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- 66 - 956 MHz (with gaps)
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- Supplied c/w earphone, belt clip, charger and rubber duck antenna

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- 66-174, 420-470 MHz
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PRICE MATCH

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Yaesu's Flagship Desktop Ultra Wideband Scanning Receiver

- 0.1 to 2600 MHz
- Tons of features!

£600 £599 P&P £10 3 CHEQUES OF £203.00

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- 100 kHz to 1300 MHz
- AM/FM/WFM/SSB/CW
- 1,000 Ch Memories

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YAESU VR-1200 New D model with

- NEW! Charge Socket
- NEW! Mains Adaptor
- 0.1 - 1299.995MHz
- AM, FM, Wide FM
- Auto select ch steps
- 12 preset memories
- 89 ch Memory Bank
- 640 ch memory system
- Slot machine game!

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YUPITERU MVT 7100

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

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YUPITERU MVT 3300 SPECIAL OFFER

- 66 - 88MHz
- 108 - 170MHz, 300 - 470MHz, 800 - 1000MHz
- Modes: AM/NFM
- Memories: 200

£169 £129 P&P £10 3 CHEQUES OF £46.66

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

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ALINCO DJX3	HANDHELD SCANNER + EOH18	159.00
BEARCAT UBC220XLT	HANDHELD SCANNER	89.00
BEARCAT UBC 8000XLT	BASE SCANNER	189.00
ICOM IC-R7500	HANDHELD SCANNER	99.00
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JRC NR0245	HF RECEIVER	350.00
KENWOOD R 8000	HF RECEIVER	399.00
LDWE HF-125	HF RECEIVER	169.00
ROBERTS R-86	SHORTWAVE RECEIVER	145.00
SONY ST-SE200	FM/AM TUNER	59.00
VIDEOLOGIC	DRX-6015 DAB TUNER	169.00

NEW **BEARCAT UBC 180XLT**

A stylish new Sports Scanner with 8.83kHz Airband steps

- Frequency: 25 - 87, 108 - 174, 406 - 512, 806 - 960 MHz
- AM/FM
- 100 Memories
- Twin Turbo Scan
- Alpha Numeric display
- Supplied c/w: Mains Adaptor/charger, Nicad re-chargeable batteries, Earphone, Belt clip.

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- 500 channels
- 25-1300 MHz (with gaps)
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- 25-956 MHz (with gaps)
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BEARCAT UBC 3000XLT

- 25-550, 760-1300 MHz
- AM/FM/WFM
- 400 memory channels
- TURBD SCAN/SEARCH
- Automatic Freq Storage
- Selectable Attenuator
- Automatic Freq Sorting
- Supplied c/w earphone, case, belt clip, charger, rubber duck antenna

£199.95 P&P £10 3 CHEQUES OF £69.98

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BEARCAT UBC 280XLT SPORTCAT Twin Turbo Handheld

- Triple conversion RX
- 25-956MHz (with gaps)
- 200 memories
- C/W Antenna, Earphone, Belt Clip, Nicad battery, 240V UK Mains adaptor

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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

£69.95 P&P £8

JIM M75 Pre-Amp

- 24MHz to 2150 MHz
- Variable gain -10dB to +20dB
- 12V DC or internal Battery
- BNC plug & socket
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- Weight 180g

£79.95 P&P £4.75

GRUNDIG Satellit 800

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- 118-137MHz for Aircraft Band
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- WFM mode only for 87-108MHz
- Three built-in bandwidths for SW
- C/W Deluxe Stereo Headphones

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GRUNDIG YB400 Hi-Performance SW Radio

- 144kHz - 30MHz
- SW, FM Stereo, MW/LW
- SSB reception (both USB/LSB)
- Dual alarm clock
- Narrow/Wide bandwidth
- Mains or Battery (with optional mains adaptor)

supplied c/w: SW HANDBOOK, CARRYING CASE, EXTERNAL WIRE ANTENNA, CARRY STRAP

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PORSCHE G-2000 Stylish Radio

- FM Stereo, AM/FM/MW/SW
- Clock, alarm, sleep function, world times
- Mains/Battery (optional AC adaptor)
- Supplied c/w leather cover & in-ear stereo headphones

a stylish radio designed by F.A. Porsche

£89.95 £74.95 P&P £8

ALINCO DJ-X3 Ultra modern Scanning Receiver

- 100kHz - 1300MHz
- AM/FM/WFM
- 700 memory channels
- Bug detector
- Stereo FM (with headphones)
- Size: 56w x 102h x 23d mm
- Supplied c/w: 3 AA dry cell, battery case, carrying strap

with 8.83kHz for air band

£129.95 £94.95 P&P £8

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World Radio History

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YAESU FRG-100 Shortwave Communications Receiver



- Fully featured radio with Frequency 50 kHz to 30 MHz
- Receives AM/SSB/CW
- 50 Memories
- Programmable on/off
- Twist 12/24 hour clock/Timer
- Memory Scan
- Selectable input Attenuator
- Noise Blanker
- Size 238(W) x 93(H) x 243(D)
- Optional FM Unit - £33
- Supplied with Free 240V mains - 13.8V DC Supply

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FREE MAINS PSU

ICOM IC-R8500



SAVE £177
PRICE MATCH
 Communications Receiver
 This receiver is everything we hoped it would be, covering 100kHz - 2GHz, lots of features including computer control.

£426 PPG 3 CHEQUES OF **£142.20**
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ICOM IC-R5



SAVE £20
PRICE MATCH
 Communications Receiver
 • 495 kHz-1309.995MHz
 • AM, FM, WFM modes
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 • 1250 memory channels
 • Dynamic Memory Scan
 • CTCSS & DTCSS Decoder
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£149 PPG 3 CHEQUES OF **£56.33**
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PALSTAR AA30



Active Antenna and/or Matcher for Receiver use only. A low loss antenna tuner suitable for random long wire, dipoles, Beveridges, Delta loops, inverted V's, Verticals, G5RV and most receiving antennas. Or use as a stand alone active antenna.
 • Frequency: 100kHz-30MHz

£69.95 PPG

ICOM IC-R75



SAVE £115
PRICE MATCH
 Communications Receiver
 • 0.03 - 60MHz
 • Twin PBT built-in
 • PC control capability
 • Synchronous AM detection

£74 PPG 3 CHEQUES OF **£203.00**
 PAY BY CHEQUESREAD INTEREST FREE!

STEEPLETONE MBR747



Multiband Receiver
 Covers LW, MW and SW
 • Shortwave
 • 3 - 22MHz
 • Marine/Airband
 • 108 - 175MHz
 • Battery/Mains

£79.95 PPG

ROBERTS R861



Worldband Radio
 • 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

£200 PPG 3 CHEQUES OF **£63.00**
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BPL CELESTE MkII WorldSpace 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 PPG 3 CHEQUES OF **£49.66**
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ALINCO DJ-X2



- Ultimate lightweight scanner
 • RX: 52kHz-999.995MHz
 • AM WFM NFM
 • Selectable scan modes
 • 700 memories
 • Audio descrambler
 • Bug detector
 • Selectable int / ex antenna
 • Internal or external supply
 • Priority channel monitoring

with 8.33kHz for airband

£129.95 PPG 3 CHEQUES OF **£46.65**
 PAY BY CHEQUESREAD INTEREST FREE!

ALINCO DJ-X10E



- Advanced featured scanning RX
 • Receives: 100kHz - 2000MHz
 • AM, WFM, NFM, SSB, CW
 • 1200 memory channels
 • Channel scope
 • Advanced scanning features
 • Battery save facility
 • Cloning facilities
 • Built-in 24 hour clock
 • Switchable attenuator

£299.95 PPG 3 CHEQUES OF **£103.31**
 PAY BY CHEQUESREAD INTEREST FREE!

ALINCO DJ-X3



- 100kHz-1300MHz AM/FM/WFM
 • 700 memory channels
 • Steps: 5 6.5/8.33/10/12.5/15/20/25/30/50/100kHz
 • Bug detector
 • Stereo FM (with headphones)
 • Supplied c/w: 3 AA dry cell, battery case, carrying strap

with 8.33kHz for airband

£129.95 PPG 3 CHEQUES OF **£46.65**
 PAY BY CHEQUESREAD INTEREST FREE!

ALINCO DJ-X2000



- Intelligent scanning receiver
 • Covers 100kHz-2,149.99MHz
 • 2000 channel memory
 • AM/NFM/WFM/LSB/USB/CW auto mode position
 • Flats tune
 • Transweeper
 • Record up to 160 seconds
 • Descrambler • Channel scope
 • Bug detector

£499.00 PPG 3 CHEQUES OF **£169.66**
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... until NOW!

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

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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

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SCANMASTER Product sheet 2003



SCANMASTER B128 AIRBAND BASE SCANNER

A dedicated CIVIL AIRBAND base antenna designed to give long distance reception on 117-140MHz. Supplied c/w mounting tube & mast clamps.
 • 'N' Type connector
 • length: 1mtr

£39.95 PPG £4.75 P&P



SCANMASTER LP1300 WIDEBAND BEAM ANTENNA

16 EL LDG PERIDDD DESIGN
 • 105 - 1300MHz
 • Gain 11-13dBi
 • 'N' type connector
 • 500W



SCANMASTER DESKTOP

A complete desktop antenna covering 25 - 1300 Mhz, just 36" high with 4 m of cable, fitted BNC plug with a magnetic base.

£49.95 PPG £4.75 P&P

SCAN AIRMASTER DEDICATED CIVIL & MILITARY AIRBAND ANTENNA

• Covers 117 - 137 MHz, 224 - 400 MHz
 Antenna contains:
 • 2 dipoles for Civil Band
 • 6 dipoles for Military Airband
 • Uses 'N' Type connector

£59.95 PPG

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POWEREX SPECIAL OFFER

Set of 8 BATTERIES

	NORMAL PRICE	OUR PRICE
1600mAh x 8	£15.90	£9.95
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MH-C401FS

- apid Charge 1 - 3 or 4 NiMH / NiCd AA/AAA batteries under 100 mins accurately & coolly.
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£39.95 PPG £6.90

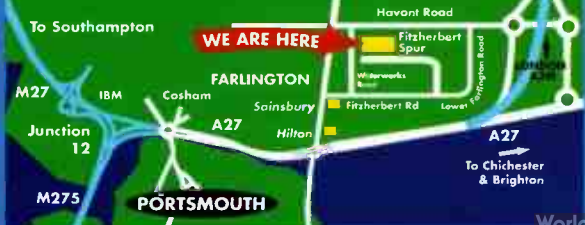
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- 12 LM&S
- 17 Bandscan America

Features

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Clive Hardy G4SLU reports on his recent attendance, in an official capacity, at the IronMan half triathlon challenge. A fascinating read!



