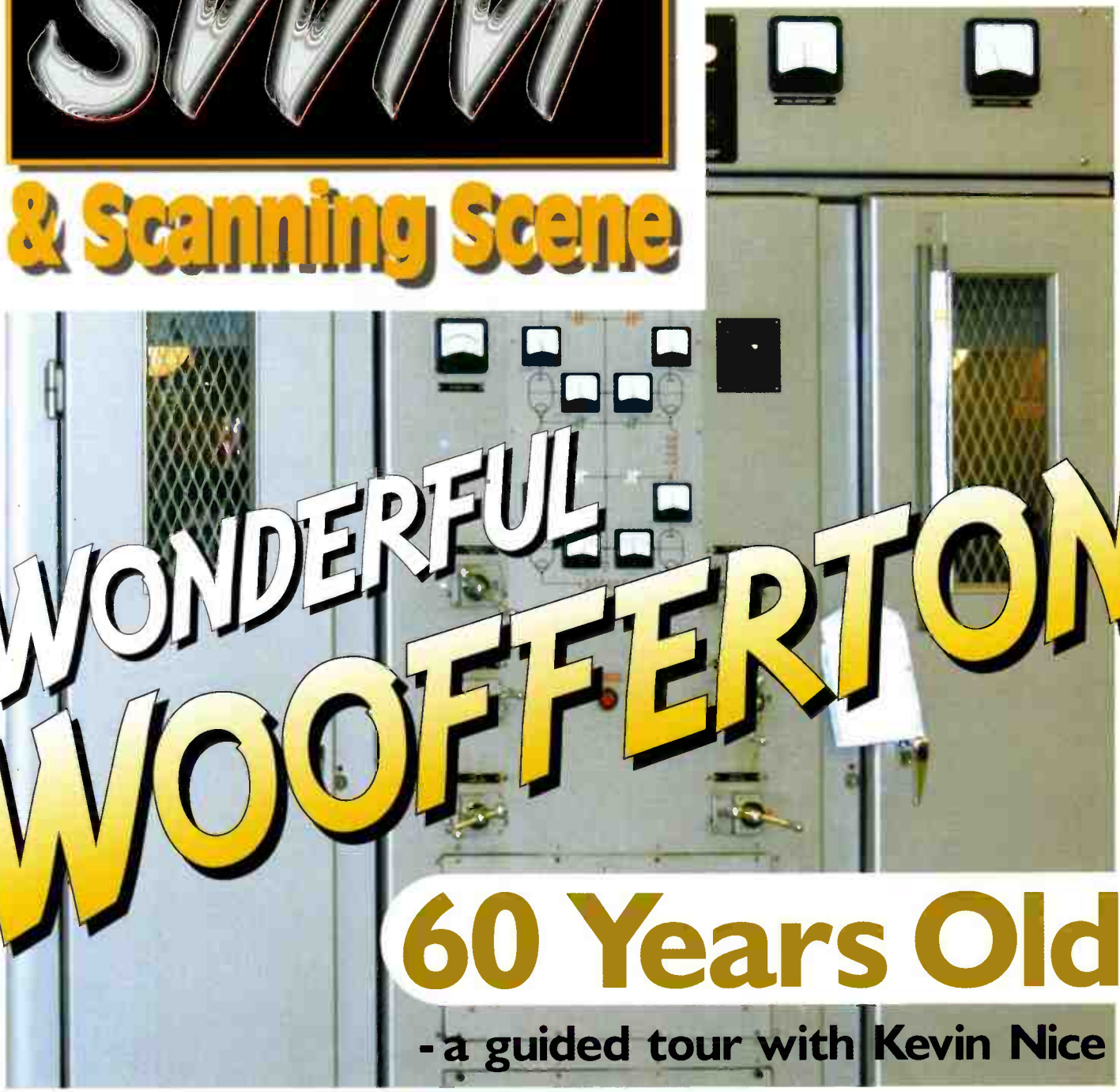
www.pwpublishing.ltd.uk/swm

The SHORT WAVE Magazine SWM

& Scanning Scene

Decode Special

- Data Modes Explained



WONDERFUL WOOFFERTON

60 Years Old!

- a guided tour with Kevin Nice

September 2003 £3.25

09>

North Atlantic Flight Monitoring

What do you need?

The latest DAB digital radios • Stunning crystal clear sound • Mo

Evoke-1

- Band III (174-240MHz)
- Fast Autotune
- Scrolling digital text display
- Dynamic range control

£99.95 P&P £10

Pure ST-1 Auxiliary Speaker

Upgrade to stereo with this real wood veneer matching speaker

- Easily connects to your new EVOKE-1
- Outstanding midrange 3" drive unit
- Ported for bass enhancement
- Solidly constructed maple veneered casing with metallic speaker grill

£29.95 P&P £5

Evoke-2

Portable DAB & FM Radio

Enjoy DAB digital radio indoors and out with the battery and mains powered EVOKE-2. The latest DAB technology brings you crystal clear digital radio with no hiss, crackle or fade, and gives you access to more stations than ever before. And, in addition to great-sounding DAB digital radio, EVOKE-2 also receives FM so you won't miss out on your favourite local FM stations.

£159.99 P&P £10

PAY BY CHEQUESPREAD 3 CHEQUES OF INTEREST FREE! £56.66

save £100

Pure DRX-601ex

Have crystal clear digital radio anywhere in the house with this deluxe DAB digital radio

~~£499~~ **£399** P&P £10

PAY BY CHEQUESPREAD 3 CHEQUES OF INTEREST FREE! £136.33

DRX-701ES New DAB Digital RadioTuner *Available in Black or Silver*

- Fast Autotune, Digital Text Display with four levels of LCD brightness
- Frequency range: Band III, 174 - 240 MHz
- USB connector for future software upgrades
- Display button selects between DLS *(Dynamic Label Segment)* scrolling text, programme type, multiplex name, time/date, channel and frequency, technical information and signal quality.
- Setup button gives access to station list order selection, tuning aid, DRC setting, software version details and software upgrade.
- Dimensions: 430(w) x 65(h) x 270(d) mm
- Supplied with: Stereo phono to stereo phono cable, DAB 'T' indoor aerial, Remote Control
- Telephone support hotline and Internet website.

£249.99 P&P £10

PAY BY CHEQUESPREAD 3 CHEQUES OF INTEREST FREE! £85.66

Goodmans GCD200 Active

CD with DAB Digital Radio & AM/FM Tuner

- DAB Digital & FM/AM Analogue Radio with CD player plus a pair of Active speakers
- True Portable with battery or mains operation
- Batteries give 7 hours CD playback and 15 hours DAB *(when using alkaline batteries)*
- 10 DAB Station Pre-sets with Autotune and select up/down functions
- 20 FM/AM station Pre-sets
- Electronic volume & Bass boost control
- Top Loading CD Player, 20 Track Programmable
- Random repeat and play function
- LCD Display with Backlight
- Aux input and headphone Socket
- Supplied with quality Earphones

£169.00 P&P £10

PAY BY CHEQUESPREAD 3 CHEQUES OF INTEREST FREE! £59.66

Perstel DR-101

Two Band Coverage :-

- DAB Digital Radio band
- FM Radio Band
- Large full graphic 4 line display with backlight
- Stereo Headphone output
- Supplied with 2 x AA Alkaline batteries
- Battery Life 6 hours
- Mains adaptor supplied
- Carrying case
- Stereo earpiece
- User Manual

£149.00 P&P £10

PAY BY CHEQUESPREAD 3 CHEQUES OF INTEREST FREE! £53.00

Perstel DR-201

Digital Audio Centre

- DAB + MP3 Digital Audio Player + FM Radio + Portable Memory Stick
- DAB Digital Radio Band
- FM Radio Band • Band III
- MP3 player *(64MB)*
- Use as 64 MB removable disc with your PC *(USB lead supplied)*
- Supplied with 64 MB Embedded Flash Memory
- Ensemble / Service / PTY Seek tuning
- Preset 100 service components
- Display of Ensembles, Components, Dynamic Label, Program Type etc
- Pre-selection for Announcements *(News/Traffic/Weather)*
- Large full graphic 4 line display with backlight.
- Stereo headphone output
- Battery life: 6 hours *(supplied with 2 x AA Alkaline batteries)*
- Supplied with: Mains adaptor, Carrying case, Stereo earpiece, USB Connecting lead
- Windows 98/ME/2000/XP

£199.00 P&P £10

PAY BY CHEQUESPREAD 3 CHEQUES OF INTEREST FREE! £69.66

PocketDAB 1000

Personal DAB Digital Radio

- PocketDAB 1000 – perfect radio in the palm of your hand.
- Slimline styling with rugged anodised aluminium casing and cool blue backlit display.
- Headphones act as DAB aerial. Simple multifunctional control adjusts volume and scrolls effortlessly through station names and menu options.
- Ten station presets. Six EQ settings. Display shows battery life, time, signal strength, EQ setting and favourite station mode.

£169.99 P&P £10

PAY BY CHEQUESPREAD 3 CHEQUES OF INTEREST FREE! £59.99

re choice • Ease of use • No retuning

DAB
Digital Audio Broadcasting

smooth operator...

Intempo PG-01 new

NEW DAB Digital/FM Radio
with alarm clock & sleep function

- Dual band DAB/FM radio
- DAB Digital radio with Alarm, Clock and Sleep features
- Amazing choice of new DAB stations
- Interference-free crystal-clear digital sound
- All stations instantly accessible at the touch of a button
- Receive data via the LCD screen - song and artist info, news and much more
- User-friendly controls
- Headphone socket
- Fully integrated pair of 3" stereo speakers
- Blue LCD Panel 16x2 characters
- 4 DAB presets, 4 FM Presets, Auto Tuning
- after-service

£119
PAY BY CHEQUESPREAD INTEREST FREE £43.00

Buy direct
or from our dealers throughout the UK

Goodmans GPS280 DAB Digital Radio/Stereo system

- DAB Digital Radio 10 presets, Autotune and select up/down
- FM/AM Analogue radio
- Top Loading CD player with LCD Display
- 20 Track Programmable CD

£129.00 P&P £10
PAY BY CHEQUESPREAD 3 CHEQUES OF INTEREST FREE! £46.34

VISIT OUR SECURE ONLINE STORE
www.nevada.co.uk

nevada®

THE DAB RADIO SPECIALISTS

Nevada are the UK Distributors of INTEMPO, PURE, PERSTEL, GOODMANS DAB radios

ORDER HOTLINE:
023 9231 3090

Unit 1 • Fitzherbert Spur • Farlington • Portsmouth • PO6 1TT
email: sales@nevada.co.uk

66th year of publication

The SHORT WAVE Magazine

contents

September 2003

On Sale August 28
Vol.61 Issue 9
(October Issue on sale September 25)

Published by
PW Publishing Limited
Arrowsmith Court
Station Approach
BROADSTONE
Dorset BH18 8PW
Directors: Stephen Hunt & Roger Hall

Editorial Department
☎ 0870 224 7810
Fax: 0870 224 7850

Editor
Kevin Nice G7TZC, M3SWM, BRS95787
kevin.nice@pwpublishing.ltd.uk

Production Editor
Donna Vincent G7TZB/M3TZB
donna@pwpublishing.ltd.uk

Deputy Production Editor
Zoë Shortland
zoe@pwpublishing.ltd.uk

Technical Editor
NG (Tex) Swann G1TEX/M3NGS
tex@pwpublishing.ltd.uk

Art Department
☎ 0870 224 7820
Fax: 0870 224 7850

Art Editor
Stephen Hunt
steve@pwpublishing.ltd.uk

Layouts
Bob Kemp
bob@pwpublishing.ltd.uk

Typesetting
Peter Eldrett
peter@pwpublishing.ltd.uk

Sales Department
Fax: 0870 224 7850

Advertisements
Eileen Saunders M3TTO
eileen@pwpublishing.ltd.uk
☎ 0870 224 7820

Book Orders
Clive Hardy G4SLU
clive@pwpublishing.ltd.uk
☎ 0870 224 7830

Subscription Orders
Joan Adams
joan@pwpublishing.ltd.uk
☎ 0870 224 7830

Subscription Administration
(For all queries regarding exisiting subscriptions)
Kathy Moore
subs@pwpublishing.ltd.uk
☎ 01590 641148

Finance Department
☎ 0870 224 7840
Fax: 0870 224 7850

Finance Manager
Alan Burgess
alan@pwpublishing.ltd.uk

Finance Assistant
Margaret Hasted
margaret@pwpublishing.ltd.uk

Web Site
www.pwpublishing.ltd.uk

All our 0870 numbers are charged at the BT Standard National Rate

Broadcast

12 LM&S
22 Bandscan Australia

cover subject: *Woofferton's Sender 93. A Marconi BD272 250kW transmitter with triode PA. This Sender has been in use for 39 years!*

Features

34 Exploring North Atlantic Flights
Have a look at what you could hear, as 'Big Ears' shows you how to monitor what's going on over the Atlantic Ocean by listening to h.f., airband, ACARS and Weather FAX signals.

40 Wonderful Woofferton!
Celebrating 60 years on air in October, the former BBC World Service site and UK VOA relay station recently opened up its doors to two keen radio magazine editors. Read on to discover more as Kevin Nice tells the tale.

45 New Enthusiasts' Digital Receiver
Roger Bunney has news of a brand new digital satellite receiver that brings full search facilities to the news feed hobbyist - the Coship CDVB3188C.

73 *SWM* Club Listing
Are you alone with your radio interest? If you want to meet others with a radio passion, then look no further - use our comprehensive guide - which now includes International Radio Clubs on page 76.

SWM Author Info

To provide you with a handy reference we have set the contact details of our regular authors

Amateur Bands
Clive Hardy G4SLU,
c/o SWM Editorial Offices
E-mail clive@pwpublishing.ltd.uk

Attention 123!
Enigma, 17-21 Chapel Street,
Bradford, West Yorkshire BD1 5DT
E-mail: enigma@pwpublishing.ltd.uk

Bandscan
Bandscan America
Gerry Dexter,
c/o SWM Editorial Offices.
E-mail: gdexter@pwpublishing.ltd.uk

Bandscan Australia
Greg Baker, PO Box 3307, Manuka,
ACT2603, Australia. E-mail:
greg.baker@pwpublishing.ltd.uk

Bandscan Europe
Martin Peters, *c/o SWM* Editorial
Offices. E-mail:
martin.peters@pwpublishing.ltd.uk

Decode
Mike Richards G4WNC,
49 Cloughs Road,
Ringwood,
Hampshire BH24 1UU. E-mail:
decode@pwpublishing.ltd.uk

DXTV
Keith Hamer and Garry Smith,
17 Collingham Gardens,
Derby DE2 4FS
E-mail: dxtv@pwpublishing.ltd.uk

Info In Orbit
Lawrence Harris,
55 Richville Road,
Shirley,
Southampton SO16 4GH.
E-mail:
info.orbit@pwpublishing.ltd.uk

LM&S and Maritime Beacons
Brian Oddy G3FEX,
Three Corners,
Merryfield Way, Storrington,
West Sussex RH20 4NS.

Off The Record
Andy Cadier,
28 Romney Avenue,
Folkstone, Kent CT20 3QJ
E-mail:
off.the.record@pwpublishing.ltd.uk

Propagation
Jacques d'Avignon VE3VIA
E-mail:
jacques@pwpublishing.ltd.uk

Satellite TV News
Roger Bunney,
35 Grayling Mead,
Fishlake,
Romsey,
Hampshire
SO51 7RU.
E-mail:
roger.bunney@pwpublishing.ltd.uk

Scanning
Dave Roberts,
c/o SWM Editorial Offices.
E-mail:
scanning@pwpublishing.ltd.uk

ShackWeb
Jerry Glenwright,
c/o SWM Editorial Offices
E-mail:
shackweb@pwpublishing.ltd.uk

Sky High
Peter Bond,
c/o SWM Editorial Offices.
E-mail: skyhigh@pwpublishing.ltd.uk

SSB Utilities
Graham Tanner,
64 Attlee Road, Hayes,
Middlesex UB4 9JE.
E-mail: ssb.utils@pwpublishing.ltd.uk

DECODE SPECIAL

PAGE 24

Modus Operandi

Kevin Nice takes us on a quick tour of the most popular datamodes in use on today's h.f. bands. Sample frequences are courtesy of the recently published Ferrell's *Confidential Frequency List* 13th Edition.

RegularColumns

Advertisers Index 78
Amateur Bands 58
Bandscan Australia 22
Communiqué 9
Decode 56
DXTV 55
Editorial 6
Info In Orbit 60
LM&S 12
Maritime Beacons 59
Order Form 78
Propagation Extra 66
Propagation Forecast 65
QSL 7
Rallies 11
Satellite TV News 54
Scanning 51
ShackWeb 50
Sky High 52
SSB Utilities 47
SWM Book Store Catalogue 68
Trading Post 67

Coming Next Month

in SWM October 2003

- ***Broadcast Special with Martin Peters***
- ***News, reviews and essential data from the world of listening***
- ***How to assemble and fit coaxial connectors***
- ***Keep on top of the world of monitoring with SWM***
- ***and much more...***

**contents subject to change*

For the latest radio news, see our web site www.pwpublishing.ltd.uk/swm/news

Join in with the on-line action on the *SWM* Readers' E-mail Forum - send an E-mail to **swm_readers-subscribe@yahoogroups.com** to subscribe - don't miss the on-line action!

Share your thoughts

SWM Services

Subscriptions
Subscriptions are available at £36 per annum to UK addresses, £43 in Europe and £48 (Airsaver), £54 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £61 (UK) £74 (Europe) and £81 (rest of world), £94 (airmail).

Components For *SWM* Projects
In general all components used in constructing *SWM* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

Photocopies & Back Issues
We have a selection of back issues, covering the past three years of *SWM*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for *SWM* are £3.25 each and photocopies are £3.25 per article inc P&P.
Binders are also available (each binder takes one volume) for £6.50 plus £1.50 P&P for one binder, £2.75 P&P for two or more, UK or overseas. Prices include VAT where appropriate.
A complete review listing for *SWM/PW* is also available from the Editorial Offices for £1 inc P&P.

Placing An Order
Orders for back numbers, binders and items from our Book Store should be sent to: **PW Publishing Ltd., Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling. Credit card orders (Access, Mastercard, Eurocard, AMEX or Visa) are also welcome by telephone to Broadstone **0870 224 7830**. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Broadstone **0870 224 7850**.
The E-mail address is **bookstore@pwpublishing.ltd.uk**

Technical Help
We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by *SWM*, then please write to the Editorial Offices, we will do our best to help and reply by mail.

ED's comments

Editorial

Picking up from where I left off last month, I've yet more changes for the good to announce. Firstly the conjecture regarding the dropping of Morse as a requirement for full UK amateur radio licensees to use h.f. amateur allocations has now turned to reality. The *Gazette* announcement was made by the RadioCommunications Agency and was published on the 26 July 2003.

HF access

I've had an E-mail from George Wall who has worked in communication "all his life" and has recently discovered *SWM*. George tells me that his interested and enthusiasm is growing and he's very interested to learn more regarding the recent changes concerning access to h.f. for former B class UK amateur licensees.

On 26 July, there was a Notice of Variation issued, which allows Full, B Class licensees to have the same exactly the same privileges as Class A holders. In essence, for UK operation there is no longer a difference between the two. The notice of variation and the BR68 booklet defines the frequencies, modes and power levels that are allowed in full detail. Copies of these documents can be obtained from the RoadioCommunications Agency. They are also available on their website **www.radio.gov.uk**

Telephone numbers

Yep, these have changed too. Our publishers have had a 'bee in their bonnet' for some time about BT's 'profiteering' so we've changed our telephone service supplier. Please make a note of the new numbers should you wish to contact us by 'phone or FAX.

Masthead

Finally, with this issue the 'masthead' - a magazine publishing term for the list of people working on the magazine, contact information and other vital information regarding the publication - has caught up with the changes made last month. We couldn't bring you the correct version last month as it was still being 'worked on'. As of this month we're including everyone in the Company - now you'll be able to see just who does what.

ISS

Just recently there have been a couple of high profile activities concerning radio and the *International Space Station*, both have made it onto TV and into the national press. In these two separate events, astronaut Ed Lu, KC5WKJ, conducted contacts with two UK schools in August, using the *ISS* callsign NA1SS. I've heard many report of 5 and 9 signals on hand-held receivers during the contacts. Annoyingly I missed both of these events, but I've previously monitored the Shuttle and *ISS* at these kinds of level.

On 6 August 2003, Charles Riley G4JQX, squeezed in a marathon twenty questions posed by pupils of Neston Primary School in Wiltshire. The *ISS* was only above the horizon for ten minutes, and the QSO on 145.800MHz started precisely as predicted by the computer software. Charles, who is a parent of one of the children participating in the event, was able to hold the contact throughout the pass as the children asked their questions with an audience of over two hundred. Also in attendance were dozens of reporters and camera crews who were assisted by Charles' wife, Rachel. A two minute long piece was broadcast on the national BBC TV's *Newsround* the following day. Several regional TV and radio news broadcasts carried the story too, with one radio program broadcasting the entire contact. The RSGB's GB4FUN road show wagon was in attendance and Yaesu UK very generously loaned a G-5500 rotator so that the directional antennas could track the Space Station.

Two days later, thirteen students, aged 11 to 13, of Soar Valley College in Leicester had the opportunity to ask Ed their questions too. Ed was heard as predicted precisely by the computer software again. Derek Hatton G4GWI, who is a teacher at Soar Valley College, organised the contact and successfully guided the thirteen students using the school's club callsign M0SVC. Ed gave some quite detailed answers, much appreciated by the assembled audience of students, parents and teachers. Earlier Derek provided newspaper and TV reporters with stories to run. Soar Valley College had been running a summer school during the week, and the *ISS* contact fitted in perfectly at the end of the studies, providing an unforgettable event for the students.

Howard Long G6LVB, who is AMSAT-UK's ARISS delegate has provided pictures, audio and video on his website **www.g6lvb.com/neston** and **www.g6lvb.com/svc** for those who missed the events.

I hope you enjoy this month's *SWM* it's been a great issue to put together.

Happy Listening

qsl

Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor at QSL, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

THE BEST LETTER WILL RECEIVE A £20 VOUCHER TO SPEND ON ANY SWM SERVICE.

Dear Sir

In August's *SWM*, Bill Semmens makes the comment that "There is a lot of snobbery in Amateur Radio. Short Wave Radio Hobbyists are looked down upon..." ('Top QSL', page 7).

I write to assure all *SWM*'s readers that at least two internationally known, UK based organisations welcome enthusiasts regardless of whether they hold an amateur radio licence or not. One of these organisations is BARTG (the British Amateur Radio Teledata Group) which welcomes anyone interested in datacoms in amateur radio.

The other organisations is RAOTA (the Radio Amateur Old Timers' Association) which welcomes anyone interested in the Traditions and Spirit of amateur radio. RAOTA already includes in its membership many very experienced s.w.l.s, some of whom are real Old Timers. Holding an Amateur Radio Licence is **not** a requirement for membership of RAOTA.

Details of both organisations are in *SWM*'s International Radio Clubs listing. I can speak with some assurance about both of these organisations because I'm actively involved with the running of both of them. I'm sure there are many other organisations which welcome listeners.

Ian Brothwell, G4EAN & 9H3YI
Nottingham
Secretary, British Amateur Radio Teledata Group
www.bartg.demon.co.uk
Publicity officer of the Radio Amateurs' Old Timers Association
http://go.to/raota

Ian, you never fail to impress by your ability to promote the organisations you represent! Clearly you are the right man for the job! - ***Ed.***

topqsl

Dear Sir

I am referring to the letters published in May and August issues of *SWM*. I am a Canarian born and resident in the Island of Tenerife. As I have recently retired as a Professor of Electrical Engineering in our local University, I have plenty of spare time and, mainly as an exercise of my English, I listen almost daily to the External Service of the BBC, with scarcely any reception problems.

I have at home a Kenwood R-5000 and, of course, with this receiver the reception reports for the BBC are excellent, with signal strength around S9+40dB. But as the above mentioned letters refer to reception with portables as those taken by travellers abroad, I am going to refer to my reception with a portable.

In the mornings, from 0900 to 1200, I go to a Nautical Club and take with me a Sony model ICF-SW100. This is probably one of the best portable short wave receivers in the market (your opinion, Mr. Wilson?) and is really portable for a traveller. The frequency with best reception is 15.485MHz, with a signal strong and stable with slight fading. As second frequency 15.400MHz; in this one the reception is not so good, but sometimes it gets better than the previous one. A third one is 21.470MHz, but here the signal is normally poor, so I scarcely use it. In the evenings, at home, I have tried the reception of the BBC and on 6.195MHz the reception is excellent, **seated inside my home sitting room**.

One point to mention, I never use the set telescopic antenna for two reasons: one because the mechanical fixing is weak and I am afraid to break this fixing and two because the reception is poorer. Solution? I always carry with the set a 'long wire" (about 2m long) antenna made of flexible wire, with a 3.5mm plug in one end and a suction cup in the other.

Regarding the excellence of this wonderful little set, I shall mention that in the mornings I can also listen Radio Nacional Argentina on 15.345MHz (mere 100kW). In spite that this station is severely interfere by a monster (500kW) arabic transmitter, I can still receive Argentina using the Synch a.m. reception facility in this set.

In the August letter mentioned above, Mr. Armstrong say to have BBC reception problems with a Sangean ATS-808 - well, I have had the opportunity, about two months ago, to try an ATS-505, an inferior one, and the reception was very good. He also mention the use of the Sony AN-71 Compact Antenna. As this an active antenna, its use inside a hotel will pickup all the EMC pollution from hotel elevators, fluorescent lightning, pumps motors, etc., making the receiver behave like a box of noise.

Yes, of course, the ICF-SW100 is a somewhat expensive set, but if somebody is fond of short wave reception and, as Mr. Armstrong goes frequently abroad, this set is worth some sacrifice.

Pedro Padron
Santa Cruz de Tenerife,
Canary Is.

Dear Sir

After being inspired by reading 'The Other Man's Shack', I thought I should start writing. As my radio shack cupboard was built by the idea of reading your sister magazine *PW*, I thought I should build a station like this to keep little fingers out, Connor (5 yrs), Daniel (6 yrs) and keeping the XYL happy.

- The first shelf is fitted with all radio manuals, *Callbook*, world atlas, *WRTH* books, QSL cards, etc.
- An MFJ-969 a.t.u. and a Palstar 50A p.s.u. live on the second shelf.
- The third shelf supports my Kenwood TS-850, Kent key and bedside lamp.
- The next shelf holds my collection of *RadCom*.
- The last shelf is home to my collection of *SWM* since 1993.

My main interest has always been radio broadcast stations and amateur bands. In 1993 I was an active s.w.l. (still active), in 1995 I took the call G7UYT and in 2002 I received M3HEM.

The antenna is a commercially made Windom 7-28MHz, which does me well. I'm very lucky to have a very lovely understanding wife Debra who lets me play radio sometimes.

I've been involved with fundraising for the local air ambulance since 1995. I love doing this so much also that's why I was able to have the callsign M3HEM.

Many thanks for the wonderful magazine you bring us. God bless to you all at Dorset. P.S. I also QSL 100% to all s.w.l. reports - via **www.qrz.com**

John M3HEM, Essex

Dear Sir

I hope the following may be of some interest under the 'LM&S' heading. On the 8 June last I was listening on my vintage Ekco A52 and found what appeared to be a maritime beacon on medium wave. As this was rather suspect, I then decided to check with my Icom IC-R75 in conjunction with a Wellbrook loop. This appeared at 587.5kHz, with the callsign HZ, the bearing I took to be c. 280°, which would make about that for Valentia.

These transmissions were quite short in duration - some less than one hour and not at regular times, but usually from about 0630 to 0730. Recent l.f. activity: RTE Radio 1 has appeared at odd times during the last couple of days on 252kHz!

Russell L. Clarke, Somerset

Sound Engineering Solutions from bhi

Say goodbye to annoying QRM and QRN!
With DSP noise cancelling solutions from bhi

- **Dramatically reduce interference and unwanted background noise**
- **Listen clearly on SSB, HF, UHF, VHF and FM**
- **Superb voice quality - with virtually no distortion**
- **Enables you to upgrade your existing equipment to DSP**
- **Significantly reduces heterodyne tones**

NES10-2 & NES5

◆ Speaker with bhi's unique fully adaptive built-in DSP noise cancellating 9-35dB ◆ 8 filter settings and input sensitivity control (NES10-2) ◆ Preset DSP filter setting for "plug and go" operation (NES5) ◆ Earphone socket (NES10-2) ◆ Plugs directly into 3.5mm speaker socket ◆ Handles up to 5 watts input and 2.5 watts max output ◆ Requires 12-24 V DC 500mA

NEIM1031

◆ Flexible in-line unit ◆ bhi's unique fully adaptive DSP noise cancelling 9-35dB ◆ 8 filter levels ◆ Input sensitivity control with LEDs ◆ Audio output 2.5W RMS max (8 ohms) ◆ On/off switch with bypass facility ◆ Audio connections: Line level in/out (RCA Phono), Audio in/out 3.5mm mono jack ◆ Headphone socket ◆ Power 12-24 V DC 500mA ◆ Supplied with a fused DC power lead and a 3.5mm - 3.5mm audio lead for immediate operation

Come and see us at Donnington

NEW 1042 Switch Box

Allows connection of up to 6 pieces of equipment to one extension speaker.....£29.95 + £2.75 P&P

NEW - BANNER BADGE KIT

Scrolling message badge will really get you noticed.....£49.95

Postage & packing £6.95 on all orders that include speakers or modules otherwise P.O.A.

NEW NEDSP1061 PCB module.

A small PCB module allows the bhi noise cancellation technology to be fitted into existing equipment. Different DSP levels are selected with a single button, along with visual and audible indication of which level has been selected. Controls are provided onboard to set the input and output levels from the DSP, to allow the matching of signal levels.

Features:

- ◆ 4 levels of noise cancellation (11 - 35dB)
- ◆ Single button operation
- ◆ Low distortion to audio signal
- ◆ Visual and Audible indication of DSP level.
- ◆ Input and output signal level adjustment
- ◆ Small size - only 27mm x 37mm

NES10-2

DSP Noise eliminating speaker.....£99.95

NES5

Basic (plug and go) DSP noise eliminating speaker £79.95

NEW NEIM1031

Noise eliminating in-line module.....£129.95

Also available from our approved dealers, telephone us or see our website for details.

bhi Ltd, PO Box 136
Bexhill-on-Sea, East Sussex TN39 3WD
Tel: 0870 240 7258 Fax: 0870 240 7259

Website: www.bhi-ltd.co.uk E-mail: sales@bhi-ltd.co.uk

Kenwood's New Transceiver

The *SWM* Newsdesk has received some preliminary product information from **Kenwood Electronics UK Ltd.** regarding their forthcoming HF/50MHz all-mode transceiver. Due to be launched in the autumn, the transceiver features the following:

* Continuous RX: 500kHz (VFO: 30kHz) to 60MHz. Quad mixer offers RX dynamic range in the TS-950 class.
* RX: Covers all Amateur bands from 1.8 to 50MHz. Terminals for external antenna tuner and linear amp.
* Large alphanumeric l.c.d., backlit keys for enhanced operating.
* Compact design - ideal for mobile use - with detached face plate.
* Accommodates up to two optional i.f. filters (500Hz/270Hz band c.w. narrow filters, 1.8kHz band s.s.b. narrow filter.
* AF d.s.p. processing offers wide range of features, including beat-cancel, d.s.p. noise reduction, digital noise limiter, TX/RX equaliser, d.s.p. search processor and c.w. auto-tune.
* Electronic memory keyer.
* New voice recording/synthesis unit available (plug-in installation)
* Packet Cluster Tune function with TM-D700E.
* Terminal for connecting to PC - control software enables PC-based operation of transceiver.

Unfortunately, no price details or a release date were available at the time of going to press, however, as soon as this information is received, all will be revealed here in *SWM*! Kenwood Electronics UK Ltd., can be reached at **Kenwood House, Dwight Road, Watford, Herts WD18 9EB** or visit their website at **www.kenwood-electronics.co.uk**

Hawaiian Good Time

On Saturday 19 July 2003, **Waters & Stanton PLC** threw a party to celebrate 30 years in business. The theme was a Hawaiian Evening and many partygoers dressed appropriately for the occasion. Pictures show **Rob Mannion G3XFD**, Editor of *PW*, who made the

480km round trip to Essex to join in the festivities and (L to R) **Mark Francis G0GBY**, **Peter Waters G3OJV** and **Jeff Stanton M3JJS** after the presentations had been made. Looks like a good time was had by one and all!

This Little Peggy Went To Market...

The new **Intempo** model PG-01 DAB Digital radio will give its predecessors a run for their money. This stylish radio earned itself the 'Peggy' nickname from the all female team at Intempo responsible for its design and innovation.

With DAB technology, radio listening has been revolutionised, giving more choice of stations and better reception quality. Intempo has added style and design to this cutting edge technology, bringing an affordable radio that enhances lifestyle, complimenting living and working spaces.

'Just turn it on' - the radio is simple to use as that...with large push buttons and a clear display screen for programme information. The sound quality is said to be perfect through the two stereo speakers, without the crackling fuzz of regular analogue radio.

Peggy can receive DAB digital and f.m. stereo, including the new digital BBC7 and Five Live programmes. At only £119 with twin speakers, DAB Digital, f.m. radio and a two-year guarantee, 'Peggy' is sure to be popular!

For Stockists telephone **0239-231 3090** or visit: **www.nevada-radios.co.uk**

AGM At Leicester Show

The **Radio Amateur Old Timers' Association** (RAOTA) will be holding its AGM during the **Leicester Show**. The AGM will be on **Friday 19 September** at the Tudor Inn in Castle Donington (note that the venue is not actually at the show site).

A pre-AGM buffet lunch will start at 1300 - this lunch is optional and members are welcome to come along to the AGM without partaking of the lunch if they so wish. The lunch will be subsidised by RAOTA as a way of thanking members for attending the meeting.

The venue is a couple of miles from the site of the Leicester Show, so transport will be provided for anyone who needs it. Last year's AGM had the same arrangements and was a very enjoyable and productive meeting. RAOTA has high hopes that this year's AGM will also be a successful event for everyone involved.

RAOTA's aim is to maintain the traditions and spirit of Amateur Radio. Membership is open to anyone (licensed or listener) who shares the aim of RAOTA. More details about RAOTA can be obtained from the web at **go.to/raota** via E-mail to **edit@raota.fsnet.co.uk** or by post to **Edward Rule G3FEW, 15 Norwich Road, Lenwade, Norwich NR9 5SH** or, of course, from the RAOTA stand at the Leicester Show.

Fantastic In-Car Entertainment

At the 2003 Radio Festival held on 8 July at the International Convention Centre, **Goodmans** launched the **GCE7007DAB** - the world's first in-car DAB Digital Radio that operates using existing car antennas. Uniquely, this means that the GCE7007DAB can be installed without the need for specialist equipment or the inconvenience and expense of fitting an additional DAB-specific antenna.

Unlike other models on the market, upgrading your car to the benefits of DAB technology is now a simple 'five minute' job, courtesy of easy, push-fit industry-standard ISO connections. There's no need to drill holes in the bodywork to install a DAB antenna or run new antenna cabling through the car.

The Goodmans GCE7007DAB is not only the most technologically advanced in-car DAB Digital Radio head unit available, it's also the most affordable. Costing considerably less than other DAB in-car units on sale today, it represents incredible value.

In addition to the full DAB functionality, this new model has a host of new features including a quality CD player, 3-band f.m./m.w./l.w. RDS analogue radio with traffic announcement system and 30 pre-set stations. There's also a detachable front panel with carry case and an anti-theft l.e.d. indicator.

Not only does this new in-car radio offer a great choice of DAB Digital and analogue radio stations, but, via DAB Digital Broadcasting, the sound quality is fantastic. What's more, the display panel gives you useful information about the song, artist, competitions, radio station and other digital broadcasting information - what more could you want?

The GCE7007DAB (priced at £199.99) is available now from leading high street retailers, including Halfords, Argos and Littlewoods, as well as through several Mail Order catalogues.

Not One, But Three!

Why stick with one band when you can have three? Yes, the KRC-X-1 covers 7, 10 and 14MHz - all you do is plug in a different crystal assembly and re-tune the antenna.

Now available from the **Kit Radio Company**, the KRC-X-1 comes with a die-cut and labelled case (7 x 4 x 3in) giving a professional look to your completed project at no extra charge. There is no coil winding, nor is there any tricky alignment or test equipment required to complete the project.

Along with a 25 page step-by-step construction booklet, this project should be within reach of anyone who can solder, Novice and experienced alike. Why not take advantage of the package price and pair the JRC-X-1 up with their well proven ('very sensitive receiver'), the KRC-2, as stated by Rob Mannion G3XFD in his review in *PW* June 2003.

Amaze yourself by reaching other amateurs with just 1W of power. Supplied crystal covers 14.280 to 14.290MHz. Additional crystals are available on request.

Priced at £64.99 for KRC-X1 or £99.99 for the KRC-2/X1 Pack, postage and packing £4 (UK & Ireland). The Kit Radio Company can be reached at **Unit 11, Marlborough Court, Westerham, Kent TN16 1EU, Tel: (01959) 563023**.

young innovator COMPETITION

Telecom Design Communications Ltd. (TDC), Basingstoke specialist technical electronic components distributor, is delighted to announce the launch of its second annual Young Innovator of the Year Competition, this year's theme being 'Make Machines See'. Invitations are being sent out to all schools in Hampshire and Berkshire to participate.

Video cameras are part of everyday life and now new technology is allowing everyday machines to see for the very first time. And TDC anticipate that by 2010, video cameras will be built into every vehicle on the road!

This year TDC is asking students to list the number of video cameras that will be installed in the car of the future. Possible suggestions might include cameras to help reversing and parking. Students have the task of listing as many innovative uses as possible on two sides of A4.

The Competition has been kindly sponsored by Siemens who have donated an M50 mobile 'phone, Natwest Bank who will be opening two bank accounts with £50 and OmniVision - TDC's latest franchise, who have kindly donated a Polaroid digital camera, memory card and leather carry bag. TDC will also present £200 of book vouchers to the winning school.

Entries are open to students under 18 years of age in full time education in Hampshire or Berkshire. The Competition will close on 30 September and schools are being personally invited to sign-up before the end of the Summer term, entries are being accepted now at **www.tdc.co.uk/competition**

Further information on entering the Competition can be found by contacting **Carlie Cohen** on **(01256) 332800** or via E-mail: **carlie.cohen@tdc.co.uk** Students can also ask for advice by E-mailing **Bob** - TDC's Technical Support Specialist - at **youngbob@tdc.co.uk**

New Best 'Celler'

A new edition of Yuasa's 20 page *Little Red Book of Batteries* has recently been published. With over 100,000 copies of earlier editions in circulation throughout the UK and Europe, this new 'Millennium' edition contains some revised data and provides the reader with general and technical information on Valve Regulated Lead Acid batteries. Subjects covered include: Design & Construction, Applications, Charging, Care and Maintenance and, at the end of their life, Safe Disposal and Recycling.

Apart from information on VRLA batteries, the *Little Red Book of Batteries* presents introductory information on the full range of batteries now available from Yuasa. A copy of this publication is available from request from **Yuasa Battery Sales (UK) Ltd., Hawksworth Industrial Estate, Swindon, Wiltshire SN2 1EG** or download a pdf copy from **www.yuasa-battery.co.uk**

RAE Courses

The **North Bristol ARC** are holding a Foundation Licence course starting in September 2003. Candidates of all ages are most welcome. The Club are also preparing candidates for the very last RAE exam in December this year. More information from **Dick Elford G0XAY** on **(01454) 218362** or E-mail: **g0xay@aol.com**

The **City College Coventry**, Tile Hill Centre, Tile Hill Lane, Coventry, West Midlands, will be running Amateur Radio Classes from September 2003 for the following: Foundation licence; Intermediate (Novice) licence; Full licence; Morse Classes (5 and 12w.p.m.) and Amateur Radio constructional classes. More information from course tutor **Michael Dixon G4GHJ** via E-mail: **m.dixon@staff.covcollege.ac.uk** or from the **Course Enquiry Team** on **(02476) 791138**.

An RAE Class leading to the new examination syllabus will be held in Orpington at **Newstead Wood School for Girls**, Avebury Road, Orpington, commencing Monday 15 September 2003, 1930 till 2130. Enrolment is held at the Bromley Adult Education College, The Widmore Centre, Bromley BR1 2SQ, Tel: **0208-460 0020**. Arrangements can be made with local radio clubs to obtain the Foundation and Intermediate examinations prior to the RAE exam. It is not essential to have these prior to enrolment.

rallies

August 31: The Telford Rally will be held at RAF Cosford, Aerospace Museum, one mile south of J3 M54 on A41. As in previous years, entrance and parking will be **free**. For more details contact **M0RJS**, QTHR, via E-mail: **bob@somrob.u-net.com**

September 14: The Anglian Five Esses Rally - sponsored by Suffolk Data Group - are holding their Suffolk Super September Rally & Surplus Sale on the Raceway Centre Green at Foxhall Stadium, near Ipswich, Suffolk. There will be Amateur Radio, computers, electronics, computer jumble and surplus equipment and on-site refreshments. Traders admission from 0800 - £5 car booters' admission from 0800 - £5. Visitors admissions from 0930 - £1. Everyone is welcome to attend. More information from Rally Manager **Peter G8HUE** on **(01473) 631313** or visit **www.suffolkdatagroup.freeserve.co.uk**

September 21: The annual Blarney Rally will be held at the Blarney Park Hotel, Blarney, Co. Cork, Republic of Ireland. Organised by the Cork Radio Club the proceedings begin at 1100. For more details contact **Con EI7DJB**, QTHR, on **00 353-12 4270136** mobile: **00 353-86 1071312** or E-mail: **conmac@engineer.com** The official website of the Blarney Rally is **www.blarneyrally.com**

October 12: The Great Lumley Amateur Radio and Electronics Society are holding their rally at the Community Centre, Front Street, Great Lumley, Chester-le-Street, Co. Durham. Doors open 1030. This is the biggest and best rally in the North East! There will be free parking, plus easy access, good, inexpensive food and drink. There will be a flying display by Chester-le-Street Model Aircraft Club with a stand. Bring & Buy in two sections, radio, hobbies, electronics, computer, satellite and component stalls. Admission is £2. Free of charge for under 14s if accompanied by adult. More details from **Nancy Bone** on **0191-477 0036** (home) or **(07990) 760920** (mobile) or E-mail: **nancybone2001@yahoo.co.uk**

October 19: The Blackwood & District Amateur Radio Society are holding their rally at the Newport Centre, Newport, one mile from Junction 25A of the M4 Junction 26 when travelling West to East. Doors open at 1045 (1030 for disabled visitors), admission is £1.50. There will be a free car park, Bring & Buy, Talk-in, trade stands, specialist interest groups, bar, catering, disabled facilities and a raffle. For more details contact **D. Lewis GW6GW, 23 Gelligroes Road, Pontllanfraith, Blackwood, Gwent NP12 2JU.**

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off.

Flying High!

The 2003 Royal International Air Tattoo was a huge success with an estimated 100 000 people attending each day. Despite the weather not being as glorious as it had been earlier in the week, visitors to the ulitmate airshow experience were not deterred and the vast array of military, civilian and 100 Years of Flight displays coupled with some spectacular flypasts from international air force teams set the scene for a memorable day out.

Air forces from all over the world, including the USA, Netherlands, Germany, UK were represented. The White Helmets Motorcycle Display team put on a display and there were plenty of stalls selling aviation memorabilia and other related items too.

One visitor to RIAT, **Kevin Mitchell**, enjoyed a great day out with fellow members of the 130 Bournemouth Squadron Oakmead Flight Air Training Corps. The Squadron members were lucky enough to see a Grob tutor plane at the Air Tattoo, which is the 'backbone' aircraft of the Air Training Corps and one which most cadets get the opportunity to experience flying in during their time with the Corps.

If you are between the ages of 13-18 of age, or you would like to become an adult volunteer and would like to find out more about the Air Cadets, who have over 1000 squadrons located all over the country, contact **Headquarters Air Cadets, Royal Air Force College, Cranwell, Sleaford, Lincolnshire NG34 8HB. Tel: (01400) 261201 ext 7630** or take a look at **www.aircadets.org** If you are interested in finding out more about the 130 Bournemouth Squadron Oakmead Flight Air Training Corps, who have been in existence for 62 years, contact Kevin Mitchell at **cimitchell130@hotmail.com**

Pictured alongside the Grob tutor plane are (L-R) Corporal Andrew Sullivan, Cadet Piers Charman, Flight Sergeant Ashley Mitchell, Corporal Liam Searle, Cadet Ben Sheppard (sat in plane), Corporal John Sullivan, Cadet Lyndsey Harris, Warrant Officer Jamie Green and Pilot Officer Kevin Mitchell.

Left-Handers Have Their Day!

Right-handers beware! Things took a sinister turn on 13 August 2003, when left-handers marked the 11th Annual Left-Handers Day celebrations by declaring their homes and offices 'Lefty Zones'. The 28,000 members of The Left-Handers Club, and the thousands of visitors to the website, celebrated by turning the tables on right-handers, who experienced how awkward and frustrating it can be living in a 'back-to-front-world', (such as right-hand drive transceivers!).

Organised by the International Left-Handers Club, the purpose of Left-Handers Day is to create awareness among the right-handed majority, in a light-hearted way, of the problems right-biased design of everything from scissors to sinks, chequebooks to computer mice, or musical instruments to microwaves can have on the 13% of the population who do not use their right-hand for tasks.

The International Left-Handers Club is free to join from the website **www.anythingleft-handed.co.uk** and currently has 28,000 members world-wide. It hosts a forum for club members, has regular newsletters and special offers and usually co-ordinates events world-wide to celebrate Left-Handers Day on 13 August each year. This year, Left-Handers Day celebrations were focused on Internet-based activities in order to reach more people wanting to take part.

BRIAN ODDY G3FEX, THREE CORNERS, MERRYFIELD WAY, STORRINGTON, WEST SUSSEX RH20 4NS

LM&S

Last month I referred to the seasonal variations in the ionisation of the layers forming the Ionosphere and mentioned that the daytime critical frequencies of the E and F1 layers are higher in summer than in the winter, but in the highest F2 layer the daytime critical frequency is greatest in winter and least in summer. So why, you may well be wondering, does this occur?

Over the years a number of theories have been advanced to account for this unexpected effect, but so far it may not have been fully explained. One of the most likely is that during the summer the radiation from the Sun results in pronounced heating of the uppermost F2 region of the ionosphere, consequently the gas present there expands and reaches much greater heights than during the winter. In the expanded state, the ionised gas is therefore more widely distributed than in its contracted state, consequently the critical frequency decreases in summer, but rises in winter when the gas is more dense.

The poor propagation conditions which prevailed in the higher frequency short wave bands during June were a good example of this effect. In fact, many listeners had difficulty in receiving some of their favourite broadcasts and some began to wonder if their receiving equipment had developed a fault.

Another factor that affects reception in the lower frequency bands, namely the static produced by thunderstorms. Heavy rain and thunderstorms often occur at this time of the year, especially after prolonged periods of fine weather. Every time a lightning discharge occurs, electromagnetic radiations are set up that cover a wide band. Those produced by a distant storm may be detected with a radio receiver as 'atmospherics', especially at low frequencies. During a local thunderstorm their intensity can easily destroy the front-end transistor(s) of a powered receiver, so at the first rumble of thunder switch off!

When rain falls from an electrified cloud each droplet carries a charge. Those that fall on an outdoor antenna gradually build up a charge on it. If no easy path to earth exists, a very high potential can build up and a hiss or distinct crackling noise may arise where it discharges to earth. The dangers associated with a thunderstorm should never be under-estimated. Always earth an outdoor antenna before a storm arrives or whenever it is not in use.

Warning: Never touch or attempt to earth an antenna which is exhibiting these properties during a storm.

Listeners:-
(A) Simon Hockenhull, while near Coverack, Cornwall.
(B) Simon Hockenhull, E.Bristol.
(C) Eddie McKeown, Newry.
(D) Ernie Strong, Ramsey, Cambs.
(E) Fred Wilmshurst, Northampton.

Long Wave Chart

kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	D*
153	Donebach DLF	Germany	500	A,C,D,E
162	Allouis	France	2000	C,D,E
171	Nador Medi-1	Morocco	2000	D
171	B'shakovo etc	Russia	1200	C,E
171	Lvov	Ukraine	500	D*
177	Oranienburg	Germany	500	C,D,E
183	Saarlouis	Germany	2000	C,D,E
189	Gufuskalar	W.Iceland	150	C*,D*
198	Droitwich BBC	UK	500	A,C,D,E
198	WesterglenBBC	UK	50	B
207	Munich DLF	Germany	500	C,D,E
207	Eidar	E.Iceland	100	C*,D*
207	Azilal	Morocco	800	D*
216	Roumoules RMC	S.France	1400	A,C,D,E
225	Polskie R-1	Poland	?	C*,D,E
234	Beidweiler	Luxembourg	2000	C,D,E
243	Kalundborg	Denmark	300	A,B,C,D,E
252	Tipaza	Algeria	1500	A,B,C*,D,E
252	Yerevan	Armenia	150	C*
261	Burg(R.Ropa)	Germany	85	C*
270	Topolna	Czech Rep	1500	C*,E
279	Sasnovy	Belarus	500	C*

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during June.

During a three week holiday in June **Simon Hockenhull** (E.Bristol) stayed on a farm near the village of Coverack on the Lizard peninsula. He used a battery powered Roberts R-617 portable plus external antennas to explore the long, medium and short wave bands. The level of electrical interference from local machinery and electric fencing proved to be quite high, but nevertheless he compiled some interesting logs - see charts and s.w. data herein.

Between 2300 on the 7th and 0200 on the 8th there was a torrential rain storm. The rain drops were electrically charged and the impulse interference which they produced when they landed on his external antenna varied in sympathy with the intensity of the rain. It was the first time Simon had encountered this dangerous effect, which could have so easily written-off his receiver.

Upon returning home on the 22nd Simon logged, through lightning static, Westerglen on **198kHz** as SINPO 25252 at 1428, during a break in the transmission from Droitwich which may have been caused by lightning in that locality.

Over in Co.Down **Eddie McKeown** (Newry) found reception in this band affected by summer propagation conditions. The Rikisutvarpid (RUV) outlets at Gufuskalar, W.Iceland on **189** (300kW) and Eidar, E.Iceland on **207kHz** (100kW) were almost impossible to log. Sasnovy on **270kHz** was audible for only fifteen minutes to half-an-hour. Nevertheless, he compiled quite an extensive log - see chart.

The Icelandic stations on **189** & **207kHz** were both heard late at night by **Ernie Strong** in Ramsey, Cambs. At best he rated them respectively 22332 and 21231. There was no mention of Sasnovy on **207kHz** in his report, but a number of other stations were logged after dark. Some were also noted during daylight - see chart.

Medium Wave Reports

Despite the long hours of daylight during June some listeners searched the band after dark for the sky waves from the m.w. stations in the Middle East, N.Africa, Europe and Scandinavia. An extensive log was compiled by **Fred Wilmshurst** in Northampton and 62 of his entries were received after dark - see chart.

Whilst on holiday at Seaton, near Looe, Cornwall **Clare Pinder** (Appleby) listened at 2300 to the news and TT results broadcast by Manx Radio, Isle of Man on **1368kHz**. Their transmission rated 32222.

Many of the entries in the interesting report from **Harry Richards** were received during daylight.

The medium wave local radio scene attracted the attention of several listeners. Most of the entries in the log compiled by **Richard Reynolds** (Guildford) were heard between 0500 and 0700.

At 0800 on the 22nd **Sheila Hughes** (Morden) listened to Three Counties Radio via Luton on **630kHz** (0.2kW) with an interesting talk about Bletchley Park, Enigma machines and the breaking of coded messages. At 1050 on the 23rd she was surprised to hear a cookery programme on Classic Gold 1521. She says "A new programme for me which I must check out again".

Whilst in Holyhead **Geriant Gill** (Llanfairfechen) picked up the ground waves from some quite distant stations with his Pioneer car radio between 1730 and 1800 - see chart.

Short Wave Reports

As expected, there were no reports of any official broadcasting activity in the **25MHz (11m)** band during June. It will be interesting to see if Radio France International (RFI) and/or Deutsch Welle (DW) include this band in their transmission schedules for the winter period commencing October 27. If they decide not to do so, the band may remain unused until favourable propagation conditions exist during the next solar sunspot cycle.

The propagation conditions in the **21MHz (13m)** band varied from day to day. Reception over long distances was very erratic. R.Australia's early morning transmission to Pacific areas via Shepparton

Tropical Bands Chart

MHz	Station	Country	UTC	DXer
2.310	ABC Alice Springs	Australia	2109	K
2.325	ABC Tennant Creek	Australia	2114	K
2.485	ABC Katherine	Australia	2117	K
3.200	TWR Manzini	Swaziland	0305	G,K
3.230	WYFR via Meyerton	S.Africa	2002	K
3.240	TWR Manzini	Swaziland	0306	G,K
3.255	BBC via Meyerton	S.Africa	2144	G,J,K
3.320	SABC (RSG) Meyerton	S.Africa	2140	G,J,K
3.350	R.Ext.Espana	Costa Rica	0215	K
3.915	BBC via Kranji	Singapore	2130	F,G,J,K
3.955	R.Korea via Skelton	England	2100	B,C,G,H,J
3.955	R.Taipei via Skelton	England	1800	A,B,C,G,H,I
3.975	R.Budapest	Hungary	1909	C,G
3.985	VOIRI	Iran	2130	J
3.985	China R.Int via SRI	Switzerland	2146	G
3.995	DW via Julich?	Germany	2147	B,G,J
4.005	Vatican R.	Italy	1954	E,G,J
4.760	AIR Port Blair	India	2329	J,K
4.765	R.Rural, Santarem	Brazil	2348	K
4.770	FRCN Kaduna	Nigeria	2145	G,J,K
4.775	R.Congonhas	Brazil	2349	K
4.775	TWR Manzini	Swaziland	0410	K
4.790	AIR Chennai	India	2359	K
4.790	R.Atlantida	Peru	0219	K
4.800	CPBS 2 Beijing	China	2145	G,J,K
4.800	LNBS Maseru	Lesotho	0307	K
4.805	R.Nac.Amazonas	Brazil	2230	K
4.815	R.Difusora, Londrina	Brazil	2351	K
4.820	R.Botswana, Gaberone	Botswana	0307	D,G,K
4.820	Xizang, Lhasa	China	2130	G,J,K
4.832	R.Litoral, La Ceiba	Honduras	0341	K
4.835	RTM Bamako	Mali	2105	G,J,K
4.845	ORTM Nouakchott	Mauritania	2110	G,J,K
4.860	AIR Delhi	India	1844	K
4.875	RRI Sorong	Indonesia	2151	K
4.885	R.Clube do Para	Brazil	2239	B,G,K
4.885	KBC East Sce Nairobi	Kenya	2200	J
4.890	RFI Paris	via Gabon	0358	G,K
4.905	Xizang-Tb, Lhasa	China	2145	J,K
4.910	AIR Jaipur	India	2200	J
4.915	R.Anhanguera	Brazil	2332	K
4.915	R.Difusora, Macapa	Brazil	0306	D
4.915	GBC-1, Accra	Ghana	2140	G,J,K
4.920	Xizang-Tb, Lhasa	China	2152	G,K
4.920	AIR Chennai	India	1745	J
4.930	AIR Shimla	India	2145	J
4.950	R.Nacional, Mulvenos	Angola	2117	D,K
4.950	VOA via Sao Tome	Sao Tome	2024	G,K
4.955	R.Cultural Amauta	Peru	2354	K
4.960	VOA via Sao Tome	Sao Tome	0400	B,D,G,K
4.965	Christian Voice	Zambia	2240	J,K
4.975	R.Pacifico, Lima	Peru	2355	K
4.975	R.Uganda, Kampala	Uganda	2026	G,K
4.985	R.Brazil Central	Brazil	0303	D,G
5.009	R.TV Malagasy	Madagascar	2240	G
5.010	R.Misones Int.	Honduras	0305	D
5.015	R.Brazil Tropical	Brazil	2209	K
5.025	R.Rebelde, Bauta	Cuba	0201	D,G
5.025	R.Pakistan, Quetta	Pakistan	2145	J
5.025	R Uganda, Kampala	Uganda	2028	J,K
5.030	R.Burkina	Burkina Faso	2155	G,K
5.030	CNR-1, Beijing	China	2145	J
5.030	AWR Latin America	Costa Rica	0347	K
5.040	Jeypore	India	2145	J
5.047	R.Togo, Lome	Togo	2150	J
5.050	R.Tanzania	Tanzania	2030	K

DXers:-
(A) Bernard Curtis, Stalbridge.
(B) Ian Evans, Ebbw Vale, Gwent.
(D) David Hall, Morpeth.
(E) Simon Hockenhull, while nr Coverack, Cornwall.
(F) Simon Hockenhull, E.Bristol.
(G) Eddie McKeown, Newry.
(H) Clare Pinder, Appleby.
(I) Clare Pinder, while in Seaton, Cornwall.
(J) Vic Prier, Seaton.
(K) Richard Reynolds, Guildford.

on **21.725** (Eng 0200-0900) seldom reached the UK. During favourable conditions it was logged as SINPO 24112 at 0805 in Newry. From 0900 they broadcast to Asia via Shepparton on **21.820** (Eng 0900-1400). During a few mornings it was audible in the UK. In Northampton it was rated 24222 at 0905.

Also mentioned in the reports were Swiss R. Int (SRI) via Sottens **21.750** (Fr, Ger, It, Eng to Near East, Africa 0600-0800), rated 44333 at 0730 in Morden; Swiss R. Int (SRI) via Sottens **21.770** (Eng, It, Ger, Fr to Near East, Africa 0830-1030) 45344 at 0830 in Newry; R.Pakistan, Islamabad **21.465** (Ur, Eng to Eur 0700-1010) 54444 at 0800 by **Bernard Curtis** in Stalbridge; Voice of Greece via Kavala **21.530** (Gr to M.East, Indian Ocean 0400-0830; also to Australia 0400-0800) 34423 at 0830 by **Vic Prier** in Seaton, Devon; R.Prague, Czech Rep **21.745** (Eng, Czech to W.Africa, S.Asia 0900-0957) 55434 at 0925 by **Ian Pakeman** in Folkestone; Voice of Turkey via Emirler **21.715** (Tur to Asia, Australia 1000-1300) 44434 at 1015 by **Rhoderick Illman** in Oxted; R.Portugal Int, S.Gabriel **21.830** (Port to W.Africa 0700-1655, Sat/Sun) 34333 at 1034 by **Peter Pollard** in Rugby; BSKSA Riyadh **21.505** (Ar to N.Africa 0600-1500) 44444 at 1320 by **David Hall** in Morpeth; Channel Africa via Meyerton **21.760** (Eng to Africa 1300-1455, Sat/Sun) 25343 at 1330 in Northampton; UAE R.Dubai **21.605** (Ar, Eng to Eur 0600-1630) 54544 at 1340 by **Stan Evans** in Herstmonceux; BBC via Ascension Is **21.470** (Eng to S.Africa 1200-1900) 25422 at 1817 near Coverack, Cornwall.

