180MHz, and an accompanying MCW (F2A) Morse code '6M' identification transmitted every 30 to 60 seconds. This signal was so strong that it could be heard all the way through the concrete tunnel under Manchester airport's runways, even when amateur signals had squelched out. The prime target frequency would therefore have been 7295kHz (Radio Liberty) or 9725kHz (Radio Free Europe).

The Soviets assigned 2-letter non-attributable callsigns to the jammers within Russia, and 2-character (one digit and one letter) calls to those in their European satellites. Thus, '6M' would have been in Eastern Europe and jamming RFE. Only Natalya's secret section in Moscow knew the identities of all the jammer call signs, the individual transmitter controllers were kept in the dark. During the late 1970s the Soviets devised a method of mixing or jumbling several human voices (actually male and female presenters from their internal broadcasting services). They then played these back as a jamming source, using multi-track reel-to-reel tape recorders. This technique was termed 'rechepodobny', meaning a speech emulation signal.

The simplest and most efficient form of jamming was developed by the French. Imagine wobbling the VFO knob of a transmitter, which is delivering an otherwise unmodulated carrier, backwards and forwards over a range of ±2.5kHz. The result, carried out electronically, is a variable frequency shift-keyed signal, or FSK mode F1A, producing a wobbling or 'bubbling' beat note, of 5Hz to 20Hz 'swing rate', when heterodyning the target's carrier. Once again, this has the benefit of a 100% duty cycle FM emission, provided that melt-down of the RF power amplifier valves can be avoided. This was the form of jamming most commonly employed during the 1980s.

RL PHASED-OUT

JUST BEFORE THE end of the Cold War around 1989, the Russians had devised another jamming technique which they applied especially against Radio Liberty. This involved receiving a clear signal from RL, at a point within the jamming transmitter's skip zone. The phase of the received audio signal was then changed electronically by 180 degrees and retransmitted by the jamming station on the target transmitter's frequency. The resultant effect, along with any selective fading caused by the ionosphere, was a varying but permanent distortion of the RL signal in the target area. At this stage, it has been estimated that the cost to the Soviets of these jamming activities amounted to about £626-million per annum.

SPANISH RAREBIT

TODAY THE mediaeval village of Playa de Pals, its sandy beach and its rocky coves, is a golfers' and holidaymakers' paradise; but what would inquisitive radio amateurs find just behind those tree-lined coves? Perhaps rabbits that glow in the dark. Certainly the rabbits in question have developed a liking for cable insulation, and have damaged transmission lines at the RL site.

In later years, an effort was made by the USIA to set up a high-power relay station in the Israeli Negev desert. The plan was to relay the Voice of America to Russia, but the local inhabitants scuppered the project. Perhaps they didn't want to end up like the rabbits of the Costa Brava! ♦

In the next part of 'The Voices', Gordon Adams will deal with the epidemic of voices that were to break out in the Caribbean and particularly in Cuba and Florida.

inpractice

by **Ian White,** G3SEK*

http://www.ifwtech.com/g3sek E-mail: g3sek@ifwtech.com

USING OPEN WIRE FEEDER

'ANTENNAS IN SUBURBIA' (June) was very interesting - but how do you bring the open wire feeder into the house?

IT'S MUCH EASIER than the old antenna textbooks might suggest. Open wire feedline is sensitive to proximity effects, and needs to be kept several line-widths away from ground, walls or metal objects. But that doesn't mean you have to drill a pair of holes through the window or use those enormous old-fashioned feedthrough insulators - it can all be done with coax instead. The vast majority of ATUs used with open wire or 300/450Ω ribbon are basically unbalanced circuits (eg the familiar C-L-C T-network) with a ferrite toroidal balun built into the back. However, these baluns are subject to losses when terminated in reactive loads that are far from the design impedance - which is sure to be the case on some bands. In such situations, you'd do better to use an external balun. Therefore, you might as well use coax to bring the feedline out of the house without the installation difficulties of open wire, and then have the balun just outside (**Fig 1**).

The reason why an external balun is usually better than the one built into your ATU is that size is much less of a constraint. You can make excellent baluns for all HF bands using coax, with no ferrite core to saturate or overheat. Let's just recall what the balun is there for [1]. 'Balun' is short for 'balanced-to-unbalanced transformer' and that's basically all it does. The open-wire feed is a balanced system, meaning that both sides have - or *should have* - equal impedance to ground. Coax is an unbalanced system where one side generally is - or rather, *should be* - at ground potential. The balun simply converts between these two systems. (Note that a balun does not have to be an impedance transformer, although baluns can do this also.)

A truly balanced feedline has equal and opposite currents in its two conductors (**Fig 2a**) but it's a fallacy to assume that this will happen automatically. Unless you actually take steps to *make* it balanced, a more realistic situation might be two conductors carrying unequal currents of say 0.9A and 1.1A (**Fig 2b**). This can be separated into balanced (equal and opposite currents) of 1.0A and a current of 0.1A that flows in the same direction in both conductors (**Fig 2c**). This current in the same direction is called the common-mode current, and your so-called 'balanced' feedline will happily support both the balanced mode and the common mode together. The common mode current *shouldn't be there* because it brings a high risk of EMC problems and generally erratic behaviour. The purpose of the balun is to force this common-mode current as near to zero as possible, and there are two basic methods to do this [2, 3]. One is to force equal voltages at the terminals of the open wire line, which is how the transformer-type 'voltage' baluns work. The other method, more direct and generally more effective, is to create a high impedance against common-mode currents while letting the balanced currents though. This latter type of balun is called a 'current balun' or 'choke balun' [3].

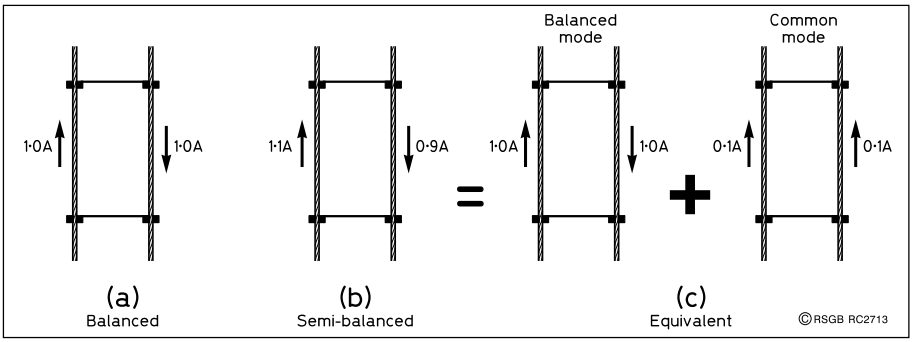


Fig 2: Open wire feedline is not necessarily 'balanced'. It can carry both balanced currents and unwanted common-mode currents at the same time.

I'd recommend the choke balun for transitions from open wire line. You can make one quite easily by coiling up the end of the coax, just before it connects to the open wire (**Fig 3a**). Because of the skin effect which confines RF currents to the surfaces of conductors, separate currents flow on the inside and outside of the coax shield, and coiling up the coax doesn't affect the currents inside [4]. These inside currents are equal and opposite, strongly enforced by the close coupling between the inner conductor and the outer which completely surrounds it. However, currents on the outside see the coil as an RF choke, which creates a high impedance. When open-wire feedline is connected to the output of this choke balun, the currents in its two conductors are forced to be equal and opposite. Any would-be common mode current sees only the high impedance of the RF choke, so common mode currents are effectively suppressed. Enforcing zero common-mode current at the bottom of the feedline still doesn't guarantee the same all the way up to the antenna, especially if the antenna is markedly asymmetrical and the feedline is an odd number of quarter-wavelengths long [3, 5], but it's the first and biggest step towards a truly balanced feed system.

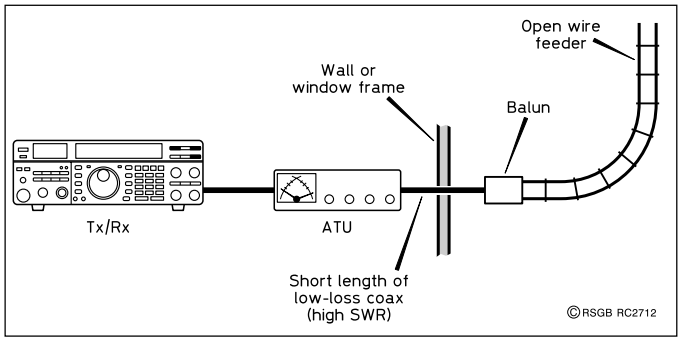


Fig 1: Instead of bringing open wire feedline into the house, you can use coax and mount the balun just outside.

So how do we make a choke balun from coax? Physical size is important here, because you probably should be using large coax. The impedance at the bottom of open-wire feedline can be a lot different from the 50Ω characteristic impedance of coax, so the SWR on the coax will generally be very high - in other words, there will be unusually high currents or voltages. This means the resistive or dielectric losses of the coax will be much higher than the normal matched loss. Therefore you should be using low-loss coax such as RG213/URM67 (or better) for the balun and then all the way to the ATU, and also the total run of coax to the ATU should be as short as possible. (QRPers, this means you too! *Nobody* can afford the extra losses in thin coax carrying a high SWR.)

There are two basic ways to wind a common-mode choke out of coax: in a flat coil (Fig 3a) or as a solenoid on a former (**Fig 3b**). In both cases the inductance needs to be sufficient to create a high impedance against common-mode current at the frequency of operation, but the self-capacitance will be different for the two forms of construction. The self-capacitance appears in parallel with the inductance, and at a certain frequency the choke forms a parallel-resonant circuit with extremely high impedance. Above this frequency the choke appears capacitive, but still with quite a high impedance up to 2-3 times the resonant frequency. At lower frequencies, the choke appears inductive and its reactance decreases. With the right size and shape of winding you can thus make a very effective monoband

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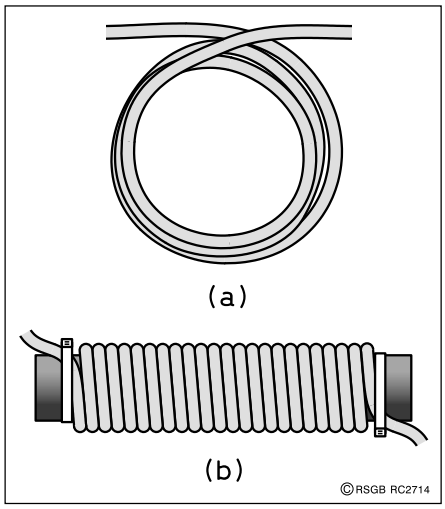

Fig 3: Two ways to wind a common-mode choke (or choke balun) out of coax.

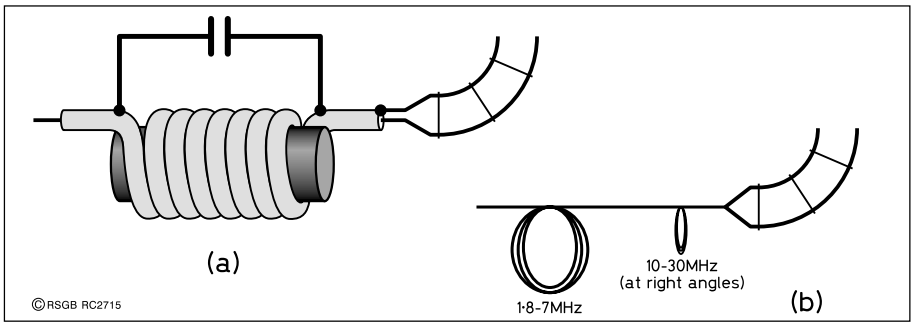

Fig 4: (a) Monoband common-mode choke using a resonating capacitor. (b) Common-mode chokes for different bands can be cascaded (but avoid mutual coupling).

choke balun. The resonance is actually quite broad, so the choke will cover several amateur bands with reasonable effectiveness.

The *ARRL Antenna Book* gives details of various choke baluns for the bands from 3.5 to 30MHz, reproduced in **Table 1**. The monoband chokes are very effective on the design frequency and on adjacent bands, while the multiband chokes are compromises aiming to spread the performance across more bands. In all cases the required length of coax is simply wound into a flat coil of the specified number of turns, which are then taped together and the coil allowed to hang freely. Some users favour the alternative solenoid type of construction, for example winding the coax on to a length of large-diameter plastic water pipe (the material is not at all critical for this application). I haven't seen any tables of data for various amateur bands using this type of construction, but if you short the ends of a trial coil you can easily find the resonant frequency using a GDO or SWR analyser. Yet another trick for a single lower-frequency band, where the size of a self-resonant choke might be too large, is to resonate it deliberately using a tuning capacitor (**Fig 4a**) [6]. This is a narrowband solution, but there's nothing to prevent you from adding another multiband choke directly in series to cover the higher bands (**Fig 4b**). Just take care to avoid magnetic coupling between the two chokes, by separating them by a few diameters or orienting them at right angles.

Finally, remember that you can use these common-mode chokes as baluns for antennas with direct coaxial feed, or anywhere else that outer-surface currents on coax need to be suppressed.

MHz	RG213/ URM67	RG58/ URM76[1]
3.5	22ft, 8 turns	20ft, 6-8 turns
7	22ft, 10 turns	15ft, 6 turns
10	12ft, 10 turns	10ft, 7 turns
14	10ft, 4 turns	8ft, 8 turns
21	8ft, 6-8 turns	6ft, 8 turns
28	6ft, 6-8 turns	4ft, 6-8 turns
3.5-30[2]	-	10ft, 7 turns
3.5-10[2]	-	18ft, 9-10 turns
14-30[2]	-	8ft, 6-7 turns

Notes:
[1] This thinner coax is not recommended for chokes connected to open wire line, where the coax often has to operate at a very high SWR.
[2] The multiband chokes are less critical in construction than the monoband chokes, but being a compromise they are also less effective.

Table 1: Self-resonant choke baluns.

I HAVE A balanced ATU, designed to connect directly to open-wire feedline, so how do I bring the feedline indoors?

USE TWIN COAX to make a balanced line that will ignore external effects because it is shielded. By twin coax, I mean two exactly equal lengths of coax, taped closely together and with the shields also spot-soldered together at intervals (**Fig 5**). Ground both shields to the case of the ATU. Since each conductor is individually shielded, you don't have to take any special precautions about routing this twin coax. As with the single coax, the SWR on the lead-through will normally be very high, so you need large cable such as RG213/URM67 and the shortest possible total length. Usually your balanced ATU will provide the necessary high impedance against common-mode currents on the feedline [5] but in principle you could make a current balun out of twin coax by winding it into a similar kind of coil. Another possibility for a shielded balanced lead-in would be 'Twinax', which is used in computer networking and has two insulated twisted conductors inside a common screen. At a guess, its losses would be somewhat similar to thin coax, although I don't know about its voltage and current capabilities when the SWR is very high.

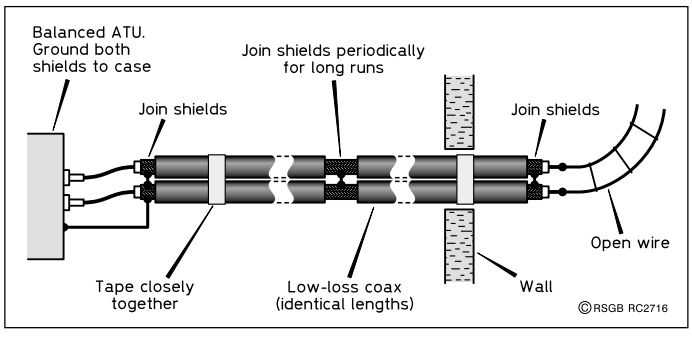

Fig 5: Twin coax for use with balanced ATUs.

REFERENCES

[1] This topic connects with several previous *In Practice* columns, especially September 1994, May 1997 and September 1999; and also with Reference 2. Even so, I make no apology for repeating this information, simply because the same questions about baluns keep coming back!
[2] Tony Plant, G3NXC, 'An Introduction to Baluns', 'Down To Earth', *RadCom*, July 2000 - an excellent introduction indeed.
[3] Roy Lewallen, W7EL, 'Baluns: What They Do and How They Do It'. This article is a classic combination of theory and experimental work, and also the source of the terms 'voltage balun' and 'current balun'. Although the conclusions are summarised in the *ARRL Antenna Handbook*, the complete original article is hidden away in *The ARRL Antenna Compendium, Volume 1* (1985) which, frankly, only a dedicated enthusiast would buy at this late date.
[4] 'Coax - Inside and Out', 'In Practice', May 1997.
[5] 'Best Feeder Length?', 'In Practice', September 1999.
[6] Rick Littlefield, K1BQT, 'Light-Weight Resonant-Trap Baluns', *Communications Quarterly*. ♦

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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Dear Martin,

Last year, when I decided to 'renew' my interest in Amateur Radio I was faced with a number of stark decisions. It was not just a matter of choosing one 'black' box in favour of another, but the difficulty of reading behind the lines of product reviews and getting expert advice based solely on quality and not on mark-ups or potential commissions. In this regard I approached two companies - yourselves and a substantially larger outlet.

In the end, however, there was no real competition. The advice I received from yourselves was absolutely first class and value for money could not be beaten anywhere. What I did not realise at the time, however, was that I had bought from a company that truly values its customers - providing nothing short of excellence in customer service and after-sales care and support.

In this regard, I remain particularly grateful for all of the care, time and effort which Chris Taylor has provided in resolving the current issues with Yaesu. It was Chris's excellent advice that brought me to ML&S in the first instance and his excellent sense of customer service that will keep me a loyal customer for the long-term future.

May I wish you all the very best of success - it is well deserved.

Yours sincerely,

Dr Bruce Styne
MI0CML

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technical topics

by **Pat Hawker**, G3VA*

LOW-POWER AM TRANSMITTER

IT SEEMS A long time since amplitude modulation (AM or A3A) was the dominant phone mode on both HF and VHF. It was in the late 50s and early 60s that AM was largely driven off the bands by what now seems like a concerted effort of the SSB operators. There were of course some genuine reasons why, at least on HF, AM should be driven into the shadows, although some of the claims were carried to extremes. Certainly, on an equal-power basis, SSB gave significantly better DX performance. In crowded bands the elimination of one set of sidebands enabled communications-quality to be carried in 3kHz channels instead of 6kHz, although we soon learned that sideband splatter from badly adjusted rigs could negate this advantage. When it came to the use of early bipolar transistors with limited RF output and working from 12V lines, these were inherently more suited to FM than either AM or SSB, since they tended to be voltage-limited rather than current-limited. If a final amplifier is amplitude modulated it can be operated as a highly efficient Class C stage. On the other hand, a low-power AM transmitter can be used to drive a linear amplifier.

But there was one, largely unintended, result. SSB brought about the demise of transmitters that could be built and adjusted on the kitchen table with a minimum of tools and servicing instruments such as oscilloscopes, etc. The end of AM brought about the dominance of the factory-built SSB transceiver, often with no facilities for the reception of double-sideband signals. By the mid 1970s, if not before, AM virtually vanished from the HF/VHF bands and began to justify the jibe of 'Ancient Modulation' that had been liberally splattered around during the struggle.

However, AM never entirely disappeared. A number of devotees have kept the AM flag flying, sometimes using transmitters dating back many years, but which continue to function satisfactorily. They can take advantage of the fact that a double-sideband transmission can be received as single-sideband on receivers intended solely for SSB reception. On some bands, at some times of the day, there is little likelihood of causing interference to other band users; our bands are often far from full!

In ZS6AAW's 'QRP' column *Radio-ZS* (February 2000) he presents a low-power solid-state 3.5MHz CW/AM transmitter contributed by Dave, ZS6AZP, in which a low-cost VN66AF FET PA is run from a 12V supply and is modulated by a TDA2003 audio amplifier IC: **Fig 1**. Operation is described as "self-explanatory", however ZS6AAW provides the following brief 'guided tour'. "The modulator is obviously an AF amplifier using a TDA2003 IC power device that is matched to the VN66AF VMOSFET RF power amplifier by means of the secondary winding of the line transformer. Please note that its primary winding is unused". The rig is normally used as a CW QRP transmitter, but for AM a push-to-talk switch replaces the Morse key plugged into sockets A, B, and presumably, although this is not indicated, the modulator section disconnected from the 12V supply which then goes directly to C on the transmitter section. The transmitter output could be substantially increased by the use of a linear amplifier using a low-cost V-MOSFET device fed from a 25V or 50V DC power source. Incidentally there is a move in the USA to raise the standard voltage for car electrics from a nominal 12V (13.8V) to 24V.

A bonus with AM is that it can be demodulated on the simplest receivers without the requirement for high stability - even a crystal set can be used as a monitor! ZS6AAW points out that both AM and DSB (double sideband with full carrier) are the same mode (A3E), although many amateurs use DSB as an abbreviation for DSBSC (double sideband with suppressed carrier) ie A3. DSBSC is a useful mode for experimental work, since it can be implemented simply by means of a balanced modulator without the requirement for sideband filtering, and can still be received on an SSB receiver. However, a low-level balanced modulator must always be followed by linear amplification. This is of course also true for AM if the modulated stage is not the final power amplifier stage.

LINEARS FOR RECENT 6146B VALVES

IT WAS NOTED in *TT* (November 1998, see also *Technical Topics Scrapbook 1995-1999* pp243-245) that from about 1970 to about 1990 or so the quality of valves tended to go through the floor. Since then, with the added

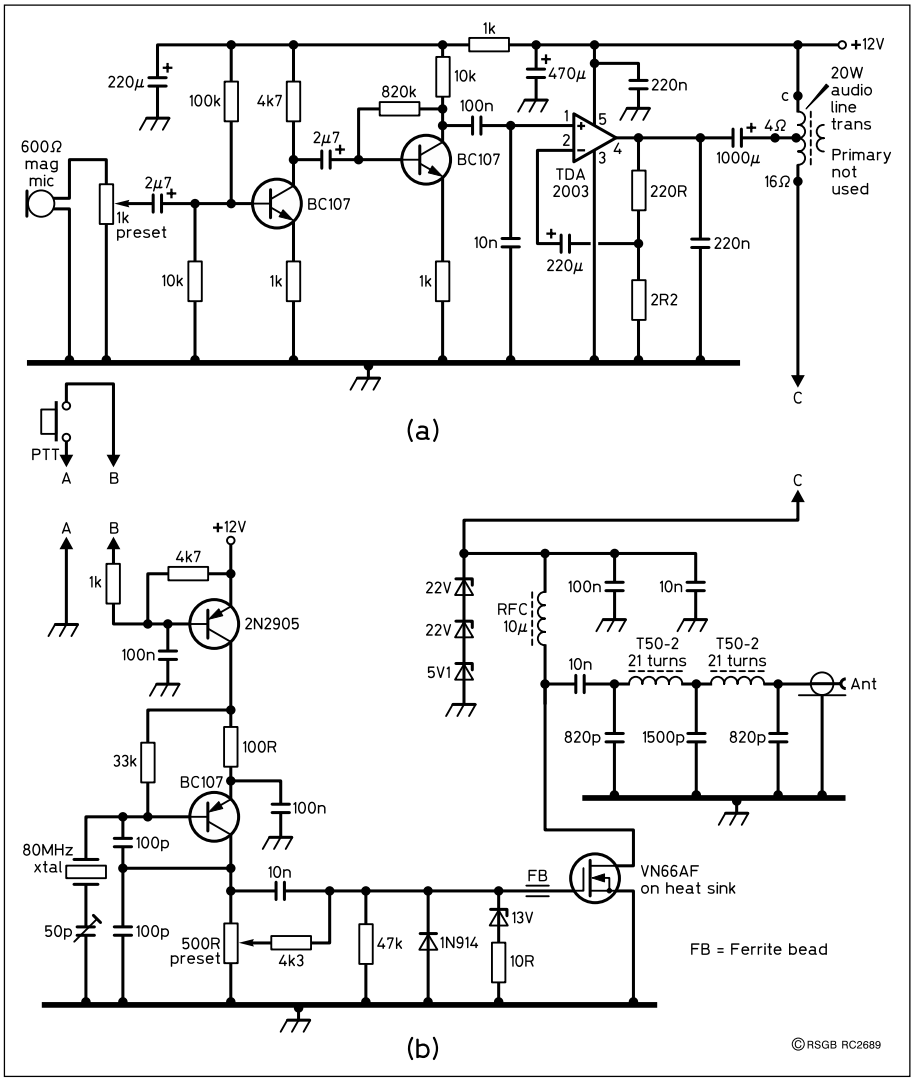

Fig 1: ZS6AZP's low-power 3.5MHz AM/CW transmitter, using a VN66AF MOSFET in the power amplifier stage. For CW operation a Morse key replaces the PTT switch across sockets A, A. It should prove possible to modify the crystal oscillator stage to form a ceramic resonator VXO capable of tuning parts of the CW-only and telephony 3.5MHz sub-bands.

*37 Dovercourt Road, London SE22 8SS.

experience gained by those firms and countries still catering for the resurgent 'valve-sound' audio business, quality has generally improved. However, many amateurs have found that the characteristics and life expectancy of modern valves still do not always meet expectations.

Jorge Dorvier, EA4EO, writes: "After testing eight 6146B valves of different brands and different stages of their working lives, I came to share the conclusion of other amateurs that some recent production of this still popular valve is not working as well as formerly. It is not as easy as it used to be to obtain good performance in linear amplifiers using two 6146Bs due to looser tolerances, leading to problems in matching and biasing. However, in a recent homebuilt amplifier I overcame my problems by separating the two cathode lines, using two independent Zener diodes rather than a single common Zener diode: **Fig 2**.

"The starting point is to use (with a single valve) a 5.1V 1W Zener diode, see how this performs, and then try other Zener diodes of higher and lower voltage, selecting the diode that provides the most linear performance. Then repeat the process with the other valve and other Zener. It is quite likely to be found that the optimum bias voltage will vary between the different valves. Both Zener diodes should be 1W rating.

"As can be seen from the circuit diagram, I use the G2DAF screen-supply arrangement and an input system that I use in all my amplifiers due to the good results that I am obtaining. This comprises a 1:9 ratio wideband toroidal input transformer, instead of the classic 50Ω resistor or the 1:4 ratio transformer. This system means that it is possible to drive the amplifier with less power."

As I attempted to show in the May *TT* item 'Thoriated Tungsten and the 813 etc', much skill and effort went into the design and manufacture of RF power valves in the heyday of the valve era. As mentioned, my notes on the production of thoriated tungsten filaments were based on a description in the 14th Edition (1956) of the *Radio Handbook* edited by Bill Orr, W6SAI, who was for many years with Eimac (later Varian-Eimac). This resulted in an interesting letter from Enver H Chaudri, FIEE, G3DCS, who was in charge of 813 production some 50 years ago while working at the English Electric Valve Company. He feels that the description of the processes involved with thoriated tungsten filaments may be in error or unduly condensed, since it is different from the process used at EEV and at RCA, whose information EEV had under licence.

G3DCS has supplied a detailed description of the EEV/RCA processes and also a fascinating account 'Four Jobs - My career in industry (1941-1990)', which he has compiled as a writing project of 'The University of the Third Age' (U3A).

He writes: "The carburising processing took place while at the 'mount' stage (ie on its glass base), not after the valve envelope was sealed/attached to it. . . As the filament becomes very brittle after carburising, I doubt if the rest of the assembly could have been completed without breaking it. The filament was flashed in a bell jar at a high temperature, as you say, but in hydrogen. This reduced any oxides on the surface and brightened it. Then the hydrocarbon gas was flushed into the system. This was hydrogen, which was bubbled through xylene liquid. The filament was then flashed again, intermittently, to form the tungsten carbide surface. As the carbide layer formed, the resistance of the filament increased, and it was flashed until it reached a certain cold resistance, which determined the operating filament current of the valve. Once the carbide layer is formed, the filament becomes extremely brittle and is easily broken, hence my earlier comments."

Once the valve was sealed to its envelope in a forming gas atmosphere, it underwent a whole series of further processes which G3DCS describes but which I am omitting due to space limitations. But it seems of general interest to stress that, as he puts it: "The carburised filament is extremely brittle, and a sharp knock to a tube could easily fracture it. I don't know that I subscribe to the suggested slight reduction in filament voltage recommended, but it is possibly all right if the tube is running very well within its ratings. Cool running filaments are more easily poisoned by residual gases."

I must admit that I had not previously realised how brittle the thoriated tungsten filaments can be, and in future will handle my 813 even more delicately than in the past!

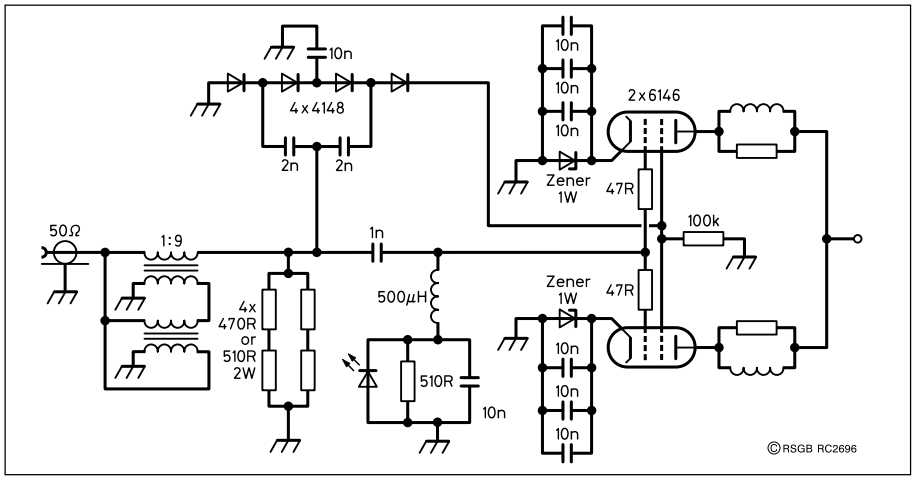

Fig 2: EA4EO's modified input and biasing arrangements for a linear using two non-matched 6146B valves, overcoming the problems of the wider tolerances found in current manufacture or used valves. 1:9 input transformer comprises 2 x FT-56-61 toroids with 12 turns twisted each pair. Wire, 0.65mm diameter.

CRYSTAL SETS & TUNING DIODES

TWO APPARENTLY dissimilar topics raised in *TT* - crystal sets (January and April 2000) and electronic tuning diodes (February 2000) - may appear to belong to widely separated eras, but in fact both relate to the junction barrier of semiconductor diodes and the effect of the voltages applied to them.