66 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 69.

Info In Orbit Special

22 MSG-1 - Image Processing with GeosatSignal-4

If you've recently put together the capability to receive MSG-1 images, then David Taylor's image processing software could be of interest to you. Lawrence Harris reviews its capabilities.

25 MSG-1 Image Expose

Lawrence Harris presents the first ever comprehensive collection of MSG-1 images to be published.

29 24hrs With The Polar Weather Satellites

The first WXSAT - TIROS - was put into polar orbit in 1960. As of 2003 there are many polar orbiting geostationary WXSATs, with more scheduled for launch during the next 10 years.

36 Timestep's Hotbird for MSG System

It is now possible to receive WXSAT images from the new MSG-1 satellite relayed via broadcast satellite Hotbird 6. Here Lawrence examines the package offered by Timestep to enable reception of these transmissions.

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Lawrence's monthly round-up of satellite action.

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cover subject: **RAYNET** provides communications at the recent IronMan half triathlon event in Dorset.



Share your thoughts

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@yahoo.com to subscribe - don't miss the on-line action!

Coming Next Month

in SWM December 2003

- Don't miss next month's action packed issue
- News, reviews and essential data from the world of listening
- Keep on top of the world of monitoring with SWM
- and much more...

On sale 27 November 2003

*contents subject to change

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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.

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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

I was recently fortunate enough to be invited to the official Launch Ceremony for Digital Radio Mondiale - DRM at the VT Merlin medium wave transmitter site located at Orford Ness in Suffolk. This significant event followed on from the initial launch of DRM at WRC2003 in Geneva earlier this year.

Regular readers will know that we've given coverage of DRM since early on. Last year we featured an in depth two part article covering the development and initial test transmission from the likes of the former BBC, now VT Merlin site located in Rampisham, Dorset.

The launch ceremony took place from within the huge VT complex located on the unusual coastal feature Orford Ness, which inspite of being referred to by some as an island, it is in reality a spit or sand bar, the result of the mechanism called long shore drift.

In spite of the land link to the mainland coast, the launch guests' trip to the transmitter site was via VT Merlin's own ferry which turns out to be a converted landing craft of Vosper Thornycroft (the VT in VT Merlin) origin.

VT Merlin, host of the launch event, occupy the former 1970 US Cobra Mist Over The Horizon radar project site which is former MOD land formerly used for nuclear weapon detonator testing.

Later on, between the presentations by VT Merlin's Managing Director **Doug UMBER**, their DRM Programme Manager **Peter Gordon**, **Steve Gray** Head of Broadcast Operations and the official opening ceremony, we visitors were treated to a guided tour of the whole very impressive building. The complex is massive, it has an immense 'Cold War' feel to it. The building was clearly designed to operate in high electrical noise levels as each of the currently unoccupied first floor sections - they are too big to be called rooms - feature screening fingers on all of the doorways. The whole building is actually one huge Faraday cage!

VT Merlin only occupy a small fraction of the entire space, our tour guides were showing us around with the aid of torch light, as there is no connected electricity supply to the upper floor. It is, even after some 30 years of abandonment by the Americans, easy to imagine the tightly secured work carrying on in complete secret. We were warned not to wander during the guided tour as many of the huge, heavy doors only open from one side. There was a very real risk of being trapped alone and in the dark for who knows how long?

The DRM Transmitter Launch Ceremony took place at one o'clock with speeches given by **Mike Cronk**, BBC World Service Controller of Distribution & Technology, **Simon Tarrant**, VT Group's Managing Director of Support Services. The new DRM transmitter was then unveiled and the test transmissions officially began on 648kHz.

I'd like to thank VT Merlin for both their kind hospitality during the day and also the fascinating insight to the history of their Orford Ness facilities.



1. We land on the Ness courtesy of the VT Merlin ferry.



2. The VT Merlin/DRM demonstration vehicle. This car is fitted out with an impressive DRM a.m. receiving set-up designed to impress. It is to be used to show the public what is possible and will no doubt be used around the country at trade shows and the like.



3. Post presentation networking.



4. Yours truly deep in discussion with VT Merlin STE Andy Matheson and fellow journalist Lawrie Hallett.



5. BBC World Service Controller of Distribution & Technology Mike Cronk, unveiling the plaque on the new DRM transmitter. VT Merlin's DRM Programme Manager Peter Gordon watches closely.

AV4 73 Kevin

QSL

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

Dear Sir

With reference to the letter from **Russell Clarke** in September *SWM* regarding his reception of what he believed to be a maritime beacon on 587.5kHz. Having studied the information contained in his letter, I would strongly suspect the beacon he received was what is termed as a maritime mobile station.

These are drilling rigs, support vessels, accommodation platforms, etc., associated with oil exploration. Allowing for publication lead-in times, etc., I believe the beacon he was receiving was located in the Celtic Sea of the County Cork coast in an appropriate position of 51.21°N 07.55°W. Two drilling platforms were operating in this area establishing new wellheads in the Seven Heads Field.

The platforms (Sedco 404 and Sedco 711) were supported by a temporary accommodation platform, Stena Spey. Judging by the times he reported hearing this beacon, it looks likely it was activated during the helicopter transfer or personnel between the accommodation platform and drilling rigs.

The reason for the short duration of the transmissions is due to the fact that by law these platforms are classed as mobile and can only operate their NDB for the minimum time necessary for helicopter transfers. After which they must be switched off again to minimise possible interference to other services, namely broadcast stations, as these NDBs operate in this band on a secondary basis.

Russell Clarke also mentions receiving test transmissions from RTE Radio 1 on 252kHz and I can inform readers that this service will be fully operational with effect from 1 October using the former Atlantic 252 transmitter which RTE part owned. I can also advise that the planned long wave station, Musicman 279, to be located on a platform just to the north of the Isle of Man, expects to be operational by next summer according to information their resident engineer kindly supplied to me in the last week.

A number of NDBs operating close to that frequency are also to have frequency relocations, namely LA Lynham (282kHz) and CHT (277kHz).

Robert Connolly
N. Ireland

Dear Sir

I was extremely interested in your article in the September issue on the Woofferton transmitters. It was all the more interesting for me because as a driver on BR we passed through Woofferton quite often. The following may be of interest to you and your readers.

One particular type of multiple unit that was occasionally used on that route used to exhibit some very peculiar tendencies when in the Woofferton area. These units had a fault panel in the cab with perhaps a dozen or more indicator lights that would illuminate to indicate a fault. When passing through Woofferton it was not uncommon for all of these lights to become illuminated all at once, accompanied by a loss of power and the engines reverting to idling. All that could be done was to close the throttle and coast out of the area when miraculously everything would return to normal. If this occurred when stopping at Woofferton for signals then the unit was completely immobilised and had to be towed out of the area. This would sometimes take over an hour.

Of a more serious nature to my mind was the interference of safety equipment. All traction units are equipped with Audible Warning Systems (AWS), this gives the driver an audible indicator and a useful reminder of the aspect exhibited by signals ahead of him. The audible indication came in the form of a 'ping' or buzzer from a small speaker. At Woofferton again, on these particular units it was not uncommon to hear speech or music and off noises coming from this speaker. One wonders if the radiation in the Woofferton area could possibly give false indications.

What I have heard about the happenings in the signal box would be hearsay to repeat. I hope that this little bit of information, which would not normally be in the public domain, will be of interest to your readers.

P. Jones
Glamorgan

I am aware of problems with rail traffic passing high power broadcast stations such as Woofferton. I believe that simple r.f. decoupling was required to cure the seemingly odd occurrences. I can imagine that it was rather worrying the first time the problems occurred! - Ed.

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.

topqsl

Dear Sir

Thank you for a very interesting article on 'Wonderful Woofferton' in the September *SWM*. As an 'old' transmitter engineer, ex Skelton, Moorside Edge, Pontop Pike and Holme Moss *et al* it was a subject very close to my heart!

Dave Porter and his colleagues would seem to require the skills of computer engineers, as well as transmitter men these days, with everything being done remotely via software, but I wonder if they ever had to set off into the night on an old fixed wheel bike to 'biff', 'slew' or 'reverse' an aerial, equipped only with a heavy 'nife' battery around your waist and a miner's lamp for illumination! Such was the lot of the antenna switching engineers in the 1960s.

Transmitter engineers also had to have the skills of railway shunters when wavechanging senders, especially Marconi SWB18s. They had a mini railway track at the rear with coils and capacitors mounted on trucks which had to be shunted into correct positions to enable the change to be done within a fifteen minute period. The joys of 'roll ins' and 'roll overs' are probably unknown these days!

I suppose it's inevitable that computers are now used to predict propagation paths and provide the graphics. At Skelton in the 1960s we used an old RAF radar transmitter, an RA17 and an oscilloscope up to the actual antenna to do 'back scatter' measurements. The small signal reflected back from the target area was indicated on the 'scope and showed how far and how many 'hops' we achieved, it was very effective and in real-time too! The transmitter was affectionately known as the 'fish and chip machine' since its sloping front and size gave it a resemblance to the equipment in the local 'chippy'.

Digital technology was introduced in the 1980s although I used to tell visitors to Moorside Edge in the 1970s that all the equipment was 'digitally operated' and held up my index finger to show the actual digit!

Dear old Moorside Edge bit the dust in 1985 and new Marconi transmitters were installed, 50kW with only three little valves! Later, 'Talk Radio' and Virgin installed 50kW units with no valves at all - just lots of transistors! It'll never work we thought - but it did!

Best wishes to Dave Porter and his colleagues for the future, it's still an interesting job with new techniques and challenges around the corner. I just hope they've swapped the bikes for Range Rovers.

I look forward to future articles on 'Splendid' Skelton, 'Ravishing' Rampisham and maybe even 'Dear Departed' Daventry!

John White (ex Senior Maintenance Engineer
Moorside Edge)
W. Yorks

John, many thanks for your letter, we seem to have struck a chord with readers 'interests' by covering the Woofferton station. I'm due to visit 'Ravishing' Rampisham soon. - Ed.

KENWOOD

Special K

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7 T.SEL	8 SHIFT	9 MN-IN	MR	C
* L. OUT	0 REV	# MN-f	C.IN	D
* MHz	0 FINE	# ENT	CALL	

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TH-F7E

Available from all official Kenwood amateur radio dealers. For full details of our dealer network and all Kenwood amateur products contact your local dealer or Kenwood Electronics UK Ltd. 01923 655284.

E-mail: comms@kenwood-electronics.co.uk

Goodbye Analogue

After six months of dual standard transmission the German capital, Berlin and the surrounding state Brandenburg have switched off analogue and moved to digital television broadcasting.