In the **18MHz (15m)** band the Voice of America (VOA) via Sri Lanka **19.010** (Dari to Afghanistan 1130-1230) was rated 34333 at 1130 in Morden; Family R, WYFR via Okeechobee FL, USA **18.980** (Eng to Eur 1800-2146) was 32223 at 1800 in Stalbridge; Christian Science Herald via WSHB Cypress Creek **18.910** (Fr, Eng to E/S.Africa 1600?-2200?) 33333 at 1900 in Rugby; Family R, WYFR via Okeechobee FL, USA **18.930** (Eng to Eur, Africa 1800?-2200) 24121 at 2006 in Newry & 35343 at 2143 in Northampton.

Unreliable conditions also prevailed in the **17MHz (16m)** band. R.Australia's broadcast to E/SE.Asia via Shepparton on **17.750** (Eng

Listeners:-
(A) Geraint Gill, while at Holyhead.
(B) Simon Hockenhull, while nr Coverack, Cornwall.
(C) Simon Hockenhull, E.Bristol.
(D) Sheila Hughes, Morden.
(E) Richard Reynolds, Guildford.
(F) Ernie Strong, Ramsey, Cambs.
(G) Fred Wilmshurst, Northampton.

Local Radio Chart

kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	F,G
603	C.G.Litt'brne	I	0.10	D,E,F,G
630	R.Bedfordshire(3CR)	B	0.20	D,E,F,G
630	R.Cornwall	B	2.00	A,E*
657	R.Cornwall	B	0.50	E*
666	Cl.Gold 666, Exeter	I	0.34	A,B,E*,F,G
666	R.York	B	0.80	F
729	BBC Essex	B	0.20	E,F,G
738	Hereford/Worcester	B	0.037	F,G
756	The Magic 756,Powys	I	0.63	G
765	BBC Essex	B	0.50	E*,F,G
774	R.Kent	B	0.70	F,G
774	R.Leeds	B	0.50	F
774	Cl.Gold 774, Glos	I	0.14	E*,G
792	Cl.Gold 792,Bedford	I	0.27	D,E,F,G
801	R.Devon	B	2.00	A,B,C,D,E*,F
828	Cl.Gold 828, Luton	I	0.20	D,E,F,G
837	R.Cumbria/Furness	B	1.50	A
837	Asian Net Leicester	B	0.45	E*,F,G
855	R.Devon	B	1.00	B
855	R.Lancashire	B	1.50	A
855	R.Norfolk, Postwick	B	1.50	F
855	Sunshine 855,Ludlow	I	0.15	G
873	R.Norfolk, W.Lynn	B	0.30	E*,G
936	Brunel CG, W.Wilts	I	0.18	E*,F,G
936	Fresh AM, Hawes	I	1.00	A
945	Cl.Gold GEM, Derby	I	0.20	G
945	Capital G, Bexhill	I	0.75	E
954	Cl.Gold 954 via ?	I	?	F
954	Cl.Gold 954,Torquay	I	0.32	B
954	Cl.Gold 954, H'ford	I	0.16	C,E*,G
963	Liberty R, Hackney	I	1.00	D,F,G
972	Liberty R, Southall	I	1.00	C,D,F,G
990	R.Devon, E.Devon	B	1.00	B,C,D
990	Magic AM,Doncaster	I	0.25	F
990	Cl.G, Wolverhampton	I	0.09	G
999	C.Gold GEM Nott'ham	I	0.25	F,G
999	Magic 9-99 P'stn	I	0.80	A
999	R.Solent	B	1.00	B
1017	Cl.G,WABC,Shr'shire	I	0.70	G
1026	R.Cambridgeshire	B	0.50	D,E,F,G
1026	Downtown R, Belfast	I	1.70	A
1026	R.Jersey	B	1.00	B,E*
1035	Mean Country 1035	I	1.00	F*,G
1116	R.Derby	B	1.20	F,G
1116	R.Guernsey	B	0.50	B,E*
1152	Cap.G 1152,Birm'ham	I	3.00	F
1152	LBC 1152, London	I	23.50	F,G
1152	Magic1152,Manch'ter	I	1.50	A
1152	Cl.G 1152, Plymouth	I	0.32	B
1161	R.Bedfordshire(3CR)	B	0.10	F,G
1161	Magic 1161, Goxhill	I	0.35	F
1170	Cl.G Amber, Ipswich	I	0.28	F
1170	Magic 1170,Stockton	I	0.32	E,F
1242	Capital G,Maidstone	I	0.32	D,E
1251	C.G Amber,Bury StEd	I	0.76	F
1260	Marcher G, Wrexham	I	0.64	A
1260	SabrasSnd,Leicester	I	0.29	F,G
1278	Cl.Gold 1278 W.York	I	0.43	F
1296	Radio XL,Birmingham	I	5.00	A,E*,F,G
1305	Magic AM,Barnsley	I	0.15	F*
1305	Premier via ?	I	0.50	F,G
1323	Capital G,Southwick	I	0.50	D,E,F
1332	Cl.Gold 1332,Pt'bo	I	0.60	F,G
1359	Breeze, Chelmsford	I	0.28	D,F
1359	Cl.Gold 1359, C'try	I	0.27	F,G
1368	R.Lincolnshire	B	2.00	F,G
1368	Southern Counties R	B	0.50	D
1413	R.Gloucester via ?	B	?	G
1413	Premier via ?	I	0.50	F
1413	Fresh AM, Skipton	I	0.10	F
1431	Breeze,Southend	I	0.35	D,F
1431	Cl.Gold, Reading	I	0.14	E,F,G
1449	Asian Net Peterbro	B	0.15	F,G
1458	R.Cumbria	B	0.50	A
1458	R.Devon	B	2.00	B
1458	R.Newcastle	B	2.00	F*
1458	Sunrise, London	I	50.00	F,G
1458	Asian Net Langley	B	5.00	G
1485	Cl.Gold, Newbury	I	1.00	D,G
1485	R.Humberside (Hull)	B	1.00	F
1485	R.Merseyside	B	1.20	A
1485	Southern Counties R	B	1.00	B,D,G
1503	R.Stoke-on-Trent	B	1.00	E*,F
1521	Cl.Gold, Reigate	I	0.64	D,F*,G
1530	R.Essex, Southend	B	0.15	F
1530	Cl.Gold via ?	I	?	E*
1548	Capital G, London	I	97.50	D,G
1548	Magic88,Liverpool	I	4.40	A
1548	Magic AM, Sheffield	I	0.74	F*
1557	Cl.Gold C7,N.hant	I	0.76	F,G
1557	Capital G, So'ton	I	0.50	D
1566	CountySnd,Guildford	I	0.50	D,F,G
1566	SomersetSnd,Taunton	B	0.63	B
1584	London Turkish R	I	0.20	F
1584	R.Nottingham	B	1.00	E*,G
1602	R.Kent	B	0.25	F

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Listeners:-
(A) Geraint Gill, while at Holyhead.
(B) Simon Hockenhull, while nr Coverack, Cornwall.
(C) Eddie McKeown, Newry.
(D) Clare Pinder, Appleby.
(E) Clare Pinder, while in Seaton, Cornwall.
(F) Richard Reynolds, Guildford.
(G) Harry Richards, Barton-on-Humber.
(H) Ernie Strong, Ramsey, Cambs.
(I) Fred Wilmshurst, Northampton.

0030-0400, 0530-0800, 0830-0900, 0930-1100) sometimes reached the UK. During favourable conditions it was rated 34333 at 1044 in Oxted.

Other broadcasters active in this band include Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1600), rated 22232 at 0730 in Seaton, Devon; R.Japan via ? **17.585** (Eng to Eur 1000-1100) 55444 at 1015 in Folkestone; R.France Int, (RFI) via Ascension Is **17.815** (Eng to Africa 1200-1230) 24122 at 1201 in Newry; Israel R. Jerusalem **17.535** (Heb to Eur, N.America 0500-0100) 44444 at 1315 in Morpeth & 54445 at 2115 in Stalbridge; Voice of Turkey, Ankara **17.830** (Eng to Eur 1230-1325) 45544 at 1315 in Northampton; R.Sweden **17.840** (Eng to N.America 1330-1400) 54554 at 1345 in Herstmonceux; World Harvest R. (WHRA) via Greenbush, Maine, USA **17.650** (Eng to Africa 1300?-2300) 54444 at 1530 in Morden; VOA via Morocco **17.895** (Eng to Zimbabwe 1730-1800) 55445 at 1755 in Stalbridge; BBC via Ascension Is **17.830** (Eng to W & C.Africa 0800-2100) 25322 at 1822 near Coverack; Israel R, Jerusalem **17.545** (Eng to Eur, N.America 1900-1925) 34333 at 1920 in Rugby; RCI via Sackville **17.870** (Eng to Eur, M.East, Africa 2000-2130) 44233 at 2004 by **Ian Evans** in Ebbw Vale; VOA via Greenville, USA **17.895** (Eng to W/C.Africa 2000-2200) 45433 at 2140 by **Jim Brown** in Dreghorn.

Better reception over long distances was noted in the **15MHz (19m)** band. R.Australia broadcasts on three frequencies from Shepparton: **15.415** (Eng to SE.Asia 2330-0900); **15.515** (Eng Australia, Asia 0200-0700); **15.240** (Eng to Pacific, Western N.America 0700-0900) and during favourable conditions they may reach the UK. In Herstmonceux **15.415** was rated 44333 at 0615; **15.515** was 44333 at 0620; **15.240** was 43333 at 0850. Much later, R.New Zealand's broadcast to Pacific areas on **15.160** (Eng 1851-2215) sometimes reached the UK. It was rated 32222 at 2000 by **Clare Pinder** when she returned home to Appleby.

Many other broadcasts are active in this band. They include the Voice of Nigeria via Ikorodu **15.120** (Eng to N.Africa, Eur 0500-0800), rated 44423 at 0800 in Seaton, Devon; UAE R.Dubai **15.395** (Ar, Eng to Eur 0600-2045) 43333 at 1041 in Oxted; HCJB Quito via Kununurra, Australia **15.480** (Eng to Asia 1230-1730) 34433 at 1335 in Morpeth & 32222 at 1725 in Stalbridge; AWR via Abu Dhabi, UAE **15.320** (Eng to SE/S.Asia 1330-1400) 44333 at 1340 in Morden; R.Japan via Moyabi, Gabon **15.355**

Medium Wave Chart

kHz	Station	Country	Power (kW)	Listener
531	Ain Beida	Algeria	600/300	H*
531	Akraberg	Faeroe Is.	100	A
531	RNE5 via ?	Spain	?	B,H*
531	Beromunster	Switzerland	500	C*,H*
540	Wavre-Overijse(VRT)	Belgium	150/50	C*,H,I
549	Nordkirchen (DLF)	Germany	100	H*
549	Thurnau (DLF)	Germany	200	I*
558	Espoo	Finland	50	C*,H*
558	Gheslagh	Iran	1000	H*
567	Tullamore(RTE1)	Eire	500	A,B,C,G,H*,I
576	Muhlacker(SDR)	Germany	500	C*,H*,I*
576	Barcelona(RNE5)	Spain	50	H*
585	Paris(FIP)	France	8	C*,H
585	Madrid(RNE1)	Spain	200	C*,H*,I*
585	Dumfries(BBCScot)	UK	2	A,C
594	Frankfurt(HR)	Germany	1000/400	C*,H*,I*
594	Oujda-1	Morocco	100	H*
603	Sevilla(RNE5)	Spain	50	C*,H*
603	Newcastle(BBC)	UK	2	C,G,H*
612	Athlone(RTE2)	Eire	100	A,B,C,H,I*
621	Wavre (RTBF)	Belgium	80	G,H*,I
621	Batra	Egypt	2000	H*
621	RNE1 via ?	Spain	10	H*
621	Barcelona(OCR)	Spain	50	C*
630	Vigra	Norway	100	C*
630	Tunis-Djedeida	Tunisia	600	B,C*
639	Praha(Liblice)	Czech	1500	C*,I*
639	RNE1 via ?	Spain	?	B,C*,H*
648	Orfordness(BBC)	UK	500	B*,C*,G,H*,I
657	Firenze	Italy	100	H*
657	Madrid(RNE5)	Spain	20	H*,I*
657	Wrexham(BBCWales)	UK	2	A,C,H,I
666	MesskirchRohrd(SWF)	Germany	150	C*,H*,I*
666	Sitkunai(R.Vilnius)	Lithuania	500	H*
666	Lisboa	Portugal	135	C*
675	Lopic(ArrowCl.Rock)	Holland	120	B,C,G,H*,I
684	Tanaf	Iraq	1000	H*
684	Sevilla(RNE1)	Spain	500	C*,H*,I*
684	Avala(Beograd-1)	Yugoslavia	2000	C*
693	Droitwich(BBC)	UK	150	A,G,H*,I
702	Flensburg(NDR)	Germany	5	C*
702	TWR via Monte Carlo	Monaco	300	H*
711	Rennes (R.Bleu)	France	300	B,C*,H*,I*
711	Murcia(COPE)	Spain	5	H*
720	Langenberg	Germany	200	H*
720	Lisnagarvey(BBC4)	N.Ireland	10	A,B
720	Crystal Palace BBC4	UK	0.75	H*,I
729	Cork(RTE1)	Eire	10	B,C*
729	RNE1 via ?	Spain	?	B,H*,I*
738	Paris	France	4	C*,H*
738	Barcelona(RNE1)	Spain	500	C*,H*,I*
747	Flevo(NOS-1)	Holland	400	B,C*,G,H*,I
756	Braunschweig(DLF)	Germany	800/200	C*,H*,I*
756	Redruth(BBC R-4)	UK	2	F*
765	Sottens	Switzerland	500	C*,H*
774	Enniskillen(BBC)	N.Ireland	1	C
774	RNE1 via ?	Spain	?	C*,H*,I*
783	Leipzig(MDR)	Germany	100	C*,H*,I*
783	Barcelona (COPE)	Spain	50	H*
792	Limoges	France	300	C*,I*
792	Sevilla(SER)	Spain	20	C*
792	Londonderry(BBC)	UK	1	B
801	Munchen-Ismaning	Germany	300	C*,H*
801	RNE1 via ?	Spain	?	H*
810	Westerglen(BBCScot)	UK	100	A,C,H*,I*
819	Batra	Egypt	450	C*,H*
819	S.Sebastian(EI)	Spain	5	H*
828	Heinenoord(Cl.Rock)	Holland	20	C*
837	Amchit	Lebanon	100	H*
837	COPE via ?	Spain	?	C*,H*
846	Rome	Italy	1200	C*
855	Berlin	Germany	100	C*
855	RNE1 via ?	Spain	?	C*,H*,I*
864	Santah	Egypt	500	H*
864	Paris	France	300	B,C*,H*,I*
873	Frankfurt(AFN)	Germany	150	C*,G*,I*
873	Zaragoza(SER)	Spain	20	C*,I*
873	Enniskillen(R.UI)	UK	1	C
882	Penmon(BBCWales)	UK	10	A
882	Washford(BBCWales)	UK	100	B,C,H*,I
891	Algiers	Algeria	600/300	H*,I*
891	Hulsberg	Netherlands	20	C*
900	Brno(CRo2)	Czech Rep	25	C*,H*
900	Milan	Italy	600	B,C*,I*
900	COPE via ?	Spain	?	H*
909	B'mans Pk(BBC5)	UK	140	H*,I
909	M'side Edge(BBC5)	UK	200	A,G
918	Domzale	Slovenia	600/100	C*,H*,I*
918	Madrid(R.Int)	Spain	20	H*,I*
927	Wolvertem	Belgium	300	C*,G,H,I
936	Bremen	Germany	100	C*,I*
945	Toulouse	France	300	B,C*,H,I*
954	Brno (CRo2)	Czech Rep.	200	C*,H*
954	Madrid(CI)	Spain	20	H*,I*
963	Pori	Finland	600	C*,H*
972	Hamburg(NDR)	Germany	100	C*,H*,I*
981	Alger	Algeria	600/300	B,H*
981	Megara	Greece	200	H*
990	Berlin	Germany	100	C*,H*,I*
990	R.Bilbao(SER)	Spain	10	H*
990	Tywyn(BBC)	UK	1	A
999	Schwerin (RIAS)	Germany	20	C*
999	Madrid(COPE)	Spain	50	H*,I*
1008	SER via ?	Canaries/Spain	?	H*
1008	Flevo(NOS-5)	Holland	400	C*,H,I*
1017	Rheinsender(SWF)	Germany	600	C*,H*,I*
1017	RNE5 via ?	Spain	?	C*,H*
1035	Lisbon	Portugal	120	C*
1044	Dresden(MDR)	Germany	20	C*,H*,I*
1044	Sebaa-Aioun	Morocco	300	H*
1044	S.Sebastian(SER)	Spain	10	C*,H*
1053	Talk Sport via ?	UK	?	A,C,G,H*,I
1053	Plymouth(Talk)	UK	1	B
1062	Kalundborg	Denmark	250	C*,H*,I*
1062	R.Uno via ?	Italy	?	C*
1071	Bilbao(EI)	Spain	5	C*,H*,I*
1071	Talk Sport via ?	UK	?	C*,H*,I
1080	Ajedabia	Libya	40	H*
1080	SER via ?	Spain	?	C*,H*,I*
1089	Talk Sport via ?	UK	?	A,C,G,H*,I
1098	Nitra(Jarok)	Slovakia	1500	C*,H*,I*
1107	AFN via ?	Germany	10	C*
1107	Talk Sport via ?	UK	?	A,C,H*,I
1107	Torbay(Talk)	UK	1	B
1116	Bari	Italy	150	H*
1116	Pontevedra(SER)	Spain	5	C*,H*,I*
1125	La Louviere	Belgium	20	C*,H*
1125	Deanovec	Croatia	100	I*
1125	El Beida	Libya	500	H*
1125	RNE5 via ?	Spain	?	H*
1125	Llandrindod Wells	UK	1	H*
1134	Zadar(Croatian R)	Croatia	600/1200	B,C*,H*,I*
1143	AFN via ?	Germany	1	C*
1143	Stuttgart(AFN)	Germany	10	H*
1143	Bolshakovo(Mayak)	Russia	150	H*,I*
1143	COPE via ?	Spain	2	C*,H*,I*
1179	SER via ?	Spain	?	H*
1179	Solvesborg	Sweden	600	C*,G*,I
1188	Kuurne	Belgium	5	C*,H*
1188	Reichenbach(MDR)	Germany	5	H*
1188	Marcali(VOA/RFE)	Hungary	500	C*,G*,H*,I*
1197	Munich(VOA)	Germany	300	C*,G,I*
1197	Virgin via ?	UK	?	C,H*,I
1197	Torbay(V)	UK	1	B
1197	Wallasey(V)	UK	0.5	A
1206	Bordeaux	France	100	B,C*,G*,H*,I*
1215	Virgin via ?	UK	?	C,H*,I
1215	Droitwich(V)	UK	50	A
1224	Vidin	Bulgaria	500	C*
1224	Lelystad(Qthe beat)	Holland	50	H*
1224	COPE via ?	Spain	?	C*,H*
1233	Nitra	Slovakia	40	C*
1233	Virgin via ?	UK	?	C*,H,I
1242	Marseille	France	150	C*
1242	Virgin via ?	UK	?	C*,H
1251	Huisberg	Netherlands	10	C*,H*
1260	SER via ?	Spain	?	B*,C*,H*
1269	Neumunster(DLF)	Germany	600	C*,H*,I
1269	COPE via ?	Spain	?	H*
1278	Dublin/Cork(RTE2)	Eire	10	A,C,H*,I*
1278	Strasbourg	France	300	C*,H*
1287	Litomysl	Czech Rep	150	H*
1287	Lerida(SER)	Spain	10	C*,H*,I*
1296	Valencia(COPE)	Spain	10	H*,I*
1296	Orfordness(BBC)	UK	500	C*,H*
1305	RNE5 via ?	Spain	?	C*,H*
1314	Kvitsoy	Norway	1200	A,C*,G,H*,I
1323	W'brunn (VOR)	Germany	800/150	C*,H*
1332	Rome	Italy	300	C*,I*
1341	Lisnagarvey(BBC)	N.Ireland	100	A,B,H*,I*
1341	Tarrasa(SER)	Spain	2	H*,I*
1359	Madrid(RNE-FS)	Spain	600	C*,H*
1368	Foxdale(Manx R)	Is of Man	20	A,C,D,E
1377	Lille	France	300	B,C*,H,I*
1386	Bolshakovo	Russia	1200	C*,G*,H*
1395	Fllake	Albania	500	C*,G*
1395	Lopic (Biz Nieuws)	Netherlands	120/40	C*,G
1404	Brest	France	20	B,C*,H*,I
1413	RNE5 via ?	Spain	?	C*,H*
1422	Heusweiler(DLF)	Germany	1200/600	C*,G*,H*,I*
1440	Marnach(RTL)	Luxembourg	1200	C*,G
1440	Dammam	Saudi Arabia	1600	C*,G*
1449	Squinzano (RAI)	Italy	50	C*
1458	Fllake	Albania	500	H*
1458	Eilat	Israel	10	H*
1467	Monte Carlo(TWR)	Monaco	1000/400	C*,I*
1476	Wien-Bisamberg	Austria	600	C*,I*
1485	SER via ?	Spain	?	H
1494	Clermont-Ferrand	France	20	B,C*,H*,I*
1494	Krasnyy Bor	Russia	1200	C*,H*
1503	Bashehr	Iran	50	C*
1503	RNE5 via ?	Spain	?	H*
1512	Wolvertem	Belgium	300	C,D,G*,H*,I*
1521	Kosice(Cizatice)	Slovakia	600	C*,I*
1521	Duba	Saudi Arabia	2000	B
1530	Vatican R	Italy	150/450	C*,I*
1539	Mainflingen(ERF)	Germany	350(700)	C*,I*
1539	SER via ?	Spain	?	H*
1557	Nice	France	300	B
1575	Genova	Italy	50	B
1575	SER via ?	Spain	5	C*
1602	SER via ?	Spain	?	C*,H*
1602	Vitoria(EI)	Spain	10	C*,H*,I*
1611	Vatican R	Italy	15	H*

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

(Eng, Jap to S.Africa 1700-1900) 42222 at 1700 in Seaton, Cornwall; RCI via Sackville **15.325** (Fr, Eng to Eur, M.East, Africa 1900-2200) 45544 at 2000 near Coverack; Voice of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100) 34233 at 2003 in Newry; R.Ext.Espana via Noblejas, Spain **15.290** (Eng to Eur 2000-2100) SIO 322 at 2013 by **Francias Hearne** in N.Bristol; BBC via Ascension Is **15.400** (Eng to W.Africa 1500-2300) 42322 at 2035 in Ebbw Vale; Voice of Greece, Athens **15.650** (Gr to M.East, Indian Ocean, Australia 2100-0000) 54333 at 2135 in Dreghorn; Herald BC via WSHB Cypress Creek, USA **15.665** (Eng to Eur 1800-2200) 35544 at 2135 in Northampton; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 54444 at 2215 in Folkestone.

Noted in the **13MHz (22m)** band were R.Bulgaria, Plovdiv **13.600** (Eng to Eur 0630-0700), rated 55544 at 0635 in Northampton; BBC via Cyprus **13.660** (Ar to M.East 0900?-1200?) 34433 at 0928 in Oxted; Croatian R, Deanovec **13.830** (Cr to Eur) 25443 at 1033 near Coverack; R.Ext,Espana (REE) **13.720** (Sp to Eur 0700-1300) 44434 at 1040 in Rugby; UAE R.Dubai **13.675** (Ar, Eng to Eur 0600-2045) 32332 at 1042 in Oxted & 45545 at 1740 in Seaton, Devon; All India R. (AIR) via Bangalore **13.620** (Ar to Asia 1730-1945) 54444 at 1810 in Stalbridge; Voice of Vietnam, Hanoi **13.740** (Eng to Eur 1800-2000?) 53433 at 1910 in Herstmonceux; Swiss R.Int (SRI) via Julich, Germany **13.645** (It, Ar, Eng, Ger, Fr to Nr.East, Africa 1830-2130) 44344 at 1953 in Newry; Voice of Korea, Pyongyang **13.760** (Eng to Eur 2100-2200) 43333 at 2100 in Morden; VOIRI Tehran **13.665** (Eng to SE.Asia, Australia 2130-2230) 33333 at 2140 in Ebbw Vale; R.Australia via Darwin **13.620** (Eng to SE.Asia 2200-0000) 55343 at 2220 in Dreghorn.

The **11MHz (25m)** band carries R.New Zealand's early morning broadcasts on **11.820** (Eng to Pacific, Mid-West USA & Eur 0506-0705). Their 100kW transmission was rated 33233 at 0530 in Appleby. Much later, R.Australia may be heard on **11.880** (Eng to Oceania, N.America 1700-2200), noted as 23342 at 2140 in Northampton.

During the morning World Harvest R. (WHRI) via Maine, USA **11.730** (Eng to Africa 0500-1000) was rated 44444 at 0545 in Morpeth; VOA via Kavala, Greece **11.805** (Eng to Eur, Mid East, N.Africa 0600-0700) was 43333 at 0640 in Morden; R.Finland via Pori **11.755** (Fin to Eur, Russia, W.Africa 0700-?) 55534 at 0715 in Seaton, Devon; R.France Int, (RFI) via Issoudun **11.670** (Fr to C.Eur 0700-1030) 44444 at 1028 in Oxted; R.Prague, Czech.Rep **11.615** (Eng to NW.Eur 1030-1057) 55555 at 1057 in Rugby.

After mid-day, WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1200-2300?) was 44333 at 1315 in Stalbridge; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 54434 at 1850 in Herstmonceux; Voice of the Mediterranean via Russia **12.060** (Eng to Eur, N.Africa 1900-2000) 44444 at 1938 in Newry; R.Canada Int via Skelton, UK **11.690** (Eng to Eur, Africa, M.East 2000-2059) 33532 at 2005 near Coverack; R.Tashkent, Uzbekistan **11.905** (Eng to Eur 2130-2200) 43444 at 2145 in Folkestone; China R.Int via ? **11.790** (Eng to Eur 2000-2200) 43333 at 2155 in Ebbw Vale; RAI Italy **11.895** (Eng to Far East 2205-2230) 43222 at 2205 in Seaton, Cornwall; HCJB Quito **12.025** (Ar to N.Africa 2100-2230) 44443 at 2220 in Dreghorn; R.Prague, Czech.Rep. **11.600**) (Eng to N.America 2230-2257) SIO 333 at 2242 in N.Bristol.

Radio Australia has been reaching the UK in the **9MHz (31m)** band on three frequencies from Shepparton: **9.475** (Eng to Asia 1330-1858), rated 43333 at 1805 in Stalbridge; **9.500** (Eng to Asia 1900-2130) 33333 at 1940 in Newry; **9.580** (Eng to Oceania, N.America 0800-2130) SIO 322 at 1924 in N.Bristol.

During the early morning VOA via Greenville, USA **9.575** (Eng to Africa 0300-0500) rated 44444 at 0420 in Morpeth; WTJC Newport NC, USA **9.370** (Eng to N.America 24hrs) 44333 at 0621 in Ebbw Vale; R.Prague, Czech Rep. **9.880** (Eng to NW.Eur 0700-0727) 54554 at 0710 in Herstmonceux; TWR Monaco **9.870** (Eng to Eur 0700-0820) 45555 at 0815 in Northampton; R.Vilnius, Lithuania **9.710** (Eng to W.Eur 0830-0900) 43333 at 0835 in Morden; R.Nederlands via Bonaire, Ned.Antilles **9.785** (Eng to Asia, Far East, Pacific 0930-1125) 24122 at 0932 in Newry; R.Mediterranee Int [Medi-1], Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0400) 44334 at 1039 in Oxted.

Later, the Voice of Vietnam via Austria? **9.725** (Eng to Eur 1700-1730) was rated 43434 at 1700 in Seaton, Devon; R.Vlaanderen Int (Belgium) via Krasnodar **9.925** (Eng to Eur 1730-1800) was 44344 at 1730 in Seaton, Cornwall; DW via Nauen, Germany **9.545** (Ger to Eur, S.America 0400?-2200?) 55555 at 1758 in Rugby; BBC via Cyprus **9.410** (Eng to W.Eur 1600-2200) 55545 at 2002 near Coverack; R.Ext. Espana via Noblejas, Spain **9.840** (Eng to Eur 2100-2159) 44444 at 2100 in Appleby; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2245) 44434 at 2200 in Folkestone.

In the **7MHz (41m)** band the BBC via Meyerton, S.Africa **7.120** (Eng to W/C.Africa 0300-0500) was rated 44444 at 0319 in Morpeth; R.Japan via Woofferton, UK **7.230** (Eng to Eur 0500-0700) 34333 at 0611 in Ebbw Vale; R.Slovakia Int **7.345** (Ger to W.Eur 0800-0830) 55444 at 0815 in Stalbridge; R.Polonia (Polish R), Warsaw **7.285** (Eng to Eur 1700-1800) 53333 at 1755 in Herstmonceux; Sudwestfunk via Rohrdorf **7.265** (Ger to Eur 24hrs) 33333 at 1835 in Seaton, Devon; R.Thailand, Udon Thani **7.155** (Eng to N.Eur 1900-2000) SIO 222 at 1924 in N.Bristol; R.Minsk, Belarus **7.105** (Eng to Eur 1930-2000, 2030-2100, Tues/Thurs) 33433 at 1950 near Coverack; R.Bulgaria, Sofia **7.500** (Various, Eng 2100-2200) 45544 at 2115 in Northampton; RCI via Skelton, UK **7.235** (Eng to Eur, N & W.Africa 2100-2130) 44343 at 2120 in Newry. Note: The relay of RCI continues at 2130 via Flevo, Nederlands (Fr 2130-2200); R.Yugoslavia via Bosnia **7.230** (Eng to Eur? 2200-2230) 43333 at 2200 in Morden.

There are many broadcasts to Europe in the **6MHz (49m)** band. Some come from R.Japan via Skelton, UK **5.975** (Eng 0500-0600), rated 44444 at 0515 in Morden; R.Vlaanderen Int (Belgium) via Germany **5.985** (Eng 0700-0730) 55544 at 0715 in Herstmonceux; Deutschland R, Berlin **6.005** (Ger 24hrs) 34323 at 0800 in Seaton, Devon; TWR Monaco via Germany **6.045** (Eng 0700-0815) 55344 at 0814 in Newry; R.Nederlands via Julich, Germany **6.045** (Eng 1030-1225) 44344 at 1038 in Oxted; R.Polonia [Polish R] Warsaw **5.995** (Eng 1700-1800) 42343 at 1700 in Seaton, Devon; Bayerischer Rundfunk, Germany 6.085 (Ger 24hrs) 44444 at 1745 in Rugby; R.Yugoslavia, Serbia **6.100** (Eng? 1830-1900) 43334 at 1835 in Stalbridge; R.Canada Int via Skelton, UK **5.995** (Eng 2000-2100) 55455 at 2000 in Seaton, Cornwall; RAI Rome, Italy **6.185** (Eng 2025-2045) 45544 at 2030 in Northampton; R.Budapest, Hungary **6.025** (Eng 2100-2130) 54444 at 2100 in Appleby; R.Ukraine Int, Kiev **5.905** (Eng 2100-2200) 25433 at 2103 near Coverack; R.Canada Int via Horby, Sweden **5.850** (Eng 2000-2130) 55555 at 2125 in Folkestone; R.Sweden Int via Horby **6.065** (Eng 2130-2200) SIO 333 at 2131 in N.Bristol; R.Bulgaria, Sofia **5.800** (Eng 2100-2200) 45544 at 2139 in Ebbw Vale; R.Bulgaria, Plovdiv **5.900** (Serb 2200-2300?) 54343 at 2205 in Dreghorn.

Some intended for listeners in other areas may be received in the UK. Among those mentioned in the reports were R.Havana, Cuba **6.000** (Eng to N.America 0100-0500), noted as 23222 at 0206 in Newry; Channel Africa via Meyerton, S.Africa **5.955** (Eng to S.Africa 0400-0430) 44444 at 0410 in Morpeth; BBC via Antigua, W.Indies **5.975** (Eng to C & S.America 2100-0500) 54444 at 0415 in Morpeth; WEWN Birmingham, USA **5.825** (Eng to N/C.America 0000-1000) 45434 at 0527 in Ebbw Vale.

The SINPO code is used for broadcast station reports, here is an explanation of the code.

Signal Strength
5 excellent
4 good
3 fair
2 poor
1 barely audible

Interference
5 nil
4 slight
3 moderate
2 severe
1 extreme

Noise
5 nil
4 slight
3 moderate
2 severe
1 extreme

Propagation Disturbance
5 nil
4 slight
3 moderate
2 severe
1 extreme

Overall Merit
5 excellent
4 good
3 fair
2 poor
1 unusable

MOONRAKER

www.scannerantennas.com

GOING MOBILE

G SCAN II MOBILE

Freq: 25-2000 Mhz Length 620mm
Dual coil capacitor trapped vertical coils, 3.5" magnetic base with rubber protection. 4mtrs RG58 coax cable, terminated with a BNC. (Don't loose those signals while on the move, the G Scan II is the answer for continued high performance reception where ever when ever).
Our Price £24.95 plus £6.00 p+p

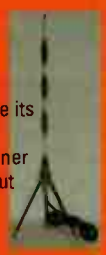
SKYSCAN MOBILE

Freq: 25-2000 Mhz Length 650mm
4 tuned stainless steel vertical radials. 3.5" magnetic base with rubber protection. 4 mtrs RG58 coax terminated with a BNC. (With not just one but four vertical radials, take your scanner in the car & enjoy superior reception with this dedicated antenna).
Our Price £19.95 plus £6.00 p+p

MINISCAN MOBILE

Freq TX: 144-146 430-440 Mhz
Freq RX: 100-1300 Mhz Length: 300mm
Spring loaded black stainless whip, 1" super strong magnetic mount, 4mtrs of mini hi-spec coax, terminated with a BNC. (Ideal for "low profile" scanning while for those with transceivers with wideband receive, its the perfect choice for dual band TX and continued large scale reception).
Our price just £14.95 plus £3.00 p+p

PORTABLE ANTENNAS



TRI-SCAN III

Freq: 25-2000 Mhz Length: 900mm
This Desktop Internal Antenna comes with 3 vertical capacitor loaded coils, mounted on a unique helically wound tri-pod, to give its own ground plane for smooth reception. Complete with 5 mtrs of RG58 coax, terminated with a BNC. (Get the most from your scanner with the Tri-Scan III Desktop and enjoy great performance without the hassle of erecting an external one).
Our Price £39.95 plus £6.00 p+p.

SKYSCAN DESKTOP

Freq: 25-2000 Mhz Length: 900mm
This discone style indoor antenna comes with 4 tuned stainless steel vertical whips, 8 ground plane 12" radials, plus 4 loaded horizontal 3" helical radials. Complete with heavy duty base 5 mtrs RG58 terminated with a BNC. (Don't loose those wanted signals while indoors. Use the Skyscan Desktop at your radio station, on the window seal or even in the loft for increased performance).
Our Price £49.95 plus £6.00 P+P.

SWP GLASS MOUNT ANTENNAS

These two superb universal antennas, one for VHF/UHF & one for HF have internal tuned wound coils encased in a fibreglass tube with black covering. Includes two suction cups for easy fitting to any smooth surface, complete with 5mtrs of mini hi-spec coax terminated with a BNC. (With these antennas, take your hobby mobile in the car, at home on the patio or bedroom window. A perfect solution for sometimes awkward antenna instillations. Great results - No hassle)

SWP2000

Freq: 25-2000 Mhz Length: 515mm.
Our Price £29.95 PLUS £6.00 P+P.

SWPHF30

Freq: 0.05-30 Mhz Length: 770mm.
Our Price £39.95 PLUS £6.00 P+P.

MAX-5 ACTIVE

Freq:25-1800 Mhz Length:1400mm
This portable active antenna incorporates a easy fold away 300 Ohm receiving element joining to a matching coil, wideband pre-amplifier (9v batt not inc) 4mtrs RG58, terminated in a BNC. (Don't loose performance by not choosing an external antenna! Install the in the loft, hang by the window, or even from a tree while out and enjoy upto 14dB Gain with the MAX-5 pre-amplified Active Antenna).
Our Price £49.95 PLUS £6.00 P+P.

SHORT-WAVE WIRE ANTENNAS

MD32 SKYWIRE

Freq: 0-40 Mhz Length: 25mtrs
This complete HF wire antenna system comes with 25 mtrs of enamelled copper antenna wire, dog bone insulator, choke balun, & 10mtr RG58 patch lead terminated with a PL259.
Our Price £39.95 plus £6.00 P+P.

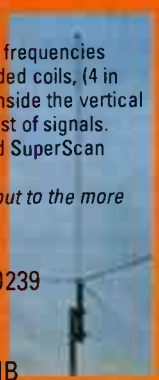
MWA-HFMKII

Freq: 0-40 Mhz Length: 25mtrs
This complete HF wire antenna system comes with 25 mtrs of high grade flexweave antenna wire, dog bone insulator, di-pole centre choke balun,guy rope,& 10mtr RG58 mil spec patch lead terminated with a PL259.
Our Price £49.95 plus £6.00 P+P.
(Both these wire antennas have our own ferrite wound baluns that give an extra 2 "S" points greater signal than some similar baluns. No ATU required as perfect 50 Ohm match is achieved over all 40 mhz).

Long Wire Balun

Balun only with SO239 socket and wing nut for wire connection.
Our Price Just £19.95 plus £2.00 P+P.

BASE VERTICALS



SUPERSCAN STICKS I & II

These two superb external antennas will receive on all frequencies unlike a mono base antennas. Both have capacitor loaded coils, (4 in the SuperScan Stick and 8 in the SuperScan Stick II) inside the vertical element to give maximum sensitivity to even the weakest of signals. Also the SuperScan Stick II has 3dB gain over standard SuperScan Stick !!!
(Perfect for every scanner, from the beginner starting out to the more experienced listener).

SUPERSCAN STICK

Freq: 0-2000 Mhz Length:1000mm Socket: SO239
Our Price £29.95 PLUS £6.00 P+P.

SUPERSCAN STICK II

Freq: 0-2000 Mhz Length:1500mm Gain: 3.00dB
Socket: SO239.
Our Price £39.95 PLUS £6.00 P+P.
(Both these antennas come complete with 3 ground plane radials 12" stub mast, v-bolts & clamps). ★ Also Available !!! Base Scan Sticks (as above) with Tx Capabilities !!! (for use with transceivers only) ★

MULTISCAN STICK I

Freq RX:25-2000 Mhz TX 144-146/430-440 Gain 2.0/4.0dB
Length:1000mm Socket: N-type.
Our Price £39.95

MULTISCAN STICK II

Freq RX:25-2000 Mhz TX 144-146/430-440 Gain 4.0/6.0dB.
Length:1500mm Socket: N-type.
Our Price £49.95

IVX2000

Freq RX:25-2000 Mhz TX 50-52/144-146/430-440
Gain 2.5/5.0/7.0dB
Length: 2500mm Socket: N-Type. **Our Price £89.95**

MOONRAKER (UK) LTD. UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD, WOBURN SANDS, BUCKS MK17 8UR. TEL: (01908) 281705. FAX: (01908) 281706

AR-AIR BAND ANTENNAS

These dedicated civil & military fibreglass antennas are made pre-tuned & dual band trapped for both Air Band frequencies. Easy connection with an SO239 socket (With these antennas you can obtain high dual band gain which is not available on wideband antennas. Just don't miss take off !!!)

AR-30

Freq:Civil & Millitary Gain:3.0/6.0 dB Length:1000mm.
Our Price £39.95 PLUS £6.00 P+P.

AR-50

Freq:Civil & Millitary Gain:4.5/7.0 dB Length:1500mm.
Our Price £59.95 PLUS £6.00 P+P.
(Both these antennas come complete with 3 ground plane radials 12" stub mast, v-bolts & clamps).

X1-HF VERTICAL

Freq:1-50 Mhz Length: 2005mm
Socket: SO239
The X1 incorporates loaded helical traps, similar to that of a horizontal di-pole, encapsulated in a heavy duty high impact plastic tube, with a top tapered stainless steel whip. (The answer for those enthusiasts looking for short-wave reception but haven't the space for a long wire).
Our Price £49.95 PLUS £6.00 P+P.

DISCONE ANTENNAS

STANDARD DISCONE

Freq: 25-1300 Mhz Length:1000mm
Socket:SO239
This antenna comes with heavy duty centre cone with 16 sturdy aluminium radials, no capacitor coils just pure elements, complete with mounting pole, clamps & v-bolts to mount upto a 2" mast. (The discone has been around for over 25 years and is generally recognised as the original and probably the best all round scanner antenna).
Our Price Just £29.95 plus £6.00 P+P.

SUPER DISCONE

Freq: 25-2000 Mhz Length: 1380mm Gain: 3.0dB Socket: SO239
The super discone has enhanced the original discone design with a vertical wire trapped fibreglass vertical element. Comes complete with mounting pole, clamps & v-bolts to mount upto a 2" mast. (Experience increase range and upto 3dB gain over standard conventional discone !!! Get more with the Super Discone !!!)
Our Price £39.95 plus £6.00 P+P.

HF DISCONE

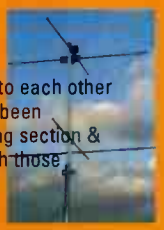
Freq:0.05-2000 Mhz Length:1840mm
Socket: SO239
The HF Discone has the same spec as the Super Discone, but includes a 3ft heavily wire trapped vertical section, encapsulated in fibreglass, Thus enables to obtain a massive receive spectrum within the discone design. Come complete with mounting pole, clamps & v-bolts to mount upto a 2" mast. (Get the best of both worlds, use the HF discone for both scanner and HF receiver)
Our Price £49.95 plus £6.00 P+P.

ROYAL DISCONE 2000 (Stainless Steel)

Freq: RX 25-2000 Mhz TX: 50-52/144-146/430-430/900-986/1240-1325Mhz Length: 1550mm
Socket: N-type
The ultimate discone antenna !!! Highly polished centre cone, with 16 Stainless steel elements, loaded top coil & whip. Complete with mounting pole, clamps & v-bolts to mount up to a 2" mast. (With a WHOPPING 4.5dB Gain over standard discone, this highly sensitive, perfectly matched receiving and transmitting discone is the best there is !!!)
Our Price £49.95 plus £6.00 P+P.
★ Remember Discones can be pleced in the loft with surprising results !!! ★

BE DEDICATED

TURNSTILE 137



Freq:137.5 Length: 1000mm
This weather satellite antenna has two di-poles adjacent to each other mounted on a 1mtr fibreglass section. Both di-poles have been internally connected, for easy use. Complete with mounting section & clamp to mount up to a 2" mast. (Beam skyward and reach those weather images)
Our Price £39.95 plus £6.00 P+P.
★ For dedicated Air Band Antennas see AR-Air Band Antennes ★

BEAM ANTENNAS

MLP32

Freq:100-1300 TX&RX
Gain:11-13 dB
Length:1400mm
Con: N-Type
Our Price £99.95
plus £6.00 P+P

MLP62

Freq:50-1300 Mhz
Gain:10-12 dB
Length:3000mm
Con: N-Type
Our Price £169.95
plus £6.00 P&P.

These two professional quality antennas, come with aluminium booms, aluminium and stainless radial & stainless bolts & fittings. (Don't strain to hear those long distance signals, with near perfect matching of 2:1 SWR across the whole frequency spectrum, make your scanner come to life with the ultimate receiving antenna !!! Sold mainly to our commercial and military customers, you know your getting the best !!!)
AR300XL Rotator for above beams **£49.95** plus £6.00 P+P.

HANDHELD ANTENNAS

SUPER GAINER RUBBER DUCKS

Freq:25-1800 Mhz Length: 400mm
MRW-100 BNC fitting **Our Price £19.95** plus £2.00 P+P
MRW-210 SMA fitting **Our Price £22.95** plus £2.00 P+P
(Going Out ? Don't Miss Out! Replace your existing hand-held antenna with a Super Gainer one).

GETTING RIGGED UP

5' SWAGED POLES

Heavy Duty Ali (1.2mm wall)

SINGLE 1¼"	£7.00
SET OF FOUR 1¼"	£24.95
SINGLE 1½"	£10.00
SET OF FOUR 1½"	£34.95
SINGLE 2"	£15.00
SET OF FOUR 2"	£49.95

CONNECTORS

PL259/9	£0.75 each
PL259/6	£0.75 each
PL259/7 for mini 8	£1.00 each
BNC (Screw Type)	£1.00 each
BNC (Solder Type)	£1.00 each
N TYPE for RG58	£2.50 each
N TYPE for RG213	£2.50 each
SO239 to BNC	£1.50 each
PL259 to BNC	£2.00 each
N TYPE to SO239	£3.00 each

HI-SPEC COAX CABLE

RG58	6mm standard....£0.35 per mtr	RG213	9mm mil spec ....£0.85 per mtr
RG58	6mm mil spec ....£0.60 per mtr	RH200	9mm mil spec ....£1.10 per mtr
RF mini 8	7mm mil spec ....£0.85 per mtr	(Phone for 100 mtr discount price)	

SOMETHING EXTRA

UK SCANNING DIRECTORY 8TH EDITION

The most comprehensive frequency list for the UK. It covers thousands of frequencies from 26Mhz to 1.8Ghz.
Our Price £19.50 PLUS £6.00 P+P.

MRP-2000 (preamplifier)

Freq: 25-2000 Mhz Pwr: 9-15v imput (battery not included)
Gain: 14dB Complete with joining lead with BNC (For use with any passive antennas ie SuperScan Sticks/Discones and with upto 14dB gain, bring those lost signals to life !!!)
Our Price £49.95 plus £6.00 P+P

Open Monday to Friday 9-6pm
Callers welcome
Order 24hrs A Day Secure On-line at **www.scannerantennas.com**
Postage charges UK mainland only. All major credit cards accepted.

HAYDON Communications

PRICES SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. PLEASE VERIFY BEFORE ORDERING. E&OE

Mail order: 01708 862524

All items sold subject to our terms & conditions - available on request

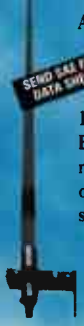
NEXT DAY DELIVERY TO MOST AREAS, £10.00.

DX-1 PRO (R.F. SYSTEMS)

This is a professional wide band receiving antenna with a very high intercept point that ensures a low noise level allowing even the weakest signals to be heard. Constructed of high-impact plastic and aluminium alloy - the amplifier is protected inside a waterproof stainless steel vessel. The unit is supplied complete with mounting hardware and an indoor controller with PSU (coax not supplied). Freq. 20kHz-54MHz. Gain: +6dB (ref dipole). Intercept points: ≥+75dBm (2nd ord), ≥ + 50dBm (3rd ord). (Static protection included). For the true professional.

£329.95 DEL £15.00

DX-10 (R.F. SYSTEMS)



A superb quality active antenna with a very high intercept point ideal for weak signal reception without increases in radiated noise. A truly amazing antenna! Freq: 100kHz-30MHz.
Bomb-proof over loading figures, 90cm long, mains PSU + controller supplied (coax optional). Atmospheric-noise compensated sensitivity.

£169.95 DEL £11.00

Q-TEK STEALTH SR-60

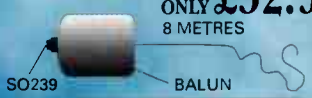
Superb, ready assembled wire antenna system. Not only is this end fed for ease of installation, it is also constructed from extremely high quality components. New 'plyweave' PVC coated wire makes this virtually invisible. It comes ready assembled including a 'noise filter system'. A 10m down lead with PL-259 is also fitted (both antenna & down lead are adjustable in length). Overall length 20mtrs (adjustable down to 6m.

SIMPLY SLING UP AND LISTEN IN OUR PRICE **£69.95** DEL £10.00

Q-TEK SKY-WIRE MkII

Ideal for any receiver. Receives all short wave bands (all mode). No ATU required. Built-in balun, PL-259 connection (0-52MHz). Ideal for flats/caravans/holiday homes/hotels.

ONLY **£32.95** P&P £3.00



MLB (R.F. SYSTEMS)

SEND SAE FOR DATA SHEET

The MLB contains a special impedance matching transformer which converts any piece of wire between 6 and 20 metres long into a wide band receiving antenna. 100kHz-40MHz. Low noise - probably the best there is!

£42.95 POST £3.00

GLOBAL AT-2000

Deluxe SW ATU 0-30MHz. SO239 fittings.

ONLY **£89.00**

(Probably the best ATU around) P&P £6.00

PL-259 to PL-259 patch lead (0.6m).....£5.99
PL-259 to PL-259 patch lead (4m long).....£9.99
BNC adaptors.....£3.95
BNC to PL-259 patch lead.....£9.99

MLBA (R.F. SYSTEMS)

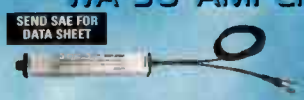
Ready assembled wire antenna offering low noise reception on long, medium, short wave (100kHz-40MHz) adjustable from 6mts to 20mts long. Magnetically coupled transfer system ensures reduced static noise levels and allows unwanted build-up to leak harmlessly to earth without damaging the receiver. (Subject to recvr. being earthed).

£64.95 POST £5.00

PL-259 to PL-259 4mtr patch lead.....£8.99

WA-50 'AMPLIFIER'

SEND SAE FOR DATA SHEET



Broadband amplifier for short wave, medium & long wave. 50kHz-50MHz. 10dB gain. Superb low noise amplifier. Ideal for short wave improvement. Requires 12V (150mA).

OUR PRICE **£99.95** P&P £7.50

Optional AC adapter.....£16.99

Q-TEK PL-30

A superb hinged (rotary) telescopic antenna (0.2-2GHz). PL-259 fitting.

NOW **£24.95** P&P£3.00

Hinged telescope

BNC adaptor.....£3.49
N-type adaptor.....£3.95

DPX-30 ANTENNA DUPLEXER/COMBINER

Allows two antennas to be connected to one receiver without interaction.

Can be used in reverse

£54.95 P&P £3.50

Ant A (0-30MHz)
Ant B (30-2000MHz) } To receiver low insertion loss

SEND SAE FOR DATA SHEET

SP-1 TWO WAY COMBINER (PROFESSIONAL)

SEND SAE FOR DATA SHEET

Very high quality combiner allows two short wave receivers to be connected to one antenna without interaction. 50kHz-30MHz (SO-239 fitting).

Can be used in reverse **£59.95** P&P £3.50

SP-3 (PROFESSIONAL)

SEND SAE FOR DATA SHEET

Two way combiner. one antenna feeds two scanners (without mismatch). 10-2500MHz. High isolation (BNC sockets).

Can be used in reverse **£59.95** P&P £3.50

NEW Q-TEK INTREPID 2000

TOP PERFORMANCE FOR SCANNERS

An amazing vertical (glass fibre) colinear antenna. Quality construction with incredible performance. For the serious scanner enthusiast.
Freq range: 0.5-2GHz. PL-259 fitting (not supplied). *Length* 3m. Mast clamps supplied. (Gain up to 9dB is easily obtained). SO-239 fitting. Requires PL-259 plug (not supplied).

ONLY **£89.95** P&P £11.00

Q-TEK D.C. 2000 DISCONE

OUR BEST SELLER

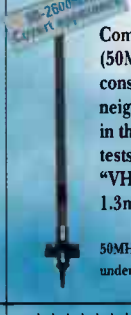
A high performance wideband discone offering superb performance from 0.2-2000MHz. Transmit range:- 6m, 2m, 70cm, 32cm & 23cm (power handling 200W). Fitted with low loss 'N' type socket. Supplied with mounting brackets. (N-plug & coax not supplied).

OUR PRICE **£54.95** P&P £11.00

Comments from John Griffiths

Putting the DC-2000 up gave me a tremendous boost to all signals with the ancient AR-2000 coming alive! Signals were well received and I found that I wandered out of airband.

Q-TEK SS-2000



Compact - indoor/outdoor scanning antenna. (50MHz-2.6GHz). Superb glass fibre constuction. Ideal in areas affected by "nosey neighbour syndrome". This antenna can be put in the loft or outside on the building. Initial tests show this to far outperform a discone at "VHF". SO-239 socket (PL-259 plug needed) 1.3m long (mast clamps supplied).

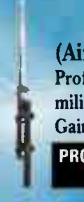
50MHz-2.6GHz and under 1.3m long **£49.95** DEL £11.00

Q-TEK DSL-2500

Superb directional antenna for the real scanner enthusiast. This antenna benefits from an extraordinary tight 'lobe' resulting in an incredably high gain figure. Freq range: 60-2500MHz. T/radius: 1.4 mtrs. Fitting: N-type. Gain: 12-16dB. 16 elements.

£129.99 DEL £10.00

AIR-44



(Airband base)
Prof quality base antenna for AIRBAND. (Civil & military). With SO-239 fitting (1.7m long). Gain 4.5/7dB.

PROFESSIONAL QUALITY **£79.95** P&P £11.00

AIR-44N As above "N-type" fitting.....£84.95

AIR-33 (As above) 1m long. Gain 3/6dB. **£49.95** P&P £8.50

NEW WSK-3000

Weather satellite antenna kit includes:
A) A 2 element crossed dipole for receiving weather satellite pictures.
B) Software for your PC. No interface needed (use your PC's sound card). Available at £4.50 extra.
Requires scanner or receiver.

OUR PRICE **£29.99** P&P £10.00

headphones

KENWOOD HS-5

Superb padded professional communications headphones. Designed specifically for SWL. 1/4" jack.

PRICE **£56.99** Del £5.00

KENWOOD HS-6

A professional lightweight pair of dedicated short wave listening headphones. 1/4" and 3.5mm jack.

PRICE **£36.99** Del £5.00

REALISTIC DX-394

★ Superb performance SW receiver ★ 0.2-30MHz (all mode) ★ Selectable tuning steps (down to 100Hz) ★ 240 or 12V ★ Digital S-meter ★ Attenuator ★ Key pad entry ★ 160 memories ★ Noise blanker.

OUR PRICE **£199.95** P&P £10

OUR BEST SELLING LOW PRICED RECEIVER

ID-1010 optional headphones.....£9.99

ICOM IC-R75

OUR BEST SELLING HF RECEIVER (Optional DSP £85.00)

The short wave receiver for the true enthusiast. Includes free PSU. ● 0.03-60MHz (all mode) ● Synchronous AM detection ● PC control capability.

OUR PRICE **£589.00**

R-75 PLUS "3"
R-75 + SP-21 + DSP + voice board.....**£749.00**

desktop receivers

portable receivers

SANGEAN ATS-909

A superb performance all mode synthesized world receiver with true SSB and 40Hz tunning for ultra clean reception. The same radio is sold under the Roberts name at nearly twice the price. Other features include RDS facility, 306 memories and WFM.

£139.95 (P&P £10) Optional PSU.....£16.95

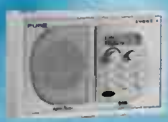
SONY SW-100E

★ Miniature portable all mode SW receiver ★ Station presets for 50 frequencies ★ Single side band system ★ Synchronous detector ★ Tuning in 100Hz + 1kHz steps ★ Includes compact antenna/stereo earphones/ carrying case.

£159.95 (P&P £10)

Optional PSU.....£24.95 AN-100 active aerial.....£64.95

EVOKE-1



Using the latest third-generation D.A.B. technology, Evoke-1 delivers outstanding digital sound quality at an affordable price. A stylish, mains powered receiver without the normal hiss, crackle and fade of old AM/FM broadcast. Transform your listening.

OUR PRICE **£99.95**

Car DC lead.....£14.99 Optional spkr.....£29.99
Evoke 2.....£159.95

top buys

ICOM PCR-1000

100kHz-1300MHz. AM, FM, WFM, SSB, CW. Superb short wave performance. Real-time bandscope now "XP" compatable. (Requires suitable PC).

OUR PRICE **£329.99**

Optional DSP unit.....£85.00

ICOM IC-R3

'A first!' TV/video picutre & sound! Certainly a gadget for the future – see things you didn't know existed! A wide-band scanner covering 0.5-2.3GHz (AM/FM/WFM) with "TFT" colour display.

FOR THE TRUE ENTHUSIAST

OUR PRICE **£329.00**

Soft case for IC-R3.....£17.99

TRX-200

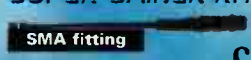
New superb compact handie from Trident. 0.1-2.15GHz. AM/FM/WFM/ USB/LSB/CW. Band scope, PC compatable (via interface). Includes batteries/charger.

SUPERB HANDY SCANNER

OUR PRICE **£199.99**

items of interest

SUPER-GAINER RH-9090 (SMA)



SMA 40cm flexible whip that is ideal as replacement.

OUR PRICE **£26.95** P&P £1.50

SUPER-GAINER RH-9000 (BNC)

BNC 40cm flexible whip for the ultimate in gain. (Rx:- 25MHz-2GHz).

OUR PRICE **£21.95** P&P £1.50

DB-2000

A superb "BNC" black telescopic whip. Ideal for scanners. Folds neatley away. (0.1-2GHz).

OUR PRICE **£14.99** P&P £1.50

DA-2000 SMA.....With SMA adapter £19.99

MICRO MAG ANTENNA

Micro magnetic base with (19") whip. Rx:- 0.5MHz-2GHz. Ideal for all scanners supplied with miniature coax lead & BNC (all fitted).

OUR PRICE **£24.95** P&P £5.00

BNC to PL-259 adaptor.....£3.49
BNC to N-type adaptor.....33.95

WATSON HUNTER

Frequency counter covers 10MHz-3GHz. Incl's nicad, charger, antenna.

ONLY **£59.95** P&P £6.00

Optional case ~~£14.99~~.....£7.50

SANGEAN QSR-1

Voice activated desktop recorder with quarter speed record. (Sold for more under Roberts name:- C-9950). Superb accessory for the radio enthusiast.

OUR PRICE **£69.95** Del £10.00

NEW 8th EDITION

THE UK SCANNING DIRECTORY

Britain's best selling scanner book now larger than ever. Nearly 700 pages packed full of frequencies from 25MHz-1.8GHz.

Order yours today!

PRICE **£19.75** P&P £4.00

not to forget

Q-TEK APOLLO 3000

A brilliant new compact indoor antenna that covers 0.1-3GHz and is just 24" when collapsed. Features "horizontal or vertical" adjustable elements. Ideal for table top mounting or by the window. Patch lead with BNC plug fitted. (Frequency range: 0.1-3GHz).

£59.95 P&P £6.00

M-75 SCANNER PRE-AMP

Superb BNC in-line amplifier to boost signals! Fits on top of your scanner and away you go. (Powered by PP-3 battery - not supplied). Freq: 24MHz–2.1GHz. Gain: -10dB to +20dB.

OUR PRICE **£79.95** P&P £5.00

A SELECTION OF SECONDHAND ITEMS

Alinco DJ-X3 as new.....£89.99	Icom R-7000 VGC.....£[illegible]
Icom R-2 VGC.....£99.99	Icom R-8500 As new.....£[illegible]
Icom R-5 As new.....£135.00	AOR AR-5000 VGC.....£899.99
TRX-200 As new.....£169.99	AOR AR-8600 MkII As new.....£525.00
MVT-7100 As new.....£169.99	Uniden BC-780XLT As new.....£229.99
AOR AR-8200 VGC.....£199.99	Yaesu VR-5000 As new.....£449.00
AOR AR-8200 MkII As new.....£269.99	Sony ICF-7600GR As new.....£109.99
Alinco V-5 (2m 70cm + Rx 0.5-950kHz).....£139.99	Alinco DX-394 As new.....£135.00
MVT-9000 MkII As new.....£275.00	Alinco X-2000 As new.....£349.99
Icom R-3 (with TV screen).....£299.00	GRE-225 desktop scanner.....£179.00

HAYDON Communications

PRICES SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. PLEASE VERIFY BEFORE ORDERING E&OE

MasterCard VISA SWITCH

Mail order: 01708 862524

NEXT DAY DELIVERY TO MOST AREAS, £10.00.