Ray Coley, G3IFF, has been investigating the characteristics of galena crystals which he made by mixing finely divided lead with sulphur, heating it up in a steel tube, cooled slowly. Dick Biddulph, M0CGN, admits to having once "liberated" some galena from his school display cabinet, but without success until he resorted to germanium diodes. For general applications, he recommends pill boxes for coil formers, which seem to be made from polypropylene, but warns against salt cartons since many have an inside layer of either aluminium foil or evaporated aluminium. The only problem he has found with pill boxes is that polystyrene dope won't stick to it. This is solved by putting a layer of 'Kleenex' on top of the wire before doping. Hole boring at the start and finish is simply done with a fine soldering bit!

Alan Williams, G3KSU, recalls that while on holiday some 40-50 years ago in the Southampton area, he took along a crystal set and long wire antenna, but was surprised to find that he could hear the local medium-wave transmitter on his DLR No.5 headphones *alone!* He also recalls his father telling him of a time when he was once able to hear the next-door neighbours talking via both his and their crystal receivers! Long parallel antennas down the back garden plus receivers tuned to the same wavelength afforded simple electromagnetic coupling between the two systems. I remember once reading a short story which featured a similar incident. I had always assumed this was fiction, but apparently not. I can only suggest that this was possibly due to induction, with the necessary 'power' provided by the sounds acting on the headphones, just as connecting two pairs of headphones alone

can be used as a crude 'telephone'.

There are many reports in the 1920s of 'oscillating crystals', though I doubt if this was the explanation in this case. In 'An invention that changed the world - the birth of the transistor' that I wrote for BVWS's *Vintage Wireless*, Vol 19 No 1, (1993), I noted that Henry Sutton in Australia and Dr W H Eccles (RSGB President 1923-24) in the UK had reported oscillating galena experiments as far back as 1910 (*The Electrician).* There was a flurry of interest in the 1920s, peaking in 1924, when *Wireless World* described work by the Russian engineer O Lossev on oscillating and amplifying zincite crystal detectors. Lossev even reported that "it has been possible to achieve transmission over a distance of one mile. On both sides the crystal served simultaneously as a generator and detector, so that even duplex transmission was possible."

Bruce Carter, GW8AAG, felt that the *TT* heading should have been "Crystal sets - recruiting aid or a bitter disappointment?", recalling his various attempts from the age of 10 years onwards to make them work. But, then, what can you expect if you live in the beautiful but isolated Brecon area?

Geoff Southern, G3RWW, was interested in the references to the concept of semiconductor junction barrier voltage. He writes:

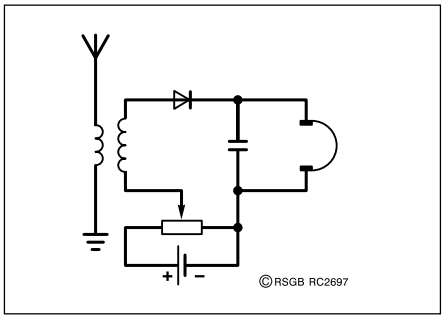

Fig 3: Simplified arrangement of a 1916 crystal set, using adjustable forward bias to overcome the junction barrier voltage of a zincite detector and thereby increase sensitivity.

"During recent research in the libraries at Liverpool University, I came across an article in *The Post Office Electrical Engineers Journal* of April 1916 'Notes on the Design of the Crystal Receiver, Wireless Telegraphy No.2' by L B Turner. The receiver used a carborundum detector, which had an adjustable forward bias applied to it via a potentiometer and battery. The article points out that: "The carborundum detector is most sensitive when subject to a constant polarising PD [potential difference]. The best value varies with different crystals, but is usually about three-quarters of a volt. The PD is obtained from the potential divider, the slider of which is to be set to give the loudest signals." A simplified form of the quasi-aperiodic receiver (centred on 250m by the jigger [tuning coil]) but omitting a relay switching arrangement to protect the crystal from the associated transmitter is shown in **Fig 3**.

Although written many years before the introduction of the term 'junction barrier voltage', it is clear that the "polarising" potential served to overcome (just) this barrier voltage when correctly adjusted and so enable detection of very weak signals. I dimly recall that this technique was still being described occasionally in the 1930s in articles and books on crystal receivers. L B Turner, in his introductory notes wrote: "It is well known that for good efficiency the crystal detector, owing to its large resistance (even in the more conductive direction) can only pass energy at a sufficient rate and with a suitably small ohmic loss at the contact, if the high-frequency power applied to it is in the form of small current at large tension."

The early history of the crystal rectifier is told in *Early Radio Wave Detectors* by V J Phillips (Peter Peregrinus Ltd in association with the Science Museum, 1980, pp 206-207): "The story of the crystal rectifier started in the 1870s with the discovery by Braun of the asymmetrical conduction properties of certain metal sulphides. Other investigations

SEE OUR NEW BUSINESS CARD SECTION ON PAGE 97

and patents concerning the junction of metals and crystalline substances followed in the early years of the 20th century but many of these, although used as rectifiers, were regarded by their inventors as being thermo-electric devices. . . In the years between about 1906 and the 1914-18 War, great interest was shown in the phenomenon, and various investigators looked into the properties of every conceivable combination of substances. Many pairs were found to behave as rectifiers, some being more effective than others, of course. Among the most popular materials used were molybdenite (molybdenum sulphide), galena (lead sulphide) and carborundum (silicon carbide). Many devices were marked under trade names such as the Perikon detector [a chalcopyrites (mixed copper and iron sulphide)/zincite (zinc oxide) combination], the Pyron [iron pyrites (iron sulphide)/silicon)] and the Bronc Cell [tellurium/graphite]. It is

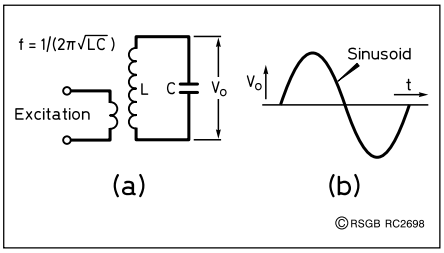

Fig 4: Sinusoidal excitation of a tuned circuit at its resonant frequency produces a corresponding sinusoidal voltage across both L and C.

HERE & THERE

DAVE PORTER, G4OXY, while clearing out some old papers came across a cutting apparently from the February 1956 *Wireless World* on 'Finding inductance of LF chokes' by J E Gunn. This begins: "Very often the experimenter has a smoothing choke on his hands and would like to know its inductance. . . The choke is connected across the 5-volt winding of a mains transformer, in series with an AC current meter, and the current flowing in mA is put into the formula: Inductance (henrys) = 16/current in mA. For example, if the current were 2mA, the inductance would be 8 henrys." For other values of AC frequency or other low-voltage transformer windings, a more general formula is:

$$I\ (mA) = \frac{E(volts) \times 1000}{[2\pi \times f(Hz) \times L\ (henrys)]}$$

or, for 50Hz, $$L = \frac{1000 \times E}{(314 \times I)}$$

Incidentally, G4OXY is the Engineering Manager of the Merlin (former BBC) transmitters at Woofferton and Orfordness, and reports that the output tuning coils and some of the high-power valves used in the 600kW Aspi 1 transmitter located at Crowborough for many years from 1942 are now on display at Orfordness.

ROBERT DANCY, G3JRD, recalls that he encountered a working mechanical Hellschreiber (*TT* May 2000) at the famous Post Office Radio Transmitting Station at Hillmorton, near Rugby, some 50 years ago. He still has his notes on the system, dated 6 November 1953. He agrees that it needed no synchronising signals, but he remembers fine tuning the speed of the tape to obtain a more-or-less continuous flow of letters without one line gradually drifting off the tape. As there was room on the tape for two complete lines of print, one above the other, there was always a complete letter displayed. Even if the bottom of the top line and the top of the bottom line were showing, there was a complete letter in the middle. He still has a piece of the tape, not very well synchronised, stuck in his notebook. Each letter was in a square block, with 7x7 dots in the matrix, printing always upper case letters. As he left Rugby Radio the following month, he does not know for how much longer the Hellschreiber was used.

FOR SEVERAL years F A S Sterrenburg has been puzzled at the enormous amount of work involved in the calibration of 3000 points for the WW2 BC221 frequency meter. He believed that in view of the large production runs of this still highly prized instrument, hand calibration would have involved an inordinate amount of time. The mystery has now been solved. An automatic set-up was designed and made by Philco that combined a standard frequency source, some locked dividers, early calculating equipment, a mechanical claw and an extremely clever form of frequency diversity receiver to solve the zero-beat problem. The results were stored on [paper] tape and sent to a teletype printer. He feels that the whole set up was chock-full of innovative ideas and a revelation of the ingenuity of the 1940s engineers in those pre-digital-computer days!

IN HIS REGULAR 'Reflections' column in *IEEE Spectrum* (March 2000, p27) Robert W Lucky poses the question of the greatest engineering accomplishments of the last century. He recalls that a recent discussion included nominations, in no particular order, of the automobile, telephone, radio, television, computer, Internet, aeroplane, air conditioning, highway system, imaging systems, space technology, home appliances, health technology, nuclear energy, safe drinking water, waste treatment, electrification, agricultural mechanisation, dams and bridges, skyscrapers, jet engines, lasers and optics, integrated circuits, microprocessors, and the transistor. A number of these were combined into single categories: transistor, IC and microprocessor became 'electronics' etc. Radio and television were similarly joined. But how to judge which was the most significant to society - telephone or television? "There are more television sets than telephones in the world. There are even, so I understand, more televisions than flush toilets. . . Some 90 per cent of the people in the world have never made a telephone call. . . Maybe the nod here goes to television. Again, which would you choose - the computer or electrification? Given the choice of computers or the electrical power distribution infrastructure, it is pretty clear which an average person would choose. How significant is the Internet? Sceptics say 'wait and see'. Maybe next century's list will have it at the top. Or maybe it won't make the cut." While I guess most of us would put radio/television high on our list, this would have been severely limited without the National Grid!

THE OCTOBER 1999 *TT* included a set of suggested "ten commandments" for using petrol-electric generators, to which were added eleventh and twelfth suggestions. The twelfth commandment was "Always check the output *voltage* before connecting your radio equipment. Governors have been known to go wrong." Paul Collett, G0BQF, recalls: "Some years ago I was involved with a club which used a 3kVA petrol generator for field days and special event stations. On one occasion the HF linear amplifier showed considerable instability. Investigation showed unacceptable variation in the voltage delivered by the generator and long extension lead; also the delivered waveform was far from sinusoidal! One member was able to scrounge two failed uninterruptible power supplies, from which he was able to make one good UPS. This was installed in the operating tend during later events. Irregularity in the 240V supply was completely overcome and the supply a perfect sinewave. There was another benefit. When the generator needed oil and petrol it was no longer necessary to take the station off the air, because the generator could be stopped to refuel, leaving the rig and lights to run on the UPS." [I recall at an NFD many years ago, the problem arose that the frequency of the AC output from the p-e generator was well below 50Hz, resulting in damage to the equipment – less easy to check than voltage – G3VA]

interesting to note in passing that as early as 1907 the emission of light from a rectifying junction had been observed."

This reminds me that light emission from semiconductor junctions is not confined to special purpose LEDs. In the early glass-enclosed transistors you could scrape away the paint coating and use the device as a light emitting diode. This leads also to the question raised by John Tait (ex-GW8MGF) in the February *TT* about the change of diode capacitance with voltage. How, he asked, does an oscillator using an electronic tuning diode work at all, and how does its phase-noise compare with an air-dielectric variable capacitor?

A number of readers have provided useful comments, but one of the detailed answers came from R T Irish, G4LUF: "I have been giving some thought to the problem posed on varactor/tuning diodes and wonder whether the following explanation may be of help.

"In the circuit shown in **Fig 4(a),** sinusoidal excitation at the resonant frequency (fr) of the tuned circuit will produce a corresponding sinusoidal voltage (vo) across both L and C, as shown in **Fig 4(b).** When the capacitor is replaced by a variable reactance diode (electronic tuning diode) as in **Fig 5(a),** other factors become important. The diode will have the general property that its capacitance will *decrease* as the reverse voltage

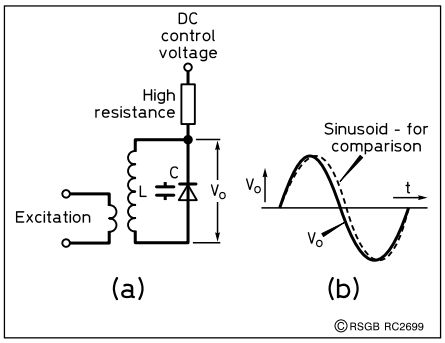

Fig 5: When C is changed to an electronic tuning diode, the shape of the output waveform is changed for each half-cycle, but together the timing and hence frequency remains the same, provided that the input voltage is low. If high, there will be components at 2f, 3f, 4f, etc (ie it becomes a varactor multiplier), but there are no close-in components to affect phase noise according to G4LUF.

increases and will *increase* as the reverse voltage *decreases.*

"Initially, assume the DC voltage applied to the diode produces a capacitance which resonates, with the inductor, at the excitation frequency. Then, when an AC voltage at the resonant frequency is applied on top of the DC bias, changes from the simple case occur.

"The *positive* half cycle will *increase* the total reverse voltage, reducing the average capacitance and increasing the resonant frequency *for this half-cycle.* The half-cycle will therefore occur in a shorter time than expected, as shown in **Fig 5(b)**. Conversely, the following (negative) half-cycle will result in the average capacitance *increasing* beyond the expected value, resulting in a *longer* half-cycle, exactly compensating for the shorter first half-cycle.

"Provided that the AC voltage is much less than the DC voltage, there will be little overall effect and resonance will be as expected from simple consideration of the DC voltage only.

"On the other hand, if the signal voltage is appreciable with respect to the DC bias voltage, the effects indicated above will be more significant. The shortening and lengthening of successive half-cycles will have the effect of *phase modulating* the original wave, advancing it in the first half-cycle and retarding it in the second. This modulation occurs at the same frequency as the wave itself, ie every cycle!

"The phase-modulated wave will therefore have side waves, removed in frequency from the carrier by the modulation frequency (and its harmonics), producing components at 2f, 3f, 4f etc, forming a varactor frequency multiplier. Since there are no components produced in the vicinity of the original frequency of the wave, the phase noise performance should not be affected. Strong, off-tune signals may however still affect operation at the nominal operating frequency." ♦

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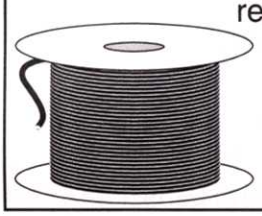

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ICOM	IC-735 HF 100W	£450.00
ICOM	IC-745 HF BASE inc FM 100w	£425.00
ICOM	IC-746 HF/50/2M 100w	£999.00
ICOM	IC-751 BASE HF CLASSIC!	£425.00
ICOM	IC-756 HF/6M BASE TRANSCEIVER	£1,050.00
ICOM	IC-765 HF BASE 100w	£950.00
ICOM	IC-775DSP 200w HF BASE TRANSCEIVER	£1,799.00
ICOM	IC-821 H 2/70/ BASE TRANSCEIVER	£750.00
ICOM	IC-W31E DUAL BAND HANDY	£175.00
ICOM	PS-15 POWER SUPPLY	£100.00
ICOM	PS-55 PSU 20 amp	£120.00
ICOM	R10 HANDY SCANNER	£199.00
ICOM	R2 HANDY RECEIVER	£110.00
ICOM	SP-20 EXT SPEAKER	£85.00
ICOM	T81E QUAD BAND HANDY	£250.00
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KENWOOD	TM-255E 2M MOBILE MULTI MODE TRANS	£475.00
KENWOOD	TM-455E 70CM MOBILE MULTI MODE TRANS	£495.00
KENWOOD	TM-742E DUAL BAND , DUAL READOUT	£295.00
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YAESU	FT-7B HF MOBILE TRANSCEIVER MINT!	£225.00
YAESU	FT-840 HF MOBILE-BASE TRANSCEIVER	£450.00
YAESU	FT-847 HF/6M/2M/70cm/4m	£999.00
YAESU	FT-8500 DUAL BAND MOBILE TRANS 50w	£295.00
YAESU	FT-920 HF 50 MHz BASE TRANSCEIVER	£925.00
YAESU	FT-990 AC HF BASE TRANSCEIVER	£800.00
YAESU	SP-102 Ext Speaker inc filters	£45.00
YAESU	VX-500 HANDY SCANNER	£195.00

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

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

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

FOR SALE

COLLINS R-390 rcvr. Washed, revalved, realigned, refurbished front. Comtek 4-square switching unit. Four 36ft/44ft verticals. Butternut HF-4B minibeam, unused. Palomar rcvr noise bridge. B&W hi-power ATU. Daiwa hi-power ATU. Mans for all items, everything must go, offers invited. 0118 9693284 (Reading). E-mail: 010764.2735@compuserve.com

GRUNDIG Satellit 700 portable rcvr, unused, poorly-advised purchase by blind listener, cost £300, has 23-function display, AM/FM/RDS LSB/USB/CW top band through 10m, two keyboards, all commercial shortwave, all amateur bands. Everything one could desire in second set or go-anywhere portable rcvr, £220 ono. GM4FLX, QTHR. 01505 843524 (Lochwinnoch). E-mail: alangm4flx@aol.com

SHACK clearance, GM3DUS. Icom 728, £350. FT-747, £250. FT-102, £150. R1000, KW2000, Kenwood ATU, Alinco 22E, PCS-6000, Icom 24G, VVM V7AU, HM2102 sig gen, TE20D PUs, all for quick sale. Offers to John, GM3LBX, QTHR. 01880 820842 (Kintyre).

SILENT key sale of Collins, Drake, Eddystone, Racal, Plessey, RCA, Heath, HRO, Hammarlund, Johnson, Hallicrafters, GEC, ex-WD. Receivers, transmitters, also test gear, mics, accessories, hi-fi, meters, counters, Marconi, HP, Grundig, Philips, Yaesu, Zenith. See www.riola.com for complete list. Many collector's items included. Brian, GI4GNZ, QTHR. 028 2588 0740 (Ballymena). E-mail: radio@riola.com

TB-3 beam, vgc, spare traps, £175. NTR-1 DSP-unit, never used, boxed, £100. FT-101, working, £150. Butternut 40/80m vertical, never used, brand new, boxed, £200. Vibroplex Morse key, 1960 model, £150. Old English Electric Morse key with original base, collectors item, offers, photo available by e-mail. All items ono. 01635 866881 (Newbury). E-mail: g0orh@aol.com

YAESU 767GX tcvr, mic, speaker. Kent twin paddle. Kenwood tuner. Emotator rotator control. Hy-Gain motor. Tilting telescopic tower. UHF/VHF Yaesu FT-8000. Kenwood DC power supply. Portable power unit. Unique portable and table packages. Numerous antennas, inc Hy-Gain 2-ele beam. Wharfedale h/phones. Guarantees on condition, highest offer for all. 192 West Heath Rd, Northfield, Birmingham, B31 3HB. 0121 4781579 (Birmingham).

29MHz mobile. Magnum 257 multimode, 25W, SSB, FM, AM, repeater shift, CTCSS, scan, memories, virtually unused. Rare American import. VAT/duty paid, includes packaging, all accessories, man, £200. No offers. Mark, G0OIW. 0118 948 3593 (Reading). E-mail: g0oiw@qsl.net

60FT 3-section tilt-over tower and head unit, £450. Also 1kW 240V inverter, £150. 01361 810584 (Greenlaw).

A super tcvr, Icom IC-725, gen cov rcvr, 10-100W HF, vgc, with mic and man, £295 plus carriage. G4GCU. 01642 471484 (nr Redcar).

ALINCO DR-599E d/b mobile, £235. Alinco DJ-580E d/b h/held, £195. AEA PK12 TNC, £60. Could deliver locally or buyer collect. Shipping at cost. 01482 809274 (Hull). E-mail: igower@g8vhg.karoo.co.uk

ALTRON mast SM-30WM, antenna AQ6 20/3E, JayBeam 5Y2M, JayBeam 12XY70, 1000 winch + spare HD cable. Refurbished rotator Yaesu G400RC + control, refurbished rotator Diawa + control. All dismantled, buyer collects, £100. Silent Key, G3LDT. 01625 572614 (Macclesfield).

AVO-8 multimeter, £50. Variable transformer £50 (10A), £30 (3A), Taylor 172 volt-ohm meter, £30. Dual beam 20MHz 'scope, £50. Loads of transformers – lists. 0151 489 9620 (Liverpool). E-mail: a.choraffa@livjm.ac.uk

BNOS 6m linear amplifier with pre-amp. 10W input, 50W output, vgc, £70, NAG valve linear amplifier, 10W input, 200W output, with pre-amp, SWR meter, slight fault with changeover relay, hence £125. Buyer to collect NAG. G0EWN. 0114 246 8463 (Sheffield). E-mail: gfiander@linone.net

CLEARING shack – HF tcvrs – Drake TR7+PSU, man, £180. Kenwood TS-820, as new, £235. Trio TS-700 base station, £180, seen working. G0UAU, QTHR. 0121 358 3639 (Birmingham).

CUSHCRAFT R-5, set of traps, unused, £55, Icom IC-T22A 2m h/h, charger, etc, boxed, £85. 01245 256416 (Chelmsford).

DIAMOND SX2000 auto-SWR and power meter, as new, 1.8MHz to 200MHz 13.8V DC for auto, £50 includes postage original packing. 01629 812398 (Bakewell).

DRAKE TR-4C with RV-4C VFO and MS-4 speaker, h/book, vgc, £425. 01379 783657 (nr Diss).

FOR sale, due to upgrade, my much-loved Icom 740, all xtal filters FM & calibrator, mint cond, original packaging & PSU, offers around £160. Good starter rig, in use now. Silent key sale: KW-2000A + PSU & ant tuner, not used for years, offers around £80. G4OPL, QTHR. 01726 72760 (nr St. Austell). E-mail: twb@polgooth15.freeserve.co.uk

FREE! 2m 9-ele Yagi when you donate £25 to your favourite charity! Recipient to collect, West Yorks. (Bradford). E-mail: walanj@supanet.com

GEM quad, unused, £250. HF9V vertical, one year old, £150. Karl, 01296 435815 eves (Aylesbury).

HEATHKIT Mohican rcvr, 580kHz-30MHz, b/spread, pre-WARC bands, RF stage, BFO, batts/12VDC, man, offers? Canon 286 computer, 1MB RAM, 40MB HD, 14in VDU, £15. Panasonic KX-P1170 9-pin printer, cables, £25. Ideal w/proc combo. All gc, buyer collects. G3UZM, QTHR. 01395 273090 (Exmouth). E-mail: c.haddock@talk21.com

HUNTER linear amp, very heavy, buyer collect, £450. G3BPE, QTHR. 01373 826939 (Westbury).

ICOM 751A, SM-6 mic, PS-55 PSU, man, box, £450. FT-208R 2m h/held, £45. Gap Titan vertical, £200. Carriage extra. G2FDF, QTHR. 01691 658422 (Oswestry).

ICOM IC-207H, purchased January 1999, used 5 months, exc cond, £200 ono. 01772 813340 or 812629 (Southport).

ICOM IC-735 HF tcvr, CW filter, mic, boxed, with man, £250. Matching PSU, £70. Both exc. G4GRN. 01992 631698 (Waltham Cross).

ICOM IC-740 HF tcvr, PSU-20, SM-5 desk mic, £350. Yaesu FT-2700, 2m/70cm, £160. Daiwa 140-450MHz SWR/PWR, £25. 50 books, SAE list. 01527 546048 (Redditch). E-mail: g2fty@gduffin.screaming.net

ICOM IC-745 HF gen cov, int PSU, boxed, as-new cond, great HF tcvr, £390. Icom IC-271H 2m base station, 100W output, as new, boxed, £390. Daiwa 30W 2m amp, suit h/held, £25. All in above average cond. Grant, G4ILI. 01452 855339 (Cheltenham). E-mail: grant@cratch.demon.co.uk

ICOM IC-R8500 rcvr with CW filter, speech board and PSU type AD55, £850. Trio TS-780, 144/432MHz all-mode tcvr, £800. Two TS-700s, £120 each. Icom IC-1201E, 23cm mobile tcvr, £320. Two Icom IC-12GE 23cm h/helds, £175 each. ADI AR-146 144MHz mobile tcvr, £100. Silent key sale. All ono, with mans and vgc. Buyer collects or pays carriage. 01483 723506 after 7pm (Woking). E-mail: nedjane@folkcorp.co.uk

ICOM IC-T81E 6m, 2m, 70cm, 23cm, FM handy tcvr. Wideband AM/FM receive, soft case, 5 months old, mint cond, £250. 01202 460174 (Poole). E-mail: g0faj@freenet.co.uk

KENWOOD TR-751E all-mode 2m tcvr with mobile bracket, quick release and man, £250. Trio station monitor SM220 with pan adaptor and man, £240 ono. G0KGU. 01482 896471 (Hull).

KENWOOD TS-140S, PS-430 power supply, MC-435 mic, gc, £275. Telequipment D32 scope with carry case, Nicads, probes, man, £45. Yaesu MH-1 mic, unused, £35. Radio books – various Scott Taggart, Admiralty h/books of Wireless Telegraphy, Newnes' Wireless Constructors Encyclopedia – swap for good Morse key or anything interesting. Regret no transport. Wanted: Kenwood MC-60A desk mic. Ron, G4MNB, QTHR. 01793 331585 (Swindon).

KENWOOD TS-450SAT, ultra-reliable, £450. Matching PSU PS-33 if required, £100. Reason for sale – now have TS-570DGE. 0116 287 5241 (Leicester). E-mail: r73@beeb.net

KENWOOD TS-850SAT HF tcvr, immaculate, mans, but not boxed, £695. Yaesu FT-726R 6m/2m/70cm multimode, with satellite module, as new, with mans, boxed, £495. Timewave DSP-599ZX all-mode digital signal processor, as new, man, boxed, £165. 01249 656702 (Chippenham).

KENWOOD-Trio TS-830S HF tcvr, mic, man, boxed, gc, £300. G0TYJ, QTHR. 01323 503918 (Eastbourne). E-mail: iretyj@talk21.com

KW Atlanta, complete set spare valves, KW power supply. KW (E-zee) match. All believed OK, SAS. Osker SWR 200 and power meter. Burns Electronics TC-101 wavemeter. Shure 201 mic. 14-AVQ vertical antenna. All above with mans/instr, £300 complete. 01562 69745 (Kidderminster).

MAGNETIC loop, Capco AMA-4, 3.5-10MHz, vgo, power pack plus 50 yards cable, £110, buyer collects. GM3AKM. 0131 315 4814 (Edinburgh). E-mail: gm3akm@cwcom.net

MARCONI HF-1000 broad-band linear amplifier. Large commercial unit giving 1kW continuous from 250mW input, £450. Harper Simmonds precision DC power unit, 54.48V at 100A, £50. Wanted: Suitcase for B2. Palomar TX-5300 linear. BC-729C ATU. Morriss, G4GEN. 01825 712205 (Nutley).

MARINE D/F audio/visual Plath SFP-700/2, 240-535kHz, 1.5-3.2MHz, with Gyro repeater. 110/220VAC power unit N-701/3, vgwo/vgc, with man. Also Cheetah telex, gwo, but needs new tube, offers? G3ICB, QTHR. 01635 848783 (Thatcham). E-mail: tonybull@g3icb.freeserve.co.uk

MEDICAL expenses force sale of two Icom 775 IIs, also Icom 821H ex-MoD round section tower, 9-ele 2m Yagi, 3/4 bedroom semi/det house, full planning on tower, hilltop location, enclosed garden to rear, close to hospital, town, shops, with countryside views over lake, peaceful QTH. Disability forces regrettable sale. 29 Trenance Avenue, Newquay, Cornwall.

MFJ-1798 10-band vertical, partially dismantled. Sigma 28MHz vertical, new. 2-ele 6m HBG, all three £150, buyer collects. 01296 487983 (Aylesbury).

MICROWAVE Modules 144MHz linear amplifier with pre-amp, 30W output model MML 144/30LS, hardly used, with circuit, £55 ono. Various VHF/UHF coaxial relays, high and low power. BC-221 with charts and ministry PSU, £20. GW3KAJ, QTHR. 01686 413511 (Llanidloes).

MOSELEY Junior 2-ele tri-bander 10/15/20, gc, £75, also Hidaki 3-ele tri-bander 10/15/20, new stainless steel hardware, gc, £100. Both antennas ready to go, also wanted, un-modified R-210. Buyer collects or pays postage. G0PUD. 01706 632502 (Rochdale). E-mail: dave.shaw@zen.co.uk

MOSELEY TA-32JR, two-element tri-band beam, 10/15/20. All hardware and assembly instructions, vgc, prefer buyer collects, £85 ono. 01608 662609 (Moreton-in-Marsh). E-mail: beedee@beeb.net

PENTIUM computers made by IBM. This includes Windows 98, modem 56K, soundcard, speakers, 15in Super VGA monitor, Canon BJC-1000 printer, £750. All computers come with a two year guarantee. 028 2074 2167 (Dervock). E-mail: petermi0ape@cs.com

RG-213 100m reel, new, £25. BW 6-way antenna switch, £10. JPS NIR-10 noise reduction unit, £40. 01189 693284 (Reading).

SGC high-power 500W Smartuner, £750. SGC-303 500W all HF band mobile antenna, £350. Both £1000. Yaesu FT-301 HF tcvr, £295. 01708 374043 (Romford). E-mail: g3rcq@supanet.com

SILENT key sale for G4RGJ. FT-902DM, FC-902, SP-901, IC-2E, TR-9000, FT-730R, Datong FL-3, telescopic aerial mast, various antennas, 1000s of junk box items, PSUs and miscellaneous units, G6FRB, QTHR. 01905 421182 (Worcester)

SMARTUNER SG-230, automatic antenna coupler, exc cond, £200. Jim, G4LWY, QTHR. 01925 762485 (Warrington). E-mail: jimbryce@talk21.com

TB3 with rotator & winch. Peter, G0CSK. 07957 549150 (Mexborough).

TELEQUIPMENT D61 2-beam oscilloscope, £30, S61 single-beam oscilloscope, £25, good order, Heathkit decade R-box, 0-1Meg £15. Heathkit 0-220MHz sig-gen, £15. Philips PM-5108L func gen, £20. Advance PG-58 gen, £20. Irwin variable power supply, 8A 0-30V, £15. All good working order and tested. Buyer collects or arranges collection. Ted, G4TLY, QTHR. 01666 822935 (Malmesbury). E-mail: g4tly.ted@virgin.net

TR 1998. TR 1986. R 1937. Ex-RAF equipment for sale. Buyer collects. Offers please to 01484 654650 (Huddersfield).

TRIO 9R-59DS general coverage rcvr, including SP-5DS speaker and man, £45. Ten-Tec Century 22 CW tcvr, £220. BNOS 25A PSU, £55. Buyer collects. 01733 554331 after 7pm (Peterborough).