Berlin is the first region in Europe to make the digital switch and was able to do so because of the high penetration of cable and satellite television, meaning that fewer households needed to invest in additional set-top boxes. The Berlin-Brandenburg Media Authority believes that of the 170,000 households that needed to purchase a box, 150,000 had done so by the deadline of 0800 on a Monday morning!

A total of 21 channels are currently available, including the German public and commercial channels and BBC World, in a continuation of its service previously available to analogue viewers. Saxony, Saxony-Anhalt, Thuringia and North-Rhine Westphalia are expected to commence digital transmissions over the next 12 months ahead of the final switch-off in 2010.

New Website Has Australia Covered

Radio station ABC Radio Australia has launched an exciting new website called *Understanding Australia* www.abc.net.au/ra/australia which aims to provide international students, visitors and backpackers with information about the continent and its people.

Understanding Australia contains information about how Australians live, work and spend their leisure time, how they view their institutions and civic responsibilities and how they see their place in the world.

"For more than 60 years, Radio Australia has been working to enhance understanding between Australia and the nations of our region," says Tony Hastings, Program Manager for ABC Radio Australia.

"*Understanding Australia* goes one step further by providing multimedia information about Australia and its people. We hope to extend the accessibility of this information even further by having the materials available in other languages in the near future".

Understanding Australia is produced by ABC Radio Australia's Education & Knowledge centre and features study notes from Monash University's National Centre for Australian Studies.



Annual Surplus Sale

Members of the **Bangor & District Amateur Radio Society** meet on the first Wednesday of every month in 'The Stables', Groomsport, from 2000. On **Wednesday 5 November 2003** they are holding their Annual Surplus Sale. This excellent event is always a popular way to make some space in your shack! There will



be a small admission charge but there is no charge for the tables.

The sale will be held at the **Crawfordsburn Country Club** which is **not the usual venue from 2000**. Visitors and new members are most welcome. More information from **Mike G4XSF** on **0284-277 2383** or visit the club's website at www.bdars.com

New Venue

The **Wythall Radio Club** who hold their annual radio and computer rally on the second Sunday of March every year will be changing venue next year to **Woodrush Sports Centre in Shawhurst Lane, Wythall**, approximately 2km from their normal Venue in Silver Street, Wythall.

The rally organiser, Martin Moyes said, "The main reason for changing venue is to provide on-site parking for visitors to the rally. The new venue also has two much larger halls doing away with the need for a marquee, which in the past has left us at the mercy of the weather and is far superior from the point of view of access for traders. I am convinced that both traders and visitors alike will see that the new venue is far better for all and is just round the corner from our old rally venue".

The Wythall Radio Club will be holding their Radio and Computer Rally on **Sunday 14 March 2004** so don't forget to mark the date in your diary! For more details telephone **0121-474 2077**, visit www.wrcrally.co.uk or E-mail: enquiries@wrcrally.co.uk



Tonight Matthew, I'm Going To Be...

If singing along to pop hits of the past is your thing, then Roadstar's innovative DVD/karaoke DVD2200K system which hooks up to your TV, allowing you to have an exciting entertainment system that's great value and saves space may be just what you need! Forget bulky karaoke boxes, this one is ultra stylish with a silver finish and being slim-line can blend in with most TV set-ups.

The DVD2200K comes with a remote control and two high quality microphones, which is great for getting friends and family singing to



Chaka Khan and Meatloaf! Microphone mixing and echo control balances sound, so even if you sound like a cat with a bad cough, you won't seem half as bad with this system!

The DVD2200K can play DVD, Karaoke DVD and CD+G formats as well as CD, CDR, CD-RW and MP3 plus comes with karaoke demo discs

packed with Karaoke tunes that'll have you tapping your toes and itching to outdo Lulu.

The Roadstar DVD2200K is £99.99 in Argos. The stockist enquiry number is **(0870) 8730084** or visit www.roadstar-uk.co.uk for more details about this and other products from Roadstar. Go on, upset the neighbours!

W&S @ Lowe Open Day

Open Days are always popular and the recent Open Day on 6 September 2003 at W&S@Lowe in Matlock was no exception. **Ian Brothwell G4EAN** went along and reports: "A marquee housed stands by Icom, Kenwood and Yaesu. In addition, there was a Bargains stand run by two senior people from the two companies - **Richard McLachlan** of Lowe Electronics and **Peter Waters** of **Waters and Stanton**.

The bargains on offer included amateur radio antennas, tools and even a hot-air balloon d.i.y. kit, sadly not a full size one! Could things get any better? Yes, I managed to find a Lowe SRX-50 portable radio at the bargain price of £50. I'd wanted a portable radio for some time and this one was at the right price and the right time. The marquee was also home to a superb buffet.

Moving onto the showroom itself, visitors had a range of radios to try out plus the usual extensive range of accessories on sale. This Open Day certainly was a good reason to spend a pleasant time talking and playing amateur radio and being fed into the bargain.

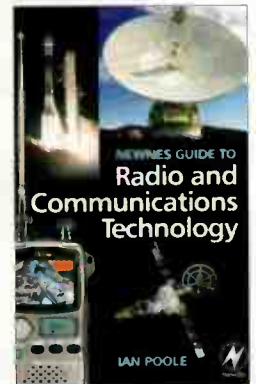
Moving away from the W&S@Lowe store, Matlock has a good range of shops, several tourist attractions including a very enjoyable steam railway, so plenty for the family to see while the amateur radio enthusiast enjoys his or her time at the Open Day. The Open Day is a regular booking in my diary and I am already looking forward to the 2004 Open Day!"



Some of the bargains on display at the recent W&S @ Lowe Open Day.

New Book

Now on sale is *Newnes Guide to Radio and Communications Technology* by Ian Poole. It provides readers with an up to the minute and user-friendly guide to the technology and applications of modern radio and communications equipment. Encompassing basic principles and the latest applications, each topic is covered in an easy to understand style making it an invaluable foundation read for college students and technicians seeking an update on the latest technology. It is equally useful for managers in the communications industry, sales staff or anyone seeking to update their knowledge of an exciting and rapidly expanding area of technology.



The book covers the key areas associated with radio, starting off with a brief overview and history, subsequent chapters detail the basic fundamentals of radio waves and their propagation. Several chapters are devoted to the elements of radio systems including receivers, transmitters and antennas. In addition, many important radio and wireless applications are explained in detail. These include broadcasting with information on a.m., f.m., stereo, RDS and DAB Digital Radio, satellites, Private Mobile Radio, cellular telecommunications and short-range data wireless data communications.

Newnes Guide to Radio and Communications Technology is published by Newnes in paperback, 320 pages, ISBN: 0750656123. It is available through outlets world-wide as well as directly from the publisher including through their website at www.newnespress.com It is also available through the author's website at www.radio-electronics.com priced at £16.99.

Winter Schedules

International short wave broadcasters start their winter frequency schedules on October 27. The **World DX Club** publishes a 12 page pamphlet listing the times and frequencies of English broadcasts in country order. Over 100 broadcasters are listed and the pamphlet is constantly updated so that the information is as up-to-date as possible when you order. A revised edition covering the new schedules will be issued in mid-November. To reserve a copy send 50p or two IRCs to **Arthur Ward, 17 Motspur Drive, Northampton NN2 6LY**.

Icom Support St. John at WSB

Icom (UK) Ltd. recently came to the aid of the Farningham Division of Kent St. John Ambulance at the European round of the World Superbikes Championship at Brands Hatch. The Farningham Division whose primary customer is Brands Hatch found itself with a shortfall of radios as another major event running in the country meant the normal supply of extra radios was not available. Icom UK agreed to loan the St. John 30 IC-F12 v.h.f. hand portable radios and 10 IC-F4GS u.h.f. hand portable radios to make up the deficit.

Jon Brooks, Marine and Avionics Dealer Manager Icom UK, who is himself a member of St. John Ambulance, arranged the donation.

He said, "Icom UK has a long history with the voluntary sector and is a chosen supplier for many countries for both St. John and the British Red Cross. So, when I found out that the Farningham brand was having problems, I approached our directors and they agreed to help".

Jon delivered the radios personally and also assisted in engineering the control room for the weekend. This involved installing the antennas

and setting up the radios in the control room. The control room equipment was also Icom, comprising IC-F510, IC-F1010, IC-F2010 commercial mobiles, IC-PCR100 PC controlled scanner as well as an Icom 17in TFT computer screen. The control radios were interfaced with the Fulcrum Voice Technologies - Hands free Dispatcher Unit (HDU) allowing the interconnection of radio, foot p.t.t. and headset.

Susan Page, County Staff Officer and Divisional Superintendent for Farningham Division said, "I would like to say a big thank you to Icom UK. The loan of these radios was a great help to the overall running of the St. John operations for this event.

Radio plays such a vital role in the job we do. Without it we could not provide the professional service expected of us. We have used Icom's radios for many years and find them both cost effective and easy to use. Both these parameters are paramount to a charity like the St. John".

Icom (UK) Ltd., can be reached at **Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742, E-mail: info@icomuk.co.uk or visit Icom's website at www.icomuk.co.uk**



New Commercial Manager

Martin Lynch & Sons have recently appointed **Laurence Knott** as their Commercial Manager. The newly created role has been created to ensure the commercial radio market is given the correct attention it deserves at ML&S.

Laurence Knott M0LSK, an active licensed radio amateur since 1985 and keen contester, previously held the position of



Marketing Manager for Cable & Wireless before joining the team at ML&S and brings nearly 20 years of sales and marketing experience gained in the corporate sector.

"I have been a customer at ML&S since the

day Martin opened his first shop in 1990 and I am delighted to now be part of the team. My new role is one that will allow me to use my sales and marketing skills gained in the corporate sector and channel them to the radio and communications market that is my passion. I am looking forward to the challenge that lies ahead", stated Laurence. Laurence will also oversee the company's marketing and customer service functions including the introduction of many new product lines.

Martin Lynch, Managing Director at ML&S said, "The commercial market is one which we have served for a number of years purely on a reactive basis. Now with Laurence on board, we will be able to offer more of a focused professional and pro-active approach. The appointment of Laurence further underlines our commitment to the commercial communications market".

More information about ML&S at www.hamradio.co.uk

November 2: The South Yorkshire Repeater Group presents its 13th Great Northern Hamfest at the Metrodome Leisure Complex, Queen Road, Bamsley, South Yorkshire. Doors open at 1000. The Leisure Complex is in the town centre, just five minutes walk from the train and bus stations - (follow the brown Metrodome signs from all directions). The venue is all on one level and has excellent disabled facilities. Features include all the usual trade stands, component and specialist interest groups with a large Bring & Buy. Admission is £2.50. More information from Hamfest Manager **Ernie Bailey G4LUE** on (01226) 716339 or mobile (07787) 546515.