All items sold subject to our terms & conditions - available on request

A TEMPTING TAKE OUT FOR THE SUMMER

ALINCO DJ-X3

Micro-handy scanner. 100kHz-1300MHz. 700 memories/stereo FM (earphones)/attenuator/bug detector/audio descrambler. AM/FM/WFM/ Selectable tuning steps (incl's 8.33kHz).

OUR PRICE **£99.95** Del £10

Optional battery pack and drop in charger £39.99

Soft case £15.99
PC interface £42.95

ICOM IC-R5

New pocket hand-held scanner (0.1-1310MHz) AM/FM/WFM. Superb high-speed scanner featuring alpha tag and much more.

OUR PRICE **£149.99** Del £10

BATTERIES AND CHARGER INCLUDED

Icom IC-R3:- Scanner with TV screen ..... our price £349.99

YUPITERU MVT-7100

Wideband hand-held scanner covers 500kHz-1650MHz. (All mode). Includes nicad/car charger/charger/antenna. Extremely user-friendly hand-held reciever with outstanding performance unmatched by its rivals.

OUR PRICE **£199.95** Del £10

Soft case for 7100EU/9000 - specify £19.99
MVT-9000 MkII ..... Our price £325.00
MVT-7300EU ..... Our price £219.00

ALINCO DJ-X10

Full-featured handy. 100kHz-2GHz all mode. Includes SSB/CW band scope, alphanumeric display plus loads more. (Includes battery/drop-in charger).

OUR PRICE **£269.95** Del £10

Optional case £15.00
Optional battery box £14.99
PC interface £42.95
Cigar power lead £19.99

ALINCO DJ-X2000

The intelligent scanner! 100kHz-2.15GHz. All mode incl's SSB, "Flash Tune" reads frequency of nearly of nearby signal & tunes the handie for you. Incl's battery, charger and antenna.

Includes 8.33kHz spacing

£439.95 Del £10

Optional case £15.00
Optional battery box £14.99
Cigar lead £19.99
PC interface £42.95

AOR AR8200MkIII

Never before has one hand portable offered so much.
★ Covers 100kHz-3GHz (all mode) ★ Computer control capability ★ 8-33kHz steps for the new airband spacing ★ Reaction tune capability ★ Includes nicads/charger/antenna and car lead.

OUR PRICE **£385.00** Del £10

Optional case £19.99
CC-8200 PC interface £79.99

■ Greg Baker, PO BOX 3307, MANUKA, ACT 2603, AUSTRALIA
■ E-MAIL: greg@pcug.org.au

Bandscan Australia

This column, if my counting is correct, is the fiftieth since I began with the first in March 1991. From interest, I have re-read what I wrote twelve years ago and updated some of that now. In addition, I have some news on the Australian Broadcasting Corporation, digital television, Australia's latest satellite and a few other items.

SWM March 1991

It's interesting looking back at my first column in March 1991. In that column, I reported that Radio Australia's (RA) Japanese service had closed; that the Special Broadcasting Service (SBS) operated 36 u.h.f. television transmitters and two m.w. radio transmitters; that the 85-108MHz part of the spectrum was being cleared of television transmissions to make way for f.m. radio stations and that the nationally-owned Aussat satellites would be sold to private enterprise.

Well, the RA Japanese service has remained closed and RA now broadcasts only in Chinese, Indonesian, Vietnamese Khmer and PNG Tok Pisin, Solomon Islands Pijin and Vanuatu's Bislama.

According to their latest annual report, SBS operates 210 analogue television transmitters and is re-broadcast through a further 152 self-help transmitters owned and operated by local communities across remote areas of Australia. SBS also operates 13 a.m. and f.m. radio transmitters and is broadcast through a further three self-help radio transmitters.

The f.m. spectrum has been freed and Australia now has numerous f.m. commercial and national stations littering that part of the spectrum. True to their word, the then Australian government sold the Aussat satellites. They are now owned and operated by Optus, which only very recently launched its latest effort. There are more details of this below.

Now, for the eagle-eyed among you who have noted that there are 51 quarters in the period March 1991 to September 2003, yes, I missed one column in 1994!

VNG Closed

Despite howls of protest from Australia's scientific community, radio time signal station VNG has been closed. Standard time signals had been available in Australia on 2.500, 5.000, 8.638, 12.984 and 16.000MHz. Since the closure of VNG, short wave time signals available in this part of the world are of necessity via WWVH. For the historically minded, a description of VNG and details of broadcast codes and format can be found at **http://tufi.alphalink.com.au/time/nsc_vng_leaflet.pdf**

Digital Television

The Australian Broadcasting Corporation (ABC) has pulled the plug on its two digital television channels. The two channels - ABC Kids and Fly TV - were the ABCs first venture into digital television and are the first casualties of government budget announcements that the ABC would receive no additional funding over the next three years.

These young people's channels are reported to have been funded from once-off savings elsewhere in the ABC, once those savings were exhausted, these digital channels were left wanting for funds. As an aside of course, I should note that the ABC could well be using this to pressure the government over funds: this government is keen to see its digital television policy a success.

Commentators here are mixed in their reaction to this news. Some see it as another sign that digital penetration is languishing in Australia. Household conversion to digital has certainly been slow. At this time, there are not many more than 70,000 Australian households with digital television. The greatest number of these use analogue sets attached to a set top box rather than spend the serious money needed to buy a digital receiver.

Minister Alston has grumbled that it is the fault of the industry for not pushing the technology. Others merely point to the cost and the lack of significant programming choices. In this regard, industry sources say that consumers want more programming choices rather than better pictures.

Others are more optimistic. Transmission facilities owner Broadcasting Australia (the privately owned successor to the National Transmission Agency) has just announced the first commercial trial of datacasting. The trial will carry the content from six providers for a three-year period.

Also, pay television provider Foxtel has committed A$600 million (about £240 million) for the launch of its digital television services. Foxtel has done a deal with UK company Pace Micro Technology for the supply of set top boxes and a deal on interactive technology with US company OpenTV. With pay television penetration, like digital penetration, stalled (in the case of pay television at 23% of households), Foxtel has hopes that this will kick-start some enthusiasm.

One of the big players, keen to cash in on interactive gambling, claims that the take-up of digital television will be boosted if such gambling is permitted. This may well be true, but the government has banned on-line gambling and looks like staying with that decision for the foreseeable future.

With analogue services due to be switched off in 2008, Australians will need to have a burst of enthusiasm soon. Otherwise the government of the day may find itself in the position of having to move the date for the loss of analogue. I'm sure that voters would be very savage with a government that took away affordable television.

ABC Funding

As noted above, the ABC was unsuccessful in its bid to increase triennium funding. Although the government claims that the ABC budget has been maintained in real terms over the past triennium, although the ABC management points out that the amount offered is still 30% less in real terms than it was in 1985-86. The broadcaster had argued for an extra A$250 million (£100 million) over three years to help fund digital television and to get News Radio, youth radio station Triple J and Classic FM to the millions of Australians currently without these services.

Optus C1

Optus, operators of Australia's second largest telecommunications company, have successfully launched their latest satellite, dubbed *C1*. Optus is the successor to Aussat as owner of Australia's communications satellites.

The satellite was launched aboard an *Ariane 5G* rocket from French Guiana and placed into an orbit at 156°E. The satellite has 24 Ku-band transponders designed to provide coverage for Australia, New Zealand and east Asia. This satellite is the fourth in the Optus fleet and is expected to be in service for 15 years.

Half the satellite capacity is allocated to Australia's Department of Defence; the balance will be used to deliver broadcast services, high speed Internet and voice and data communications. As I think I have noted before, Optus is owned by Singapore Telecommunications, SingTel.

Frequencies

The Royal Flying Doctor Service operates the following stations and frequencies: VJB Derby on 5.300, 5.360 and 2.792MHz; VKL Port Hedland on 5.300, 5.360 and 2.280MHz; VJT Carnarvon on 5.300, 5.360 and 2.280MHz; VKJ Meekatharra on 5.300, 5.360 and 2.280MHz; VJQ Kalgoorlie on 5.300, 5.360 and 2.792MHz; VJD Alice Springs on 2.020, 5.410 and 6.950MHz; VNZ Port Augusta on 2.020, 4.010, 6.890 and 8.165MHz; VJC Broken Hill on 2.020, 4.055 and 6.920MHz; VJN Charleville on 2.020, 4.980 and 6.845MHz; VJI Mt Isa on 2.020, 5.110 and 6.965MHz and VJN Cairns on 2.020, 2.260, 5.145 and 7.465MHz. The 2MHz frequencies are used during Australian night time. More information is at **www.rfds.org.au/hfradio.htm**

Other News

In a further addition to the slew on news about the ABC of recent days has been the accusation from the responsible minister, Senator Richard Alston, that the ABC has shown bias in its news reporting from the Iraq war. The government, of which Alston is a part, had been a strong supporter of the war and appeared sensitive to criticism or implied criticism of the US approach to waging that war.

In the wake of January bushfires which wiped out about 500 houses in suburban Canberra, there have been accusations that the radio systems used by the firefighters were inadequate to the task. Firefighters have complained that there were numerous black spots, breakdown in vehicle-to-vehicle communications and loss of contact with fire-centre controllers.

Any of these things are bound to happen, of course, during such a crisis, but firefighters say that they had warned of these issues years before the fires hit. No doubt the range of enquiries now in the pipeline will draw out some usable truth from the assertions being made.

I welcome any news and comments. In particular, I am interested in any s.w.l. information on Australian stations heard by *SWM* readers so I can chase up more details and interesting snippets from this end. My address is **PO Box 3307, Manuka, ACT 2603, Australia.** For personal replies, please send two IRCs. Those with an Internet connection, can get me at **greg@wordgraphics.com.au**

Decode Special

Modus Operandi

Kevin Nice takes us on a quick tour of the most popular data modes in use on today's h.f. bands. Sample frequencies are courtesy of the recently published Ferrell's *Confidential Frequency List* 13th Edition.

This year's Decode Special is something a little different. I'm providing a guide to h.f. data modes that can be heard, identified and in some instances decoded. There is, in the arena of professional h.f. datacoms, a move to faster, higher bandwidth modes than in years past, this is due to many users having installed multi-tone phase modulated modems that provide much higher data rates than until very recently had been possible at reasonable budget levels. The good news though, is that this move is far from universal and there are still many of the older f.s.k. modes which it is possible to decode still in regular use. Additionally, many of the users of the more recent modes utilise a MIL-STD-188-141A ALE compatible system to initiate contacts prior to switching to the faster modes. There is a tremendous amount of interesting monitoring to be done with a decoder which is capable of resolving ALE transmissions. Many utility listeners are dedicated to identifying users and networks from ALE callsigns and idents.

Similar to the traffic analysis of both numbers stations and crypto RTTY by many enthusiasts, simply monitoring the ALE call-up procedure can be both fascinating and rewarding as a picture begins to build.

Modern sound card based d.s.p. decoders such as *Skysweeper* offer ALE modules in addition to the *defacto* standard hobbyist ALE decoder from Charles Brain - *PC-ALE* - for details of where to obtain these and other decodes see the resources section at the end of this feature.

If you are keen and have an inquisitive mind, then there are many interesting signals to pursue on the h.f. bands. To keep abreast of other keen utility monitors activities, I recommend that you have a look at the activities of the excellent WUN - World Utility Network's activities. They maintain an excellent website pack full of utility information. WUN also have a pretty active Internet mailing list which is well worth a look.

This guide was inspired by the superb WUN reference that has been

mentioned many times in the pages of this very magazine. The *Digital Signals FAQ* VS.0, produced by Mike Chase and Stan Scalsky, is a document that all serious data-mode enthusiasts should have. Point your browser at the WUN site and make sure you get a copy.

Information

The very nature of our hobby means that we have to play detective. This involves gathering and collating information, essential due to a fundamental problem with digital utility listening - lack of information. Many systems are used by Military or Diplomatic Services and information on the specifics of a particular mode are impossible to find, even from the manufacturer. Many are considered proprietary, but that doesn't mean that a signal cannot be identified! With the proper tools a given signal can be identified via the way it sounds (aurally) or how it looks (visually). Whilst most decoders that include some kind of signal analysis can identify a signal by bit-pattern or baud rate, many signals have a unique baud, i.e. 300 baud packet, 240 baud HC-ARQ or 164.5/218.3 ROU-FEC. Many enthusiasts, myself included, believe that the best way to identify a system is by listening to the characteristic sound it produces. There are several resources containing audio sample of data modes in common use, but in my opinion the best is the website run by **Leif Dehio**, the URL is listed at the end of this featuere. Leif's site also features a collection of screen grabs showing key parameters for many systems.

Once a signal is identified there are many decoders that can print the traffic for you, but keep in mind various kinds of encryption are commonly found in use with these signals. Encryption types include figure group or letter group messages and even random bit-masking or bit stream encryption, which looks like a continuous stream of random characters. You may often read the term 'on-line' and 'off- line' used in conjunction with various encryption schemes. Generally, off-line encryption is taken to mean groups of letters or numbers (most usually groups of five), whereas on-line schemes just appear as a continuous stream of random characters.

Of course you must be able to find a signal before you can fire up the decoder of your choice on the signal for identification and possible decoding. Most signals found on the airwaves today are obvious with easily distinguishable sounds, from chirping two tone f.s.k. to musical multitone m.f.s.k., but as communication technology develops this is changing. It is safe to say that the more efficient a modulation/coding method is, the more noise like it must become - just listen to a Harris 39-tone modem.

The Modes

What modes are currently on h.f. ? This section attempts to present a little information about each kind of signal that can be heard within the h.f. spectrum. Signals are grouped together by the way that they sound. The use of this method is an attempt to narrow the field of possible signals when trying to identify an unknown. The typical baud rate(s) of the signal is mentioned, if known, and any other synonyms or possible names are given. But - don't make the assumption that these are **all** the modes that you will hear. There are many signals that remain unidentified. New modes are being developed all the time as the quest for higher reliability and throughput is never-ending.

Single Tone Systems

Single tone systems are becoming common these days with the classic Morse still in use and found in most utility bands. Newer single tone systems using Phase Shift modulation are starting to appear and are reported to perform well in poor conditions.

CW

Morse is still used by radio amateurs and maritime users. Speed varies depending on whether hand generated or machine generated, but rates varying from 10-400 can be found. Most often found using either the standard or Cyrillic Morse character set.

LINK-11 LESW

There is a new Link-Eleven Single-tone Waveform (LESW) specification. It features an eight phase PSK (DCPSK, Differentially Coherent PSK), scrambled, 1800Hz tone. The system is supposed to be good against poor h.f. conditions and problems such as multi-path and fading. Throughput rates up to 4800bps occur with block inter- leaving of 0, 1.2 or 9.6 sec delay. Each packet has 192 bits (80ms) + 64 bits sync (26.67ms), each frame carries 72 bits of user info and the last frame always contains a 72 bit stop sequence. See MIL-STD-188-110A or NATO STANAG 4285. This waveform is implemented in the General Atronic GA-122 HF modem or the Harris RF-5254B. Swedish diplo stations use a derivative of this system from Rockwell/Collins.

Single tone modems sound like 3kHz of noise.

HF Datalink

An ACARS-like system used between aircraft and ground stations for passing flight related information has been in common use on h.f. for about two years. The system is an adaptation of the MIL-188-110A single tone waveform modem and uses 8PSK modulation at a rate of 3600chips/s. Ground stations broadcast system management uplink packets ('squitters') every 32s on three or more active frequencies. This assists in finding error free channels. Adaptive rates of 150, 300, 600, 1200 and 1800bps are supported. Also known as HFDL and ARINC 753. Both Charles Brain's *PC-HFDL* and *Skysweeper* offer good solutions for monitoring HFDL transmissions.

Synchronous Data Block Signals

Signals of this type generally sound like SITOR-A - a distinctive chirping sound is their main characteristic. Short SWED-ARQ sounds and is exactly like SITOR-A. Idling TWINPLEX is the same as SITOR-A. To identify these signals by ear may be impossible depending on which mode they are currently in. A decoder that can determine signal type may need active traffic to correctly identify the mode currently tuned.

ARQ6-70

A simplex ARQ system with a 70-bit block length using the ITA3 alphabet. A regular user is unknown but the French Diplo service has used this mode in the past. No loggings have been noted for quite some time and no loggings have been reported for some time via the WUN E-mail list.

ARQ6-90/98

Six-character-block simplex ARQ used by French and Italian Diplo services, typically 200bd. ARQ-6/90 and ARQ-6/98 differ in their inter-datablock timing.

G-TOR

Golay Transmission over Radio is a system developed by engineers at Kantronics, Inc. Users of this system include Military (Irish Air Corp, Irish Navy, Mexican Army), governmental agencies (ICRC) and the Albanian Christian Network (ACN).

It is claimed that G-TOR's main advantage is speed - up to 4x faster than PACTOR. It also incorporates a data interleaving system that assists in minimising the effects of atmospheric noise and has the

ability to fix corrupted data. G-TOR tries to perform all transmissions at 300bd but drops to 200bd if difficulties are encountered and then finally to 100bd. All acknowledgements (ACKs and NAKs) are sent at the 100bd rate.
Frequencies: 3.493, 4.992, 6.3528, 8.4378, 8.440MHz.

SWED-ARQ

Swedish Adaptive simplex ARQ used by Swedish Diplomatic services, typically 100bd. Comes in three packet lengths: 3, 9 and 22bits. The system is able to change packet length in mid transmission, depending on conditions, giving SWED-ARQ its adaptive capability. Also known as ARQ-SWE.
Frequencies: 7.972, 8.3215, 9.0439, 10.1519, 10.164, 10.366, 10.583MHz.

TWINPLEX

This is a four frequency duplex system used by organisations such as Interpol and United Nations and the government Diplo services of countries such as Australia, Denmark, Holland, Norway, Pakistan and Spain. The mode typically runs at 100 and rarely at 200 or 300bd.

This two channel system supports several different shift parameters and word, bit, character or not-interleaved of the channel characters but is easy to identify because of its 4-peak signal. This system was developed by Thrane and Thrane of Denmark. It is also known as F7B4 or TWINPLEX-SITOR.
Frequencies: 5.145, 5.7926, 6.7066, 6.7978, 6.8144, 6.8667, 10.8917, 11.0165, 11.2379, 11.3275, 11.3279, 11.3419MHz.

SITOR-A

The most common ARQ signal used by Amateur, maritime and some Government Diplo services, typically 100bd. SITOR-A is most commonly monitored with a 170Hz shift but stations such as MOI Spain have been monitored using a 400Hz shift, Guardia Civil, Spain have also used a 400Hz wide shift, the Spanish Air Force has been using a 300Hz wide shift and the Norwegian Navy has been noted using 300 and 850Hz shift. Also known as ARQ or TOR.

SI-ARQ

Siemens Simplex ARQ used by Austrian and Indonesian Diplo services, typically 96, 144, 192 or 200bd. Also known as ARQ-S or ARQ-1000S.

RS-ARQ/MERLIN/ALIS

Rohde & Schwarz simplex ARQ, so far found in use by German, Italian (MFA and GDF), Nairobi and Turkish Diplo services, typically 228.7bd but reports of 457.0 have been noted. Usually found with an ACF=59. The modems generating the traffic are the GM857 and GM2000.

Many of the diplo users actually control their networks with MERLIN, the name for the R&S complete data-over-radio and message handling system that can transparently deal with many types of data (FAX and voice included). Consequently it has many modes.
Frequencies: 5.712, 5.794, 6.307, 6.724, 6.773, 6.775, 6.777, 6.800, 6.8047, 6.8117, 6.8145, 6.8303MHz.

DUP-ARQ

A semi-duplex ARQ system used by the Thai and Hungarian Diplomatic service with unconfirmed use by at least one other Far Eastern Diplomatic service so this system is not unique to the Hungarians. Baud rate is typically 125bd using ITA-2. If a DUP-ARQ system detects interference it will change frequency in 400Hz steps.

If a 3kHz channel is full of interference the system will select another frequency. Also known as ARTRAC, or 125-ARTRAC.
Frequencies: 5.022, 5.4566, 13.8766, 13.877, 14.810, 14.840, 16.4542, 20.045MHz.

DUP-ARQ-2

An ARQ system with the same block timing as DUP-ARQ but runs at twice the baud rate - 250bd and uses the ITA2 or ITA5 character set. Recent DUP-ARQ systems now auto-switch to DUP-ARQ-2 at 250bd so this system is really an enhancement to the original DUP-ARQ system. Automatic channel selection and channel hopping are still supported. Also known as ARTRAC II. This system has been monitored sending "foxes de stc".

Probable DUP-ARQ-2 signals have been noted on 13.459, 13.462, 14.873 and 16.061MHz. Look for the characteristic channel hopping.

IRA-ARQ

Duplex ARQ with IRA (ITA-5), used by Czech/Slovak Diplo stations (MFA Praha, CZE), typically 171.42, 200.2, or 300.3bd. This system uses an 11 bit character and the signal has some very wide ACF values, ACF=352 or 448 have been recorded.

If you encounter this mode it is often advisable to remain on frequency with your decoder set to ASCII/ITA-5 at the same speed that the ARQ is sending. Once the transfer is complete, operator chat often takes place in standard ASCII or BAUDOT RTTY.
Frequencies: 9.084, 9.162, 9.262, 10.158, 10.178, 10.256, 10.306, 10.4622, 10.601, 10.6772, 11.0533MHz.

PACTOR

A system designed with a combination of PACKET and SITOR techniques used by amateurs, MARS stations and many quasi-governmental organisations. Mutually incompatible variations are becoming common with changes made to the packet structure to support privacy requirements of the various quasi-governmental users. Commonly referred to as UN-Pactor, ICRC-Pactor or Swiss-Pactor.

The developers of Pactor, Special Communication Systems (SCS), have licensed their hardware and software to Schuemperlin Engineering AG which has actively pursued commercial acceptance of this protocol and as many as seven different variants have been noted so far. Hoka decoders cater for the following variations:

Pactor 1 Amateur PACTOR Non-Governmental Organisations
Pactor 2 ICRC PACTOR-I (International Committee of the Red Cross)
Pactor 3 UNHCR PACTOR-U (UN High Commissioner for Refugees)
Pactor 4 IFRC - International Federation Red Cross & Red Crescent Societies
Pactor 5 UNO/MSF - Medicins sans Frontiers
Pactor 6 Features in Code 30
Pactor 7 Features in Code 30

Pactor I is the original implementation and is also known as f.s.k. Pactor. Pactor II is d.s.p. based and is as much as eight times faster then Pactor I.

A Pactor Level II signal features two tones with a 200Hz shift using baud rates of 100 or 200 fitting into a 500Hz channel. Pactor II is a half-duplex synchronous ARQ system and designed to be backward compatible with the older Pactor Level I protocol. The system can handle raw 8-bit data and ASCII compression. Depending on band conditions the data throughput can be increased by changing the modulation form used. Maximum throughput is 800bps. Pactor Level II is operational in Europe.

Format vs Baud Rate

DBPSK Differential Binary PSK - 200bps
DQPSK Differential Quad PSK - 400bps
8-DPSK 8-phase Differential PSK - 600bps
16-DPSK 16-phase Differential PSK - 800bps

Asynchronous Data Block Signals

Whilst packet signals are a non-continuous signal much like SITOR-A their sound is totally different from the regular chirp, chirp sound of SITOR-A. These signals do not have the regular cadence of SITOR-A but have more of a long duration burst sound.

HC-ARQ

Haegelin-Cryptos simplex ARQ, a mode used by UN and Red Cross services but these organisations have been making a switch to PACTOR in recent years with very few recent loggings. This asynchronous system uses a packet like protocol with no defined timing and supports packet/block sizes of 38, 68 and 188 ITA2 characters but always runs at 240bd.
Frequencies: 5.6684, 5.6692, 5.6922, 5.777, 6.7409MHz.

PACKET

A mode used to allow data communications between PCs and dumb terminals. This system is typically used by radio amateurs, and to a lesser degree, United Nations organisations. Incompatible versions also exist and are in use by quasi-governmental organisations such as ICRC, UNHCR or IFRB. Typically the AX.25 protocol incorporates a modified CRC. On h.f. there are a few items to note;

AX.25

Typically 300bd on h.f. Data is arranged in packets of up to 256 bytes of 8 bit ASCII data. Each packet contains a single byte start flag, 3 byte address field, 1 byte control field, 0-256 bytes of data, 2 byte CRC and finally a 1 byte end flag. Packets are transmitted with no fixed timing. See the latest specification published by the American Radio Relay League (ARRL) for complete details on this system. There is also some 1200 baud PSK work done in the 10m amateur band.

Automatic Packet Reporting System or APRS, is an application that runs ulilises AX.25 protocol. It was invented by Bob Bruninga WA4APR and utilises GPS data to plot a packet station's location on a map of a given region, city, state, or even country.
Frequencies: 5.8435, 6.825, 6.8917, 7.9936, 8.266, 8.566, 9.1577, 10.050, 10.1517MHz.

CLOVER

Clover was originally developed by **Ray Petit W7GMH**, and now marketed by HAL Communications. The original modem was named CLOVER-I, the latest DSP based modem is named CLOVER-II. In operation it sounds like a canary. A signal consists of a one second burst and a long 20s data transmission. Clover's key characteristics are bandwidth efficiency with high error-corrected data rates. Clover adapts to conditions by constantly monitoring the received signal. Parameters which can affect quality and reliability of the transmission such as block data errors, phase dispersion, frequency offset, and signal to noise ratio are monitored. Based on this monitoring, Clover determines the best modulation scheme to use. Clover supports the following formats:

Format vs Baud Rate

BPSM 4 pulse binary phase - 125bps
QPSM 4 pulse quad phase - 250bps
8PSM 4 pulse 8 phase - 375bps
16PSM 4 pulse 16 phase - 500bps
8P2A 4 pulse 8 phase 2 amplitude - 500bps
16P4A 4 pulse 16 phase 4 amplitude - 750bps

The total band width for all modes is a narrow 500Hz with a symbol rate of 31.25. Also known as 500Hz-CLOVER.
Frequencies: 3.90825, 5.692

400Hz-CLOVER

This is regular d.s.p. based CLOVER packed into a narrow, 400Hz bandwidth. This form of CLOVER is proprietary to Globe Wireless and was developed in cooperation with HAL Communications for use in Maritime communications. Also known as CLOVER-II or KFS-CLOVER. This form of CLOVER cannot be demodulated with standard CLOVER boards as the d.s.p. programming, power requirements and memory capacity of the board was re-engineered to support the new narrow bandwidth.

CLOVER-2000

A commercial form of CLOVER developed by HAL Communications. Supports four times the speed of standard CLOVER and uses a bandwidth of 2kHz. With the doubling of tones HAL has effectively doubled the rate. Symbol rate is now 62.50. The eight tones that make up this signal are spaced 250Hz and are both phase and amplitude modulated. Maximum bit rate is 3000bps. BPSM, QPSM, 8PSM, 8P2A, and 16P4A with 'auto-throttling' are supported. Data packets are long, about 4s in duration. Idle chirps are short, about 300ms in duration with about .8s between chirps. Also known as '8-tone CLOVER', Q-CLOVER, or QUAD-CLOVER.

Format vs Rate

BPSM 8 pulse binary phase 500bps
QPSM 8 pulse quad phase 1000bps
8PSM 8 pulse 8 phase 1500bps
8P2A 8 pulse 8 phase 2 amplitude 2000bps
16P4A 8 pulse 16 phase 2 amplitude 3000bps
Frequencies: 9.085, 12.205, 12.219, 12.310, 23.898, 25.498, 26.748, 12.208

Multi-Tone Signals - MFSK Systems

These signals are distinctive in how they sound. A rapid succession of tones, almost music-like in quality is their main feature. A sophisticated decoder and a rock steady receiver is needed to process these signals.

Piccolo MK6/MK10

Originally developed in 1957 in Great Britain at the Diplomatic Wireless Service or as it is known today the Communication Engineering Department of the British Foreign and Commonwealth Office (FCO). The original system was a 32-tone system and the development team was lead by J.D.Ralphs.

There is a 6-tone system (Mk6) using ITA2 and a 12-tone system (also Mk6) using ASCII/ITA5 but the 6-tone system is the more common. The 6-tone system is used mainly by the British and Australian Gov. stations also the Chilean Military. The 12-tone system is used mainly by the British Government/Military.

Both of the above systems normally run at 20bd but a 40bd, double speed variant, known as Piccolo MK10 has been reported in use by British Gov. Piccolo Mk10 uses six tones, a special alphabet and different standby tones. Both 20bd systems can still be found on the air and the modern MK6 unit is manufactured by Racal. The 40bd system is rarely found at this time. Reference the Klingenfuss *RadioTeletype Code Manual* 13th Edition for the tone pairs and Piccolo Mk6 alphabet.

In order to tune a 6-tone Piccolo MK6 signal, zero between tones 3 and 4, on a 12-tone Piccolo signal, zero between tones 6 and 7. A Piccolo signal only has a 20Hz shift between tones so precise tuning is important and the ability to magnify a signal is a great feature. Inaccurate tuning will produce translation errors.
Frequencies: 2.768, 3.2095, 3.2825, 4.0405, 4.375, 4.930, 7.857, 8.0455, 10.477, 10.9005

Coquelet

Coquelet MkI is an asynchronous 13-tone ITA2 system used by French (possibly abandoned) and Belgian military/police. Coquelet MkII is a synchronous 8-tone ITA2 system used by Algerian Diplo and Customs.

MkI is also referred to as COQ13. Coquelet Mk II is also referred to as COQ8 and can use a fourth shift Arabic/Latin keyboard.

Have a trade in? We pay TOP MONEY

call the sales

ML&S £179.00 WITH FREE NICADS, CHARGER AND PROTECTIVE CASE!

ICOM IC-R5

This little handy scanner is very simple to operate and is very popular among our commercial customers. The new IC-R5, complete with NiCads & charger.

NOW IN STOCK!
Call for more details

KENWOOD TH-F7E

ML&S £289 ZERO DEPOSIT! 24 x £14.48

The Scanner that transmits! Covering 100kHz - 1300MHz AM/FM/WFM plus SSB (100kHz - 470MHz) with Lithium Ion battery and Charger plus Transmit (6 Watts) on 2 metres and 70cms. An ideal scanner for radio amateurs!
All this for only **£289.00**
PC Programmable. Requires PG-4P at £31.95

NEW - call for more details NOW!

ML&S PRICE: £439 ZERO DEPOSIT 36 x £15.96

AOR AR-8200 MKIII

The best Handheld Scanner available with AM/FM/ CW/WFM /USB/LSB. Frequency range: 530kHz-3000MHz, PC programmable and controllable (requires PC8200 ***£85***).Complete with high capacity NiCads, Charger, Cigar lighter lead, rubber helical wideband antenna, medium wave plug-in antenna. Add the ***Super Searcher*** and ***RT8200 (£119.99)*** for reaction tuning to nearby transmitters

MAYCOM FR-100

Pocket scanner with 8.33khz steps for the airband. AM/FM & WFM. Basic scanner at a basic price.

ML&S £99.95

MAYCOM AR-108

This little airband scanner sells itself with coverage of the civil airband.

ML&S £69.95

ML&S £159.95 SPECIAL OFFER

YAESU VR-120D

Pocket Mini Scanner. 500kHz-1300MHz AM/FM and WFM. Ideal ***Go Anywhere*** pocket scanner.
12V DC! Now with NiCads and Charger.

NEW LOW PRICE

ML&S £349.95 ZERO DEPOSIT! 36 x £12.69

ICOM IC-R3E

The Scanner with TV built-in that picks up a bit more than Coronation Street! Complete with Lithium Ion battery and charger, all ready to go!
PC Programmable.
Requires PC-R3 at £39.95

NEW LOW PRICE

ML&S £319.99 ZERO DEPOSIT! 24 x £16.04

ICOM IC-R10

Covering 100kHz to 1300MHz with AM/FM/WFM and SSB. Complete with Nicads,Charger and rubber helical wide band antenna all for only ***£319.99***. Add the ***Super Searcher (£99.95)*** and ***RT-R10 (£109.99)*** for reaction tuning to nearby transmitters. ***PC Programmable. Requires PC-R10 at £39.95***

YAESU VR-500

100kHz-1300MHz AM/FM/WFM/LSB/USB/CW. This amazing little scanner is an ideal pocket communications receiver with keypad entry!
PC Programmable
Requires ADMS-3 at £39.95

ML&S £199.95

GRUNDIG YACHT BOY 400

This popular portable shortwave Receiver is in stock now.

ML&S £99.95

ML&S £229.95

YUPITERU MVT-7100

This scanner is very old in design and lacks a few features but offers good scanning facilities. Covering 100kHz-1300MHz AM/FM/WFM/USB/LSB. Complete with NiCads, Charger & Telescopic Antenna.

PC Controllable

FREE PSU!

ML&S £899 ZERO DEPOSIT! 48 x £26.60

SDU 5500

See what is happening on the air with this add on spectrum scope. Not only will it work with the *AR5000* and AOR3000a - it will also work with *Icom ICR8500, ICR9000, ICR7100* and *TS-870*. *(A good alternative to the SM-230)*

BEARCAT UBC 780XLT

ML&S PRICE: £329 ZERO

AOR 5000

This is the finest co produced and has al users and Scanning version with extra e recep-tion as well as ***FREE PSU. PC Cont***

ML&S £1599.0
ZERO DEPOSI

ICOM PCR 1000

This black box gives all mo your PC. Supplied with sof Featuring DTMF decoder, C much more. We can suppl that will work with XP *(Reg* with Whip antenna,PSU, U

ML&S £385
ZERO DEPOSIT!
24 x £19.30

AOR 8600 MKII

new Mk II

With many of the this is an except receiver with ***FR***

ML&S £699.00

KENWOOD TS-570GERX

Our bes modifie an exce ***Progra***

ML&S
ZERO

ICOM R-75

Icom's Lat
With all mod Options avai
• Voice synt

ML&S £59
ZERO DEF

ICOM ICR-8500

Icom's Fla covering AM/FM/V is as good receivers where thi Complete **software**

ML&S P
ZERO D

garmin e map

Handheld version of the Street Pilot and comes with Data Lead, 16Mb Ram Card and UK Metro Guide on CD Rom.

ML&S £329 ZERO DEPOSIT! 24 x £14.49

garmin street pilot 3 deluxe

NEW GPS V Deluxe
NOW IN STOCK!

GPS V Deluxe has announced a hand held GPS looking similar to the established GPS3 range again with built in route calculator and 24Mb of RAM.

ML&S £499
ZERO DEPOSIT! 36 x £18.14

The first portable GPS to talk directions to you. This unit looks similar to the *Colour Street Pilot* but has the inbuilt ability to calculate your route for you. It will then speak directions to you in a clear female voice. The ***Street Pilot 3 Deluxe*** uses a faster processor than previous versions and is much faster at relocating. Supplied with all you need to mount the unit in the car, plus 128Mb memory module, plus European City Street Map CD ROM with keys & you get a ***FREE USB Memory Programmer***

ML&S SPECIAL PRICE £899
ZERO DEPOSIT! 36 x £32.68

New DAB Radios in stock now.

Perstel DR101 Portable DAB receiver.
Only £169.95.

Goodmans GPS280 DAB digital radio & CD player.
Only £129.95!
Call for details!

YAESU VR5

FREE PS

This amazing desktop scanner is the only scanner to offer tru receive. Coverage is from kilohertz to gigahertz offering all m has optional DSP for enhanced shortwave reception. Comple ***FREE PSU*** at only ***£599.99. PC Programmable.***

ML&S £599.99 ZERO DEPOSIT! 48

The BEST RADIO EQUIPMENT at the BEST PR

martin lynch & sons

Supplie of Co mmuni ions Equi ment

CALL US 6 DAYS A WEEK, MON-SAT 9.30-5.30

0208 566 1120

128, 140-142 Northfield Avenue • Ealing • London W13 9SB
email: sales@hamradio.co.uk fax: 0208 566 1207

esk or EMAIL your request. sales@hamradio.co.uk

PC Controllable - NOW SUPPORTS WINDOWS XP
receive 100kHz to 1300MHz via
are for Windows 3.1/95 and 98.
SS decoder, Spectrum scope and
ou with alternative demo software
ration is under £30.00). Complete
06 DSP module and software.

ersion!
eatures of the AR8200 Mk2
al desktop communications
PSU. PC Programmable
ERO DEPOSIT! 48 x £20.68

elling HF Transceiver
or Receive only makes this
nt DSP Receiver. PC
nable
949.00
EPOSIT! 48 x £28.08

t Shortwave Receiver
coverage from 30Hz to 60MHz.
le are:
siser • UT106 DSP Module.
00
SIT! 36 x £22.26

hip Communications receiver
kHz-2000MHz
M/SSB & CW. SW performance
s many short wave only
t the VHF/UHF performance is
adio comes into its own.
th Free PSU and Control
ot suitable for XP or Macs)
CE: £1199
OSIT 36 x £43.59

This is our fastest selling scanner for a long time - we just cannot get them in fast enough! Covering 25-510MHz and 800-1300MHz AM/FM - plus it is the only CE approved desktop to offer the Trunk Tracker facility. Complete with DC lead, FREE PSU and Whip Antenna.

DEPOSIT 36 x £11.60

unications receiver AOR have
e features needed for Commercial
nusiasts. There is also The plus
ncements. Offering good short wave
cellent VHF/UHF performance. With
ble.

48 x £47.31

A

00

al
and
ith

£17.72

Also Available
The New Yaesu VR-5000 plus 3. This unit has the DSP module, Digital Voice Storage Unit and Voice Synthesiser fitted and is available for £729.00.

bhi Ltd.

A British company producing probably the worlds best DSP noise reduction speakers and modules. ML&S stock the whole range of BHi products offering excellent technical engineering, quality and reliability. You just wouldn't believe how much noise these units remove - SSB transmissions almost sound FM quality!

NES-5 Only £79.95
Entry Level DSP Noise Cancelling Speaker for AM & FM Reception

NES10-2 Only £99.95
Adjustable Noise Eliminating Speaker

NEIM-1031 Only £129.95
Noise Eliminating In-Line Module

The same as the NES-10 but an in-line module for you to place between your receiver/rig and own speaker.

Six Way Switch Box
Only £29.95
Need to Connect more than one piece of equipment to your bhi Noise Eliminating Speaker or In-Line Module? The 1042 Switch box is the answer...

Just when you thought that there is nothing in shortwave that can surprise you anymore, here comes the new WiNRADiO G303i shortwave receiver.

This new low-cost receiver (intended for experimenting and hobby use) continues in the fine tradition established by WiNRADiO's successful range of wide-band PC-based receivers.

The WiNRADiO G303i: A ground-breaking shortwave receiver that will surely amaze you.

Only £439
call now for the full spec.

grundig satellit

800 Millennium

Covers Shortwave, Airband and FM Broadcast. An ideal shortwave broadcast radio - suitable both the experienced or novice listener.

ML&S £549 ZERO DEPOSIT! 24 x £27.52

AOR AR-7030

This strange looking radio has stunning audio and a very lively receiver. It is one of the best broadcast band receivers available and an ideal radio for Broadcast DX chasers but is equally at home on SSB and CW. Even old Lynchy uses one of these! The Plus version is an enhanced version of 7030.

ML&S £799 ZERO DEPOSIT! 36 x £29.05

The AOR 8600mk2 Plus is the fully loaded scanner from AOR. Coverage is 100khz-3000mhz all mode.

The "AOR8600mk2 Plus" comes supplied with the following:

- EM-8200 Memory Card
- VI-8200 Voice Inverter
- RU-8200 Record Unit
- CT-8200 CTCSS Card
- TE-8200 Tone Eliminator
- MF-2.5 Collins SSB Filter
- MF-6 Collins AM Filter
- PSU-8600

star sellers

AOR 8600mk2 PLUS
ML&S £1139 ZERO DEPOSIT! 36 x £41.41

Icom ICR8500

ML&S £1349
ZERO DEPOSIT! 48 x £39.91

NEW! OREGON SCIENTIFIC

ML&S are pleased to announce their recent appointment for the full range of Oregon Scientific Products.

With innovation and attention to style always at the forefront of its state-of-the-art design and development, the company brings world class consumer electronic products with the very latest LCD and microprocessor technology to consumers throughout the world.

WMR982N Profesional Weather Station	Only £389.99
BAA898HG Long Range Weather Forecaster	Only £79.99
PDA188 PC Link Touch Screen Organiser	Only £19.99
VR399 Digital Voice Recorder	Only 69.99
Digital Camera DS6618 Card Cam	Only £59.99
Digital Camera DS6888 D Shot	Only £49.99
Digital Camera DSDS9300 3.3megapixel	Only £199.99
RM888PU Radio Controlled Compact Projection Clock	Only £29.99
BAR338PU Radio Controlled Projection Clock & Barometer	Only £79.99
WD338 Weather Station & DECT Cordless telephone	Only £149.99
BWR102U Body Weight monitor with BMI & Remote Header Display	£59.99

This is just a very short listing of the Oregon Range. Call now to place your order!

They have a huge range of different products including:
Clocks - Radio Controlled and Projection;
Environmental Monitoring - Weather stations and Barometers;
Sport and Fitness - Heart and Pulse Monitors, Pedometers, Scales etc;
Personal Information Products - Organisers, Voice Recorders, Digital Cameras etc; and Educational Learning - utilising the latest educational techniques in a multitude of fun ways ('mini' PCs, laptops etc.) to introduce young people to information technology skills.

DS6618

WMR982N WEATHER STATION

Not only is ML&S able to offer the entire range but we can ship anywhere in the world. Call the sales desk on 020 8566 1120 or email: Oregon@hamradio.co.uk

We have many accessories for the SWL including:
MFJ-461 Pocket Morse Decoder..£84.95
Global AT-2000 Antenna Tuner.....£89.95

NEW! dressler active antennas

This outstanding range is ideal for use with all base station receivers, ICR-8500, AR 5000, PCR 1000, NRD 545, FRG 100 & MORE! Beautifully designed and manufactured in Germany.

ARA 100 HDX	£349
ARA 2000 HDX	£349
ARA 60	£189.95
ARA 2000	£189.95

Micro PSU

Ideal for scanners and shortwave receivers. This Mini switch mode 2.5 amp PSU will power many scanners and SW receivers. About the size of 20 cigarettes and very light. Ideal for popping in your brief case or suitcase! *(State make and model of receiver when ordering)* Only *£29.95*

New Maldol Handheld Discone

Maldol HDX30.

New discone to clip on top of any bnc scanner
Only *£38.95*

Maldol GDX-30 General Discone £49.95

mydel

MiniMag Scanning Antenna available with BNC fitting.....£32.95
SMA fitting £34.95
Will also work on 2M & 70cms TX (50 W)

Magnetic Long Wire Balun.....£19.95
Skywire Antenna Kit .....only £39.95

UK Scanning Directory

The 8th edition of this excellent frequency guide.
PRICED **£19.75** *plus £5.00 P&P*
It's **BIGGER** *than ever!*

MIRACLE WHIP

This *Amazing Antenna* at only 55 inches long is an ideal companion for any receiver covering 600kHz - 460MHz. *PRICED* **£129.99**

AVAILABLE NOW!

"Miracle whip received with thanks, had a test run on receive with an Icom 71E and Yaesu 7700 found it very good indeed reception was as good as with the outside long wire"

ICES at ML&S - where else!

FINANCE EXAMPLE

YAESU VR5000

APR	19.9%
PRICE	£599.00
Deposit	£00.00
48 Payments of	£17.72
Total purchase price	£850.56

Martin Lynch can offer finance terms up to 48 months with no deposit. We welcome your part exchange against any new (or used) product provided it is clean and in good working order, call the Sales Desk today! Usual APR: 19.9%. Payment protection is also available up to 48 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 add-itional charges for credit cards. Martin Lynch is a licenced credit broker. Full written details are available on request. Finance is subject to status. £10 p&p on all major tems. E&OE

SAVE £££s!

Check out our

NEW SHOPPING BASKET

on our website: www.hamradio.co.uk

HOT NEWS!
New Radio from AOR!
CALL FOR DETAILS

Also note that users of COQ8 seem to be using a hybrid COQ8/COQ13 system (possible Coquelet MkIII?). It is probable that this is COQ-82 or Coquelet-8 v2, a synchronous scrambled system (mentioned as being available on Wavecom's W41PC/W4100DSP) used on the Algerian Diplo links. This system is capable of recognising either Latin or Arabic keyboards and can switch accordingly. The system has a distinctive 13.3bd preamble with a row of 'j's. This system is likely being phased out.

COQ13 translates each five bit ITA-2 character into a sequence of two tones out of total of 12. A 13th tone represents the idle condition. The system takes each character and breaks it into a 3-bit section and a 2-bit section. The first three bits of the character are sent as 1 out of 8 possible tones (1-8) and the second two bits are sent as 1 out of 4 possible tones (10-13). The idle tone, tone 9, is heard only during the idle or standby condition. Each tone is 75ms in length or one character is 150ms long giving the system a baud rate of 13.5.

COQ8 directly translates each character into a set of two tones from a total set of eight tones. The idle condition used by this system is made up of tones 1 and 8 sent alternating. Each tone has a duration of 37.5ms or 75ms, giving an effective baud rate of 26.67 or 13.3. Baud rates of 53.3 have also been monitored.

For tuning purposes on a 13-tone Coquelet signal, zero on tone 9 during standby or between tone 8 and 10. On an 8 tone Coquelet signal zero between tones 1 and 8, these tones alternating is the idle condition. In general, a Coquelet signal only has a 30Hz shift between tones so exact tuning is important and the ability to magnify a signal is a great feature.

Klingenfuss *RadioTeletype Code Manual* 13th Edition provides this system's tone mapping and alphabet.
Frequencies: 5.603, 5.655, 6.7214, 6.7741, 8.010, 10.231, 16.2877, 18.006, 20.050MHz.

CROWD36

This Soviet MFSK system uses 36 tones and is based on British Piccolo Mk1. CIS Diplo service is the main user with suspected use by CIS Intel and Military services. This system is found at 40bd with a single tone lasting 25ms. Hand keyed traffic is usually 10bd with a single tone lasting 100ms. A spectrum analyser will show the tones arranged in three distinct groups of 10+11+11 tones. The tones are spaced 40Hz apart and tones 1, 12, 24 and 36 are rarely used so you are likely to see an 80Hz gap between groups. Each of the 32 tones represents one ITA2 character code.

Also known as CIS/Russian Piccolo, URS multitone, CIS 10-11-11 MFSK or CIS-36. As of this date there are **no** publicly available decoders for this system although they do exist in the professional market. Some decoders available, possibly Wavecom and definitely Hoka and *Skyweeper Pro*, provide tools that can be used to demodulate the tones and from there derive a character set. ITU documents have listed four different kinds of CROWD36 that vary with tone duration and baud speed. The entries marked * below are most commonly heard.

Variants

	Duration (ms)	Tone shift (Hz)	Tones Present
1	25	40	34 * 40bd
2	25	10	34
3	100	40	34 * 10bd
4	100	10	34

A few distinct patterns can be detected in a CROWD36 signal: selcall, idling and sending traffic. Selcall and idling are a series of five tones repeated in the same pattern. Traffic mode is most commonly, but not always, found as 40bd encrypted and many times operator traffic can be found in the clear at 10bd. Start-up and sign-off are usually 10bd and hand keyed.
Frequencies: 8.630, 10.4747, 10.5175, 11.0725, 11.115, 11.1167, 11.5255, 12.150, 12.176, 12.204, 12.2094, 14.414, 14.421, 14.624MHz.

Mazielka

A SELCAL system used by the 'brotherhood' stations to wake up the receiving station operator outside normally scheduled transmissions. Reported to be part of the CROWD36 system outlined above. It is composed of six tones out of a tone library of 13. See WUN Special Edition, V1.3, April 1995 for a good explanation of the system and its uses.

MIL-188-141 ALE

An 8-tone MFSK system running at 125bps with users all over the world including Europe, Africa, Asia, Middle East and China. The only good way to distinguish users is by monitoring the follow-on voice, c.w., or other modems. Tones are spaced 250Hz with tone frequencies of 750, 1000, 1250, 1500, 1750, 2000, 2250, and 2500Hz. Symbol duration is 8ms. This system looks and sounds very much like TT2300b/TPLEX and is easy to confuse but especially look for it preceding the 2400bps NATO p.s.k. traffic. Also known as MFSK188, NATO MIL188.
Frequencies: 10.244, 10.275, 10.581, 24.268MHz.

TT2300b/TPLEX

An 8-tone, adaptive, synchronous system manufactured by Thrane & Thrane of Denmark. The system runs at 100 or 200bd using 8-bit ASCII with data throughput of 300 or 600bps. Primarily designed to be connected directly to a serial port of a computer, the system features auto-dial, subscriber addressing, electronic mail and can be connected to a FAX machine. The full-duplex, error- correcting (24 unit CRC) link protocol is completely transparent to any type of data coding. Used by French Diplo, UK Civil Aviation Authority (National Air Traffic System/NATS datalink, Prestwick/Reykjavik) and Algerian oil companies. This may be logged in some commercial frequency lists as TT2300-ARQ, or TRA-2300. The manufacturer's name for the protocol/coding is TPLEX.

Two distinct modes have been monitored: Traffic mode and an idling sequence.

Frequencies to try: 5.0287, 5.1097, 7.7167 and 7.7197MHz. 8 tones, 200Hz spacing, ACF=8

RS-ARQ/MERLIN/ALIS-2

This is the 240bd 8-tone burst ARQ mode used in the Rohde & Schwarz MERLIN modem. When the system is found in the 7-tone mode it is in ISS mode, the IRS mode uses an 8-tone signal. Both will be measured as 240bd (720 bits/sec) with tones shifted by 240Hz. Character set can be ITA2 or ASCII with 8-bit ASCII being the most common.

Turkish, German and Italian Diplo stations are the most commonly found users. The Italian Diplo stations seem to favour the 5-bit (ITA2) mode. Turkish Diplo stations have been found using the 8-bit mode for all traffic.

It has been discovered that all eight tone channels have ALIS (228.7bd) 2kHz below. So if you hear an ALIS procedure in progress on a frequency it's worth waiting to see if 8-tone traffic appears 2kHz higher soon after.
5.712, 5.794, 6.307, 6.724, 6.773, 6.775, 6.777, 6.800, 6.8047, 6.8117, 6.8145, 6.8303MHz.

LINK-11

A US Military/NATO 40 DPSK synchronous system using 16 tones (one Doppler tone + 14 data + one sync tone), the 14 data tones are 4-p.s.k. modulated and spaced every 110Hz (935 to 2585Hz with Doppler tone at 605Hz). The sync tone is 2-p.s.k. modulated. Typical rates are 1364b/s or 2250b/s. This is a ground wave only system, so a signal received via h.f. will be nearly impossible to decode because the ionosphere messes up the phase. Also known as TADIL-A or 'alligator'. Largest manufacturer of LINK-11 equipment is Rockwell-Collins. See also LINK-11 LESW.
Frequencies: 1.697, 3.525, 4.018, 4.181, 4.528, 4.702, 8.000MHz.

MS5

This is the Soviet 12-tone Vocoder system with each channel QPSK modulated at 100 symbols/sec. Each tone has a shift of 200Hz and spans a frequency range of 700Hz to 2900Hz in the lower side band. This system has a distinctive pilot tone (unmodulated) at 3300Hz above a kilohertz point with unconfirmed reports of a pilot tone at 3600Hz and has a maximum capacity of 4800 bits/s. Commonly logged in the UK.

ANNEX 10

An ARINC HF SELCAL system with 16 tones.

Harris 39-tone modem

A 4-phase p.s.k. system implemented per MIL-STD-188-110A, appendix B. The system supports data rates of 75 to 2400bps using 39 tones spread from 675 to 2812.5Hz with a spacing of 56.25Hz. A single Doppler tone can be found at 393.75Hz. Block interleaving with up to 12s delay is supported. This modem has been implemented in the Harris RF-3466A and has been referred to as the Harris 39-tone modem. Check out 6.7120 (Croughton), 11.2230, 11.1830 or 5.720kHz.

A 39-tone modem sounds like jet noise, so as you tune across this signal an 'S' metre will rise and fall. It sounds very much like tuning a noisy frequency.

CODAN Modem

A commercial unit from Codan Pty of Australia currently used in Australia and Africa by the United Nations, aid agencies and various public authorities. The modem uses 16 tones and are QPSK modulated. The tones range from 656.25 to 2343.75Hz with a tone shift of 112.5Hz and runs at 2400bps. The modem is fully automatic and supports compression and selective calling. No ALE is used for link set-up but a simple beacon call and audio analysis on the return signal is all that's needed. This modem is mainly used in mobile networks.

The modem has a few distinctive sounds to it. A two second. 'squawk' is used to realign channels. If you hear short bursts then the modem is idling.

What To Look For In A Decoder

Some useful features include:

* Signal Identification
* Accurate baud rate measurement
* Correlation Bit Analysis
* Variety in modes decoded/identified
* Ability to save captured text (disk and printer)
* Tools for analysis

You really can't beat a good Signal Identification Mode, both the Wavecom and Hoka units include this option. Also, the excellent, shareware - but sadly *DOS* based *RadioRAFT* includes Signal Identification. A good Signal Identification mode simplifies the task of figuring out what mode is currently tuned, unfortunately even the best Identification mode is not always 100% correct. A common problem is that some keying systems share common idle characteristics (for example: SWED-ARQ, SITOR-A and TWINPLEX or SITOR-B and POL-ARQ) and active traffic is needed to correctly identify the exact mode. Also the presence of local interference, various propagation effects, or a noisy signal can make it difficult to correctly identify. Universal decoders do not include an Identification mode.

Accurate measurement of baud rate is another essential capability. Many modes can be accurately identified on baud rate alone because many rates are unique to a keying system. The facility also provides the opportunity to 'fingerprint' a signal, system or the user. For example, the Hoka decoders can measure baud rate accurately to three decimal places in the presence of a quality signal, but also do well on marginal signals, eventually settling down on a reasonable measurement. If your signal is full of noise you might not see three decimal places displayed, but at least on Hoka decoders you will have displayed those decimal places that make sense - a very nice feature. Universal decoders have trouble with accurate baud rate measurement on the faster keying systems (for instance: 192 ARQ-E) and noisy signals can be particularly confusing resulting in some very odd numbers.

Auto correlation Bit is a technique that samples the incoming digitised bit stream and presents the data as a graph of bit occurrences plotted against time. This will show when patterns occur within a signal, allowing you to determine the number of bits in a character frame (this is commonly referred to as the ACF), giving you another piece of information when working out an unidentified system. This kind of analysis tool reveals cycle period and shows when there are **no** patterns in a signal indicating an encrypted or random bit-masked signal, allowing you to move quickly onto more productive signals. Hoka and Wavecom decoders include auto correlation bit modules.

Mode variety is a personal preference. I would like to have a module for any mode I can receive in the spectrum! While not possible or realistic I will take as many as I can get. I find there is nothing more frustrating than being able to receive a clean signal and then not being able to identify or decode it (ignoring the problem of encrypted signals for the moment). As of this writing it seems that Hoka offers the largest variety of modes, followed by Wavecom and finally Universal. See the manufacturers listing in Section 5 for the modes decoded by various units.

The ability to save decoded output to a file and/or the printer should be considered a very important feature of any decoder. Having some form of hard copy, on disk preferably, allows for archiving for later reference or later analysis and independent printing and editing. Hoka decoders have the ability to save decoded text to disk or output to the printer. I believe Wavecom units have a similar ability. Universal decoders support direct output to a printer and with some software can capture to disk.

If you are interested in going beyond the Identification and decoding of signals heard on the air, you are going to need tools. Tools such as Spectrum Analysers, Character Analysis and Phase modules are some of the necessary tools needed to analyse today's modern systems. This is, for obvious reasons, not for everyone.

Resources

For those with unlimited pockets, there are two general purpose decoders available with exceeding good reputations and pedigree to match. After all the world's intelligence and professional monitoring communities are know to be using both. Hoka and Wavecom represent the ultimate in commercially available decoders.

For details of the Wavecom offerings take a look at **www.wavecom.ch** If you wish to learn more of Hoka solutions then visit **www.hoka.com**

The relatively 'new kid on the block' is *Skysweeper* from Skysweeper Technologies located in Finland. Representing the 'state-of-the-art' in affordable decoders, *Skyseeper* has a limited number of systems available. This is however growing all the time. A recently introduced Professional version also provides better analysis tools and generic configurable decoder module which allows you to build say, an m.f.s.k. decoder which allows the capture of tone activity and timing to file for further analysis and mapping to character schemes. It is therefore possible to construct decoders for the like of Coquelet, Piccolo and Crowd36 systems. Similar tools also allow the building of p.s.k. modules too. For more information visit **www.skysweep.com/skysweep.html**

Leif Dehio's exellent Utility Monitoring Site for waveform screen shots and audio samples **http://people.wiesbaden.netsurf.de/~signals/**

The WUN Club, for all things utility: **www.wunclub.com**

Mike Chase, co-author of the WUN *Digital FAQ* also has an excellent site at **www.chace-ortiz.org/umc/**

Charles Brain's *PC -ALE* and *PC-HFDL* decoders can be found at **www.chbrain.dircon.co.uk**

SWM

WATERS & STANTON

MAIN STORE•22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS. TEL: 01702 206835/204965
•FAX: 01702 205843 •E-MAIL: sales@wsplc.com•WEB: www.wsplc.com.
MIDLANDS STORE W&S @ LOWE•BENTLEY BRIDGE, CHESTERFIELD RD, MATLOCK, DERBYSHIRE, DE4 5LE. •TEL: 01629 580800•FAX: 01629 580020 •E-MAIL: info@lowe.co.uk
•WEB: www.lowe.co.uk
SCOTTISH STORE W&S @ JAYCEE•20 WOODSIDE WAY, GLENROTHES, FIFE, KY7 5DF.
•TEL: 01592 756962•FAX: 01592 610451 •E-MAIL: jayceecoms@aol.com
•WEB: www.jayceecoms.com

WEB ORDERING
www.wsplc.com

CARRIAGE CHARGES: A=£2.75, B=£6, C=£10

LOWE

DON'T MISS LOWE ELECTRONICS OPEN DAY SATURDAY SEPTEMBER 6TH 2003

Come and visit Yaesu, Kenwood and Icom stands. FREE food and bargain prices. Opens at 10am. Be there!

GLOBAL AT-2000 RECEIVER ATU

- 100kHz - 30MHz
- SO-239 socket
- Size: 150 x 67 x 146mm
- Weight 300g

£89.95 B

The AT-2000 one of the most popular receiver ATU's on the market. It covers 100kHz to 30MHz more than enough for most SW receivers. A deluxe feature is the 'Q' switch which adjusts the front-end selectivity to match the band and QRM conditions. The unit is passive, no power supply is necessary. Matches long wires, and coax systems.

MFJ-8100K SW REGEN Rx KIT

£75.95 B

Build your own SW receiver. Kit includes PCB, components, and metal case. Covers SW bands with gaps from 3.5MHz to 22MHz. Includes 80, 40, 30, 20, 17 & 15m amateur bands.