TRIO TS-700G 2m multimode, serviced this year, £200. G4GMY. 01235 225060 (Wantage).

TRIO TS-830S, fitted 500Hz filter, one owner, £275. Diamond CP5 vertical antenna, £30. G/whip Multimobile 71 plus 40/80m coils, £20. AKD HPF6/FIL8 TVI filter, unused, £18. Purchasers view/inspect and collect items 1-2-3 from Norfolk.G8FF, QTHR. 01763 713210 (Norfolk).

TS-430S HF tcvr with matching PS-430 and AT-250 auto ATU, MC-425 mic, h/book, boxed, £450, also Yaesu FT-50R 2m/70cm h/held with charger, £130. Heatherlite mobile mic, 6-pin connector, unused, £12. G3KYF, QTHR. 0116 277 8279 (Blaby, Leics).

YAESU FL-2100Z amp, exc cond, with book, £295 ono. Lake TUA1 QRP SWR meter, mint, £20 ono. Kenwood MC-85 compressor mic, exc cond, £69 ono. Sandpiper 80m to 10m vertical, £75 ono. Wanted: MFJ-259B. Steve. 01691 650722 (Oswestry). E-mail: m0ccn@btinternet.com

YAESU FRG-100, boxed, c/w man, FM option, P/S, perfect cond, 6 mths old, £275 ono. 01460 73315 (Crewkerne). E-mail: nixona35@yahoo.com

YAESU FT-101 modified for all HF WARC bands, £150 ono. KW Vespa, HF CW/SSB tx, £50 ono. Rexon RL-102 VHF h/held 2m tcvr, 5W, 138-174MHz rcvr, £60 ono. G4GCI. 023 8057 6371 (Southampton). E-mail: ntpalmer@palm23.freeserve.co.uk

YAESU FT-101ZD, fan, AM/FM boards, FT-902 ATU, SP901 speaker, YD-148 desk mic, YH-55 h/phones, spare valves, all exc cond, £325. 2 x 14 element MET 2m antennas, as new, £35 each or £60 the pair. 01489 573997 (Southampton). E-mail: colin@hyattc.freeserve.co.uk

YAESU FT-227RA 2m 10W FM, £45.

Kenwood TS-530S HF tcvr, 160-10m plus WARC, £175. Kenwood VFO-240 matching VFO, £50. Hi-mound HK-110 telegraph key, Marble top, £35. Roller-Coaster ATU, 1.8-30MHz, £55. G3JFC, QTHR. 01529 413547 (Sleaford).

YAESU FT-290 MkII, 25W linear amp, £200. Tokyo HX-24 HF transverter, £100. 01204 401673 (Bolton). E-mail: g0wsy1@breathemail.net

YAESU FT-51R dualband 2m/70cm h/held tcvr, charger, h/book, original packing, mint cond, plus two FBA-14 battery cases, new FNB-33 Ni-Cd battery, vinyl case, £210. Bev, G3UIE, *not* QTHR. 01736 350885 (Penzance).

YAESU FT-51R dualband 2m/70cm h/held tcvr, plus spare FNB-31 Ni-Cd battery and diamond RH6 antenna, exc cond, original packing, £195. Icom IC-PCR1000 inc DSP, computer-driven wide-band rcvr, exc cond, original packing, £195. Rob, GW0DFY, QTHR. 01745 590257 (Rhyl). E-mail: robert@ranthony.freeserve.co.uk

YAESU FT-736R VHF/UHF all mode tcvr, exc cond, owned since new, boxed, man, etc, 240V AC, £675. G0KDR, QTHR. 01728 663476 (Saxmundham). E-mail: g0kdr@btinternet.com

YAESU FT-890AT tcvr, HF bands, general coverage receive, mint cond, boxed, with mans, £550. Kenwood TS-440SAT HF tcvr, all bands, boxed, with mans, £425. Robot 1200 SSTV with mans, £275. AEA mini packet, ideal for portable use, self-powered, new Ni-Cads fitted, £85. Timewave DSP-9 audio interference filter, includes leads, PSU, boxed. All the above exc cond, collect. G3TRK, QTHR. 01282 603031 (Nelson). E-mail: don@g3trk.freeserve.co.uk

YAESU FT-990AC HF tcvr, immac cond, boxed, £725. Adonis AM-508 desk mic, boxed, £45. 20ft tilt-over mast, £25. 01474 823797 (Gravesend). E-mail: zipwax@bigfoot.com

YAESU G-500B rotator, elevation/azimuth, £250. 2m 10-ele crossed Yagi, £25. 70cm 8-ele crossed Yagi, £20. 2m masthead pre-amp, £70. 70cm masthead pre-amp, £70. 2 x 17m Heliax, £25. Bolt to house mast with wing, £80. Heathkit Cantenna, £20. MM 2m 100W PA, £80. MM 70cm 100W PA, £80. Bird through-line wattmeter, 3 elements, £150. 01608 811102 (nr Oxford). E-mail: leeming@one-name.org

WANTED

HEATHKIT SB-220 linear amplifier. 01276 686889 (Camberley).

INTERFACE cables or 12 and 16-pin male connectors for Kenwood Trio TS-820S to R-820, TV-502 and TV-506 transverters. Require TV-506 transverter. Glen, M0CPE. 01462 811353 (Shefford).

KEYBOARD for Microwave Modules MM-4001 RTTY tcvr, may buy full system if price is right. Also required is an original Sinclair ZX80 for a private computer collection. Lee, G0PVO. 01706 842355 (Oldham). E-mail: lee.hewitt@oldham.ac.uk

KW160 L-match ATU. Any condition will be considered and reasonable offer made. David. 01823 323015 (Taunton).

MANUAL for Marconi Apollo rcvr. Buy or borrow to copy. Also ditto for Marconi Marlin tcvr. Richard, G0OGN. 01789 293375 (Stratford-on-Avon). E-mail: g0ogn@aol.com

QRP stuff homebrew, Argonaut, Heathkit, Old okay, for keen QRPer. 01730 895309 (Liss). E-mail: m0air@qsl.net

QTH in South Gloucestershire, 2/3 bed, detached or semi, garage with large gardens, up to £150,000. John. 01179 311693 (Bristol). E-mail: m5jon@tinyworld.co.uk

R7000 HF vertical. G0CSK. 07957 549150 (Mexborough).

RA-17L table top cabinet, also red 'Racal' badge. Price to include carriage. 0151 525 5568 (Liverpool). E-mail: clive@g7luc.freeserve.co.uk

ROTARY converter power supply for WS19 (19 set), also base plate. 07768 492562 (Isle of Wight). E-mail: paul.i.martin@btinternet.com

SILENT key clearout, or just not needed. Wanted for research project, QSL accumulations, old call books, etc. Can collect.

0113 269 3892 (Leeds). E-mail: g4uzn@qsl.net

TRIO TS-850, must be mint cond, will consider models fitted with CW filters, primarily state age. TS-120S, £100. G4EVP, QTHR. 01902 847296 (Wolverhampton). E-mail: con@g4evp.fsnet.co.uk

WANTED manual or photocopy for Yaesu FT-101EE. Please help if possible. Good price offered and expenses paid. G3GLW, *not* QTHR. 023 668 918 (Southampton).

YAESU FT-5100 dual band mobile, c/w bracket, etc, vgc. Also FT-290, no mods, vgc. WHY? Steve, G0EVJ. 01543 251915. (Lichfield).

YAESU FTV-901R transverter, with 6m, 2m and 70cm or 4m modules or WHY? FT-736R, FT-726R. 01202 460174 (Poole, Dorset). E-mail: g0faj@freenet.co.uk

Club NEWS

ABERDEEN ARS

4, Junk Sale; 11, Fun Knight - Left foot Keying? (GM8FFX); 18, 2-metre Fox Hunt; 25, Night on the air. Robert, 01224 896142.

APPLEDORE & DARC

19/20, Bull Point Lighthouse weekend; 28, Talk on the Lighthouse weekend. Brian Jewell, 01237 473251.

BARRY ARS

1, On the air & Morse practice; 2-7, GB4GT from Grand Turk Ship; 8,15, On the air; 22, Final planning meeting for GB5FI ; 25-30, GB5FI 2000 Expedition to Flatholm Island (EU-124). Rich, GW4BVJ, 01656 658830.

BLACKMORE VALE RS

1, Morse practice & on the air (VHF); 8, Talk 'CW', by Colin Draper, G3TSK; 15, Morse practice & on the air (HF); 22, Morse practice and shack upkeep. Tony, G0GFL, 01258 860741.

BRACKNELL ARC

9, RSGB Video. E-mail Baugh @compuserve.com

BRAINTREE & DARS

7, EGM re name change; 21, Talk 'Test Equipment', by Dave, G0DEC. Keith, M0CLO, 01376 347736.

BROMSGROVE ARS

8, DF Hunt on foot; 22, Discussion on events over the summer and DF Hunts. B Taylor, G0TPG, 01527 542266.

CAMBRIDGE & DARC

4, '10GHz Power and Frequency Measurement Techniques' - demo by Mike, G8VCN, and Mike, M0BLP; 11, 'The Fascination of Amateur TV' - demo by Sid, G6FKS; 18, '10GHz Tx Laser Communications - Line of Sight' - an experiment by the crazy gang; 25, Talk 'Magnetic Loop Antennas - a Real Copper Pipe Job', by Clive, G8BOU, M5CHH. Bob, G0GVZ, 01223 413401.

CHELMSFORD ARS

1, Talk 'EMC', by Robin Page-Jones, G3JWI. Charles, G0GJS, 01245 256654.

CHELTENHAM ARA

4, Talk 'EMC', by Simon, GW0NVN. John, G4PDQ, 01242 242336.

CHESHAM & DARS

2, General meeting; 9, Antenna erection. Phil, G8BLB, 01494 784811.

CHESHUNT & DARC

2, Members' Forum; 16, Evening on the air; 30, Internal lecturer. David, M1DGS, 01920 463746.

COCKENZIE & PORT SETON ARC

11, 7th Annual junk night, main hall, Community Centre, Port Seton; 19/20, Lighthouse Weekend - Barns Ness. Bob, GM4UYZ, 01875 811723.

COVENTRY ARS

4, Test equipment evening - checks by RA (provisional); 11, Night on the air, Novice class, Morse practice; 18, Treasure Hunt and Barbecue; 25, Night on the air, Novice class, Morse practice. F A Noakes, G2FTK.

CRAY VALLEY RS

3, Communications the St John Ambulance way - Colin, G8XDR (tbc); 17, 'On the Buses', by Richard, G7GLW. Bob, BRS32525, 020 8265 7735 (after 8pm & weekends).

CRYSTAL PALACE & DRC

19, Summer Barbecue at the club house. Bob, G3OOU, 01737 552170.

ECHELFORD ARS

24, RSGB Hamfest - Hatfield House. Robin, G3TDR, 01784 456513.

EDGWARE & DARS

24, Briefing for SSB Field Day entry. David, G5HY, 01923 655284.

FAREHAM & DARS

2, Talk 'Crossed-Field Magnetic Loop Antennas', by Andrew, G0AMS; 9, Talk 'A Simple Guide to the Oscilloscope', by Steve, G7HEP; 16, Club Station G3VEF/G8KGI on the air; 23, Circuits and Components - Part 6; 30, F & DARS mobile on Portsdown Hill - G8KGI/M and others. Steve, G7HEP, 01329 663673.

FARNBOROUGH & DARS

9, Club Awards - Ivor, G4BJQ & Bob, G0YYY; 23, Talk 'Development of Radio and Radar', by John, G3KND, and SWL Fred. Norman, G0VYR, 01483 835320.

FELIXSTOWE & DARS

21, Otley site visit (part of Ipswich Club's Open Week). Paul, G4YQC, 01394 273507.

GLENGORMLY E & ARS

7, Fox Hunt & Barbecue afterwards. David, GI7KAW, 0802 908292.

GLOUCESTER AR & ES

7, Night on the air; 14, Search and Rescue Centre visit; 21, 5WPM Morse practice; 28, VHF/P from escarpment site. Tony, 01452 618930 (office hours).

GRIMSBY ARS

3, Talk/demo 'QSL cards and local photos', by Adrian, G1BRB; 17, Open Night, bring your QSL cards. Brian, G4DXB.

HALIFAX & DARS

15, Sale of pre-used items. Ray, 01274 600297.

HARWICH ARIG

9, Video evening. Eugene, G4FTP, 01206 826633.

HODDESDON RC

1, Rob Mannion – Editor of *Practical Wireless;* 15, Carlos Eavis – Chairman of the RSGB Repeater Management Group; 2, Open Forum. Dave, G0OXI, 07780 862637.

HORNDEAN & DARC

1, Club Social Evening; 22, Talk 'The Mary Rose', by Bill, G7HNW. Stuart, G0FYX, 023 9247 2846.

HORNSEA ARS

2, DF Hunt; 9, Museum pieces; 16, Video techniques with G4YTV; 23, Activity. John, G0TPS, 01964 562258.

HORSHAM ARC

3, Homebrew. David, G4JHI, 01403 750228.

KEIGHLEY ARS

3, Night on the air; 17, DF Hunt, Keighley area; 24, Prize Word Quiz; 31, Barbecue. Ian, M1BGY, 01274 723951.

KIDDERMINSTER & DARS

1, Pre-contest blues. Geoff, G0RJP, 01299 888826.

LEICESTER RS

7, Quarterly Meeting; 14, Barbecue; 28, Bank Holiday - Night on the air. A T Wann, G0TNI, 0116 2630947.

LEISTON ARC

1, Wine and Cheese evening. John, G0FSP.

LINCOLN SHORT WAVE CLUB

2, G5FZ on air; 16, Video - North Texas Contest Club, 1983; 23, Preparation for Special Event; 28, Special Event - Aviation Heritage Centre, East Kirkby, Lincs. John, G1TSL, 01522 793751.

LIVERPOOL & DARS

1, Quiz with G0MSO; 8, Club on the air; 15, ATV demonstration; 29, Surplus Sale. Ian, G4WWX, 0151 722 1178.

LOUGHBOROUGH & DARC

1, On the air evening - try the new 6m beam; 8, 5th DF of the year - bands 2m & 160m; 15, Open Forum - 2m DXing; 22, Any computer old or new - bring it along; 29, 6th and final DF of the year - bands 2m & 160m. Chris, G1ETZ, 01509 504319.

MAIDSTONE YMCA ARS

5, (Sat) RSGB official scheduled Morse test. John, G0RHO, 01622 832259.

MAXPAK

7, Planning for the Elvaston Castle and Leicester Rallies. Ron, G6LRD, 01922 684496.

MID-WARWICKSHIRE ARS

5, Club Field Day - GX3UDN/P on air; 22, ARDF - 2m DF Hunt. Bernard, M1AUK, 01926 420913.

MORECAMBE BAY ARS

15, Talk 'Electricity - Is It As Safe As It Could Be?', by Bob Gant. Brian, G0RDH, 01524 424522.

NORFOLK ARC

9, Ladies' Evening; 23, Table Top Sale. Bring the equipment you didn't sell at

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 by *RadCom*, *Radio Today* 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 not be included. Basic, unchanged details about RSGB-affiliated clubs are published annually in the *RSGB Yearbook*.

Louis Varney, G5RV

LOUIS VARNEY, G5RV, inventor of the aerial that bears his callsign, died peacefully at his home in Burgess Hill, West Sussex, on 28 June 2000. He was 89.

Arguably the most famous name in amateur radio today, his interest in the subject dates back to his early scouting days. At the age of 16, Louis had the Artificial Aerial Licence 2ARV and, with his friend Jack Hum, 2AJI, he experimented with crystals of galena, zincite and bornite in LC circuits with a cat's whisker, obtaining a feeble oscillation. The results of their joint efforts were submitted to the Postmaster General of the day, and they were then awarded their full licences of G5RV and G5UM. Louis remarked "Had we had a better knowledge of Physics, we might have invented the transistor some 18 years before the Americans". As it was, this was left to Bardeen, Shockley and Brattain at the Bell Laboratories in 1948.

He was born on 9 June 1911 into a talented, middle-class family. His schooling began in Golders Green and Hendon, where he became a Boy Scout, earning his Signaller's badge and building his first crystal set at the age of 11. He used to listen to radio amateurs on the 440-metre band.

He left school at the age of 17, becoming an electrical apprentice. After two years, he was invited to attend interviews with the Chief Engineers of the BBC and of the Marconi Company, and decided to accept a post with the Marconi Company in Chelmsford. Within three years he became Chief Instructor, and by 1941 he became Chief Technical Assistant to the Chief Engineer. He left the Marconi Company during the war, and accepted a Commission at Hanslope Park, being responsible for the installation, calibration and maintenance of all SCU3 HF direction-finding systems in the UK.

Returning to the Marconi Company after the war, he worked at the Great Baddow Research Laboratories before being posted to Caracas, Venezuela, on company business.

In 1960, he left Marconi for work with the Supreme Headquarters, Allied Powers, Europe (SHAPE) on a multi-European defence communication project.

The world-famous G5RV aerial dates back to 1946, when his back garden in Stony Stratford was barely 100 feet long. During the intervening years, manufacturers have reaped the financial rewards for selling their G5RVs, while Louis never made a penny from it. He has been satisfied with radiating a good signal from his own three aerials – a half-size, a standard, and a double-size G5RV. Would he use anything else? Louis was always too much of a gentleman to comment.

Over the years, Louis lived in or visited some 75 countries, and has held about 55 callsigns. He was a

(Photo G0WGP)

founder member of the First-Class CW Operators' Club and of the Radio Amateur Old Timers' Association. He was a member of the Radio Society of Great Britain until his death, serving as a member of Council in the 1960s, and having an unbroken membership of 74 years.

His funeral was held at the Woodlawn Crematorium in Brighton, on 4 July. The RSGB was represented, and the funeral was attended by radio amateurs from many countries. Such was the esteem in which he was held by all who knew him, either personally, or via the medium which was his life – amateur radio. Our thoughts and sympathy are extended to his family at this difficult time.

SILENT KEYS

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

2E1EOG	Mr A D Collins	14/03/00
G0DZJ	Mr D S Jelley	21/05/00
G0EAA	Mr J A Handley	03/04/00
G0EAP	Dr J Portnoy	
G0GOF	Mr S Lightfoot	08/06/00
G0SDG	Mr P T Knight	07/06/00
G0UYG	Mr A J Forster	
G0UZU	Mr A Kearney	06/06/00
G0VLP	Mr G Pittam	04/06/00
G0WHB	Mr H A Pope	11/06/00
G1AZM	Mr H Everitt	
G2FHF	Maj C D Didcott MBE, TD	
G3FGT	Mr L F Crosby	
G3GKF	Mr E R Honeywood	
G3IGX	Mr L F Cowling	22/01/00
G3IPZ	Mr D A Allen	
G3OS	Mr F Green	30/04/00
G4AVT	Mr V S Evans	08/02/00
G4ISO	Mr F E Wilson	
G4KZE	Mr R P Ward	
G5BZ	Capt GGE Bennett	28/05/00
G7JSA	Mr E J Toome	/06/00
G8VFU	Mr B A Crof	/10/99
GI3NUM	Mr J S McKinley	23/03/00
GI3VFK	Mr P Harvey	09/04/00
GM3WML	Mr D Smith	
RS174994	Mr D H Gorton	03/06/00
RS22446	Mr A D Smith	02/02/00
RS96271	Mr MPA Nixon	
RS96683	Mr JEV Parker	25/05/00
VK3MR	Mr M Campbell	28/12/99

Barford. John, G0VZD, 01953 604769.

OXFORD & DARS

24, Talk 'Computer Clinic', by Ray Goff, G4FON. Dave, G3BLS, 01865 247311.

QRZ AR GROUP OF SUSSEX

11, Talk and demonstration 'Basic Fault-Finding in Radio Equipment', by Dave, G4XXM. Stuart, M0CHW, 01435 863020.

RADIO SOCIETY OF HARROW

27, GB2DHH on the air. 60th anniversary of Mosquito maiden flight. Jim, G0AOT, 01895 476933 or 020 7278 6421.

SALOP ARS

3, Talk 'Civil Aviation', by M1EQV; 24, Final DF Hunt. Fred, G3NSY, 01743 790457.

SOUTH BRISTOL ARC

2, 70cm activity evening; 9, Summer darts match/Bristol Rally preparations, with Fred and Muriel; 16, On the air; 23, M5s HF Activity evening; 30, Final Bristol Rally preparation evening with Muriel, G4YZR. Len, G4RZY, 01275 834282.

SOUTH MANCHESTER RC

4, Talk 'PSK31', by G4HON; 11, On the air; 18, Talk 'Africam', by G0BJK. Edward, G7FQY, 0161 969 1964.

SOUTH NOTTS ARC

23, Meet at the Sun Inn Gotham for SSB Field Day. 01509 672846.

SPEN VALLEY ARS

3, 2m Direction Finding on foot. Russell, G0FOI, 01274 875038.

SURREY RADIO CONTACT CLUB

7, Talk 'The Wright Brothers', by David Foster, G3KQR. Berni, G8TB, 020 8660 7515.

TELFORD & DARS

2, On the air; 9, Talk/demo 'Using a PC as Test Equipment', by G7KZB; 16, HF operating practices/WAB operating. Talks by G3UKV, G3JKX and G3VUV; 24, Antenna night, with G3UKV et al; 31, Pre-Rally meeting. Mike, G3JKX, 01952 299677.

THORNTON CLEVELEYS ARS

7, Quiz; 14, Talk 'Aircraft Instuments', by Mic, G4EZM; 21, Talk 'Electronics', by Jack, M0BMQ. Jack, G4BFH, jack@duddingt.u-net.com

TORBAY ARS

18, Barbecue. Peter, G4VTO, 01803 864528.

VERULAM ARC

21, Demonstration and discussion on Dowsing. Walter, G3PMF, 01923 262180.

WAKEFIELD & DARS

1, Treasure Hunt; 8, Rally meeting; 22, Visit TBA; 29, Video evening. John, G7JTH, 01924 251822.

WARRINGTON ARC

1, Talk 'Ferrite Applications', by George, G3OGQ, John, G0RPG, 01925 762722.

WELWYN HATFIELD ARC

21, Designing a QSL card on a PC, with Bob Fuller, G6PWS. Dean, 07968 119975.

WEST SOMERSET ARC

1, Barbecue. Alan, M0AOJ, 01643 707207.

WESTON-SUPER-MARE RS

7, 2m Test Oscillator Mk II (Walter Titmuss); 21, Workshop. Doug, G0WMW, 01934 629160.

WORTHING & DARC

2, Vertical Antennas for HF; 9, ONdigital; 16, Discussion; 23, Printed Circuits. Roy, G4GPX, 01903 753893.

YEOVIL ARC

3, SWR Measurement, G3KSK; 10, Brains trust with M0ARO; 17, The Novice Licence, G3ICO; 24, Talk 'Pre-WWI Amateur Radio', by G3MYM; 31, On the air. George, G3ICO, 01935 425669.

Rallies & Events

This is a list of all rallies, hamfests, exhibitions and conventions notified to HQ (as at press date). Items are given in detail for the next three months inclusive and in brief thereafter. Please send detailed information, including contact callsign andtelephone numbers direct to HQ and marked 'Rally News – DIARY'.

6 AUGUST 2000

DERBY & DARS Mobile Rally & Computer Fair – Littleover Community School, Pasture Hill, Littleover, Derby, on the A5250 just north of A38 junction, on Derby outskirts. Martin, G3SZJ, 01332 556875 or e-mail martin@martinshardlow.demon.co.uk

11 AUGUST 2000

COCKENZIE & PORT SETON ARC 7th Annual Radio Junk Night – Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton. OT 6.30pm, £1, JS, C, DF. Bob, GM4UYZ, 01875 811723, e-mail bob.gm4uyz@btinternet.com or packet GM4UYZ@GB7EDN.

13 AUGUST 2000

FLIGHT REFUELLING ARS Hamfest 2000 – Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. OT 10am, TS, B&B, CBS, TI on S22, CS. Keith, G1VHG, 01202 577937.

KING'S LYNN ARC 11th Great Eastern Rally – Park High, Queen Mary Road, Gaywood, King's Lynn. TI on S22, CP free, B&B, C. Derek, G0MQL, 01553 841189, Fred, 01760 440570 or www.qsl.net/g3xyz

18 – 20 AUGUST 2000

PRINCE GEORGE HAMFEST 2000 – Prince George, BC, Canada. CP, CS, LEC, C, WIN. www.pghamfest.dhs.org/

20 AUGUST 2000

LEEDS & DARS Twice-yearly boot sale – Yarnbury Rugby Club, Brownberrie Lane, Horsforth, Leeds. CBS, C, CP free for buyers. J A Mortimer, M1CAI, 01943 874650.

27 AUGUST 2000

COLERAINE & DARS Annual Rally – Bohill Hotel, Coleraine. OT noon, TS, B&B. Brian, GI8LTB, 02870 358664 or Jim, GI4ORI on 02870 352393

MILTON KEYNES ARS 14th Rally and Car Boot Sale – Bletchley Park Museum. OT traders 7am, buyers 9am, £1, TI on S22 and SU22, C, MT (two photos needed), museum tours, GB2BP open. Dave, G3ZPA, 01908 501310 or e-mail m0bzk@bletchley.net

TORBAY ARS Mobile Rally – Churston Grammar School, Greenway Road, Churston, Torquay. OT 10am, £1, TI, CP, C, TS, WIN, MT (two photos needed), B&B. John, 01626 205514 or rally@tars.org.uk

28 AUGUST 2000

HUNTINGDONSHIRE Amateur Radio Rally – Emulf Community School, St Neots, Cambs (near Tesco superstore on the A428). OT 10am, £1.50, C, CBS, TI on S22.

David, G7DIU, 01480 431333 between 9am and 9pm.

3 SEPTEMBER 2000

ANDOVER RADIO AMATEUR CLUB Radio & Computer Boot Sale – Middle Wallop Airfield, on the A343 between Andover and Salisbury. Entrance near to the Museum of Army Flying. OT 10am, 50p, TI on S22. Jack, G0UJW, 01264 391383.
SOUTH BRISTOL ARC Computer & Radio Rally–Brunel Centre, Temple Meads Station, Bristol. OT 10.15am/10.30am, £1.50 (accompanied under-12s free), B&B, C. Muriel, 01275 834282.

10 SEPTEMBER 2000

LINCOLN SWC Hamfest – Lincolnshire Showground, on A15, 5 miles north of Lincoln. OT 10.30am, £2 (under-14 free), CP, TI on 2m, CS by arrangement, C, TS, B&B, FM, MT (two photos needed). John, G8VGF, 01522 525760.
TELFORD RADIO RALLY – RAF Museum, Cosford. OT 10am, DF, TS, RSGB, B&B, FM, SIG, MT (two photos needed), FAM, TI on S22. E-mail jim@tweedale15.freeserve.co.uk
VINTAGE Technology 2000 – Blackpool. Brian, 01253 508232.

16/17 SEPTEMBER 2000

TRANSMISSION 2000 – National fund-raising event organised by the British Wireless for the Blind Fund. Get sponsorship for every contact you make and help to provide specially-adapted audio equipment free for life to UK-registered blind people who are lonely and in need. There are prizes for the most contacts. See July *RadCom* p76, telephone 01634 832501 or e-mail Pat@blind.org.uk

22/23 SEPTEMBER 2000

LEICESTER Amateur Radio Show – Donington International Centre, Castle Donington, Leics. Geoff, 01455 823344, fax 01455 828273, or e-mail g4afj@argonet.co.uk

1 OCTOBER 2000

BELGIUM AMATEUR RADIO & COMPUTER RALLY – Hall 'la Louvière Expo', la Louvière, access direct from motorway, 50km south of Brussels. OT 9am, TI on repeaters 145.600 and 430.325MHz, TS, FM. Michel, ON7FI, 0032 64 849 596.
GREAT LUMLEY AR & ES Rally – Great Lumley Community Centre, Front Street, Great Lumley, Chester-le-Street. OT 10.30am/11am, £1 (accompanied under-14s free), TI, CP free, C, B&B, JS. 0191 384 2803 or 020 8937 2772.

8 OCTOBER 2000

NORTH WAKEFIELD RC 17th Radio Rally – TS, SIG, B&B, C, MT (two photos needed). http:/www.nwrc.mcmail.com or 01924 824451.

13 -15 OCTOBER 2000

RSGB International HF and IOTA Convention - Old Windsor, Berkshire. RSGB, 01707 659015.

15 OCTOBER 2000

BLACKWOOD & DARS Radio, Computer & Electronics Rally – Newport Centre, Newport, 1 mile from jn 25A M4. OT 10.30am/11am, B&B, TI, CP, TS, SIG, LB, C, DF. Stuart, 01495 243824 or 07970 777756, fax 01495 240260 or e-mail fireham@aol.com

CONGRATULATIONS

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

50 years		*60 years*	
Mr E F Steventon	G3JJA	Mr J Sagar	GW3ARS
Mr K Frankcom	G3OCA		
Mr M C Bunting	G6BZ		
Mr F T Farmer	G6JY		
Mr D R Rollo	GM3GRG		
Mr A Lawrence	GM3IQL		

HORNSEA ARC Rally – Duncan, G3TLI, 01964 532588.

29 OCTOBER 2000

GALASHIELS & DARS Annual Radio and Computer Rally – The Volunteer Hall, St John's Street, Galashiels. TS, B&B, C. Jim, 01896 850245 or e-mail jimk@gm7lun.freeserve.co.uk

4/5 NOVEMBER 2000

NORTH WALES RRC Rally 2000 – Muriel Mee, GW7NFY, 01745 591704 or Ted, GW0DSJ, 01745 336939. Club web page www.nwrrcw.org.uk

5 NOVEMBER 2000

NORTH DEVON RADIO RALLY–G8XMI, QTHR, 01409 241202.

12 NOVEMBER 2000

GREAT NORTHERN HAMFEST – Ernie, G4LUE, 01226 716339 or 07787 546515 or ernest.bailey1@virgin.net
MIDLAND ARS 12th Radio & Computer Rally – Peter, 0121 443 1189.

19 NOVEMBER 2000

WEST MANCHESTER RC Red Rose Rally – Don, G3BSA, 01942 871620, or don@g3bsa.freeserve.co.uk

25 / 26 NOVEMBER 2000

LONDON AMATEUR RADIO & COMPUTER SHOW - 01923 893929.

26 NOVEMBER 2000

BISHOP AUCKLAND RAC Rally – Mark, G0GFG, 01388 745353 or Brian, G7OCK, 01388 762678.

21 JANUARY 2001

OLDHAM ARC Rally – Geoff, 01706 846143.

28 JANUARY 2001

LANCASTRIAN Rally - G0GVA, 01772 621954.