November 9: The Bishop Auckland Radio Amateurs Club (BARAC) 2003 Rally will take place at Spennymoor Leisure Centre. This venue is ideally suited for both trader and disabled as it boasts good parking and access to a large ground floor hall. There will be the usual radio, computer and electronics, plus a Bring & Buy stall as well as catering and bar facilities. Morse tests will be available on demand. Doors open 1100 (1030 for disabled visitors) and admission is just £1, under 14s free of

charge with adult. Talk-in on S22. **Mark G0GFG** on (01388) 745353 or **Brian G7OCK** on (01388) 762678.

November 16: The Mayo Radio Experimenter's Network (MREN) welcome you to the 2003 Mayo Rally which will be held in the Belmont Hotel, Knock, County Mayo, with doors opening at 1100. Remembering the success of the first Mayo rally last year the club are already hard at work to ensure a repeat success and *PW* Editor Rob Mannion E15IW/G3XFD will again be visiting. Further details from **John McDonnell E16IR** (00 353 from UK) 094 60127

November 16: The Midland Amateur Radio Society are holding their 15th Radio & Computer Rally at King Edwards Grammar Camp Hill School, Vicarage Road, Kings Heath, Birmingham. There will be trade stands, local clubs, special interest groups, large free car park, refreshments and a Bring & Buy stall. Doors open 1000 and admission is just £1. Trader information from **Norman G8BHE** on 0121-422 9787, mobile: (07808) 078003, E-mail: ngutteridge@aol.com or **Peter G6DRN** on 0121-443 1189 or mobile (07710) 963123.

November 22: The Rochdale & DARS are holding a traditional radio rally at St. Vincent de Paul Catholic Church Hall, Caldershaw Road, off the A680 Edenfield Road, approx two miles west of Rochdale. Follow the orange arrows from M62, J20. Open from 1015/1030 admission just £1. There is ample free parking, plenty of trade stands, a Bring & Buy stall and a large chat/refreshment area. Talk-in on S22. **John G7OAI** on (01706) 376204 evenings or E-mail: radars@mbc.co.uk Full details on website www.mbc.co.uk/RADARS

November 23: The RadioSport Communication and Computer Show is to take place at the Stevenage Leisure Centre, Lytton Way, Stevenage, Herts. Doors open 1000 and admission is £3. There will be a Bring & Buy, talk-in, Morse tests, Morse assessments, catering, disabled facilities, special interest groups and car parking. More information from **RadioSport** on (01923) 893929 or visit www.radiosport.co.uk

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.

2004 RAFA Air Show

The date has now been confirmed for next year's **Royal Air Forces Association Air Show 2004**. The date for your diary is **Saturday 28 and Sunday 29 August 2004**, which is the Bank Holiday weekend. This date has been moved forward a week, so as not to clash with another local major event. Plans are already in progress to make next year's event larger than ever and there will be many new additions, both in the air and on the ground. So make it a date in your diary and don't miss out!

CLUB CORNER

Members of the **Great Lumley Amateur Radio & Electronics Society** meet at the Community Centre, Front Street, Great Lumley, Chester-le-Street, Co. Durham every Wednesday from 1930 to 2130. On **Wednesday 19**

November there is a talk on Radiocommunications in Developing Countries by Carolyn Crook B.E.Eng. More information from **Nancy Bone** on 0191-477 0036 (home) or (07990) 760920 (mobile), E-mail: nancybone2001@yahoo.co.uk or visit the society's website at www.glares.fsnet.co.uk

The **South Bristol Amateur Radio Club** meet at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol BS14 0LN, every Wednesday from 1930. **Wednesday 29 October** is an 'On Air' evening where club

members have free access to the club radio equipment to contact other amateurs. New M3 call signs can have their first try! More information from **Len Baker** on (01275) 834282 which is a 24hr answerphone.

Since its inception in 1936 as the Southgate & Finchley Group of the RSGB, the aim of the **Southgate Amateur Radio Club** has been to hold meetings, bringing together people interested in Amateur Radio or Electronics generally and to foster the spirit of Amateur Radio. Membership is open to anyone and the club has numerous and varied activities not being restricted to those holding transmitting licenses. Members range in age from youngsters to senior citizens. Visitors and new members are always most welcome. More details from Treasurer **Donald Berry G4DFB** on 0208-360 3614.

Club News

The **West Somerset ARC** meet on the first Tuesday of the month at the West Somerset Community College, Bircham Road, Alcombe, Minehead TA24 6AY in the Gibbs Block, room 7, at 1930 for 2000 start. Each month is something different, i.e. every January is a social evening and in June each year a Fox hunt is held around West Somerset. In July each year the club have a BBQ and then in September each year the club hold a Junk sale with the proceeds going to the Club Funds.

The West Somerset ARC also run Foundation, Intermediate and Full licence Courses and are also a Registered Exam Centre, so you can learn and take your exam. All classes and exams are held on demand, so you do **not** have to wait six months for the next course to start.

The club have a website at www.westsomerset-arc.co.uk where full details of activities, etc. are listed and they also run an E-mail update service, all you have to do is send an E-mail to info@westsomerset-arc.co.uk asking "please add to list" and you will be added, it's as simple as that! More information from **R.J. Bonar**, 6 Harepark, Allerford, Minehead, Somerset TA24 8HL, Tel: (01643) 863462.

LM&S

Long, Medium & Short Wave Bands

• **Brian Oddy** Three Corners, Merryfield Way, Storrington, West Sussex RH20 4NS

Quite a few of the international short wave broadcasters will implement their 'Winter' transmission schedules at midnight on October 26, so if you use 'LM&S' as a guide when searching the s.w. bands please bear in mind that some of the data herein may be 'no longer applicable' soon after this column is published on October 23.

Unlike the information in guide books, the data in 'LM&S' is based upon reports of actual reception which are compiled by listeners in the UK and overseas. Some are sent to me on a monthly basis and others arrive here from time to time - all are very welcome. If you would like to join the contributors, please post the details of your latest reception and/or any s.w. schedule changes which you have encountered, to reach me at the above address no later than the end of the first week of the month following reception. Please ensure that the times you quote are in

Universal Time Co-ordinated (UTC), which for most purposes is the same as Greenwich Mean Time (GMT).

From time to time the SWM offices in Broadstone receive via the Internet messages and reception reports addressed to me. They have to be printed out and then posted to me by the staff. When an originator has not included a full postal address and a reply is necessary it has to be sent to the SWM offices and then via Internet. The extra work for the SWM staff and resulting delays could be avoided if queries and contributions are sent to me by post to the above address.

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

Long Wave Reports.

Quite a dramatic improvement in propagation in this band was observed during August by **Eddie McKeown** in Newry, Co.Down. He says "I enjoy listening to Sasnovy on 279kHz and I am now able to hear it from around 2000 with ease. The rest of the band is also perking up, with autumnal conditions settling in". Eddie rated the transmission from Sasnovy as SINPO 35243 at 1943. Quite a few of the other occupants of this band were also noted in his extensive report - see chart.

Commenting upon l.w. reception in E.Bristol **Simon Hockenull** says "A fairly interesting month with conditions favouring a southerly direction." He found that reception from Azilal, Morocco on 207kHz was often quite good - on the 9th he logged their transmission as SINPO 35544 at 0405 during what sounded like a morning call to prayer. In contrast, signals from the east were often very poor but on the 26th the transmission from Sasnovy, Belarus on 279kHz peaked 24443 at 2124. Later, he listened to their National Anthem before they signed off at 2200. Reception from the north was not much better. The Rikisutvarpid (RUV) outlets at Gufuskalar, W.Iceland on 189kHz (300kW) and Eidar, E.Iceland on 207kHz (100kW) were heard only on the 30th at approx 2343.

Further test transmissions from the Clarkestown, Eire long wave transmitter on 252kHz were heard on August 20 & 21 by Bernard Curtis in Stalbridge. He says "RTE-1 was relayed for a couple of days and then

they closed down. I have seen it reported that they will officially launch RTE-1 on 252 on October 1st, primarily for Irish listeners in the UK".

A test transmission from RTE-1 on 252kHz was also picked up by **Sheila Hughes** in Morden at 1010 on the 26th, which she rated SINPO 44444. Sheila mentioned in her report that she would certainly sometimes be a daytime listener if the reception was like it was during that morning. The programme, part of a series entitled *Just The Job*, was about a Vets' surgery and made very interesting listening.

Medium Wave Reports

Some listeners searched the band after dark for the sky waves from m.w. stations in the Middle East, N.Africa, Europe and Scandinavia. An extensive log was compiled by **Ernie Strong** in Ramsey, Cambs during an all night listening session - see chart. However, he found the band very noisy.

In W.London **Bruce Watt** has been hearing the Netherlands station Radio 10 on 1395kHz. During one evening the transmission suddenly stopped. When he tried to telephone the number given during the broadcast it was not recognised. Their broadcasts were also picked up on 1395kHz by **Harry Richards** in Barton-on-Humber.

During daylight, some listeners searched the band for the ground waves from distant local radio stations. A quite extensive log was compiled during the early morning by **Richard Reynolds** in Guildford - see chart. Commenting upon this aspect of our hobby **Francis Hearne** (N.Bristol) says "This is not as exciting as in the past, with such stations as Classic Gold broadcasting generally the same programmes regardless of where the listening audience is. A far cry from the original concept of independent local radio started nearly 30 years ago. Similarly with BBC local radio becoming more regionalised during the evening".

Short Wave Reports

In the August 2003 edition of SWM I mentioned in LM&S that the daily broadcasts in the 25MHz (11m) band from Radio France International (RFI) on 25.820 (Fr, Eng to E.Africa, Indian Ocean 0900-1300) had become inaudible from May 1. The propagation conditions at that time made it difficult to be sure if they had ceased or were simply buried in the noise. During subsequent

Listeners:-

- (A) Bernard Curtis, Stalbridge.
- (B) Simon Hockenull, E.Bristol.
- (C) Sheila Hughes, Morden.
- (D) Eddie McKeown, Newry.
- (E) Ernie Strong, Ramsey, Cambs.
- (F) Thomas Williams, Truro.
- (X) Bruce Watt, W.London.