** Frequency range: A: 3.5-4.32, B: 5.95-7.4, C: 9.56-12.05, D: 13.21-16.5, E: 17.6-22MHz * Modes: AM, CW, SSB * Audio o/p 200mW into 8 Ohms * Supply: 9V DC (PP3, not included) * Size 180 x 60 x 150mm * Weight 710g*

MFJ-1022 ACTIVE ANTENNA

- 300kHz - 200MHz
- Pwr: 9V batt / ext 9-18V DC
- Inc Telescopic whip
- SO-239 connector
- Size: 76 x 32 x 102mm

£55.95 B

The MFJ-1022 Active Antenna covers the HF to VHF bands. It easily plugs into your general coverage receiver or scanner. Handles strong signals and reduces intermod with low noise reception. Provided with a detachable telescopic antenna.

MFJ-1026 NOISE CANCELLER

£189.95 B

• Frequency range: 1.8 - 30MHz • Active Antenna • Whip Ant • RF sensed/control • Supply: Ext. 13.8V • Size: 210 x 60 x 150mm

All mode QRM eliminator including active antenna. Eliminates local electrical noise even before it reaches the antenna socket. This is achieved by a phasing technique which cancels noise, but lets the wanted signal through.

WATSON HP-200 & HP-100

Superb headphones with tailored response for radio comms. Excellent sound proofing, can pull in the weak DX.
- Mono 8 Ohm 200-10,000Hz
- Padded ear pieces
- 3.5mm stereo plug
- 1/4" stereo adaptor

£22.95 B

Excellent lightweight comm headphones with tailored response for the modern transceiver or receiver.
- 8 Ohms 200-9,000Hz
- adjustable headband
- 3.5mm stereo plug
- 1/4" stereo adaptor

£19.95 B

WS-2300 WEATHERSTATION NEW

Professional remote weather station is a high quality weather system that measures the indoor surrounding area and receives weather data from three outdoor sensors through wireless 433MHz frequency signal or optionally by wire transfer to the receiver. Set the alarms for constant monitoring of weather changes for temperature, humidity, air pressure, wind, dew point, rainfall and even storm warning. All the weather information is continuously updated and displayed on the large user-friendly LCD for current weather information. Included is the "Heavy Weather" software for PC users which uploads all the received weather data from the base station to the PC. Access the latest weather information from your PC and record up to 175 sets of weather data recorded by the base station and generate useful statistics and charts onto your spreadsheets with Excel (not included). Unlimited data sets can be transferred to PC memory for indefinite history records.

£199.95 C

YUPITERU MVT-7100 "THE ONE & ONLY"

- 100kHz - 1650MHz *Displayed*
- NFM, WFM, USB, LSB, CW, AM
- 1000 memories
- 500 Pass channels
- 12 tuning steps
- 4xAA Ni-Cds / AC charger
- 12V DC cigar lead
- Telescopic Antenna
- Earpiece

£229 B

YUPITERU MVT-7300 "COMPACT SIZE"

- 521kHz - 1320MHz
- NFB, WFM, NAM, WAM, USB, LSB, CW
- 1000 memories
- 500 Pass channels
- 16 tuning steps
- 8.33kHz airband spacing
- 3xAA Ni-Cds
- 12V DC/230V AC mains
- Telescopic Antenna

£239 B

YUPITERU MVT-9000 mk2

- 530kHz - 2039MHz
- NFB, WFM, NAM, WAM, USB, LSB, CW
- 1000 memories
- 500 Pass channels
- 25 tuning steps
- Voice-reversed scrambled decoder
- 4xAA Ni-Cds
- 12V DC/230V AC mains
- Telescopic Antenna

"TOP OF THE RANGE"

£369 B

AOR AR-8200 mk3

- 530kHz - 3000MHz
- WFM,NFM,SFM,WAM,AM,NAM,USB,LSB,CW
- 1000 memories
- 50 select scan channels
- Tuning steps programmable
- 8.33kHz airband spacing
- 4xAA Ni-MH
- Detachable MW bar antenna
- Telescopic Antenna

£379 B

ALINCO DJ-X3 "SUPER VALUE"

- 100kHz - 1300MHz
- AM, FM, WFM
- 700 memories
- 11 tuning steps
- 8.33kHz airband spacing
- Stereo FM (with headphones)
- Audio descrambler
- 3xAA dry cell battery case
- SMA Antenna

£109 B

UNIDEN-BEARCAT UBC-3000XLT

- 25 - 1300MHz *with gaps*
- NFM, WFM, AM (Airband)
- 400 memories
- 10 Priority channels
- Twin Turbo scan & Search
- 6V 600mAh Ni-Cd pack + AC charger
- BNC Flexible Antenna
- Leatherette case
- Earphone

£189 B

UNIDEN-BEARCAT UBC-280XLT

- 25 - 956MHz *with gaps*
- NFM, AM (Airband)
- 200 memories
- 10 Priority channels
- 5/12.5kHz channel steps
- 4.8V 800mAh Ni-Cd power pack
- AC Charger
- BNC Flexible Antenna
- Earphone

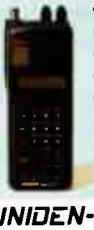
£179.95 B

UNIDEN-BEARCAT UBC-220XLT

- 66 - 956MHz *with gaps*
- NFM, AM (Airband)
- 200 memories
- 10 band coverage
- 100 Ch/sec scan speed
- Priority channel
- 4.8V 600mAh Ni-Cd int.
- AC Charger
- BNC Flexible Antenna

£119 B

UNIDEN-BEARCAT UBC-120XLT



- 66 - 512MHz *with gaps*
- NFM, AM (Airband)
- 100 memories
- 10 Priority channels
- 5/12.5kHz channel steps
- Data skip (lockout channels)
- 4.8V DC Int. battery
- BNC Flexible Antenna
- Earphone

"GREAT PRICE"

£99 B

UNIDEN-BEARCAT UBC-60XLT-2

- 66 - 512MHz *with gaps*
- NFM
- 80 memories
- 1 Priority channel
- 5/12.5kHz channel steps
- Data skip (lockout channels)
- 4x AA cells (not provided)
- BNC Flexible Antenna
- Earphone

£69 B

GENERAL ENQUIRIES:
01702 206835/204965
FREEPHONE ORDERLINE:
08000 73 73 88

THE ONLY THING WE WON'T DISCOUNT • CUSTOMER SERVICE •

PRICE MATCH

ALINCO DJ-X2000 "FABULOUS FEATURES"

- 100kHz - 2150MHz
- AM, NFM, SSB, CW
- 2000 memories
- 23 tuning steps
- Channel scope
- Fully programmable
- 4.8V Ni-Cd battery pack
- 8-15V DC ext.
- Telescopic Antenna

£449 B

UNIDEN-BEARCAT UBC-780XLT

- 25-1300MHz with gaps
- NFM, WFM, AM
- 500 memories
- Analogue Trunk Tracking
- Alphanumeric display
- Automatic Tape recorder option
- Antenna BNC
- 13.8V DC 700mA

£349.95 C

AOR AR-8600 II

- 530kHz - 2040MHz
- FM, AM, SSB, CW
- 1000 memories
- Tuning steps programmable
- 8.33kHz airband spacing
- RS232 PC interface fitted
- Power 10.8-16V DC
- Telescopic Antenna
- Optional slot card sockets

£599 C

YAESU VR-5000

- 100kHz - 2599MHz
- FM, AM, SSB, CW
- 2000 memories
- Large digital display
- Real-time band scope
- DSP Noise & notch filters (Opt)
- Super HF performance
- Automatic Tape recorder option

£599 C

YAESU VR-500 YAESU 2 YR WARRANTY

- 100kHz - 1300MHz
- NFM, AM
- 1000 memories
- 100 Skip channels
- Smart search feature
- 8 character Alphanumeric display
- Band scope
- PC programmable
- Flexible Antenna

£199 B

YAESU VR-1200

- 100kHz - 1300MHz
- AM FM WFM
- Adjustable steps
- Over 600 memories
- Skip channels
- Smart Search
- Alpha Numeric Tags
- Requires 2 x AA cells

£119 B

bhi NEIM1031 NEW

NOISE ELIMINATING IN-LINE MODULE

** Noise attn -20dB (typical) * Noise Attn levels 8 * Audio output power 2.5W RMS max (8 Ohms) * Audio connections: Line level in/out (RCA Phono), Audio in/out 3.5mm mono jack * Line i/p impedance 10K * Line o/p impedance 100 Ohms * Line in sensitivity 300mV -2V RMS * Headphone socket 3.5mm mono jack * Power 12-24V DC 500mA*

£129.95 B

bhi NES10-2 & NES-5 FORMERLY NESCB

NES10-2

£99.95 B

**Speaker with built-in DSP noise filters *Dip switches for 8 filter settings (NES10-2) *DSP settings preset, no user adjustment (NES-5) *Plugs directly into 3.5mm speaker socket *Handles up to 5 Watts input *Max 2.5 Watts output *Requires 12V at 0.4 Amps max *Use mobile with cigar adaptor*

NES-5

£79.95 B

ICOM IC-R5 NEW

- 150kHz - 1310MHz
- AM, FM, WFM
- 1250 memories
- Built-in ferrite rod antenna
- CTCSS & DTCS tone squelch
- Cloning capability
- 2xAA Ni-Cds + AC Charger
- Flexible Antenna

£159 B

ICOM IC-R3 SCANNER & TELEVISION

- 495kHz - 2450MHz
- AM, FM, WFM, AM-TV, FM-TV
- TV mode PAL (UK)
- 450 memories
- 50.8mm (2in) TFT colour display
- Simple bandscope
- BP-206 Lithium-ion battery
- Telescopic Antenna

£339.95 B

ICOM IC-R10 "ICOM QUALITY SCANNER"

- 500kHz - 1300MHz
- AM, FM, WFM, SSB, CW
- 1000 memories
- 14 tuning steps
- Real-time bandscope function
- CI-V compatibility (option)
- 4.8V DC Ni-Cds
- Flexible Antenna

£259 C

ICOM IC-R8500

- 100kHz - 2000MHz
- USB, LSB, CW, AM, FM, WFM
- 1000 Memories
- 3x Antenna Connectors
- Audio 2.5W (8 Ohms)
- Supply 13.8V DC
- Free PSU included
- Weight 7kg

£1299 C

ICOM IC-PCR1000IS

- 100kHz - 1300MHz
- USB, LSB, CW, AM, FM, WFM
- Unlimited memories
- Synchronous AM detection
- RS-232 interface D-sub 9-pin
- BNC Antenna connector
- New Icom version 2 software
- Requires PC (Not included)

£309 B

WINRADIO G303I NEW

HF PC RECEIVER
9 kHz to 30 MHz
See Review in February Short Wave Magazine
**Tuning resolution: 1Hz *Modes: AM, AMN, AMS, CW, FM3, FM6, FMN, (ISB & DSB, Pro Demodulator Option only) *Antenna: 50ohm (SMA) *Dynamic Range: 95dB *IP3: +8dBm*

£440 C

ROBERTS R9914

- 153kHz-30MHz, 87.5-108MHz
- AM, SSB/CW, FM (Stereo)
- 45 Station preset memories
- Stereo through earphones
- Dual time
- Clock/Alarm
- 4 x AA cells (Alkaline)
- 230V AC adaptor

£99.95 B

bhi 1042 SWITCH BOX NEW

The bhi 1042 Switch Box - No more swapping of wires. Allows up to six piecies of equipment to be connected to one bhi noise eliminating module/speaker or even a standard extension speaker.

** 6x inputs: 3x loaded (8 Ohms spkr level), 6x unloaded (h/phone/line level), 1x output (to spkr/module) * Sockets 3.5mm mono Size *c/w 2x 3.5mm mono - 3.5mm mono leads*

£29.95 A

MFJ-784B DSP FILTER

£259.95 B

The MFJ-784B Tunable DSP filter automatically eliminates all hetrodynes, random noise, white noise, impulse noise, static, ignition noise, power line interference, atmospheric noise etc. There are 16 factory pre-set filters to match all the popular modes which can be re-programmed by the user and saved.

OREGON SCIENTIFIC BAA 898 HG NEW

The **BAA898HG Wireless Weather Station** offers more info than ever! Weather, temperature, pressure trends as well as pressure readings, history and max and min readings. Operates with up to 3 remote thermo-hydro sensors, one supplied. **Wireless freq. 433MHz *Main unit 195x105x77mm, 4xAA cells *Remote unit 92x60x20mm, 2xAA cells.* Optional Thermo-Hydro Sensor THGR228N

£79.95 B

WS-2300 WEATHER STATION NEW

This professional wireless weather station is a high quality system that measures the indoor surrounding area and receives weather data from 3 outdoor sensors through 433MHz signal. **Base receiver station *3 Outdoor sensors- Thermo-hydro transmitter, Wind sensor, Rain Sensor *PC program on CD-ROM *RS-232 serial data transfer *AC/DC power adaptor*

£199.95 C

GARMIN GPS-V DELUXE NEW

Compact Handheld GPS with detailed street-level maps provided from MapSource City Select CD. Will automatically calculate a route and guide you to your destination with turn-by-turn directions and audible beeps to alert you to approaching turns. **Size: 127x59x41mm *Weight: 255g*

£445 B

MFJ-461 "INGENIOUS ACCESSORY"

The MFJ-461 is a stand-alone pocket sized Morse code reader. Similar in size to the MFJ Morse tutors, all you do is hold it close to your receiver, and it instantly displays CW on the 32 character high contrast LCD. It has automatic speed tracking and a serial port. Truly pocket sized at 57 x 82.5 x 25.5mm and 158g.

£84.95 B

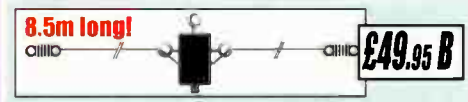
WATSON FC-130 SPECIAL OFFER

Free Test Meter With every FC-130 purchased in August

- Off-air Frequency Counter
- 10MHz - 3GHz range
- 4 Switched Gate Spreads
- Hold Display Button
- 2 Switched ranges
- Internal ni-cad battery
- Whip Antenna
- AC Charger

£59.95 B

WDP-30 Short Wave Dipole



£49.95 B

This new design from Watson gives you dipole performance across the entire short-wave bands. Unlike random wires, it reduces the background noise and pulls in the signals. And its small size means it will fit most gardens. Absolutely no adjustment required. 10m coax feeder included

W&S 2003 CATALOGUE !!

336 PAGES
PACKED WITH PRODUCTS, TIPS & INFORMATION

£2.95 B
carriage £1.25

CAN'T DECIDE? PHONE FOR EXPERT ADVICE

EXPLORING NORTH ATLA FLIGHTS

I have recently had an enforced period of inactivity whilst waiting for my hip replacement. To overcome the boredom during this wait and with my inability to do much moving around I have been monitoring transatlantic flights. I can now 'lock onto' an aircraft as it leaves say Manchester, and track its progress across the 'pond' until it makes contact with Gander before transferring to New York control on v.h.f.

As I have an interest in weather, I have also been monitoring the effect that weather has on flights, through Royal Naval weather charts from the RN at Northwood. I've been trying to predict what will be the preferred flight levels, etc. For the various crossings, of which you'll not only hear civil airlines, but also the military aircraft including Reach (US) and Canforce (Canadian Armed Forces) aircraft as they cross the Atlantic.

I am now able to compile a fairly comprehensive overview of North Atlantic air traffic. I won't say that I know when the aircraft captain is going to sneeze but I'm getting there! If you'd like to do some monitoring yourself, but are unsure of what you need, or what you might achieve, this article is for you. I stress this article considers only the basics to provide you with a solid low cost (well fairly low) starting point in this aspect of the hobby.

Receivers

To monitor the various transmissions, you will of course need some receivers. As part of my station, I use three receivers. The receiver I use for h.f. reception, is a NASA Communications Receiver model HF-4E with a home-brewed antenna matching unit (a.m.u.) courtesy of *Radio Active* magazine.

The NASA receiver is connected to a sloping loop antenna running between two chimneys, one at each end of the house. The antenna and feeder then run down to the eaves and along the gutters to the upstairs shack window, where it passes via my home-brew balun into the a.m.u. The total length of wire in the system is about 32m. The earth for the radio is down into the backyard and ends up in an underground stream under my yard.

The second receiver in my station is a Yupiteru MVT-7100 which is fed from an SSE AGPK-2C antenna. This antenna is actually inside the shack and hung from the ceiling. I am lucky to have quite high rooms (3m) which allows me to suspend this antenna out of the way but next to the window. The MVT-7100 receiver handles the ACARS Traffic through an audio link being decoded and displayed on the computer.

Receiver number three, is an Alinco DJ-X3 using a dipole cut to length from an old TV Antenna and hung vertically inside the shack window (also quite tall). This was the only radio purchased as new, the other two were demonstration models purchased for a very reasonable price. The DJ-X3 is used to listen to the airband while the MVT-7100 is doing duty on ACARS.

● Fig. 1: Details from the ACARS logs.

FLIGHTS FROM ACARS (RX location N. Yorkshire)

DATE	DAY	TIME	P	COMPANY	Flt. No.	A/Reg.	Type	From	To
11/18/02	1	1412		British Airways	BA1327	G-EUOD	A319-131	Newcastle	Heathrow
11/18/02	1	1422		Spanair	JK3102	EC-HRP	A320-232	Las Palmas	Teeside
11/18/02	1	1542		Cargolux	CV0772	LX-NCV	B747-4R7F	Manchester	Seattle
11/19/02	2	1301		Continental	CO0067	N14115	B757-224	Gatwick	Cleveland
11/19/02	2	1310		Continental	CO0005	N74007	B777-224ER	Gatwick	Houston
11/19/02	2	1348		Air Canada	AC0857	C-GHKR	A330-343X	Heathrow	Toronto
11/19/02	2	1355		Air France	AF0344	F-GHGH	B767-37EER	Paris (CDG)	Montreal
11/19/02	2	1358		Swiss Air	LX0088	HB-IQK	A330-223	Zurich	Montreal
11/19/02	2	1409		Air France	AF0050	F-GSPG	B777-228ER	Paris (CDG)	Chicago
11/19/02	2	1429		Air Canada	AC0891	C-GDUZ	B767-38EER	Heathrow	Toronto
11/19/02	2	1432		Biz Jet - USA	GS0001	N8CA	Gulfstream V		
11/19/02	2	1447		British Airways	BA1803	G-EUPZ	A319-131	Birmingham	Glasgow
11/20/02	3	1538		Air France	AF0358	F-GLZT	A340-313X	Paris (CDG)	Toronto
11/20/02	3	1541		Martinair	MP7313	PH-MCR	MD11CF	Amsterdam?	Atlanta
11/20/02	3	1552		Singapore Airlines	SQ7990	9V-SFC	B747-412F	Europe	N. America?

● Fig. 2: A log sheet detailing the h.f. oceanic voice traffic.

JUNE, 03 NORTH ATLANTIC ICOA HF - SHANWICK & GANDER (G) RADIO TRAFFIC

Date	Time	Freq.	Airline	FLT /REG.No	From	To	REMARKS qv in 'FROM' column - A/C details noted earlier)	M/F	SEL CAL	REG	A/C
1/6/03/7	1910	5.649	Icelandair	IC 501		KEF	Oceanic confirm BREKI next after 15W	S			
1/6/03/7	1912	5.649	Speedbird	1	LHR	JFK	Checking posn, At 15W	S			Concorde
1/6/03/7	1912	5.649		TXY 501			Unreadable by Shamwick (or me)				
1/6/03/7	1915	5.649	Speedbird	239	LHR	BOS		S	GKBS	G-VIIC	B777-236
1/6/03/7	1916	5.649	Virgin	9	LHR	JFK	NIBOG/1847/350/57N20W/1930/58N30W	S			
1/6/03/7	1922	5.649	Alitalia	9124			DOGAL/1923/340/55N20W/1938/56N30W	F	EJKL	I-DEMR	B747-243F
1/6/03/7	1926	5.649	Speedbird	225	LHR	IAD		S	GJHS	G-VIIX	B777-236
1/6/03/7	1926	5.649	Icelandair	501	qv		64N10W/1929/360/64N30W/1954/Keflavik				
1/6/03/7	1945	5.649	Alitalia	9124	qv		55N20W/1944/340/56N30W/2024/55N40W				

NTIC

Have a look at what you could hear, as 'Big Ears' shows you how to monitor what's going on over the Atlantic Ocean by listening to h.f., airband, ACARS and Weather FAX signals.

Frequencies

So, you're set up to listen to aircraft traffic, but what are the frequencies to actually listen too? Most of these are shown in various publications, but I list below those that I find best for me. Of course this may be different for you depending on your location and antennas, etc.

Frequencies on the h.f. band are as follows: 4.675, 5.598, 5.616, 5.649, 5.661 & 6.622MHz. These frequencies are used for Shanwick, Gander, and Santa Maria (in the Azores). As I said these are the best for me. Other frequencies to listen too, may be obtained from books such as *airband Radio* by David J. Smith or or *Ferrell's CFL13*. David's book is, I find, an excellent publication and if you want to understand more about air traffic control, I can recommend this book.

VOLMET Weather

I also receive VOLMET Weather from Gander/New York on 6.604MHz, and from Shanwick on 5.505MHz and finally VOLMET is available from the RAF transmissions on 5.450MHz. There are other frequencies for these services and again they are listed in the publications mentioned in this article.

Weather Fax from the RN is usually to be found on 8.040MHz and from Hamburg, Germany on 3.055MHz. Further details of these frequencies can be obtained from *FAX, Satellite and RTTY Weather Reports* by Phillip C. Mitchell.

SELCAL

One other piece of information available over h.f. radio link is SELCAL - short for Selective Calling, and indicating codes issued to individual aircraft. These codes are sent by radio to the aircraft and let the pilots know that there is a message for them, meaning that the pilot's workload is cut, not having to keep a constant radio watch. If you know the SELCAL code you can find out which aircraft it was' aimed at'. The Seldec book *Directory Of Aircraft SELCALS* lists the various codes in code or aircraft order.

Airband

The v.h.f. airband is the band of frequencies from 118 to 136MHz. It uses amplitude modulation (a.m.) rather than frequency modulation (f.m.), and has rather a large number of channels even for a modern scanner. The method I use to decide on the frequencies that are the ones pertinent to my location, is to scan right through the band but with the squelch turned so that the radio appears to be at its least sensitive.

Using this method of scanning with the squelch set high, means that the radio will only pick out the strongest channels in your area. If you listen to the scanner over a period of a few days and note down the most used frequencies as they appear, you'll soon find you have a list of the active channels around your area. Enter the list into your scanner and you're ready to go.

NORTH ATLANTIC FLIGHTS	HF RADIO REPORTS											
	1	2	3	4	5	6	7	8	9	10	11	12
FREQUENCY												
DATE												
TIME												
FLT/REG.NO												
From												
To												
Route/Random												
Postion 1												
North (or Way Point)												
West												
Time at												
FLIGHT LEVEL												
Position 2												
North (or Way Point)												
West												
Time at												
Position 3												
North (or Way Point)												
West Way Points												
Mach (Speed)												
Fuel on Board												
Sat. Air Temp.												
Wind Direction/Speed												
Sky												
Ice												
SELCAL												
Remarks												
1												
2												
3												
4												
5												
6												
7												

● Fig. 3: A simple-to-use home-designed logging sheet for h.f. oceanic traffic logging.

Where I live in North Yorkshire, I have 46 channels that are in common use from Manchester, Leeds/Bradford, Newcastle and Teeside Airports as well as the frequencies used for the upper and lower air routes. For the North Atlantic traffic I have trimmed this list down further to 20 which mainly cover upper air routes, oceanic traffic clearance frequencies and the international airport at Manchester.

Again the book *Airband Radio* can help with a list of frequencies, but for starters try 123.950 and 127.650MHz. for oceanic clearances. It's also possible to find a frequency with your local VOLMET Weather reports on it.

● The NASA Communications Receiver model HF-4E is an enhanced version of the AKD HF3E receiver, which could also be used for h.f. traffic monitoring.

ACARS

Now let me turn to the use of ACARS! The acronym means Aircraft Communications Reporting and Addressing System. To receive and decode ACARS I use the primary frequency which is 131.725MHz. It is necessary to turn the squelch right up on the Scanner and do not use too much volume.

An audio link is taken from the radio's output socket, to the computer via a Persivell Demodulator. I also purchased from Persivell the *Sky Spy* ACARS decoding program. This program I find is easy to use and works well and some of the data is shown in **Fig. 1**.

It's possible with some scanners to interface them directly with a computer with the appropriate

summer SCOOPS

B Grade Specials

Ex Demo/Mail order returns

- Fully QC Checked
- One Year Warranty

NB: *Outer packaging may be damaged, all products in A1 condition*

NEW DAB DIGITAL RADIOS

Treat yourself to this HOT PRODUCT at a very special B Grade price!

PERSTEL OR-101
Personal DAB Radio

- Two Band Coverage: DAB digital Radio Band, FM Radio Band
- Large full graphic 4 line display with backlight Shows programmes and programme info
- Stereo Headphone output
- Audio Output Power: 5mW @ 16 Khz
- C/w 2 x AA size alkaline batteries
- Size: 69 x 88 x 22 mm
- Weight: 40g (without battery)
- Carrying case, User Manual

~~£169.00~~ **£129.00** P&P £8

PERSTEL OR-201
Digital Audio Centre

- DAB Digital Radio
- FM Analogue Radio
- MP3 Audio Player
- Removeable 64Mb PC disk
- Supplied c/w: Personal Stereo Headphones, 2 x AA Batteries 60 x 84 x 24 mm

~~£229.00~~ **£189.00** P&P £8

GRUNDIG
Satelit 800

- 100-30,000kHz (0.1-30MHz) for AM Broadcast and Shortwave
- 87-108MHz for FM Broadcast
- 118-137MHz for Aircraft Band
- AM, USB, LSB modes (0.1-30MHz)
- AM mode only for 118-137MHz
- WFM mode only for 87-108MHz
- Three built-in bandwidths for SW
- C/W Deluxe Stereo Headphones

~~£549.00~~ **£399.00** P&P £8

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF £136.33

BEARCAT UBC 220-XLT

- 66 - 956 MHz (with gaps)
- AM/FM
- 200 memories
- TURBO SCAN/SEARCH
- Data Skip facility
- 10 Priority Channels
- Memory Backup
- Supplied c/w earphone, belt clip, charger and rubber duck antenna

~~£149.95~~ **£99.00** P&P £8

GRUNDIG YB400
Hi-Performance SW Radio

SUPPLIED C/W
- SW Handbook
- Carrying case
- External Wire Antenna
- Carry Strap

- 144kHz - 30MHz
- SW: 1.711-26.1MHz
- FM Stereo: 87.5-108MHz
- MW/LW
- SSB reception *(both USB/LSB)*
- 40 station preset
- Fine tuning
- Dual alarm clock
- Narrow/Wide bandwidth
- DX/Local sensitivity
- Auto Search
- Sleep timer
- Snooze timer
- Mains or Battery *(with optional mains adaptor)*

~~£129.00~~ **£79.00** P&P £10

MAYCOM FR100
New Dual Civil/Military Airband Radio

- 66-174, 420-470 MHz
- AM/FM/WFM
- 150 Memory ch.
- S meter bargraph
- 3 x AA cells (not supplied)
- Supplied c/w: SMA antenna, belt clip, carrying strap

~~£99.95~~ **£79.95** P&P £8

PORSCHE G=2000
Stylish Radio

- FM Stereo, AM/FM/MW 13 SW bands, 2.3-26.1MHz
- 20 station presets
- Clock, alarm, sleep function, world times
- Mains/Battery (optional AC adaptor)
- Supplied c/w leather cover & in-ear stereo headphones

~~£89.95~~ **£74.95** P&P £8

MAYCOM AR108

- Airband: 108-136.975MHz VHF: 136-180MHz
- Selective Channel Steps: 5, 10, 12.5, 15, 25, 1MHz
- Modes: AM or FM
- Memories: 99
- Supplied c/w Belt Clip, Carrying Strap

Mains Charger £8.95 £2.75 p&p

~~£69.95~~ **£54.95** P&P £8

ALINCO DJ-X3
Ultra modern Scanning Receiver

100kHz - 1300MHz AM/FM/WFM

- 700 memory channels
- Steps: 5/6.5/8.33/10/12.5/15/20/25/ 30/50/100kHz
- Auto descrambler
- Bug detector
- Stereo FM (with headphones)
- Attenuator
- SMA Antenna
- Battery saver cct
- Size: 56w x 102h x 23d mm
- Weight: 14.5g (without batt)
- Supplied c/w: 3 AA dry cell battery case, carrying strap

Optional extras
- Ni-Mh battery pack
- Drop in Hob mains charger
- Earphone

~~£129.95~~ **£94.95** P&P £8

YAESU FRG-100

FREE MAINS PSU

This receiver provides solid coverage from 50kHz - 30MHz with all mode reception of AM, SSB and CW.

~~£499~~ **£399.00** P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF £136.33

YUPITERU MVT 7100

- 530kHz-1650MHz
- 1000 memories
- AM/FM/WFM/SSB/CW
- C/w NiCads, mains charger, 12VDC cigar lead, belt clip, carry strap

~~£249~~ **£229.00** P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF £79.66

MORE YUPITERU.....

MVT 3300	~~£159.00~~	£129.00
MVT 7300	~~£289.00~~	£239.95
MVT 9000 EU		£369.00

AOR AR-8600
All Mode Wideband Base Receiver

NEW Mk II Version

OPTIONAL PSU AVAILABLE

- Now 100kHz-3GHz
- Increased RX sensitivity
- New Bandpass filter
- 12V DC or optional internal NiCad pack

£699.00 P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF £236.33

BEARCAT UBC 780XLT
A MUST HAVE for enthusiasts

- 500 channels
- 25-1300 MHz *(with gaps)*
- AM,FM,WFM
- 5/7.5/10/12.5/20 /25/50/100Hz
- Trunktracker- includes Motorola/EDACS/ LTR
- VHF/400 /500/800/900
- Smartscanner™ interface
- Alpha tagging
- PC+VFO control
- Clone feature
- CTCSS/ DCS
- Record functions

£349.00 P&P £8

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF £119.66

BEARCAT UBC 60XLT-2
Low Cost Scanner!

A brand new low cost scanner that covers MARINE, LAND MOBILE and more!

- 66-512 MHz *(with gaps)*
- 80 memories
- Channel or Freq display
- Priority Channel
- Channel Lockout
- Scan Delay

NEW! UPGRADED MODEL - now with 80 memories for the SAME PRICE!

£69.95 P&P £8

MORE BEARCAT.....

UBC 3000XLT	£199.95
UBC 280XLT	£179.95
UBC 220XLT	£119.00
UBC 120XLT	£99.95
UBC 278CLT	£159.95

ICOM IC-R8500
Communications Receiver

PRICE MATCH

This receiver is everything we hoped it would be, covering 100kHz - 2GHz and lots of features including computer control.

~~£1375~~ **£1249.00** P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF £419.66

ICOM IC-R75
Communications Receiver

PRICE MATCH

£699.00 P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF £236.33

ICOM IC-R5

- 495 kHz-1309.995MHz
- AM, FM, WFM modes
- PC programmable
- 1250 memory channels
- Dynamic Memory Scan
- CTCSS & DTCS Decoder
- Auto Squelch

£179.00 P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF £63.00

ROBERTS R861
World Band Radio

DIGITAL WORLD BAND RADIO WITH RDS

- Covers MW/LW/FM/SW
- SSB/CW reception on SW
- 307 presets
- Clock/alarm facilities
- Supplied with:
  - Dual voltage AC supply
  - SW antenna
  - earphone
  - carrying case

WE STOCK THE COMPLETE RANGE OF ROBERTS RADIO!

~~£200~~ **£179.00** P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF £63.00

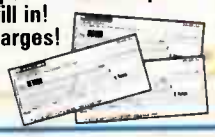
USED EQUIPMENT

ALL SAFETY TESTED & GUARANTEED for 3 MONTHS

ALINCO DJX-2	HANDHELD SCANNER	99.00
ALINCO DJX-2000 + ACCESSORIES		
H/HELD SCANNER+SOFT& CELL CASES		399.00
ALINCO DJX3 HANDHELD SCANNER C/W ACC & BOOK		165.00
BEARCAT UBC3000XLT	HANDHELD SCANNER	149.00
BEARCAT UBC9000XLT	BASE SCANNER	190.00
AKD HF3 TARGET	HF RECEIVER	99.00
DRAKE R8E RX	C/W CONVTER & SPKR	499.00
JRC NRD345	HF RECEIVER	350.00
LOWE HF225	HF RECEIVER	199.00
SANGEAN ATS-909	SHORTWAVE RECEIVER	115.00
ICOM IC706GII	HF-70CM TRANSCEIVER	699.00
ICOM IC-706MK2G+CR282 HF-70CM MOBILE TRANSCEIVER		699.00
ICOM IC-706MKII+ACCESSORIES HF/6M/2M MOBILE+FL223/MB62&63		575.00
ICOM IC725	HF+FM BASE/MOBILE TX	325.00
ICOM IC-756	HF/6M 100W TX	899.00
ICOM IC-756PRO	HF/6M 100W TX	299.00
KENWOOD TS-50S	100W HF TRANSCEIVER	399.00

Easy to pay & GENUINE INTEREST FREE with CHEQUESPREAD

- Pay by three post dated cheques
- No forms to fill in!
- No hidden charges!
- No hassle!
- No catch!
- No problem!



- Simply divide the price *(including carriage)* into 3 equal payments.
- Write 3 cheques dated in consecutive months starting with today's date.
- Write your telephone number, cheque card number and 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.

CHEQUESPREAD AVAILABLE ON ITEMS OVER £100 ONLY

ORDER HOTLINE

023 9231 3090

Unit 1 • Fitzherbert Spur • Farlington • Portsmouth • PO6 1TT

email: sales@nevada.co.uk • fax: 023 9231 3091

ALL GOODS SHIPPED FOR 24 HR DELIVERY

P&P: £10 (UK Mainland) unless otherwise stated

E&OE

DJ-X2 THE ULTIMATE LIGHTWEIGHT SCANNER

- Receives: 522kHz - 999.995MHz
- AM WFM NFM
- Selectable scan modes
- 700 memories
- Audio descrambler
- Bug detector - detects presence and frequency of bug giving audible warning
- Selectable internal / external antenna
- Internal or external supply
- Program Search banks
- Illuminated backlight display
- RX attenuator
- Auto power off mode
- Priority channel monitoring
- Squelch control

ALINCO

£129.95 P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF **£46.65**

DJ-X3 ULTRA MODERN SCANNING RECEIVER

- 100kHz - 1300MHz
- AM/FM/WFM
- 700 memory channels
- Steps: 5/6.5/8.33/10/ 12.5/15/20/25/ 30/50/100kHz
- Auto descrambler
- Bug detector
- Stereo FM (with headphones)
- Attenuator
- Battery saver cct
- Size: 56w x 102h x 23d mm
- Weight: 14.5g (without batteries)
- Supplied c/w: 3 AA dry cell, battery case, carrying strap
- Optional extras: • Lithium ion battery pack, Ni-Mh battery pack, Drop in mains charger, Earphone

with 8.33kHz for airband

ALINCO

£129.95 P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF **£46.65**

DJ-X10E ADVANCED FEATURED SCANNING RECEIVER

- Receives: 100kHz - 2000MHz
- Multi mode reception AM - WFM - NFM - SSB - CW
- 1200 memory channels
- Channel scope spectrum analyser that allows monitoring of 40 channels
- Advanced scanning features: Programmed scan (up to 10 groups) Programmed memory scan
  - Any memory scan
  - Mode scan (not found on many scanners!)
  - VFO search
  - Dual VFO search
  - Band encursion scan
  - Priority scan
  - Any channel ship scan
- Battery save facility
- Facilities for cloning another set
- Built-in 24 hour clock
- Switchable attenuator

ALINCO wideband scanning receivers

£299 95 P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF **£103.31**

DJ-X2000 THE 'INTELLIGENT' SCANNING RECEIVER

- Covers 100kHz - 2,149.99MHz
- 2000 channel memory
- AM/NFM/WFM/LSB/USB/CW auto mode position
- 'Flashtune' reads the frequency of a nearby transmitter and instantly takes your receiver to it
- Transweeper - instantly locates hidden transmitters that may be used for eavesdropping
- Record up to 160 seconds with the digital memory of audio direct from the receiver or voice via the built in microphone
- Descrambler • Channel scope
- Bug detector
- CTCSS decoder built in
- CTCSS - Search facility
- Frequency counter
- Field strength meter • S Meter
- FM Stereo receive
- Two level attenuator
- PC programmable
- 24 hour timer

ALINCO wideband scanning receivers

£499.00 P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF **£169.66**

BPL CELESTE Mk II WordSpace Digital Satellite Radio

Crystal clear digital radio, almost anywhere in the world!

- FM / AM reception
- 10 Preset memories
- Dataport provision
- Stereo Line output socket

£139.00 P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF **£49.66**

summer SCOOPS

Shortwave Radio's Best Kept Secret . . . . until NOW!

WRTH HANDBOOK BEST HF DESIGN 2002 ★★★★

Don't just take our word for it! Check out the user reviews on eHam.net where the Palstar R30 consistently receives the 5 Star Rating! *'Great SWL RX'...'Best I have used!'....'Wow-that audio!'...Amazing Radio - Exceptional Value!'*

PALSTAR R30 Portable Communications Receiver

The R30 is a compact portable high performance shortwave radio *(capable of running from internal batteries or 12V DC)* providing excellent strong signal handling, high sensitivity and dynamic range.

- 100kHz - 30MHz AM, SSB, SW
- 20Hz, 500Hz tuning steps, synthesized *(low phase noise performance)*
- 500Khz up/down
- 45MHz 1st IF, 455 kHz 2nd IF
- RF derived AGC, fast/slow
- 4-pole crystal filter at 45 MHz
- Ceramic filters fitted
- Bandwidth, 4kHz AM and 2.5 kHz SSB
- 6-digit LCD display
- Analog S-Meter
- 100 channel memory
- 5W low distortion full fidelity audio amp
- External soft muting
- Line Audio output
- +18dBm 3rd order intercept
- 455kHz IF output
- Switchable 7 pole input filters
- Power source either: Internal batteries (not included) or 12V DC
- Ultra miniature size 8"(w) x 2.5"(h) x 9"(d)
- Weight: 7 lbs

£449.00 P&P £10

PAY BY CHEQUESPREAD INTEREST FREE! 3 CHEQUES OF **£153.00**

We carry everything the radio enthusiast could possibly want at what we believe are the keenest prices in the UK. If you find something cheaper - tell us!

Now shop 24/7 on our secure website but we always look forward to meeting our customers so come and visit us at our showrooms. As major distributors you get to see the very latest kit, we also have the specialised knowledge to advise you.

NEW

ROBERTS C9950 Programmable Cassette Recorder

- Dual record speed,
- 6 separate timed recordings
- 6 hr recording, C90 cassette
- Voice activated recording, timed voice activated recording, remote switching of other equipment

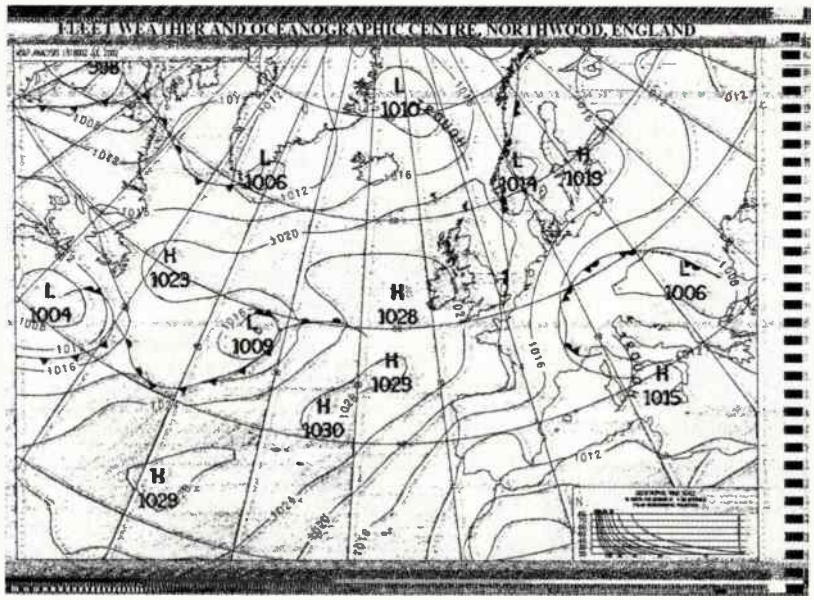
IDEAL FOR THE RADIO ENTHUSIAST **£80.00** P&P £10

THE SITE YOU CAN TRUST — SECURE ONLINE ORDERING

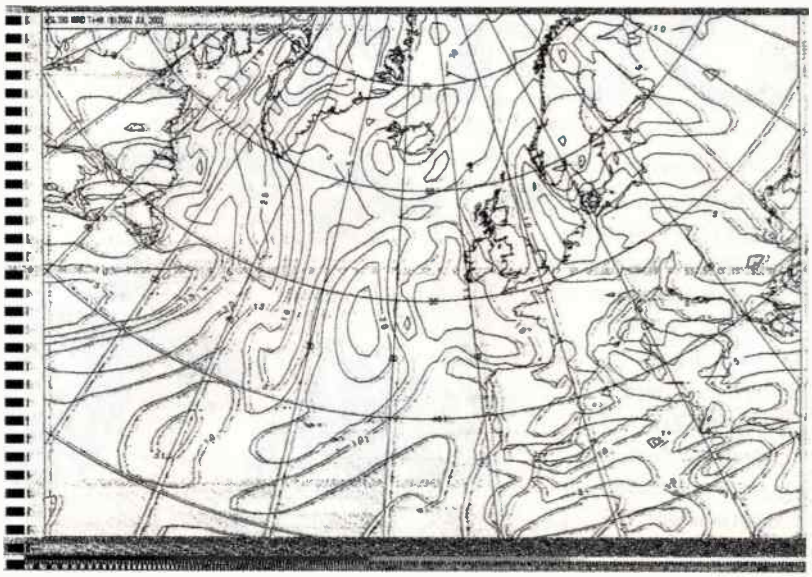
www.nevada.co.uk

how to find us

nevada



● Fig. 4: A smooth isobar plot giving more settled warm weather. Contrast this with Fig. 5.



● Fig. 5: A much busier isobar plot, gives rapid changes of weather over Europe and the western Atlantic.

software but I do not use this at present. Scanners with this capability are a tad more expensive, not to mention the extra cost of the software. So, if you're just starting out you may want to consider this as a later option.

It's also worthwhile recording the voice traffic that you hear. And for this, I use a Roberts C9950 Dual Speed Tape Recorder which can run for up to six hours on a C90 tape and can be programmed to start and stop at up to six different times and is also capable of being voice activated so it will only turn itself on when something comes up on the radio.

When you start listening to voice traffic, in the first instance most may be difficult to understand so, a tape recorder is a good idea. You can record it and play it back until you get the hang of the 'air speak' at your leisure.

Audio Filtering

On h.f. traffic, when the background noise is bad and I'm having difficulty in hearing what is said, I bring in an SSE AAF – 2002 Audio Filter with five individual switches you can set in various positions until the background noise is cut out or reduced. Cheaper than digital filtering (d.s.p.) though not quite as good, but effective enough for your initial requirements.

To answer the question "Just what will I receive?" have a look at **Fig. 2**, which shows a sample of my h.f. logs, and I've taught myself to keep up with the Shanwick Radio Operators. This task is not so difficult as there is a set format to the way the pilots report to Shanwick. Another sheet, **Fig. 3**, is a layout I have designed to make collecting this information easier.

Not all the items on the list are passed with each contact, but by using it allows me to fill in the information and acts as an *aide memoire*. You'll also be able to hear weather reports and company messages passed to and from the aircraft. Once you has the flight number you can obtain departure and destination points from publications such as *Flight Routings* - (the latest version is obtainable from the SWM Book Store).

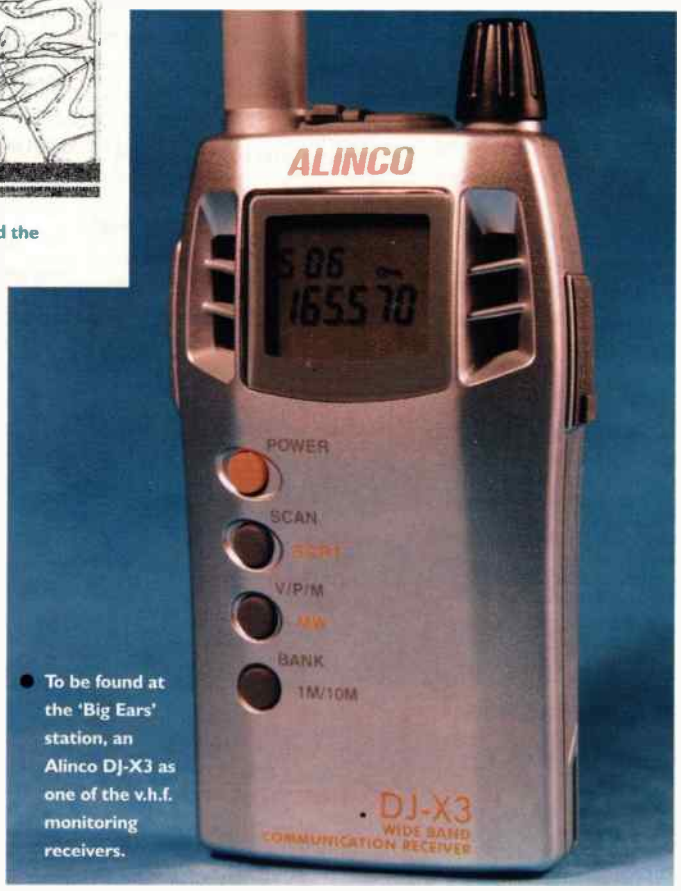
A minor niggle is that *Flight Routings* tends to become a bit out-of-date as the year goes on, due to changes made by airlines. Changes such as changing flight numbers, opening new routes and sometimes for other operational requirements. But nonetheless it's a useful book to have to hand.

From the ACARS information you will be able to see the exact route the aircraft intends to take over 'the pond'. Sometimes, you may find yourself asking "Why, if he is going to Los Angles is he going up over Greenland"? Is the pilot going in the wrong direction?

Of course the pilot hasn't 'taken the wrong turn' he's going by a great circle route to the other side of the world. To understand the great circle routing, get a globe and a piece of string. Using the string, measure the distance between his departure airport, then try to find the shortest direct route over the globe to Los Angeles. Knowing the size of the globe, you can estimate the actual great circle distance.

Then using a large(ish) scale atlas measure, or estimate the direct atlas distance and compare this new distance with the great circle distance. You should see that the distance travelled is shorter by a Great Circle Route.

So, airband listening is a great opportunity to open up another avenue of interest – Navigation. For



● To be found at the 'Big Ears' station, an Alinco DJ-X3 as one of the v.h.f. monitoring receivers.

a full list of ICAO h.f. AREA network frequencies world-wide, the book to have is *Ferrell's Confidential Frequency List*.

Airband

As far as the North Atlantic is concerned airband frequencies will allow you to hear the aircraft getting clearance and its route, height and other information, until it reaches the West Coast of Ireland and changes frequency to h.f. You will soon learn which aircraft you hear are going 'international'. And again, the book *airband Radio* will again help you with frequencies for this.

Digital Mode

As ACARS is a digital mode, it needs to be decoded to make sense of the transmissions. You won't actually hear any speech with ACARS. If you did listen all you'd hear among the noise from the radio with the squelch turned right up is the occasional 'brrrp' which will be translated into a message on your computer screen by the software.

Understanding the decoded ACARS messages, very few of which, are in plain language is difficult at first. Perhaps the best way to start is to look at two sites on the Internet that I have found. One is About ACARS to be found at **www.acarsonline.co.uk/aclink/alabout.htm** which is an overview. The second site is to be found at **www/acarsonline.co.uk/aclink/almsg.htm** which is titled 'Message Labels' and which explains how to interpret some of the more frequently seen message formats.

Some of the received ACARS information is, for instance, from the Flight Data Recorder and it's about things such as engine performance and is just a series of numbers and letters. See **Fig. 1** for examples here of these messages with some idea of their meaning. These were taken from the *Sky Spy* software files and which have been placed into word processor documents to be edited and then printed out.

You'll notice that the aircraft registration is included in the message and with a copy of *Civil Aircraft Markings* an Ian Allan publication, you can find out which aircraft are being used on the route. It is also possible to discover their departure and destination because the messages contain the ICOA Codes for the airports.

A summary of these codes is given in the very useful publications *The Pilots Free Flight Atlas*. I have the copies for Europe and USA, and apart from these codes they contain a wealth of other information of interest to airband listeners. There are also other items such *North Atlantic Route Charts* which you will find useful if you are to understand the ACARS messages. In these messages there are way points that are mentioned, Way points that have some wonderful names such as **Mimku**, **Beano**, **Dando**, etc.

Weather Maps

These can be received and printed out from an h.f. radio via an audio link to the computer using various software packages. I use *JVFAX71*, as I'm used to the set-up and it does a good job for me. There is only one thing to watch out for. If you want to print out weather maps, as shown in **Fig. 4** and **Fig. 5,** from this or any other DOS programs just make sure your printer will print from DOS.

I recently purchased a new printer, which is wonderful while printing from within *Windows*, but it just would not print out from any *MSDOS* program. So, I had to reinstate an ancient Epson dot matrix printer which now does the job.

If you are not well up on weather and would like to know more, I mentioned a book above called *FAX, Satellite and RTTY Weather Reports*, it had a companion book called *Weather Reports from Radio Sources* sadly now out of print. Both of these books, by **Philip C. Mitchell** are worth having if you can get them, they will be of great interest and help you to interpret radio weather maps.

Any Time

So, when should you listen? The answer is any time really, although there are busy times bearing in mind that passengers leave and arrive at a reasonable hour. Even when it is quiet though, there is still likely to be military traffic to and from the US and Canada. Also freight aircraft are in the air at all hours of the day or night. But in general, the busy hours appear to be between 1000 and 1700.

Sometime though you can get help to organise your listening. Royal Naval weather FAX schedules are sent out at about 1415 on Tuesday afternoons. Listening to this transmission means you can plan your times for reception of these bearing in mind what you want to find out.

So, to recap, what I've tried to do with this feature is just to start you off with an idea of what to use, where to go to get it and what you can expect to hear. Which type of transmission you chase is up to you and your particular area of interest. There are so many specialised avenues to many different areas, such as weather and navigation, to explore.

Equally, if you are not interested in the North Atlantic traffic, you can listen for signals from elsewhere. Areas such as the South Atlantic, Middle East, Africa etc. The world really can be your oyster.

You don't need a lot of expensive equipment to start, a reasonable h.f. receiver for oceanic traffic and a v.h.f. scanner are all you really need to begin with. And don't forget that you can dip into this aspect of the listening hobby and see if you like it without giving your bank manager an apoplectic stroke. You may already have most of the equipment you need!

I hope this little piece will help to get you started in this aspect of radio listening that is more than just 'listening'.

SWM

● Using *Airnav* to monitor aircraft flights and information, overlaid over a map of Europe.

● The *Airnav* program can also be used to monitor aircraft around the world, shown here displaying a saved log of several aircraft over the Atlantic heading east.

wonderful

Celebrating 60 years on air in October, the former BBC World Service site and UK VOA relay station recently opened up its doors to two keen radio magazine editors.

Read on to discover more as Kevin Nice tells the tale.

It was an early start on an overcast late June morning, that saw *Practical Wireless* Editor Rob Mannion G3XFD, fighting through the local traffic jams to collect me from home in readiness for our trek northwards to the Shropshire based h.f. broadcast station now owned and run by VT Merlin Communications. Although the postal address is Shropshire, Woofferton actually nestles on the border of Hereford and Shropshire with some of the antennas residing in the former county.

A Day's Adventure

The whole adventure started many months ago when Senior Transmitter Engineer Dave Porter G4OYX invited Rob to visit the station to mark the year's significant event. Rob mentioned the trip and I pointed out that *SWM* readers were likely to be most interested in the site, so I got myself invited too.

As usual when Rob and I share a car journey, the hours of travel flew by. The three hour plus journey from Dorset was over in what seemed like an instant, so engrossing was the conversation. At least we didn't overshoot our destination this time Rob! This was I'm sure, due to the impressive view of the 23 masts which can clearly be seen on the horizon for a fair few miles before arriving at the Woofferton 300 acre site. I never cease to be fascinated by large antenna arrays such as those erected at our destination. Masts that tower 300 feet above your head supporting h.f. beams that offer 18dB of gain are awe inspiring - I could study the beauty of those arrays all day.

On our arrival at reception we were welcomed by the station manager, Barrie Elding and Dave Porter, who quickly reminded us how long the journey had actually taken by offering us lunch. Woofferton, which is a base for a total of 26 staff, though some of that number are roving or assigned to Orfordness in Suffolk, has its own canteen. It was here that he presented the run-down of what the station did and some history of its activities. I was most impressed with the canteen - excellent service indeed and very tasty sandwiches. Part way though our preliminary chat I was spotted by another engineer who'd popped in for lunch, when I say 'I' was spotted, it's more of a case that my Land Rover shirt was spotted. Tony Galvagni, who'd just returned from the VT Merlin MF and DRM site at Orfordness, is like myself, a keen Land Rover owner. So we did the inevitable and drifted off into Land Rover chat for a while, sad I know, but it's much like radio, an addiction.

Following our re-energising lunch, Rob and I were treated to the tour of the main 'sender' hall. Sender is the historical BBC term for h.f. transmitters, a term which has been retained to this day. Other frequency bands utilise transmitters for dispersing radio energy but h.f. broadcasts utilise senders! The use of this term dates back to the 1930s and was employed as its use makes it easy to differentiate between the transmission of programme material and the equipment used to send it.

The Main Hall

Just incredible, that's what went through my mind as we entered the main hall, rows of modulators and senders lined the walls of this impressive space that must be 30 -

- (top left) The feeder switching shed. Banks of pneumatic relays ensure the correct antenna is connected to the sender.
- (top) The twin feeders emerge from the switches.
- (left) Two of the site's substantial towers supporting the considerable load of a curtain array. The switching shed is in the foreground.

- One of the dishes utilised for reception of the satellite feeds, this connect to one of the professional satellite receivers in the control room.

Woofferton

50m in length. Being a utility enthusiast and a radio amateur, the main mode I listen to is s.s.b., but here at this broadcast site, I was reminded quickly that a.m. is the mode of the day. The need for high power modulators was brought home with a jolt. Since the nominal power output of each sender is 250kW of r.f., then, as those of you familiar with a.m. techniques will know, you need about 180kW of audio to achieve 100% modulation. As a result, there are some mighty powerful audio amplifiers in the main hall at Woofferton. Powerful they may be, but they are very simple but effective designs.

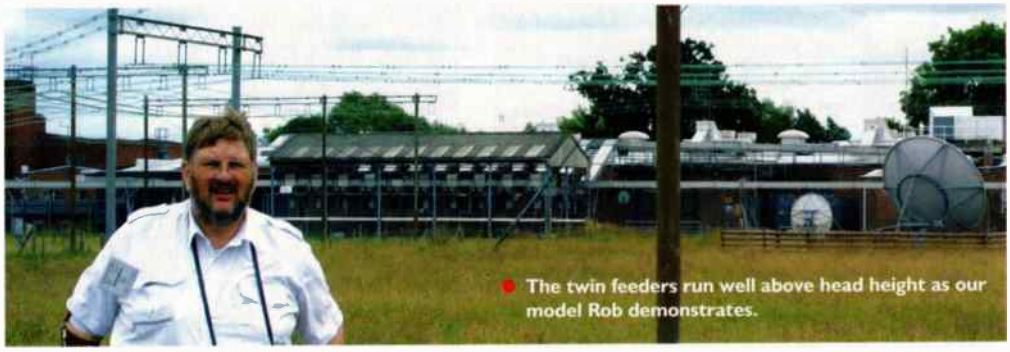
The thing that strikes you about the whole Woofferton site is the scale of the components used. I remember quite clearly some 30 odd years ago, peering into a Heathkit DX-40 amateur band a.m. transmitter owned by the late G3UNR and thinking how complex it was, but once the major functional blocks had been identified then the apparent complexity evaporated. The Marconi senders are essentially the same as the Heathkit

● The back of the satellite dish collection on the main building beyond.

● (far left) This is 328 feet high. I fancied climbing that!

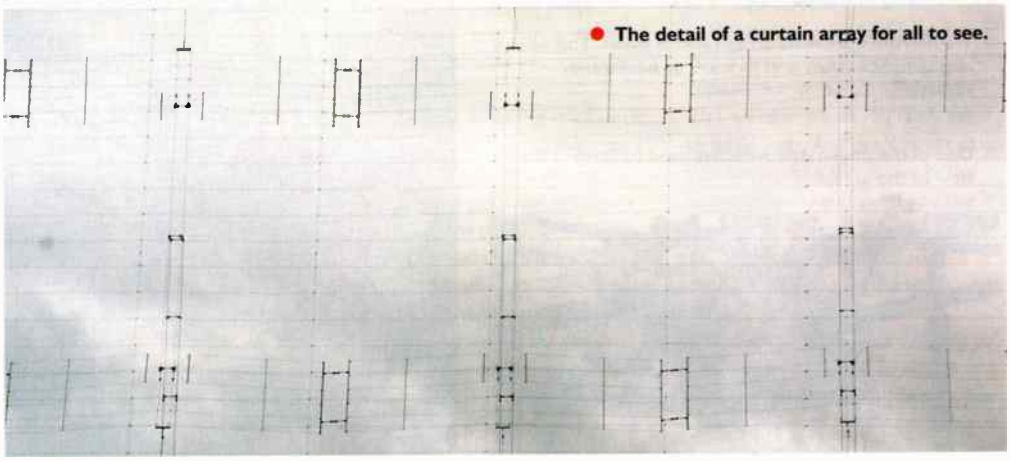
● (left) The substantial anchor point for a main tower guy wire. Most of use would be happy with that much concrete as a main mast base!

● (right) More suspended wire.



● The twin feeders run well above head height as our model Rob demonstrates.

● Just who is photographing who?



● The detail of a curtain array for all to see.

transmitter. The difference in size is mind-blowing though. Dave took Rob and I into the interlock protected modulation enclosure to the rear of the sender and modulator pair that make up 'Sender 94'. After disabling the CO2 protection and then checking with an 'Earthing Wand' in UK, ['Shorting Stick' in USA] that there were no stored dc voltages lurking to harm the three of us, we manoeuvred our way around the room which contained the power supply for the 300kW units. The smell of hot transformer oil pervaded the enclosed space, the whole room was rather reminiscent of an electricity sub-station.

Two rather significant mains transformers live in here as does the approximately two metre cube modulation transformer. Additionally, there is an even larger audio choke - now there's an understatement, as I consider an modulation choke to be something that measures a few centimetres in length, this one needs a crane to move it! This particular choke is utilised to apply the modulation to the PA in the sender. The canny engineers at Marconi wanted to avoid having to run up to 30A of anode current through the modulation transformer secondary winding so came up with a cunning use of both the choke to supply the d.c. h.t. and a bypass capacitor of 21υF 11000V for the audio and use a much smaller (cheaper and more reliable) mod transformer. This design expertise has clearly paid off as the senders 91 to 96 are all BD272 types which were installed in 1964 and still performing a sterling job 39 years later. Some of the senders are fitted with modulator valves that were installed in the mid 1980's, these have completed over 65,000 hours!