4 FEBRUARY 2001

HARWELL ARS Rally – Ann, 01235 816379
SOUTH ESSEX ARS 16th Mobile Rally – Brian, G7IIO, 01268 756331 or briang7iio@yahoo.com

11 FEBRUARY 2001

CAMBRIDGE & DARC Radio Rally & Car Boot Sale – G0GKP, 01954 200072.

21/22 APRIL 2001

LONDON AMATEUR RADIO and COMPUTER SHOW - 01923 893929.

20 MAY 2001

DRAYTON MANOR Radio & Computer Rally - Peter, G6DRN, 0121 4431189 (eve).

GB calls

These callsigns are valid for use from the date given, but the period of operation may vary from 1 – 28 days before or after the event date. Operating details are provided in an abbreviated form as follows:
T = 160m; L = 80 or 40m; H = HF bands (30 – 10m); V = 6 and / or 4m; 2 = 2m; 70 = 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.

1 Aug GB0KW: Korean War. Southampton, Hants. LHV2 (G0SWY)
GB2MUM: Queen Mother. Woking. LH2 (G0WEE)
GB2TFA: Twenty Fifth Anniversary. Denmead, Hants. TLHV27 (G4PRG)
GB4GT: Grand Turk. Dover, Kent. (GW0PUP)
GB4SFL: South Foreland Light. Dover, Kent. (GW0ANA)

2 Aug GB2QM: Queen Mother. Taunton, Devon. (G3RNB)

3 Aug GB0RIP: Ripley Castle Camp. North Yorks. LH2 (M0BJX)

4 Aug GB0QM: Queen Mother. Bristol. TLH (G0NFH)
GB2FX: Felixstowe. Felixstowe, Suffolk. LH2 (G4YQC)

6 Aug GB2TSR: Torbay Steam Rally. Near Brixham, Devon. TLHV2S (G0CDB)

9 Aug GB2QM: Queen Mother. Boston, Lincs. LH (G3JRY)
GB2RCC: Radio Caravan Camping. Elvaston, Derby. (G4EPN)

12 Aug GB2BPM: Big Pit Mine. Blaenavon, Gwent. L2 (G4KJV)
GB2HA: Hood Association. Hampshire. LH27P (G0LMD)
GB2OG: Oxfordshire Guides. Blackwell, Worcs. LH27 (G0RKG)
GB2TS: Tollerton Show. Tollerton, York. LH2 (G3WVO)
GB4ASH: Ashfield Show. Sutton in Ashfield, Notts. LV27 (G0NRA)

13 Aug GB0RID: Wartime Call sign. Great Yeldham, Essex. L (G3MMA)
GB4CPF: Clayton Playing Fields. Royton, Clayton. L2 (G0BJR)

16 Aug GB2QM: Queen Mother. Moray. (GM3KHH)

17 Aug GB0DCW: Dawlish Carnival Week. Dawlish, Devon. LH2 (G3LHJ)
GB2DCW: Dawlish Carnival Week. Dawlish, Devon. LH2 (G3LHJ)

18 Aug GB2RFS: Ruthin Flower Show. Denbighshire. LH2 (GW4WSU)

19 Aug GB0BTC: Belfast Titanic City. Belfast. LH2 (GI0VAB)
GB0CCL: Calshot Castle Light. Southampton. LH2 (G0LKG)
GB0LCS: Lairg Crofters Show. Sutherland, Scotland. (GM4VVX)
GB0LSP: Lightship Petrel. Whiterock, Co. Down. TLH2 (GI4NJQ)
GB0SHW: Saltburn Heritage Week. Saltburn-by-the-Sea. L2 (G4OLK)
GB2BPL: Bull Point Lighthouse. Morthoe, North Devon. LH2 (M0BRB)
GB2LBN: Lighthouse Barns Ness. Dunbar. LH2 (GM4UYZ)
GB2LMG: Lighthouse Mull of Galloway. Dumfries & Galloway. TLHV27P (GM0FSZ)
GB2LO: Lighthouse Orkney. Birsay, Orkney. LH (GM0HTH)
GB2LSA: Lighthouse St. Ann's. Pembrokeshire. LHV2 (GW3IGG)
GB2LT: Lighthouse Turnberry. Turnberry, Ayrshire. LHV2 (GM4SUC)
GB2LZL: Lizard Lighthouse. The Lizard, Cornwall. LH (M0BMX)
GB2RL: Roker Light House. Roker, Sunderland. TL2 (M0AYI)
GB2SL: Spurn Lightship. Hull Marina. H27 (G4VHM)
GB2SML: St Mary's Lighthouse. Whitley Bay, Tyne & Wear. (M0BHS)
GB2THL: Trevose Head Lighthouse. Padstow, Cornwall. LH (M0BGA)
GB2WL: Whitehaven Lighthouse. Whitehaven, Cumbria. LH2 (M0CRM)
GB4KEN: RAF Kenley. Kenley, Surrey. LH27P (G3ZPB)
GB4SCA: Scarborough Lighthouse. North Yorks. LH2 (G4SSH)

24 Aug GB2RCC: Radio Caravan Camping. Cambs. (G4EPN)

25 Aug GB0RAF: Royal Air Force. Doncaster. TLHV27 (G0DAM)

26 Aug GB2LL: Langford Lodge. Crumlin, Co. Antrim. LH (GI0OUM)
GB2PJN: Peter John Neal. Alvaston, Derby. LH27P (G0IYZ)

27 Aug GB2NJA: Suffix of Club's Callsign. Brixham, Devon. LH2 (G3LHJ)
GB2SS: Silk Screen. Spilsby, Lincolnshire. TL27P (G4OSB)
GB4RFC: Rosliston Forestry Centre. Swadlincote, Derbyshire. (G4CRT)
GB5MC: Morse Campaign. Cambridge. L (G3PJT)

28 Aug GB4TCF: Town & Country Festival. Warwickshire. TLHV27P (G4GHJ)

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.

Helplines FOR MEMBERS

● Henry, G0NBQ, would like to **thank everyone** who responded to his 'Helplines' appeal in the April edition of RadCom, especially René, F6BGI, who sent his KW202 Manual.

● Umberto, I1BIN, is looking for a copy of the circuit diagram and information on the **Racal RA-1781**. Also, any information on the **Beckman L-10A** Megohmmeter. All costs reimbursed. Umberto Bianchi, 81 C.so Cosenza, 10137 Torino, Italy.

● Jim, G0VOA, is looking for a manual for the **Sinclair PFM-200** frequency meter. All costs covered. G0VOA, QTHR. Tel: 01244 332649.

● Gwyn, G4FKH, Vice Chairman of RSGB Propagation Studies Committee, is looking for volunteers to **assist with a committee project** that is associated with monitoring NCDXF beacons. The project is expected to run for between one and two years. G4FKH, QTHR. E-mail: gwyn@g4fkh.demon.co.uk

● Adrian, G4JBH, is looking for a copy of the circuit diagram and recommended modifications for the **KW Atlanta** transceiver. All costs gladly reimbursed. Tel: 01288 331113. E-mail: g4jbh@compuserve.com

● Ted, G8HLJ, is looking for information on the **Taylor 172A** valve voltmeter. All costs covered. G8HLJ, QTHR. Tel: 0151 632 0614.

● Bob, G0IIP, is looking for a copy of the wiring diagram of the **Yaesu MH-1 E8** microphone. All costs covered. G0IIP, QTHR. Tel: 0973 548138. E-mail: g0iip@compuserve.com

● Albert, G4PYQ, would like a copy of the instructions for the **MARC Pathfinder NR52F1** dual-conversion radio. He would also welcome contact from any owner of the same. G4PYQ, QTHR. Tel: 0161 366 0927. E-mail: hill.albert@talk21.com

● Ron, G3JXV, is looking for a copy of the service manual for the **Yaesu FT-707**. G3JXV, QTHR. Tel: 01245 323293.

● Alan, RS180509, is looking for information on the AEL Communications **Saturn C100** data terminal. Also, any information on the ICS Electronics **FAX-1** weather fax system. Tel: 01794 501551

● Pat, G3YFK, needs a copy of the technical manual (*not* the operators' manual) for the **JRC NRD-92** or **NRD-93** HF receiver. All costs fully reimbursed. G3YFK, QTHR. Tel: 01743 884858.

● Martin, G4GRS, would like to hear from anyone who has information on the **BSRA**. Their badge (see photo) is similar in size to an RSGB lapel badge. G4GRS, QTHR. E-mail: martin@g4grs.co.uk

● G0IPT is loooking for circuits for the **Scopex 4D10A**, the **Rapid Electronics 7020-20M**, and the **EMI MOD101** oscilliscopes. D Briggs, 5 Collingwood Avenue, Muswell Hill, London N10 3EH.

● Zygmunt, G3PTN, is looking for a users/service manual or any information on the **Trans-World TW-100** transceiver, supplied in the UK by KW Communications Ltd. All costs reimbursed. Telephone 01132 654644 or email zygic@btinternet.com

Helplines is a free service to members. Requests for help are published in the order they are received.
We regret it is not possible to provide an undertaking of when any submitted request will be published.

RSGB BOOKSHOP

Space Radio Handbook
All about Amateur Radio satellites.
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NOSintro TCP/IP over Packet Radio
practical info - setting up KA9Q.
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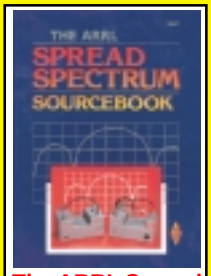

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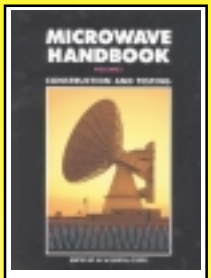

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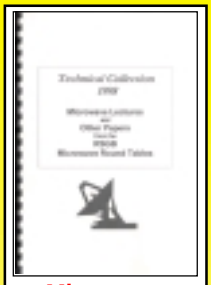

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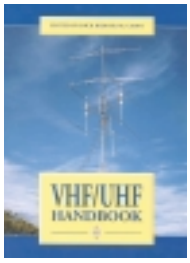

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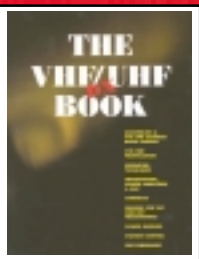

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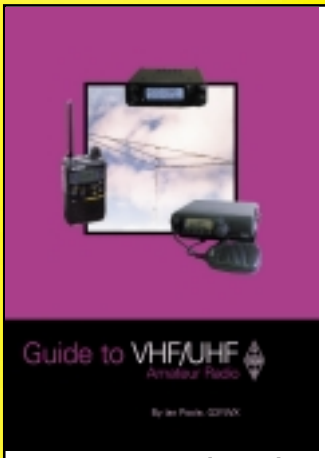

Guide to VHF/UHF Amateur Radio

By Ian Poole, G3YWX

The handy new guide to operating on the bands between 30MHz and 3GHz. Ian Poole describes how to get the most from your VHF/UHF station. Covers propagation, bandplans, receivers & transmitters, antennas, mobile and repeaters, DXing, data comms and commonly used abbreviations.

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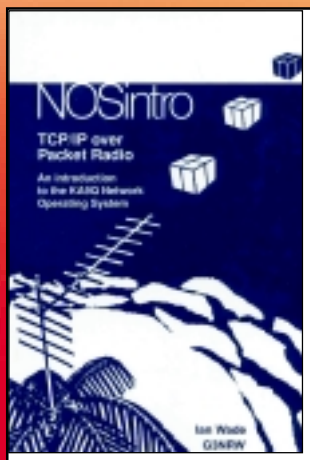

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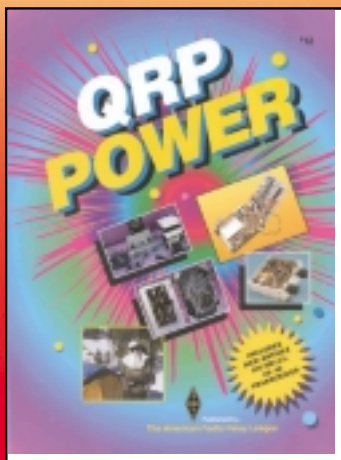

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BM65 2 X ⅝ Wave, Length 100", 8.0 dBd Gain **£69.95**

Reinforced hardened fibre glass masts (GRP)

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

Guy rope 30 metres

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

70cms vertical co-linear base antennas

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

Multi purpose antennas

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

Yagi Beams

All fittings Stainless Steel

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

Mobile HF Whips

(with 3/8 base fitting)

AMPRO 6 mt **£15.95**
(Length 4.6' approx)
AMPRO 10 mt **£15.95**
(Length 7' approx)
AMPRO 12 mt **£15.95**
(Length 7' approx)
AMPRO 15 mt **£15.95**
(Length 7' approx)
AMPRO 17 mt **£15.95**
(Length 7' approx)
AMPRO 20 mt **£15.95**
(Length 7' approx)
AMPRO 30 mt **£15.95**
(Length 7' approx)
AMPRO 40 mt **£15.95**
(Length 7' approx)
AMPRO 80 mt **£18.95**
(Length 7' approx)
AMPRO 160 mt **£49.95**
(Length 7' approx)

Single band mobile antennas

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

ZL Special Yagi beams All fittings stainless steel

2 metre 5 Element
(Boom 38") (Gain 9.5dBd) ... **£31.95**
2 metre 7 Element
(Boom 60") (Gain 12dBd) **£39.95**
2 metre 12 Element
(Boom 126") (Gain 14dBd) .. **£65.95**
70 cms 7 Element
(Boom 28") (Gain 11.5dBd) **£24.95**
70 cms 12 Element
(Boom 48") (Gain 14dBd) **£39.95**

Dual band mobile antennas

MICRO MAG 2 Metre 70 cms Super Strong 1" Mag Mount (Length 22") **£14.95**
MR 700 2 Metre 70 cms (¼ & ⅝ wave) (Length 20") (⅜ fitting) **£6.99**
MR 700 2 Metre 70 cms (¼ & ⅝ wave) (Length 20") (S0239 fitting) **£9.99**
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (¼ & 5/8 wave) (Length 60") (3/8 fitting) **£16.95**
MR 777 2 Metre 70 cms 2.8 & 4.8 dBd Gain (¼ & ⅝ wave) (Length 60") (SO239 fitting) **£18.95**
MR 750 2 Metre 70 cms 5.5 & 8.0 dBd Gain (⅛ & 3 x ⅝ wave) (Length 60") (SO239 fitting) **£38.95**

Tri band mobile antennas

MR 800 2 Metre 70 cms 6 Metres 3.0, 5.0 & 7.9 dBd Gain (¼, ⅜ & 3 x ⅝ wave) (Length 60") (SO239 fitting) **£39.95**

Ribbon ladder USA imported

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

Short Wave receiving antenna

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

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

Duplexer & antenna switches

MD-24 (2 Way Internal Duplexer) (1.3-35 Mhz 500w) (50-225 Mhz 300w) (350-540 Mhz 300w) insert loss 0.2dBd **£22.95**
MD-25 (2 Way external/Internal Duplexer) (1.3-35 Mhz 500w) (50-225 Mhz 300w) (350-540 Mhz 300w) insert loss 0.2dBd **£24.95**
CS201 Two way antenna switch, frequency range 0-1Ghz, 2.5 Kw Power Handling **£18.95**

Log Periodic

MLP32 TX & RX 100-1300 Mhz One Feed, S.W.R. 2:1 and Below over Whole Frequency Range. Professional Quality **£99.95**

Mounts

TURBO MAG MOUNT (7") 3/8 or S0239 ..... **£14.95**
TRI-MAG MOUNT (3x5") ⅜ or SO239 ..... **£39.95**
Stainless Steel Heavy Duty Hatch Back Mount with 4 mts of coax and pl259 plug (⅜ or SO239 fully adjustable with turn knob) **£29.95**
Stainless Steel Heavy Duty Gutter Mount with 4 mts of coax and PL259 plug (⅜ or SO239 fully adjustable with turn knob) **£29.95**

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RG58 BEST QUALITY STANDARD per mt **35p**
RG58 BEST QUALITY MILITARY SPEC per mt **60p**
BEST QUALITY MILITARY SPEC MINI 8 per mt **70p**
RG213 BEST QUALITY MILITARY SPEC per mt **85p**
H100 Coax Cable per mt **£1.10**

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Antenna Rotators

AR-300XL Light duty UHF\VHF **£49.95**
YS-130 Medium duty VHF.. **£79.95**
RC5-1 Heavy duty HF **£299.95**

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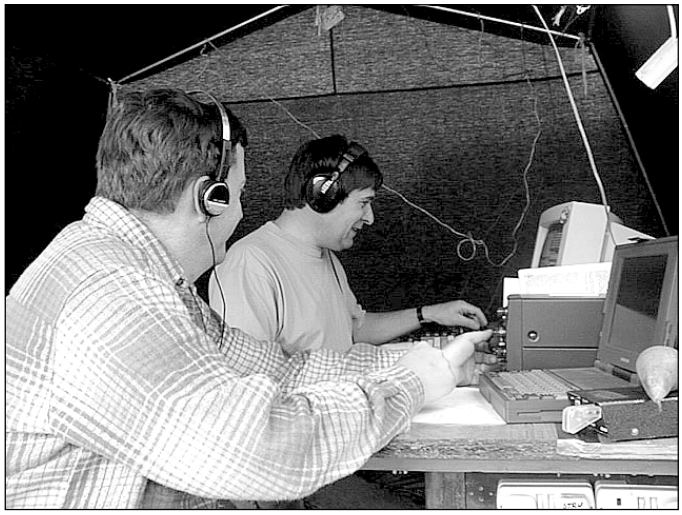
CONTEST

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

I HAD THE PLEASURE of joining Dave, G4BUO, and Gary, G4IFB, for part of this year's CW NFD at G3GRS/P. It is always interesting to see how different people approach the event, and this year was no exception. I came away very impressed and having enjoyed the weekend. Something that was new to me, for NFD at least, was using a FT-1000, which of course has two receivers. So, whilst one operator is calling CQ, a second operator can be tuning around the band, looking for stations not yet worked. This takes a reasonable amount of care, but can yield good results. Of course, when things get really quiet, you can both tune around the band, which yields a much higher search and pounce rate than you might have otherwise achieved.



Gary, G4IFB, and Dave, G4BUO, operate G3GRS/P during NFD 2000.

To maximise the effectiveness of this approach, you really need to have two linked logging computers, one for each operator. That way, both can check calls independently to see if they are needed. Linking the two logs and machines is quite easy to do using software such as K1EA's CT. There is a networking system built into CT that allows you to use a null-modem serial cable between the machines to create the link. More advanced users are employing Ethernet networks between the two machines, which of course provides much faster performance (eg a link speed of 100Mb/s rather than 115kb/s).

Many operators have been using 'two-radio' techniques in single-operator contests for some time now. The idea is very similar, to use two radios and whilst you are calling CQ on one band, you can listen on another band. You have to discipline yourself to listen carefully on another band whilst you are calling CQ. It's ideal, for example, for checking if 28MHz is open. I first had the opportunity to use this system at VE3EJ during the Commonwealth Contest. It proved ideal, because there are several times during the contest when different bands are open to the UK and Oceania simultaneously, so it is very handy to be able to listen on both bands to assess the most productive band to be on.

WHERE HAVE ALL THE STATIONS GONE?

IN EVERY CONTEST, there's generally a period when you start to wonder whether you are radiating any signals, because the contacts seem to dry up. What do you do at this point? Certainly the first thing to realise, if you are to succeed in the contest, is that you must persevere. For example, you might check the band, to see if there is anyone calling CQ that you haven't yet worked. If so, a few moments of search and pounce are almost certainly called for. Don't forget that you should work everyone you can hear, not just the multipliers! They are all good points.

Once you have mopped up those stations, what then? Clearly you are back to calling CQ. The essential point is that you need to make it as easy as possible for new stations to hear you and work you. The strategy you use may differ from HF to VHF, for example, and also on whether you are a low- or high-powered station. On HF, with a high-powered station you have the luxury of trying some beam directions that you suspect will be profitable and calling fairly persistently. Use your knowledge of propagation to help you decide where to put the beam, whilst remembering some of the quirky openings that happen from time to time (eg the 28MHz 'dog-leg' path from Europe to North America rather than the usual great circle route). At VHF, with a low-power station, what you certainly cannot do is leave the beam in the same direction and just keep calling CQ. You need to change things a bit. One mentor told me that if you called CQ three times in a row without any replies, then it was time to nudge the beam around a fraction. This is particularly true on the higher bands where beamwidths are so narrow, so keep tweaking the beam around, but don't move it so much and so often that people are likely to hear you for a second and then fade out as you turn the beam, make sure that they have a chance to work you first! Also, use your imagination a bit. If you are on one of the airways in and out of the UK, put the beam along that path in the hope that you may get some scatter off a high-flying plane. If you are both quick, this can be a very effective technique. Perhaps you might try calling CQ on CW, sometimes you will be pleasantly surprised to work people that might not hear you (or want to work you) on phone.

The essential thing then, when it all goes quiet, is to realise that you must persevere and you must keep changing things until you find something that works and brings you more contacts. Remember the soft skills too – like sounding like a happy and efficient operator. They will always attract more callers than someone who sounds bored.

CONTESTS THIS MONTH

ONE OF THE interesting contests this month is the Worked All Europe (CW) event, organised by the German national society, DARC. The exchanges are fairly standard, but there is also the QTC which has the capacity to make a grown person cry! The QTC is actually quite simple, and is a list of stations that you have worked, along with times and serial numbers, that are exchanged between competitors – to test the ability to pass information. Have a listen to the contest on 12/13 August to hear it in action!

A nice series of cumulative contests for the VHF enthusiast starts up this month as well; the 144MHz series. They are two-and-a-half hours in duration, between 2000 and 2230 local time. It's an ideal time to work a few people in a gentle sort of contest environment.

The 70MHz Trophy is one of the flagship contests on this band. This takes place on 13 August and you are guaranteed to be able to work some good DX on four metres. Generally speaking, to win this contest you need to be away from the major centres of population and to have a good system. Most of the groups that have been successful in the past have headed for Scotland, Northern Ireland or the Isle of Man. Go too far north and you won't be able to work the smaller stations. So it is an interesting balancing act! It's also a great opportunity to work people from other areas which don't get activated on four

metres so regularly. If you are an occasional user of four, this is a day to be active.

LF Cumulative, January 2000

THESE EVENTS are a great way to start the new year. From my own station, the contest was as lively as ever, right from the first session on New Year's Day, with some good competition between entrants at both ends of the table.

Something definitely new in this contest was the appearance of the /2K millennium suffixes – several entrants were caught out by these and logged them as /2 thinking that the 'K' was the invitation to transmit and not part of the callsign!

John Muzyka, G4RCG, from Wakefield, takes the top honours and the HFCC Trophy, thanks to a superb band-winning 40m score, and for finding a few more elusive Novices. Chris Burbanks, G3SJJ, takes second place again this year, and tops the 80m and 160m individual band listings.

For next year, if you are active in three sessions per band, please remember to state *which two sessions* you would like to count for the final results. Congratulations to all of the winners, and thanks to everyone who took part.

I must thank John, G3MCX, Alan, G8OO (ex-G0SAH), and Jan, G0IVZ, for their work with the band adjudications.

Lee Volante, G0MTN

RSGB 7MHz DX CW, February 2000

THIS CONTEST SEEMS to retain its popularity and the number of stations entering seems to remain pretty constant. This year's soapbox reiterates the problems, with more than one contest being run simultaneously. Our contest co-exists with that of the UBA and this seems to cause a problem to some. "How some stations managed to find 500+ stations, I do not know. I struggled to make 181" - G3HZL. "This contest, like so many of the RSGB contests, needs a serious facelift" - G0LII. "Always an enjoyable contest. Pity the UBA is on at the same time" - G3MPB. "The aurora reduced my QSO total by about 100" - GM3POI. "Got the impression there were not so many Gs this year" - EA6ZY. "Where were all the GJ, GU, GD and GI stations?" - DL1JFM. PA0JR stated he was using a 'Windom' as an antenna – I assume he meant a 'Windom'! I should comment on YU7SF, who has now entered 33 contests on 7MHz – well done Rudic!

This year the Open Section was won comfortably by Clive, GM3POI, from his eyrie in Orkney. Clive used an FT-1000D and a Titan amplifier into a 4-square with some 400 radials. Runner-up was Chris, G3VHB, who used an IC-775 at 200W into a 3-element yagi at 100 feet!

LF Cumulative, January 2000

Pos	Call	40m	80m	160m	Total
1	G4RCG	705	673	518	1896
2	G3SJJ	456	681	558	1695
3	G3IZD	573	557	435	1565
5	G3GLL	498	600	401	1499
4	G0JQN	504	575	416	1495
6	G4OGB	459	509	426	1394
7	G3ZBE	474	523	352	1349
8	G2HLU	471	528	339	1338
9	G3HZL	426	491	417	1334
10	GW3NJW	513	478	294	1285
11	G3YAJ	435	506	328	1269
13	G0VQR	396	496	335	1227
15	G2AFV	420	515	276	1211
14	G3FYQ	408	469	327	1204
16	G3TJE	402	469	330	1201
18	G3ZGC	387	501	285	1173
17	G3JSR	435	458	270	1163
12	G3LIK	501	450	210	1161
19	G0MTN	330	510	207	1047
20	G3JJG	486	357	138	981
21	G0IGP	381	452	132	965
22	G3AWR	390	351	213	954
23	GW3WWN	441	482	-	923
24	G3GMS	321	346	193	860
25	G4XPE	330	381	132	843
26	GW3SB	297	365	180	842
29	G0DVJ	465	359	-	824
28	GW3PRL	270	294	255	819
34	G4BLI	309	422	-	731
27	GW0KZW	276	241	213	730
31	G0LZL	183	533	-	716
30	G0VYR	216	346	140	702
32	GM3UM	282	231	180	693
33	G3RSD	270	270	150	690
35	G4EBK	171	450	-	621
36	G0MRH	221	256	139	616
37	G3GMM	135	242	207	584
39	G4ZRR	210	357	-	567
38	GM0CLN	192	222	150	564
40	G4PTE	240	246	-	486
41	GW4KVJ	177	96	156	429
42	LY3BA	-	266	-	266
43	GM0JKF	-	241	-	241
44	G0VZC	72	53	36	161
45	G3ZDD	-	160	-	160
46	G3VQO/2K	-	-	150	150
47	UA9CR	-	-	63	63

Checklogs: GW3SYL, GW3KDB

7MHz DX CW, February 2000

UK Open Section

Pos	Call	QSOs	Mults	Score
1	GM3POI	715	87	630750
2	G3VHB	624	82	494100
3	G4BJM	610	74	421504
4	G4RCG	471	71	269275
5	G0LII	487	63	258074
6	M0ABC/P	561	52	256584
7	G2QT	361	62	190180
8	G3UFY	281	50	123970
9	G3ZDD	194	44	58212
10	G3BPM	140	43	42140
11	G2AFV	134	35	31556
12	G3TXF	77	35	18865

UK Restricted Section

Pos	Call	QSOs	Mults	Score
1	G3WPH	318	49	106575
2	G3VYI	285	50	101200
3	G4CWH/P	248	49	83300
4	G3SJJ	257	45	80775
5	G3RSD	254	47	80605
6	G3YEC	215	45	70435
7	GM3CFS	212	48	62700
8	G0WHO	235	42	62494
9	GW3NJW	214	41	61798
10	G3MPB	220	45	60654
11	G3KXF	200	42	56407
12	G2HLU	215	41	53524
13	GW3WWN	182	41	53524
14	G3TJE	195	41	53500
15	G5MY	135	44	49194
16	G3GLL	174	42	45835
17	G3HZL	182	38	40546
18	G0IGP	163	36	38940
19	G3GMS	180	35	36835
20	GM4SID	179	36	36800
21	G4EBK	161	36	31945
22	G6QQ	152	34	29055
23	G3GMM	120	32	23485
24	G3LHJ	75	30	16485
25	G3VQO	83	26	12895
26	G3KKQ	62	27	12825
27	G0MTN	62	17	5225
28	MM0BQI	36	14	3190
29	G4FDC	19	10	995
30	G3ZGC	80	26	600

Overseas Section

Pos	Call	QSOs	Mults	Score
1	VK6VZ	53	43	68370
2	EA8CN	61	46	41175
3	RZ3AA	87	55	23900
4	N5DO	38	32	18240
5	HA8FK	80	71	17340
6	LY2BLQ	154	36	16524
7	9A5I	70	48	16100
8	HA8VK	65	49	15600
9	EA6ZY	66	47	15510
10	4L7AA	34	29	14790
11	LY3BA	65	45	14625
12	SM5NBE	68	47	13860
13	RA6LBS	66	42	13860
14	OK1FCA	60	47	13800
15	K2SX	33	28	12960
16	VE3STT	30	26	11700
17	EI7CC	54	41	11070
18	PA0JR	55	42	10865
19	DL3BRA	54	40	10800
20	EI5IY	51	41	10710
21	RA9AN	29	24	10440
22	UR3HC	53	41	10335
23	OM3KFV	53	39	10070
24	DL4JYT	51	41	9750
25	SM5AOG	50	39	9750
26	PA3HEQ	49	41	9310
27	UA9YC	32	9	9100
28	DJ3XK	48	38	8880
29	R3K	49	39	8695
30	DL1DQY	46	36	8325
31	OK2SJI	44	37	8140
32	RW3DW	46	35	8050
33	OK1AYY	44	36	7920
34	DL2ZAV	45	35	7875
35	DL8TWA	46	35	7820
36	HA3GA	56	44	7310
37	RU3RQ	42	34	7140
38	HA0HH	40	35	7000
39	8S3A	41	32	6560
40	LA1IE	38	34	6460
41	UR4III	39	33	6435
42	OK2QX	39	32	6240
43	UR5EIT	37	32	5920
44	HA6IAM	36	32	5760
45	DF4QW	41	30	5740
46	YL2NK	41	32	5655
47	RU4WE	35	32	5600
48	VK8AV	14	13	5460
49	UA1WAL	36	30	5400
50	DL1JFM	35	31	5250
51	DL3LBZ	35	29	5075
52	HB2DOT	33	29	4785
53	UA4LU	44	35	4620
54	UX1IL	34	27	4590
55	YU7SF	32	28	4480
56	PA3BEJ	31	28	4185
57	LZ2MP	30	24	3600
58	SP2EPV	30	23	3450
59	SP5CGN	26	23	2990
60	OK1FRO	26	23	2990
61	RX3AEX	19	19	1805
62	OK2ZJ	45	35	1575
63	DL5FCO	18	16	1440
64	SP3VT	18	16	1440
65	YO8MI	14	14	980
66	9A4KA	15	14	975
67	PA3CLQ	13	11	770
68	VK4XW	5	5	750
69	DL5KVV	12	10	600
70	OG3VX	10	10	500
71	UA0AGI	5	5	375
72	OG1UP	8	8	320
73	RU3WR	7	7	245
74	JA2KKA	2	2	60

SWL Entries

Pos	Call	QSOs	Mults	Score
1	ONL-383	32	27	4320
2	UA3-155-28	24	23	2760
3	OH1-688	39	18	1710
4	UA3-170-847	8	7	280

Checklogs: SP6CES, DK9EA, RU3RQ

In the Restricted Section, G3WPH did just enough to pip G3VYI. G3WPH used an FT-1000MP barefoot into a ground-mounted 44ft vertical. Mike used a TS-930S, also running barefoot,

Always a good signal during 144MHz events: M0AFC/P from IO84 square.

into a full-wave loop vertically fed with a 40ft top.