Long Wave Chart

kHz	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	E*
153	Donabach DLF	Germany	500	B,C*,D,E
162	Allouis	France	2000	C*,D,E,F*
171	Nador Medi-1	Morocco	2000	B*,E
171	B'shakovo etc	Russia	1200	B,C*,D,E*,F*
177	Oranienburg	Germany	500	B*,C*,D,E*
183	SaarLouis	Germany	2000	C*,D,E,F*
189	Gufuskalar	W.Iceland	150	B*,D*,E*
198	Droitwich BBC	UK	500	C*,D,E
207	Munich DLF	Germany	500	B*,C*,D,E*,F*
207	Eidar	E.Iceland	100	B*,D*,E*
207	Azilal	Morocco	800	B*,E*
216	Roumoules RMC	S.France	1400	B,D,E,F*
225	Polskie R-1	Poland	?	B*,C*,D,E*
225	Van TRT-1	Turkey	600	E*
234	Beidweiler	Luxembourg	2000	D,E,F*
243	Kalundborg	Denmark	300	B,C*,E,F*
252	Tipaza	Algeria	1500	B*,C*,D*,E*,F*
252	RTE Test Txms	Eire	500	A,C,E*,X
261	Burgi(R.Ropa)	Germany	85	E
270	Topolna	Czech Rep.	1500	B*,C*,D,E*,F*
279	Sasnovy	Belarus	500	B*,C*,D*,E*

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

- DXers:-
 (A) Bernard Curtis, Stalbridge.
 (B) Ian Evans, Ebbw Vale, Gwent.
 (C) Stan Evans, Herstonmouceux.
 (D) David Hall, Morpeth.
 (E) Simon Hockenhuil, E.Bristol.
 (F) Clare Pinder, Appleby.
 (G) Vic Prier, Seaton.
 (H) Richard Reynolds, Guildford.

Tropical Bands Chart					MHz	Station	Country	UTC	DXer
3.200	TWR Manzini	Swaziland	1924	H	4.860	AIR Delhi	India	1800	A,H
3.255	BBC via Meyerton	S.Africa	0320	D,G,H	4.885	R.Clube do Para	Brazil	2150	D,G,H
3.279	La Voz del Napo	Ecuador	0323	D	4.890	RFI Paris	via Gabon	0453	H
3.300	R.Cultural	Guatemala	0325	D,H	4.895	AIR Kurseong	India	2200	G
3.320	SABC (RSG)	Meyerton,S.Africa	0137	D,G,H	4.905	Xizang-Tb, Lhasa	China	2150	G,H
3.350	R.Ext.Espana	Costa Rica	0416	H	4.910	AIR Jaipur	India	2100	G
3.915	BBC via Kranji	Singapore	2140	G,H	4.910	R.Zambia, Lusaka	Zambia	0310	D,H
3.955	R.Korea via Skelton	England	2100	C,F	4.915	R.Anhanguera	Brazil	0455	H
3.955	R.Taipei via Skelton	England	1801	B,C,F	4.915	R.Difusora, Macapa	Brazil	0210	D
3.955	R.Budapest	Hungary	1920	C	4.915	GBC-1, Accra	Ghana	2013	G,H
3.965	RFI Paris	France	2218	E	4.920	Xizang-Tb, Lhasa	China	2211	H
3.975	R.Budapest	Hungary	1900	E	4.920	R.Quito, Quito	Ecuador	0334	D
3.985	VOIRI	Iran	2210	G	4.920	AIR Chennai	India	2130	G
3.985	Nexus, Milan	Italy	2210	G	4.935	R.Capixaba, Vitoria	Brazil	0456	H
3.995	DW via Julich?	Germany	1902	E,G	4.950	VOA via Sao Tome	Sao Tome	2016	B,H
4.005	Vatican R.	Italy	2130	G	4.960	VOA via Sao Tome	Sao Tome	0506	H
4.770	FRCN Kaduna	Nigeria	2137	G,H	4.965	Christian Voice	Zambia	2018	G,H
4.775	TWR Manzini	Swaziland	0447	H	4.975	R.Uganda, Kampala	Uganda	2020	H
4.800	CPBS 2 Beijing	China	2150	G,H	4.985	R.Brazi Central	Brazil	0340	D,H
4.820	R.Botswana, Gaborone	Botswana	2130	D,G	5.025	R.Parakou	Benin	0458	H
4.820	Xizang, Lhasa	Tibet	2140	H	5.025	R.Rebelde, Bauta	Cuba	0215	D,H
4.835	RTM Bamako	Mali	2145	G,H	5.025	R.Uganda, Kampala	Uganda	2210	G
4.845	ORTM Nouakchott	Mauritania	2210	G,H	5.030	R.Burkina	Burkina Faso	2122	G,H
					5.047	R.Togo, Lome	Togo	2215	G,H

checks here I could not detect their carrier, so I came to the conclusion the RFI service planning engineers had probably decided to withdraw the transmissions from their broadcast schedule for the remainder of the summer period. However, the latest report from **Thomas Williams** in Truro indicates that he heard them on August 3 & 10 and logged them respectively as SINPO 21111 at 1010 and 22222 at 1002. RFI was also heard here at 1130 on September 7 but the signal was very weak, fading into the noise. Reception during the next morning proved to be slightly better - at 1100 their transmission was peaking 25232.

Reception in the **21MHz (13m)** band, especially over long distances, proved to be very unreliable during August. R.Australia's broadcast to Asia via Shepparton on **21.820** (Eng 0900-1400) was inaudible in the UK during most mornings but some improvement was evident towards the end of the month. At 1235 on the 31st it was rated SINPO 33333 in Truro.

Some of the broadcasts in this band from other areas came from Swiss R. Int (SRI) via Sottens **21.750** (Fr, Ger, It, Eng to Near East, Africa 0600-0800), rated 45434 at 0703 by

Ian Evans in Ebbw Vale; **BSKSA Riyadh 21.705** (Ar to Eur 0600-1500) 53544 at 0730 by **Vic Prier** in Seaton; R.Thailand via Udon Thani **21.795** (Eng to Eur 0530-0600) 34333 at 0830 in Morden; Swiss R. Int (SRI) via Sottens **21.770** (Eng, It, Ger, Fr to Near East, Africa 0830-1030) 24321 at 0901 by **Rhoderick Illman** in Oxted; BBC via Thailand **21.660** (Eng to E.Asia 0900-1030) 45333 at 1025 in Stalbridge; **BSKSA Riyadh 21.505** (Ar to N.Africa 0600-1500) 34233 at 1111 by **Peter Pollard** in Rugby; R.Portugal Int, S.Gabriel **21.830** (Port to W.Africa 0700-1655, Sat/Sun) 24112 at 1123 in Newry; BBC via Ascension Is **21.470** (Eng to S.Africa 1300-1900) 24422 at 1300 by **Gerald Guest** in Dudley; BBC via Meyerton, S.Africa **21.490** (Eng to Africa 1400-?) 44444 at 1405 by **David Hall** in Morpeth; Channel Africa via Meyerton **21.760** (Eng to Africa 1300-1455, Sat/Sun) 33333 at 1405 by **Stan Evans** in Herstonmouceux; BBC via Cyprus **21.660** (Eng to E.Africa 1400-1700) 35533 at 1501 in E.Bristol.

The occupants of the narrow **18MHz (15m)** band include R.Denmark via R.Norway on **18.950** (Dan to S.America? 1000-1030) rated 22222 at 1014 in Truro; R.Norway Int via Sveio **18.950** (Norw to N/C.America 1100-1130) 35423 at 1102 in E.Bristol; Voice of America (VOA) via Sri Lanka **19.010** (Dari to Afghanistan 1100?-1230?) 35243 at 1111 in Newry; Christian Science Herald via WSHB Cypress Creek **18.910** (Fr, Eng to E/S.Africa 1600?-2200?) 44333 at 1725 in Stalbridge; Family R, WYFR via Okeechobee FL, USA **18.980** (Eng to Eur 1800-2146) 44444 at 2054 in Oxted; Family R, WYFR via Okeechobee FL, USA **18.930** (Eng to Eur, Africa 1800?-2200) 44333 at 2105 in Morden.

- Listeners:-
 (A) Francis Heame, N.Bristol.
 (B) Simon Hockenhuil, E.Bristol.
 (C) Sheila Hughes, Morden.
 (D) Rhoderick Illman, Oxted.
 (E) Richard Reynolds, Guildford.
 (F) Ernie Strong, Ramsey, Cambs.

Local Radio Chart					kHz	Station	ILR	e.m.r.p	Listener	kHz	Station	ILR	e.m.r.p	Listener
kHz	Station	ILR	e.m.r.p	Listener	BBC	(kW)				BBC	(kW)			
558	Spectrum, London	I	0.80	B,D,F	972	Asian Club, Southall	I	1.00	B,D,F	1359	Breeze, Chelmsford	I	0.28	D,E,F
603	C.G.Litt'brne	I	0.10	C*,E,F	990	R.Devon, E.Devon	B	1.00	A,B,F*	1359	Capital G, Cardiff	I	0.20	A
630	R.Bedfordshire(3CR)	B	0.20	B,C*,D,E,F	990	Cl.G.Wolverhampton	I	0.09	F	1368	R.Lincolnshire	B	2.00	F
657	R.Clwyd	B	2.00	E	999	C.Gold GEM Nott'ham	I	0.25	F	1368	Southern Counties R	B	0.50	D
666	Cl.Gold 666, Exeter	I	0.34	B,E,F	999	R.Solent	B	1.00	B,D,E	1368	Wiltshire Sound	B	0.10	A
666	R.York	B	0.80	F	999	Valley R. Aberdare	I	0.300	B	1413	R.Gloucester via ?	B	?	A
729	BBC Essex	B	0.20	C*,D,E,F	1017	Cl.G.WABC, Sh'rshire	I	0.70	B	1413	R.Gloucester, Botton	B	0.50	D
738	Hereford/Worcester	B	0.037	A,B,E,F	1026	R.Cambridgeshire	B	0.50	C*,D,E,F	1413	Premier via ?	I	0.50	D,F*
756	The Magic 756,Povvys	I	0.63	B,F	1026	R.Jersey	B	1.00	B	1431	Breeze, Southend	I	0.35	B*
765	BBC Essex	B	0.50	B,C*,D,E,F	1035	Mean Country 1035	I	1.00	D,F	1431	Cl.Gold, Reading	I	0.14	B*,D,E,F
774	R.Kent	B	0.70	D,E,F	1116	R.Derby	B	1.20	F	1449	Asian Net, Gunthorpe	B	0.15	F
774	Cl.Gold 774, Glos	I	0.14	A,E	1116	R.Guernsey	B	0.50	B,E	1458	R.Newcastle	B	2.00	F*
792	Cl.Gold 792, Bedford	I	0.27	C*,D,E,F	1116	Valley R. Ebbw Vale	I	0.50	B	1458	Sunrise, London	I	50.00	D,F
801	R.Devon	B	2.00	B,E	1152	Cap.G 1152, Birm'ham	I	3.00	A,B,F	1458	Asian Net, Langley	B	5.00	B,F
828	Cl.Gold 828, Luton	I	0.20	B,D,E,F	1152	Cl.G Amber, Norwich	I	0.83	F	1485	Cl.Gold, Newbury	I	1.00	B,E
828	Cl.G 828 Bournemouth	I	0.27	B	1152	LBC 1152, London	I	23.50	D,F	1485	R.HumberSide (Hull)	B	1.00	F
837	Asian Net Leicester	B	0.45	B,D,E,F	1161	R.Bedfordshire(3CR)	B	0.10	C*,F	1485	Southern Counties R	B	1.00	E
855	R.Devon	B	1.00	A,F*	1161	Southern Counties R	B	1.00	D,E	1503	R.Stoke-on-Trent	B	1.00	B*,E,F
855	R.Norfolk, Postwick	B	1.50	D,E,F	1170	Cl.G Amber, Ipswich	I	0.28	F	1521	Cl.Gold, Reigate	I	0.64	D
855	Sunshine 855,Ludlow	I	0.15	A,B,F	1170	Capital G,Portsmouth	I	0.50	E	1530	R.Essex, Southend	B	0.15	F
873	R.Norfolk, W.Lynn	B	0.30	F,F	1170	Swansea Snd,Swansea	I	0.58	A,B	1530	Cl.Gold, Worcester	I	0.52	B
936	Brunel CG, W.Wilts	I	0.18	A,C*,E	1242	Capital G, Maidstone	I	0.32	C*,D,E	1548	Capital G, London	I	97.50	D,F
945	Capital G, Bexhill	I	0.75	D,E	1251	C.G Amber, Bury StEd	I	0.76	F	1557	Cl.Gold 1557, N.hant	I	0.76	F
954	Cl.Gold 954 via ?	I	?	A,F	1260	SabrasSnd,Leicester	I	0.29	F	1566	CountySnd,Guildford	I	0.50	B*,D,F
954	Cl.Gold 954, Torquay	I	0.32	B	1296	Radio XL, Birmingham	I	5.00	B,E,F	1566	SomersetSnd, Taunton	B	0.63	A,B,F*
954	Cl.Gold 954, H'ford	I	0.16	B,E	1305	Premier via ?	I	5.00	D,F	1584	London Turkish R	I	0.20	D
963	Asian Sd, E.Lancs	I	0.80	B	1305	Capital G, Newport	I	0.20	A	1584	H/Worcs, Woofferton	B	0.50	B
963	Asian Club, Hackney	I	1.00	D,F	1323	Capital G, Southwick	I	0.50	B*,D,E,F*	1602	R.Kent	B	0.25	D,F
					1332	Premier, Battersea	I	1.00	D					
					1332	Cl.Gold 1332, Pt'bo	I	0.60	F					
					1332	Wiltshire Sound	B	0.30	A					