Whilst mentioning valves, I was amazed that the audio driver stage of this Marconi BD272 uses four 813's, a valve well known in amateur circles, truly incredible!

I kept being struck by the scale of this whole operation, everything seemed strangely familier, just bigger. For instance, when switching bands and Dave tells me that it's possible to shift from 6 to 21MHz in less than 15 minutes with two engineers working on the task, the driver, PA and antenna coupling 'coils' need to be changed and the sender has to be retuned. I say coils, but the plug-in inductors are actually formed tube-work of about 25 to 30mm bore. These inductor sets are no mean feat in themselves and were constructed by brass musical instrument maker Boosey and Hawkes. So, next time you see an orchestra play, you can admire the very same craftsmanship that is utilised in the Woofferton senders.

Antennas

Next we moved outside to the field installed with grazing sheep to maintain trim grass. There are a total of twenty three guyed lattice masts at the Woofferton site comprising many tonnes of steel, some punch as high as 100m (328ft) into the air, an extremely impressive sight indeed. The masts are cleverly positioned to allow the antenna arrays rigged between them to achieved the headings needed to fire the station's output at the chosen target areas. The arrays themselves are, dependent on type, steerable. By steerable, I should say, to be correct, they can be slewed.

Since the antennas at Woofferton, in common with those at many h.f. broadcast sites around the world, are 'curtain arrays' they can be steered electrically by tens of degrees. As the arrays can be used to beam either forwards or backwards this slewing arrangement is very effective indeed and allows pin point accuracy for pointing the senders transmission into the target area.

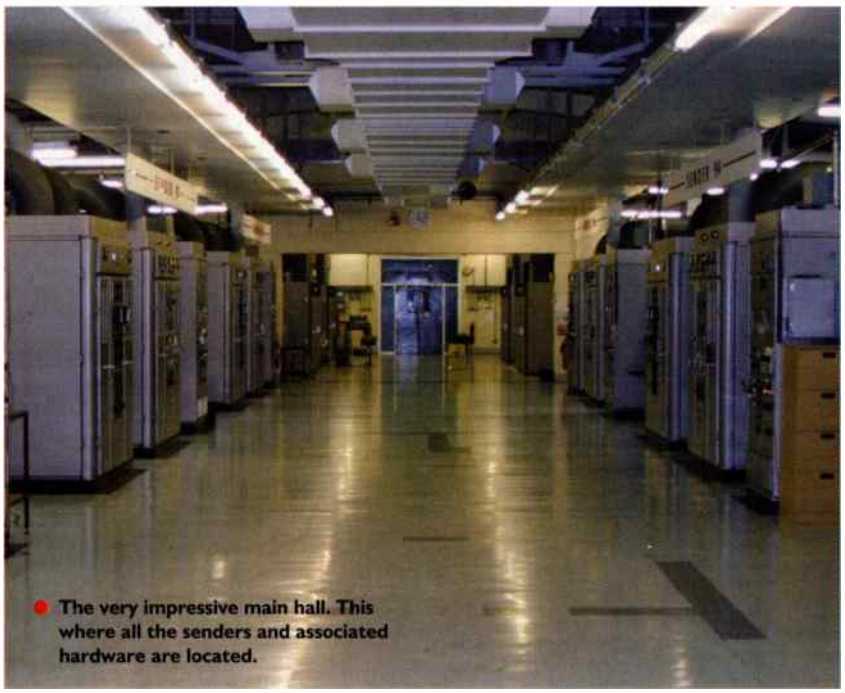
All this is achieved due to the construction of the arrays. At first encounter, it all seems very complicated, with yet again the scale of everything being rather

Woofferton's antenna array control panel. This allows adjustment of slew and forward or backwards radiation.

(top) The delay sections that are switched in and out to create the slew effect.

(left) Sender control panel.

One of the pneumatic switches used to control the slew of the array.



The very impressive main hall. This where all the senders and associated hardware are located.

intimidating. In essence though, the whole concept is pretty straightforward. Each of the arrays comprises of full-wave dipoles, typically these are stacked in two columns, four high by two deep. Thus an array has a total of sixteen active elements spaced in an appropriate manner. All the elements are driven and phased in such a way as to allow the radiated power to constructively combine to form a high gain antenna that fires backward or forwards and with differing take-off angle. It is just possible to see the construction of the array in the photos I took during our visit. The wires would have appeared clearer if there had been less cloud, however you can make out how it all connects if you study carefully.

The feeders, which are 320Ω balanced open type, run all the way from the push-pull output stages of the senders, via harmonic filters then along elevated poles via switching stations in the antenna field to the arrays, are twisted as the ascend up the stack of dipoles this is clear to see and allows you to see where the driven elements are in the mass of antenna and support wires.

What you can't see in the antenna pictures, is the means by which the beam is slewed. This electronic turning is achieved by adding critical lengths of feeder into either the left of right side stack of dipoles. This has the effect of delaying the wave fronts and produced the equivalent action to physically turning the whole array. I've included a picture of the pneumatic switching unit which is responsible for adding the delay lines which produce the slewing effect. Compressed air is used all around the antenna field to route the sender output to the chosen array. Its use is no doubt related to the high electrical field strength which exists around the antennas. As we were walking around the site in the secured area Dave carried a field strength meter at all times - this indicated at just a few points up to 60V/m! So the station was on air at the time. A reading of 60V/m is the maximum level to which station staff are allowed to be exposed. Any higher and they cannot enter the area. Though this is a recently [late 1980's] revised figure, the former limit being 200V/m. With high levels such as this I doubt that any electrically based feeder switching system would prove to be totally reliable. This high field strength is the reason why those fitted with a heart pacemaker or metal bone implants are advised to stay away - you should note that there is no such warning regarding avoiding mobile 'phone output.

There are several different types of array aloft in the Woofferton antenna field, single band, dual band and four band types. The four band antennas can be slewed by up to ±30° whereas the single and dual band arrays are slewable up to ±12°. This steering ability allows the programme being transmitted to have its main signal beam targeted accurately enough to arrive in one country rather than its neighbour.

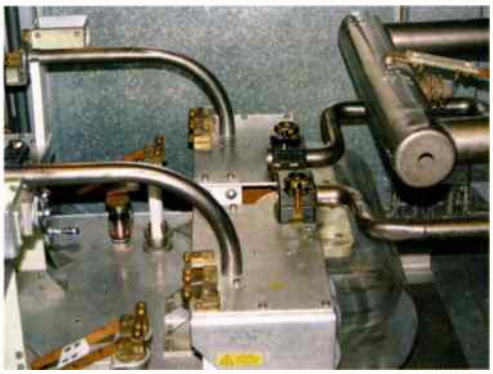
Unusually for an HF station in UK there is an MF station on site as well. BBC Hereford and Worcester have a 250W, [NOT 250kW!] emrp relay on 1584kHz. The MF vertical wire antenna is slung from 'W' mast on the NE extremity of the site

This transmitter is looked after by Crown Castle, the BBC's domestic services provider!.

Rigging

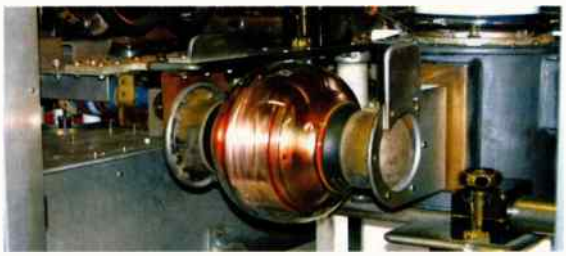
With the many kilometres of wire in the sky at Woofferton, I suspect that the team of riggers located on site have a pretty busy time. Dave commented that there is a very real need for urgency should any antenna wires suffer any damage due to ageing or the effects of the wind or ice build-up. This is quite understandable when you've got millions of listeners world-wide awaiting their favourite short wave programme to air. As I understand

● **Antenna coupling is achieved by an antenna coil, mounted on servo driven plate, that moves in and out of engagement with the PA coil on the right.**

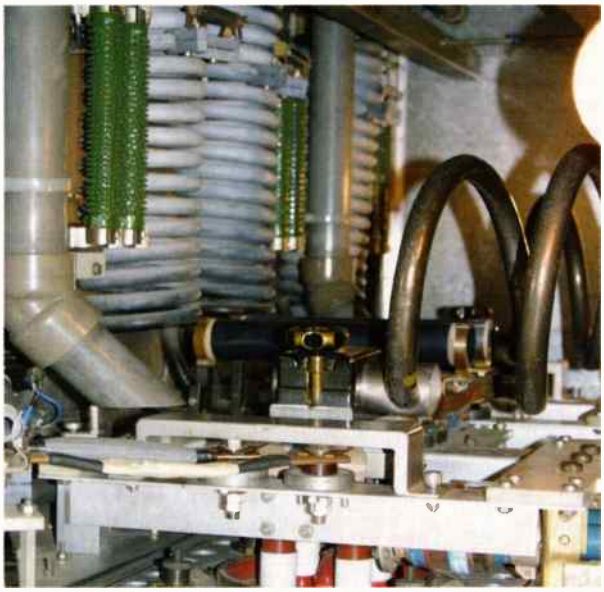


● **(above) A PA valve the evaporator cooling arrangement can be seen at the left-hand edge of the picture.**

● **Inside of one of the 1964 Marconi senders, you don't often see capacitors like that.**



● **Driver stage inductors. Note the parasitic stopping resistors on the upper section of the coils on the left and the band change clamp in the centre of the picture. Releasing this allows the horizontal coil on the right to be changed. The plastic waste pipe on the left is used to provide forced air cooling.**



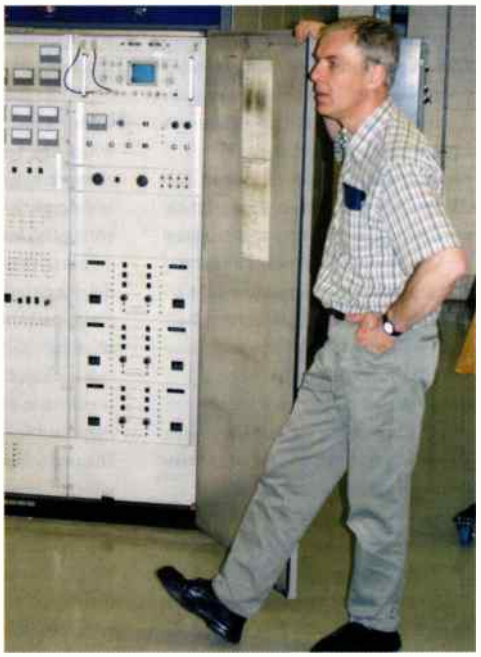
● **Sender 93's modulator.**

● Guess what Dave's callsign is.

● Also in the car park, nice one Tony. Radio and Land Rovers, what a brilliant combination.

● Sender 83, the much more recent Marconi sender - type B6124.

● Our host for the wonderful Woofferton day out, Dave Porter Senior Transmission Engineer.



it, the highly professional VT Merlin rigging team recently impressed the MoD with their efficiency, when, at a recently won VT Merlin military contract h.f. site, they completed the work required in a fraction of the former response time. Good news indeed and proof that commercial organisations can provide benefits to the Taxpayer.

Electricity Bill

Whilst we were on our way back into the main station building and passing Woofferton's very own mains electricity substation, it occurred to me that the station is a big user of said supply. The answer to my enquiry of just how much produced the answer that the electricity bill amounts to about £40,000 per month - phew! With a requirement for six Megawatts of electricity the provision of standby generating plant is uneconomic so arrangements are made to supply the substation at 66kV from two separate routes by the local supply authority.

In Control

Having toured the main hall and the antenna field the other main area remaining was the Control room, here the programme feeds which can arrive via land lines (ISDN/ATM) or more usually satellite, as the dishes on the edge of the antenna field show, are processed and routed to the appropriate sender. The output of the sender is then fed to the appropriate antenna which is selected based on frequency and target area. The antenna slew is also set in the control room. Woofferton, is as mentioned earlier, a part of VT Merlin's world-wide h.f. network and as such relays a wide variety of programmes for many of the world's international broadcasters. The majority of the station's output is for the BBC, but there is plenty of capacity to serve their other customers such as NHK (Radio Japan), Radio Free Europe/Radio Liberty, Radio Canada International and the Voice of America. I was very interested to learn that it is a quite common occurrence for the station to swop output with other non-company relay stations, e.g. Radio Netherlands, to cater for maintenance and breakdowns. All this is of course, undetectable to the casual listener, though it would obviously show up if they were to d.f. the signal being received.

Checking just where your favourite programme is coming from could prove to be a hobby within a hobby! One thing that did take me by surprise was the discovery that although the programme sources for broadcasting are studio feeds, the continuity announcements can be pre-recorded material played to air from Woofferton control room. We discovered this as our mini-tour of the feed and antenna racks in a room off of the main control room coincided with a programme change. The result was a mildly worried member of the Woofferton team as he contemplated our impeding his insertion of the correct MiniDisc for the announcement. I'm sorry we got in the way!

Whilst amongst the equipment racks, which as you can see in the photos, house panels for feeds, senders antenna arrays and so on. We noticed a tall rack containing ten Orban 'Optimod HF' processors. This is the broadcast industry standard audio compression system. I was under the impression that the processing was done at the studio end of things an therefore puzzled to see it at a transmitting station. After a quick demonstration of the audio characteristics of some of the feeds, both before and after the application of the 'C2F' process I now understand the use of the unit prior to the modulator input stage.

Frequency Management & Planning

Our last port of call on this busy whirl-wind tour of Woofferton was the Shropshire arm of VT Merlin's Frequency Management and Planning section. Andy Rook who is based at Woofferton treated us to an insight in to the many activities under taken by the Scheduling and Frequency Management section.

This is an area of the company which appears fascinating and is worthy of further investigation our brief chat with Andy although most informative, didn't really give me opportunity to discover all the facets of the Departments functions and responsibilities. I will report in more detail soon.

The short session that was possible revealed some very interesting discussions and demonstration of the tools used for forecasting best path/frequency and time for transmissions into distant target zones. The tool used provided graphical representation of the energy beam from Woofferton's antenna and the resulting coverage on the ground at the target end. Most enlightening was the demonstration of the use of oceans for bouncing the beam to create double-hop propagation.

The effect of tiny amounts of antenna slew were also plain to see.

Grateful Thanks

I very much appreciate the opportunity to visit the Woofferton transmitting site and would like to extend my thanks to all the staff and management who made possible such a wonderful visit. Rob and I appreciate the time taken from a busy working day for most people we met. Dave Porter looked after use on his day off. Special thanks to you Dave. I will be bringing further reports on similar sites in the future. **SWM**

What and where is Woofferton?

The Woofferton short wave broadcast site is one of the three former BBC owned UK sites for transmitting the World Service around the globe. The others are Skelton located in the Cumbria just north of the B5305 and Rampisham in Dorset just south of the A356 near Dorchester. You really can't miss them if you drive past the area as the large number of lattice towers are very prominent features. For that matter, they stand out on the map too.

A Word From Woofferton's Owners

VT Merlin Communications, part of VT Group plc, is a leading critical communications company providing world-wide communications services and innovative technical solutions to customers in the broadcast, defence, space communications, IT, emergency services and security sectors. They provide services in over 100 countries from 23 key strategic locations around the world. Currently VT Merlin Communications operate within two core business areas:

Critical Communications - The range of critical communications services include the design, build, operation and maintenance of technical communications facilities and infrastructure world-wide. They also offer a proven track record in delivering communications vehicle engineering and conversion services for all types of military and commercial vehicles, providing customers with a complete engineering solution from design to manufacture, installation, assembly and testing. There IT and network services include the design and installation of IT systems, networks and hardware, specialist electrical and satcomms installations. We provide these services to customers including BBC World Service, the UK Ministry of Defence, European Space Agency (ESA), QinetiQ, GCHQ and other public sector organisations.

Broadcast Services - Operating the world's leading commercial short wave network, VT Merlin delivers over 1000 hours of both short and medium wave every day for international and religious broadcasters world-wide. They currently deliver broadcast services to our customers from 15 strategically located transmission facilities and broker services from a further 45 sites through established relationships with other major broadcasters around the world. Transmission customers include BBC World Service, NHK (Radio Japan), Australian Broadcasting Corporation, Radio Canada International and Voice of America. VT Merlin also has extensive experience in the design, build, operation and maintenance of radio broadcast facilities and networks world-wide. VT Merlin is a founder member of Digital Radio Mondiale (DRM) a consortium committed to delivering a world-wide initiative to bring digital a.m. to the marketplace. The digital technical standard developed by DRM will see VT Merlin deliver near f.m. quality broadcast and data services to its short and medium wave customers. VT Merlin (formerly Merlin Communications International) was created in 1997 through a management and employee buyout (MEBO) from BBC World Service, following the UK Government's decision to privatise the BBC 's transmission network. In December 2001, the company was acquired by Vosper Thornycroft PLC (now VT Group plc). The company was then re-branded VT Merlin Communications in August 2002 as part of the groups re-branding strategy.

New Enthusiasts Digital Sat Receiver

Roger Bunney has news of a brand new digital satellite receiver that brings full search facilities to the news feed hobbyist - the Coship CDVB3188C.

Last month I trailed news of a soon-to-arrive 'enthusiast's' satellite receiver, made in China with specifications suited for sat-hunting.

Well, it's arrived and we certainly have a receiver worthy of any enthusiast's 'shack', particularly if he has a tracking Clarke Belt dish. The Coship CDVB3188C visually resembles any other standard satellite receiver, a bland silver case, a single l.c.d. escutcheon, a row of small buttons and nothing else! The rear is equally bland, no SCART sockets, no modulator, only phono sockets. **But**, this receiver features something that no other receiver offers, **Blind Search**! This menu accessed facility allows the user to set a low Ku-band frequency - say 10.950GHz, then a high Ku-band frequency - e.g.11.350GHz. Select a polarity either vertical or horizontal and a tuning i.f. bandwidth e.g. wide, (mine counts up in 3MHz steps) or narrow (unknown bandwidth) and push 'OK', the receiver then tunes, or rather scans on its own. Each time a signal is discovered the tuning panel displays the signal strength and the signal parameters such as frequency, symbol rate, etc. are shown on the menu listing. The receiver then commits each signal eventually to memory.

The all important Coship 'Blind Search' scanning screen.

The 'Blind Search' feature enables the satellite spectrum to be 'scanned', signals found are listed on the Blind Search menu and all parameters are recorded (other than FEC), the receiver in effect tunes and finds out all digital parameters, you just tell the machine what to tune and the receiver does the rest!

Front and rear views of the Coship satellite receiver series.

Low signal threshold is better than my RSDs, The Coship CDVB3188C is very cool running but the main advantage is that most tuning operations on the infra red remote are now unecessary. 'Using the set of DXing' has improved the activity considerably and has changed the whole concept of signal hunting! The Nokias with DVB2000, much favoured and commanding high prices, are consigned to the museum, Sat-DXing has moved into the 21st century!

The upside - for once I can recommend unreservedly this realistically priced receiver for satellite 'TV-DXers', based on my four weeks testing.

The downside - my Coship is the MkI version, it has no r.f. modulator, no SCART sockets and basically is an NTSC defaulting machine (525 lines, 60Hz) though the format does change to PAL (625 lines, 50Hz) as soon as an appropriate signal is received. My Coship receiver was imported via the USA and even with air freight, the total cost was a reasonable £125, which makes it a cheapish receiver - however, I understand that the main processor chip stocks are now exhausted and the MkI receiver is discontinued pending the arrival of new processor chips.

The new improved Coship (MkII which has the working model number ST-3600) hopefully will be available later this year, I understand that this new version will also be without SCART connectors, but it will have more memory and an on-board v.h.f./u.h.f. modulator. The price for the new unit hasn't been announced until a UK importer/European distributor is organised by the Asian manufacturer to ship directly into the UK to avoid Asia-USA, USA-UK dual shipping charges. I'll advise readers full details of the UK price and outlet once known. The new set is due to be available in the Autumn.

■ GRAHAM TANNER, 64 ATTLEE ROAD, HAYES, MIDDLESEX UB4 9JE
■ E-MAIL: ssb.utils@pwpublishing.ltd.uk

SSB Utilities

Shuttle News

The next Space Shuttle launch plans have been announced by NASA, following the Columbia tragedy earlier in 2003. According to NASA, flights could resume in December and they are quoting December 18 as a 'working date' for the return to flight for the Shuttle fleet, although most experts think that early 2004 is a more likely date. Some new plans and procedures have also been agreed for future flights and these will make launches more interesting for European listeners.

It has been decided by NASA that all future Shuttle flights will be restricted to lift-off during daylight hours only (US time), and that they will also limit the type of orbits it can reach. The launch restriction is quite good news for European listeners as even though a Shuttle launch is planned for a specific time, there is actually a 'window' where the launch must occur for the mission to reach its objectives.

International Space Station (ISS) missions usually have a short five minute launch window, but other missions can have as much as two hours. For the launch to take place during daylight the entire launch window must be in daylight, in case there are any last-minute delays. This means that launches are unlikely to take place much after 2000 in Florida - but this is either midnight or 0100 in Europe, so a late (in the day) launch means that the Shuttle will pass over Europe (and be heard by European listeners) during the late evening. If the sky is clear it will be possible to see the Shuttle pass over the UK and much of Europe. Launches which occur earlier in the day will still be heard, but may not necessarily be visible.

It's also been announced by NASA that almost all future Shuttle flights will operate in orbits which allow docking with the *ISS*, allowing them to use the *ISS* as a refuge if there were problems with the Shuttle. This is also quite good news for UK listeners (and viewers), as this requirement limits the launch window, and also forces the orbital inclination so that the Shuttle will pass over the UK immediately following its launch and then several times a day while it is in orbit.

There is one exception however, during 2004 there is scheduled to be a trip to the Hubble Space Telescope (HST), and this requires an orbit from which the Shuttle is unable to reach (and dock with) the *ISS*. There's a possibility of having a second ground-based Space Shuttle on standby, ready to launch, in case there are problems during the HST mission. This is only being considered as an option as the moment, as it would be very difficult to achieve operationally.

From a 'listeners' perspective, it's good news to hear that NASA has plans for resuming Shuttle flights. Although it's not possible to hear the Shuttle itself on the h.f. bands, there are many other ships and aircraft associated with a Shuttle launch which can be heard. According to the information from various NASA websites, the next six launches are all *ISS* missions, but this was based upon launches occurring throughout 2003. Plans will now have to be changed to accommodate the HST mission during 2004. I, for one, look forward to seeing and hearing the Space Shuttle again.

Trans-Atlantic Balloon

In 'Communiqué' *SWM* July 2003 details were published of the attempt to cross the Atlantic by an open-basket *Roziére* balloon. **David Hempleman-Adams** planned an ambitious flight from west to east, and like all balloon flights, it was dependant upon good weather. Since the launch of the flight could not be predicted much more than a few days in advance, it was not possible to notify readers of when to listen, other than to suggest they keep a watch on the mission's website (see Web Watch panel).

By now, almost everyone will be aware that the flight has already taken place, and most listeners will have missed it because it was over so quickly. The balloon did not make an 'appearance' on the h.f. bands as the flight was terminated early. The balloon didn't even manage to get over the Atlantic, but made a landing in a field in Massachusetts, after just a few hours. It launched from a field near Pittsburgh and landed just under 31 hours later.

There was plenty of media coverage for the flight, which prompted many questions on the *SWM_Readers* list on the Internet asking if it was possible to hear the balloon, and which frequencies to monitor. The item mentioned in 'Communiqué' was an incorrect frequency for its oceanic ATC communications – had the flight managed to get much further it would have been using **5.649MHz**. In fact, as the balloon is registered in the UK, it would have been using the 'east of 30°W' family of frequencies, so it would have been using one of 2.872, 5.649, 8.879 or 11.336MHz. These frequencies are the 'NAT-C' family, and the frequency in use each day depends upon propagation, weather and the number of flights.

Across the western part of the Atlantic the balloon would be talking to Gander Radio, and when it crossed 30°W it would transfer to Shanwick. There is a chance that the balloon might have taken a more southerly track, which would have meant a different set of frequencies. This would be a very interesting flight to track in *Airnav* or other tracking program, with the flight taking many days to move across the screen instead of the more usual few hours.

I don't think that there will be any more attempts this year, however Mr Hempleman-Adams is a very resilient and resourceful person, and I fully expect to hear about a further attempt next year.

Qinetic Balloon

Another balloon flight which has been in the news recently is the 'Qinetic 1' flight which is attempting to break the world record height for a balloon. This flight requires some very specific weather conditions to launch, and those conditions did not occur during 2002, so now they are waiting and hoping for a chance in 2003. The balloon is a specially constructed *Roziére* balloon, which will be about the height of the Empire State Building (if the website is to be believed, see Web Watch panel) once inflated. It is planned to launch from either Cornwall in the south-west of England or (more likely) from a ship somewhere in the south-western approaches. The exact launch location and date are uncertain because they have to wait for favourable weather conditions.

By planning to launch from a ship at sea the Qinetic team can move to a suitable area with the correct conditions, instead of waiting for the conditions to come to them if they attempt a land-based launch. There are two pilots who will be riding in the pressurized gondola beneath the balloon. The flight is expected to take less than a day, and they will need to be in contact with the civilian ATC agencies, and possibly also the oceanic ACC at Shanwick. For such a short flight, there will only be limited chances to hear the flight, and probably the most that anyone will hear about the flight (on h.f. or airband) will be warnings to another aircraft to avoid the flight.

As with the Atlantic Challenge flight by David Hempleman-Adams, this flight may need to contact Shanwick OACC, so the same set of frequencies should be monitored while the flight takes place.

Web Watch

Atlantic Challenge Balloon
http://explorers.org/newsfiles/archivefiles/hempleman-balloon.php

www.bankofireland.ie/2003specialolympics/atlanticchallenge/index.html

Qinetic1 Balloon
www.qinetiq1.com/content/index.html

RADIOWORLD

Model	Description	£ RRP inc VAT
AOR		
 AR5000		
AR5000	High performance full featured wide band all mode base receiver 10kHz - 2600 Mhz. IF selection as standard 220kHz, 110kHz, 30kHz, 15kHz, 6kHz, 3kHz (500Hz optional). Supplied with mains power supply.	**£1345.00**
AR5000+3	High performance base receiver with three enhanced options factory fitted: noise blanker, synchronous AM, automatic frequency control.	**£1499.00**
 AR3000A		
AR3000A	Unique all mode extremely wide band base-mobile receiver 100kHz - 2036mhz with no gaps. RS232 port fitted.	**£699.00**
AR3000A +(plus)	Customised AR3000A with switchable narrow SM & SAT filters, Tape relay, SDU ready and discriminator output.	**£799.00**
AR8200 MkIII 3	New advanced wide band all mode hand-held receiver with enhanced microprocessor facilities, slot card options available, multi-function display.	**£365.00**
ICOM		
 PCR1000		
ICOM R5	0.1300mhz Handie. Fits in the palm of your hand. AM/FM, FM Narrow - 450 memory channels. Comes with nicads & charger.	**£159.00**
IC R8500	100kHz - 2GHz Continuous. All mode no gaps.1000 Memories. 4IF band widths. Excellent all round for the professional listener	**£1179.00**
IC-R75E	0-60MHz. High Stability receiver circuit 100 DB Dynamic range. Twin bandpass Tuning. Optional digital processor. Best selling receiver	**£599.00**

YAESU VR-5000

£549.00

IC-PCR1000 & PCR 100 ICOM PCR1000 - 0-1300mhz. All modes. Computer driven. On screen programming. Band scope. Instant band scope access via mouse. List of features, call for brochure.
PCR 1000 £329.00 + XP software inclusive
PCR 100 £229.00 (SAME SPEC WITHOUT SSB)

UNIDEN

UBC-60-2XLT

UBC-120-XLT

UBC-220-XLT

UBC-280-XLT

UBC-3000-XLT

UBC-278-CLT

UBC-780-XLT

UBC-60-2XLT	£74.95
UBC-120-XLT	£119.00
UBC-220-XLT	£145.00
UBC-280-XLT	£169.00
UBC-3000-XLT	£179.00
UBC-278-CLT	£149.00
UBC-780-XLT	£299.00

GRE

PSR-255
26-[illegible], 68-88, 137-174, [illegible]-512MHz
£84.95

PSR-216
£119.95

PSR-214
£84.95

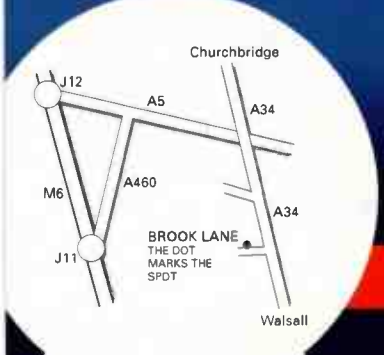
PSR-225
£249.95

MAYCOM

66-174MHz and 420-47MHz
FR-100 .....£99.95

TRIDENT

100kHz-2149MHz
TRX-200.....£199.95



We accept all major plastic!!! VISA SWITCH There is NO CHA

42 Brook Lane, Great Wyrley, Walsall, West Midlands WS6 6BQ
Phone: 01922 414796 Fax: 01922 417829
E-mail: sales@radioworld.co.uk Web: www.radioworld.co.uk

E&OE

YUPITERU

YUPITERU MVT 9000 EU

Yupiteru's flagship model, with a range exceeding 2000mhz, a real time bandscope.

- 531 kHz - 2039 Mhz
- 1000 memory channels
- All modes: W-FM, FM, N-AM, AM, LSB, USB, CW
- Multiple scanning steps 50Hz - 125kHz
- Alpha numeric display
- Band scope with marker function for direct access to displayed frequencies
- Duplex receive capability - hear split frequency signals easily with VFOs
- 20 search bands
- Fast tune facility gives 10 times function for quick tuning
- Built-in ferrite rod antenna for AM broadcast reception
- OP90 Soft Case

£329.00

YUPITERU MVT 3300EU

An exciting new handheld packed with features - but at a price you can afford! The receiver has "breathtaking performance" ensuring this set is destined to be a number one seller

£159.95

- FREQUENCY
  66 - 88MHz
  108 -170MHz
  300 - 470MHz
  806 - 1000MHz
- MODES: AM/NFM
- STEPS: 5, 6.25, 10, 12.5, 25kHz
- MEMORIES: 200
- BAND MEMORIES: 10 (user re-programmable)
- PRIORITY CHANNELS: 10
- SCAN/SEARCH SPEED: 30 per sec
- POWER: Requires 4 x AA batteries
- SUPPLIED WITH: Antenna, Earpiece, Carrying Strap and built-in Desk Stand

YUPITERU MVT 7100 EU

Probably the most popular high end scanner. It's easy to use and can receive just about anything going!

- 530kHz - 1650mhz
- AM/FM/WFM/SSB/CW
- 1000 Memories
- C/W N/Cads & charger
- OP51 Soft Case £17.95 + £2 p&p

£199.00

GARMIN GPS11

RWP **£325.00**

Moving map features basemap, built-in European, African and Middle East to 20mi; includes lakes, rivers, cities, railways, coastlines, motorways and roads. Uploadable CD ROM, detailed map data available from MapSource CDs.

GARMIN STREET PILOT DELUXE

£849.00

Built-in international map contains motorways, major roads, lakes, rivers, streams, airports, cities, towns, coastlines, motorway exits plus waypoints.

GARMIN GPS12

RWP **£149.00**

The Garmin GPS12 series products are as rugged as GPS gets. Military-tough construction and waterproof cases make these units ideal companions for any outdoor adventure. All feature a 12 channel receiver that locks onto stellites fase and stays locked on, even under extreme conditions. These units may be tough on the outside, but their operations are easy and logical.

BEARCAT UBC-780XLT TRUNCKTRACKER

£299.00

Freq 25 - 1300MHz
500 Channels
Modes AM, FM, WFM Trunktracker
Alpha Tagging
With UK mains adapter, Telescopic aerial.

AOR AR8600 MKII

All mode, wideband desktop scanner
530KHz - 2040MHz. Additional slot cards
PC Control. 1000 memories

£649.00 **Exculding power supply**

ICOM £369.00

ICOM IC-R3

The only scanner with built-in TV!

- PACKED FULL OF FEATURES
- Excellent for surveilance

Grundig satellite 600 Milenium

£549.00

- 0-30MHz
- HF receiver
- Airband
- VHF
- Large easy to use base/portable
- Suitable for all ages

ROBERTS

ROBERTS R-809

Multi-band digital PLL preset stereo world radio.

£79.99

- High specification, easy to use
- 54 preset stations
- 5 tuning methods
- LCD display for all important functions
- Dual time display
- Standby function
- Clock/alarm
- Snooze function
- Adjustable 59 minute sleep timer
- Power supply battery (6V power)
- FM stereo on external socket
- 3.5mm stereo headphone socket
- AM wide-narrow filter
- MW switched tuning steps

USED EQUIPMENT

MAKE	MODEL	PRICE
ALINCO	DJ-X10 WIDE BAND RECEIVER	£275
ALINCO	DJ-X2000 SCANNER	£375
ALINCO	DJ-X3 SCANNER	£99
ALINCO	DJ-X2 HANDHELD SCANNER	£99
AOR	AR-2800 SCANNER	£140
AOR	AR-3000 WIDE RECEIVER	£450
AOR	AR-3000A WIDE RECEIVER	£475
AOR	AR-3030 HF RECEIVER	£399
AOR	AR-5000 TOP CLASS RECEIVER	£999
AOR	AR-7030 TOP RECEIVER	£550
AOR	AR-8000 WIDE BAND RECEIVER	£199
AOR	AR-8200 WIDE BAND RECEIVER	£230
AOR	AR-8200mkII WIDE BAND SCANNER	£275
DRAKE	SW-2 RECEIVER	£275
DRAKE	SW-8 WORLD BAND RECEIVER	£375
FAIRHAVEN	RD-500 WIDE BAND RECEIVER	£575
GRUNDIG	SAT-800 SATELITE 800 MILLENIUM	£400
ICOM	IC-R9000 TOP CLASS COMMUNICATIONS RECEIVER	£2,995
ICOM	IC-PCR100 COMPUTER SCANNER	£175
ICOM	IC-R2 HANDY SCANNER	£99
ICOM	IC-R7000 RECEIVER MINT! CONDITION	£550
ICOM	IC-R71E RECEIVER	£325
ICOM	IC-R72 RECEIVER	£399
ICOM	IC-R75 HF / 6m RECEIVER	£475
ICOM	IC-R8500 WIDEBAND RECEIVER	£899
JRC	NRD-345 RECEIVER	£299
JRC	NRD-535 HF RECEIVER	£600
KENWOOD	R-2000 RECEIVER	£225
KENWOOD	R-5000 RECEIVER	£499
KENWOOD	R-5000 RECEIVER + CONVERTER	£600
KENWOOD	R-600 RECEIVER	£175
REALISTIC	PRO 2042 1000 CHANNEL SCANNER	£175
SANGAEN	ATS-909 WORLD BAND RECEIVER	£130
TARGET	HF-3S RECEIVER	£99
TRIO	R-2000 RECEIVER + CONVERTER	£300
TRIO	R-1000 AC HF RECEIVER	£120
YAESU	FRG-100 HF RECEIVER	£300
YAESU	FRG-7700 HF RECEIVER	£220
YAESU	FRG-8800 RECEIVER	£285
YAESU	FRG-8800 RECEIVER INCLUDES CONVERTER	£399
YAESU	FRG-9600 RECEIVER	£200
YAESU	VR-120 RECEIVER FM /WFM/AM	£99
YAESU	VR-5000 TOP RANGE SCANNER RECEIVER	£450
YAESU	VR-500 HANDHELD SCANNER	£149
YUPITERU	MVT-225 AIRBAND SCANNER	£150
YUPITERU	MVT-7300 MULTIBAND HANDHELD SCANNER	£199
YUPITERU	MVT-8000 SCANNER	£225
YUPITERU	MVT-9000mkII MULTIBAND HANDHELD RECEIVER	£275
YUPITERU	VT-125 AIRBAND SCANNER	£120
YUPITERU	MVT-7100 HANDHELD SCANNER 500KHZ - 1650 MHZ	£140

AGE for using credit cards

FINANCE NOW AVAILABLE. PHONE DAVE FOR DETAILS!

JERRY GLENWRIGHT, c/o *SWM* EDITORIAL OFFICES, BROADSTONE
E-MAIL: shackweb@pwpublishing.ltd.uk

ShackWeb

Hello and a warm welcome (phew - almost 30° today!) to 'ShackWeb', the bi-monthly column devoted to presenting an eclectic mix of radio-oriented sites culled from the world-wide web. It certainly isn't the weather for sitting in front of a computer as I write, but there's some interesting stuff from amateur web pages to commercial on-line shops this time around. So, fire up the modem and let's get surfing...

Valve Heaven

If you're interested in short wave and associated listening, it's almost certain that at some time in your hobby you've built a kit - a v.l.f. receiver perhaps, coil-based coupling/tuning devices or home-brew antenna and of course Editor Kevin devotes a page or two in *SWM* every so often to building interesting kits in the shack.

Of course, the thing about kit building is that you soon get the bug! The smell of hot solder, the frustration when you complete the kit and it doesn't work and the pleasure and sense of achievement when you track down a bad solder joint or a reversed diode and finally get your kit up and running.

For those who are smitten, **Hans Summers**' 'virtual residence' as he describes it will scratch the itch. This website is an almost perfect example of why the web is so powerful - providing a 'publishing' outlet for information that might otherwise never see the light of day and yet which is incredibly interesting and useful if not terribly commercial.

On Hans' home page, there are three buttons which link to information devoted to computers, electronics and radio - my favourite combination. Below is an index link to lots of tempting projects: a clock and decoder for radio time signals, a binary clock and a sidereal clock, 80m c.w. and s.s.b. transmitters, crystal-, valve- and transistor-based receivers, computer projects including various experiments with the Z80 processor and a number of associated items including a frequency counter, power supply and voltmeter.

My absolute favourite of Hans' projects is his 'Giant Nixie Clock' (see pic) which uses giant numeral-displaying valves to create a clock that would look fantastic in any shack. Where's my soldering iron... See this and other projects for yourself at **www.hanssummers.com**

If you decide to build the clock or you have a need for valves and similar components (plus some very odd curiosities), be sure to visit **www.die-wuestens.de/engindex.htm** - the web pages of German Nixie supplier **Jan Philipp Wüsten Elektronik** (don't worry, the site's in English).

In the UK, it's probably fair to say that Maplin is the primary source of electronic components for radio amateurs - in the high street at least. Though gradually the company appears to be moving further towards consumer items, it continues to carry vast stocks of common components and many people are within reach of branch.

Maplin's website is a great option if you're not close to one of their outlets, or want to browse out of hours and while 'ShackWeb' is not meant to be an advert for commercial web pages, Maplin ought to be on the bookmarks list of everyone interested in radio.

The Maplin homepage is organised much like the catalogue and you can either browse the various categories at leisure or look for a particular component using the search field provided. Maplin's URL is **www.maplin.co.uk**

Another components supplier which I've used many times over the years is Greenweld. Originally based in Southampton (if memory serves) and latterly relocated to Essex, Greenweld mixes new with surplus for a product selection that is a treat to browse. The company's on-line shop is very easy to use and the pop-up menus make it easy to navigate. See **www.greenweld.co.uk**

Finally, no mention of components and surplus would be complete without a mention of Display Electronics based in Thornton Heath just south of London and describing itself as 'probably Europe's largest supplier of surplus electronics'. Visit **www.distel.co.uk**

Breaker Browsing

Regular readers are familiar with my fondness for CB radio (soon to be made licence-free if the authorities have their way - though as a downside we may lose the UK frequency allocation). Back in the very early 1980s, CB shops sprang up in every town, but now, sadly, many of them have shut their doors or chosen to stock mobile telephone accessories.

So, where do you go to see and buy an extensive range of CB equipment? The on-line Thunderpole shop - **www.thunderpole.co.uk** - could be just what you're looking for. Sporting an extensive range of CB rigs, twigs and everything in between, you can browse and buy on-line and read interesting reports and really helpful guides. And it isn't just CB at the Thunderpole site, PMR446, 10m and digital radios are all available too.

Pubic Access

No 'ShackWeb' would be complete without something to listen to and over the past few years I've become hooked on live emergency services broadcasts from the US available over the Internet. In a land where public servants consider it their civic duty to make themselves accountable at every step, many US states provide direct access to official transmissions of all kinds (though, paradoxically, are very strict indeed about tuning in to some frequencies).

There are many web portals for emergency service transmissions, but one of my favourites is **genesis.infonline.net/scanner/** which features everything from fire and police services to rescue squad and government offices.

Big Thank You

Just a quick mention and a very big thank you to **Ian Brothwell G4EAN** who very kindly contacted me a month or two ago to ask if I'd be interested in some old Tandy computer equipment he was clearing out of the attic. Interested? You can guess my response!

Not only did Ian donate the machines, he delivered them too (receiving a groan from Angela as another load of old silicon arrived at the door - I was out at the time). So thank you Ian, those TRS80s have a very good home here and will be well looked after.

Until next time, good surfing and good listening.

■ DAVE ROBERTS c/o SWM EDITORIAL OFFICES, BROADSTONE
■ E-MAIL: scanning@pwpublishing.ltd.uk

Scanning Scene

Does anyone listen to the US military satellites between about 240 and 270MHz? If you are in the more southerly latitudes of the UK and Ireland, (somewhere below Manchester or thereabouts) then you could hear them using an ordinary scanning antenna.

The signals are transmitted with circular polarisation and a lot of the traffic is encrypted data but the old fashioned 'birds' carry some rather unusual signals. In the past, commercial radio stations from other continents have been heard via the satellites. As these radio stations were only supposed to serve their local areas, it seemed odd that the signals were being transmitted via a military satellite.

The broadcasters were contacted and their transmission frequencies noted, it became apparent that a harmonic of their transmissions was 'nipping' straight into the satellite's transponder input and were therefore being sent out again all over the world. Listeners then started to report f.m. signals in Spanish emanating from the spacecraft! Plenty of Americans are of Hispanic origin, but it wasn't them.

The transmissions finally turned out to be from pirate operators in South America hooking up with pirates in Spain. They were using either commercially built gear or were purchasing equipment to convert 2m wide-banded transmitters to the 300MHz range required to up-link to the big repeater in the sky. The frequency split on the satellites is 53.6MHz with the up-link being the higher frequency.

Because of the need to economise on bandwidth, the satellite converts all a.m. signals to s.s.b. and all f.m. signals to narrow f.m. The preferred down-link frequencies seem to be around 260.580 and 260.530 with 243.640MHz in use too. Remember that the input transmissions are actually 53.6MHz higher. Some illegal long range cordless 'phones of Chinese origin transmit around 290 to 320MHz and therefore their users may be getting a longer range from their 'phones than they imagined.

Lurking On 327MHz

Lurking around 327MHz is a new type of baby alarm, consisting of two pager sized boxes. One is clipped to the child and the other is kept on the parent. Should the child wander out of range the unit emits a loud noise, warning the adult to locate said offspring. It's all very efficient for £5, but not as much fun as a cattle prod for keeping children in order!

The Chinese are producing walkie-talkies that transmit in the 300MHz region. This all means that a part of the spectrum that scanner owners seldom visit is inhabited by all this r.f. junk, as well as all the legitimate military traffic. Things are certainly getting busy up there! It seems that children under 25 are getting crafty! During school exams, some pupils are using mobile 'phones to text questions to an accomplice and receive answers. Earpieces are also being worn allowing answers to be directly conveyed to the pupil. What an excellent idea!

Sorry to be the bearer of bad tidings, but it seems that the examination boards are on to this, with 350 cases of the type discovered this year alone. Accordingly some schools are trialling the use of mobile 'phone detectors in exam rooms. **All Hallows High School**, Preston, Lancashire is using the detectors costing £150. The children are asked to hand over their mobiles for 'safe keeping' during exams and are informed that a mobile 'phone detector is in operation. **Tony Hacking**, the deputy head teacher, said that the detector is "A very good deterrent which we will use again". His comments were echoed by **Nigel Roper** the deputy head at **Heathland School, Hounslow** who have also tested the detectors.

All this increased r.f. activity is going to keep the ears of the intelligence services warm isnt it! Those Low Earth Orbiting satellites listening to conversations and monitoring traffic for those all important key words or strings will certainly be worth the expense.

Project Echelon

Project Echelon is the name for the system operated by the UK/USA/Canada/Australian and New Zealand intelligence services. Communications are scanned for tell-tale key words, strings, number series or any threads that link messages to messages, events or people of interest. Differing areas have different 'dictionaries' and the system really works.

A chap in Australia commented, "Around 1996-7 when I first heard of Project Echelon, I and a couple of friends in the US and UK commenced inserting various inflammatory sentences (like 'send me the C4 to blow up the us Embassy') after approximately 50 lines of white space at the end of our messages. After a further 50 lines or so of white space we also included the text to the effect of 'this is just a joke, no need to send the Marines around OK! Just testing to see if project echelon exists...' After one week we all received an E-mail, which after several pages of smiley faces said, 'We do exist, we do search on keywords, please stop now'. We did".

In a similar vein, several years ago a mate of mine was preparing to get his head down in his Land Rover. He'd been driving for around 12 hours and was pretty tired so he parked up at the top of a mountain pass in Scotland. It was about 0230 and just before unravelling his sleeping bag he put out a quick CQ call on 2m, it was raining hard and blowing a gale.

After calling for around five minutes he abandoned the hope of a contact and by way of a final call he said, "There ain't nobody here but us chickens". Immediately an American voice boomed out of the speaker, "Don't bet on it, buddy". My pal questioned the voice who said he was at an American monitoring facility on the east coast of the country and that he should not have gone to transmit but he thought that my friend could use a contact. You just never know who's listening, do you?

Distance VHF Signals

Many people have reported signals being received at v.h.f. from great distances in the last few days of June. Friends on the Western Isles of Scotland were hearing Norwegian 2m repeaters and a station from that country called into the **GB3IG** repeater near Stornoway making several contacts.

In England, repeaters were being heard many miles away from their normal coverage area and continental p.m.r. services were also being monitored on v.h.f. frequencies. The same situation existed in the West Country and Wales. These conditions are frequently associated with atmospheric circumstances often heralded by hot weather here in the UK. Many distant radio users have been monitored by surprised v.h.f/u.h.f. listeners during these events.

To monitor propagation conditions I always have the 2m amateur repeater channels programmed into my scanners. The repeaters are required to send their callsigns frequently and from this I get early warnings of openings to a particular area and can then programme up the receiver accordingly. It's just a tip but it really works for me.

Mafia Conversations

Last month I mentioned that a conversation had been overheard on h.f. that appeared to be taking place between 'mafia' types and the inference was that these could have been drug traffickers. I've been reliably informed that only the cheapskate, unsuccessful drug suppliers use h.f. these days. Any cartel worth their weight in Charlie or Skag is supposedly using a satellite 'phone, usually on Inmarsat-M, like the one pictured here!

Right it's time to pack my backpack for the trip to the Donnington Show. I only seem to ever buy a few plugs and some solder, but always get through about £200 - I just don't understand it!

■ PETER BOND, c/o EDITORIAL OFFICES, BROADSTONE
■ E-MAIL: skyhigh@pwpublishing.ltd.uk

Sky High

The annual pilgrimage to the RIAT was under a slightly different format this year with the main arrival days being Tuesday to Thursday. The somewhat over the top £20 to get into Park and View on Friday, plus work at the weekend, prevented me from attending the main show days. I had hoped to return for the departures on Monday, but that's another story.

The callsigns I have listed in this report are hopefully correct, I could not make a note of them all as my photography always comes first and consequently I missed quite a few, especially on Thursday, aircraft noise also played a part in the monitoring situation. By the time I compiled this report, information on the 'net was sparse and I didn't have the advantage of a check list, so any interesting additions or corrections would be welcome, so hopefully I'll have an update on them next month.

Tuesday

An 0530 start on Tuesday saw us head off on the three hour journey to Fairford, the weather was glorious, but sadly it was to be the last day of the long spell of good weather, (some had called it a heat wave and I wasn't going to argue). We arrived just after 0830, and after a brief visit to the Eastern end, we assessed the wind direction and decided it would be Runway 09 with the wind building from the East.

Those who elected to stay at the Runway 27 end to watch the aircraft exit at the end of the runway were greeted by a long line of green and white cones located between them and the runway/taxiway, very handy for good photographs! Fortunately, they were moved by the time I next visited the eastern Park and View on Thursday.

After the chaos of last year, it was a pleasant surprise to find no security checks at Park and View (P&V) on the Tuesday or for that fact on Wednesday and Thursday. In fact, it was difficult to find anything at P&V on the Tuesday, I had bought some £10 advance tickets, but anyone who turned up on Tuesday was given a Woolworth's Raffle ticket as there were no official tickets available!

If you wanted a re-entry, for example for a change of Runway, there was no stamp available to let you back in so, it was a raffle ticket or nothing. After all these years you would think that they would have got their act together! As for the car parking on Tuesday - well it was interesting!

The first inbounds were due shortly after the airfield opened at 1000 and the morning started well with a B-52H, callsign JAMBO 22, EC-130 JIMI 11, E-8 RAZOR 08 plus an OHIO ANG C-130, which I think used the callsign HERC 75. After that, the day got hotter and hotter and the arrivals less and less the rest of the day saw just 25 movements that I noted, and four of those were the Jordanian team.

However, amongst those movements were a few very nice items, French Navy E-2 callsign French Navy 5481, Let-410 callsign Lithuanian Air Force 145, two very nice Turkish Air Force F-4s, (no callsign) and a Polish Navy M-28B Bryza in an special Anglo/Polish 2nd World War commemorative scheme.

The two B-1s arrived as HAWK 11 and 12 and were noted using 337.25 as an Air to Air. All-in-all it was a very quiet day, but very warm with the temperature peaking at 32.8°C, which is just over 90°F!

The Fairford/Brize Norton frequencies in use were as follows:

Fairford	Tower	128.975	337.575
	Radar	123.55	277.35
	Ground	119.15	259.975
	Clearances	124.55	(Monday only)

Brize Norton were also using the UK Airshow common frequency of 134.55, although this was not on the official list of RIAT frequencies. I did make a note of a few of the ground operations frequencies, but I have mis-placed it, the one I can recall was Engineering Operations using 444.3 n.b.f.m., (always useful for advance inbound information).

Wednesday

Wednesday dawned bright and clear, but by 0930 a bank of cloud had arrived and shortly afterwards a band of intermittent rain - typical, after seven weeks of pretty good weather. The wind was still Easterly and Runway 09 was once again in use.

One thing I should point out to those who have not been to P&V on this end was that the viewing area is considerably further from the runway than the eastern end and photos of smaller aircraft such as a Hawk required a 600mm lens. Consequently, a lot of enthusiasts gave up on the main viewing area and stood in the two fields west of the parking area, (me included).

There were about 65 movements that I noted, a few of the more interesting callsigns I recorded were:

MADFOX 4	P-3C	VP-5/USN
MATRIX 55	F-16	2 WING/BAF
SPANISH ARMY 9501	CH-47	BHELTRA-V
SWEDEFORCE 4391	GRIPENS	?
KIWI 511	BOEING 757	40 SQN/RNZAF

Quite a number of Italian Military aircraft arrived, but all used the standard INDIA callsign, they were:

INDIA 7018 Tornado, INDIA 4258 F-104, INDIA 2127 C-27J, INDIA 2170 ATR-42MP (Coastguard) and INDIA 2168 P180 Avanti.

A point of interest here is that the Avanti arrived using the callsign 2168, but its serial was 2167, there lies a lesson to those of you who make a note of serials as well as callsigns. Whilst the Italians and other air-arms do regularly use their serial as part of the callsign, it is not always the case, you cannot rely on the callsign/serial tie-up to always be the same unless you can read the serial yourself.

Also, it was noted that some of the callsigns listed on the RIAT daily movement sheets were incorrect, so the lesson is never assume anything. Having mentioned those RIAT sheets, £2.50 for a single A4 sheet on the Tuesday with around 30 movements, my money stayed firmly in my pocket and I enjoyed the anticipation of awaiting the radio call of the next inbound.

Thursday

Thursday was the aircraft enthusiasts day from Hell! We got to the Eastern Park and View at 0815 to find Runway 27 in use, around 20 minutes later it started raining and barely stopped until about 1630, at times it was almost torrential with the wind gusting up to 20 knots. The cloud base was low and the light was awful and it was just about the worst possible scenario for taking photographs.

Because of my photographic work for the local papers where results have to be immediate, in late April, after 32 years as a film photographer, I was reluctantly dragged kicking and screaming into the world of digital photography, three months later I am a total convert.

The awful conditions on Thursday meant that I could push the camera to extremes and the light was so bad I actually took a few photos at 800 ASA to maintain a reasonable shutter speed of 1/250 second - it was that bad. If I had still been using a film camera, I doubt if I would have taken 20 photographs all day, in fact, some enthusiasts did not get their cameras out of the bag until late in the day.

My new camera performed admirably in the poor conditions and allowed me to at least get some respectable results. The poor light was a shame as there were some very nice special schemes amongst the inbound aircraft, but grey camouflage against an even greyer sky is not the ideal scenario!

Once I have had time to collate a more accurate and comprehensive picture of the Thursday and other movements, I will include it in next month's column.

Batteries

When I wrote the piece about rechargeable batteries in my July column, I did wonder if readers might moan that they wanted to hear about the airbands and not boring batteries. In fact, the opposite seems to be the case, and with many of you owning hand-held radios, the subject of battery power is obviously close to your hearts.

Thanks to all of you who dropped me a line and especially to Environmental Health Officer **Richard G.** He makes an important point, 'Cadmium is a toxic substance and should be disposed of in an environmentally friendly manner. If you have some NiCads to dispose of, please do not throw them in with the household rubbish - the best thing to do is to wait until you next make a trip to the local council tip and hand them in there where they can be disposed of in the correct manner'. Good point, thanks Richard.

'Sky High' readers have been in contact passing on information about radios with low battery consumption, so I'll have more information on this subject next month.

Intercepts

I have been sent the first few issues of a new newsletter called *Scottish Intercepts Monthly*. It is currently two A4 sheets, but may well expand in the future and covers all aspects of military airband listening with an obvious bias towards Scottish airfields and airspace. It also has some content covering the so called, 'Black Projects'.

One quick comment I would make to the author, I would like to see each issue with a date of issue, or publication number on the first page. Anyone interested in this new newsletter should contact *Scottish Intercepts Monthly* at **28 Eglington Street, Saltcoats, Ayrshire KA21 5DG** or E-mail them at **stealth_chaser@yahoo.com**

Bits & Pieces

(1) Andy J. from Norwich reports to me that Coltishall appears to have had a small change around with its frequencies. The GROUND and Secondary RADAR frequencies have been swapped, so ground is now 254.25 and the radar frequency is 387.775.

(2) Bristol (Lulsgate) has gained a Ground frequency on 121.925. **(3)** On June 17, Hickham based C-40B of the 15 ABW, serial 00-0015 made a first visit to Mildenhall on a training flight using the callsign, SPAR 55. **(4)** Culdrose has withdrawn their h.f. frequency on 6748 and now use 5696.

(5) The Lakenheath Ground frequency is now 231.425, I presume that 397.975 has been withdrawn? **(6)** 820 Squadron at Culdrose withdrew their Sea Kings from service on the 1 July and after a flypast departed for HMS *Sultan*. They are to re-equip with Merlin HM.1s later in the year. I wonder why they didn't wait for their airshow on July 16 to perform the stand-down of the Sea King HAS.6, it would seem the logical day to do it?

(7) A recent UK Military Notam indicates that DONNA NOOK range control primary freq. is to change from 387.675 to 340.150. **(8)** RAF Lyneham is to close by 2012 when the C-130K Hercules reaches the end of its operational life, the newer C-130Js are to move to Brize Norton. Judging by the various press reports it was not a popular decision!

Our photos this month are from the sunny Tuesday of RIAT 2003. Polish Navy, M-28B Skytruck Bryza in special marks plus a French Navy E-2C from 4 Flotille.

■ ROGER BUNNEY, 35 GRAYLING MEAD, FISHLAKE, ROMSEY, HANTS SO51 7RU

Satellite TV News

The past few weeks has been relatively quiet across the Clarke belt with sports perhaps dominating centre stage. June 21 and the 'European Cup' was being fought on the sports stadium in Florence, Italy with all types of athletic, healthy action. This on the usual Saturday afternoon sports satellite - *Eutelsat W1*, 10°E at 10.997GHz-H (5703+3/4).

Meanwhile BBC Sports were linking back to White City, their coverage of the Royal Ascot horses at 11.072GHz-V (5632+3/4). The thrills and spills of the Daytona racing circuit ex Florida were carried over *Atlantic Bird-1* @ 12.5°W within the Globecast bouquet 11.014GHz-H (20145+3/4) on channel 2, meanwhile the regular weekend American PGA golf tournament was being played out on channel 3 - for golf enthusiasts check out this bouquet from about 1700. **Roy Carman** (Dorking) watched the 24 hours *Le Mans* racing June 14th over *Telecom 2A* @ 3°E. This satellite is in a gentle inclined orbit of about 1.5° which means that on a 1m dish, signals should remain within the 52dBW contour (South UK) and hopefully into Scotland/Ireland within the 48dBW band. *Telecom 2A* is still used extensively for 'local' regional French news/sports feeds - *Le Mans* for example at 12.636GHz-V (6111+3/4), the same day cycle racing was carried at 12.551GHz-V (6820+7/8).

Roy also came across North Korean military propaganda transmitting to an unknown client/broadcaster, June 29 on *Eutelsat W1*, 10°E via a 'SATLINK' circuit - 12.732GHz-H (5632+3/4). General military content of the victorious North Korean army and air forces, superior to their counterparts in South Korea. A very unusual sighting and perhaps a Ku-band first for Europe! The off screen 'grabs' show a senior officer addressing his men and comrades singing of victory.

Unfortunately, the 'Fox Feeds' that provided news footage out of Israel have now left *SESAT* @ 36°E and moved to *Intelsat 904* at a low UK horizon elevation @ 60°E. *SESAT* is now much quieter but an evening tune late June found a Llubljana TV station 'TV PIKA' sharing 11.137GHz-V (4882+2/3) with an Arabic channel 'ISLAH TV'. There's a web site for Islah - **www.myislah.org** - and checking out 'Islah' found it was a London based organisation promoting Islamic Reform in Arabia and appears to be anti-Saud. As a complete contrast, car racing from Germany over up-link facility 'TV-UNI-1' used *SESAT* over the weekend 14/15th June - FTA - 11.107GHz-H (6111+3/4).

Whilst musing things Globecast and *Atlantic Bird-1*, a very impressive live corporate was transmitted over channel 2 (see above) June 23 for Apple Mac computers. Apple's CEO Steve Jobs introduced their new G5 computer to a gathering of Apple staff in San Francisco, explaining all the new facilities that the G5 possessed, each new package being cheered and applauded. A large screen, perhaps 8m high, carried a projected image of the computer screen and Steve demo'd all the new refinements perfectly but perhaps most impressive was the conference package *iTalk*. Steve checked out fellow Apple folk in Paris, LA and from a nearby university, their faces revealing no pixellation/sticking on the large screen and then set up a 4-way video conference between Steve and his three colleagues, all via a '56K' modem. The Apple presentation ran for about 130 minutes (1800-2010) without a break, no glitches and technical perfection throughout, a very impressive corporate presentation from Steve - previous transmissions to their world-wide staff have always shown great technical and production expertise!