In the Overseas Section Steve Ireland, VK6VZ, triumphed again. Steve uses an FT-1000MP into an inverted V at 90ft. Steve wishes there was more new blood in this contest – only a few M0 stations appear in the log. Runner up was Andy Nyberg, EA8CN, and Roman, RZ3AA, took third place. Roman uses an FT-1000D at 200W into a 3-element yagi at 70ft.

The leading short-wave listener was ONL-383. Checklogs were gratefully received from SP6CES, DK9EA and RU3RQ. Most of the logs were able to be computer checked this year, with only a handful having to be done manually. I do hope this trend continues.

Tom Wylie, GM4FDM

1296/2320MHz, April 2000

1296MHz Single Operator, Fixed Station

Pos	Call	Loc	QSO	Points	Pwr	Ant	Best DX	km	Rig
1 *	G3XDY	JO02OB	25	4628	300	4x23el	PA0ME	274	FT-736R
2 *	G4DEZ	JO01IN	27	4355	100	4x55el	GD4GNH	458	IC-1271E
3	G4BRK	IO91DP	27	4044	40	35el	PA5DD	444	FT-290+DB6NT
4	GD4GNH	IO74QD	14	3897	115	8x23el	G4DEZ	458	FT-736R
5	G8NEY	IO81VK	18	2336	200	55el	PA5DD	481	Transverter
6	G4THI	IO93HC	12	1732	100	35el	G4LDR	223	FT-736R
7 *	G4GFI	IO91VH	17	1696	20	28Q	GD4GNH	433	FT-101+tvtr
8	G3UYM	IO91UW	9	1046	1	23el	PA5DD	342	Transverter
9	G4LDR	IO91EC	10	1023	8	55el	G3XDY	223	FT-736R
10	G1EHF	IO91LH	7	529	18	26el	G4THI	200	Transverter

1296MHz Single Operator, Open Section

1 *	G6SPS/P	JO01IT	27	5432	150	23el	GD4GNH	441	TS-711+tvtr
2 *	GM4WLL/P	IO85NR	1	109	20	27Q	GM4LBV	109	TR-9130+ tvtr

2320MHz Single Operator, Fixed Station

1 *	G4BRK	IO91DP	12	1348	30	90cm d	G4DDK	211	FT-290+DB6NT
2 *	G3XDY	JO02OB	7	960	50	44Q	PA5DD	240	FT-736+tvtr
3	G8NEY	IO81VK	8	670	40	44Q	G3XDY	245	Transverter
4 *	G4THI	IO93HC	4	523	4	25el	G8NEY	194	FT-290+DB6NT
5	G4LDR	IO91EC	5	329	1.5	90cm d	G6SPS/P	180	DB6NT tvtr

2320MHz Single Operator, Open Section

1 *	G6SPS/P	JO01IT	10	1589	40	25el	PA5DD	276	FT-290+tvtr

* Certificate winner

1296/2320MHz, April 2000

THE COMBINATION of average-to-poor conditions and a low level of activity restricted the QSO numbers in these contests. Even so, for the better-sited stations, some DX was there to be had.

The standard of logging was generally very good, with 50% of stations not losing any points at all. Thank you for the logs received on disc or by e-mail. If you use a computer to prepare your log, please send it in on disc or via e-mail.

Congratulations to John, G3XDY, for winning 23cm and to Neil, G4BRK, for winning 13cm. The winners and runners-up in each section will receive certificates.

Ian Pawson, G0FCT

CONTEST CALENDAR

HF Contests

Date	Time	Mode	Contest
6 August	0700-0900	CW	RSGB RoPoCo #2
12/13 August	*0000-2359*	*CW*	*WAE DX Contest*
19/20 August	*Various*	*RTTY*	*SARTG WW RTTY Contest*
28 August	1900-2030	CW	RSGB 80m Slow Speed Cumulative #1

VHF Contests

Date	Time	Mode	Contest
13th August	0900-1500	CW/SSB	RSGB 70MHz Trophy
13th August	0900-2100	All	RSGB All Microwave Bands Contest
14th August	1900-2130	CW/SSB	RSGB 144MHz Cumulative #1
20th August	1700-2100	CW/SSB	RSGB 432MHz
27th August	0900-2100	All	RSGB 10GHz Cumulative #4
29th August	1900-2130	CW/SSB	RSGB 144MHz Cumulative #2

The full rules of RSGB HF and VHF/UHF contests were published in the RSGB Contesting Guide in October 1999 *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

HF

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

AS A postscript to last month's item about Dayton 2000, I am pleased to report that, after the DX Dinner, it was announced that Chod Harris, WB2CHO/VP2ML (silent key), and John Kanode, N4MM, were to be inducted into the CQ DX Hall of Fame. The following evening, at the Contest Dinner both Larry 'Tree' Tyree, N6TR, and Walter Skudlarek, DJ6QT, were announced as the newest members of the CQ Contest Hall of Fame. Congratulations to all four.

DX NEWS

THE INTERNATIONAL Lighthouse/Lightship Weekend takes place over the weekend of 19/20 August. Last year, 218 amateur radio stations were established at lighthouses and lightships in 39 countries on 6 continents. So far this year another two countries, Chile and Turkey, have confirmed their participation. A full list appears at www.waterw.com/~weidner/LH-day-table.htm or you can e-mail Mike, GM4SUC, at gm4suc@compuserve.com for further information. Equally, I can provide hard copy in return for an SAE.

Members of PI4TUE will once again be operating from Liechtenstein from 31 July to 16 August. They plan to be on all bands and modes.

After 2 years of being QRT, Andy, RW3AH, is now active as 4O8/9X0A from Pristina, Kosovo. At present, he seems to be the only active operator there and will stay until next year. Andy is usually active from 0300-0500 and 1600-2300 UTC around 14,195kHz (SSB) and 14,007kHz (CW). QSL is via his home callsign.

Antonello, IK2DUW, Bruno, IK2PZG, and Michele, IK2GPQ, will activate various islands in the Liguria Region of Italy between 23 July and 6 August for the Italian Islands Awards. QSL to their home calls.

EA1GA/P will be active from Erbosa Islands (EU-077) from 12 to 15 August. QSL is via his home call.

Chris, G0WFH, plans to be active with the special call sign GH4BJC/P from Jersey between 12-22 August. He will be operating QRP with the ISWL club call on SSB only. A web page has been set up at www.qsl.net/g0wfh/g0wfh

RTTY DXers will be happy to know that Alan, VK0MM, plans to be on this mode later this year, possibly in August or September.

Special event call EM500E will be on the air on all bands and modes between 1-31 August to celebrate the 500th anniversary of the Kazak Glorian in Ukraine.

After a year of waiting, Jeff Hambleton, G4KIB/5B4YY/KF9BI, in Khartoum, Sudan, reports that he is now licensed as ST0P (ST0 was, of course, previously the prefix for Southern Sudan which is no longer on the DXCC list). Jeff uses an IC-746 transceiver, plus a G5RV and a delta loop. His licence covers 40, 20, 15 and 10m and he expects to be on the air (SSB and PSK-31 only) after 1700 UTC occasionally. He is there until sometime in August.

Maurice, ON4BAM, was planning to be in South Africa late July and early August. He expected to be active from Swaziland as 3DA0MA on 26/27 July. Look for him on the bands between 10 and 20 metres. QSL to his home call.

The communications building: workplace of Alan, VK0MM, on Macquarie Island. Photo: Alan Cheshire, Australian Antarctic Division.

Ben, DJ8FW, expected to be on air from Madeira, possibly as CT3/DJ8FW, from 20 July to 20 August.

Hopefully there will be a major operation from Tromelin Island (FR/T) between 1-16 August. I say hopefully, as the group was having trouble raising the substantial funds required, but were keen to pull this off as they have all the permissions needed. It is likely that visits to the island will grow increasingly difficult in the future, because the weather station is being automated and the island is a designated nature reserve. Landing permission will be given only in special cases. The latest information should be available on the expedition's web site: http://perso.e asynet.fr/~f6jjx/menu.htm Assuming all goes well, the group, which consists of F5PXT, F5PYI, F6JJX and F5NOD, plans to have three complete stations on the air on all bands and modes. They will be using beams from 6 to 20 metres and Titanex verticals for 30 to 160m. No callsign had been announced at the time of writing.

Ethiopia and Eritrea recently ended almost two years of war. Plans are currently underway for a 1-2 month DXpedition to Eritrea, which ranks 7th on the ARRL 'most wanted' list. The emphasis of the trip will be to train locals to become radio amateurs. At the time of writing I have no more details, but you may want to keep a weather ear to the bands.

Masa, JA6GXK, expects to be QRV from Meshima Island, Danjo Archipelago (AS-056) this year as follows: 22nd August to 1st September, 12-22 September and 13/14 October. This is not a DXpedition because he will be working on the island and will be on the air in his spare time. Look for him on 14,260 and 21,260kHz ± QRM. QSL is via the bureau.

JK1FNN and his XYL, 7L1MKM, plan to be active as FO0YAM and FO0YAA from King George Island, Manihi Atoll (OC-131) from 13-18 August. They will be on the bands between 10 and 30 metres CW and SSB. QSL is via JK1FNN.

Bert, PA3GIO, will be active as VK9CQ from Cocos/Keeling (OC-003) between 16 August and 1 September, and as VK9XV from Christmas Island (OC-002) from 2 to 13 September. The web site for these operations is at www.qsl.net/pa3gio/ From both locations he will operate on 80, 40, 20, 17, 15, 12 and 10m SSB. QSL is via PA3GIO, or preferably through the bureau.

Rick, KL7AK, Blaine, KL7TG, Larry, KF6XC, and Tom, W0GLG, will activate the Kudiakof Islands, part of the Northern Alaska Peninsula West group (new IOTA), between 5-9 August. They will concentrate on 20m, which is expected to be open around the clock. Look for KL7AK on 14,260kHz. They will make CW contacts on request. The Island Radio Expedition Foundation, Inc (IREF) is a major sponsor of this operation. QSL is via N6AWD.

Low Land DXpedition Team (LLDXT) members Ronald,

WARC BANDS TABLE 2000

Call	10	18	24	Total
G3SXW	133	134	112	379
G0NXX	125	114	128	367
G4UCJ	78	91	77	246
G4KHM	77	92	27	196
G3ING	41	57	45	143
G4AFI	24	39	57	120
GM4OBK	24	31	32	87
G0VLC	24	37	21	82
GW0VSW	21	20	40	81
M0CAL	0	23	33	56
MM0BQI	18	17	19	54
G0TSM	15	13	25	53
2U0ARE	51	0	0	51
G4OBK	13	22	13	48
G4YWY/M	0	19	29	48
G4ERP/M	0	40	0	40
M0CNP	3	20	11	34
G4FVK	0	7	15	22
M5AFA	0	7	11	18

PA3EWP, Peter, PA4EA, Rob, PA5ET, and Dennis, PA7FM, will be active as V26WP, V26EA, V26ET and V26FM from Antigua (NA-100) from 11 to 23 August, then from Barbados (NA-021) from 23 August to 4 September. Barbados callsigns will be issued upon arrival. From both locations two HF stations will be activated around the clock on all HF bands and modes, with special attention to Europe and Japan, especially on the WARC bands and 160m. On-line logs will be available as well as a tour diary and digital photos. QSL is via PA5ET (ex-PA3ERC). The web site is at www.qsl.net/lldxt

Fritz, DL4TT, will be in New York City from 27 July to 20 August and will try to operate on several days from the UN headquarters club station (4U1UN). Exact dates will be announced on the packet clusters when known. All activity will be on CW.

Dave Heil, K8MN, active for the past two years as 5H3US in Dar es Salaam, Tanzania, is pulling the plug on a decade-and-a-half of DXing and contesting, which resulted in over 230,000 QSOs from various spots. Dave and his Finnish XYL, Leila, were due to retire to the US in June. Dave says that a book on his travels is in the works. The Heils met in 1986 during Dave's first assignment to Helsinki. They married in Guinea-Bissau in early 1989. Dave's subsequent Foreign Service assignments took them to Sierra Leone and Botswana. The couple took a needed break from Africa from mid-1995 until mid-1998, returning to Finland over the solar minimum. Dave's ex-calls include OH2 and OH0/K8MN, J52US, 9L1US, A22MN. He was also a member of the 1986 OH0MD/OJ0 team. QSL manager WA8JOC still holds logs for all of Dave's operations.

Jacques, F6BUM, will be active as XE3/F6BUM from 30 August until 8 September from Mujeres Island (NA-045).

Carlo, I4ALU, will be active from 14 to 28 August as VP5/I4ALU from Jody's, VP5JM, QTH on Providenciales in the Turks and Caicos Islands. Activity will be on all HF bands CW only. QSL is via I4ALU.

A group of Brazilian YL operators will operate (SSB, CW and RTTY) as PR5YL from Mel Island (SA-047) from 10 to 14 August. QSL is via PP5LL.

IOTA CONTEST

IN ADDITION TO the activities I reported last month, the following are expected to be on for the IOTA Contest on 29/30 July. Bob, I2WIJ, will sign J45W from Kos Island (EU-001), and will be there until 2 August. Outside the contest he will concentrate on WARC bands and SSB. QSL is via his home call. Ed, G3SQX, will sign TF/G3SQX from Iceland (EU-021). He will be active (CW only on as many bands as possible) until 6 August. QSL is via his home call. A group of Italian amateurs will operate from San Pietro Island in the Cheradis (EU-073), possibly as IJ7ET. QSL is via IK7AFM. Timo, OH1MDR, Pasi, OH1MM, and Timo, OH1NOA, will sign OH9A from Sandstrom Reef (EU-096). QSL is via OH1NOA. Jorge, EC1BXI,

HF-Layer Propagation Predictions for August 2000

	3.5MHz	7.0MHz	10.1MHz	14.0MHz	18.1MHz	21.0MHz	24.9MHz
Time	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122	000001111122
(UTC)	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802	024680246802
*** Europe							
Moscow	654.....45	99851...1388	999856557789	9..988778899	...98888899.	....9988899.	.....
*** Asia							
Yakutsk	.....	.1.....3.	4....11..244	665412..34.6	...544.....	....55.....	.....11.1..
Tokyo	.....	.....	1.....2.	4321.11..3.5	...32111...1	....33.....	.....
Singapore	.....	.....	.....1..2	21.....122	.1.....2223	..11...1333.	...1....33..
Hyderabad	.....	4.....23	43.....34	554.....2356	...322.24445	...43433445.	.....1.
Tel Aviv	541.....145	7741.....477	8774122 13478	7..655555777	..1.666667.	.....	.....
*** Oceania							
Perth	.....	.....	1.....	1.....	.1.....	1...1.1.1...	....1.1.....
Sydney	.....	.....	.....11.	22	.....	...111.....1	...1.....
Wellington	.....	.....	.....1.	....11..3...	....4445..41	..1.....	.....
Honolulu	.....	.....	.....1...	11.1.....1	....21..1122	...1.....	.....1..1.
W. Samoa	.....	.....	.....	...1..1.....	....23222.12	.1...3.....	.....1.
*** Africa							
Mauritius	.....	21.....1.3	43.....1.13	4.1.....35	...111..3445	...23312344.	....44.3.44.
Johannesburg	.....	12.....111	...1....1.21	.....34.	...2111.14..	...23221235.	....4334....
Ibadan	211.....11	554.....56	6663.1...266	8776332..568	777755544687	7..765556777	....6.66677.
Nairobi	.....	43.....44	4631.....244	66631...1566	6..433334566	...543444566	.....
Canary Isles	445.....44	88842....188	888754455688	9998887 57888	9..9888888.9	98889999	....99.9.99.
Tromelin Isle	.....	12.....111	34.....11	4.21...1.435	...12111 3445	4..333234455	...44444555.
*** S. America							
Buenos Aires	.....	222.....1	443.....3	4443.1...124	44.4.....144	4....2112244	.....2.44.
Rio de Janeiro	.....	443.....3	5442.....34	665411...45	6..5.2223355	66...3344456	..1...444456
Lima	.....	2221.....1	333.....2	44.3.....13	4...2.....14	.....11133.	.....3..
Caracas	.....	4542.....1	5653.....5	66652.1..255	6..15434 4466	1....444456.	....1.....1.
*** N. America							
Guatemala	.....	2441.....	4553.....	555531...144	5.....233455	11..1.444455	.....5.
New Orleans	.....	1442 1.....	4453.1.....4	55.4..1.1245	1...1..33445	.1....1..15.	.....
Washington	.11.....	45511.....	665431....42	5776.321 3465	7.11..455677	556677	.....1.....
Quebec	221.....	55631.....31	776421.2.367	77...2244577	7.....556677	.....1.7.	.....
Anchorage	.....	..4..1....1	4451....1.34	44.42..12445	.....1..5	..1.....	.....1..1
Vancouver	.....	1.2.1.....	444....1..12	44.....1344	4.....4	....1.....	.....
San Francisco	.....	1.2.....	.43...1....	4343.....244	4.....2353	.....1..4	.....

Key: Each number in the table represents an S-meter reading on the average amateur rig, whilst colours represent availability. When the predictions are expected to be 67-100% certain, the numbers are blue; when 33-66% certain, red; when less than 33% certain, black.

The RSGB Propagation Studies Committee provides propagation predictions on the Internet at www.g4fkh.demon.co.uk The page is updated weekly.
The provisional mean sunspot number for June 2000 issued by the Sunspot Data Centre, Brussels, was 124.9. The maximum daily sunspot number was 171 on 14 June and the minimum was 75 on 3 June. The predicted smoothed sunspot numbers for August, September and October are respectively: (SIDC classical method – Waldmeier's standard) 106, 104, 102 (combined method) 119, 122, 124.

is on Ons Island (EU-080) until 30 July and hopes to be active during the contest as EF1ONS. QSL is via his home call. Alex, RU0LL, will sign R0L from Putyatina Island (AS-066) until 2 August. QSL direct to IK2DUW. Mark, AA1AC will sign AA1AC/P from Aquidneck Island (NA-031). QSL is via his home call. Joe, W8GEX, Ron, WA8LOW, Mike, N9NS, and Mike, K9AJ, will be active from Berry Island, Bahamas (NA-054) from 28 to 31 July, including the contest. Two stations will be activated, CW and SSB. The team will sign C6DX during the contest and C6AJR outside the contest. QSL to W8GEX. Stan, N2US, plans to be active from Chincoteague Island, Virginia (NA-083). He will be in the single-op 12-hour category and active from 1200 to 2359 UTC on 29 July. PY5GVC expects to be active from Mel Island (SA-047). QSL to his home call. Club station DL0KWH will be active from Rugen Island (EU-057). Doug, W3CF, Tim, N9NU, and Matt, KB9UWU, will be active from Assateague Island (NA-139). JM1PXG/6 will be active from Daito Is (AS-047) from 29-31 July. During the contest look for him on 10, 15 and 20m CW. QSL is via JM1PXG. Finally, an updated list of IOTA contest operations is maintained by Bill NG3K, at www.ng3k.com/Misc/iota2000.html

IARU HF WORLD CHAMPIONSHIP July 1999

England

Call	Score	QSOs	Mult	Cat
M0BEW	508,354	1062	154	A
G0MTN	386,540	820	140	A
G0VSN	363,926	673	157	B
G0LII	983,192	1363	194	C
G4OGB	296,208	607	144	C
G4PDQ	288,222	666	121	C
G3TXF	178,625	401	125	C
G3ESF	174,230	386	131	C
M4T	66,591	425	49	C *
G4FDC	57,624	200	98	C
G3VQO	47,061	205	83	C
G6QQ	5,678	61	34	C
G8A	1,110,120	1711	174	D †
M4U	64,325	258	83	D ‡

Scotland

GM3CFS	243,110	474	121	C

Wales

GW3NJW	223,820	551	124	C

Categories: A = SSB, B = CW, C = Mixed, D = Multi-op

* Operator G0VQR

† Operators G0KXL, G4WSE, G4NXG, G3RTU, G0DBE, G1AOF

‡ Plus G0DVJ, G7HOW

AWARDS

THE ARRL HAS announced the addition of a 15m single-band DXCC award, to start 1 July. Those who qualified for 5-band DXCC prior to the introduction of computerisation at ARRL can resubmit enough cards to qualify with no per-card checking fee. The fee for the award itself is $10. UK applicants can submit to the local checkpoints in the usual way (see April 'HF').

My congratulations to Alan, G4NXG/M, who recently worked A5 (Bhutan) and FR/G (Glorioso) to qualify (subject to getting the QSLs) as the first UK station to reach the DXCC Honor Roll entirely from his mobile operations.

Andrew, M5AEX, writes that he has received the ARRL Millennium Award Certificate. Andrew has been licensed since 1972 with the call G8GNI, but got his M5 call last September. He completed the 100 countries for the award in three months, all SSB and with about one third of his contacts made at the 5-watt power level. He was particularly pleased to have worked 4U1ITU, Nigeria (5N) and Burkina Faso (XT2), but says the highlight was probably having an 'armchair copy' QSO with CE5SG (Chile) on just 5 watts.

Look for special event stations EO225E, EO225EA, EO225EJ, and EO225EL to be active on all bands until 27 August to celebrate the 225th anniversary of the city Krivoy Rog. If you make contacts with these stations (3 QSOs, dupes are valid on different bands or modes), you will receive the 'Krivbass Award' (for $5). QSLs for all stations are via Yuri Arkhipov, UT1EJ, PO Box 101, Krivoy Rog, 50071 Ukraine.

The 'Worked All Italian Lighthouses' award is for contacts with 10 (in the case of European amateurs) Italian lighthouses. The award is sponsored by ARI - Comitato Regionale Piemonte e Valle d'Aosta - and managed by Sezione ARI di Alba. The lighthouses valid for the award are those in the WAIL list available from the Award Manager (Paolo Garavaglia IK1NLZ: ik1nlz@425dxn.org) and on the web sites of the Comitato Regionale Piemonte e Valle d'Aosta (http://aricrpva.go.to) and the *425 DX News* (www.425dxn.org/awards/wail_ref.html). I can also provide a list and further details in return for an SAE. Applications go to WAIL Award Manager, Paolo Garavaglia, Strada Valcossera 11, 14100 Asti - AT, Italy. Do not send QSL cards, but they must be in your possession. Send a GCR (General Certification Rule) list which should include the WAIL reference number, the name of the lighthouse and log data (date, time UTC, band, mode, station's callsign). The GCR list must be certified as correct by two radio amateurs. The fee for the basic WAIL certificate is $8 (postage included). Endorsements at $2 each are available for each additional 5 lighthouses.

OTHER CONTESTS

THE FORMAT OF the Seanet (South-East Asia Net) Contest has changed this year. The contest runs from 1200 on 19 August for 24 hours. All bands (except WARC) and modes, unlike previous years, where there were separate contests for each mode. There are several single- and multi-band categories for single-ops, and also a multi-op category. Send RS(T) and serial number. Work Seanet stations only. Multipliers are DXCC countries in the Seanet region, which count once only regardless of band or mode. I can provide a full set of rules and a list of Seanet call areas in return for an SAE. Further details can also be obtained from the Seanet Web site www.seanet2000.com or by e-mail from Ray HS0/G3NOM (g3nom@ibm.net) to whom the logs should also be sent (by e-mail or to Ray's mailing address, which is Seanet Contest 2000, Ray Gerrard HS0/G3NOM, PO Box 1300, Bangkok 10112, Thailand).

I seem to have been missing the occasional scores from contest results recently. My apologies for this. In the 6th EUHFC (see June), G0VQR was 165th with 864 points in the CW Low Power section, while G3VAO, G0OOF and MW0CNK were 14th, 27th and 91st respectively from 94 entries in the SSB Low Power category, with scores of 36,808, 13,938 and 304 points. My thanks to G3VAO for the correction. In the CQWW WPX 1998 results (May), I missed the QRP results where Derrick, G3LHJ, took 1st place (G) for 14MHz QRP/P with 117,120 points, while GW0VSW had 33,033 points. I have the results of the 1999 CQ WPX contest to hand and will run them as soon as space allows. This month I include results of the 1999 IARU HF World Championship.

QSLING

JIM, VK9NS, REPORTS that he has made arrangements for dealing with bureau requests for A52JS QSOs. Cards should be sent only via the RSGB QSL Bureau, marked for the attention of M0BJI. The QSL bureau will hold the cards until a reasonable quantity has arrived, and they will then be forwarded for attention. It is unlikely that Jim will receive cards sent by any other bureau QSL route, and there are no bureau facilities on Norfolk Island. Jim thanks the RSGB QSL Bureau for their assistance in this matter.

The Kermadec DX Association advises that the address for all QSL cards for both the ZL8RI and ZL9CI DXpeditions has changed. All direct QSL cards should now go to: Ken Holdom, ZL4HU (also ZL2HU), Kermadec DX Association, PO Box 7, Clyde, Central Otago, New Zealand.

Following my report in May that 9J2BO's manager no longer responds to bureau cards, I have received several comments that, while this may indeed be his policy, it is certainly against the RSGB's recommendations of good practice, and generally not in the spirit of the hobby. No doubt readers will have their own views.

THANKS

MY THANKS TO all who have provided information. Special thanks go to the authors of the following for information extracted: *OPDX Bulletin* (KB8NW), *The Daily DX* (W3UR) and *425 DX News* (I1JQJ). Apologies to those who were eagerly awaiting the 28MHz Countries Table and QTH Corner. There was simply no space for them! They will put in an appearance next month. Please send items for the **October** issue by **19 August.** ♦

The Future of Amateur Radio Examinations

a report on responses to G3XWH's 'Speakers' Corner' article in the February 2000 *RadCom*

THE ARTICLE invited comments, and the scale of them was staggering and unprecedented in the recent history of the Society. Many e-mails arrived within a few days of publication, followed by faxes and, eventually, letters.

In all, over 100 responses were received. Some were short, just registering an opinion, others ran to several pages, setting out comprehensive plans for the future of amateur radio. The results have been analysed and all have been circulated to Council to help their decision-making. This article attempts to present the views expressed and to encourage further debate on the future of licensing and the examinations.

Majority Agrees

The vast majority agreed with the contents of the article which advocated hands-on-a-rig training. Only three disagreed. 48 correspondents went further and recommended that a practical element should be included in all future examinations. 42 suggested that supervised operation should be available during exam instruction whilst others went so far as to suggest the idea of a 'probationary licence' which would, after some supervised operation, allow up to one year of operation on the bands after which a test should be taken before further operation was allowed.

Opposed to Progression

26 expressed the view that the hobby should move on to survive, but eight expressed the view that RSGB is opposed to progression. Five suggested that we should adopt the American 'Volunteer Examiners' concept, and five thought we should apply the Novice approach to the RAE. Several congratulated Richard on getting the article published and said he had done well to get the Editor of *RadCom* to publish it.

Council Forum

Richard had originally written a paper for Council along the same lines and Council found it thought-provoking and recommended publication in *RadCom* as soon as possible so that members could comment on it. You did not let us down!

There were many useful comments to assist the thinking of Council and, at its January meeting, it agreed to set up two groups - one to look at the future of licensing and one to look at the future of the RAE. As a result of an initial meeting of the RAE group it was realised that there was a great deal of overlap between the two groups and that it would be more effective to combine them. The members of the group, known as the 'Future Licensing and Examination Forum', are Richard Horton, G3XWH (Chairman), Dave McQue, G4NJU (Vice President), Robin Page-Jones, G3JWI, Ian Suart, GM4AUP, Peter Kirby, G0TWW (RSGB General Manager), Geoff Dover, G4AFJ, and Anthony Vinters, G0WFG (Chairman of STELAR). This group would draw on others as necessary. It was agreed also to publish the results in *RadCom* and on the web site and to invite further input from radio amateurs in general.

Over to You

So, once again, it is over to you to expand on *your* ideas for practical training, the future licensing structure and examinations for amateur radio.

Send your comments, replies and suggestions to me, G4AFJ, preferably by e-mail, to g4afj@rsgb.org.uk Otherwise, you may fax them on 01455 828273 or you can write to me at the address in the *RSGB Yearbook*.

Geoff Dover, G4AFJ

VHF/UHF

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

IT SURE HAS been a busy month with over 100 e-mails, faxes and letters received reporting on the excellent conditions. Sporadic-E (Es) on 50MHz has produced some fine DX, both to east and west, and there were some superb events on 144MHz.

In the 'Band Reports' section, an asterisk (*) indicates a CW QSO and all times are UTC. 'QTHR' signifies that the operator's address is in the current *RSGB Yearbook* and (EX), (BL), etc after a call sign indicates the station's postal area.

BEACON NEWS

STEFAN HECK, LA0BY, advises that LA8VHF is a new 2m beacon on 144.480MHz located near Drammen (JO59CN) at 400m ASL. At the moment it is only running 1W, but this will be increased to 25W when mains power becomes available. The antenna array comprises three stacked 2-element home-made HB9CVs, giving a gain of 9dBd, directed at 125º - ie towards SM1 and LY. This beacon is intended for tropospheric monitoring.

METEOR SCATTER

LAST YEAR'S Perseids meteor shower proved rather disappointing in Europe and even more so in North America. Nevertheless, it should be possible to complete QSOs in the 12/13 August period during the expected peak of this all-day stream. Those looking for MS software will find OH5IY's *MSSOFT* program excellent. It can be downloaded from Ilkka's website - see the panel.

Several groups plan operation from 'wanted' places. John Peters, PE1OGF, has posted information on the Internet about HB0/PI4TUE/P. The team could be ready (QRV) in the afternoon of 3 August until the 14th, using 350W to two 8-element Yagis. Listen for their CW skeds on 144.132MHz. Their random SSB frequency (QRG) is 144.222MHz. They have a 1.5kW permit for their base station, skeds for which may be made via pe1ogf@iae.nl but they won't take skeds for the portable operation.