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

1005 in Morpeth & SIO 333 at 2234 in N.Bristol; R.Bulgaria, Plovdiv 15.700 (Fr, Eng to Eur 1100-1200) 33233 at 1100 in Rugby; R.Ukraine via Kharkov 15.415 (Eng to Eur 1100-1200) 45434 at 1121 in E.Bristol; BBC via Rampisham, UK 15.565 (Eng to C/E.Eur 0700-1900) 34434 at 1400 in Dudley; VOA via Thailand 15.550 (Eng to Far East, Asia 1500-1600) 33333 at 1500 in Morden; R.Japan via Moyabi, Gabon 15.355 (Eng, Jap to S.Africa 1700-1900) 44444 at 1700 by Clare Pinder in Appleby; Voice of Indonesia, Jakarta 15.150 (Eng to Eur, Africa 2000-2100) 45343 at 2005 in Newry.

In the 13MHz (22m) band AFRTS via Keflavik, Iceland 13.855 (Eng? [u.s.b.] to ?) was 44444 at 0500 in Morpeth; Vatican R. Italy 13.765 (Eng to Africa 0630-0700) 33333 at 0630 in Morden; R.Bulgaria, Plovdiv 13.600 (Eng to Eur 0630-0700) 55544 at 0635 in Herstmonceux; R.Ext, Espana (REE) 13.720 (Sp to Eur 0700-1300) 44444 at 0950 in Truro; R.Kuwait 13.620 (Ar to Eur, N.America 0930-1600) 43434 at 1321 in Ebbw Vale; UAE R.Dubai 13.675 (Ar, Eng to Eur 0600-2045) 44434 at 1820 in Seaton; Voice of Vietnam, Hanoi 13.740 (Eng to C.Asia, Eur 1800-1830) 44344 at 1822 in Rugby; BBC via Rampisham, UK 13.745 (Russ to E.Eur 1700-2030) 54555 at 1835 in Stalbridge; Swiss R.Int (SRI) via Julich, Germany 13.645 (It, Ar, Eng, Ger, Fr to Nr.East, Africa 1830-2130) 32222 at 1930 in Appleby; R.Damascus, Syria 13.610 (Eng to Eur 2005-2100) 44444 at 2007 in Newry; R.Australia via Darwin 13.620 (Eng to SE.Asia 2200-0000) 35433 at 2205 in E.Bristol.

R.New Zealand's early morning broadcasts in the 11MHz (25m) band to Pacific, Mid-West USA & Europe have been reaching the UK. Their 100kW transmission on 11.820 (Eng 0506-0705) was rated 34232 at 0542 in Newry & 33233 at 0600 in Appleby. R.Australia's morning broadcast to Asia via Shepparton on 11.880 (Eng 0900-1330) was logged as 23432 at 0952 in E.Bristol. Later, while beaming to E/SE.Asia from Shepparton on 11.660 (Eng 1330-1700) their transmission peaked 44444 at 1430 in Morpeth.

Also mentioned in the reports were the BBC via Ascension Is 11.765 (Eng to W/C.Africa 0700-0800), rated 45333 at 0710 in Ebbw Vale; R.Prague, Czech Rep. 11.600 (Sp to SW.Eur 0730-0757) 44444 at 0741 in Oxted; R.Finland via Pori 11.755 (Fin to Eur, Russia, W.Africa 0700-?) 55555 at 0830 in Seaton; R.Netherlands via Petropavlovsk 12.065 (Eng to Asia, Far East, Pacific 0930-1125) 24121 at 0932 in Newry; BBC via Woofferton, UK 12.095 (Eng to Eur 0600-1700) 43343 at 1000 in Dudley; R.Jordan via Al Karanah 11.690 (Eng to W.Eur 1100-1530) 55544 at 1410 in Herstmonceux; WWCR Nashville, USA 12.160 (Eng to N.America, Eur 1200-2300?) 44333 at 1515 in Morden; All India R. (AIR) via Bangalore 11.620 (Eng to Eur 1745-1945) 54445 at 1810 in Stalbridge; R.Kuwait via Kabd 11.990 (Eng to Eur, N.America 1800-2100) 44334 at 1815 in Rugby; Voice of the Mediterranean via Russia 12.060 (Eng to Eur, N.Africa 1900-2000) 33333 at 1940 in Truro; R.Prague, Czech.Rep.

11.600 (Eng to N.America 2230-2257) SIO 333 at 2231 in N.Bristol.

Good reception over long distances has been evident in the 9MHz (31m) band. R.New Zealand's transmission to Pacific areas on 9.885 (Eng 0706-1305) was rated 44333 at 1300 in Stalbridge. Radio Australia's broadcasts have been reaching the UK on two frequencies from Shepparton: 9.475 (Eng to Asia 1330-1858), rated 23432 at 1825 in E.Bristol; 9.500 (Eng to Asia 1900-2130) 24442 at 1918 in E.Bristol.

Some of the many other broadcasts which reach our shores in this band come from WTJC Newport NC, USA 9.370 (Eng to N.America 24hrs), rated 44444 at 0420 in Morpeth & 34333 at 0540 in Morden; R.Prague, Czech Rep. 9.880 (Eng to NW.Eur 0700-0727) 43444 at 0715 in Seaton; R.Slovakia Int via Rimavska Sobota 9.440 (Eng to Australasia 0700-0730) 44444 at 0722 in Oxted; R.Vilnius, Lithuania 9.710 (Eng to W.Eur 0830-0900) 54544 at 0835 in Herstmonceux; R.Mediterranean Int [Medi-1], Morocco 9.575 (Ar, Fr to N.Africa, S.Eur 0500-0400) 55445 at 0851 in Ebbw Vale; R.Netherlands via Bonaire, Ned.Antilles 9.785 (Eng to Asia, Far East, Pacific 0930-1125) 44444 at 0945 in Truro; R.Netherlands via Wertachtal, Germany 9.860 (Eng to Eur 1030-1225) 34433 at 1140 in Rugby; R.Polonia, Warsaw 9.525 (Eng to W.Eur 1200-1255) SIO 333 at 1218 in N.Bristol; R.Vlaanderen Int (Belgium) via Krasnodar 9.925 (Eng to Eur 1730-1800) 33323 at 1730 in Appleby; Voice of Armenia 9.960 (Eng to Eur 1940-2000) 45344 at 1940 in Newry; R.Tashkent, Uzbekistan 9.545 (Eng to M.East, Eur 2130-2200) 44433 at 2130 in Dudley.

Noted in the 7MHz (41m) band were WRMI Miami FL, USA 7.385 (Eng to N.America 2300?-0900?), rated 33333 at 0433 in Morpeth; Family R. (WYFR) via Okeechobee FL, USA 7.355 (Eng to Eur 0600-0750) 45344 at 0606 in Newry; R.Japan via Woofferton, UK 7.230 (Eng to Eur 0500-0700) 55555 at 0650 in Herstmonceux; R.For Peace Int, Costa Rica 7.445 (Eng to N.America, Eur 2200-0800) 34332 at 0730 in Oxted; Sudwestfunk via Rohrdorf 7.265 (Ger to Eur 24hrs) 45444 at 0806 in Ebbw Vale & 15431 at 1332 in E.Bristol; R.Polonia (Polish R), Warsaw 7.270 (Eng to Eur 1530-1555) 44333 at 1530 in Morden; R.Polonia (Polish R), Warsaw 7.285 (Eng to Eur 1700-1800) 43333 at 1723 in Ebbw Vale; All India R. (AIR) via Bangalore 7.410 (Hind, Eng to Eur 1745-2230) 44333 at 1826 in Rugby; R.Slovakia Int. 7.345 (Eng to Eur 1830-1900) 55555 at 1830 in Seaton; BBC via Skelton?, UK 7.325 (Russ to Russia 1800-2000?) 22222 at 1840 in Stalbridge; R.Netherlands via Madagascar 7.120 (Eng to Africa 1730-2025) SIO 444 at 2004 in N.Bristol; R.Thailand, Udon Thani 7.155 (Eng to N.Eur 1900-2000) 33433 at 1905 in E.Bristol; Vatican R, Italy 7.250 (Eng to Eur 1950-2010) 44344 at 1959 in Newry.