Scanning over the upper Ku-band of *Europe*Star-1*, 45°E evening of July 3, (the Coship RX is still under test - see my mini review on page 45), and I hit NTSC signal activity @ 11.515GHz-V (5632+3/4). I've struck 'GLOBECAST AFRICA ENC' which eventually transmits several interview packages detailing a South African produced 'BIG BROTHER AFRICA' for CNN and other North American broadcast networks. Some 11 countries are taking part from the Johannesburg studio, the programme described in one interview as promoting "continental togetherness" and the easing of "cultural, national and racial differences".

Many of our *Short Wave Magazine* readers are aircraft enthusiasts and would have been excited to witness mid-June TV pictures arriving via secondary hop on *Eutelsat W2*, 16°E showing the arrival of an Air France Concorde airliner in the 'States. The TV network 'CBS-NY' were relaying pictures of the elderly Concorde that has been taken out of service and apparently donated to the Smithsonian Institute. News pictures over *W2* @ 11.190GHz-H (5632+3/4).

Week 3 of June and the 'EU2003' Summit talks were being held, many news feeds originated out of Greece including a facility company 'TBS LONDON' running *W2*, 16°E @ 11.563GHz-5632+3/4 the 19th) and on the 20th with 'APTN GREECE PATH 1' on *W1*, 10°E on a frequency used APTN slot 10.966GHz-V (4167+5/6). A few days later Russia's President Putin and Mrs. Putin are on a state visit to the UK, doing the sites and meeting the locals. The 23rd the President is in Edinburgh, visits the castle and receives a book (live over 'APTN CANADA GATE EDINBURGH', 10°E, 10.961-V. The 26th the President is doing the London sites and has afternoon tea at No.10, faithfully transmitted by APTN over *W1*, 10.965-V 4167+5/6. Meanwhile a police helicopter hovers above and in Whitehall vocal noise from a demonstration!

Found a new satellite in June, at 39°E a recently slotted *Hellasat* bird has appeared, this will be used to provide extra capacity for the 2004 Olympic Games. It's a quiet sat but several enthusiasts have reported that on or about 10.958GHz-V can be found down linking video. The 19th for example carried an MPEG 4:2:2 offering of a 'God-Slot' programme ex USA, this carried into Europe by *Atlantic Bird-1* in the primary hop. **Alan Richards** (Nottingham) noted *Hellasat* carrying news footage of the Greek globalisation riots in Thessaloniki, same slot but SR6075+3/4.

Some months ago the Globecast feeds over *Atlantic Bird* died overnight, it's thought due to 'an onboard malfunction' but rumours circulate of duff solar cells, loss of orbital stability, etc. One mid June day and my receiver is running on the same Globecast bouquet namely 11.104GHz-H via 12°W at 1842.The colour bars start to pixellate, intermittent loss of carrier and then the signal drops below threshold. A quick check shows that all channels are dead by 1845. At 1855 the channels return but are now running around 50% of normal carrier level, it's another 20 minutes before signal levels return to the norm. Definitely an on-board problem. Alan Richards notes that the US 'ABC NEWS' feeder has appeared to *Atlantic Bird-3* @ 5°W (12.721GHz-H, 3300+3/4) and wonders if this is a temporary measure until the apparent difficulties on *Atlantic Bird-1* are sorted?

A final thought for any Balkans readers - Albanian satellite programming for Europe -TV Shqiptar, AlSat - live on *Eutelsat W2* @ 16°W, curious that 'ALBANICASAT' (RTV21) has appeared on *Sirius* 5°E, 11.739GHz-H (6430+3/4).

ISLAH-TV, the anti Saud TV channel on 36°E

A colourful test card seen over Atlantic Bird-1.

This is from the nearby NTL uplink site at Winchester.

The Americans launch their Martian exploration craft early June, seen on Globecast, 12.5°W.

The Anglia TV satellite truck cover a large M1 pile-up for their evening news programme via Telecom 2D @ 8°W.

The North Korean propaganda offering of June 29.

■ KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS
■ E-MAIL: dxtv@pwpublishing.ltd.uk ■ WEB: www.test-cards.fsnet.co.uk

DX Television

June proved to be one of the most exciting DX periods ever with transatlantic TV reception in abundance on many days. There were even reports of a possible Venezuelan station on Channel A3 along with a station from China on C2!

Spanish Band I Reception

The days of Spanish Band I station reception are numbered so, enjoy them while you can, even though it was considered a pest in the past! **Roger Bunney** (Romsey) describes an early June opening on E2, E3 and E4 as just like the old days, i.e. strong, heavy smearing and ghosting. The Spanish Guadalcanal E4 transmitter finally closed on July 1st.

A few days earlier, **John Lees** (Cheltenham) E-mailed to say that a scrolling caption was advising viewers to retune to Channel 43. The 350kW Izaña E3 transmitter, located in Tenerife at 2400m above sea-level, was received numerous times throughout the month, leading to speculation that the mainland TVE-1 E3 Aitana outlet had closed and was freeing up the channel. Izaña E3 was commonly received in the late 70s when it stayed on-air showing a local test card when mainland transmitters had closed for the afternoon siesta.

Reception Reports

Exotic reception was the theme for June! On the 2nd at 2050, **Peter Chalkley** (Luton) became aware of pictures from the Middle East on E2. On the 6th, Izaña E3 was in for most of the day and well into the early hours. The 7th saw a transatlantic opening lasting from mid-morning until late afternoon, with Canadian stations logged on Channels A2 to A6. Several co-channel signals emerged on A2 during the event, including the 56kW Canadian station CKCW Moncton, New Brunswick.

Syria E2 was already established by 0815 on the 9th with its L-shape logo in the lower-left of the picture. Later, a second logo appeared in the top-right during the news. Syria made a brief appearance on E4 around 0900, but was then swamped by a mystery PM5534 test card with a large identification at the top and a long identification consisting of two words with smallish letters at the bottom.

Roger Bunney noted an obscure test card emerging on E3 which resembled the monochrome PM5540 once used by The Netherlands and Denmark in the late 60s. The odd thing was the time -1815.

Incidentally, Portugal is still airing the FuBK test card before programmes commence. **Stephen Michie** (Bristol) noticed Latvia (LTV-7, the second network) using the PM5544 on Channel R1 at 1325 on the 20th. **Gordon Still** (Ruislip) comments that he has resolved LTV from Riga on R3 with SECAM colour rather than PAL.

Syria E2 emerged again at 1700 on the 17th when **Paul Foley** (Newhaven, East Sussex) received it at P4 quality for at least two hours, at times co-channelling with Iran. Jordan (JTV) E3 appeared at 1730, but **Peter Barber** (Coventry) saw it earlier at 1449 according to a sketch he sent of an 'unidentified' logo.

Paul's equipment consists of a Thomson 10in colour portable, a D-100 converter and notch filter, a five-element beam, a vertical dipole and an 8-element f.m. beam for Band II Channels C and R4. On the 19th, **John Faulkner** (Sutton-in-Ashfield) caught Syria E2 co-channelling with Dubai.

On the 26th **Simon Hockenhull** (Bristol) encountered Serbia E3 battling with Slovenia. The same opening confirmed that ORF-1 (Austria) E2a is still on-air. **David Hamilton** (Cumnock, Ayrshire) witnessed transatlantic reception on Channel A2. At one point a 'K' logo could be made out but its origin is still unknown.

On the 30th at 1945 there was a 6m path from Europe into Brazil and Argentina. From the south, Mauritania was also received. Needless to say, Izaña E3 was visible at the time. In northern India, **Lt. Col. Rana Roy** reports that conditions have been far from gloomy with lots of Middle East, Russian and Chinese stations being received in Band I.

Peter Barber comments that there were at least 18 days during the month when activity occurred around 1900 , with only a couple of days with activity as early as 0500 or as late as midnight.

Fig. 1: The Russian clock caption radiated by ORT with their station logo in the top right-hand corner.

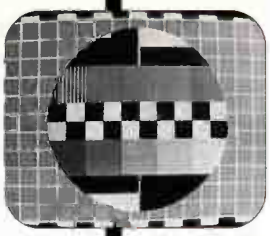


Fig. 2: The PM5540 electronically-generated test card. This particular example shows reception from the Smilde transmitter in the Netherlands.

Band III SpE

Sporadic-E breached the 2 metre band several times. On the 20th at 1007, an excited **Tim Bucknall** (Congleton) 'phoned to say that Slovenian TV was belting in on E6. A subtitled sitcom 'Suddenly Susan' was being shown and the station was identified by the 'Znova' logo in the top-right of the picture. In the past, north African exotics such as Morocco, Algeria, Tunisia and Libya have been identified on E5, E6 and E7. In June 1981 Russian stations occupied Channels R6 to R12!

FM Reports

There were record-breaking transatlantic catches on the 26th by **Paul Logan** (Linaskea, Northern Ireland) and **David Hamilton** (Cumnock, Ayrshire). Between 1950 and 2009, David identified a Canadian station CBTE-FM located at Baie Verte). Paul's f.m. reception between 1900 and 2015 was incredible:-

US stations
88.5MHz WHCF Bangor, Maine
88.7MHz Unidentified US station
95.9MHz Two North American stations co-channelling

Canadian stations
92.9MHz CKLE Bathurst, New Brunswick
92.9MHz CBTR Roddickton, Newfoundland
97.1MHz CBTB Baie Verte, Newfoundland.

Congratulations to both David and Paul on these magnificent achievements. No doubt this will be the start of many other reports from Canada and the USA as more DXers turn their antennas towards the north-west.

Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS**. We can also use off-air pictures stored as JPG files on PC discs and good-quality video recordings.

Our DXTV and Archive TV website can be found at: **www.test-cards.fsnet.co.uk** .

Fig. 3: Following our recent series featuring the current, 'abysmal', BBC-1 Identification Symbols, we return to the good old days before the BBC had lost their way. This mechanical Globe Symbol was used during the late Seventies and early Eighties.

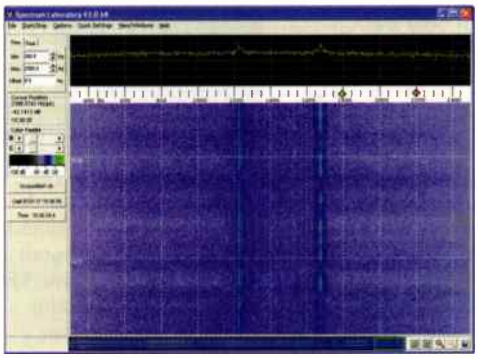
■ MIKE RICHARDS G4WNC, 49 CLOUGHS ROAD, RINGWOOD, HANTS BH24 1UU
■ E-MAIL: decode@pwpublishing.ltd.uk ■ Web: http://www.mikespage.btinternet.co.uk

Decode

Amongst other things, this month I've got two really good software packages for you. You may have seen the adverts for the new *Skysweeper Pro* on the web, well it's arrived, and I've got an early copy to play with. The other 'goodie' is the wonderful Spectrum Lab from Wolfgang Buescher.

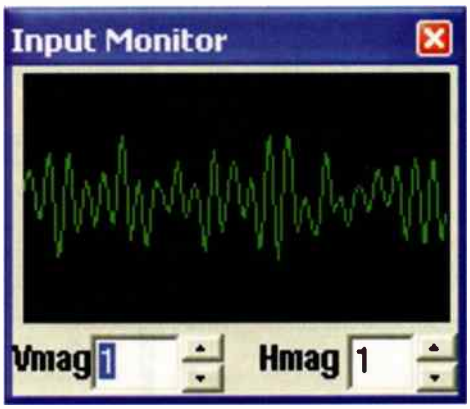
Spectrum Lab

Over the years I've looked at many audio analysers, some designed for radio use and others for general purpose analysis. The secret with all of them has been the amazing sophistication that's built into the soundcard of just about every reasonably modern PC.



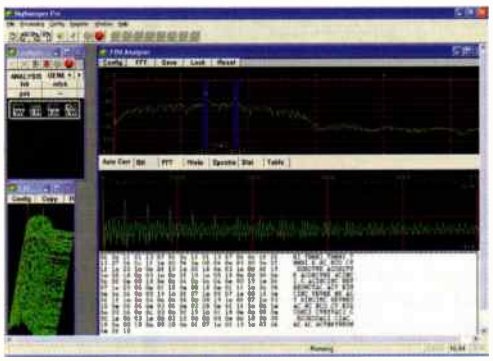
Spectrum Lab main waterfall display.

The digital signal processing chip in most soundcards is well up to the mark to perform some pretty sophisticated processing of radio signals. The huge amount of processing capacity is required to enable the soundcards to process CD quality stereo audio signals. When it comes to looking at a typical radio signal, we only need mono and a restricted frequency range of say 0 to 4kHz. That frees up a stack of d.s.p. power to do more interesting things.



Spectrum Lab's handy input monitor.

The trick is to use innovative programming techniques to make the most of that spare power. With the development of Spectrum Lab, **Wolfgang Buescher** has done an impressive job and created a really powerful analyser with stacks of facilities for those listeners that like to try and understand the detail of utility signals.



New *Skysweeper Pro* bit analysis.

If you're a techie, you will love the Component window. This has similarities to the Winradio G303 advanced PC receiver and the block diagram mode in *Skysweeper*. I've included a screen shot so you can see what I mean. One of the great benefits of this pictorial layout is that you can see exactly what's available and switch it on/off with a click of the mouse.

You can also see exactly where in the signal path each component sits - very useful when you're trying to achieve a particular effect. This component window was so well implemented it effectively replaced most of the functions of the menu system in the main program.

I really liked the provision of an input indicator to check the level from your receiver. Input overload is one of the most common causes of errors in decoders so the provision of this simple indicator is a great benefit. The indicator can be selected from the menu using the View/Window - Input Monitor, or from the component window by just clicking on the Input Monitor box.

When activated, the monitor provides an oscilloscope type display of the input signal. The default settings for the scope are usually fine, but if you want to change them, you can use Hmag to magnify the horizontal (time) scale or Vmag for the vertical (volume scale). With this monitor, any overload shows-up as clipping of the signal, i.e. square tops to the signal peaks.

To put things right, you just open-up your PC's recording controls via the 'options' menu and reduce the record volume until the clipping stops. Once activated, the input monitors stays on top so you can keep a constant eye on what's going-on.

Next in the line of goodies is the excellent signal analysis window. When you first start the program you are presented with a main window containing a detailed waterfall display in the centre. At the top is a spectrum graph and the left-hand side contains the reference section where you can set and measure the parameters for all the displays.

Unlike some systems, setting the display parameters was really simple. The most common requirement is to restrict the displayed frequencies down to that required by the signal being monitored.

For example, you would want to limit the display to 300Hz to 2.5kHz for most utility signals. The settings provide considerable scope for adjustment and you can reduce the display to just a few 10s of Hz if you really want to get into the detail.

To help make accurate measurements, the top spectrum graph includes a neat peak indicator that automatically selects the peak that's adjacent to the cursor position. There is also a full analysis of the actual cursor position shown in the top left of this section. This data provides accurate frequency, signal level and time information - all essentials for signal analysis.

To help with the analysis of burst or intermittent signals, Spectrum Lab operates with a buffer that stores the monitored audio signal. To help find interesting or relevant parts of the signal, the bottom of the display has a time window that you can use to scroll back through time to find the wanted sections of signals.

Whilst analysis is fine, it is also useful to be able to play with a decoder within the analysis program. Spectrum Lab have thought of this and built-in a Digicode Terminal. This terminal is a self contained unit with its own tuning display and a selection of modes that can be selected from the Digicode Terminal menus.

Although very competent, the Digicode Terminal

ARQ-E frequency List

One of the most active 'complex' modes is the ARQ-E system used predominantly by the French military. This mode is included in most of the more advanced decoders, so I thought you might appreciate an ARQ-E selection from **Day Watson**'s latest frequency list.

If there are any other modes you would like to see featured, please drop me a line and I'll see what I can do.

Freq	MOD	Baud Rate	Shift	Erect/Invert	STN
3.1665	ARQ/E//85.7/E/170	85.7	170	E	GAF ?LOC
3.8585	ARQ/E//85.7/I/170	85.7	170	I	GAF ?LOC
4.798	ARQ/E//85.7/E/170	85.7	170	E	GAF ?LOC
4.944	ARQ/E//85.7/E/170	85.7	170	E	GAF ?LOC
5.095	ARQ/E//184.6/E/400	184.6	400	E	FF UNID
5.284	ARQ/E//85.7/E/200	85.7	170	E	GAF ?LOC
5.7657	ARQ/E3//300/E/400	300	400	E	FF UNID
7.8222	ARQ/E3//200/E/400	200	400	E	FF PARIS ?
8.031	ARQ/E//184.5/I/400	184.5	400	I	FF NAQOURA ?
8.105	ARQ/E//184.6/E/170	184.6	170	E	FF PARIS?
9.2492	ARQ/E//46.2/E/170	46.2	170	E	EGYPTIAN AIRFIELD ?LOC
10.4823	ARQ/E3//100/E/400	100	400	E	FF PARIS ?
10.626	ARQ/E//184.6/I/400	184.6	400	I	FF NAQOURA
10.9135	ARQ/E3//48/E/400	48	400	E	FF DAKAR
10.9177	ARQ/E3//48/E/400	48	400	E	FF DAKAR
13.4442	ARQ/E3//100/E/400	100	400	E	FF DJIBOUTI
14.4617	ARQ/E3//192/E/400	192	400	E	FF PORT BOUET
14.669	ARQ/E//184.6/I/400	184.6	400	I	FF NAQOURA
14.6707	ARQ/E3//192/E/400	192	400	E	FF UNID ?
14.9267	ARQ/E3//192/E/400	192	400	E	FF DAKAR
16.2802	ARQ/342//200/E/400	200	400	E	FF PARIS?
16.3057	ARQ/E3//200/E/400	200	400	E	FF NDJAMENA ?
16.3247	ARQ/E3//192/E/400	192	400	E	FF LIBREVILLE?
16.4217	ARQ/E3//48/E/430	48	430	E	FF DAKAR
16.6277	ARQ/E3//200/E/400	200	400	E	FF NDJAMENA?
17.5509	ARQ/E3//192/E/400	192	400	E	FF DAKAR
18.0427	ARQ/E3//192/E/400	192	400	E	FF LIBREVILLE
18.3208	ARQ/E3//192/E/400	192	400	E	FF DAKAR
19.0487	ARQ/E3//192/E/140	192	140	E	FF PARIS?
19.2167	ARQ/E//96/E/400	96	400	E	FF FT DE FRANCE
20.1797	ARQ/E3//100/E/400	100	400	E	FF PARIS?
20.6337	ARQ/E3//100/E/400	100	400	E	FF LE PORT
23.7167	ARQ/E3//96/E/400	96	400	E	FF FT DE FRANCE

is not for newcomers as you have to select the details of the mode you want to receive rather than just Choose RTTY, SITOR, etc. If you're able to cope with this level of expertise, it is a very useful tool.

One of the real plus points of Spectrum Lab is that it's free! If you'd like to give it a try, here's the web address: **http://www.qsl.net/dl4yhf**

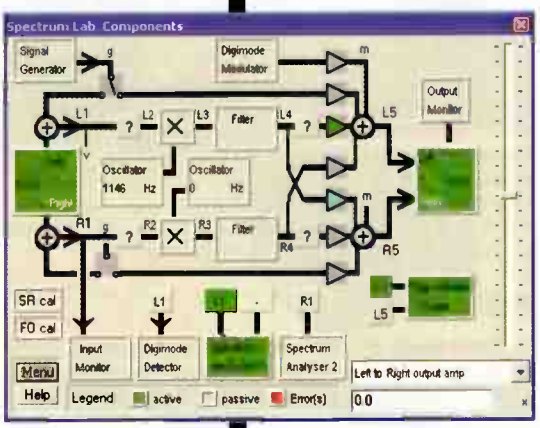
Skysweeper Pro

Arrived at last is the new professionally featured *Skysweeper Pro*. I don't have time for a full review this month, so I'll just give you a summary of some of the new features. The main difference between the normal and Pro versions is the inclusion of a comprehensive set of analysis tools and some generic decoders for handling new modes.

The analysis tools are very comprehensive and include a variety of bit, speed and phase analysers. In addition, the Pro version features a set of 'Generic' decoders that are amazingly powerful tools for working with any new modes.

There are generic decoders for all the basic signal types, i.e. f.s.k., m.f.s.k., p.s.k., m.p.s.k. and p.a.m. To help with the analysis of new modes, the recording options have been greatly increased as have the detailed f.f.t. displays.

Overall, this looks to be a pretty impressive set of enhancements to an already good package. Hopefully I'll be able to bring you more details next month. If you would like to have a look for yourself, the program will be available for download from Pervisell's website - see **http://www.pervisell.com**



Spectrum Lab's excellent component window.

■ CLIVE HARDY G4SLU, *SWM*, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW
■ E-MAIL: clive@pwpublishing.ltd.uk

Amateur Bands

In early June this year the Yeovil & District ARC held its 19th annual QRP (low power) Convention in nearby Sherborne, Dorset. As usual, part of the event was a construction challenge. In keeping with the QRP theme the challenge is never about building something spectacular. It's more about squeezing the maximum performance from the minimum of equipment.

The term - KISS - Keep It Simple Stupid – is one of the tenets of the QRP home-brewer. In adherence to that philosophy the task this year was to make a transmitter for the 3.5.MHz band using no more than two active components, that would run on a single 1.5V AA cell.

Despite the design limitations, there were a number of good entries to the challenge. The winning design came from Yeovil club member and prolific radio designer, **Tim Walford G3PCJ**, who managed to squeeze slightly over 30 milliwatts from his transmitter.

If you'd like to try and better that, here's the circuit diagram of the winning design, **Fig. 1**. As can be seen, it's a very basic design and without any sort of filtering The chances are that this circuit will produce lots of interference generating harmonics and sproggies, and Tim advises that it's not a practical form of useable transmitter – but could provide scope for a little tinkering perhaps?

Next year's convention is pencilled in for the 18th April. Like all those before, it'll be a friendly affair with a good selection of traders selling all those components that the home-brewer needs. Details of the construction challenge will be released nearer the date in *Sprat*, the magazine of the G-QRP club. If building simple low power equipment appeals to you then visit **www.gqrp.com** or write to **George Dobbs G3RJV, The Vicarage, 498 Manchester Road, Rochdale Lancs OL11 3HE** for details of club membership.

Location, Location, Location!

Continuing the QRP theme, and also in June, was the *Practical Wireless* (*SWM*'s sister magazine) 144MHz low power contest. Being a 'line of sight' frequency means that it pays to be in a high location if maximum coverage is required. Limited to just three watts, contest participants maximised their potential range by operating from some of the UK's higher hills.

In most cases their point scoring potential was further increased by the use of multi-element beam arrays with many dBs of gain. With the transmit and receive capabilities enhanced by such antenna systems, plus their elevated locations, stations many hundreds of kilometres apart were able to communicate.

I, on the other hand, operated with a simple collinear antenna from my home QTH down in a valley. Not surprisingly, although there were many stations on the air for the event, I only heard a few. Despite that, and no doubt due to his location and antennas, I somehow managed to work **GW5NF/P** who must have been a good 150 kilometres away. Although I only ever intended to look in on the contest to give away points, I think that next year will see me up on a hill if I'm going to make any sort of useful contribution!

Echolink – Sort Of

Conscientious *SWM* readers will have learned of the 446 PMR Internet based repeater network from Jerry Glenwright's 'ShackWeb' column in July. Similar to *Echolink* (Amateur Bands – May 2003) and originally set up for amateurs, there are separate 'rooms' on the servers. Some for 446 PMR users and others for amateur radio use only. This is because amateurs accessing the system on amateur frequencies can only talk to other amateurs on those frequencies.

To prevent unlicensed users entering amateur rooms, the system throws out anyone trying to access such a room without a valid amateur callsign. The good news for unlicensed listeners, and where *eQSO* wins over *Echolink*, is that anyone can enter an amateur radio room to monitor traffic between licensed stations because *eQSO* will allow 'SWL' as an amateur callsign provided the listener also indicates in their Comments field that it is a receive only set up. Visit **www.446user.co.uk** for much more information and easy to use downloadable *eQSO* software written by **M0ZPD**.

The program *eQSO* in progress. The link is between M3PJO/M on the M1 using G7WFM-L (highlighted) in Nottingham on 145.3375MHz to contact M0CRP who's listening via G0SPH-L on 431.125MHz in Cheshire. Two stations at the bottom of the screen are s.w.l.s.

A Brit Abroad

John G4IRN is off to the Seychelles in the western Indian Ocean from the 13 to the 27th September using the call S79IRN. His visit will be interrupted for a week from the 16th when he moves a little south and west to the French dependant Mayotte where he'll operate as FH/G4IRN. Morse fans will be pleased to note that he'll be using c.w. most of the time on frequencies from 7 to 29MHz.

Italian Castles

The third annual Italian Castles Weekend will take place from 0800 to 1600 on Sunday 7 September. Look out for IO1DCI over the weekend 20/21 September. It's the special event station for the Italian Castle Award meeting at the New Central Meeting Place, Beila, Mondovi **www.dcia.it/WCI2002_UK.htm**

An Italian castle - Torrione di Villarbasse, near Turin.

Wrong Code

Ian Brothwell of **BARTG** - the British Amateur Radio Teledata Group (**www.bartg.demon.co.uk**) put me right about the code used for RTTY which I erroneously wrote in July's column was the 1960's ASCII (American Standard Code for Information Interchange). What I should have written was that RTTY uses ITA2 (International Telegraph Alphabet number two), a five unit code that pre-dates ASCII by a good three decades.

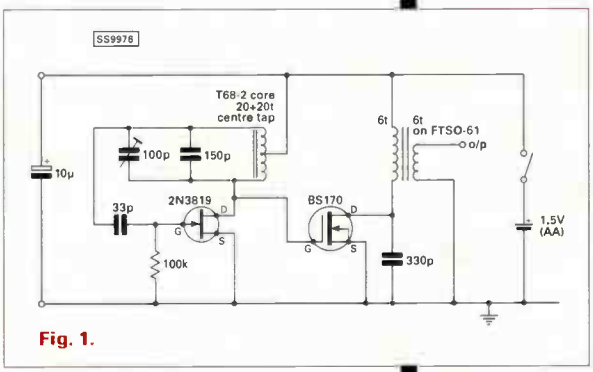


Fig. 1.

Philip Davies in Shropshire has submitted his brief listening log for the *SWM* contest and comments that propagation hasn't been so good on h.f. of late. **VK1MJ** in Canberra was a nice catch for him on 3.5MHz, along with Indonesian **YB0AI**. Philip was also pleased to hear **VY0/VE7FFP** in the Eskimo territory of Nunavut on 14MHz.

The latest UK amateur callsigns issued alphabetically at the time of going to press in mid July were: **M0DHN, 2E0AVO** and **M3EEV.**

■ LAWRENCE HARRIS, 55 RICHVILLE ROAD, SHIRLEY, SOUTHAMPTON SO16 4GH
■ E-MAIL: info.orbit@pwpublishing.ltd.uk ■ WEB SITE: http://www.astronomer.plus.com

Info in Orbit

Fig. 1: LRIT image from *MSG-1* channel 1 1145 7 July *(image © Eumetsat 2003).*

I don't know how many people received the first WEFAX images during the mid-1960s, but many of us witnessed history in the making on 7 July 2003 when the first LRIT (Low Rate Information Transmission) images were received from *MSG-1* (METEOSAT Second Generation) on our humble domestic computers.

The first of the images, **Fig. 1**, was received on my computer at 1145 that day. LRIT will replace WEFAX - weather facsimile. Although the passing of WEFAX will be tinged with nostalgia, the new (LRIT) format holds such potential that even the most luddite of WXSAT hobbyists would not seriously expect WEFAX to last forever.

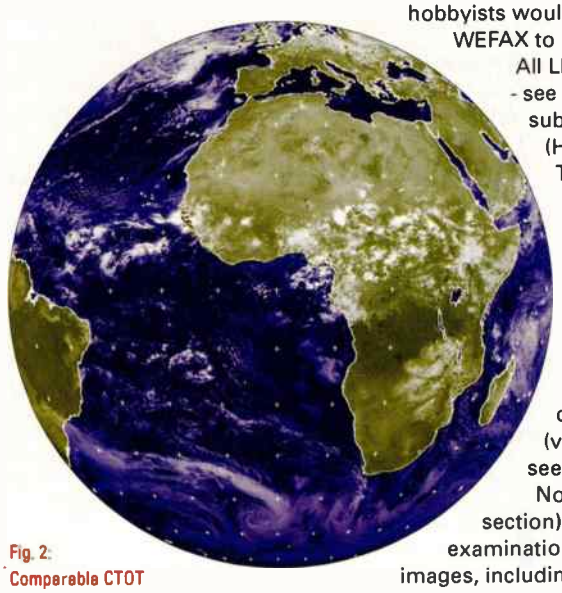


Fig. 2: Comparable CTOT WEFAX *METEOSAT-7* 1200 7 July *(image © Eumetsat 2003).*

All LRIT images are full-disc - see Fig. 1 - and are a subset of the original HRIT (High Rate Information Transmission) data. The corresponding WEFAX image - see **Fig. 2** - was received from *METEOSAT-7* a few minutes later. I have extracted a section from Fig. 1 that approximates to the coverage of the C02 (visible-light UK) format - see **Fig. 3** and **Fig. 4**.

Note that Fig. 3 (LRIT section) is not perfect. A close examination of 'local' LRIT images, including this one, reveals artefacts. The LRIT data stream capacity is 128kbit/s, and all local images are compressed in a lossy manner by a factor of 5, in full spatial resolution.

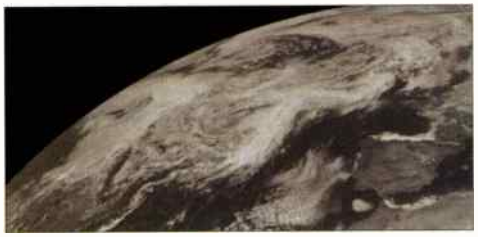


Fig. 3: Part of Fig. 1 to compare with Fig. 4 *(image © Eumetsat 2003).*

One consequence is the introduction of non-existent 'detail'. I see this in my own astronomical images when I over-compress them. We are in a trial period with *MSG-1* data and I personally expect that by the end of the trials, Eumetsat data processing staff may have developed optimal ways to compress with minimal artefacts production.

First Transmissions Of LRIT

The Low Rate Information Transmission Image Data Dissemination Service from *MSG-1* (*HotBird-6* EUMETCast) offers digital data from five channels of the HRIT service - channels 1, 3, 4, 5, 9. These lower resolution images are derived from the high rate images, and were originally to be transmitted to (relatively) low-cost user stations called Low Resolution User Station (LRUS) - costing considerably less than an HRIT reception station.

Recent events have blurred this difference; hardware costs for the changed reception system are virtually identical - see Reception Reminder - part 2. A good computer specification permits the reception and decoding of both data streams - almost like using one computer to receive PDUS and WEFAX simultaneously!

I looked back at the early records from NOAA's archive (America's National Oceanographic and Atmospheric Administration) to find an early sample of WEFAX imagery.

WEFAX - A Nostalgic Glance

The *ATS-1* (Applications Technology Satellite) was launched from Cape Canaveral in Florida on 7 December 1966 into geostationary orbit. Participants included NASA, Hughes, Jet Propulsion Laboratory, Aerospace Corporation and Bell Telephone. Its mission was to test experimental geostationary techniques of satellite orbit and motion, to measure the orbital environment at about 36,000km above the Earth's surface, and transmit meteorological information (imagery and data) to surface ground stations. I was at college in 1966, reading books about satellites and orbits in my spare time, although unfortunately the topic was not part of my course!

The *ATS-1* spacecraft was designed and configured exactly the same as the polar WXSAT *NIMBUS-1* - see later. It was a cylinder with a phased array of eight whip antennas extended from the top, and a phased array of eight v.h.f. antennas extended from the base. The sides of the cylinder were covered by 23,870 solar cells which, together with NiCad (nickel-cadmium) batteries, provided the power for the satellite.

Two meteorological experiments were on board. One was a spin scan cloud camera that provided continuous images of the sun-lit earth every half hour. The spinning motion of the satellite generated line scans with a spatial resolution of 3.2km. This process took approximately 20 minutes for the full image, and then 10 minutes to reset the camera for a new scan.

The second experiment was Weather Facsimile (WEFAX) - a data relay and re-transmission instrument. This instrument relayed data from the central ESSA (Environmental Science Services Administration) data processing facility to a.p.t. ground stations located around the western hemisphere - see **Fig. 6**.

The *ATS-1* was placed in transfer orbit directly over the equator over Ecuador. This orbit was such that the satellite would drift slowly westward with time. It eventually reached 151°W (just east of Christmas Island) and was finally deactivated on 1 December 1978. Of the satellite's 12-year life span, useful data was received for the first six years (1966-1972).

NIMBUS-1 was a polar orbiting spacecraft launched on 28 August 1964, preceding *ATS-1* by over two years. It mission was to test the NIMBUS

■ BRIAN ODDY G3FEX, THREE CORNERS, MERRYFIELD WAY, STORRINGTON, WEST SUSSEX RH20 4NS

LW Maritime Radiobeacons

Enhanced propagation conditions were sometimes encountered by the listeners who regularly searched the band at night during April, May and June.

A beacon located along the south coast of Spain at Cabo Palos (PA) on **301.0kHz** was heard at night for the first time by **Fred Wilmshurst** in Northampton. He also heard at night the beacon at Mahon, Minorca (MH) on **293.5**. From the north coast of Spain he received the beacons at Cabo Machichaco (MA) on **284.5**; Cabo Mayor (MY) **289.5** and Estaca de Bares (BA) **292.5kHz**.

Three beacons on the Faeroe Is at Myggennaes (MY) on **337.0**; Akraberg (AB) **381.0** and Nolso (NL) **404.0kHz** were received by Fred during some nights, but there was no mention in his report of the Prinz Christian Sund beacon (OZN) **372.0**, which is located on the southern most tip of Greenland.

Over in N.Ireland, **Robert Connolly** (Kilkeel, Co.Down) searched the band mainly at night and his findings included beacons along the coast of the Canaries, Egypt, the Faroes Is, Greenland, Iceland, Lithuania, Minorca, Baltic Russia and Spain - see chart.

Commenting upon his reception during this quarter Robert says "Several nights while checking the band I found propagation conditions quite poor with some regulars such as MA and MY not being heard at all. On other nights there were good conditions to the Canaries with NA (**283.5** La Entallada) almost becoming a regular at times. LT (**300.0** La Isleta) was also heard here several times.

"Other rare catches here included DA (**305.7** Dalatangi) from Iceland and BR (310.5 El Burullus) from Egypt. However, the rarest catch was on the night of 19 May when D (**304.0** Rota) was heard very clearly here. I had not heard it since before the Spanish changed the frequencies of their maritime beacons back in September 2001. It was good to hear that it was still active.

"Despite regular checks, there was no sign of the Ukranian beacon chains that occasionally pop up when suitable conditions exist, although cross checking with the weather data I use for targeting areas, conditions would not have been suitable for reception of these in the UK due to enhanced conditions existing over other parts of Europe at the same time as any possible enhancement from the Black Sea area".

Robert continued "This last quarter demonstrates that given the right conditions along with patience, regular and careful listening, rarer marine beacons operational in Europe can still occasionally be heard. The more frequent the listening the better the chances. I usually manage two or three night-time sessions per week along with a couple of daylight sessions each month.

"Those new to maritime beacon listening should remember that unlike aero beacons that operate with several different frequency off-sets, depending on the country they are located in, marine beacons operate with a zero frequency off-set and also in order to hear them careful listening is required and the beat frequency oscillator (b.f.o.) of the receiver must be activated".

The latest (8th) edition of the popular and inexpensive radiobeacon guide compiled by Robert extends to about 60 pages and details almost 3000 aero and maritime radiobeacons! It is available in printed format and it can also be obtained as a pdf file for use with *Acrobat Reader* or as an *Excel Workbook*. If you would like an information sheet about his guide, please send an s.a.e. with your request to Robert via me at the above address.

Maritime Beacons Chart

kHz	C/S	Station Name	Location	DXer
283.5	NA	Punta Lantailla	Canaries	A*
284.5	MA	Cabo Machicharo	NE.Spain	A.,B*
287.0	IA	Llanes Lt	N.Spain	A*
288.0	OR	Punta de Llobregat	S.Spain	A*
289.5	MY	Cabo Mayor	Spain	A,B*
292.5	BA	Punta Estaca Bares	N.Spain	A,B*
293.5	MH	Mahon, Minorca	Balearic Is	A*,B*
294.0	FI	Cala Figuera	Majorca	A*
295.5	PS	Cabo Penas Lt	N.Spain	A*
296.5	FI	Cabo Finisterre Lt	NW.Spain	A*
297.0	NO	Cabo de la Nao Lt	S.Spain	A*
299.0	TA	Cabo Gata	S.Spain	A*
300.0	LT	La Isleta	Canaries	A*
300.5	VI	Cabo Villano Lt	N.Spain	A*
301.5	PA	Cabo de Palos Lt	S.Spain	A*,B*
303.0	O	Tarifa	S.Spain	A*
304.0	D	Rota	SW.Spain	A*
305.0	KA	Klaipeda Rear Lt	Lithuania	A*
305.7	DA	Dalatangi Lt	Iceland	A*
310.5	BR	El Burullus	Egypt	A*
312.5	BK	Baltijsk	Balt.Russia	A*
312.5	BT	Mys Taran Lt	Balt.Russia	A*
314.0	SN	Cabo San Sebastian	S.Spain	A*
337.0	MY	Myggenaes	Faeroe Is	A,B*
372.0	OZN	Prins Chris's Sund	Greenland	A*
381.0	AB	Akraberg	Faeroe Is	A*,B*
404.0	NL	Nolso	Faeroe Is	A*,B*

Note:
Entries marked * were logged during darkness.
All other entries were logged during daylight or at dawn/dusk.

DXers:-
(A) Robert Connolly, Kilkeel.
(B) Fred Wilmshurst, Northampton.

APPENDIX - List of equipment used:-

Robert Connolly, Kilkeel: JRC NRD-525 plus Timewave DSP9+ filter and Datong AD-370 active antenna.

Fred Wilmshurst, Northampton: Icom IC-R70 + Global AT-1000 a.t.u and random wire antenna in loft.

Fig. 4: *METEOSAT-7* WEFAX C02 format 1200 7 July *(image © Eumetsat 2003).*

spacecraft configuration and provide improved cloud photographs using the a.p.t. system deployed on *TIROS-8*. Advanced cameras and high-resolution infrared radiometers were also to be tested for improved daylight as well as night cloud-cover conditions.

The craft contained three cameras with direct readout and delayed readout capabilities. A high-resolution infrared radiometer operated in the 3.4 to 4.2 micron region. Two horizon scanners, sun sensors and freon gas jets provided altitude control.

WEFAX was subsequently adopted for use on Europe's METEOSAT, and has been received, first on facsimile machines, and then on countless computers - see Fig. 2 and Fig. 4. It will continue to be transmitted by many geostationary WXSATs, including *METEOSAT-7*, but its life is now counted in months, rather than years. My thanks to **Charlie Vance** of NOAA for providing the sources of this information.

LRIT Foreign Satellite Coverage

This is now probably the main reason for many of us wanting to receive LRIT imagery, but the start of these transmissions has been postponed until 29 July. The transmission schedule includes images from *GOES-E*, *GOES-W* and *GMS/MT-SAT*. Each will provide three images - visible, infra-red and water vapour - on a three-hourly cycle. Fortunately, images will be loss-less.

MSG-1 Reception - Reminder

If you have any interest in WXSAT imaging, *MSG-1* is probably a 'must-have'. To receive and decode the data, you have to take the following steps:

1) Contact the EUMETSAT User Service and (a) register as a trial participant. This can be done via E-mail to **ops@eumetsat.de** (b) Fill in the registration form that is available on their web site.
2) Buy a reception system for *HotBird-6*. Timestep offers a complete system: SkyStar II receiver, PC card V2.6 for £55.95; SkyStar II USB version receiver for £149.00. MTI Blue Label LNB for £14.95; 10m CT100 cable (F plugs fitted), £15.00. Triax 0.88m dish, £45.00 (recommended by Eumetsat); Professional ground stand for Triax £82.25, 0.60m perforated dish £TBA (about £19 inc.); ground stand for perforated dish about £15 inc. Contact **Timestep** on **(01803) 833366** or E-mail **sales@Time-step.com** for prices and delivery. I shall be completing my review of Timestep's *HotBird* (*MSG-1*) reception system shortly and publishing it as soon as possible.
3) Contact EUMETSAT to obtain the tq Tellicast client software. They supply this for about 60Euros.
4) Set up the software using the password and username provided by EUMETSAT and edit the parameters such as PID data. Refer to EUM TD 15 for a description of the process.
5) Set-up decoding software; David Taylor's program *MSG Data Manager* is widely used.

Fig. 5: LRIT channels *(image © Eumetsat 2003).*

Fig. 6: *ATS-1* WEFAX image.

MSG-1 On A Small Dish

Peter Benney has been doing some tests on the reception of *MSG-1* data (from *HotBird-6*) using small dishes. He told me: "The local satellite dealer uses a series of mini-dishes set up on various satellites such as *HISPASAT, THOR, SIRIUS, HOTBIRD, ASTRA-2A* (and *2C*) for giving demonstrations. He is getting good reception, so I borrowed a 0.45m Sky minidish with a Cambridge G57 0.6dB LNB.

Setting it up right next to my *METEOSAT-7* Yagi, as reference to due south, was easy and took less than ten minutes. The mini-dish pulls in all the channels that the 0.88m dish receives. Other than the interruption during the downpour, which was truly torrential, reception so far has been good. I am only doing this as a matter of interest, I will revert back to my Triax 0.88m dish after a few days testing this set-up. The results could be of interest to those who cannot install a large dish and can tolerate the occasional loss of signal due to rain or snow".

MSG-1 Data Reaches Further

At a recent EUMETSAT Council meeting it was decided that EUTELSAT's *Atlantic Bird-3* satellite will carry the C-Band dissemination service. This satellite is stationed at 5°W, and is part of EUTELSAT's 'Atlantic Gate' series. The C-Band beam will cover the whole of Europe and Africa. Apart from parts of Morocco, southern Algeria, Mali and Niger, all of Europe and Africa lies within the 39dBW footprint.

The format of the C-band dissemination will be the same as for *HotBird-6* dissemination - DVB EUMETCast. The data will be uplinked to *Atlantic Bird-3* via the Fucino Ground Station in Italy, and will be a re-broadcast of the *Hot Bird* EUMETCast service. Successful tests were carried out during early June. It will take some weeks to set-up a trial service and it is hoped to check out systems already installed in African States during September. My thanks to **John Tellick** (Remote Imaging Group) for this update.

Fig. 7: APT night-time infra-red image from *NIMBUS-1* August - September 1964.

SICH-1M Launch Scheduled For December

I regularly check for news about the launch of Russian weather and resources satellites. Launch dates for *SICH-1M* and others have remained obscure; all the documents that I found, including some UK university papers, refer to a '2000' launch, that obviously did not happen. The National Academy of Sciences of Ukraine also includes this old date on their web page - **http://www.isr.lviv.ua/variant.htm** - in their discussion of Project Variant.

I eventually located an organisation called Ukrinform that appears to be an official source of up-to-date information. They advise: "As National Space Agency sources told Ukrinform, the launch of the *SICH-1M* satellite, together with the MiktroSputnik from the Baikonur Space Center has been slated for December 2003. The *SICH-1M* is supposed to be placed on a solar synchronous orbit.

The launch is an element of the Russo-Ukrainian Space Cooperation Program for 2003-2004, which was endorsed as a result of the two national space agencies' deliberations in Moscow. This program is based on the two nations' space programs, both embracing the 2003-2007 period. The *SICH-1M* project is viewed as a major element of the two nations' space cooperation".

Yury Alekseyenko is Public Relations director of the Dnipropetrovsk-based Pivdenne State Design Bureau, and he told the newspaper *The Day*: "As is known, our design bureau has won an international tender to build a satellite for Egypt. Late last year, we began to draw up the design sketch, while Dnipropetrovsk experts opened a training course for Egyptian specialists. On the whole, our cooperation is on schedule and quite success(full). But we also always remember our own spacecraft: we expect a *SICH-1M* Ukrainian microsatellite to be put into low earth orbit this year".

Mr Alekseyenko adds: "The achievements of Ukrainian rocket producers will be displayed at a very high-profile international forum called Dnipropetrovsk, the Rocket Capital of Ukraine, which will be held on the basis of the Pivdenne bureau and the Southern Mechanical Engineering Plant in August - September 2003. At the same time, a memorial to rocket builders, the only one in this country and perhaps in the world, will be unveiled in Dnipropetrovsk".

Correspondents' Pictures

Professor Robert Moore of Liverpool sent **Fig. 8**, showing Scotland as seen by *NOAA-12*. This is just a part of the image received at 1522 on 25 June. Robert explains that many of the afternoon passes of that week showed sun glint off western Scotland. "This is just one rather good example, highlighting the coastline and a number of lochs". Robert uses Timestep's HRPT system and David Taylor's *ReadHRPT* program.

Dale Ireland of Seattle, USA, has a permanently operating web camera that shows the view from his house. Dale is an active monitor of WXSATs

Fig. 8: *NOAA-12* Sun glint over Scotland on 25 June from Robert Moore

(**http://www.drdale.com/cam/index.htm**) and received **Fig. 9**, showing ships' contrails near Seattle.

Kevin Hughes sent me his regular weather picture from Tamworth where he waits patiently for the men from the ministry (Radiocommunications Agency) to pay a second visit to check out the renewed interference that once more affects his a.p.t. images. The 137MHz band (in which WXSAT frequencies are found) is protected, so the RA is obliged to investigate any significant interference reported to them.

Current WXSATS

No new WXSATs are due for launch for some time, so we continue to receive a.p.t. from *NOAA-12*, *NOAA-15* and *NOAA-17*. During those periods when the footprints of *NOAA-12* and *NOAA-15* overlap, the former is temporarily switched off. The h.r.p.t. transponders are not affected, so those with h.r.p.t. reception systems can receive imagery from these three WXSATs, plus unsynchronised images - see **Fig. 11** - from *NOAA-14*; weak telemetry can be received from the Chinese *FY-1C* satellite, and a stronger signal from *FY-1D*.

Fig. 9: *NOAA-17* 25 June showing contrails near Seattle - from Dale Ireland.

Fig. 10: *NOAA-17* 1009 7 July from Kevin Hughes.

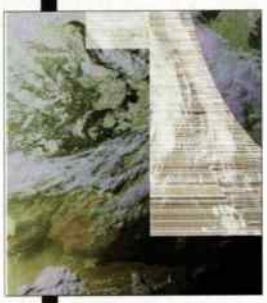


Fig. 11: *NOAA-14* h.r.p.t. unsynchronised image 10 June.

Frequencies

a.p.t.
NOAA-12 and *NOAA-15* transmit a.p.t. on 137.50MHz.
NOAA-17 transmit a.p.t. on 137.62MHz.
During overlap periods, *NOAA-12*'s a.p.t. is switched off.

h.r.p.t.
NOAA-12 and *NOAA-16* transmit h.r.p.t. on 1698.0MHz.
NOAA-14 and *NOAA-17* transmit on 1707MHz.
NOAA-15 transmits on 1702.5MHz.
FENGYUN-1C and *FENGYUN-1D* transmit on 1700.5MHz.

WEFAX: *METEOSAT-7* (geostationary) transmits WEFAX on 1691 and 1694.5MHz and Primary Data on 1691.0MHz.
HRIT/LRIT: *MSG-1* (geostationary) transmits DVB format data streams from *HotBird-6*.

■ JACQUES D'AVIGNON VE3VIA ■ E-MAIL: jacques@pwpublishing.ltd.uk

Propagation Forecasts

How to use the Propagation Charts

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

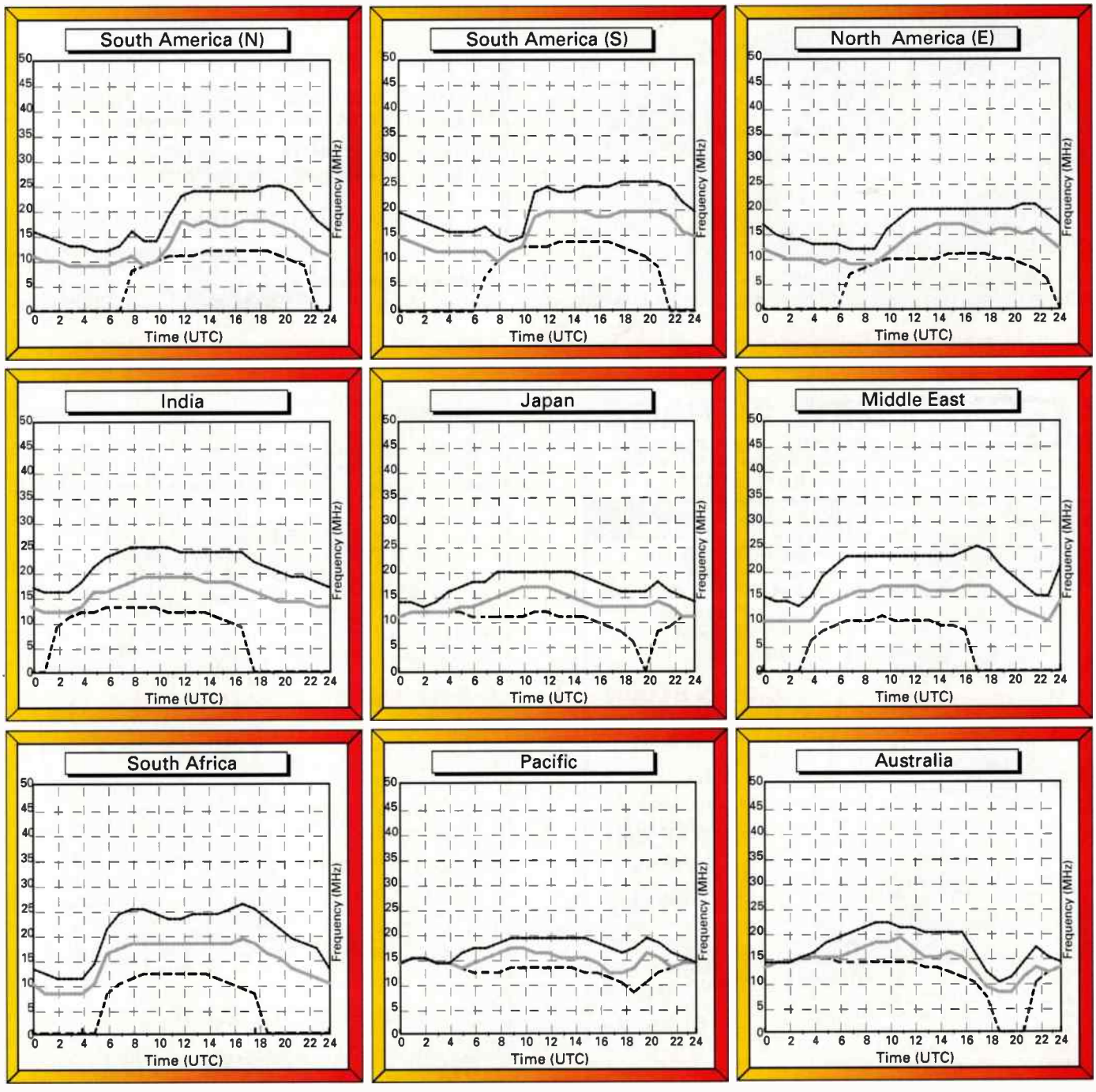
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50% probability of success for the path and time.

To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.

September 2003
Circuits to London

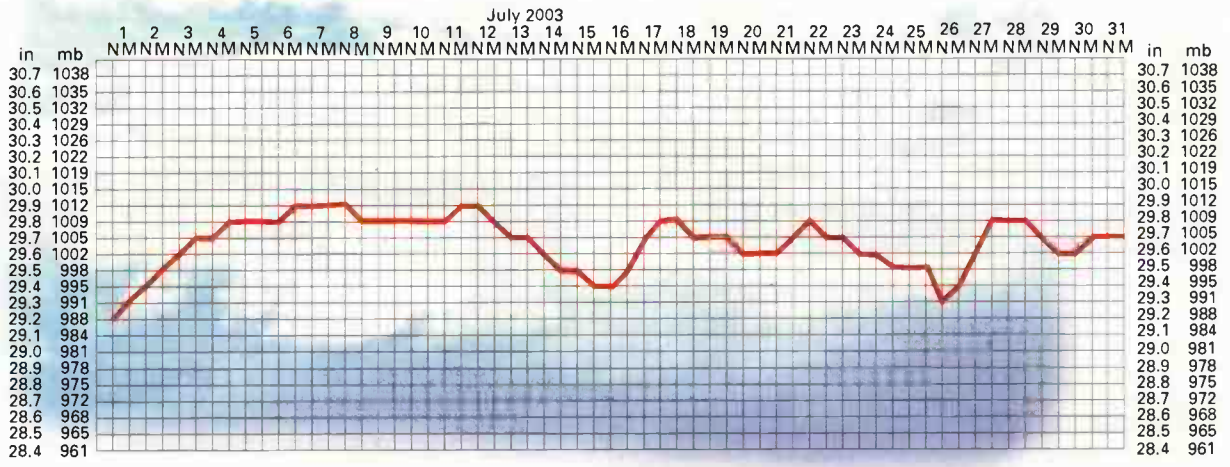


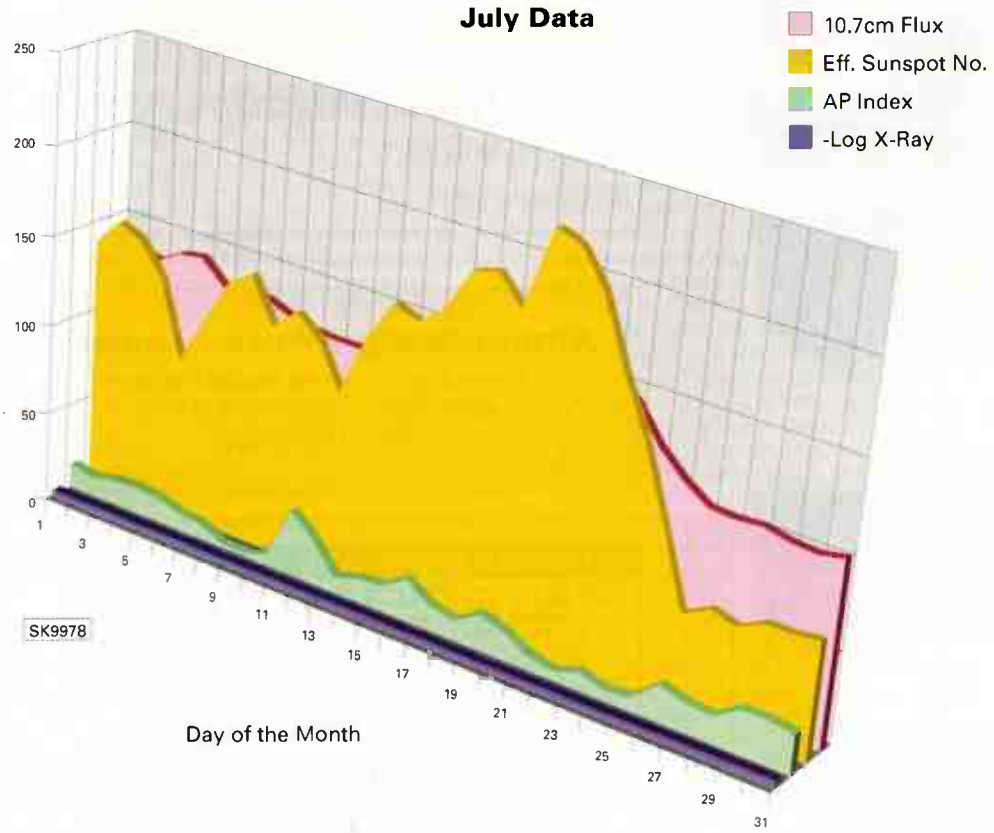
SK9977

■ KEVIN NICE G7TZC/M3SWM, SWM EDITORIAL OFFICES, BROADSTONE ■ E-MAIL: kevin.nice@pwpublishing.ltd.uk

Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, July 2003





guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.

The K and AP indices are measures of geomagnetic activity.

The K index ranges from zero (very quiet) to nine (severely disturbed).

K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.

The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.

TRADING POST

Subscribers free, £4 non-subscribers

Please write your advert **clearly** in **BLOCK CAPITALS** up to a maximum of 30 words, plus 12 words for your contact details, and send it together with your payment of £4 (**subscribers free!**) to **Trading Post, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.** You can also E-mail your Trading Post advertisements to: **tp@pwpublishing.ltd.uk** (if you don't want to include your credit card details with your E-mail, just 'phone us on 0870 224 7810).
If an order form is not provided due to space constraints, a form from a previous issue can be used as long as the cornerflash or subscriber number is attached as proof of purchase of the magazine. Adverts appear on a first come first served basis. All queries on 0870 224 7810.
We **cannot** accept advertisements from traders, or for equipment which is illegal to possess, use or which cannot be licensed in the UK. Please note that *SWM* are in no way liable for any loss incurred as a result of buying or selling via 'Trading Post'.
Please note if we have sufficient notice, it is possible to remove ads, unfortunately no refunds are possible.

FOR SALE

19 Set, as original, Canadian with Russian writing, B-set, etc., complete, £350. Another with internal mains pack, £150. Also two (19) power unit, £95 each. AR88D, good condition, overhauled, £175. Tel: (01872) 241005 evenings.

AKD Target HF3 receiver, 30kHz to 30MHz, very good condition, with power supply, wire antenna, manual and box and packing, £95. Tel: Scunthorpe (01724) 861472.

Alinco DR-MQ6 (see rig guide, page 16) 6m mobile f.m. transceiver, 100 memories, scanning, tuning steps programmable, CTCSS, 20W-1W, 50-54MHz, the magic band, the lot as new £245, sell for £100 o.v.n.o. including P&P. G6LSW on (01986) 896658.

AOR AR3000, v.g.c., no box, hence £330. Yupiteru MVT-7300, four months old, very little use, £180. Watson frequency counter Hunter, mint condition, inc. antenna, NiCads, charger, £40. Tel: (01246) 417429.

AOR AR7030 'Plus' plus receiver, top of the range R600 communications receiver, £130. Both mint and boxed, AOR offers invited. Vectronics AT100 active antenna, boxed, unused, £45. All items carriage paid. Tel: Worcs (01386) 881034.

AOR AR7030 receiver with Plus upgrade and Inrad 2.1kHz additional filter, mint, boxed, with manual, little used, £510 carriage paid. Vectronic AT100 active antenna, new, boxed, £45. Tel: Worcs (01386) 881034.

AOR AR7030, fitted battery pack, £380. AOR AR800 with case, £150. Bearcat 9000, £140. All boxed, as new. Kenwood HS-5 headphones, £35. Trio AT-230 a.t.u., £60. Diamond D707 active antenna, £50. Tel: Cambs (01733) 241227.