Peter Varadi, HA5OV, advises of operation from KN07 from 1800 on 2 August to 0800 on the 4th, then from KN17 from 1800 on the 4th to 0800 on the 6th, in the run-up to the Perseids. The callsign will be HA0P, sent as HATP on CW, and they will be on 144.173MHz SSB and CW for MS skeds, random and tropo. E-mail Peter at ha5ov@dpg.hu for skeds, giving your call sign, locator, equipment details, date/time, CW speed - up to 3500 LPM - and e-mail address.

MOONBOUNCE

HOWARD LING, G4CCH (IO93), has been hard at it, completing his 5.4m dish for 23cm. He finally got everything going on 6 May and at 1500 heard his first ever real echoes, then completed many QSOs, with LW5DX* giving him Worked All Continents (WAC) after *18 years*. Since then he has been on for two activity weekends, adding 26 'initials' - stations worked for the first time - to bring his total to 110. He queries if LU8EDR, LW5DX and LU4DHD count separately, or do they all work from the same station? His e-mail address is howard.ling@g4cch.co.uk

The next sked weekend is 26/27 August, a 'day PM' one giving 32 hours of Moon time for London latitude stations. The declination in this perigee period varies from +21.74° to +18.80° and the 144/432MHz sky temperature range is 411/30K to 216/16K. The signal degradation, referred to perigee, varies from 0dB to -0.07dB. The Sun offset at Saturday midnight is –34°. These data were derived from VK3UM's software.

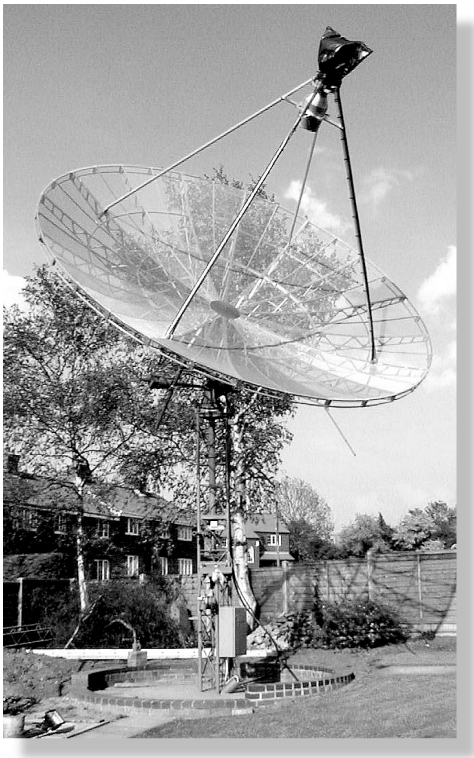
BAND REPORTS

50MHz

Ted Collins, G4UPS (EX), reports that the first opening towards North America from G this year was on 25 May, when WP4G and KP4EIT were copied at 1310, but no mainland Ws or VEs were heard. Around 1400 on the 29th a few Ws were copied weakly in IO80, working stations in IO91 and further east.

Alec Trusler, G0FIG (BN), lists some choice DX worked such as SV5BYR (KM46) on 19 May, EY8MM (MM58), ZD7VC (IH74), YO5CRO (KN17) and UR5GL (KN66) on the 28th and OX2K (GP47) next day. That gives a good indication how widespread the openings have been since the latter half of May.

Members of the Caterham Radio Amateur Group made their annual fun weekend radio trip to Shilton (OX) in the 23-28 May period. Paul Lewis, G4APL, and John Stockley, G8MNY, sent a breakdown of what they worked, using the call GX0SYR/P. They completed 93 QSOs with stations in DL, EH, F, G, HB, I, IT9, IS0, LZ, OE, OK, OM, S5, SP, TK, YO, YU, 9A and 9H. It was their best-ever performance on the band, and all done with just 5W to a 5-element Yagi at 50ft AGL from a 300ft ASL site.



The new 5.4m dish for 23cm EME, recently commissioned by Howard Ling, G4CCH (see 'Moounbounce').

On a sad note, one of their long time members, Ted Honeywood, G3GKF, died suddenly from a heart attack a few hours after they returned. He was 74 and a real radio amateur who joined the RSGB while serving with the RAF in Burma in the late 1940s. He experimented on all bands from 160m to 3cm and was a pioneer of SSB on 15m in earliest days of the mode. His funeral was on 9 June at the Croydon Crematorium and there were at least 17 radio amateurs present.

Terry Chaplin, G1UGH (IP), was in on the Es in June and worked lots of Italians, plus stations in DL, EH, F, OE, OK, S5, SM, SP, YU, Z3, 4N and 9A. He heard lots more from the Mediterranean, through the Balkans, to Scandinavia. Ken Punshon, G4APJ (BL), puts his limited spare time to good use and worked 4Z4TL on 27 May. The aurora on 8 June brought GI0OTC (IO65) with several GMs heard.

Bryn Llewellyn's, G4DEZ (SS), best DX (ODX) includes RN6HW (LN16), on 28 May, C31HK for a new country next day, 8P9HW on 20 June, K2RTH on the 23rd and CN2DX (IM63) and CN8NK (IM64) on the 24th.

G4UPS heard LUs and CX1CCC (GF15) from 1659 on 23 May, and Ted worked LU2FFD (FF97) at 1701. At 1608 on the 25th, FR5DN (LG78) was country 149 and on the 27th, FH/TU5AX (LH27) was number 150. He also worked down into southern Africa and all the usual Euro-DX in the latter part of May. He mentions that OD5PN now has LX1NO as his QSL manager. His address is in the *International Call Book*.

Andrew Thomas, G8GNI (MK), worked around 50 stations and six new grids in the late-May bank holiday weekend. He tried some QRP work with just 5W to a 3-element Yagi 10m AGL, and over a couple of weekends netted 13 countries and 39 grids from a poor QTH 76m ASL.

John Hilton, GM1ZVJ (KY), added TF3MLT (HP94) for coun-

PROPAGATION

THE APRIL ISSUE of *The Six and Ten Report* records moderate Es openings to Europe on 5, 23 and 28, with a few more marginal ones. DX events to South America, Southern and Eastern Africa, ZD8 and ZD9 were reported on six days. Meteor scatter (MS) reception occurred on ten days and the Lyrids shower seems to have been better than normal. Auroras were noted on five days, the exceptional one on the 6/7 being covered in some detail.

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

The May edition of *SunMag* starts with an article 'Solar Ups and Downs' which comments on the observed wide variations in sunspot numbers from one month to the next. The next piece is concerned with the 'close encounter' between Jupiter and Venus, which took place on 17 May. At the time they were only 7° from the Sun, so impossible to see except by the SOHO spacecraft.

Of more relevance to amateur radio is the next article 'Radio Jove'. HF operators often complain about a noisy background. A typical noise is like waves breaking on the seashore and at times it is sufficient to make weak DX signals difficult to read. The culprit is giant planet Jupiter.

These emissions are generated naturally by plasma instabilities in Jupiter's magnetosphere. The saga starts with its volcanic moon, Io. Tidal forces from Jupiter and its other large Galilean satellites superheat Io's interior, causing volcanic ejecta to be thrown far above its surface. Some of this then orbits around Jupiter forming a huge gaseous cloud, an 'Io torus', which has an important impact on its magnetic environment.

As Io orbits through this magnetised ring of ionised gas, a huge electrical current flows between Io and Jupiter. It carries about 2 *trillion* watts of power, and is the biggest DC electrical circuit in the solar system. The current is the power source for plasma waves that give rise to radio emissions in the form of cone-shaped beams that rotate every 9h 55min, rather like a slow-turning pulsar.

There are two basic varieties of radio bursts, which occur in the 15-40MHz part of the spectrum and the ocean-waves variety are known as 'L-bursts'. The 'S-bursts' produce a rapid-fire woodpecker sound and, slowed down by a factor of 128 times, they sound like eerie drifting whistlers. You can get more data from the University of Florida Radio Observatory (UFRO) which has a website - see the panel.

The table of Daily Solar Data shows a wide variation in the solar flux in May, with the maximum of 262 on the 17th and a minimum of only 127 on the 6th. There are tables of Daily Geomagnetic and Particle Data and a Solar Flare List. There are nine pages of Sunspot Group Data, a diagram of the spot groups on the Sun on 17 May and an explanation of the coding used to describe the spots. *SunMag* is compiled and distributed by Neil Clarke, G0CAS (QTHR), whose e-mail address is neil@g0cas.demon.co.uk He has a website - see the panel.

try 46 on 31 May and from 8 May through 11 June he worked 11 new grids. II0JX, contacted on 13 June, is a special Jubilee Year call: QSL via I0JX.

Mike Johnson, GU6AJE, has logged over 300 QSOs in the period 19 May to 20 June and reports only seven days without Es propagation from Guernsey. His separate log ran to seven A4 sheets and lists hundreds of European and North African DX contacts. I picked out ZB2CF (IM76) on 21 May, SV5BYR in the mammoth opening on the 27th, ZA/N7BHC (JN91) on the 31st, ID9/I2AND (JM78) on 4 June and CN8LI (IM64) on the 13th. The real DX were LU2FFD at 10,811km on 1 June and FH/TU5AX on the 7th. Mike Kerry, GW1SXT (NP), has worked into I, IS0, LA, SP and 9H using 10W from an IC-505 into a 3-element Yagi.

Jamie Ashford, GW7SMV (NP), lists some really choice QSOs, including JY9NX (KM71) on 16 May, LU6DRV (GF05) and LU2FFD on the 17th, 4Z5AO (KN72) on the 19th, CX1CCC and LU9AEA (GF05) on the 23rd. ZA/OK1JR (JN91) and FR1GZ (LG79) on the 27th, Z21KQ (KH52), OY9JD (IP62) and UR5GL* (KN66) on the 28th, 9A4QV/MM (HM50) on the 29th, 5B4AGC* (KM64) and C31HK on the 30th.

In June, ER6A/P (KN47) on the 3rd, LU2MHP (FF57) on the 5th, 5A1A (JM62) on the 6th, 5B4FL (KM64), FH/TU5AX and 7Q7RM* on the 7th. The big day was the 9th, which brought CN2DX, CT3FT (IM13), CU8AO (HM49), SV4FGT (KM19), OD5PN (KM73), JY4NE (KM71), UN7IY (LO80) and PZ5RA (GJ25). He worked ZC4FL (KM64) on the 14th, and on the 20th, KP4EIT at 1346 and 8P9IIW (GK03) at 2118 for his 98th country.

70MHz

John Hunter, G3IMV (MK), is QRV again using his HF wire antenna. On 25 May he worked S53X and S59F (JN65). On 13 June he contacted S53J (JN75) and S51DI (JN76). Kevin Law, G4WMZ (PE), has been QRV on the band since 5 May using 25W of FM to a J-pole antenna 30ft AGL. He has worked 20 stations, five of them mobiles. He has since heard S51DI on 70.450MHz a couple of times, and beacon S55ZMB, all at S9.

G8GNI worked OY9JD cross-band to 6m on 29 May using 25W to a 3-element Yagi, but couldn't raise him on 6m. Darrell Mawhinney, GI4KSO (BT), worked S53X, S57UUD (JN65) and S59F from 1934 on 27 May. GU6AJE also worked S59F (JN76) and S53X the same day. GW1SXT has been using FM for local mobile contacts over a 40-mile radius.

Emilio Cutolo, IK0OKY (JN61), reports an opening from 0820 on 28 May. The Angus beacon, GB3ANG, was S9 as was the Dublin one, EI4RF (IO63), still giving its locator as WN38C. G3UKV* and G3TCU* were heard in the contest and G0JHC* was contacted cross-band to 6m. Emilio and IK0NOJ, IK0FTA, IW0GPN and IZ0DEI are always QRV on 50.185MHz for cross-band QSOs.

144MHz

Derek Gilbert, G0NFA (GU), reports good tropo to Spain on 7 June. He worked EA2AGZ (IN91), EA1CRK and EA1DDU (IN73), but activity was low. On the 17th G1UGH worked GWs in IO81-83 and a GI in IO74. Graham Coyne, G3YJR (SD), lists HA, I7, YU, together with 9As worked from 1707 on 27 May. He runs 60W to a 9-element Yagi 12m AGL.

The CATRAG's Shilton trip caught the 27 May Es opening, enabling GX0SYR/P to work into HA, I, UR, YO and YU. Including the earlier tropo, they made 68 QSOs, although heavy rain static at times made reception difficult. They used 200W to an 11-element Yagi 54ft AGL.

David Butler, G4ASR (HR), was QRV for the 27 May Es and, in the first session from 1216, he worked three LZs, and ODX was LZ1QB (KN12) at 2232km. In the evening session, from 1721, he completed 41 QSOs, ten of them over 2000km, with stations in HA, OE, OK, OM, YO and 4N, pick of the bunch being ZA/OK1JR at 2089km.

Paul Lock, G4STB (TR), caught a quick burst of Es from 1915 on 31 May and worked a bunch of Italians in JN52-54. It was all over in eight minutes. He runs 50W to a 7-element ZL-Special 25ft AGL.

John Regnault, G4SWX (IP), was QRV from 1633 on 27 May and completed 21 QSOs with Italians, plus HA, YO, YU and 9A stations. He finds his 4 x 5-wavelength Yagi EME array too sharp for Es working. In an aurora on 8 June, beaming (QTE) 30-45°, he contacted YL3AG* (KO26), LA2PHA* (JO38),

USEFUL WORLDWIDE WEB SITES

OH5IY	www.saunalahti.fi/oh5iy
RSGB PSC	www.keele.ac.uk/depts/por/psc.htm
UFRO	www.astro.ufl.edu/radioobs.html
G0CAS	www.g0cas.demon.co.uk/main.htm

SM1HOW* (JO97), LY2SA* (KO14) and SP4PMB* (KO03). DL1EJA* (JO31) was worked at 300° with 15° of elevation, as was PA2DWH* (JO22). He worked another dozen Is in JN71, 80, 81 and 90 from 1047 on 11 June, in a brief Es opening.

John Maclean, MM0CCC, together with some fellow members of the Cockenzie and Port Seton ARC, made a trip to the Isle of Tiree, IO66. They took with them a 2m station and participated in the RSGB contest on 21/22 May, completing 22 contacts. ODX was G4MJS/P* (IO90) at 754km, one of ten QSOs over 500km. John hopes to be QRV from Mull for the September Trophy Contest.

David Anderson, GM4JJJ (KY), was alerted to the Es opening on 27 May in a telephone call from DC7UT. Between 1712 and 1849 he completed 27 QSOs with stations in 9A, S5, T9, SV, YU, I, HG, HB and ZA. ODX was an exceptional 2858km to SV1RK (KM17VU) at 1728. ZA/OK1JR was a new country at 1811, and both are probably 'firsts' from Scotland by terrestrial modes.

In the 21/22 May contest David Dodds, GM4WLL/P (IO85NR), made 174 QSOs, including four novice licensees, with stations in nine countries, 90 districts and 31 grids in variable conditions. ODX was ON4PSP (JO20) at 778km. Conditions were excellent in the *Practical Wireless* QRP contest on 18 June and, using 2.5W to and 8-over-8 slot fed Yagi at IO85NR, he made 85 QSOs into eight countries and 23 grids. ODX was OZ1DLD/P (JO45) at 783km.

The Es event of 27 May was the best that GW7SMV has so far enjoyed. UR5BAE (KN29) was a new country and grid for Jamie at 1540 and soon after he was adding new grids in HA, I, OK and YO. He worked into EI, GI and GM in the 8 June aurora. More Es QSOs were made on 9, 11 and 13 June. The month also brought some good tropo to the south, including many southern Fs, northern EAs and EA1/G4BAH/P (IN82).

John Palfrey, EA7IT, caught an Es opening on 31 May into I, ON, PA, OK, S5 and OE. On 9 June there were three openings in which he worked 150 stations and 14 new grids. ODX was DF2CK (JO71AD). Graham Daubney, F/G8MBI (JN04FT), had Es to 9H at 2000 on 18 May; on the 27th to YU, 9A, T9, YO, HA and LZ from 1123; to YU, 9A, S5, YO, IT9, SV, I7 and I8 from 1638 and to LA at 1900. On the 28th from 1530 he mentions ZA, I7, SV and SV5, and on the 31st from 1520 to 9H and IT9. On the 30th, 1930-2100 there was FAI propagation to YU and LZ2FO (KN13) "...at strengths rarely heard before over this distance".

LOCATOR SQUARES TABLE

Starting date: 1/1/1979

Call	50	70	144	430	1296	Total
G3XDY	-	33	246	170	120	569
GJ4ICD	753	1	267	121	79	1221
G4RGK	409	-	345	233	78	1065
G4DEZ	465	17	257	81	67	887
G3IMV	630	19	612	125	53	1439
G7LRQ	212	-	60	36	34	342
G1SWH	338	42	222	81	30	713
G8TOK	293	31	132	55	29	540
G6TTL	220	-	133	90	27	470
G3FIJ	236	29	105	50	23	443
G0EVT	416	14	292	77	16	815
G4FUJ	57	17	19	4	5	102
2U0ARE	238	-	18	12	2	270
G0FIG	407	-	374	92	-	873
G0JHC	750	25	48	4	-	827
G0FYD	502	1	259	10	-	772
GW6VZW	488	-	146	6	-	640
G4YTL	-	50	490	72	-	612
GW7SMV	428	-	173	-	-	601
G7CLY	238	-	221	13	-	472

Call	50	70	144	430	1296	Total
G0XDI	196	-	213	59	-	468
G0GCI	279	19	99	39	-	436
GU7DHI	415	-	-	-	-	415
G1UGH	268	-	130	16	-	414
MM1BUO	296	-	76	31	-	403
G8XTJ	247	-	137	-	-	384
G4OBK	279	-	58	-	-	337
G4ZHI	39	-	238	32	-	309
GU6AJE	261	8	32	-	-	301
G1EFL	207	-	64	-	-	271
G0ISW	162	-	80	22	-	264
G3FPK	3	-	246	-	-	249
GM1ZVJ	235	-	-	-	-	235
GW3EJR	233	-	-	-	-	233
G8NGI	136	14	39	18	-	207
G4APJ	140	-	41	20	-	201
G4UCJ	141	-	26	-	-	167
G4OUT	-	23	107	-	-	130
EA7IT	-	-	90	-	-	90
G3NKS	5	52	12	4	-	73

No satellite, repeater or packet radio QSOs.
If no updates received for a year, entries will be deleted.
Next deadline is 17 August. Band of the month 1296MHz.

FINALE

AN EXCITING MONTH, so let's hope it continues this way. Sorry I had to omit repeater news, but I acknowledge receipt of the Kent Repeater Group's and Cambridge Repeater Group's *Newsletters*. I'll try to refer to them next month. The copy deadline for October is **17 August** and for November it is **14 September**. My telephone answering/fax machine is on 020 8763 9457 and my CompuServe ID is g3fpk. ♦

EMC

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AS REPORTED in the 'News' section of the June 2000 *RadCom*, the EMC Committee has appointed an EMC Membership Services' Administrator, Charles Elliott, G4UJW, to deal with routine contacts with members. Like all other EMC Committee members, Charles is a volunteer. We are also pleased to welcome two other new Committee members with valuable experience in this field. This brings the total number of full EMC Committee members to seven, compared with four earlier this year.

Two of us - Robin, G3JWI, and myself have been heavily involved with meetings with other organisations about EMC standards for xDSL (Digital Subscriber Line) and other high-speed data communication networks.

NOISY TV DETAILS

EVER SINCE television broadcasting started, TV sets have radiated line timebase harmonics in the HF amateur bands, but this only affects spot frequencies and can often be notched out. In the last few years however, some new models of TV set have appeared that radiate broadband noise. This seems to be a particular problem with large screen models and, in some cases, the interference still occurs when the set is in standby mode. The RSGB EMC Committee is trying to persuade TV manufacturers to improve the design of their products to reduce such emissions.

The subject of electrical appliances left on standby has been in the news recently for environmental reasons because, nationally, it represents a significant waste of electricity. In the case of TV sets, the switch-mode power supply is normally left running just to power the remote control receiver and associated circuitry, so that the set can be turned on using the remote control.

As reported in April 1998 'EMC', the first noisy TV sets that came to our attention were Toshiba models 2857DB, 2877DB and 3377DB, which were made around 1996-98. Although these sets already met the relevant EMC standard, Toshiba UK took notice of our concerns and investigated design modifications to reduce the level of emissions.

In 1998 a neighbour of Lee, G0ULN, bought a Panasonic 'Quintrix' TW28R3 wide-screen TV. Lee reports that when this is in use about 18m from his three element tri-band HF beam, he receives a continuous buzzing at levels of S5 on 14 and 28MHz and S7 on 21MHz.

In December 1998 Graham, G4MFX, bought a new Panasonic TX29AD70DP TV set, but found that it emitted noise on HF amateur bands, particularly 14MHz where the level was S5. The dealer normally offered a free 3-day home trial, but when Graham asked them to take this TV back he found that the offer did not apply as the set had been specially ordered.

In May 1999 Jack, G2CIW, reported that his Panasonic TX21S3T caused S7 noise on all bands 3.5 to 28MHz. Unplugging the TV aerial did not make any difference.

Bill, a CB operator near Aberdeen, complained to Panasonic about the noise on 27MHz from his neighbour's Panasonic TXW28R3 TV set. Although it was over 30m from Bill's CB aerial, it radiated noise at S2-3 on 27MHz. Weak FM signals that were perfectly readable when the TV set was off were lost in noise when it was on. A TS-850 showed noise in the 28MHz amateur band at a level of S2-3. Panasonic refused to accept a complaint from Bill, as he was not the owner of the TV set. Recently, however, the neighbour has moved away and Bill has passed his Radio Amateur Exam and is now MM1MAC.

In October 1999 Owen, GW3YVC, informed us of received interference from 7 to 24MHz. He had just found that the source was the Panasonic TX-W28R3 TV set that he had bought in March 1998. Panasonic eventually sent an engineer who fitted a Watson WHP-4A braid breaker/high pass filter in the aerial lead. This reduced the interference, but weakened the TV signal.

Mike, 5B4AGX/G4PFF, has had a Panasonic TX21ADI TV for over 4 years and reports that it generates noise on the 14 and 21MHz bands.

The EMC Committee has an ongoing dialogue with Panasonic UK about RF noise emitted from TV receivers.

G3LKZ purchased a Hitachi C28W410N 28in wide-screen TV earlier this year. He reports that it emits wide band 'hash' from 1.8 to 30MHz when in use or in standby mode. Although his amateur aerial is quite close to the TV, his previous 15-year old TV made no significant RF noise.

G0PWX reports QRN on 3.5, 18 and 21MHz from his Hitachi C32WD2TW, bought in November 1998. Andy, G0UEU, reports that his neighbour's Hitachi C2556TN TV emits broad-band noise from 5 to 28MHz, peaking at around 18MHz.

Last year Gerry, G0PWX, bought a Hitachi 32in wide-screen TV and found that it was producing S7 - S8 noise on the 18 and 21MHz bands. The noise continued at a lower level (S5) when the TV was in standby mode.

In May 1999 Terry, G4OXD, reported that he had received noise from 3.5 to 50MHz from a Hitachi CN24WN TV. He found the Hitachi service department helpful and the dealer came and exchanged the TV for another of the same model but with much less RFI.

In 1998 Steve, G3VMW, was puzzled by continuous broad-band interference from 2 to 7MHz, including S7 'hash' across the 3.5MHz band. He reports that it was caused by his new Grundig ST 70-725/8 FT/GB TV set, and was present when the set was in use or in standby

TV EMISSION TEST

THE CASES HERE raise the question of what EMC standards TV sets are required to meet. The harmonised European standard for interference emitted is EN 55013. We have no reason to believe that emissions from any of the models mentioned above exceed the EN 55013 limit, but the limit is not tight enough to protect amateur reception in the HF bands. It seems that in the past, most TV sets and other equipment were far below the limit from 1.8 to 30 MHz, but some recent models produce emissions that peak at around 10 to 20MHz.

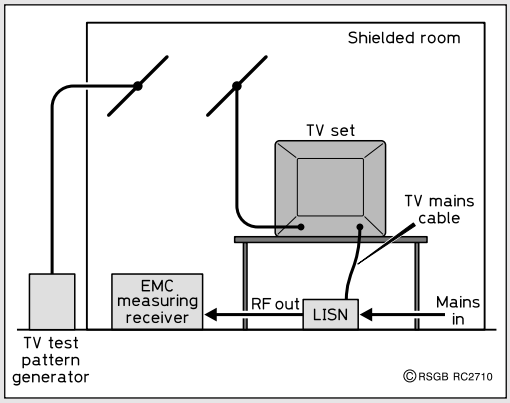


Fig 1: The principle of conducted-emission testing of TV receivers below 30MHz.

Another issue is the test method itself. Like most other EMC standards, EN 55013 does not test for interference radiated directly by a TV set below 30MHz. Instead, a 'conducted-emission' test is performed. **Fig 1** shows the principle of this test.

A LISN (Line Impedance Stabilisation Network) presents a defined impedance and couples interfering signals from the TV's mains plug into the EMC measuring receiver. Recent developments raise a number of issues, however.

Firstly, TV sets are getting larger and require more powerful timebases. Secondly, some sets such as the Panasonic 'Quintrix' wide-screen TX-32PF10, have an RF filter choke built into the mains plug. It would be better if all the filtering were inside the cabinet, as this would reduce interference radiated by the mains cable. This may be about 2m long with another 0.5m inside the cabinet, making a quarter-wavelength at 28MHz. Thirdly, the test assumes that the TV set has a mains lead, an aerial socket, but no other connectors. The effects of external speaker cables and other equipment connected via SCART cables are not considered.

EN 55013 specifies tests only when the TV set is displaying a normal picture, not in standby mode. It might appear that the emissions would always be lower in standby mode, but this is not always true.

mode. Grundig Technical told Steve that the set complies with EN 55013 and there was nothing they could do. He sold it at a loss and bought a Sony KV29KS which has not given him any problems.

Roy, GW3SYL, bought a 28in Sony Nicam Stereo TV about two years ago and reports that it causes interference on the 10, 14, 18 and 24MHz bands. Dave, GI0BQX, has had a Sony 28in TV for the past four years and reports noise on 14MHz at levels of S8 to S9. John, GM4NHI, reports that his new 34in Sony TV, model KV-S3432U, radiates strong line timebase harmonics from 14 to 28MHz, but that his neighbour's new wide screen JVC TV (model unknown) about 90m away is much more of a problem.

In November 1998 Bill, GW3MFY, was puzzled by a new source of interference from about 22 to 29MHz. After several months, he traced it to his own TV receiver, an NEI model NE5159NT from Maplin. He eventually took it back for a refund.

STEAM TRAINS?

WE HAVE HAD an unprecedented number of reports of a 'chuff-chuff' noise like a fast steam train, usually peaking around 18MHz. Thanks to three Scottish radio amateurs from Dalgety Bay, Fife, the source of this very distinctive sound was identified. They found that it was caused by certain types of Bush TV in standby mode. They also reported two sets in different streets, 'chuffing' at exactly the same rate and keeping in step. Ian, GM3OZJ, located a Bush 2867NTX and the owners have agreed to avoid leaving it in standby mode. Stewart, GM4UTP, has one near him, but the owners refuse to discuss it and he has reported it to the RA.

Paul, M0CAL, reports HF interference from a Bush 2872NTX/A TV set that his father bought in August 1999.

Richard, M0CLZ, recently bought a Bush 2867NTX 28in TV and found that it caused interference in the 14 and 21MHz bands. He phoned Bush, who told him that they had never heard of this problem. They were not prepared to send an engineer to investigate and suggested that he should return the set for a refund.

Alex, GI0TJJ, reports RF noise from his neighbour's Bush TV and Robert, GI0KOW, has the same problem with his own 28in Bush NICAM Model 2867NTX.

Pete, M0CFQ, bought a Bush 2876NTX TV from Tesco and reports that it emits RF interference on standby that sounds like a steam train. It also puts S7 noise across 14 to 28MHz when in use. Brian, G3XGY bought a 20in Bush 2030T TV from Tesco and reports a 'chuff-chuff' noise on the 3.5 and 14MHz bands.

In April 2000 Ken, M1DDA, noticed interference on HF, peaking at 21MHz. He borrowed a portable HF receiver and walked around to locate the source, which appeared to be in a neighbour's house. Fortunately, the neighbour was co-operative and allowed Ken to look around. The source turned out to be a new Bush 2074NTX TV on standby. The neighbour returned it to the store for a refund and bought a Hitachi TV instead.

Dave, G4YTB, has a Bush 21in TV set that is three years old and was purchased from Aldi. He reports white noise at S7 level from 14 to 28MHz.

The EMC Committee is in contact with the importers of the Bush brand about these sets, although there appear to be other lesser-known brands that emit similar signals.

Wally, G3WAL reports that his Schneider 'Scenario' 215UK TV, which he bought from Asda, produces a 'chuffing' noise in standby mode. Eric, GW3KCQ, reports a similar sound from a JEG model CT7800 28in colour TV.

G0NUF reports a 'chuffing' noise that blots out the 18 and 21MHz bands during the daytime. G4RGA sent a cassette recording of a similar sound on 18MHz. Roger, G0DIZ, e-mailed a wave file of the same sound. Dave, G0MLC, and Miles, G0ODS, have reported something similar. The above five sources are as yet unidentified, but have the same distinctive characteristics.

418/433MHz LOW-POWER DEVICES

THE SUBJECT OF the poor performance of some receivers used in 418MHz and 433MHz low-power devices has been mentioned a number of times in 'EMC' since February 1995. In February 1999, we published results of tests on 433MHz receivers used in vehicle radio keys. Some of these are susceptible to blocking near amateur 70cm repeaters.

Recently, York EMC Services Ltd at the University of York has completed a study for the Radiocommunications Agency. This includes comprehensive tests and design analyses of a number of 418 and 433MHz receivers used in various remote control devices. The subject of 418MHz receivers has been of particular interest recently. Since TETRA (Terrestrial Trunked Radio) started up on 420-425MHz, the RA has received literally thousands of reports of blocking of vehicle radio keys and cordless household intruder alarms. The York report can be downloaded from the RA web site, www.radio.gov.uk/busunit/research/extramen.htm

Another interesting report from York EMC Services is entitled 'Cumulative Effect of Radiated Emissions from Metallic Data Distribution Systems on Radio-Based Services'. This is about predicting the interference levels that could be expected in future if there is widespread use of xDSL and/or PLT (Power Line Telecommunications).

PUMPING STATIONS

WHEN BOB, GW3ECH, retired to Llanywern near Brecon, Powys, he thought he had found the ideal quiet rural location for amateur radio. Llanywern has a population of nine, two of whom are radio amateurs.

Early in 1999, an almost continuous noise source started up on the 3.5MHz band that caused problems for Bob on his 80m skeds. He traced the source to a new small pumping station that had been installed by Welsh Water about 400m from Bob's QTH. He wrote to Welsh Water and was informed that the manufacturers of the equipment would send an engineer to fit suppressors. The noise did not go away however.