Many of the broadcasts in the 6MHz (49m) band are intended for listeners in Europe. Some come from R.Vlaanderen Int (Belgium) via Germany 5.985 (Eng 0700-0730), rated 55544 at 0720 in Herstmonceux;

TWR Monaco via Germany 6.045 (Eng 0700-0815) 45434 at 0740 in Ebbw Vale; Deutsch Welle (DW) via Julich 6.140 (Eng 0600-1059) 55445 at 0810 in Stalbridge; R.Nederlands via Julich, Germany 6.045 (Eng 1030-1225) 44444 at 1101 in Rugby; R.Slovakia Int, Bratislava 5.920 (Eng 1830-1900) 44444 at 1830 in Dudley; R.Yugoslavia, Serbia 6.100 (Eng? 1830-1900) 44533 at 1837 in E.Bristol; R.Slovakia Int, Bratislava 5.920 (Eng 1830-1900) SIO 333 at 1847 in N.Bristol; Bayerischer Rundfunk, Germany 6.085 (Ger 24hrs) 55555 at 1945 in Seaton; RAI Rome, Italy 6.185 (Eng 2025-2045) 44444 at 2030 in Appleby; R.Canada Int via Horby, Sweden 5.850 (Eng 2000-2130) 45444 at 2057 in Ebbw Vale; R.Budapest, Hungary 6.025 (Eng 2100-2130) 44444 at 2100 in Morden; R.Japan via Skelton. UK 6.055 (Eng 2100-2200) 44344 at 2123 in Newry; R.Bulgaria, Sofia 5.800 (Eng 2100-2200) 44444 at 2130 in Truro.

A number of broadcasts intended for other areas may also be received here. Those mentioned in the reports came from the BBC via Antigua, W.Indies 5.975 (Eng to C & S.America 2100-0500), rated 35522 at 0411 in E.Bristol; R.Havana, Cuba 6.000 (Eng to N.America 0100-0500) 44444 at 0437 in Morpeth; WEWN Birmingham, USA 5.825 (Eng to N/C.America 0000-1000) 34222 at 0708 in Newry; WHRI South Bend, USA 5.745 (Eng to N.America 2000-1000) 34332 at 0805 in Stalbridge.

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

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

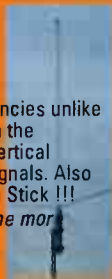
Our Price £29.95 PLUS £6.00 P+P.

SUPERSCAN STICK II

Freq: 0-2000 Mhz Length: 1500mm Gain: 3.0dB

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) ★



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 up to 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 up to a 2" mast. (Experience increase range and up to 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 up to 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 placed in the loft with surprising results !!! ★



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 & Military Gain: 3.0/6.0 dB

Length: 1000mm. **Our Price £39.95** PLUS £6.00 P+P.



AR-50

Freq: Civil & Military 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.



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5" SWAGED POLES

Heavy Duty Ali (1.2mm wall)

SINGLE 1 1/4"£7.00

SET OF FOUR 1 1/4"£24.95

SINGLE 1 1/2"£10.00

SET OF FOUR 1 1/2"£34.95

SINGLE 2"£15.00

SET OF FOUR 2"£49.95

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PL259/9£0.75 each

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PL259/7 for mini 8£1.00 each

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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)		

BE DEDICATED

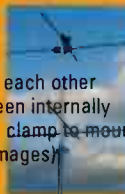
TURNSTILE 137

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 Antennas ★



BEAM ANTENNAS

MEP

Freq: 100-1300 TX&RX

Gain: 11-13 dB

Length: 1400mm

Con: N-Type

Our Price £99.95

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.

MPE

Freq: 50-1300 Mhz

Gain: 10-12 dB

Length: 3000mm

Con: N-Type

Our Price £169.95

plus £6.00 P&P.



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Bandscan

America

● **Gerry Dexter** do SWM Editorial Offices, Arrowsmith Court, Broadstone, Dorset BH18 8PW

Summer in North America this year did not bring with it very much in the way of activity or excitement on the short wave broadcast front. The higher bands were largely 'dead' for much of each 24-hour period.

It was not uncommon to tune through great swaths of frequencies and not hear a single signal! Many nights I cruised 60m and did not find even one audible signal between 4.750 and WWV on 5.000! It often seemed that short wave had shrunk to just 49, 41 and 31m from an hour or two after sunrise straight on into the evening! Hopefully we have now passed through the worst of these dreadful conditions and can look forward to significant improvements soon!

The summer did bring with it the return of one old friend - Mexico's Radio Universidad, XEXQ, from San Luis Potosi on 6.045MHz. The schedule appears to be largely confined to the local daytime, although there have been one or two reports of reception around 0300. Most logs, though, have been around 1200 when the station signs on.

Radio Insurgente, a Mexican clandestine station operated by Ejercito Zapatista de Liberacion Nacional (EZLN) - the Zapatista guerrilla group - is said to have operated on 5.800 late this past summer. The wattage of this station can be assumed to be extremely low and the transmissions are very likely subject to jamming by the Mexican government.

Even though this station is in a country right 'next door' to the USA, I am aware of only a couple of very weak receptions in the USA. Someone in South America has also reported them (around 0300). It's uncertain whether the transmissions are meant to be permanent or were just an experiment.

There's also word that Radio Tapachula in the town of the same name in Chiapas state plans to begin broadcasts later this year on 6.120 using the call XETSOC. Apparently, they were active on this frequency some sixty years ago. Talk about a comeback!

Change Of Frequency

The US Armed Forces Radio outlet in Puerto Rico has changed frequency, moving from 6.4585 to 7.507MHz upper sideband, which is subject to interference at times from US religious broadcaster KTBN on 7.505MHz. The AFRTS outlet at Key West, Florida, has also changed dial positions - it now uses 5.4465 and 12.135MHz.

By the way, the much-sought Diego Garcia outlet appears to be active, despite the increasing doubts of North American DXers, thanks to an inability to hear anything at all from this one. A DXer in the Philippines recently reported hearing it on its 12.579MHz frequency.

A good portion of the programming on Radio Miami International (WRMI) is now made up of programmes brokered by an outfit calling

itself the International Broadcasting Corporation. Their placed programming airs UTC Mondays from 0300 to 0900 on 7.385, Saturdays 1200 - 2200 on 15.725 and Sundays 0300 - 0900 on 7.385 and 1400 to 2000 on 15.725MHz.

I recently heard WRMI carrying Voice of America programming during the above Saturday block, but this may have been some sort of quick fix fill-in. Also, the Radio Prague rebroadcasts on WRMI have been discontinued due to financial concerns at the Czech station.

Something called the Office of Transition Initiatives (part of the American USAID programme) has begun broadcasts to the Sudan under the name of the Sudan Radio Service. These broadcasts air Mondays through Fridays from 1600 to 1700 on 17.630, switching to 17.660 from 1700 to 1800 in English, Arabic and a couple of tribal languages. The programmes are produced in Washington at the US government's Education Development Centre and are transmitted from the UK's Woofferton site.

Down Argentine way, 5.400 is a newly discovered frequency being employed for communications by the Argentine military. When not otherwise occupied, they sometimes relay such Buenos Aires broadcasters as 'La Red', Radio 101 (f.m.), Radio Continental and Radio Diaz (and perhaps others). There's no specific schedule for these, which means you'll need to make regular and frequent checks and hope to get lucky.

A new one from Bolivia is Radio Tacana on 4.7815 (announcing 4.780) and broadcasting from Tumupasa in La Paz Department. It's on the air from 1000 to 1700 and again from 2100 to 2200.

New Station Activity

There's always new station activity in Peru. In Peru, Radio Naylamp, Lambayeque, has been reactivated and is using 4.335 from 0930 to 1300 and again from 2200 to 0330. Also back again is Radio San Miguel from San Miguel de Cajamarca on 5.500.

Another new one is Radio La Amistad on 5.1765, as is Radio Bethel on 5.940 variable. Radio Victoria, Lima, is being heard widely and well mornings and evenings on 6.020. In Brazil, a new addition is Radio Guarujá Paulista, using both 3.235 and 5.045 from Sao Paulo.

Radio Nacional/Radiobras - always well

heard on 6.180 and 11.780 has also been using 9.665MHz recently. This seems to be part of their new service to Africa, scheduled from 1900 to 2100 and 0500 to 0800 (though it may end earlier). Now if we could just get them to reinstate their one-hour English segment for North America, but 'English to North America' is decidedly not in vogue these days! One of the more easily logged Chilean stations no longer qualifies as such. Radio Santa Maria, Coyhaique (6.030) has gone off the air due to money difficulties. Let's hope that it doesn't prove to be permanent!

Crisis Time

Summer always seems to bring with it some sort of craziness or other and on the short wave scene Radio For Peace International (RFPI) and the University For Peace filled the bill this year. The

University locked RFPI staffers out of their facility (apparently a few were locked in and were able to continue broadcasting) and employed armed guards to guard the property. It was all thanks to a dispute concerning an overdue bill for computer and telephone equipment, which the university claimed the station owed.

For the first several days of the crisis, the station devoted its airtime to stating its case and appealing for support letters. RFPI got a brief reprieve and negotiations are in progress as this is being written. A decision on what will happen to RFPI and its Costa Rica facility should be known - if not by the time you read this, then very soon.

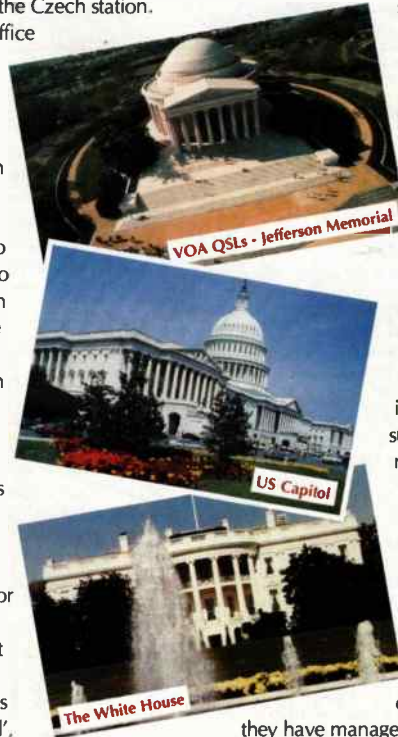
Despite Cuba's difficult economic situation

they have managed three new 100kW transmitters for Radio Havana Cuba. They're being used on 9.550, 9.600 and 11.760 from 0000-0500 and 1100-1500 with 11.705 also in use during the latter period. (Every now and then Havana's Radio Rebelde shows up on 9.600.)

In Honduras - HRMI - Radio Misiones Internacional, formerly on the very crowded 5.010 has reappeared on 3.340. Radio Imperial - the only 'active' short wave broadcaster in El Salvador may not be for much longer. There are rumours that this is now off air. I have checked 17.835 and vicinity numerous times over the summer (as have others) and find no trace of a signal. Again, let's hope this isn't a permanent situation.