Data Decoder MFJ462B Multi Reader, £100. Millar s.w. antenna, £45. MFJ-956 pre-selector, £30. Palstar AA30 combined 3 in 1 unit, active antenna, s.w. pre-amp tuner, £40. Watson WRP-1300 dynamic receiver, pre-amplifier wideband 25-1300MHz, £25 - offers. Bob, Scotland. Tel: (01259) 761557.

Desktop wideband antenna, 25-1300MHz, BNC connector, purchased new Dec 2000 £50, bargain at, £10 - buyer collects. Steve, Newmarket. Tel: (01638) 578318.

Fairhaven RD500VX, wideband RX, excellent condition, manual, £575 o.n.o. Universal 8000 decoder, 25 modes, as new, offers. Tel: Warwicks (01926) 854556.

Icom 7000 receiver, mint condition, with TV converter, remote control, £400. Also TS-130V TX/RX, 80-10m, all amateur bands, p.s.u., PS20 mic., extra 1.8 s.s.b. 270Hz c.w. filters, £350. Manuals for both. Tel: Herefordshire (01568) 780396 evenings.

Icom IC-706 MkII, h.f., 6m, 2m, a superb set for home and mobile, in excellent condition, boxed, with manuals, quick sale, £425 o.v.n.o. G0MRY on (01283) 702212.

Icom IC-R8500 receiver, absolutely mint condition with original box and paperwork, just purchased. Tel: (01483) 502410.

Icom IC-R8500, top of the range receiver, h.f./v.h.f./u.h.f., excellent condition, boxed with all leads and power supply, full instruction manual, genuine reason for sale, £750 o.v.n.o. Tel: East Sussex (01825) 722054.

Icom PCR-1000 all-mode computer scanner, barely used, as new, boxed with *XP* software, £225 postage included. Also *Ferrells* and *UK Scanning Directories*, cost £40, sell for, £20. Derek, Northumberland. Tel: (01670) 826874 after 1700.

Kenwood R-5000 with VC20 v.h.f. unit, manual and boxed, mint condition, £450. Alan, Southport. Tel: (01704) 543423.

Listening corner: Kenwood R-5000 + v.h.f. converter. Bearcat UBC9000XLT antenna tuner. FRT-7700. All working, with boxes and manuals, includes h.f. and v.h.f./u.h.f. antennas, £650 o.n.o. Tel: Dorset (01258) 860918.

Lowe HF-225 receiver, with keypad, external speaker and broadband active loop antenna, model 1530, with coaxial, antenna rotator and manuals, all in good working order, ideal for beginner, £340 o.n.o. Tel: Notts (01623) 742388.

Lowe HF-225, external keypad, director unit, internal battery, whip antenna/active antenna pre-amp, external loud speaker, original receipt, listing specification, user manual, several books, £175. Tel: Crawley (01293) 542932.

MFJ-461 c.w. pocket reader, £55 - as new. Tel: (07960) 029004 after 1800.

NRD-545 d.s.p. receiver, mint condition, with CHE199U/v.h.f. converter NVA319 external speaker, hardly used, boxed, manuals, bargain, £800. Richard, Tyne & Wear. Tel: 0191-483 2470/430 0046 nightime (07950) 455997.

Outdoor aerial and cables for Hitachi WorldSpace receiver, six months old, I cannot keep it on station, will take £20. Chris Muller on (01283) 734320.

Racal RA1792, £350 (recently serviced by Telford Electronics). Realistic DX-394, £60. Yupiteru MVT-3300EU, £70. Global AT-2000 a.t.u., £40. Prefer buyer to collect, all cash only. Richard, Keighley. Tel: (01535) 681759 evenings please.

Realistic DX-394, mint condition, with extension speaker filter, active antenna, £100. Michael on 0141-487 4029.

Sangean ATS-909 world band radio, unmarked with manual, leather case, p.s.u. and 'Reel' antenna, £60. Psion Series 5 hand-held computer, unmarked with manual, software, leather case, mains p.s.u., £50. Tel: (01892) 611389 or E-mail: david@excess.net

Three section 65ft trellis mast, c/w winch, base plate and template for installing galvanised, good condition, £250 o.n.o. Tel: (01771) 624567, mobile (07778) 156780 or E-mail: rognwil@aol.com

Yaesu FRG-7, £40 o.n.o. BC-221-M frequency meter with power unit, £40 o.n.o. Hamgear pre-selector, £15 o.n.o. Valves, boxed, new, £20. R209 receiver, battery headset, charger, manual, £50 o.n.o. Tel: (01202) 397698 - buyer collects.

Yaesu VR-500 ADMS3, £135. Realistic DX-394, £65. JPS NIR12 dual d.s.p., £80. SSE AAF 2002 filter, £17. Global ATU2000, £45. RF Active duck hand-held a.c. antenna, £50. All mint, boxed with instructions. Guy on (01562) 887690 1800-2100 Mon-Fri only.

Yaesu VR-5000, with p.s.u., boxed as new, 2003 s.w. frequency guide, £470 P&P included. Tel: 0191-483 3979.

Yaesu VR5000 all-mode communications receiver, 100kHz to 2600MHz, like new, with box and manual, £450. Tel: (01267) 220977.

WANTED

Any type or condition of Scrambler, Cipher, Code, Crypto, Privacy or converter equipment for small pirate museum, will buy or swap. Ken on (01337) 870375 or E-mail: ken@kvc-smitchell.freeserve.co.uk

For Icom R71E, CR-64 xtal, FL32, FL63 c.w. filters, FL44A s.s.b filter, prices please. Mike, Croydon. Tel: (01689) 842223.

Icom R75 receiver or Drake R8A receiver, narrow 1.8kHz filter, CFL218A and BWC unit CFL-243 for JRC NRD-535. Carl Rosser, Mid-Glamorgan. Tel: (01443) 433992 after 1730.

MFJ-461 Morse Reader, in g.w.o., price and carriage to. D. Collins on (01225) 443898 after 1700.

Q-Tek Tritan 6+2+70cm beam. Watson W-2000 vertical, WB 234A amplifier re: 144MHz, any cheap broken but repairable h.f. (ham bands) mobile antennas, w.h.y.? Handbook to FT-757GX or copy. Enquiries on behalf of G6LSW (M3BZY) Alan, write c/o: 85 Hillside Road West, Bungay, Suffolk NR35 1RH, Tel: (01986) 896658 (can collect within 50-70 miles). Payment by cash on delivery either way.

Racal RA957 Milspec antenna, must be in good working order, can you help me? Text: (07812) 2772169 or E-mail: glenhoff1@activemail.co.uk

Revco Radac nest of dipoles for airband, good clean condition, please can anyone help? Glen on 0121-684 6096 mornings only please or E-mail: glenhoff1@activemail.co.uk

Ten-Tec RX340, mint condition only please. Tel: 0208-942 2369 anytime.

Urgently wanted old half inch ferrite rods, must be half inch in diameter and be 6in long or more. Willing to pay good money for the rods. Peter (mobile) on (07931) 463823 0900 to 2200.

ORDER FORM

PLEASE WRITE IN BLOCK CAPITALS

I enclose Cheque/P.O. for £.....(£4.00)
Made payable to *PW Publishing Ltd.*

Please insert this advertisement IN THE NEXT AVAILABLE ISSUE OF SHORT WAVE MAGAZINE

Name.....
Address.....
.....
.....
.....
Post Code.....
Credit Card Details: Card Number

Signature .....
Expiry date of card.....
Issue No......
Subscription Number (on mailer label) .....

FOR SALE/WANTED/EXCHANGE maximum 30 words

	(30)		

CONTACT DETAILS maximum 12 words

SWM Sept '03 TP

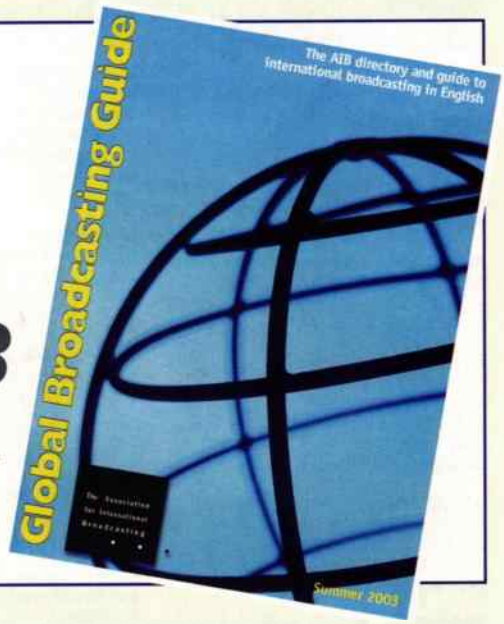
Short Wave Magazine book

new additions

Global Broadcasting Guide - Summer 2003

The *Global Broadcasting Guide* is the directory of English language international broadcasting, covering television and radio. This guide also serves as the directory of AIB members - broadcasters, transmission companies, satellite operators, service providers and manufacturers involved in international broadcasting. A handy little book, for just **£2.75 + P&P**.

Order your copy now!



	pages	price	code
LISTENING			
Airband			
AIRWAVES 2003 (Photavia)	144	£9.95	AIR23
AIRBAND RADIO GUIDE (abc) 5th Edition	112	£8.99	ABRG5
AIRBAND RADIO HANDBOOK (Haynes)	190	£12.99	ABRHB
AIR TRAFFIC CONTROL (abc) 8th Edition	112	£9.99	ATC8
CALLSIGN 2003 (Photavia)	144	£9.95	CAL23
CIVIL AIRCRAFT MARKINGS (abc)	384	£7.99	CIVAIR
DIRECTORY OF AIRCRAFT SELCALS (Seldec)	234	£12.95	DASC
FLIGHT ROUTINGS 2003 Williams	180	£8.95	FR23
MILITARY AIRCRAFT MARKINGS 2003 (abc)	224	£7.99	MILAIR
NORTH ATLANTIC ROUTE CHART (US Dept.Transport FAA)	740 x 520mm	£9.00	NAROUT
Frequency Guides			
FERRELL'S CONFIDENTIAL FREQUENCY GUIDE 13th Edition	540	21.50	FERRL13
GLOBAL BROADCAST GUIDE (June 2003 Issue)	32	£2.75	GBGJU3
KLINGENFUSS GUIDE TO UTILITY STATIONS 2003	576	£26.50	KFUTIL
KLINGENFUSS SHORTWAVE FREQUENCY GUIDE 2003	528	£23.50	KFSWFG
KLINGENFUSS SHORTWAVE CD 2003	-	£16.50	KFSWCD
PASSPORT TO WORLD BAND RADIO 2003	592	£15.50	PASS23
RADIO LISTENERS GUIDE 2003	128	£5.45	RLG23
THE SHORTWAVE GUIDE (WRTH) (June 2003)	208	£12.99	WRSWG
UK SCANNING DIRECTORY 8th Edition	700	£19.75	UK8TH
WORLD RADIO TV HANDBOOK 2003 (WRTH)	672	£19.95	WRTH23
Scanning & Short Wave			
BUYING A USED SHORT WAVE RECEIVER - 4th Edition F. Osterman	78	£5.95	BUSWRX
RECEIVING (VALUE) STATION LOGBOOK (RSGB)	80	£4.95	RXLOG
SCANNER BUSTERS 3 D.C. Poole (Interproducts) NEW		£5.00	SCANB3
SCANNERS 4 SCANNING INTO THE FUTURE Bill Robertson	245	£9.95	SCAN4
SHORT WAVE COMMUNICATIONS Peter Rouse GU1DKD (PWP)	187	£4.50	SWCOM
SHORTWAVE RECEIVERS PAST & PRESENT 3rd Edition F. Osterman	450	£25.95	SWRXPP
THE SUPERHET RADIO HANDBOOK I.D. Poole (Babani)	104	£4.95	BP370
Weather			
FAX & RTTY WEATHER REPORTS Philip Mitchell	88	£11.50	FXTWR
WEATHER SATELLITE HANDBOOK 5th Edition. Dr Ralph E. Taggart WB8DQT	192	£15.50	WSATHB

store

AMATEUR RADIO

	pages	price	code
Amateur Television			
AN INTRODUCTION TO AMATEUR TELEVISION. Mike Wooding G6IQM & Trevor Brown G8CJS	156	£5.00	INTATV
THE AMATEUR TV COMPENDIUM. Mike Wooding G6IQM	104	£3.50	ATVCOM
Antennas/Transmission Lines/Propagation			
25 SIMPLE AMATEUR BAND AERIALS E.M. Noll (Babani)	63	£1.95	BP125
25 SIMPLE INDOOR AND WINDOW AERIALS E.M. Noll (Babani)	50	£1.75	BP136
25 SIMPLE TROPICAL AND MW BAND AERIALS E.M. Noll (Babani)	54	£1.75	BP145
ANTENNA FILE (RSGB)	285	£18.99	ANTFIL
AN INTRODUCTION TO RADIO WAVE PROPAGATION J.G. Lee (Babani)	116	£3.95	BP293
ANTENNA TOOLKIT (inc. CD-ROM) Joseph J. Carr	214	£25.00	ANTOOL
ARRL ANTENNA BOOK 19th Edition	732	£24.00	RRAB19
BACKYARD ANTENNAS Peter Dodd G3LDO (RSGB)	200	£18.99	BYANTS
BEAM ANTENNA HANDBOOK W.I. Orr W6SAI & S.D. Cowan W2LX	268	£8.95	BMANHB
BUILDING & USING BALUNS Jerry Sevick	125	£18.95	BUBALS
EXPERIMENTAL ANTENNA TOPICS H.C. Wright	70	£3.50	BP278
HF ANTENNA COLLECTION Edited by Erwin David G4LQI (RSGB)	233	£9.99	HFANTC
HF ANTENNAS FOR ALL LOCATIONS Les Moxon G6XN (RSGB)	322	£19.99	HFAFAL
MORE OUT OF THIN AIR (PWP)	112	£6.95	MOOTA
WIRE ANTENNA CLASSICS (ARRL)	200	£10.50	WANTC
MORE WIRE ANTENNA CLASSICS (ARRL)	200	£10.50	MWANTC
PHYSICAL DESIGN OF YAGI ANTENNAS (Hardback) D.B. Leeson W6QHS (ARRL)	200	£15.50	PDYAGI
RECEIVING ANTENNA HANDBOOK Joe Carr	189	£17.50	RXANHB
VERTICAL ANTENNAS W.I. Orr W6SAI & S.D. Cowan W2LX	192	£8.95	VERANT
VHF UHF ANTENNAS I.D. Poole (RSGB)	128	£13.99	VUANTS
Beginners/Novice/RAE			
AMATEUR RADIO EXPLAINED. Ian Poole (RSGB)	150	£9.90	AREXPL
AN INTRODUCTION TO AMATEUR RADIO Ian Poole G3YWX (RSGB)	150	£4.99	BP257
AN RAE STUDENTS NOTEBOOK Bob Griffiths G7NHB	76	£6.95	RAESNB
FOUNDATION LICENCE NOW! R. Betts (RSGB)	32	£3.95	FLNOW
HF AMATEUR RADIO. Ian Poole (RSGB)	120	£13.99	HFAR
INTERMEDIATE LICENCE - BUILDING ON THE FOUNDATION	76	£5.75	INTLIC
RADIO AMATEURS EXAMINATION/END OF COURSE TEST PAPERS Ray Petri G0OAT (RSGB)	104	£13.95	RAECTP
RAE MANUAL (RSGB) 16th Edition	127	£15.00	RAEMAN
RAE REVISION NOTES (RSGB)	92	£5.00	RAERVN
SECRET OF LEARNING MORSE CODE Mark Francis (Spa)	84	£6.95	SOLMC
THE RADIO AMATEURS' QUESTION & ANSWER REFERENCE MANUAL. 5th Edition Ray Petri G0OAT	208	£13.95	RAQARM
Call Directories			
PW UK/EIRE CALLSIGN CD 2001/2 (PW)	-	£4.75	PWCALL
RSGB YEARBOOK. 2003 Edition	462	£15.95	RSYB23
Design & Construction			
COIL DESIGN & CONSTRUCTION MANUAL (Babani)	106	£3.95	BP160
LF EXPERIMENTERS HANDBOOK (RSGB)	112	£18.99	LFEXHB
PRACTICAL PROJECTS G. Brown (RSGB)	208	£13.95	PRPROJ
PRACTICAL RECEIVERS FOR BEGINNERS John Case GW4HWR (RSGB)	165	£14.99	PRRXFB
PRACTICAL TRANSMITTERS FOR NOVICES John Case GW4HWR (RSGB)	126	£12.50	PTXNOV
PROJECTS FOR RADIO AMATEURS & SWL. R.A. Penfold (Babani)	92	£3.95	BP304
RADIO & ELECTRONICS COOKBOOK (RSGB)	319	£16.99	RECOOK
RADIO RECEIVER PROJECTS YOU CAN BUILD	312	£20.95	RRPYCB
RF COMPONENTS & CIRCUITS Joe Carr (RSGB-Newnes)	398	£22.50	RFCOMP
TECHNICAL COMPENDIUM (RSGB)	288	£17.99	RSTECO
TECHNICAL TOPICS SCRAPBOOK. 1995-99 Pat Hawker (RSGB)	310	£14.99	TT9599
THE ART OF SOLDERING R. Brewster (Babani)	84	£3.99	BP324
UNDERSTANDING BASIC ELECTRONICS (ARRL)	314	£15.50	UNDBEL
Shack Essentials			
AMATEUR RADIO MOBILE HB. P. Dodd. (RSGB)	114	£14.99	MOBHB
AMATEUR RADIO OPERATING MANUAL (RSGB)	257	£24.99	AROPM
ARRL OPERATING MANUAL 7th Edition	420	£18.50	RROPM

Short Wave Magazine

bookstore

ARRL HANDBOOK 2003	1216	£28.00	RRHB23
AMATEUR RADIO (VALUE) LOGBOOK (RSGB)	80	£4.95	TXLOG
AMATEUR RADIO WORLD ATLAS (A4 size) (DARC)	20	£8.00	ARWAT
DIGITAL MODES FOR ALL OCCASIONS M. Greenman. (RSGB)	208	£16.95	DMFAO
GREAT CIRCLE MAP (PWP)	400 x 400mm	£1.50	GCMAP
IOTA DIRECTORY 11th Edition (RSGB)	128	£9.95	IOTA11
LOW BAND DXING (ARRL) (WSL)	586	12.00	LBDXNG
RADIO AMATEURS MAP OF THE WORLD 2002 (Traxel)	980 x 680mm	£7.00	RAMAPW
RADIO COMMUNICATIONS HANDBOOK 7th Edition. Dick Biddulph/Chris Lorek (RSGB)	580	£29.99	RCOMHB
RSGB PREFIX GUIDE	34	£8.95	PFXGDE

Microwaves

AN INTRODUCTION TO MICROWAVES F.A. Wilson (Babani)	134	£3.95	BP312
INTERNATIONAL MICROWAVE HANDBOOK A. Barter (RSGB-ARRL)	474	£24.95	IMWHB

QRP

LOW POWER SCRAPBOOK (RSGB)	320	£12.99	LPSCRA
QRP POWER (ARRL)	188	£11.50	QRPPWR
INTRODUCING QRP Dick Pascoe G0BPS	48	£4.95	INTQRP

VHF & Higher

ALL ABOUT VHF AMATEUR RADIO W. I. Orr W6SAI.	163	£8.95	AAVHF
GUIDE TO VHF/UHF AMATEUR RADIO Ian Poole G3YWX (RSGB)	180	£8.99	GTVUHF
NOS INTRO: TCP/IP OVER PACKET RADIO Ian Wade G3NRW	356	£11.50	NOSINT
VHF/UHF HANDBOOK (RSGB)	180	£22.00	VUHFHB

VINTAGE & WIRELESS

Crystal Sets

THE XTAL SET SOCIETY NEWSLETTER Volume 1 & 2 Combined. Phil Anderson W0XI	96	£14.00	XTNL12
THE CRYSTAL SET HANDBOOK & VOL. 3 XTAL SET SOCIETY NEWSLETTER. Phil Anderson W0XI	134	£8.00	XTNL3
THE XTAL SET SOCIETY NEWSLETTER Volume 4. Phil Anderson W0XI	88	£7.00	XTNL4
CRYSTAL RECEIVING SETS & HOW TO MAKE THEM (Lindsay)	124	£7.95	XTHTM
CRYSTAL SETS. The Xtal Set Society Newsletter, Volume 5. Phil Anderson W0XI	88	£7.00	XTNL5
CRYSTAL SET BONANZA Vol 9, 10 & 11 Xtal Set Society Newsletter	226	£15.00	XTBONZ
CRYSTAL SET BUILDING & MORE - Xtal Set Society	168	£10.50	XTNL67
CRYSTAL SET PROJECTS	160	£10.00	XTPROJ
CRYSTAL RADIO HISTORY, FUNDAMENTALS AND DESIGN P.A. Kinzie	122	£8.00	XTHIST
CRYSTAL SET LOOPERS, A THREE TUBER & MORE Volume 8 Xtal Set Society Newsletter	128	£10.50	XTLOOP

Historical

100 RADIO HOOK UPS 2nd Edition (reprinted)	48	£3.35	100RHU
1934 OFFICIAL SHORT WAVE RADIO MANUAL Edited by Hugo Gernsback	260	£11.85	1934SW
AMATEUR RADIO - A BEGINNERS GUIDE (1940 REPRINT) Douglas Fortune W9UVC	156	£7.70	ARABG
COMMUNICATIONS RECEIVERS - THE VACUUM TUBE ERA R.S. Moore	141	£17.95	COMRXV
MARCONI'S ATLANTIC LEAP (H/B)	96	£6.99	MALEAP
POP WENT THE PIRATES Keith Skues	568	£14.99	POPPIR
SAGA OF MARCONI OSRAM VALVE (Paperback) B Vyse	346	£25.00	SMOV
THOSE GREAT OLD HANDBOOK RECEIVERS (1929 & 1934)	94	£6.95	TGOHRX

Valves

HENLEYS 222 RADIO CIRCUIT DIAGRAMS (1924)	271	£9.95	222RAD
HOW TO BUILD THE TWINPLEX REGENERATIVE RECEIVER Lindsay	63	£6.75	HTBTRR
HOW TO BUILD YOUR FIRST VACUUM TUBE REGENERATIVE RECEIVER T.J. Lindsay	127	£8.25	HTBFVA
HOW TO BUILD YOUR RADIO RECEIVER (A4) (Popular Radio Handbook No. 1)	100	£6.70	HTBYRR
HOW TO MAKE A NEUTRODYNE RECEIVER Webb	63	£5.95	HTMNRX
SECRETS OF HOMEBUILT REGENERATIVE RECEIVERS (Rockey)	127	£8.75	SHBRRX

ELECTRONICS

BASIC RADIO PRINCIPLES & TECHNOLOGY Ian Poole G3YWX	262	£15.99	BRPRIN
ELECTRONIC PROJECT BUILDING FOR BEGINNERS R. Penfold (Babani)	110	£4.95	BP392
GETTING THE MOST FROM YOUR MULTIMETER (Babani)	102	£3.99	BP239
MORE ADVANCED USES OF THE MULTIMETER (Babani)	86	£2.95	BP265
SCROGGIES - FOUNDATIONS OF WIRELESS & ELECTRONICS 11th Edition	292	£20.99	SCROGY
TEST EQUIPMENT FOR THE RADIO AMATEUR Clive Smith G4FZH (RSGB)	170	£12.99	TESTEQ

HOW TO ORDER

Here's how to order any book or back issue from the SWM Book Store - the biggest and best selection of Short Wave Listening and Amateur Radio publications anywhere! You can place your order in one of the following ways:

By Post: Write to the Book Store, remembering to include your name, address, daytime telephone number and payment details (Sterling, cash not accepted), at: Book Store, PW Publishing Ltd., Broadstone, Dorset BH18 8PW.

By Telephone: Call **Clive G4SLU** in the Book Store, Monday to Friday 9am to 4pm. Outside these hours your order will be recorded on an answerphone. **Call: 0870 224 7830**

By Fax: If you wish to FAX your order to us please mark it for the attention of the Book Store and send it to: **FAX: 0870 224 7850**

By E-mail: You can E-mail your order direct to: **clive@pwpublishing.ltd.uk**

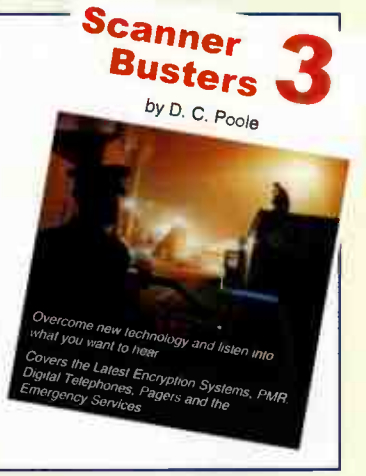
Postage Charges: Please remember to add postage to your order. Please add £1.50 P&P for one item, £2.75 for two or more (UK), For overseas surface add £2.75 for one, £4.25 for two, for three or more add and extra 75p per item. Airmail prices on application.

new additions

Scanner Busters 3

ORDER TODAY & SAVE 10%!

Now in its third edition, *Scanner Busters* has matured into a useful guide to what is and isn't possible with a scanning receiver. Topics covered are Analogue Trunked radio, Digital Radio system including TETRA and others, Pagers, Digital telephone systems, both national networks and home systems and v.h.f./u.h.f. data modes. The book concludes with an optimistic take on the future of scanning. This informative guide, which also includes some frequency tables and simple theory as to how some systems work, deserves a place on your book shelf. **92 pages, £5 + P&P**



Telephone Orders Taken On **0870 224 7830** between the hours of 9am-4pm. Outside these hours your order will be recorded on an answerphone.
FAX Orders can be sent to **0870 224 7850**

book store order form

Please send me the following books:

..... Code ..... Price (£).....
..... Code ..... Price (£).....
..... Code ..... Price (£).....
..... Code ..... Price (£).....
..... Code ..... Price (£).....
..... Code ..... Price (£).....
..... Code ..... Price (£).....

Total cost of Books Ordered: Price (£).....

Postage Charges
Please remember to add postage to your order.

UK
£1.50 P&P for one item,
£2.75 for two or more (UK)

Overseas Surface
£2.75 P&P or one, £4.25 for two,
75p extra per item for three or more
Airmail prices on application.

Total cost of Order including postage: Price (£).....

Alternatively send this completed form to:

PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW

Payment Details

Name .....

Address.....

.....

.....

Telephone (Daytime) .....

Postcode.....

I enclose my Cheque/Postal Order (made payable to PW Publishing Ltd) for £ .....

or please debit my Access/Visa/Amex Card No:

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Expiry Date .....

MasterCard DELTA AMERICAN EXPRESS VISA

or please debit my Switch Card No:

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐

Switch start date ..... Switch Issue No (if on card).....

Switch Expiry Date .....

Signature.....

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at the time of going to press. Please note: all payments must be made in Sterling, cash not accepted.

SWM UK Radio Club Listing

If you want to meet with others with a radio passion, then please use this guide...

NORTH WEST

CHESHIRE

CHESTER & DRS, G3GIZ. Meets at the Burley Hall, Waverton, Chester. Details from Bob Campbell G4CMI. Tel: (01244) 378699.

HALTON RADIO CLUB, MOBXZ. Meets at the Play Centre, Norton Hill, Windmill Hill, Runcorn. Details from Alan Parker 2E1DSF. Tel: (0192B) 79022B.

MACCLESFIELD WIRELESS SOCIETY, G4MWS. Meets at the Pack Horse Bowling Club, Abbey Road, Macclesfield. Details from Mrs Hazel Parrott.

MID CHESHIRE ARS, G3ZTT. Meets at the Cotebrook Village Hall, Cotebrook Nr. Tarporley, Cheshire. Details from Niall Reilly GOVOK.

NORTH CHESHIRE RC, GOBAA. Meets at the Morley Green Club, Mobberley Road, Wilmslow, Cheshire. Details from Jill Gourley GOOZJ. Tel: 0161-485 5036.

RADIO OFFICERS ARS, MOROA. Details from Mr J. Bell GOOMM.

UKFM GROUP WESTERN, GB3MP. Meets at the Morley Green Club, Mobberley Road, Wilmslow, Cheshire. Details from Gordon Adams G3LEQ. Tel: (01565) 652652, FAX: (01565) 634560.

WARRINGTON & DARS, GOWRS. Meets at the Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington, Cheshire. Details from John Riley GORPG. Tel: (01925) 762722.

WIDNES & RUNCORN ARC, GOFWR. Meets at the Scout Hut, Castle Road, Halton Castle, Runcorn, Cheshire. Details from Martin Tust G4LUQ. Tel: (01928) 714843.

CUMBRIA

CARLISLE & DARS, G4ARS. Meets at the Morton Community Centre, Wigton Road, Carlisle. Details from Mr J.A. Ennis G3XWA. Tel: (01228) 27463.

EDEN VALLEY RS, GOANT. Meets at the BBC Club, Penrith. Details from John Roze GOVMP. Tel: (01931) 716421.

FURNESS ARS, G4ARF. Meets at the Farmers Arms Hotel, Newton-in-Furness. Details from Mr K. Moore M1BWA. Tel: (01229) 465691.

WHITEHAVEN ARC, MOBEE. Details from Mr N. Williams MOCRM.

GREATER MANCHESTER

BURY RS, G3BRS. Meets at the Mosses Centre, Cecil Street, Bury, Lancs BL9 0SB. Details from Steve Gilbert G3OAG. Tel: 0161-881 1850.

DOUGLAS VALLEY ARS, G3BPK. Meets at the Wigan Sea Cadet HQ, Training Ship Sceptre, Brookhouse Terrace, off Warrington Lane, Wigan. Details from Mr D. Snape G4GWG. Tel: (01942) 211397.

ECCLES & DARS, G3GXI. Meets at the Eccles Liberal Club, Wellington Road, Eccles, Manchester. Details from Chris Hamson G8KRG. Tel: 0161-773 7899.

THE MANCHESTER WIRELESS SOCIETY, G5MS. Meets at the Simpson Memorial Community Hall, Moston Lane, Moston, Manchester. Details from Ian MOIPR. Tel: 0161-288 730 or visit www.g5ms.com

OLDHAM ARC, G4ORC, G1ORC. Meets at the Royston Air Training Corps, Park Lane, Royston, Oldham. Details from Michael Crossley M1CVL. Tel: (01706) 367454.

OULDER HILLS ARS, GOUQA. Meets at the Oulder Community School, Hudsons Walk, Oulder Hill, Rochdale. Details from Carolyn Hope G7WFF. Tel: (01706) 522687.

ROCHDALE & DARS (RADARS), GOROC. Meets at the Bamfield & Fieldhouse, Cricket Club, Bamfield Village. Details from John Cannell G7OAI. Tel: (01706) 376204.

SOUTH MANCHESTER RAD & COMP CL, G3FVA. Meets at the Sale Cricket Club, Dawe Road, Sale, Cheshire. Details from Chris Ward G4HON. Tel: 0161-483 5174.

STOCKPORT RS, G6UQ, G8SRS. Meets at the T.S. Hawkins, Stockport Sea Cadets HQ, Peamill Ind. Est., Stockport Road, West Howe, Lower Bredbury, Stockport. Details from David Simcock M1ANT. Tel: 0161-456 7832.

TRAFFORD ARC, GOTRC, G1TRC. Meets at the Watch House, Cruising Club, Canal Bank, Stretford, Manchester M32 8WE. Details from Roger May G4YLQ. Tel: (01457) 8666575.

TRAFFORD RADIO GROUP, GOTRG. Meets at 17th Stretford Scouts HQ, Barton Road, Stretford, Manchester. Details from Jon Mossman G7JKK. Tel: 0161-865 5609.

WEST MANCHESTER RC, G4MWC. Meets at the Astley & Tyldesley Miners Welfare Club, Mealy Road, Astley, Tyldesley, Manchester. Details from Jeffrey Moran MOBGU. Tel: (01204) 497694.

WIGAN & DARC, GOHRW. Details from Mr D.H. Barkley GODPI. Tel: (01942) 237162.

ISLE OF MAN

ISLE OF MAN ARS, GD3FLH. Meets in the Sea Cadets Hall, Tromode Road, Tromode, Douglas. Details from Dave Walton MDOBXX. Tel: (01624) 816308.

LANCASHIRE

BURNLEY & DARS, RS87674. Meets at Barden High School, Barden Lane, Burnley, Lancashire. Details from Bill Scrivener GOBQC.

CENTRAL LANCS ARC, GOFDX. Meets at the Priory Club, Broadfield Drive, Leyland, Lancs. Details from Steve Shearing M1ACJ.

DARWEN ARC, G4JS. Meets at the Darwen Catholic Club, Wellington Fold, Darwen, Lancashire. Details from Len Jackson GONPJ.

FISTS CW CLUB, GOIPX. Details from Mr E. Longden G3ZQS. Tel: (01254) 703948.

FYLDE ARS, RS53939. Meets at the A.N.T. Flying Clubhouse, Blackpool Airport. Details from Ken Randall G3RFH. Tel: (01253) 407952.

MORECAMBE BAY ARS, G4YBS. Meets at the Trimpell Sports & Social Club, Outmoss Lane, Morecambe, Lancs. Details from Bnan Watson GORDH. Tel: (01524) 424522.

PRESTON ARS, G3KUE. Meets at the Lonsdale Club, Fulwood Hall Lane, Fullwood, Preston. Details from Enc Eastwood G1WCQ. Tel: (01772) 686708.

ROLLS-ROYCE ARC, G3RR. Meets at the Club Room, Rolls-Royce Sports Ground, Barnoldswick. Details from Mr J.A. York G3KYJ.

ROSSENDALE ARS, G1RRS. Meets at the Old Fire Station, Burnley Road, Rawtenstall, Rossendale, Lancs BB4 8EW. Details from Ken Slaughter. Tel: (01706) 830306.

THORNTON CLEVELEYS ARS, G4ATH. Meets at the Frank Townsend Centre, Beach Road, Thornton Cleveleys, Lancs. Details from Mr J.E. Duddington G4BFH. Tel: (01253) 853554.

MERSEYSIDE

LIVERPOOL & DARS, G3AHD. Meets at the Churchill Conservative Club, Church Road, Wavertree, Liverpool L15. Details from David G. Parr G8DEY.

SOUTH WIRRAL CONTEST GROUP, G3CSA. Details from Mr T.B. Saggerson G4WSE. Tel: 0151-339 0842.

SOUTHPORT & DARC, G2OA. Meets at St. Marks Church Hall, Scarisbrick, Lancs. Details from Don Atkins M1BUL.

WIRRAL & DARC, G4MGR. Meets at the Irby Cricket Club, Mill Hill Road, Wirral. Details from Bnan Black.

WIRRAL ARS, G3NWR, MX1ARC. Meets at the Club Room, Ivy Farm, Arrowe Park Road, Wirral L49 5LW. Details from Alan Upton G3UZU. Tel: 0151-677 3266.

NORTH EAST

CLEVELAND

EAST CLEVELAND ARC, G4CRD. Meets at the Committee Room Of The New, New Marske Institute Club, Gurney Street, Cleveland TS11 8EG. Details from Malcolm Brass G4YMB. Tel: (01287) 638119.

STOCKTON & DARG, G4XXG. Meets at the Billingham Community Centre, Billingham, Cleveland. Details from David J. London GOVGB. Tel: (01642) 896395.

CO DURHAM

BISHOP AUCKLAND RC, G4TTF. Meets at the Stanley Village Hall, Rear High Road, Stanley, Crook, Co. Durham. Details from Mark Hill GOGFG. Tel: (01388) 745353.

DERWENTSIDE ARC, G4PFQ. Meets at the Steel Club, 36 Medomsley Road, Consett, Co. Durham. Details from Mr G. Darby G7GJU. Tel: 0191-370 2032.

*GREAT LUMLEY AR & ES, G4EUZ. Meets at the Community Centre, Great Lumley, Chester-le-Street, Co. Durham. Details from Nancy Bone G7UUR. Tel: 0191-477 0036, mobile (07990) 760920.

PETERLEE RADIO CLUB, GOKVJ. Details from Andrew Pennell GONSK.

HUMBERSIDE

EAST YORKSHIRE ARS, GOECR. Meets at the Northern Foods Sports & Social Club, Millhouse Woods Lane, Cottingham, E. Yorks. Details from David Taylor G4EBT. Tel: (01482) B76702.

GOOLE R & ES, GOOLE. Meets at the West Park Pavilion, Goole, South Humberside.

GRIMSBY ARS, G3CNX. Meets at Cromwell Social Club, Cromwell Road, Grimsby, South Humberside. Details from Mr G.J. Smith G4EBK. Tel: (01472) 887720.

HORNSEA ARS, G4EKT. Meets at The Mill, Alwick Road, Hornsea, North Humberside. Details from Jeff Southwell G4IGY. Tel: (01964) 533331.

HULL & DARS, G3AMW. Meets at the SWL Centre, Club Room, Goathland Close, Walton Street, Hull. Details from Mr R. Hatton.

RAYWELL PARK SCOUTS ARS, G4CMT. Details from Mr A.D. Russell MOAXU.

SCUNTHORPE STEEL ARC, G4FUH. Details from Alistair Butler M1ECF.

NORTH YORKSHIRE

DARLEY ARC, GOFOS.

HAMBLETON ARS, GOJQA. Meets at the Mencap Centre, Northallerton, N. Yorks. Details from Ian Brickwood GOJQA. Tel: (01609) 775598.

QUEEN MARY ARCG, G6QM. Meets at Blazefield, Pateley Bridge, Harrogate, North Yorks HG3 5DR. Details from Frank Harris G4IEY. Tel: (01242) 236715.

RIPON & DARS, G4SJM. Meets at The Bunker, rear of Ripon Town Hall, North Yorkshire. Details from Nigel Drumm M1BDZ. Tel: (01423) 884733.

ROYAL SIGNALS SCARBOROUGH ARC, GORCS. Details from Mr A.W.W. Timme G3CWW. Tel: (01484) 842330.

SCARBOROUGH ARS, G4BP. Meets at the Scarborough Cricket Club, Pavilion, North Marine Road, Scarborough, North Yorks YO12 2TJ. Details from Mr D.P. Tipper G3JBR. Tel: (01723) 377296.

SCARBOROUGH SE GRP, GXOOOO. Details from Roy Clayton G4SSH. Tel: (01723) 862924.

THE VINTAGE & MILITARY ARS, RS183536. Details from H.A. Aspinall.

YORK ARS, G3HWW. Meets at the Guppy's Enterprise Club, 17 Nunnery Lane, York. Details from Keith Cass G3WVO. Tel: (01904) 422084.

YORK RADIO CLUB (AMATEUR) G4YRC. Meets at the Bishopthorpe Social Club, Bishopthorpe Main Street, York. Details from Gareth Foster G1DRG. Tel: (01904) 421392.

NORTHUMBERLAND

NORTHUMBRIA ARC, G4AAX. Meets at the Old Telephone Exchange, Cresswell Road, Ellington, Morpeth, Northumberland. Details from Mr D. Stansfield GOEVV. Tel: (01670) 513026.

SOUTH YORKSHIRE

FINNINGLEY ARS, G7HAH. Details from John Fennell G4HOY. Tel: (01427) 872522.

MALTBY & DARS, G4SKM. Meets at the Centenary Hall, Clifford Road, Hellaby, Rotherham. Details from Keith Johnson G1PQW. Tel: (01709) 798098.

MEXBOROUGH & DARS, G4BTS. Meets at the Harrop Hall, Mexborough, South Yorks. Details from Mr R.T. Sheppard GOKSK. Tel: (01709) 586329.

SHEFFIELD ARC, GOINF. NRAE/RAE tuition provided. Meets at the Sheffield University Staff Club, 197 Brook Hill, Sheffield. Details from Mrs Irene Glossop GOSFH.

TYNE & WEAR

HOUGHTON-LE-SPRING ARC, G3NMD. Meets at the Dubmire Royal British Legion, Dubmire, Fencehouses, Tyne & Wear DH4 6LJ. Details from Foster Aungles GOABF. Tel: 0191-584 4673.

SOUTH TYNESIDE ARS, GXOWKQ. Meets at the Boldon Scout Hut, Grey Horse Car Park, Front Street, Boldon. Details from William Wilson MOBWI. Tel: 0191-421 9921.

TYNEMOUTH ARC GONWM. Meets at the Linskill Centre, Linskill Terrace, North Shields, Tyne & Wear. Details from Mr G.N. Thompson GOSBN.

TYNESIDE ARS, G3ZQM. Meets at the St Teresa's Club, 200b Heaton Road, Newcastle-upon-Tyne NE6 5HP. Details from Mr J. Pickersgill GODZG. Tel: 0191-265 1718.

WEST YORKSHIRE

DENBY DALE & DARS, G4CDD, G8KMK. Meets at the Pie Hall, Denby Dale, West Yorkshire. Details from Mr J.P. Morley G4FSQ.

HALIFAX & DARS, G2UG. Details from Mr S.P. Ortmayer G4RAW. Tel: (01422) 203062.

KEIGHLEY ARS, GOKRS. Meets at the Cricket Club, Ingrow, Keighley, West Yorkshire. Details from Mr I. Townson M1BGY. Tel: (01274) 723951.

LEEDS & DARS, G4LAD. Meets at The Radio Shack, Yambury (Horsforth), RUFC Grounds, Brownberne Lane, Horsforth, Leeds LS18 5HB. Details from Mr E. Howden GOIBU.

NORTH WAKEFIELD RC, G4NOK. Meets at the East Ardsley Cricket Club, Nr. Wakefield. Details from Mrs Olga Parker 2E1ASV. Tel: 0113-253 9087.

OTLEY ARS, G3XNO. Meets at The RAOB Club, Westgate, Otley, West Yorkshire. Details from Jack Worsnop GOSNV. Tel: (01274) 636197.

PONTEFRACT & DARC, G3FYQ. Meets at the Carleton Community Centre, Pontefract, West Yorkshire. Details from Colin Wilkinson GONQE. Tel: (01977) 677006.

SPEN VALLEY ARS, G3SVC. Meets at the Old Bank WMC, Mirfield, West Yorkshire. Details from Mr J.R. Wilde GOFOI. Tel: (01274) B75038.

WAKEFIELD & DARS, G3WRS. Meets at the Ossett Community Centre, Prospect Road, Ossett, W. Yorks. Details from Ian Roberts. Tel: (01924) 216502.

WAKEFIELD RPTR GP, GOKNR. Details from Mike Charlton G6OXZ.

WHITE ROSE ARS, G3XEP. Meets at the Moortown RUFC, Moss Valley, Kings Lane, Leeds LS17 7NT. Details from Mr M. Wilson G7SDW. Tel: 0113-273 6039.

MIDLANDS

BEDFORDSHIRE

DUNSTABLE DOWNS RC, G4DDC. Meets at the Chews House, 77 High Street South, Dunstable, Beds LU6 3SF. Details from Phil Seaford G8XTW. Tel: (01525) 384419.

SHEFFORD & DARS, G3FJE. Meets at the Church Hall, Ampthill, Shefford, Beds. Details from John West. Tel: (01462) B12739.

ST SWITHUN'S ARC, MOAJV. Meets at St. Swithun's Church, Rectory Rooms, Sandy, Beds. Details from Kelvyn Darton GOWOD. Tel: (01767) 683179.

CAMBRIDGESHIRE

CAMBRIDGE & DARC, G2XV. Meets at the Colendge Community College, Radegund Road, Cambndge. Details from Ron Huntsman G3KBR. Tel: (01223) 501712.

DUXFORD ARS, GB2IWM. Meets at Building 177, Imperial War Museum, Duxford Airfield, Cambs. Details from Mrs B.I. Pope. Tel: (01279) 656149.

GTR PETERBOROUGH ARC, G4EHW. Meets at the 6th Form Building, Stanground College, Farcet Road, Fletton, Peterborough. Details from Alan D. Ralph G8XLH.

HUNTINGDONSHIRE ARS, GOHSR. Meets at the Medway Centre, Medway Road, Huntingdon. Details from David Leech G7DIU. Tel: (01480) 431333.

MARCH & DRAS, G3PMH. Meets at the British Legion Club, Rookswood Road, March, Cambs PE15 8DP. Details from Mr J. Braithwaite G3PWK. Tel: (01353) 698885.

PETERBOROUGH R & ES, G3DQW. Details from Mr V. Edwards G8NGZ.

WISBECH AR & ELEC. CLUB, M5ARC, G4PQL, G8NED. Meets at RAFA Club, Old Market, Wisbech. Details from Alan Bridgeland MODUQ. www.warec.org.uk

DERBYSHIRE

BOLSOVER ARS, G4RSB. Meets at the Blue Bell, High Street, Bolsover, Derbys. Details from Colin Morris GORXT. Tel: (01246) 822856.

BUXTON RA, G4SPA. Meets at the Leewood Hotel, Buxton. Details from Derek Carson G4IHO. Tel: (01298) 25506.

DERBY & DARS, G2DJ. Meets at Carlton Road United Reform Church, Carlton Road, Littleover, Derby. Details from Martin Shardlow G3SZJ. Tel: (01332) 556875.

EREWASH VALLEY ARG, GOPCX. Meets at The Sitwell Arms Public House (between Horseley Woodhouse and Woodside). Details from Peter Russell MOAQI.

MOUNT ST. MARY'S ARC, G4MSM. Meets at the College, Spinkhill, Sheffield. Details from Rev. P. McArdle GODAG. Tel: (01246) B12230.

NOTTS & DERBY BORDER ARC, G4NID. Meets at Marlpool United Reform Church, Chapel Street, Marlpool, Ilkeston. Details from Graham Bromley G4UTN. Tel: (01773) 834308.

NUNSFIELD HOUSE ARG, G3EEO. Meets at the Nunsfield House, Boulton Lane, Alvaston, Derby. Details from William F. Smith G7PJJ.

STH DERBYS & ASHBY W ARG, GOSRC. Meets at the Moira Replan Centre, 17 Ashby Road, Moira, Swadlincote, Derbyshire DE12 6DJ. Details from Mrs B. Walley. Tel: (01283) 760822.

STH NORMANTON, ALFRETON & DARC, GOCPO. Meets at the New St. Community Centre, New Street, South Normanton, Derbyshire. Details from Peter Gething MOCLQ. Tel: 0115-955 5766.

GLOUCESTERSHIRE

CHELTENHAM AR ASSN, G5BK. Meets at the Prestbury Library, Prestbury, Cheltenham. Details from Ivan Wilson G4BGW. Tel: (01452) 731956.

CHELTENHAM CLUSTER SUPP GP, GB7DXC. Details from Mr A.M. Davies GOHDB. Tel: (01684) 7217B.

GLOUCESTER AR & ES, G4AYM. Meets at the Churchdown School, Churchdown. Details from Mr A.J. Martin. Tel: (01452) 618930.

SMITHS INDUSTRIES RS, G4MEN. Meets at the Sports & Social Club, Evesham Road, Bishops Cleeve, Cheltenham GL52 4SF. Details from A.J. Hooper G1JMF.

STROUD RS, G4SRS. Meets at the Minchampton Youth Centre, Nr. Stroud. Details from Mr S.G. Spencer G3ILO.

WHITE NOISE USTENING GOWNL. Details from Adnan Deane G7KCG.

HEREFORD & WORCESTER

BROMSGROVE & DARC, G3VGG. Meets at the Avoncroft Arts Centre, Bromsgrove, Worcs. Details from Mr J.F. Burford G4OAZ.

BROMSGROVE ARS, G4TUI. Meets at the Likey End WMC, Bromsgrove, Worcs. Details from Barry Taylor GOTPG. Tel: (01527) 542266.

DROITWICH ARC, G4PVO. Meets in the Community Hall, Dotwich Spa, Worcs. Details from Hector Wragg M1BUV. Tel: (01905) 794399.

HEREFORD ARS, G3YDD. Meets at the Civil Defence HQ, Magistrates Court, Gaol Street, Hereford. Details from Tim Bridgland-Taylor GOJWJ. Tel: (01432) 279435.

KIDDERMINSTER & DARS, GOKRC. Meets at the Sutton Arms, Sutton Park Road, Kidderminster, Worcs. Details from Mr A.W. Saunders GOOZB. Tel: (01299) 400172.

MALVERN HILLS ARC, G4MHC. Meets on the second Tuesday of the month at the Town Club, Great Malvern. Details from Mike G3TGD. Tel: (01905) 830752, E-mail: mike@allenson.fsnet.co.uk

REDDITCH RC, G4ACZ. Meets at the WRVS Centre, Ludlow Road, Redditch, Worcs. Details from Mr R.J. Mutton G3EVT. Tel: (01789) 762041.

VALE OF EVESHAM RAC, GOERA. Meets at the BBC Club, High Street, Evesham, Worcs. Details from Mr A.C. Lindsay G4NRD. Tel: (01386) 41508.

LEICESTERSHIRE

1F ATC, G7MCD. Details from Sqn. Cmdr. Adnan Utting G1WZQ.

BEAUMANOR ARC, G3BMR

DEMONTFORT UNIVERSITY, G3SDC. Open to past & present students. Details from Mr R.G. Titterington. Tel: 0116-257 7059.

HINCKLEY AR & ES, G3VLG. Meets at the United Services Club, St. Mary's Road, Hinckley. Details from Mr R.A. Bennett G8BFF. Tel: (01455) 846493.

LEICESTER RS, G3LRS. Meets at Gilroes Cottage, Groby Road, Leicester LE3 9QJ. Details from Mr S.P. Hay G3HYH. Tel: 0116-224 2598.

LOUGHBOROUGH & DARC, G3RAL. Meets at Hind Leys College, Shepshed, Loughborough, Leics. Details from Chris Walker G1ETZ. Tel: (01509) 504319.

MELTON MOWBRAY ARS, G4FOX. Meets at the St. John Ambulance Hall, Asfordby Hill, Melton Mowbray, Leics. Details from Mr R. Winters G3NVK. Tel: (01664) 63369.

NATIONAL SPACE CENTRE ARS, M1NSC. Details from Mr J. Heath G7HIA.

TAMWORTH ARS, G8TRS. Details from Mr A.I. Dyson GOHUW. Tel: (01827) 830437.

WELLAND VALLEY ARS, G4WVR. Meets at The Village Hall, The Green, Great Bowden, Leics. Details from The Secretary.

LINCOLNSHIRE

FIVE BELLS GROUP, G4SIV. Details from Mr B.K. Tatnall G4ODA.

GRANTHAM RC, GOGRC. Meets at the Kontak Social Club, Barrowby Road, Grantham, Lincs. Details from the Secretary. Tel: (01476) 657436.

LINCOLN SHORT WAVE CLUB, G5FZ. Meets At The Railway Club, Triton Road, Lincoln. Details from Mrs Pam Rose G4STO. Tel: (01427) 788356.

RAF CONINGSBY ARC, G3LQS. Meets at Essex Block, RAF

Coningsby. Details from Peter Hanson GONVY.

RAF WADDINGTON ARC, GORAF. Meets at Pyewpe Inn, Fossebank, Saxilby Road, Lincoln. Details from Robert Pickles G3VCA. Tel: (01522) 528708.

SPALDING & DARS, G4DSP. Meets at The Old Fire Station, Spalding, Lincs. Details from Raymond Pearson G8ELV. Tel: (01775) 711953, Web: www.sdars.org.uk

SPILSBY ARS, RS91468. Details from Clive Ironmonger G6HYF. Tel: (01790) 752712.

NORTHANTS

KETTERING & DARS, G5KN. Meets at The Lilacs Public House, 39 Chuch Street, Isham, Kettering, Northants NN14 1HD. Details from Fay Barwell G6AKS. Tel: (01536) 390954.

MID NORTHANTS AR EXP, GOING. Details from Lionel Parker G5LP.

NORTHAMPTON RC, G3GWB. Meets at the British Timken, Social & Athletic Club, Cotswold Avenue, Duston, Northampton. Details from Norman Miller GOGBZ. Tel: (01327) 349188.

NORTHAMPTON SCOUT ARG, G6NDS. Meets at Overstone Scout Activity Centre, Northampton. Details from Ian Rivett G8WPU.

PARALLEL LINES CG, G4LJP. Details from Mr P.S. Lidsay G4CLA.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM, G3EKW. Meets at the Haywood Road Community Association, Haywood Road, Mapperley Road, Nottingham NG3 6AD. Details from Ron Hague G4XOU. Tel: 0115-919 9177.

DUKERIES ARS, G4XTL. Meets at Ambleside Community Centre, Ambleside, New Ollerton, Notts. Details from Colin Foster G7DEX.

HUCKNALL ROLLS ROYCE ARC, G5RR. Meets at the Hucknall Rolls Royce Sports & Social Club, Watnall Road, Hucknall, Nottingham. Details from Mr P. Hart G4JSM.

MANSFIELD ARS, G3GQC. Meets at the Debdale Park Sports & Recreation Club, Debdale Lane, Mansfield Woodhouse, Notts. Details from David Peat GORDP. Tel: (01623) 631931.

NORTH NOTTS DATA GROUP, GOWNN. Details from Tony Jenkins G8TBF.

SIEMENS ARC, G8ZK, GBIGQ. Meets at the GPT Sports Ground, Beeston, Nottinghamshire. Details from Chris Archer G4VFK. Tel: 0115-943 3387.

SOUTH NOTTS ARC, GOOAU. Meets at the Farnham Community College, Farnborough Road, Clifton, Nottingham NG11 9AE. Details from Gary Bishop GOWUG. Tel: (01509) 672846.

WORKSOP ARS, G3RCW. Meets at the Club House, 59-61 West Street, Worksop, Nottingham S80 1JP. Details from Terry Calvert G4GBS. Tel: (01302) 743130.

SHROPSHIRE

OSWESTRY & DARC, G4TTO, G1ORA. Meets at the Sweeney Hall Hotel, Sweeney, Oswestry. Details from Ant Astley GWOAJA. Tel: (01691) 860545.

SALOP ARS, G3SRT, M1AXW. Meets at the Telepost Club, Railway Lane, Abbey Forgate, Shrewsbury. Details from John Bumford GOGTN. Tel: (01743) 249943. E-mail: john.bumford@virgin.net

TELFORD & DARS, G3ZME. Meets at the Dawley Bank Community Centre, Dawley, Telford, Shropshire. Details from Mr M. Vincent G3UKV. Tel: (01952) 255416.

STAFFORDSHIRE

BURTON-ON-TRENT & DARS, G3NFC. Meets at the Stapehill Institute, Main Street, Stapehill, Burton-on-Trent, Staffs. Details from Mr M.W. Cotton G4HBY.

CANNOCK CHASE ARS, G6SW. Meets at the Four Crosses Inn, Wading Street, Hatherton, Cannock. Details from Arnold Matthews G3FZW. Tel: (01543) 262495.

CHAD RC, G4CAR. Meets at the Swinfen Officer's Club, Swinfen, Lichfield, Staffs. Details from Bernard Jayne G8BFL. Tel: (01543) 268569.

LICHFIELD ARS, G3WAS. Meets at the Queens Head, Sandford Street, Lichfield. Details from Roger Smethers G3NLY. Tel: (01543) 672762.

MOORLANDS & DARS, G4NHT, G1MAD. Meets at the Creda Works, Blythe Bridge, Stoke-on-Trent, Staffs ST11 9LJ. Details from Mr B.J. Butcher G4HKG. Tel: (01782) 395793.

NEWCASTLE-U-LYME SCOUT AR COM GR, G7UQG

STOKE-ON-TRENT ARS, G3GBU. Meets at the '45' Club, 92 Lancaster Road, Newcastle-under-Lyme, Staffs. Details from Albert Allen G4DHO. Tel: (01782) 638801.

SUTTON COLDFIELD RS, G3RSC. Meets at the Rugby Club, Walmley Road, Sutton Coldfield, West Midlands. Details from Paul G. Turner G7MWD. Tel: 0121-350 4263.

WARWICKSHIRE

AVON VALLEY ARA, MORAD. Details from Mr Peter Bradham GOWXJ. Tel: (01905) 724531.

MID WARWICKSHIRE ARS, G3UDN. Meets at the St. John Ambulance HQ, 61 Emscote Road, Warwick. Details from Bernard Pittaway. Tel: (01926) 420913.

RUGBY ATS, G4APD. Details from Tony Humphnes GOOLS. Tel: (01455) 552683.

STRATFORD-UPON-AVON & DRS, GOSOA. Meets at the Home Guard Club, Tiddingham, Stratford-upon-Avon, Warks. Details from Ron Horsley GOMRH. Tel: (07970) 148204.

WEST MIDLANDS

ALDRIDGE & BARR BEACON ARC, GONEQ. Meets at the Aldridge Central Hall Community Centre, Middlemore Lane, Aldridge WS9 8AN. Details from Mr C.J. Baker GONOL. Tel: (01922) 636162.

COVENTRY ARS, G2ASF. Meets at the Binley Church Hall, Brinklow Road, Coventry. Details from John Beech G8SEQ. Tel: (01203) 673999.

DUDLEY ARC, G4DAR. Meets at the Community Centre, Sedgley, Central Library, St. James Road, Dudley. Details from Tony Lucas G4LVA. Tel: (01384) 277925.

HILLCREST ARS, GOSPM. Meets at The College, Simms Lane, Netherton, Dudley, West Midlands. Details from Stuart Viney. Tel: (01384) 232457.

KYNOCH R & TVS, G3HPP. Meets at the Club Workshop, IMI Ltd., Sportsfield, Perry Bar, Birmingham. Details from Mr G. Nicholls. Tel: (01922) 635376.

MIDLAND ARS, G3MAR. Meets at Unit 22, 60 Regent Place, Hockley, Birmingham (jewelry quarter). Details from John A. Crane GOLAI. Tel: 0121-628 7632.

SANDWELL AMATEUR RADIO CLUB, GOCWC. Meets at Sandwell ARC, Broadway, Oldbury, Warley, West Midlands B68 9DP. Details from Stuart Collins MOBTO. Tel: 0121-561 4663.

SIERRA HOTEL ARCG, GOOBS. Details from Warwick M. Hall G4WMH.

SOLIHULL ARS, G3GEI. Meets at The Shirley Centre, 274 Stratford Road, Shirley, Solihull, West Midlands. Details from Paul Gaskin G8AYY. Tel: 0121-783 2996.

SOUTH BIRMINGHAM RS, G3OHM. Meets at Hampstead House, Fairfax Road, West Heath, Birmingham. Details from The SBRS Secretary.

STOURBRIDGE & DRS, G6OI, G6SRS. Meets at the Old Swinford Hospital/School, Stourbridge, West Midlands. Details from Tom Edwards.

WEST BROMWICH CENTRAL RC, G4WBC. Meets at The Sandwell Public House, High Street, West Bromwich, West Midlands. Details from Ian Letch GOPAI. Tel: 0121-561 2884.

WEST MIDLANDS POLICE ARC, GOCOP, G1WMP. Details from Steven Jones G6LRL.

WILLENHALL & DARS, G4ETW. Meets at The Liberal Club, Villiers Street, Willenhall, West Midlands. Details from Dave Bradbury. Tel: (01902) 411252.

WOLVERHAMPTON ARS, GBTA. Meets at the Electricity Board Sports Club, St. Marks Road, Chapel Ash, Wolverhampton. Details from Mrs J. Smith. Tel: (01902) 751936.

WORDSLEY RC, G4WRA. Meets at the Brick Maker's Arms, Mount Pleasant, Brierley Hill, West Midlands. Details from Andy Evans G1PKZ.

LONDON & CENTRAL BERKSHIRE

ARBORFIELD ARC, G3IHH. Details from Mrs E.W. Harding 2E1AUQ.