Spot the noise source: a rural scene in Powys (see 'Pumping Stations').

While on a weekend trip to South Wales this spring, I stopped off to visit Bob and made some measurements. The pumping station is in a green glass-fibre housing the size of a garden shed at the side of the road (see photo). It was indeed radiating RF noise on the 3.5MHz band, but it is not entirely clear whether this is reaching Bob's aerials by radiating directly or by propagating along overhead power cables.

It appears that this cabinet contains pumps driven by AC motors powered by electronic variable-speed drive circuitry. This would use high power 'chopper' circuitry like a multi-kilowatt switch-mode power supply. Like the noisy TV sets mentioned previously, this also raises the issue of directly-radiated emissions below 30MHz. I would be interested to hear from any other members who have similar equipment nearby. ♦

Station Logkeeping Software

*Reviewed by Richard Newstead, G3CWI**

KEEPING A STATION log is a statutory requirement of the Amateur Radio Licence. The licence states what must be logged and how the logging must be accomplished. Two methods are allowed, the paper logbook or some sort of softcopy stored on an electronic storage medium. Taken together, these requirements set the minimum standards for logging software that is used in the UK.

There are numerous logging packages on the market and they range in price from free to nearly £100. All of them can do much more than simply log contacts. Most will track awards, countries worked on different bands and modes, recall previous QSOs (never forget a name again) and a whole host of other things. It would be impossible to review all of the packages available, so this review concentrates on five of the most widely used packages.

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

The objectives of this review are first and foremost to see if the packages meet the minimum logging requirements set on in the licence, and then to look at what other facilities and features they might have. Each package has been evaluated over a period of time to ensure that the review reflects how they work in real situations.

STEP ONE

THE FIRST STEP for anyone wishing to use this sort of software (especially if they wish to track countries worked) will be to enter all previous QSOs. This is potentially very time consuming indeed – in 23 years of operation, I have made something like 50,000 contacts. Surprisingly, only *TurboLog* incorporates an easy method of recording country/mode scores without entering in all the details of all of the relevant QSOs.

Interestingly, while all the packages reviewed support connection to the DX Cluster, none automatically logs the connect and disconnect times, which would be useful to complete the station log.

Net operation presents logging software with a particular problem in that you are effectively in contact with several stations simultaneously, people may join and leave at the same or different times. I have looked to see if this very common mode of operation is supported – with some surprises!

STEP TWO

THE NEXT STEP is to get to grips with the software. This review looks at three DOS packages and two Windows packages. Windows has a reputation for having a more intuitive interface than DOS, but it all depends on the skills of the software author to make sure that the program is intuitive.

The best DOS programs can be easier to use than a poor Windows one, and I have looked at how easy all the packages are to use.

TURBOLOG

ALTHOUGH *TurboLog* [1] is a DOS package, it has a sophisticated menu-driven interface. It has the feel of a quality product. I was quickly able to make use of the many facilities available – aided by the professional-looking User Guide. The display screen has been very well thought out and was very clear, even with the monochrome VGA display on my laptop PC. *TurboLog* interfaces to a wide variety of different systems, even allowing paging to be set up so that the avid DXer can be alerted to the appearance of a new country on the bands, wherever they are.

The software allows compliance with the UK licence requirements, with all of the relevant information being recordable. Station open and close can be logged using the remark facility in the call window; hence full compliance with the UK licence requirements is easy.

The DX Cluster facilities were good, with sophisticated filtering options available, a nice touch being that the software attempts to log out of the cluster when it is closed down. It was possible to monitor the cluster without being connected, by commanding the TNC to monitor un-protocolled messages (M U commands for a TNC2). The Morse code sending facility works well. A minor problem (for a poor typist like me) is that there is no display of what is being typed in the Morse keyboard mode.

TurboLog has its own internal country information database and instructions are provided on how to keep it up-to-date in these turbulent times. IOTA is supported through the use of *TurboLog's* keyword facilities. A ready-made IOTA file is available at extra cost (currently £10).

If you need to import logs from other packages, such as those for contests, there is a wide variety of options available, including a general ASCII format.

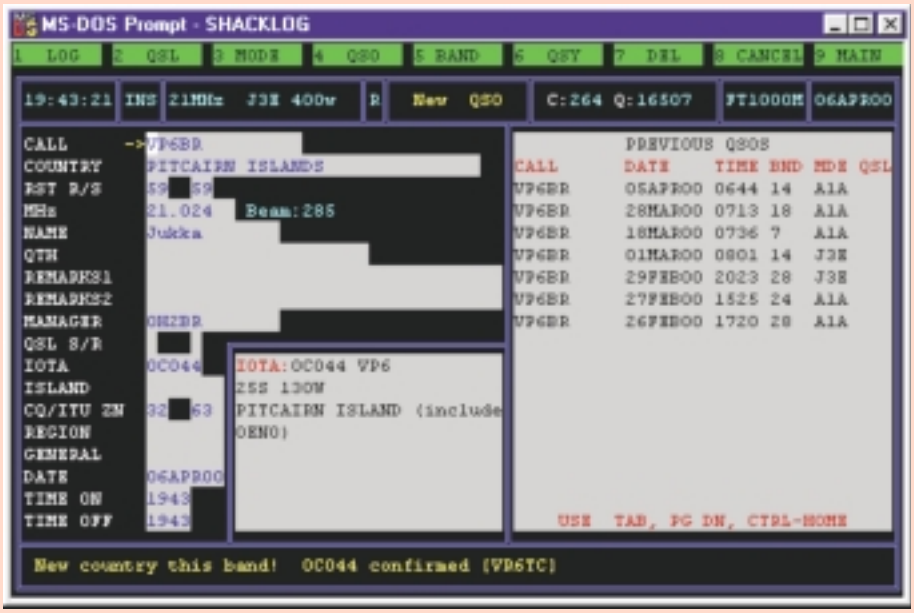
SHACKLOG

SHACKLOG HAS quite a basic user-interface, which is in part a limitation of the DOS operating system. In use, it makes extensive use of various function keys in a manner that for me was rather counter-intuitive (eg on one screen, moving between columns required the use of a function key instead of the tab key or cursor keys). The main functions are displayed on the screen, so finding the correct key to use is generally easy (usually after trying the wrong one!). Once the initial learning phase was over, the software was quite easy to use. On my shack PC, which has a VGA screen, the display used small fonts when the packet system was in operation, making it rather hard to read. This was not a problem with a higher resolution monitor.

The program has some significant strengths. Firstly, it does allow logging that conforms fully to the UK licence requirements. CQ calls, test transmissions and station closedown time can all be logged. Secondly, the program can use the DX Cluster in a non-connected 'snoop' mode. This is very useful for Short Wave Listeners and also for licenced amateurs who can hear a DX Cluster but have unreliable connection to it. As it is written and supported from the UK, *SHACKLOG* offers UK telephone support that could be handy as you get to know the package.

The software does not come with any inherent country database, which means that you must enter the relevant country information the first time that you contact each country. From then the program will recognise the country prefix. This is a rather cumbersome method of doing things and relies on the operator knowing all the prefixes, rather than the software. This omission makes the software very much less useful than it might be, especially for anyone new to the HF bands who might not know the prefixes to start with [2].

Contest logs can be imported from all of the major packages and the import routine can be adapted to import a wide range of other formats. ADIF is not directly supported however. *SHACKLOG* provides good support for the IOTA awards, via some additional software. An IOTA awards manager costs £5 and and IOTA database costs £8.



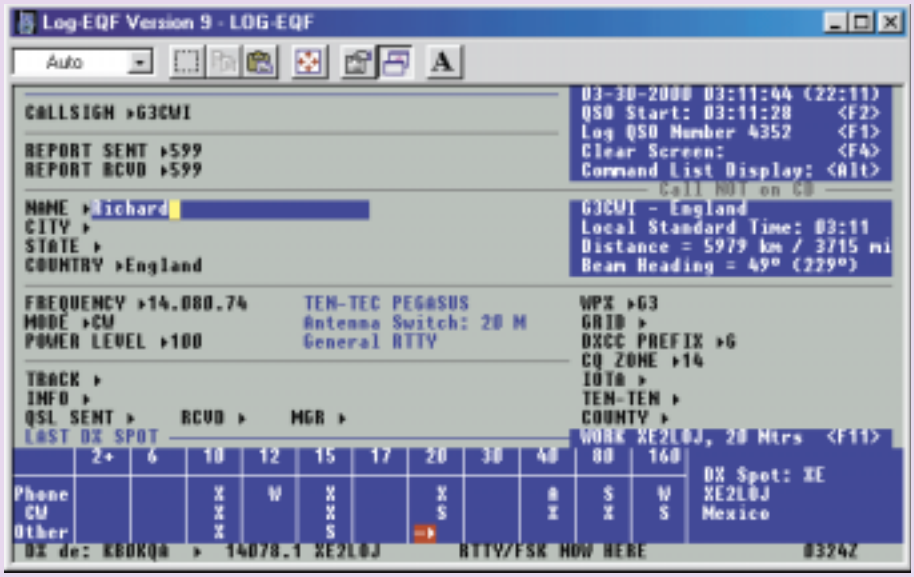
Log-EQF

Log-EQF WAS supplied to me on a CD ROM, although the author advises me that 3.5in disks are the standard method of despatch. *Log-EQF* has a fairly basic user interface which runs a program packed with features. It supports a mouse, making navigation of the menus quick and easy. It has particularly good support for contests/DXpeditions, and many users will not find the need for additional contest software if *Log-EQF* is used.

The packet operation worked well, but has one serious disadvantage. The main cluster window does not display the call sign of the station who sent the DX alert. With packet spots coming in from all round the world it is not uncommon to see spots during our daylight hours showing, for example, a W6 working JA on 160m. These spots are of little use here in the UK. If you can see that the spotter is a W6 all is well, but without that information time can be wasted looking for DX on bands that are closed. The spotting station is displayed on the main screen, but as this only displays the latest spot received, you may need to look quickly if the spots are coming in thick and fast!

Various awards are directly supported, including IOTA. Import options include ADIF, fast becoming the *lingua Franca* for software of this sort. The software supports control of two different stations, allowing operation of equipment in a holiday home or at a club station to be done with ease.

A good CW keyboard forms part of the program. All the usual facilities such as pre-programmed messages are included. File formats and rig control configuration is well documented, allowing interfaces to rigs not currently supported to be programmed easily.



DX4WIN

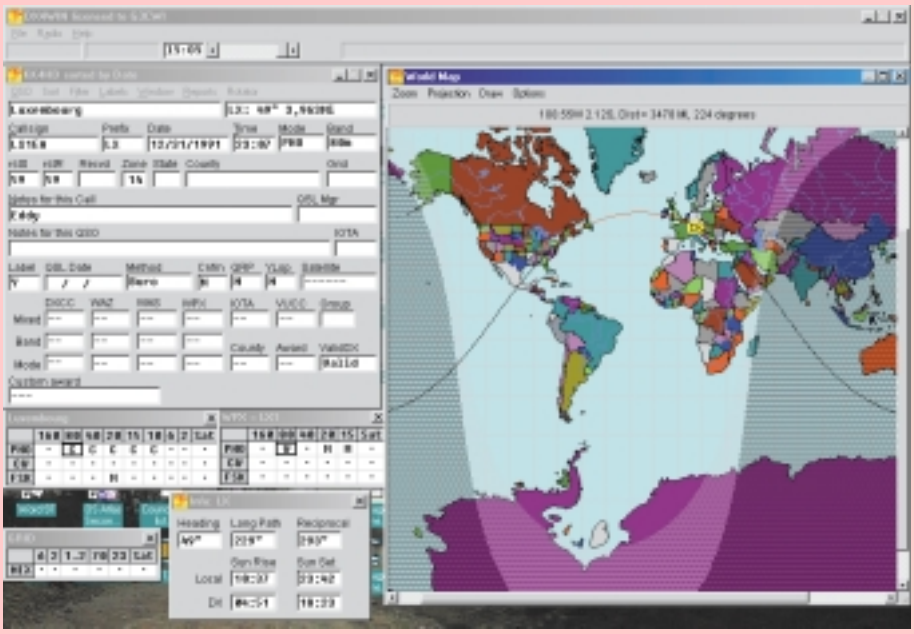
AS THE NAME suggests, *DX4WIN* is a Windows® package. It makes good use of the Windows screen, allowing a range of information to be displayed. In operation, it is easy to use and full of features. There is a 128-page manual that you are invited to print out and it is well worth the paper to do this if you want to get the maximum benefit from the software. *DX4WIN* includes a map display that shows you the approximate locations of stations as you work them. You can zoom in to the country and as you do, some additional detail is revealed. This detail includes the locations of some large towns. The choice of towns available is rather odd; for example, in England, 15 towns are shown, including Farnborough (surely not the 15th largest conurbation) and Newcastle-under-Lyme, but not Newcastle-upon-Tyne. The map also shows the grey-line and the great circle path. It will also display the locations of DX spots as they come in from the cluster. The mapping is a nice idea, but it had the feel of a work-in-progress rather than the finished article (unlike the rest of the program).

Unfortunately, *DX4WIN* does not readily allow adherence to the UK licence conditions. The authors suggest that CQ calls are logged by entering a zero in the RST field, invalidating the QSO whilst still recording it. Presumably power could be entered in the comment field. Neither of these work-arounds is ideal, and they do tend to detract from what is an otherwise excellent program.

The tracking of awards was effective and it is possible for the user to design methods for tracking new awards. This is fully explained in the manual and seemed quite easy to do. Cluster facilities were good, with plenty of filtering options. You can configure *DX4WIN* to accept spots from predefined countries, which can be useful if your cluster node relays Internet spots, some of which may not be of any interest.

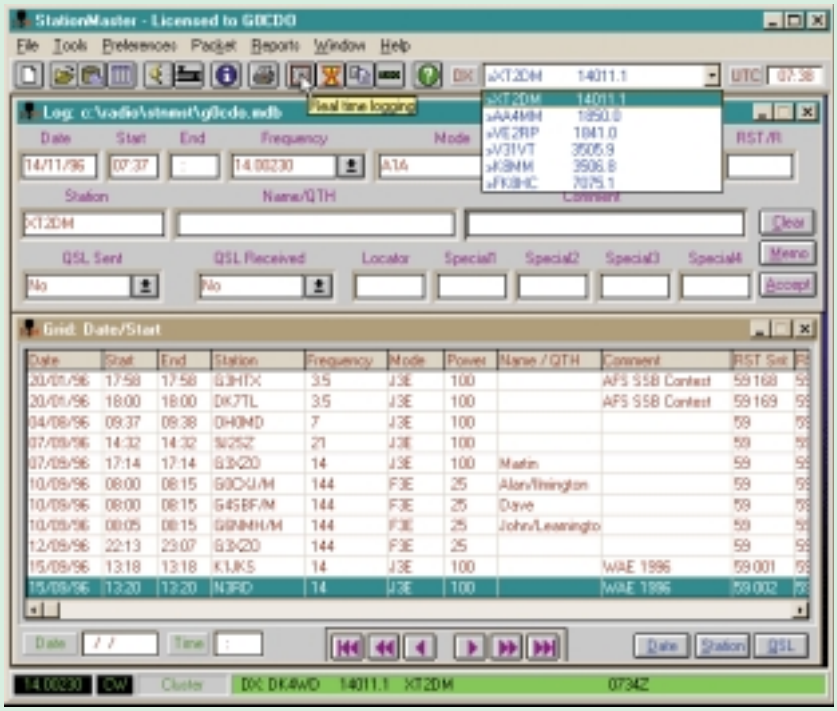
DX4WIN includes an up-to-date country file. This can easily be edited from within the program to add new DXCC entities or to delete old ones. An IOTA database is included as standard, and this can also be directly edited. Exchanging data with other programs by importing or exporting logs is well supported, with 60 formats available (including SD).

DW4WIN includes a CW sending facility. This is well implemented, with a scrolling display showing what you have typed, so you can make corrections as you go.



StationMaster

THIS IS ANOTHER Windows-based package. In operation it was easy to use *StationMaster*, initially with reference to the printed manual that is supplied in Word and PDF formats. Aside from all of the normal facilities there were one or two special things. The software includes an integrated propagation model, allowing the user to look at the Highest and Lowest possible frequencies to any location. It was not clear which propagation model was used, but it was probably *Minimuf* or something similar. The sunspot number for the propagation model is either taken automatically from the DX Cluster or can be entered manually. Uniquely, *StationMaster* incorporates support for net operation. Considering how many nets there are, it is surprising that this is not more widely supported.



The software does not allow a CQ call to be entered directly, although the author of the software was able to suggest a simple work-around that allowed conformance to the UK licence conditions. There is no display of information typed in the 'CW keyboard' mode, making accurate typing a necessity.

The log and the various country databases are all stored as *Microsoft Access* files. This enables them to be easily edited, either using *Access* or the utility supplied.

StationMaster will import many of the well-known station and contest logging package file formats, the only major package missing being NA.

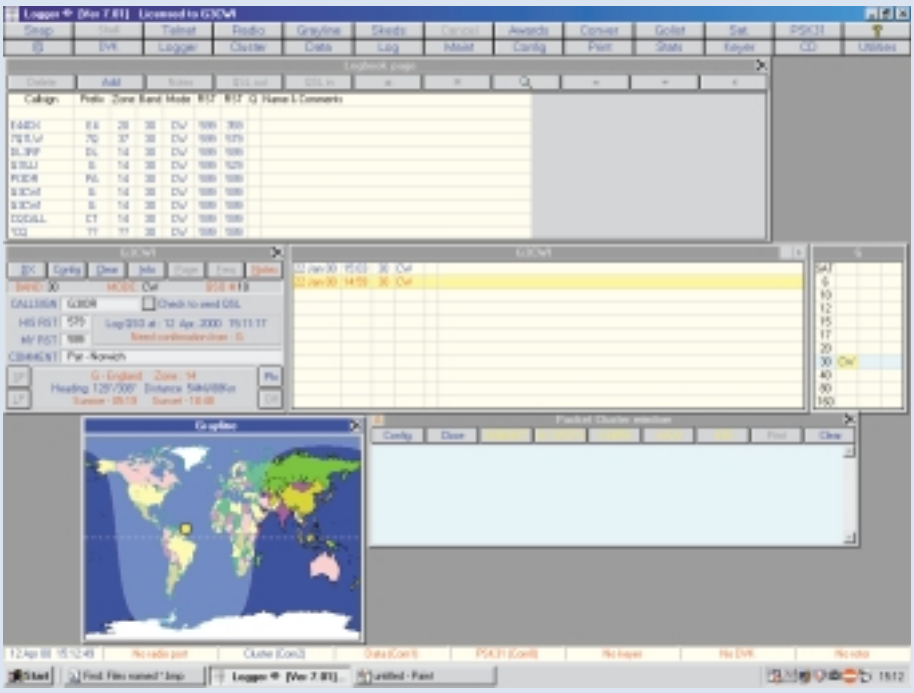
FREE SOFTWARE?

THERE ARE NUMEROUS logging packages available from the Internet for which no charge is made. Some of these are quite sophisticated, rivaling the most complex paid-for packages.

Logger, by Robert C Furzer, looks to be particularly interesting and has a wide range of features. It can be found from various amateur radio Internet sites - just search for "amateur radio logging programs".

Some of the free packages come without guaranteed support from the author, so you would be well advised make sure that you are happy with the package before you start using it.

Paying for software goes some way towards encouraging the author to keep developing the package, but it is very much an individual decision as to whether you are happy with the 'free' route.



	TurboLog	SHACKLOG	Log-EQF	DX4WIN	StationMaster
Website	Y	Y	Y	Y	Y
Version	3.17a	5.2.01	9.12	4.05	1.20
Cost	180DM	£32	$49.50	$89.95	£58.75
Operating System	DOS	DOS	DOS	Win95/98/NT/2000	Win95/98
Minimum PC Spec.	286 (386 recommended)	286	286	486DX66	486DX50
Origin	UK/Germany	UK	USA	USA	UK
Mouse Support	Y	N	Y	Y	Y
CW + Keyboard	Y	N	Y	Y	Y
DX Cluster	Y	Y	Y	Y	Y
Packet TNC Support	Y	Y	Y	Y	Y
Heading from grid ref.	Y	N	Y	Y	Y
Rotator support	N	N	Y	Y	N
Net operation	N	N	N	N	Y
Import/export	Y	Y	Y	Y	Y
RTTY/Amtor support	Y	Y	N	Y	Y
DVK support	Y	N	N	N	Y
Contest mode	Y	Y	Y	Y	Y
Country data source	Custom internal	User generated	Custom internal	Custom internal	Access Database
QSL support	Y	Y	Y	Y	Y
Rig Control	Y	Y	Y	Y	Y
Callbook CD support	Y	Y	Y	Y	Y
Award tracking	Y	Y	Y	Y	Y
DX Cluster snoop mode	Y	Y	Y	Y	Y
Meets UK Licence reqs	★★★★★	★★★★★	★★★☆☆	★★☆☆☆	★★★★☆
SWL Mode	N	Y	N	Y	N

CONCLUSIONS

THERE IS A logging package to suit every user's needs, but it is difficult to recommend one over another as the choice is rather subjective. They are all good value-for-money and over time will save the cost of paper logbooks. The facilities for tracking awards and countries will be of use to many HF Dxers, and there are lots of facilities for VHF and UHF DXers too. If I had to choose one for my own station it would probably be *TurboLog*, but in fact I'm sticking with a pen and paper for the sole reason that I have no room for a PC on the operating desk!

Finally, I would like to thank the companies who willingly supplied their software for review and provided useful comments on the draft text.

REFERENCES

[1] See *RadCom* October 1997 for a full review of *TurboLog*.

[2] I am advised that this will be addressed in the next issue of *SHACKLOG*. ♦

WEB SITE ADDRESSES

TurboLog	www.TurboLog.de
SHACKLOG	www.SHACKLOG.co.uk
Log-EQF	www.itis.net/eqf
DX4WIN	www.dx4win.com
StationMaster	www.fbsltd.demon.co.uk
Logger	www.groupz.net/~dwm/logger.htm

ICOM IC-718

160m-10m 100W output
Budget class high spec.

Great Value

Designed for HF operation and covering 1.8 - 30MHz it offers 100 Watts output on SSB, CW, RTTY and (AM 40W). Receive coverage is 30kHz - 30MHz. This transceiver is easy to operate and offers direct keypad entry. Despite its low price, the performance is startling and with a programmable menu system, and 101 memories, you can set the radio just as you want. VOX and a variable noise blanker are included as well as an effective IF shift and variable speed rate of tuning. CW enthusiasts will appreciate the built-in keying circuit, adjustable CW pitch control and full break-in. To upgrade you can add DSP (UT-106) Voice synthesizer (UT-102) and one optional IF filter.

IC-756PRO

100 Watts 160m-6m
RTTY Send & Decode
Real-Time Spectrum Scope

The IC-756PRO, despite its name, is a completely new design from head to foot. Offering 100 Watts from 160m to 6m, it is intended to be a no-compromise HF rig for the serious DXer. The large central display offers a full-colour graphic interface giving comprehensive information. This includes a real-time spectrum 'scope operating on transmit to indicate PEP and receive to indicate band occupancy. As well as SSB, FM, AM and CW, you also get an RTTY decoder and a voice recorder for both transmit and receive audio. The DSP circuit provides one of the best noise reduction functions we have ever heard, and the CW operator will love the flexibility and the built-in memory banks. The IC-756PRO has so much to offer, you will need to get the full brochure which we will happily send you on request.

IC-706 IIG

160m-70cm 100W HF
DSP Filtering
CTCSS for repeater Operation

The IC-706 IIG is latest in a steady development of one of the world's success stories, the "IC-706." This latest version extends coverage to 70cms, now offering coverage of all our major amateur bands. As well as 100 Watts from 160m to 6m, you also get 50 Watts on 2m and 20 Watts on 70cms. The choice of SSB, FM, AM and CW makes this a go-anywhere radio. The DSP offers great flexibility in dealing with QRM and the newly designed transmit audio stages offer bags of high quality audio. And the IC-706IIG is at much at home on the table as it is in the car. Phone for full brochure. Tomorrow this radio could be yours

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Fax: (01702) 205843
e-mail: sales@wsplc.com.
Web: www.wsplc.com.

22, Main Road, Hockely, Essex. SS5 4QS

ATV

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E-mail: G3YMK@aol.com

THIS YEAR the British Amateur Television Club decided to relocate their annual rally to Bletchley Park, home of the famous 'Enigma' collection, near Milton Keynes. ATV enthusiasts gathered for the event on 7 May and specialist traders were doing brisk business. There was terrific interest in the ITN mobile uplink van and several amateurs were seen drooling over the kit packed inside. Demonstrations were given over one of the *Eutelsat* satellites on 14GHz. Each time the van is used, a site clearance permission has to be obtained from the Radiocommunications Agency. The transmitter in the van runs up to 150 watts into a roof-mounted dish. Live pictures were exchanged with the Dutch repeater PI6ALK, which has temporary access to a spare transponder.

REPEATER NEWS

A FULL PROPOSAL has been submitted to the Radio-communications Agency for a new 10GHz ATV repeater to serve the Eastbourne area in East Sussex, proposed call-sign GB3XG. This is the latest development of the Worthing Video Repeater Group in Sussex. This very active group already runs the GB3VR/RV repeater system in Brighton and has also recently taken over responsibility for voice repeaters GB3BR and GB3SR. Normally, if the proposals are straightforward and all of the necessary paperwork is available, permission to activate the repeater takes about twelve weeks. If any of the interested parties have objections, this can extend the period considerably. The RA needs to ensure that other band users will not suffer interference and the necessary consultation cannot really be expected to take much less time.

The group has been experimenting recently with the receive antennas for GB3VR. The terrain to the north of their site at Race Hill, Brighton restricts coverage, but stations along the south coast enjoy good pictures from the repeater. When not in use as a repeater several pages of information are transmitted, including information from local weather monitoring equipment. A new feature is an SSTV interface receiving on 144.7MHz. Most of the automation and control for the repeater is based on Amiga 600 computers, well-loved by ATV enthusiasts. If you have one gathering dust and no longer in use, the group would like to hear from you. For further information about the Worthing Video Repeater Group and its activities, visit their website www.videorepeater.co.uk or listen on the local ATV talkback frequencies, 144.750, 433.750 or 434.575MHz.

The Ian Waters, G3KKD, mobile 23cm ATV station on display at Bletchley.

Last year the SCART group (Solent Club for Amateur Radio and Television) moved their 24cm repeater, GB3AT, from a site near Fareham to Winchester. Coverage was generally improved but, as expected, signals in the Portsmouth area were much poorer. The club has been working on a solution to the problem for some time, and a second repeater linked to GB3AT on 13cm looks promising. There is a possibility the link could be digital. When negotiations with site owners are completed, a full proposal will be made for the new system.

The Leicester Repeater Group (GB3GV) reports that the funding for their repeater is reaching critical levels. The group also looks after voice repeaters GB3CF, GB3LE and GB3UM. Rates, rent and electricity eat up over £600 per annum and subscription income falls far short of this. New members are desperately needed, and information regarding subscriptions and other activities can be obtained from the group chairman, John Senior, G7RXS, by e-mail to seniorja@aol.com or by phone on 01162 841517.

The Lincoln Repeater Group, which operates GB3VL, has proposed to increase the power of their repeater located at Lincoln Cathedral to 18dBW. Unfortunately, this has met objections from the Civil Aviation Authority. The group and the RSGB Repeater Management Committee are working with the Radiocommunications Agency to see if there might be a resolution to the objections.

A site change has been requested for the Nottingham repeater, GB3NV.

SIGN OFF

BY THE TIME you read this column, the summer should be well and truly with us. Portable ATV operation is becoming increasingly popular, so please let us hear of your exploits for inclusion in the future. Pictures are always very welcome, either in electronic or paper form. I look forward to hearing from you at G3YMK@aol.com or by post to the address above. ♦

Activity on 13cm

THERE HAS been a flurry of interest in 13cm, with the introduction of the 2.4GHz licence-free links described in this column last time. Marcel Gibelin, F1GE, has modules and kits available which make up a very elegant 13cm TV link complete with two audio sub-carriers for associated stereo sound. The frequency can be set anywhere in the 13cm band in steps of 125kHz and displayed on an LCD panel. Transmit output is said to be up to 30mW, which is certainly enough to drive a G3WDG 1-watt PA. The construction of each kit is fairly straightforward using conventional components and took two evenings including testing. All the RF bits are inside a tinplate module. Instructions are in French, but the clear parts lists, layout and circuit diagrams are very easy to follow. A sheet of operational instructions in English is also provided. Marcel has obviously spent a lot of time perfecting the equalisation and pre-/de-emphasis of the link and the results are very impressive.

All components are available separately, and complete kits (including good-quality PCBs, rotary encoders, LCD displays and pre-programmed PICs) are also supplied. The cost of the kit is 900FF, and further information can be found on F1GE's website http://hometown.aol.com/atv13cm/myhomepage/index.htm or by writing to Marcel Gibelin, F1GE, at 39 Avenue de Savignon, F93600 Aulnay-sur-Bios, France.

The transmitter can also be set to give an output above 2.5GHz, for quadrupling to 10GHz. A suitable quadrupler/amplifier would be the G3WDG unit described in *The Microwave Handbook Volume 3*, available from the RSGB Bookshop. Kits of parts for the multiplier are available from the RSGB Microwave Components Service.

Hot on the heels of this comes news of a similar unit available in the UK from Giles Read, G1MFG. Again, using RF modules sourced from the Far East, frequency-setting is by PCB-mounted DIP switches. Details are found on G1MFG's website: www.g1mfg.com

IARU

TIM HUGHES, G3GVV
10 Farm Lane, Tonbridge TN10 3DG.

IARU Administrative Council Officers: David Wardlaw, VK3ADW (Vice President), Larry Price, W4RA (President) and David Sumner, K1ZZ (Secretary).

WRITING IN the *ITU News*, before the World Radiocommunication Conference started, Robert Jones, VE3CTM, Director of the Radiocommunication Bureau of the ITU, introduced the topic by saying: "WRC-2000 will be held in Istanbul, at the kind invitation of the Turkish Government. Running a full four weeks from 8 May to 2 June, the event will require the services of nearly 300 staff, including interpreters and translators, who will work around the clock, to prepare and distribute an estimated total of 300 million pages of documentation to some 2,500 international delegates, representing both government and private sector interests. With the huge surge in popularity of radiocommunication services over the last ten years, the WRC has achieved the reputation of a gruelling event, characterised by late-night sessions, forceful debates, and intense negotiating and lobbying.