BRACKNELL AEC, G4BRA. Meets at the Coopers Hill Community Centre, Bagshot Road, Bracknell, Berks. Details from John Ellerton G3NCN.

BURNHAM BEECHES RC, G3WIR. Meets at the Farnham Common Village Hall, Victoria Road, Farnham Common, Bucks. Details from Mrs Eileen Chislett G6EIL. Tel: (01628) 625720.

MAIDENHEAD & DARC, G3WKX. Meets at the Red Cross Hall, The Crescent, Maidenhead, Berkshire. Details from Neil Savin GOSVN. Tel: (01628) 626210.

NEWBURY & DARS, G5XV. Meets at the Rugby Club, Monk's Lane, Newbury. Details from Mark Slade MOCUK. Tel: (01488) 638985.

READING ARC, G3ULT. Meets at the Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading. Details from Mamoch Standen GOJMS. Tel: 0118-972 3504.

BUCKINGHAMSHIRE

AYLESBURY VALE RS, G4VRS. Meets at the Harwick Village Hall, Aylesbury, Bucks. Details from Mr L.I. Cropley GODFC.

CHESHAM & DARS, G3MDG, G1MDG. Meets at the White Hill Centre, Chesham, Bucks. Details from Mr T.J. Thirlwell GOVFW. Tel: (01442) 832169.

CHILTERN ARC, G3CAR. Details from Roy Page G4YAN. Tel: (01494) 534216.

MILTON KEYNES ARS, G3HIU. Meets at Bletchley Park Museum (The Green Room, 8 Block Annexe), Wilton Avenue, Viechley, Milton Keynes. Details from Mrs J. Battersby M1EPL (Secretary) on (01908) 565636 or Frank Collins MORPM (Chairman) on (01234) 713148

MILTON KEYNES SCOUT ARS, GOSMK. Meets at The Quarries, M.K. Scout Campsite, Cosgrove. Details from Mr P.A. Orchard GORYZ. Tel: (01908) 648186.

GREATER LONDON

ADDISCOMBE ARC, G4ALE. Meets at the Lion Inn, Pawsons Road, Croydon. Details from Mr Q.G. Collier G3WRR. Tel: 0208-653 6948.

BARKING R & ES, G3XBF. Meets at the Parkside Community Centre. Details from Bill Chewter GOIQK. Tel: (01708) 474443.

BROMLEY & DARS, RS89030. Meets at the Victory Social Club, Kechill Gardens, Hayes, Bromley. Details from Alan G. Messenger GOTLK.

CLIFTON ARS, G3GHN. Meets at the Kidbrooke House, Community Centre, 90 Mycenae Road, London SE3 7SE. Details from Mr J. Veaney G7BKH.

CRYSTAL PALACE & DRC, G3VCP. Meets at the All Saints Church, Pansh Rooms, Beulah Hill, London. Details from Bob Burns G3OOU. Tel: (01737) 552170.

DARENTH VALLEY RADIO, GOKDV. Meets at the Crockenhill Village Hall, Swanley, Kent. Details from Mr K.W. Halls G8VJG. Tel: (01322) 663022.

ECHELFORD ARS, G3UES. Meets at The Community Centre, St. Martin's Court, Kingston Crescent, Ashford, Middlesex. Details from Robin Hewes G3TDR. Tel: (01784) 456513.

EDGWARE & DRS, G3ASR. Meets at the Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware, Middlesex. Details from Stephen Slater GOPQB. Tel: 0208-953 2164.

HAVERING & DARS, G4HRC. Meets at the Fairkytes Arts Centre, 51 Billet Lane, Hornchurch, Essex.

RS OF HARROW, G3EFX. Meets at the Harrow Arts Centre, Uxbridge Road, Hatch End, Middlesex. Details from Mr C. Friel G4AUF. Tel: (01895) 621310.

SILVERTHORNE RC, G3SRA, G2HR, G8CSA. Meets at the Chingford Adult Education and Community Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. Details from Dave Christy GOKHC. Tel: 0208-504 2831.

MITCHAM & DISTRICT ARS. Meets at the ATC Hut, Commonside West, Mitcham, Surrey CR4 4HB. Details from Mr M. Knott GOWCR.

SOUTHGATE RC, G3SFG. Meets at the Winchmore Hill Cricket Club, Firs Lane, London N21 3ER. Details from Mr D.F. Berry G4DFB.

ST. DUNSTANS COLLEGE ARS, G4SDC. Details from Sam Kennard G4OHX. Tel: 0181-690 1274.

SURREY RADIO CONTACT CLUB, G3SRC. Meets at the T.S. Terra Nova, 34 The Waldrons, Croydon, Surrey. Details from Maunce Fagg G4DDY. Tel: 0208-669 1490.

WEST LONDON ARS, RS95599. Details from Robin Clay GOVJI.

WHITTON ARG, GOMIN. Meets at the Whitton Community Centre, Percy Road, Whitton. Details from Ian Clabon GOOFN. Tel: 0208-894 9131.

HERTFORDSHIRE

BISHOPS STORTFORD ARS, G5ZG. Meets at the Royal British Legion Club, Windhill, Bishop's Stortford, Herts. Details from Tony Judge GOPQF. Tel: (01279) 506933.

DACORUM ARTS, G7RIH. GOWIH. Meets at the Guide Meeting Rooms (next to the Royal British Legion), Queensway, Hemel Hempstead. Details from Ian Hamilton GOTCD. Tel: (01442) 211925.

HODDESDON RADIO CLUB, GOTSN. Meets at the Rye Park Conservative Club, Rye Road, Hoddesdon, Herts. Details from Don Platt G3JNJ. Tel: 0208-292 3678.

MIMRAM CONTEST GP, MOABC. Details from Alan Holdsworth G8OO. Tel: (01707) 392950.

RADIO SCOUTING TEAM, GB2RST. Meets at Tolmers Scout Camp, Tolmers Road, Cuffley, Herts EN6 4JS. Details from Mill Livens G2CKB. Tel: (01992) 558493.

STEVENAGE & DARS, G3SAD. Meets at the Stevenage Day Centre, Chells Way, Stevenage, Herts SG2 0LT. Details from Peter Bell 2E1CRK. Tel: (01462) 674505.

VERULAM ARC, G3VER, G8VER. Meets at the RAF Association HQ, New Kent Road, St. Albans, Herts. Details from Walter Craine G3PMF. Tel: (01923) 262180.

WELWYN & HATFIELD ARC. G3WGC. Meets at the Royal Naval Association, Black Fan Road, Welwyn Garden City, Herts. Details from Dean Jackson G7PKF. Tel: (07973) 560649.

SURREY

BENTLEY ARC, GOVZS. Details from Derek Gilbert GONFA.

CATERHAM RG, GOSCR. Details from Mr P.N. Lewis G4APL.

COULSDON AMATEUR TRANS. SOC., G4FUR. Meets at St. Swithuns Church Hall, Grovelands Road, Purley, Surrey. Details from Andy Bners GOKZT. Tel: (01737) 552139.

DORKING & DRS, G3CZU, G7DOR. Details from John Greenwell G3AEZ. Tel: (01306) 631236.

FARNBOROUGH & DRS, G4FRS. Meets at The Community Centre, Meudon Avenue, Farnborough, Hants. Details from Mr M. Hearsey G8ATK. Tel: (01252) 715765.

GUILDFORD & DRS, G6GS. Meets at the Guildford Model Engineers HQ, Stoke Park, Guildford, Surrey. Details from Stella Whitbourn GOSWE.

KINGSTON & DARS, G3KIN. Details from Mrs Mary Ashdown GOBQV.

REIGATE ATS, G5LK, G7RAT. Details from Mr A.C. Embling G1LNT. Tel: (01883) 344723.

SUTTON & CHEAM RS, G2XP, G7SAC. Meets at the Sutton United Football Club, Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Details from John Puttock GOBWV. Tel: 0208-644 9945.

THAMES VALLEY ARTS, G3TVS. Meets at the Thames Dtton Library, Watts Road, Giggs Hill, Thames Ditton, Surrey. Details from Cdr. J. Pegler G3ENI. Tel: (01483) 284279.

WIMBLEDON & DARS, G3WIM. Meets at St. Andrews Church Hall, Herbert Road, Wimbledon, London. Details from Mr Reg Blackwell M1EEK. Tel: 0208-696 9857.

SOUTH & SOUTH EAST EAST SUSSEX

BRIGHTON & DRS, G4GQR. Meets at the Roast Beef Bar, Brighton Racecourse, Elm Grove, Brighton. Details from Mr P.J. Fellingham.

CROWBOROUGH DARS, GOCRW. Meets at the Plough & Horses, Walshes Road, Jarvis Brook. Details from Mrs M. Clark. Tel: (01892) 663666.

EAST SUSSEX AMATEUR TV GROUP, RS178475 was GB3VX. Details from Keith Ellis G8HGM. Tel: (01323) 720220.

SOUTHDOWN ARS, G3WQK. Details from Jim Harris G4DRV. Tel: (01323) 728479.

THE QRZ ARG OF SUSSEX, GB3VX. Meets at the Coach Station, Wartling Road, Eastbourne. Details from Stuart Constable MOCHW. Tel: (01435) 863020.

HAMPSHIRE

ANDOVER RAC, GOARC. Meets at the Village Hall, Wildhern, Andover, Hants. Details from Mr R.S. Coleman GOWYD.

BASINGSTOKE ARC, G3TCR, GBJYN. Meets at the GEMS Social Club, Lister Road, Basingstoke, Hants. Details from Bob Brown MOCJJ.

FAREHAM & DARC, G3VEF. Meets at the Portchester Community Centre, Westlands Grove, Portchester, Hants. Details from Andrew Sinclair GOAMS. Tel: (01329) 235397.

HIGHFIELD PARK RC, G4WD. Meets at Highfield Park RC, National Air Traffic Service, Highfield Park, Heckfield, Hants RG27 0LD. Tel: (01734) 225019.

HORNDEAN & DARC, G4FBS. Meets at Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. Details from Stuart Swain GOFYX. Tel: (01705) 472846.

ITCHEN VALLEY ARC, GOIVR. Meets at the Scout Hut, Brickfield Lane, Chandlers Ford, Eastleigh, Hants. Details from Sheila Williams GOVNI. Tel: (01703) 813827.

SONY BROADCAST ARC, G4SZC. Accredited C&G RAE centre. Meets at Sony Sports & Social Club, Priestley Road, Basingstoke. Details from Stephen Harding G4JGS. Tel: (01256) 55011.

SOUTH HAMPSHIRE INT. TELE SOC., G3DIT. Meets at G3JZV's QTH, space is limited. Details from Rev. T.R. Mortimer G3JZV. Tel: (02392) 649254.

SUBMARINE ARC, G3BZU. Meets at HMS Collingwood, Newgate Lane, Fareham, Hants PO14 1AS. Details from Mr W.S. Blyth GOPPH. Tel: (01329) 232386.

THREE COUNTIES ARC, G4WWR. Meets at the Bramshott Pansh Inst. & Club, Headley Road, Liphook, Hants. Details from Damian Kamm G7RFV. Tel: (01428) 724456.

WATERSIDE ARS, G4JYN. Meets at the Applemore Scout HQ, Applemore, Hythe, Southampton. Details from Tony Horton GOLKG. Tel: (01703) 841794.

ISLE OF WIGHT

BRICKFIELDS ARS, GOBAR. Meets at Brickfields Horse Country Cent, Newnham Road, Binstead, Isle of Wight. Details from Mr Pebody.

ISLE OF WIGHT RS, G3SKY. Meets at The Old Cafe, Whitecliff Bay, Holiday Park, Bembridge. Details from Alan Reeves G4ZFQ. Tel: (01983) 294309.

OXFORDSHIRE

BANBURY ARS, GOBRA. Meets at St. John's Church Social Club, South Bar, Banbury, Oxon. Details from Mr R.S. Marsden G1YSY. Tel/FAX: (01295) 253509.

HARWELL ARS, G3PIA. Meets at the Social Club, Harwell Laboratory, Didcot, Oxon. Tel: (01235) 223250.

OXFORD & DARS, G5LO. Meets at the Grove House Club, George Street, Summertown, Oxford. Details from Mr D. Walker G3BLS. Tel: (01865) 247311.

VALE OF WHITE HORSE ARS, G5RP, G4VWH, G6VWH. Meets at The Fox, Steventon. Details from Ian White G3SEK. Tel: (01235) 531559.

WEST SUSSEX

CHICHESTER ARC, G2NM. Meets at the St. Pancras Hall, Chichester. Details from Graham Swann GOWSD.

CRAWLEY ARC, G3WSC. Meets at the Tilgate Forest Rec. Centre, Hut 18, Tilgate Forest, Crawley, West Sussex. Details from Mr J.S. Spence GOFPI.

HORSHAM ARC, G4HRS. Meets at the Guide Hall, Denne Road, Horsham, West Sussex. Details from Alister Watt G3ZBU. Tel: (01403) 253432.

MID SUSSEX ARS, G3ZMS. Meets at Marle Place, Leylands Road, Burgess Hill, West Sussex. Details from Mr C. Childs 2E1DCP. Tel: (01444) 244689.

T.S. VINDICATRIX ASN, GOWVB. Details from Don Still GOOOC.

WORTHING & DARC, G3WOR. Meets at the Lancing Pansh Hall, South Street, Lancing, West Sussex.

WORTHING & DISTRICT VIDEO RG, GB3VR. Details from the Treasurer. Tel: (01903) 211919 (w).

WILTSHIRE

CHIPPENHAM & DARS, G3VRE. Meets at the Sea Cadet HQ, Chippenham. Details from Jon Ange G4LGZ. Tel: (01249) 462610.

SWINDON & DARC, G3FEC. Meets at the Eastcott Community Centre, Savenake St., Swindon. Details from Den Forrest MOACM.

TROWBRIDGE & DARC, G2BQY. Meets at the Southwick Village Hall, Southwick, Trowbridge, Wilts. Details from Ian Carter GOGRI. Tel: (01225) 864698.

SOUTH WEST & CHANNEL ISLANDS AVON

BRISTOL ARC, G3TAD. Meets at the Lodgeside Club, Lodge Road, Kingswood, Bristol. Details from Dave Bendrey G7BYN.

GORDANO ARG, G6GRG. Meets at The Ship, Redcliffe Bay, Portishead, Avon. Details from Mr R.T. White G8SPC. Tel: (01275) 874001.

NORTH BRISTOL ARC. G4GCT. Meets at the Self Help Enterprise, 7 Braemar Close, Northville, Bristol. Details from Dawd Coxon GOGHM. Tel: (01275) 790448.

SEVERNSIDE TV GROUP, GB3ZZ. Meets at NBARC, Filton, Bristol. Details from Paul Stevenson G8YMM. Tel: 0117-965 5386.

SHIREHAMPTON ARC, G4AHG. Meets at the TS Enterprise Sea Cadet Unit, Station Road, Shirehampton. Details from Mr R.G. Ford G4GTD. Tel: 0117-985 6253.

SOUTH BRISTOL ARC, G4WAW. Meets at the Whitchurch Folk House, East Dundry Road, Bristol. Details from Mr L.F. Baker. Tel: (01275) 834282.

THORNBURY & SOUTH GLOS ARC, G4ABC. Meets at the United Reform Church Hall, Rock Street, Thornbury, Bristol. Details from Stan Greenhill GORYM. Tel: (01454) 413177.

WESTON-SUPER-MARE RS, G4WSM. Meets at the Woodspring Hotel, High Street, Worle, Weston-Super-Mare. Details from Stephen Cole G3YOL. Tel: (01934) 843144.

CORNWALL & SCILLY IS

CORNISH RAC, G4CRC. Meets at the Perran-ar-Worthal Village Hall, Perranwell, Nr Truro, Cornwall. Details from Mrs Cheryll Hammett 2E1ADQ. Tel: (01726) 882758.

NEWQUAY & DARS, G4ADV. Meets at the Treviglas School, Newquay. Details from Mrs Maggie Reed GOKEM. Tel: (01726) 882752.

POLDHU ARC, GB2GM. Meets at the Club House, Poldhu Cove, Mullion, Cornwall TR12 7JB. Details from Mrs Carolyn Rule MOADA. Tel: (01326) 240144.

SALTASH & DARC, G4GXK, GBSAL. Meets at the Toc H Hall, Warraton Road, Saltash, Cornwall. Details from Brian Giles. Tel: (01752) 844321.

ST AUSTELL ARC, GOECC. Meets at Poltair School. Details from Reg Pears G4TRV. Tel: (01726) 72951.

DEVON

APPLEDORE & DARC, G2FKO. Meets at the Appledore Football Club. Details from Mr B. Jewell MOBRB.

AXE VALE ARC, G8CA, G7AXE. Meets at the George Hotel, Axminster, Devon. Details from Pat Cross GOGHH. Tel: (01297) 33756.

DARTMOOR RADIO CLUB, G1RCD, GODRC. Meets at the Yelverton War Memonal Village Hall, Meavy Lane,

Yelverton, Devon. Details from Ron Middleton G7LLG. Tel: (01822) 852586.

EXETER ARS, G4ARE. Meets at the Moose Centre, Spinning Path Lane, Blackboy Road, Exeter. Details from Ray Donno G3YBK.

EXMOUTH ARC, G0XRC. Meets at The Scout Hut, Marlpool Hill, Exmouth.

NORMAN LOCKYER OBSERVATORY ARG, G0AXC. Meets at the Norman Lockyer Observatory, Salcombe Hill, Sidmouth. Details from Ron Hamson G0NOC. Tel: (01395) 515349.

NTE (PAIGNTON) ARS, G0OSH. Meets at Paignton Community College, Upper School, Waterleat Road, Paignton. Details from Rod Maude G0SWM. Tel: (01803) 521066.

SOUTH DEVON ARC, G4SSD. Meets at the Hillhead, Kingswear, Devon. Details from John May G0CDB. Tel: (01803) 522995.

TORBAY ARS, G3NJA. Meets at the Highweek Family & Social Club, Highweek, Newton Abbot, Devon. Details from John Olway G3RMA. Tel: (01803) 556425.

UNIVERSITY OF PLYMOUTH ARS, G0UOP. Details from Alan Santillo G0XAW.

DORSET

BLACKMORE VALE ARS, G4RBV. Meets at Shaftesbury Club for Young People, Coppice Street, Shaftesbury, Dorset SP7 8PF. Details from Mr A. Marriott G0GFL. Tel: (01258) 860741.

BOURNEMOUTH RS, G2BRS. Meets at the Kinson Community Centre, Kinson, Bournemouth, Dorset. Details from Chris R. Ellis M5AGG, Broken Ridge, Fir Tree Close, St. Leonards, Ringwood, Hants BH24 2QW. Tel: (01202) 893126.

CHRISTCHURCH ARS, G0MUD. Meets at the Siemens Plessey Sports & Social Club, Grange Road, Somerford, Christchurch, Dorset. Details from Mr K.P. Harris G7WSN. Tel: (01202) 484892.

FLIGHT REFUELLING ARS, G4RFR. Meets at the Flight Refuelling Social Club, Merley, Wimborne, Dorset. Details from Martin Axon 2E1DFZ. Tel: (01202) 693334.

POOLE RS, G4PRS. Meets at the Bournemouth & Poole CFE, Constitution Hill Site, Poole, Dorset. Details from Phil Mayer G0KKL. Tel: (01202) 700903.

PORTLAND ARC, G0VOP/G7VQP. Meets at Clifton Hotel, Grove Road, Portland. Details from Kerry Morris G1WIK. Tel: (01305) 788591.

SOUTH DORSET RS, G3SDS. Meets at the Church Hall, Chickerell, Weymouth, Dorset. Details from John Rose M0BQO. Tel: (01305) 832057.

SWANAGE & PURBECK ARC, M0BLJ. Meets at Kings Arms, Langton Matravers, Dorset. Details from Peter Wakefield M1WCH/M3WCH. Tel: (01929) 424413.

WESSEX AMATEUR WIRELESS CLUB, G1WAW. Details from Ken Powell G1NCG. Tel: (01202) 549376.

JERSEY

JERSEY ARS, GJ3DVC. Meets at the German Signal Station, Rue Baal, La Moye, St. Brelade. Details from Mrs Anne Mourant MJ0BJU. Tel: (01534) 734948.

SOMERSET

PRESTON COMMUNITY SCHOOL ARC, G0PCS. Details from Craig Douglas G0HDJ. Tel: (01935) 71131.

TAUNTON & DARS, G3XZW. Meets at The Memorial Hall, Trull, Taunton. Details from David Rosewarn M0CIF.

WEST SOMERSET ARC, G0OWX. Meets at the West Somerset Community College, Minehead, Somerset. Details from Alan Elliott G7RSU. Tel: (01643) 707207.

WINCANTON ARC, G0WRA. Meets at King Arthur's Community School, West Hill, Wincanton. Details from Mr G.A. Fingerhut G0ENW. Tel: (01963) 370506.

YEOVIL & DARC, G3CMH, G8YEO. Meets at the British Red Cross HQ, 72 Grove Avenue, Yeovil, Somerset. Details from George Davis G3ICO. Tel: (01935) 425669.

ESSEX

BRAINTREE & DISTRICT AMATEUR RADIO SOCIETY, G4JXG. Meets at the Braintree Hockey Club, Church Street, Bocking, Braintree. Details from Keith Farthing 2E0ARS. Tel: (01376) 347736.

CHELMSFORD ARS, G0MWT. Meets at the Marconi Social Club, Beehive Lane, Chelmsford, Essex. Details from David Bradley M0BQC. Tel: (0124S) 602838. E-mail: cars@g0mwt.org.uk

CLACTON RADIO CLUB, G3CRC. Details from Mr D. Fitzpatrick M0CHL.

COLCHESTER ARS, G3VCO. Meets at the Colchester Institute, Sheepen Road, Colchester. Details from Frank R. Howe G3FIJ. Tel: (01206) 851189.

DENGIE HUNDRED ARS, G0UTT, G7SDH. Meets at the Henry Samuel Hall, Maryland, Essex. Details from Mrs Christine Wade. Tel: (01621) 772986.

HARLOW & DARS, G8UT. Meets at the Mark Hall Barn, First Avenue, Harlow, Essex. Details from Len Brackstone G7UFF. Tel: (01279) 832700. FAX: (01279) 864973.

HARWICH ARG, G0GRH. Meets at the Park Pavilion, Barrack Lane, Harwich. Details from Eugene Kraft G4FTP.

LOUGHTON & EPPING FOREST ARS, G4ONP. Details from Marc Litchman G0TOC. Tel: 0208-502 1645/(07803) 023501.

SOUTH ESSEX ARS, G4RSE. Meets at the Paddocks, Long Road, Canvey Island, Essex. Details from Mrs Betty Maynard G6LUO. Tel: (01268) 695474.

SOUTHEND & DRC, G5QK. Meets at the Alexandra Yacht Club, Cliftown Parade, Southend-on-Sea, Essex. Details from Alan Radley G0TTM. Tel: (01268) 741229.

STANFORD-LE-HOPE & DARC, G4SLH. Meets at the St Joseph Parish Rooms, Scratton Road, Stanford-le-Hope, Essex. Details from Ken Thompson G4PAD. Tel: (01375) 671238.

VANGE ARS, G3YCW. Meets at the Barnstable Community Centre, Basildon, Essex. Details from Mrs D. Thompson. Tel: (01268) 552606.

KENT

BREDHURST RX & TX SOC., G0BRC. Meets at Rock Avenue Working Mans Club, Rock Avenue, Gillingham, Kent. Details from Mr T.M. Wheeler G7MIM.

CRAY VALLEY RS, G3RCV, G1RCV. Meets at the Progress Hall, Admiral Seymour Road, Eltham, London SE9. Details from Richard Perzyna G8ITB. Tel: (01689) 602948.

DOVER RADIO CLUB, G3YMD. Meets at the Dover Grammer School for Boys, Astor Avenue, Dover. Jim Cairns M1BKI. Tel: (01304) 852773.

EAST KENT RADIO SOCIETY, G0EKR. Meets at St. Bartholomew's Church Hall, Herne Bay. Details from Paul Nicholson G3VJF. Tel: (01227) 743070, FAX: (01227) 742288.

HASTINGS ELEC. & RC, G6HH, G1HHH, G6LL. Meets at West Hill Community Centre, Croft Road, Hastings, East Sussex. Details from Mr J. Boothroyd G0MTJ. Tel: (01233) 732656.

HILDERSTONE ARS, G0HRS. Meets at Hilderstone A.E.C., Broadstairs, Kent. Details from Mr G. Shaw M0AQA.

HOME COUNTIES ATV GRP, G8HCT. Meets at the Binfield Club, Binfield (near M4/J10). Details from Mr A. Brooker G4WGZ.

MAIDSTONE YMCA ARS, G3TRF. Meets at YMCA Sports Centre, Melrose Close, Maidstone, Kent. Details from Colin Wilson G0VAR. Tel: (01622) 736636.

MEDWAY ARTS, G5MW, G8MWA. Meets at Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham. Details from Mr J. Hale G3FTH.

NORTH KENT RS, G4CW. Meets at The Pop-in-Parlour, Graham Road, Bexleyheath, Kent. Details from Mr A.V. Fribbens G8MLQ. Tel: (01474) 365694.

SWALE ARX, G4SRC, G6SRC. Meets at the Ivy Leaf Club, Dover Street, Sittingbourne, Kent. Details from Gordon Powell M0AKA. Tel: (01795) 665559.

THE MORSE CLUB, GX0OXE. Meets at The Five Wents Memorial Hall, Swanley/Hextable Road. Details from Ken M3CZA. Tel: 0208-306 3544.

WEST KENT ARS, G3WKS. Meets at the St. Marks School Hall, Tunbridge Wells, Kent. Details from Malcolm Sheppard G4FWG. Tel: (01892) 652272.

NORFOLK

ANGLIA TELEVISION ARS, G0TXV. Meets at Anglia TV, Norwich NR1 3JG. Details from Jim Bacon G3YLA. Tel: (01603) 615151.

GREAT YARMOUTH RS, G3YRC. Meets at the Bradwell Community Centre, Bradwell, Great Yarmouth, Norfolk. Details from Mr A.D. Besford G3NHU.

GRESHAM'S SCHOOL ARC, GX3PXO. Details from Rev. R.N. Myerscough G3PXO.

KINGS LYNN ARC, G3XYZ. Details From Derek Franklin G0MQL.

NORFOLK ARS, G4ARN. Meets at Norwich Aviation Centre, Norwich Airport. Details from John Wadman G0VZD. Tel: (01953) 604769.

NORTH NORFOLK ARG, GB2MC. Details from Keith J. Martin G0GFQ. Tel: (01263) 588506.

SUFFOLK

BURY ST. EDMUNDS ARS, G2TO. Meets at the Culford School Culford, Bury St. Edmunds, Suffolk. Details from George Woods G3LPT.

FELIXSTOWE & DARS, G4ZFR. Meets at the Orwell Park School, Nacton, Near Ipswich. Details from Paul Whiting G4YQC. Tel: (01473) 642595.

FRAMLINGHAM COLLEGE ARC, M0CBB. Tel: (01728) 727232.

IPSWICH RADIO CLUB, G4IRC. Meets at the Golden Hind, Nacton Road (3rd Wednesdays at The Hollies, Bucklesham Straight Road), Ipswich. Details from Keith Gaunt G7CIY. Tel: (01394) 420226.

LEISTON ARC, G0TUQ. Meets at Leiston Town Athletic Assn., Victory Road, Leiston, Suffolk. Details from Sam Lydiate G4IFD. Tel: (01728) 832999.

LOWESTOFT DRS, G3JRM. Meets at The George Barrow Hotel, Oulton Road, Lowestoft. Details from Phil Holden G0JSG. Tel: (01502) 585448.

MARTLESHAM RS, G4MRS. Meets at the BT Laboratories, Martlesham Heath, Ipswich, Suffolk. Details from Darren Hatcher. Tel: (01473) 644475.

SUDBURY & DRA, G0SWI, G7SRA. Meets at the Old School, Wells Hall Road, Great Comard, Sudbury, Suffolk. Details from Bryan Panton G1TWY.

SUFFOLK DATA GROUP, GB7MXM. Details from Peter Pryke G8HUE. Tel: (01473) 631313.

NORTH WALES
CLWYD

CONWAY VALLEY ARC, GW6TM. Meets at the Studio, Penrhos Road, Colwyn Bay, Clwyd. Details from Mr R.W. Evans GW6PMC. Tel: (0174S) 855068.

HALKYN & DARS, GW3HRG. Details from Mr D. Austin GW1XHG.

NORTH WALES RS, GW0NWR. Meets at the Old YMCA, Queen's Drive, Colwyn Bay, Clwyd. Details from Ted Shipton GW0DSJ. Tel: (01745) 336939.

WREXHAM ARS, GW4WXM. Meets at the Community Centre, Maesgwyn Road, Wrexham. Details from Mr P. Moran GW0WER.

GWYNEDD

MEIRION ARS, GW4LZP. Meets at the Royal Ship Hotel, Dolgellau, Gwynedd. Details from Gervase Chavasse GW4URJ. Tel: (01341) 421028.

PORTHMADOG & DARS, GW0MVI. Meets at The Yacht Club, The Harbour, Porthmadog, Gwynedd. Details from Mr G. Cadwaladr MW1DFN.

THE DRAGON ARC, GW4TTA. Meets at the Ebenezer Church Hall, Lon Foel Graig, Llanfairpwll, Isle of Anglesey. Details from Stewart Rolfe GW0ETF. Tel: (01248) 362229.

POWYS

POWYS ARC, GW4HVN. Meets at the ATC HQ, Park Lane, Newtown, Powys. Details from Mrs Jean Brown 2W1CEZ. Tel: (01686) 640814.

SOUTH WALES
DYFED

ABERPORTH YMCA, GW4SZV. Meets at the Hut 817, The Airfield, Aberporth. Details from Mr G. Carruther GW4HGJ. Tel: (01239) 811205.

ABERSYSTWYTH & DARS, GW0ARA. Meets at the Scout Hut, Plascrug Avenue, Aberystwyth. Details from John Woodward GW6IDK. Tel: (01970) 890657.

CARMARTHEN ARS, GW4YCT. Meets at The Aelwyd Care Home, Carmarthenshire County Council, Tregynwr Road, Llangunnor, Carmarthen SA31 3BS. Details from Mr W.D. Hughes GW4ZXL. Tel: (01267) 231359.

CLEDDAU ARS, GW0SYG. Details from Trevor Perry GW4XQK. Tel: (01646) 600725.

LLANELLI ARS, GW0EZQ. Meets in the Furnace Community Hall, Furnace Square, Llanelli. Details from Roy Jones GW0KJZK. Tel: (01554) 820207.

PEMBROKESHORE RS, GW0EJE. Meets at Furzy Park Community Centre, Furzy Park, Haverfordwest, Pembrokeshire. Details from Ian M. Jones MW0CAB. Tel: (01437) 763028.

GWENT

ABERGAVENNY RS, GW4GFL. Meets at the Hill Residential College, Pen-y-Pound, Abergavenny, Gwent. Details from Glyn Hughes GW0DQY. Tel: (01633) 483186.

BLACKWOOD & DARS, GW6GW. Meets at the Oakdale Comprehensive School, Oakdale, Blackwood, Gwent. Details from John Evans GW8ITI. Tel: (01495) 225178.

EBBW VALE COLLEGE RS, GW0IIW. Meets at the Gwent Tertiary College, Ebbw Vale Campus, College Road, Ebbw Vale, Gwent. Details from Mr T. Hayden GW0HCN. Tel: (01495) 305192.

NEWPORT ARS, GW4EZW. Meets at the Brynglas Community Centre, Brynglas Road, Newport, Gwent. Details from Paul Nicholls.

PONTYPOOL ARS, GW3RNH. Meets at the Settlement, Rockhill Road, Pontypool, Gwent. Details from Graham Smith GW0OLZ.

MID-GLAMORGAN

BRIDGEND & DARC, GW4LNP. Meets at the Club Brynmenyn, Brynmenyn, Bridgend. Details from Alun Hulmes. Tel: (01656) 721574.

HOOVER (MERTHYR) ARC, GW3RDB. Meets at the Hoover Sports Pavillion, Hoover Ltd., Pentrebach, Merthyr Mydfil, Mid Glamorgan. Details Robert Cummings GW0RVG.

MID GLAMORGAN ARG, MW0CNA. Meets at Aberkenfig Sports & Social Club. Details from Mervyn Carey GW4VSE. Tel: (01656) 734668.

SOUTH GLAMORGAN

BARRY ARS, GW3VKL. Meets at Sully Sports & Leisure Club, South Road, Sully, S. Glamorgan. Details from Richard Mortimore GW4BVJ. Tel: (01446) 738756.

HIGHFIELDS ARC, GW4LFO. Meets at the Highfields Physically Handicapped Centre, Allensbank Road, Cardiff. Tel: (01222) 561542.

WEST GLAMORGAN

PORT TALBOT (BS PLC) ARS, GW3EOP. Meets at the British Steel PLC Sports & Social Club, Margam, Port Talbot, West Glamorgan. Details from Mr J. Chinnock MW0AGE.

SWANSEA ARS, GW4CC. Meets at the Applied Sciences Building, Swansea University. Details from David Williams GW4BNJ. Tel: (01792) 519046.

SCOTLAND WEST & WESTERN ISLES
CENTRAL REGION

FALKIRK & DARS, GM0FRC. Details from Scott Waterall GM0KBU.

STIRLING & DARS, GM6NX. Meets at Bandeath Industrial Estate, Throsk, Nr. Stirling. Details from John Sherry GM0AZC. Tel: (01324) 824709.

DUMFRIES & GALLOWAY

WIGTOWNSHIRE ARC, GM4RIV. Meets at the Aird Unit, Stranraer Academy, Stranraer. (entrance from Cairnport Road). Details from Neil Macdonald GM4LQS.

STRATHCLYDE

AYR ARG, GM0AYR. Meets at the Citidal Leisure Centre, Ayr. Details from Peter Sturgeon MM0BQP.

CENTRAL SCOTLAND FM GROUP, RS38728. Details from Thomas Stalker GM7TZU. Tel: (01698) 816793.

DALRY ARG, MM0ARG. Meets at The Turf, In Dalry Court, Hill Street, Dalry. Details from Alex McKeeman MM0ABM. Tel: (01294) 823295.

DUNOON & DARS, GM0COD. Meets at the Edward Street Community Centre, Edward Street, Dunoon. Details from A.B. Horton GM0BUL. Tel: (01369) 840217.

HELENSBURGH ARC, GM4HEL. Details from G. Capstick GM7OAF. Tel: (01436) 675922.

INVERCLYDE ARG, GM0GNK. Meets at the Cardwell Bar, Cardwell Road, Gourock, Strathclyde. Details from Andrew Givens GM3YOR. Tel: (01475) 638226.

KILMARNOCK & LOUDOUN ARC, GM0ADX. Meets at the Hurlford Community Centre, Cessnock Road, Hurlford. Details from Steve Campbell GM4OSS. Tel: (01560) 483800.

LARGS & DARS, GM0VKG. Details from Mr J. Clough GM0MDD. Tel: (01475) 568584.

LORN ARS, GM0LRA. Details from T. Olsen GM0EQW. Tel: (01866) 2580.

MID LANARK ARS, GM3PXK. Meets at the Newarthill Community Ed. Cent., High Street, Newarthill, Motherwell, Lanarkshire ML1 5GU. Details from John Neary GM0XFK. Tel: (01698) 822860.

MILTON OF CAMPSIE ARS, GM0MOC. Meets at The Red Cross Hall, Kirkintilloch. Details from John MacKenzie GM0HJU. Tel: (01360) 312954.

PAISLEY ARC, GM0PYM. Meets at the Paisley YMCA Hall, 5 New Street, Paisley PA1 1XU. Details from John Quigley GM0TQA. Tel: 0141-889 6860.

SCOTTISH DIGITAL COMMS. GRP, GM7VSR. Details from Stuart Clink GM1VBE. Tel: (01698) 884803.

WEST OF SCOTLAND ARS, GS4AGG. Meets at the Multi Cultural Centre, 21 Rose Street, Glasgow. Details from Hon. Sec.

SCOTLAND EAST & HIGHLANDS
BORDERS

BORDERS ARS, GM0BRS. Meets at the St. John Ambulance Hall, Berwick-upon-Tweed. Details from A.M. McCreadie GM0BPY. Tel: (018907) 50492.

GALASHIELS & DARS, GM4YEQ. Meets at the Focus Centre, Galashiels. Details from Jim Keddie GM7LUN.

KELSO ARS, GM4KHS. Meets at the Abbey Row Community Centre, Kelso. Details from Margaret Chalmers GM0ALX. Tel: (01573) 226372.

FIFE

GLENROTHES & DARC, GM4GRC. Meets at the Football Pavilion, Station Road, Thornton, Fife. Details from Alexander Adam GM0FVD. Tel: (01592) 874374.

GRAMPIAN

ABERDEEN ARS, GM3BSQ. Meets at the Red Cross HQ, 22 Queens Road, Aberdeen. Details from Robert Duncan. Tel: (01224) 896142.

BANFF & DARC, GM0PYC. Meets at the Princess Royal Park Football Ground, Conference Room (Deveronvale F.C.), Banff. Details from Steve Roberts GM4HWS. Tel: (01888) 551377.

MORAY FIRTH ARS, GM3TKV. Meets at the Grant Arms Hotel, Fochabers. Details from Geoff Crowley GM7SJC. Tel: (01542) 882818.

HIGHLAND REGION

FORT WILLIAM ARG, GM0FRG. Details from R. Johnstone GM1YGV. Tel: (01397) 703046.

INVERNESS ARC, GM4TPF. Meets at The Emergency Operations Centre, Inverness (except July and August). Details from R.F. Goodall GM0OGZ. Tel: (01463) 811701.

LOTHIAN

COCKENZIE & PORT SETON ARC, RS177035. Meets at the Thomtree Inn, Lounge Bar, Old Cockenzie High Street, Cockenzie, E. Lothian. Details from Mr Bob Glasgow GM4UYZ. Tel: (01875) 811723.

LOTHIANS RS, GM3HAM. Meets at the Orwell Lodge Hotel, Polwarth Terrace, Edinburgh EH11 1NH. Details from Thomas G. Main, Sec.

ORKNEY

ORKNEY ARC, RS181749. Details from Mrs Terry Penna. Tel: (01856) 741233.

SHETLAND ISLANDS

LERWICK RC, GM3ZET. Meets at the Islesburgh Community Centre, King Herald Street, Lerwick, Shetland. Details from Ian C. Millar GM7RKD. Tel: (01950) 460306.

TAYSIDE REGION

DUNDEE ARC, GM4AAF. Meets at the Dundee College, Graham Street Annex, Dundee. Details from John R. Nicholson GM0MFE. Tel: (01382) 858700.

PERTH & DARG, GM4EAF. Meets at the Perth Sports & Social Club, 18 Leonard Street, Perth. Details from Ron Harkess GM3THI. Tel: (01738) 643435.

STRATHMORE & DARC, GM3GBZ. Meets at 2231 Sqdn ATC, 1 Lochside Road, Forfar. Details from Graham Scattergood MM0BSX. Tel: (01307) 468824.

N. IRELAND
CO. ANTRIM

ANTRIM & DARS. Meets at the Clotworthy Arts Centre in the Castle Grounds in Antrim. Details from David Hutchinson GI4FUM or visit www.gn4siw.co.uk

BALLYMENA RC, GI3FFF. Meets at 70 Nursery Road, Gracehill, Ballymena, Co. Antrim. Details from Jeffery Clarke GI4HCN. Tel: (01266) 659769.

CARRICKFERGUS ARG, GI0UX. Meets at the Downshire Community School, Downshire Road, Carrickfergus. Details from John Branagh GI3YRL. Tel: (01960) 367208.

GLENGORMLEY ELECTRONICS ARS, GN0XYZ. Meets at the Glengormley High School, Room 18F, 134 Ballyclare Road, Newtonabbey.

LAGAN VALLEY ARS, GI4GTY. Meets at the Harmony Hall Arts Centre, Harmony Hill, Lisburn, Co. Antrim. Details from Ron McCaughey GI4NTO.

ROYAL NAVY (ULSTER) ARC, GI0URN. Club affiliated to the Royal Navy Amateur Radio Society. Details from Alex Miller GI4SFV.

CO ARMAGH

ARMAGH & DARC, GI0ADD. Meets at County Armagh Golf Club, 7 Newry Road, Armagh City. Details from John A. Murphy. Tel: 0283-752 2153.

CO. DOWN

BANGOR & DARS, GI3XRQ. Meets at The Stables, Groomsport, Co. Down. Details from Terry Barnes GI3USS. Tel: 0289-147 3948.

NEWRY & MOURNE ARC, GI4MBO. Meets at the Shamrock Social Club, Newry.

ULSTER DX ARG, MI0UDX. Details from Mr P.G. Mercer GI4VIV.

TYRONE

THE FOYLE & DARS, MI0AKU. Meets at 159 Victoria Road, Bready, Co. Tyrone. Details from Trevor Campbell GI1XGA. Tel: 0287-134 5405.

International Radio Clubs

If you want to meet with others with a radio passion, then please use this guide...

AMSAT-UK (G0AUK)
Information from Jim Heck G3WGM, Badgers, Letton Close, Blandford, Dorset BH11 7SS. E-mail: g3wgm@amsat.or or visit www.uk.amsat.org

British Amateur Radio Teledata Group (BARTG - G4ATG, GB2ATG)
Contact Membership Secretary Andrew Thomas G8GNI, M5AEX, Dame School House, 103 High Street, Stony Stratford, Buckinghamshire MK11 1AT, E-mail: members@bartg.demon.co.uk or visit www.bartg.demon.co.uk

British Amateur Television Club (BATC - RS38114)
Enquiries to Dave Lawton G0ANO, 'Grenehurst', Pinewood Road, High Wymcombe, Bucks HP12 4DD. Tel: (01494) 528899. E-mail: memsec@batc.org.uk or visit www.batc.org.uk

British DX Club (BDXC-UK)
Enquiries to Club Secretary Colin Wright, 126 Bargery Road, London SE6 2LR. E-mail: secretary@bdxc.org.uk or visit www.bdxc.org.uk

Danish Shortwave Club
Information from Treasurer Bent Nielsen, Egekrogen 14, DK-3500 Vaerloese, Denmark or visit www.dswci.org

International Listeners' Association (RS88763)
Details from Trevor Morgan GW4OXB, 1 Jersey Street, Haford, Swansea SA1 2HF. E-mail: gw4oxb£net.ntl.com

International Short Wave League (ISWL - G4BJC)
Information from Honorary Secretary John Raynes, G16436/G0BWG, 267 Pelham Road, Immingham, Lincs DN40 1JU. E-mail: iswl@ntlworld.com or visit www.iswl.org.uk

Military Wireless Amateur Radio Society (G0PTZ)
Further details from John Taylor-Cram, 7 Hart Plain Avenue, Cowplain, Waterlooville, Hampshire PO8 8RP. Tel: 0239-225 0463.

Radio Amateurs Invalid and Blind Club (RAIBC - G4IBC, GB0IBC, GB1IBC)
Enquiries to Honorary Treasurer/Membership Secretary Mrs Shelagh Chambers, 78 Durley Avenue, Pinner, Middlesex HA5 1JH. Tel: 0208-868 2516.

Radio Amateur Old Timers' Association
Enquiries to Membership Secretary Ted Rule, G3FEW,15 Norwich Road, Lenwade, Norwich, NR9 5SH, 01603 872309, E-mail: edit@raota.fsnet.co.uk or visit http://go.to/raota

Remote Imaging Group (RS88803)
Further details from the Membership Secretary John Din, 59 Woodend Road, Coalpit Heath, Bristol BS36 2LH. FAX: (01454) 887880. E-mail: membership@rig.org.uk

Royal Air Force Amateur Radio Society (RAFARS - G8FC, G8RAF)
Details from the Administrator, HQ RAFARS, RAF Cosford, Wolverhampton WV7 3EX. Tel: (01902) 372722, E-mail: administrator@rafars.org

Royal Navy Amateur Radio Society (RNARS - GB3RN, G3CRS, G1BZU)
Enquiries to Secretary Philip Manning G1LKJ/M3LKJ, 1 Wavereley Gardens, Ash Vale, Surrey GU12 5JP. Tel: (01252) 334929, E-mail: g1lkj@amsat.org or visit www.rnars.org.uk

Royal Signals Amateur Radio Society (RSARS - G4RS)
More information from General Secretary, HQ RSARS, Cole Block, Blandford Camp, Dorset DT1 8RH. Tel: (01258) 482814, E-mail: gensec@rsars.org.uk or visit www.rsars.org.uk

The Medium Wave Circle
Details from c/o C. Rooms, 59 Moat Lane, Luton LU3 1UU. E-mail: contact@mwcircle.org

Donington Park 19-20 September 2003

The Leicester Amateur Radio Show Committee is proud to present

The 32nd LEICESTER AMATEUR RADIO SHOW & CONVENTION

COMPUTERS, RADIOS and ELECTRONICS at

THE CASTLE DONINGTON INTERNATIONAL EXHIBITION CENTRE, DONINGTON PARK NW LEICESTERSHIRE

less than 5 minutes from J23A & J24 M1 Motorway

on

Friday 19th & Saturday 20th SEPTEMBER 2003

OPENING TIMES 9.30am to 5.30pm Friday, 9.30am to 5pm Saturday

ALL MAJOR DEALERS: AOR, ICOM, KENWOOD, YAESU

FLEA MARKET, BRING and BUY, Large RSGB stand, LOCAL & NATIONAL CLUBS & SOCIETIES

Morse tests on demand, demonstration amateur radio stations, camping and caravanning on site

CONVENTION:- Including AMSAT UK, IARU DF, RSGB Forum and RAIBC AGM

BRING YOUR CARD FOR THE QSL BOARD SO YOUR FRIENDS CAN LOOK OUT FOR YOU

Drop and Swap Table for data books and catalogues

TALK IN 145.550 & 433.550MHz by GB0LS

ADMISSION PRICES

1 day ticket £3.50, OAPs & under 16 £3, 2 DAY TICKET £6, OAPs & Under 16 £5
Under 12 free when accompanied by an adult

DISCOUNT ADMISSION to The Donington Racing Car Collection

FOR FURTHER DETAILS AND THE MOST UP-TO-DATE INFORMATION SEE OUR INTERNET SITE at http://www.lars.org.uk

STAND BOOKINGS contact John Theodorson, G4MTP tel 01604 790966, fax 0701 0701 360 E-mail g4mtp@lars.org.uk

FLEA MARKET BOOKINGS contact John Senior, G7RXS on 0116 284 1517, E-mail SENIORJA@aol.com

All other enquiries to Geoff Dover, G4AFJ, on tel: 01455 823344, fax: 01455 828273, E-mail: g4afj@argonet.co.uk

DEALERS PANELS

Buckinghamshire

dontpayretail.co.uk
E-mail: info@dontpayretail.co.uk
www.dontpayretail.co.uk

Dorset

THE SHORTWAVE SHOP
Radio Communications Centre
Amateur/C.B./Shortwave
Scanners/Marine/Airband
Full range of used equipment
www.shortwave.co.uk
18 Fairmile Road, Christchurch, Dorset BH23 2LJ
Tel/Fax: 01202 490099

Kent

R. G. ELECTRONICS
SCANNERS
Walkie Talkies, CB Radio
Satellite Radio, GPS, Metal Detectors
ICOM & NEVADA DEALER.
RadioShack. STOCKISTS
www.rgelectronics.co.uk
66 Oxford St., Whitstable, Kent CT5 1DG
01227 262319

Kent

KITS! KITS! KITS
For full details send S.A.E. to
Kit Radio Company
Unit 11, Marlbrough Court
Westerham, Kent TN16 1EU
or visit our web-site
http://hometown.aol.co.uk/kitradioco/uk.htm

Leicestershire

STEWART AVIATION
Large range of hand-held scanners
Callers by appointment please
PO. Box 7, Market Harborough, Leics LE16 8YL
Tel: 01536 770962 Fax: 01536 770180
Web site: http://www.stewart-aviation.co.uk/rs
E-mail:- radios@stewart-aviation.co.uk

Mersyside

ARC Ltd.
Everything for the radio amateur under one roof!
38 Bridge Street, Earlestown, Newton-le-Willows, Merseyside WA12 9BA
Tel: 01925 229881 Fax: 01925 229882

Scotland

Everything you need for C.B., Scanners & Amateur Radio. . .
JAYCEE ELECTRONICS LTD
20 Woodside Way
Glenrothes, Fife KY7 5DF
Tel: 01592 756962
Tues-Fri 9am-5pm • Sat 9am-4pm
Closed Sunday & Monday

Somerset and South West

QSL COMMUNICATIONS
- For all amateur radio and listener needs.
- New and secondhand equipment.
- Part exchange welcome.

Unit 6, Worle Industrial Centre, Coker Road, Worle, Weston-Super-Mare BS22 6BX
Tel/Fax: (01934) 512757

West Midlands

SRP TRADING
1175 Bristol Road South, Northfield, Birmingham B31 2SL
Telephone: 0121 475 9898
or
0121 475 6969
Fax: 0121 475 3355

Subscribe Here

to Short Wave Magazine / Practical Wireless / Radio Active

- *Never miss an issue*
- *Have it delivered to your door*
- *Subscribers get their copies before they reach the shops*
- ***SWM** - The UK's authoritive magazine dedicated to all types of radio spectrum monitoring*
- ***PW** is Britain's best selling amateur radio magazine*
- ***RA** covers all aspects of radio communications, scanners, cb, amateur, 446, sw listening, and more - it's all here!*

***CREDIT CARD ORDERS TAKEN ON 0870 224 7830** between the hours of 9.00am - 5.00pm. Outside these hours your order will be recorded on an answering machine.*

***FAX ORDERS TAKEN ON 0870 224 7850** or please fill in the details ticking the relevant boxes, a photocopy will be acceptable to save you cutting your beloved copy!*

*To: **PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW***

Subscription Rates

(Please tick appropriate box)

		PW	SWM	PW+ SWM	RA	RA+ PW	RA+ SWM	PW+ RA+ SWM
1 YEAR	UK	£31 ❑	£36 ❑	£61 ❑	£25 ❑	£50 ❑	£55 ❑	£83 ❑
	Europe Airmail	£39 ❑	£43 ❑	£74 ❑	£33 ❑	£63 ❑	£68 ❑	£103 ❑
	ROW Airmail	£50 ❑	£54 ❑	£94 ❑	£37 ❑	£77 ❑	£82 ❑	£127 ❑
3 YEARS	UK	£83 ❑	£95 ❑	£163 ❑	£68 ❑	£135 ❑	£152 ❑	£225 ❑
	Europe Airmail	£108 ❑	£115 ❑	£213 ❑	£87 ❑	£175 ❑	£187 ❑	£283 ❑
	ROW Aimail	£145 ❑	£155 ❑	£263 ❑	£105 ❑	£208 ❑	£220 ❑	£365 ❑

I wish to order a.....1/3 year.....subscription to..SWM/RA/PW*.starting with the.....issue.*

Payment Details

I enclose my Cheque/Postal Order for £.....*

made payable to PW Publishing Ltd.
or please debit my Access/Visa/Amex card No.

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Expiry Date.....

or please debit my Switch card No.

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Date.....Switch Issue Number (if on card).....

Switch Expiry Date.....

Signature.....

Name .....

Address .....

.....

.....

.....

.....

Postcode .....

Daytime Tel. No .....

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at time of going to press.
Please note: all payments must be made in Sterling. Cash not accepted.

*(*Delete as necessary)*

Photocopies of this page are acceptable

ADVERTISERS INDEX

Albion Design Works 66
AOR 79
Association for International Broadcasting Ltd 66
bhi 8
British Wireless Blind Fund 46
Computer Aided Technology 72
Ferrell's Confidential Frequency List 63
Electrovalue 66
GCQ Communications 72
Haydon Communications 18, 19, 20, 21
Leicester ARC 77
Martin Lynch & Sons 40, 41
Moonraker 16, 17
Nevada 2, 3, 36, 37
Pervisell Ltd 66
Photavia Press 72
Practical Wireless 23
Radio Active 23
Radioworld 48, 49
Remote Imaging Group 72
Roberts Radio 80
Solid State Electronics 63
Sycom 76
Telford Amateur Radio Rally Group 63
Ten-Tec 66
The Shortwave Shop 76
Timestep Weather Systems 63
WACRAL 76
Waters & Stanton 32, 33
Winradio 46

AR8200 *Mark3* RECEIVER

EVOLUTION PRODUCES THE VERY BEST

Evolution had led to the **AR8200MK3** and provides excellent full coverage all mode receive including USB, LSB, AM, NFM, WFM with multiple IF bandwidths. Frequency coverage is **530kHz - 3GHz** with minimum acceptable input of 100kHz. Supplied with NiMH rechargeable batteries, charger, car lead, whip aerial, MW aerial and comprehensive illustrated operating manual.

Many options are available including SLOT CARDS for CTCSS, analogue voice inverting, external memory, recording / playback, tone eliminator, computer interface lead, reaction tune lead, soft case, free PC software from the AOR web site.

£439.00 inc VAT

Evolution in Action

AR5000A, revised version for 2003, now with frequency coverage from 10kHz to 3GHz all modes in 1Hz steps ***£1799.00***
AR5000A+3, as above with synchronous AM, noise blanker and AFC ***£1999.00***

AR8600 *Mark2* RECEIVER

TRANSPORTABLE RADIO - GO ANYWHERE

The **AR8600MK2** is an amazingly versatile receiver which can be used mobile, base or trans-portable... powered from an external 12V d.c. power supply, 12V vehicle or from an optional internally fitted NiCad battery pack.

The upper **frequency range has been extended to 3000MHz** (3.0GHz), lower band sensitivity has been increased (now officially covering to 100kHz) with an **enhancement to short wave performance** by the addition of further bandpass filters and revision to IF filters.

£719.00 inc VAT

NEW ASM8600

Following commercial use of the AR8600MK2, a new analogue signal meter has been produced so that even more accurate variations in signal level can be monitored. The signal meter simply plugs into the rear panel AUX socket of the AR8600MK2. Receivers with serial numbers below 072661 require a small modification (£20.00 inc carriage), the ASM8600 cannot be used with AR8600MK1.

£79.95, carriage £5.00 inc VAT

The **AR7030 / AR7030 PLUS** is a very popular short wave all mode receiver (0 - 32MHz). Excellent strong signal handling, low noise local oscillator (producing extremely low reciprocal mixing figures) and excellent audio fidelity.

Many innovative features such as self-calibrating IF filter routine, self-tuning Synchronous AM detector, auto-attenuator and much more. Supplied with infrared remote hand control, mains power supply & comprehensive operating manual.

AR7030 £799.00
AR7030 PLUS £949.00

AOR DIRECT AERIALS

Items in this column are available directly from AOR UK LTD, please place your order using any of the following methods:

- SSL credit card order facility from our web site **https://aoruk-com.secureserve.co.uk/c_card.htm**
- Phone, fax or post your credit card details
- Post a cheque or postal order (payable to AOR UK LTD)

Items are usually available from stock for immediate despatch, however please allow up to 28 days for delivery dependant upon demand, all delays greater than one week will be notified. Prices include VAT @ 17.5%. ***E&OE.***

The **LA350** is a compact active loop aerial specifically designed to provide good reception when away from the main monitoring location or when large external aerials are not practical.
SEE THE DETAILED REVIEW IN THE NOVEMBER 2002 SWM.
Compact, but achieving high performance, featuring an internal high-gain amplifier (13.5dB) and excellent overall strong signal handling (high IP_3 +30dBm). Very compact being constructed of metal loops and providing a quality finish, still the LA350 remains only half the diameter of other well known loop aerials. Supplied with two loops, 3.0 - 9.0 & 9.0 - 30MHz
£199.00 *carriage £5.00*

- **350L** Optional element 0.2 - 0.54 MHz for LA350, ***£49.00***
- **350M** Optional element 0.54 - 1.6 MHz for LA350, ***£49.00***

Carriage on optional elements £2.50 if ordered separately

DA3000 16 element discone aerial. Usable coverage is 25 MHz to 2,000 MHz (2GHz). Supplied with 15m of coaxial cable and terminated in a BNC plug.
£69.00 *carriage £5.00*

SA7000 Twin element 'passive' ultra wide band receive aerial 30 kHz to 2,000 MHz (2 GHz). Supplied with 15m of coaxial cable and terminated in a BNC plug.
£99.00 *carriage £5.00*

WL500: Following on from the success of the LA350 loop aerial (see above), the WL500 provides **a solution to those operators who need a good compact aerial for travelling around.** The loop is constructed of flexible cable braced by a centre pole which splits in to two sections so that it can be easily stored away.

SEE THE DETAILED REVIEW IN THE APRIL 2003 SWM.
When setup, the loop forms a diamond shape with an approximate diameter of 60cm. The loop covers 3.5 to 30MHz with a range switch mounted at the termination point of the loop (switching at 10MHz). A length of screened cable is supplied which is terminated in PHONO plugs to connect the loop to the control box. The control unit provides preselection and amplification terminated in a BNC socket for connection to the receiver. Excellent strong signal characteristics are achieved, typically 16dB gain with an IP_3 of +14.5dBm. The control unit can be powered from an internal 9V PP3 battery (current consumption is around 16mA), alternatively external 12V DC may be used. While the WL500 will operate below 3.5MHz, performance on the lower bands can be enhanced by the addition of the **optional 500LM bar element.** The bar has a selector switch for LW or MW operation and connects to the control box in place of the short wave loop.
£149.00 *carriage £5.00*

- **500LM** Optional LW/MW element ***£49.00***

Carriage on 500LM £5.00 if ordered separately

AOR (UK) LTD 4E East Mill, Bridgefoot, Belper, Derbyshire, DE56 2UA England
AOR® **Tel: 01773 880788** Fax: 01773 880780
info@aoruk.com www.aoruk.com E&OE

BY APPOINTMENT TO HER MAJESTY THE QUEEN SUPPLIERS & MANUFACTURERS OF RADIO AND TELEVISION ROBERTS RADIO LIMITED

BY APPOINTMENT TO H.M. QUEEN ELIZABETH THE QUEEN MOTHER RADIO MANUFACTURERS ROBERTS RADIO LIMITED

BY APPOINTMENT TO H.R.H. THE PRINCE OF WALES MANUFACTURERS & SUPPLIERS OF RADIO RECEIVERS ROBERTS RADIO LIMITED

ROBERTS

'Six hours recording!'

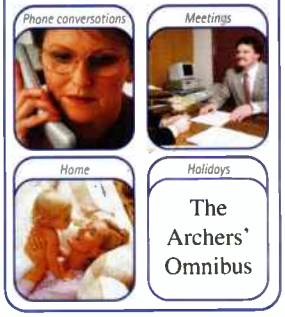
Six hours recording on a C90 cassette

C9950 *'Long Play' cassette recorder with multi event timer*

- Six hour record time using standard C90 cassettes
- Multi event timer
- Telephone record facility
- Voice activated record function
- Built in microphone
- Stereo record/playback
- Line input socket
- Microphone socket
- Digital timer with LCD display
- Tape counter
- Headphone socket
- AC adaptor
- Size 260w x 67h x 180d

Pull-out Handle

Ideal for recording:



Roberts Radio Limited, Mexborough, South Yorkshire S64 8YT. Tel: 01709 571722 http://www.robertsradio.co.uk