"At each conference, delegates debate the use of frequency bands for a large number of services, from mobile and low-Earth-orbit satellite services, satellite broadcasting, aeronautical and maritime navigation to amateur, radio astronomy, Earth exploration and deep space research.

"Some proposals to WRC-2000 concern the need for additional spectrum to facilitate the expansion of existing services and to foster development of brand new technologies and applications. Other proposals relate to regulatory procedures and the equitable use of spectrum. As some parts of the spectrum become intensively used, the conference is required to ensure that all users can share safely without harmful interference."

ATTENDING WRC-2000

IN HIS post-WRC-2000 report, Larry Price, W4RA, President of the IARU, noted that 2,037 delegates had registered from more than 130 countries. In addition, 95 organisations (including IARU) were represented by an additional 326 observers. The IARU delegation consisted of W4RA himself, David Sumner, K1ZZ, and Wojciech Nietyksza, SP5FM. In addition, Ken Pulfer, VE3PU, David Wardlaw, VK3ADW (IARU Vice President), and Paul Rinaldo, W4RI, represented their national Member Societies on their respective delegations for the full duration of the conference. Jay Oka, JA1TRC, and Oyekunle Ajayi, 5N0OBA, were also present for part of the conference. As always, there were approximately 40 more amateurs present in their professional capacities, although they were not specifically representing amateur radio.

SMALL IS EFFICIENT

IT IS DIFFICULT to transact detailed technical business in a room of nearly 2,400 persons, so the work was divided into a committee structure. IARU focused its attention on the committees dealing with Plenary 2, regulations, and allocations, with each of the three officers assigned to cover one group only. Of course the work quickly began to involve many sub-groups and there were as many as ten simultaneous meetings. By careful scheduling, doubling-up and assisting each other, the IARU representatives were able to cope with the situation.

ACHIEVING GOALS

THERE WERE TWO issues of concern at WRC. One was to attempt to achieve the positive result of meeting the goals. The other was to protect defensively any changes adverse to the interests of radio amateurs. The first positive goals, all of which were achieved, were:
1 - placing article S-25 (concerning the amateur services) on the agenda of WRC-2003;
2 - placing the harmonisation of the 7MHz band on the agenda of WRC-2003;
3 - ensuring that the realignment of bands above 71GHz protected the interests of amateurs.

In addition, IARU had goals of:
1 - monitoring the principle of Incorporation by Reference (IBR) so that IARU can have the option of making use of IBR in the revision of article S-25 - this was achieved;
2 - monitoring changes in footnotes to the Table of Allocations (article S-5) for changes favourable to the amateur service.

On balance, the favourable changes outweighed the negative changes, However, the total change was not of great significance.

OTHER ISSUES

WRC-2000 WAS NOT solely about amateur radio. The major thrusts of the Conference were other topics such as third generation wireless phones, broadcast satellite replanning, sharing between certain satellite systems, radio navigation satellites, etc. These issues, which consumed much of the time, energy and money at WRC, were monitored by the IARU team in some detail, because it was important that they should be aware of the progress of the work. IARU goals were achieved, and then began the long hard toil towards the next conference, for it is seemingly a never-ending process. It is generally thought that the next WRC will be held in June 2003 in Geneva. ♦

DATA

ANDY TALBOT, G4JNT
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E-mail: data.radcom@rsgb.org.uk

A FEW QUERIES have come in from people wondering where to find particular modes, or where to go in the band to try something. All the bandplans show the sections and preferred calling frequencies for data communications, but these are usually aimed at RTTY, AMTOR and packet usage.

Problems arise when operators try to find suitable frequencies for the lesser-used modes. There are no official frequencies, for example, for Hellschreiber, which is gaining in popularity. A particular frequency becomes the centre of activity after a time, as like minds gather there – and that is how bandplans can form! The problem is worse when trying to find space for the wide-band modes on HF used experimentally by a few. Usually taking up the full 3kHz bandwidth of an SSB channel, these are not compatible with the other narrow-band systems operating in the data segments. The only realistic option is to find somewhere in the SSB segment that does not cause interference, but it is likely that the SSB operators will then object, resulting in stalemate! Hopefully, bandplans can eventually be updated to include dedicated sections for experimental modes such as COFDM, MT63 and Q15.

CONTESTING WITH BITS AND BYTES

AND NOW FOR the joys of RTTY contesting, from Ian Brothwell, G4EAN, Secretary of the British Amateur Radio Teledata Group (BARTG):

"I usually stay well away from contests, but make a very definite exception for RTTY. Unlike phone events, even a slow operator like me can enjoy them. Catching the incoming report is not a mad dash, because the incoming text scrolls up the computer screen and I have time to read it. Composing the outgoing text is made easy by using text buffers and the backspace key. Tuning indicators help to tune quickly and warn me of QRM.

"My station is elderly and basic - an FT-757GX with a KAM TNC being driven by (honestly!) a Commodore 64. Don't knock it - it works and it wasn't expensive. My logging is still done with pen and paper, but scoring is aided by using a spreadsheet.

"Apart from the comparative leisure of RTTY contests compared with their phone counterparts, the great thing is that virtually all the participants operate to a high standard of good behaviour.

"Now a plug for BARTG. We run what is believed to be the oldest RTTY contest in the world, as well as being one of the most popular. It is held on the third weekend in March and full information on this and on our Sprint RTTY contest can be found on our web site at www.bartg.demon.co.uk"

DSP ON PHASE 3D SATELLITE

IT MAY BE A BIT premature writing about Phase 3D, but by the time this appears there is a possibility that the satellite will have been launched. The Phase 3D (P3D) payload has a large amount of uncommitted Digital Signal Processing hardware on board, the idea being that software is uploaded from the ground control station as needed. To paraphrase from the AMSAT documentation (www.amsat.org):

"P3D will be flying a plethora of DSP-based modems. While the UoSATs were the first to fly DSP modems on amateur spacecraft, P3D will be flying eight modulators and eight demodulators which can appear anywhere within the digital sub-bands. The digital section is shown in **Fig 1**. Each CPU has its own set of 'low'-speed DSP-based modems (up to 56kb/s or so). The processors/DSP modem complex has 18 programmable processors.

"The 9600-baud modems are hardwired. They will be used for the initial loading and as backup to the DSP modems on fixed frequencies in the digital sub-band. The DSP modulators and demodulators use the ADSP2171 CPU. Each modem chain has a separate processor, allowing the full power of the DSP chip to be used for a single half-duplex link, which will allow high data rates up to 56kb/s, or very heavily-coded low data rates."

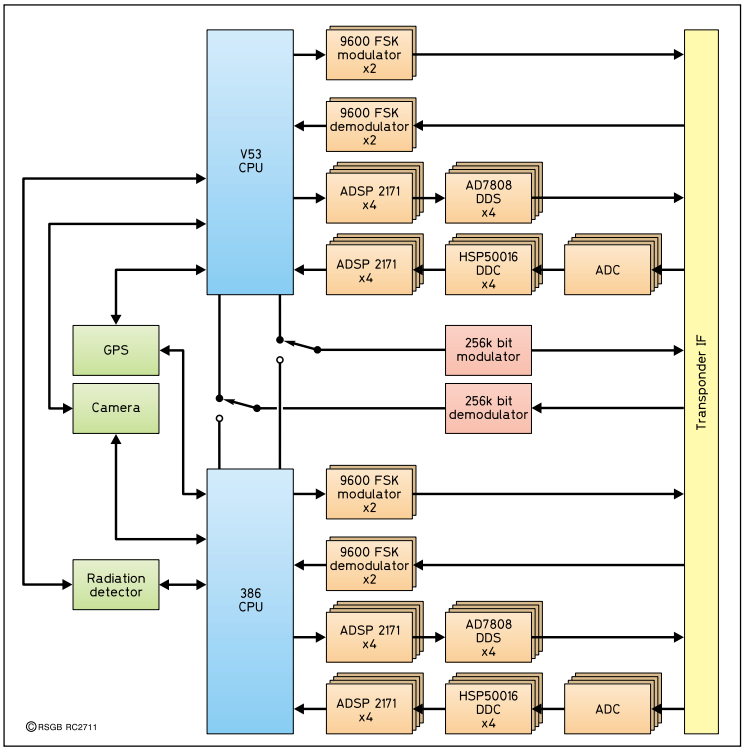

Fig 1: Block diagram of the AMSAT Phase 3D digital payload. ADC: Analogue-to-digital converter, digitising the 10.7MHz IF signal. DDC: Digital down-converter - the digital equivalent of a local oscillator and narrow bandpass filter, usually on a single chip. Note the large number of ADSP2171 DSP modules, many available for programming from ground control.

FUNDAMENTALS

LEAVING RF modulation schemes for the moment, we will now look at error detection and correction. Errors due to noise and interference can destroy intelligibility of data by introducing rogue characters and worse. For typed text and visual images, the occasional error does not matter as the human brain can interpret the results correctly but, for computer data, even a single error can be catastrophic. Therefore the bit error rate, BER (the fraction of bits in error), has to be controlled to a level suitable for the data being sent.

Two ways of achieving this are error *detection* and error *correction*. The first checks the incoming data stream, which includes some added information to allow hardware or software to detect if any errors are present, but not necessarily how many or where in the data they are. No attempt is made to correct the data, but errors are reported, allowing the data to be repeated. The second concept carries this a stage further and, by detecting which particular bits are in error, corrects them. More redundancy (extra information) is needed for error *correction* compared with error *detection*.

The simplest detection scheme is a parity check. The raw data is split into words – often of 8 bits – and another parity bit added so that the total number of bits in a word is always even (or odd). This allows single-bit errors to be found, although two errors in a single word will go undetected. Parity is often used with serial wire-based communications such as RS-232 links, and allowing the infrequent errors to be detected and a request made for re-transmission. The down side of parity checking is that the overall data rate is reduced by the factor 8/9, since for every eight data bits, nine bits need to be transmitted. For radio communications, where errors occur more frequently and almost certainly not one at a time, some error-detecting mechanism that is better than simple parity checking is needed. ♦

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SWL

BOB TREACHER, BRS 32525
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FRANCE HAS JUST won Euro 2000, VHF NFD was blessed with Sporadic-E conditions on 50 and 144MHz, but SWL response to the various requests in recent columns appears to have gone unheeded.

The number of new SWL addresses in the next *RSGB Yearbook* will not therefore reflect the true number of listeners who are members of the Society; the SWL exhibit at the HF Convention must now be in doubt; and the number of contributions to this page has dwindled in recent months. I look forward to more news soon. This is *your* page and it needs *your* contributions! One SWL who did respond was Derrick Brookes, ex-BRS28279, who sent an interesting bundle of copies of QSL cards he had received in the sixties. Derrick has recently returned to the Society and was awaiting his new membership number when he wrote. He has become interested in the hobby again and now uses a Target HF-3 receiver. Unfortunately, the copies were black and white so they do not easily lend themselves to be included here. However, there were some interesting cards including KC6BY, VE8RCS, YA1DAN, ZD7KH, ZD8RK and 5H3JL.

SUMMER CONTESTS

THE HF CONTEST season takes a break at this time of year. Few listeners seem to trade HF for VHF. This is something of a surprise in view of the intense Sporadic-E activity on 50MHz this year. Indeed, David Whitaker, BRS25429, has heard 67 DXCC entities this year in over 250 QRA locators. My 'score' is more modest (49 DXCC and 193 locators) as I am not lucky enough to have retired...yet! There have been several VHF contests recently which have corresponded with some superb Es conditions - both the 50MHz Trophy and UK Six Metre Group contests were blessed with very good propagation. Continuing the trend, VHF NFD included 50MHz for the first time this year and those who took part were treated to excellent signals from 9A, LZ, YU, YO, S5, OE - and even CN8 and 4X.

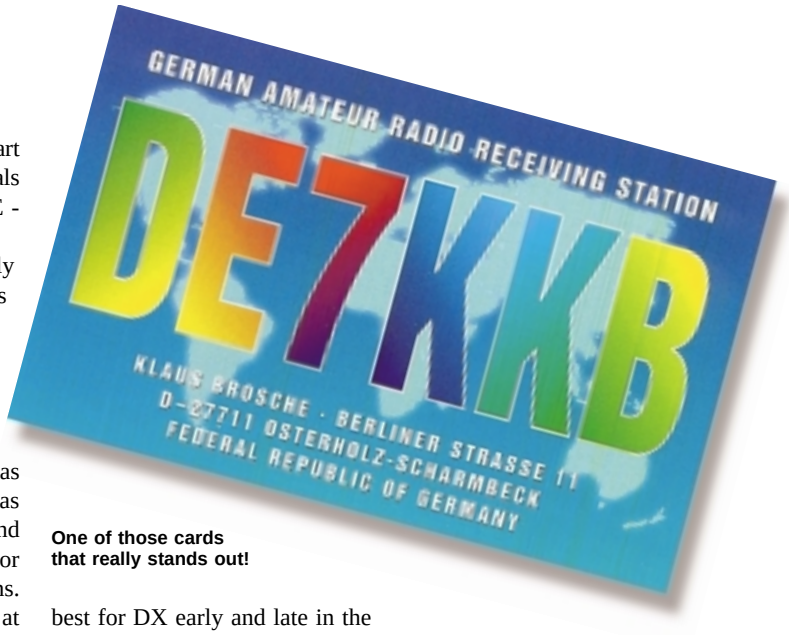
As next year will obviously bring F2 propagation, now is the time to give some serious thought to getting equipped for 50MHz.

Listeners will have noted the WRTC contest activity over the weekend of 8/9 July. It was not widely known that there was an SWL section to the event and that awards were available for hearing the participating stations. More information is available at http://wrtc2000.bit.si/

Finally on the contest scene, here are the results of the SLP competition after 5 contests. There are no further contests in this series until 9/10 September, and then 23/24 September and 28/29 October 2000. To qualify for an award, three events have to be entered - so you still have time! A copy of the rules can be obtained by e-mailing Lambert Wijshake, NL10175, at lambert.wijshake@wxs.nl

MONTHLY REPORTS

CONDITIONS SEEMED to be suffering from mid-summer blues in June. As we are near the peak of the sunspot cycle, things might have been better. Robert Small, BRS8841, reports that the new *IOTA Directory* has caused a bit of a stir on the bands, with several new island groups added to the list, many in Europe. As a result there had been plenty of IOTA activity. Other good DX heard included KH6ND/KH5, 5H1/PA3GIO, TX8JJN and A52NL. On 30m Robert heard BV3/DJ3KR, but 20m had been best for DX early and late in the day. The band provided him with the best DX this month in the shape of KH6ND/KH5 and A52NL. He was also pleased to log TF3A, JY8TT, 5H3/PA3GIO, TA0/IZ7ATN, and 5I3A from Yambe Island. 17m had also been good, with FO5NL heard on CW. Other DX heard included CP6XE, S21YI, VY0TA, 5H1/PA3GIO, JJ8XNA AS147 and TX8JNN. Robert heard little on 15m, but managed J89AAA, 5N9EAM/8, XV9SW, 9M8HI, N2ATT/KH0 and JT1DFA. The only other two new ones - in a very slack month, were heard on 12m CW - FO0CLA and TT8JLB. The only other DX of note heard on the band was 5H1/PA3GIO. 10m was far from exciting, but he heard FR5ZQ/G from Glorioso Island. On the QSL scene, Robert received his TX0DX card for his 346th DXCC confirmation of all time.



One of those cards that really stands out!

E-MAIL QSLing

THIS TOPIC IS gaining momentum. It does seem to be a way of listeners obtaining a QSL card somewhat faster than sending a card the traditional way via the QSL bureaux and having to wait an eternity to receive a card in reply. This is quite a new innovation, so it will be interesting to get some feedback from listeners.

There is a school of thought that you can submit an e-mail from ZZ9ZZ as proof of having heard him. I'm not sure that too many Award Managers will wear that, but what is acceptable is to e-mail the station you have heard, asking him to confirm your report with a return card sent via the bureau. David Whitaker, BRS25429, comments that he sent an e-mail QSL request to LY2BI on 24 April and actually received a direct card 10 days later. Listeners choosing this way to QSL should not think that the norm will be a direct reply. If it happens, jolly good! There is still very much a place for the direct card with a Dollar bill or IRC - especially when QSLing DXpeditions - but it is interesting to note that e-mail QSL requests for 9M0C were, in the main, from Eastern bloc countries where supplies of Dollar bills and IRCs are hard to come by. So, the idea could be a useful way for the younger SWL to start his or her QSL collection of DXCC entities, Islands, Locator Squares or whatever, without having to spend a fortune on postage, etc. I would be interested to know how many SWLs have started using this way of QSLing and what format you use - is it a straight "I heard you, can you send me a card?" or do you give a report which gives at least three QSOs heard and provides some personal details. Your comments could feature in 'SWL' later in the year. ♦

SET LISTENING PERIODS UP TO AUGUST 2000

Call	1	2	3	4	5	Totals
NL-7280	14758	0	14520	0	9760	39038
OM3-27707	0	15480	20952	2426	0	38858
NL-7403	8208	4176	9240	4104	0	25725
ONL-383	0	5268	18252	0	0	23520
NL-290	3706	0	7980	3472	5104	20262
NL-12089	5610	0	9424	0	0	15034
OE1-0140	1496	1952	6942	0	3960	14350
NL-11976	0	1749	3962	538	3776	10025
GW-5218	8284	0	0	0	0	8284
F-11734	2258	0	2868	2730	0	7856
F-17789	0	754	4030	0	2478	7262
NL-9723	250	1540	2871	1068	853	6582
NL-11099	1974	0	3900	204	440	6518
BRS-88921	0	0	2835	0	0	2835
I1-14016	0	0	1742	0	0	1742
PY2-80124	0	551	0	0	0	551
OE-20272	0	0	317	24	0	341
LYR-794	0	0	0	309	0	309

the last Word

Right On Target

The letter from Fay Mutlak Hamdan ('The Last Word', *RadCom*, July 2000) was right on target! However, if Fay were to visit the RSGB HF and IOTA Convention later this year I am quite certain that she would come away with an entirely different impression of the hobby.

Ian Buffham, G3TMA

People *Do* Care

I am writing to thank you for passing on to me all the replies you got from my letter that you published in the May edition of *RadCom*, under the heading 'Does Anyone Care'.

I have personally replied to all those who I was able to, but would like to thank any I have missed, through your magazine, for all the tips and ideas that were given. One or two people have sent me their old notes and some books. These I reimbursed the postage for. Whilst the areas dealing with the licence conditions were obviously out of date, all the other information was exceedingly useful and very welcome.

I also managed to contact the RAIBC and have since applied for membership. They are doing all they can to help in my goal of obtaining my RAE and licence by Christmas 2000, and sometime thereafter to get the full 'A' Licence. I will let you know how things progress.

It was nice to find out that the RSGB members were helpful and got in contact with me very quickly. I have read in the pages of *RadCom* that there do not seem to be many young people coming into the amateur radio scene; I cannot think why, because the help is there and when people are aware of the situation they will do what they can to help.

Once again I wish to thank you all for your time and help, and some time after Christmas I too will be joining you all on the air.

Richard Neale-Gardner

Unkind Weather

Could I please, through the letters column of *RadCom*, and on behalf of the Leeds & District ARS, thank everyone who, in atrocious weather, came and supported our car boot sale in June. The event had to be moved from the field to the car park, but enough people turned up to change what would have been a disastrous end to weeks of effort into a reasonable day. Let's hope the weather is kinder for the next one on 20 August.

J A Mortimer, M1CAI

Whingers & Whiners

On listening to 80 meters the other night in the shack, I was interested by a conversation by some Yorkshire amateur complaining about a radio emporium in Essex. It was concerning the time taken to repair his equipment. Being an engineer and a G4 call living in Essex, I became more interested in the conversation and would like to make a comment.

Modern radios are very complex and compact, and only certain radio emporiums have the qualified engineers and equipment to service and repair them. In a modern workshop it will take at least £35,000 to purchase good equipment for test purposes, £25,000 to provide an engineer, and on top of this calibration costs per year, workshop manuals and general tools and plant. A good management mandate within the company is ISO 9002, which is a system whereby a company has set conditions so that everyone who purchases equipment is treated the same. The employers are covered by working structures that allow the company to offer a unique service to customers, and no one customer is treated any differently. The company has strict in-house rules that guide the orders, repairs and goods inwards, through a system that cannot be deviated. On the repair side, most modern equipment is so small and the qualifications attained by service personnel have to be very high, as 75% of repairs are to component level. These engineers do not grow on trees and in most cases love the technical adrenaline produced by the challenge of the work involved. The company involved in this case I know has four engineers, all amateurs. I feel sure the true amateur with some technical knowledge will understand, but unfortunately this seems to be on the decline as most are now operators only - the operators' manual is thrown into the cupboard as soon as it is unpacked from the box. I'm afraid that with the new radios you must, I repeat, you *must* read the manual to get full benefit from the equipment - not ring the emporium for instruction on how to use it after one hour of receiving it.

The other problem encountered is rigs coming back with no paperwork attached or phone numbers, so it is booked in and put on a shelf until somebody phones to claim it. Believe it or not this is a common problem and, while most customers are very polite and understanding, a few are very dogmatic and sometimes downright rude to the staff, which is totally out of order and unnecessary. Please bear in mind when your radio develops a fault they do not have a magic wand or a crystal ball to see who it belongs to, but they do their best to get it back to you in working order as soon as they are able.

M 'Zipy' Wheaton, G4ZPE

Derestrict Planning

You may remember a popular song from years back which went something like "love and marriage, go together like a horse and carriage". So it is with regard to amateur radio in respect of transmissions and antennas. In short, I think that if you have a licence you should automatically be entitled to have appropriate antennas for legitimate usage, within the bounds of reason.

One reads in the March *RadCom* the article 'Undercover Operation – Ideas for Invisible Antennas'. Some very interesting wheezes there, but such expedients should not be necessary if we had anything like a sensible planning regime in this country.

Congratulations to Tony Lord, G8DQZ, and the Society for obtaining planning permission for his mast. One *could* assume that as it has been noted in *RadCom* (May) it is a singular occurrence. As 'one swallow does not make a summer', one wonders about the dozens that have been turned down.

Reginald A Watson, G3AYS

Non-user Friendy

As a time-served user of oscilloscopes, I continue to be astonished at how relatively difficult they are for everyday purposes, such as the measurement of frequency and magnitude of an oscillatory waveform.

For example, the timebase being calibrated in Time/Div means that to determine the frequency of the displayed wave, one must first estimate the number of horizontal divisions and fractions thereof occupied by one cycle of the waveform, then multiply that figure by the time per division in seconds, milliseconds or microseconds to determine its time period, then invert the final figure to obtian the frequency in Hz. Similarly, with amplitude, where the vertical deflection range switch is typically calibrated in Volts/Div, one must again estimate the number of divisions, multiply the figure by the volts per division as indicated by the switch to get either a peak or peak-to-peak value of the waveform, then multiply by 0.707 or 0.707/2 respectively to get the RMS value. Quite a carry on!

Would it not be more user-friendly (if slightly more expensive) to incorporate a numeric display showing electronically-derived values of frequency and RMS values, perhaps with the switched options of timer-period and peak and/or peak-to-peak amplitude? After all, the selected signal information is already there within the oscilloscope, so it shouldn't be too difficult to process it for digital display.

Edwin Chicken, G3BIK

Members' Web Site

This web site has obviously been extremely well thought out. I like its comprehansive coverage, with the ready possibilities of further features. The link service is excellent.

Thank you to everyone concerned with its conception and production.

Stephen Horsfall, G0TOB

Young Scruffs

I had to smile, reading 'You Dirty Lot' ('The Last Word', *RadCom*, July 2000). I was at the recent Yeovil QRP Convention, where most of the visitors were in my class and where 'OM' is meant to be 'OM'!

It's the younger fraternity who have shoes you cannot polish and Sunday best clothes they have not known, least of all worn. They have never been in uniform, as most of us had to be, and discipline to them is unknown. You can pick them out on the air, with their "73s" and "Best 73s". Need I say more?

B J 'Nobby' Clark, G3BEC

Please note that the views expressed in *The Last Word* are not necessarily those of the RSGB. All letters received by the Editor are considered for *The Last Word*, unless marked 'not for publication'. Letters may be passed to the relevant person, department or committee.

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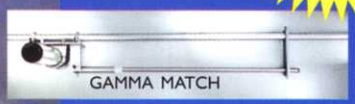

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ZX6-3	50MHz	3	1.75m	1.74	9.1	-25	3.00	£81.95
ZX6-4	50MHz	4	2.75m	2.03	11.4	-28	4.30	£99.95
ZX6-5	50MHz	5	4.35m	2.64	12.1	-28	6.50	£114.95
ZX10-2	28MHz	2	0.90m	2.63	6.3	-18	3.90	£98.00
ZX10-3CL	28MHz	3	3.00m	3.00	9.1	-25	6.00	£115.95
ZX10-3DX	28MHz	3	3.35m	3.35	10.3	-20		£129.00
ZX10-4CL	28MHz	4	5.00m	3.60	11.4	-28	10.20	£149.00
ZX10-4DX	28MHz	4	5.80m		12	-26		£156.00
ZX10-5CL	28MHz	5	7.50m		12.1	-28	13.20	£181.50
ZX10-5DX	28MHz	5	8.00m		12.7	-35		£215.00
ZX10-6CL	28MHz	6	11.40m		12.5	-35		£255.00
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ZX12-4	24MHz	4	5.50m	3.92	11.4	-28	3.70	£156.95
ZX12-5	24MHz	5	8.60m	5.13	12.1	-28	14.80	£215.00
ZX12-6	24MHz	6	14.50m	7.78	12.7	-35	19.59	£229.00
ZX15-2	21MHz	2	1.30m	3.36	6.3	-18	6.60	£112.00
ZX15-3	21MHz	3	4.15m	3.98	9.1	-25	10.90	£149.00
ZX15-4	21MHz	4	6.40m	4.67	11.4	-28	15.40	£185.00
ZX15-5	21MHz	5	10.20m	6.13	12.1	-28	20.20	£218.00
ZX15-6	21MHz	6	14.70m	8.09	12.7	-35	23.00	£266.00
ZX17-2	18MHz	2	1.45m	4.26	6.3	-18	6.80	£123.95
ZX17-3	18MHz	3	4.90m	4.85	9.1	-25	11.58	£156.95
ZX17-4	18MHz	4	7.50m	5.63	11.4	-28	16.80	£189.95
ZX17-5	18MHz	5	11.20m	7.10	12.1	-28	22.30	£229.00
ZX17-6	18MHz	6	17.40m	9.57	12.7	-35	25.60	£275.00
ZX20-2	14MHz	2	1.70m	4.57	6.3	-18	10.00	£146.40
ZX20-3	14MHz	3	6.20m	5.60	9.1	-25	13.50	£197.95
ZX20-4	14MHz	4	9.40m	6.58	11.4	-28	21.00	£255.95
ZX20-5	14MHz	5	14.40m	8.54	12.1	-28	15.90	£320.00
ZX20-6	14MHz	6	16.20m		12	-35		£395.00
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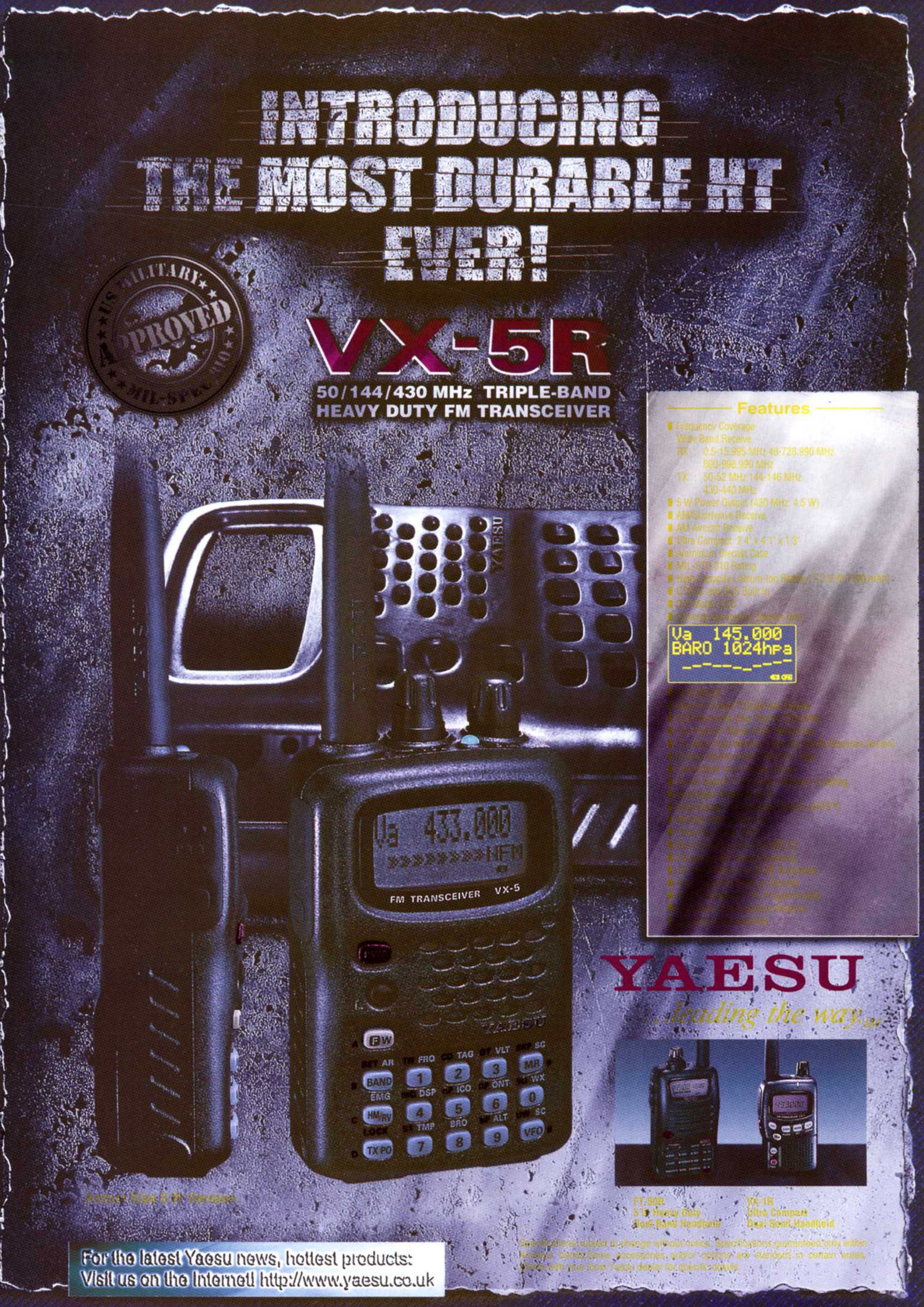
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