Having now cancelled nearly all of their English HCJB's ever-popular *DX Party Line* still airs on HCJB - Australia, but can be better heard via WWCR Saturdays at 0900, Sundays at 0200 (both on 5.070), plus Tuesdays at 0930 on 9.475 and Thursdays at 2000 on 15.825.

That wraps things up on the Americas scene for this time. I'll be back again in three months, by which time I hope reception conditions will have greatly improved. Until then, good listening!



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- Height: 40cm, Dia: 35mm
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- Connectors supplied - PL-259 termination
- Ideal for modern buildings & covert installation

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NEW Q-TEK INTREPID 2000



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). Reports have shown this to be an excellent performer!

ONLY £89.95 P&P £11.00

Q-TEK D.C. 2000 DISCONE



A high performance wideband discone offering superb performance from 0.2-2000MHz. Transmit range: 6m, 2m, 70cm (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.

SUPER-GAINER RH-9090 (SMA)

SMA fitting

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

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



Q-TEK DDC-2500 DOUBLE DISCONE 0-2500MHz



A superb multi-element 'Double Discone' for the real 'scanner buff'. An amazing 16-element antenna that could surprise even the most demanding customer. Supplied with mast clamps (up to 2" mast). 'N' type fitting (plug not supplied). Stainless steel/all'y construction. RX: 0-2500MHz, HT: approx 1.5m (5ft), WT: approx 1kg.

INRTO PRICE **£64.99** RRP: 79.99

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).

£69.95 DEL £10.00

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

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
8 METRES



AT-2000 ANTENNA TUNER



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

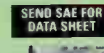
MLB (R.F. SYSTEMS)



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

WA-50 'AMPLIFIER'



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

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

SEND SAE FOR DATA SHEET

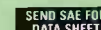
SP-1 TWO WAY COMBINER (PROFESSIONAL)



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)



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



aircraft with the same code will appear on the same frequency and will both respond to the same Selcall code.

The odds of this occurrence happening seem to be increasing all the time and I have actually noted one duplication this week (see later). This situation has not been helped by the USAF who have had the same Selcall allocated to two or three different C-17s on a number of occasions and during the past nine months a number of Selcall conflicts have been noted with almost the whole fleet of aircraft regularly crossing the Atlantic to Europe and the Gulf. These possible code conflicts mean that controllers must be even more prudent in correctly identifying the aircraft responding to a Selcall.

A second piece of correspondence asked if I had received any response regarding my request for information regarding the reasons for the apparently sporadic allocation of Selcalls to the C-135 series. Well it did generate correspondence, but not an explanation to the question.

Several readers have commented that there appears to have been many more C-135 Selcalls identified in the past year or two than in previous years. So have some aircraft been retrospectively fitted with the equipment?

Whilst writing this column I thought I would have a listen to h.f. as I had not done so for a few weeks and within a couple of hours, as mentioned earlier, I spotted a Selcall conflict. On 13 September on 5.616MHz was FUZZY 95 working Gander, he gave his type as a KC-135, his destination was KSCH, (Schenectady, NY) and his Selcall as JSKM which was new to my records.

A call to a friend at Mildenhall, confirmed that the aircraft that had departed with that callsign was 60-0358, a KC-135R, I was quite pleased, having made the tie-up. About three hours later on the same frequency was REACH 7437, which gave his type as a KC-135 and his Selcall also as JSKM! After a bit of investigation, one source suggested that it could be 57-1437, can anyone confirm this?

I have had several pieces of new information regarding C-135 tie-ups, so I will put them all together and hopefully publish an update to the special during the Winter months. Thanks to **Mick H, Gavin, Paul L, Martin** and the ARINC website.

Bits & Pieces

An E-mail from **Rob** asks if I can identify the callsign OMNI 670 which he heard on Gander Radio during September. Checking in JP Airline Fleets, I would guess this is Omni Air International who operate a fleet of nine DC-10s out of Tulsa, Oklahoma. Although a check in the ICAO documents shows them to be called Omni Air Express with the callsign Omni Express.

A couple of times recently the callsign ASPIRIN has been noted by 'Sky High' readers, presumably military it has been

suggested that it could be FR Aviation Falcons, can anyone positively identify it?

Hurricane Isabel

With Hurricane *Isabel* bearing down on the East coast of the USA, (17 September), I had two E-mails from readers. The first one was asking for the best frequencies to listen to any Hurricane aircraft activity and the second pointing me at an interesting website.

The 53rd Weather Reconnaissance Squadron no longer have their own dedicated frequencies but use Coast Guard, Navy and US Global frequencies. With thanks to **Ian P** I can point you towards an excellent website listing the current Hurricane Frequencies. It is bang up-to-date, which makes a change from many websites!

I have included an abbreviated list of frequencies which should carry any Atlantic aircraft movements and weather updates, for an extensive listing go to the very helpful website at www.hurricanefrequencies.com Anyone who is interested in Hurricanes and other extremes of nature should go to the Tropical Prediction centre, located at www.nhc.noaa.gov

There is an amazing amount of information on this site including recent aircraft weather reports, various types of satellite imaging and a host of other current and archive information. With thanks to **Martin, Ian P** and the above mentioned websites for the information.

Our photo this month is German Navy Tornado in a special 90th Anniversary scheme arriving at Yeovilton Show.

MHz	Users
2.670	USCG Wx Cape Hatteras NC
2.670	USCG Wx Fort Macon NC
2.670	USCG Wx Eastern Shore VA
2.670	USCG Wx Hampton Roads VA
4.426	USCG Wx NMN Portsmouth
4.724	US GHFS
5.236	SHARES h.f. Coordination Network
6.501	USCG Wx NMN Portsmouth
6.712	USAF GHFS SAR
6.739	US GHFS
7.507	USN/USCG hurricane net (Primary)
7.508	FAA Caribbean hurricane net
8.764	USCG Wx NMN Portsmouth
8.992	GHFS
9.380	USN/USCG hurricane net (Sec)
11.175	US GHFS
13.089	USCG Wx NMN Portsmouth
13.200	GHFS
14.396	SHARES h.f. Coordination Network
15.016	US GHFS
17.314	USCG Wx from NMN Portsmouth
All u.s.b.	

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OUR PRICE £219.99
Del £10.00



UNIDEN UBC-780XLT

New comprehensive scanner (25-1300MHz) Alpha Tag, PC cloning control. Smart scanner + trunk track facility. Includes PSU.

OUR PRICE £299.99
Del £10.00

Software 780XLT.....£34.99



YAESU VR-5000

0.1-2.6GHz all mode receiver with (optional) DSP plus bandscope/world clock and too much more to print.

(incl's PSU) **OUR PRICE £549.99**
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Voice synthesiser£49.99
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Optional DSP£79.99
VR-5000 +3 (incl's DSP + voice synth'r + record unit).....£715.00



AOR AR-8600 MkII

Extremely versatile all mode receiver (100kHz-3GHz). Now with improved short wave performance.

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Del £10.00

Optional power supply.....£19.99



FAIRHAVEN RD-500VX+

Superb wideband receiver (all mode) with over 50,000 memories capable of holding text. 20kHz-1750MHz. Incl's remote control/PSU/PC lead and software. RRP: £899.00

OUR PRICE £745.00
Del £10.00

Next generation wideband receiver for the true perfectionist. 0.1-2GHz. (All mode). Includes free PSU.



ICOM IC-R8500

OUR PRICE £1149.95
Del £10.00

SP-21 extension speaker£74.99
Voice synth board£34.95

ICR-8500 "Plus!!"....ICR-8500 + SP21 + Voice Synthesiser. **OUR PRICE £1239.00**

Something to occupy your mind on those dark winter nights!



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

ALINCO DJ-X3



Micro-handly 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

Optional soft case.....£17.99
Optional cigar lead.....£19.99

YUPITERU MVT-7100



Wideband hand-held scanner covers 500kHz-1650MHz. (All mode). Includes nicad/car charger/charger/antenna. Extremely user-friendly hand-held receiver 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 nearby signal & tunes the handle for you. Incl's battery, charger & loads more.

Includes 8.33kHz spacing

£419.95 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 **£379.00** Del £10

Optional case.....£19.99
CC-8200 PC interface.....£79.99

MSG-1

image processing with geosatsignal-4

If you've recently put together the capability to receive images from MSG-1, then David Taylor's image processing software could be of interest to you. Lawrence Harris reviews its capabilities.

For several months we have seen the rapid development of software for processing imagery from the new *METEOSAT Second Generation (MSG-1)* satellite. For those of us taking part in the tests, images started flowing from *MSG-1* on 30 April and I was able to capture them a day or two later using David Taylor's *MSG Data Manager* (originally called *MSG-Reader*). His new program was mostly written as a response to the need for *MSG-1* users to convert the flow of files into viewable images, and store them in a logical manner. That program continues from strength to strength, with updates sometimes happening twice a day! *GeoSatSignal-4 (GSS-4)* fulfils a different role. In its original existence it was called *SatSignal* and was used to decode sound recordings of polar *WXSAT* signals (a.p.t.) from *WXSAT* receivers. It was also designed to process geostationary *WEFAX* satellite data (amongst other formats) to produce various types of output. *GSS-4* offers a large number of functions for earlier data formats, as well as entering the *MSG-1* field. I decided to review the program for this 'WXSAT Special Edition 2003' because of David's reputation as a highly competent software writer and his demonstrated willingness to listen to users' requests for additional facilities - in fact I suggested, and received, some new facilities during the preparation of this review.

The program can be downloaded from David's site, where he also provides installation notes. This review mainly concerns the program's applications to *MSG-1* data, but I also take a brief look at its use for *WEFAX* because many continue to use this type of transmission. This review covers the registered version because it offers the complete suite of facilities, but the free program may be adequate for many. www.satsignal.net

GSS-4 Layout

The program launches as a display, with many options directly available. Built in to the program is a considerable level of automation, so a thorough read of the help file is essential. To see the ease of use of some of the basic features, I started with the program positioned near the lower left of the screen and then reduced the size of *Windows Explorer* and located it near the upper right - see Fig. 1. This allows the selection of suitable image files for opening or drop transfer into *GSS-4*.

METEOSAT-7 WEFAX Applications

I first checked the production of joined *METEOSAT-7* *WEFAX* images. You can use data received either directly from your own equipment, or indirectly using files downloaded from the Internet or both. Images such as *METEOSAT D1, D2* and *D3* (infra-red) images, or even the equivalent *GOES-NE* and *GOES-NW* sectors, can be joined together to display a wider area. Similarly, *GMS* *WEFAX* images can be combined. Images from the visible and thermal waveband sensors can be combined into an effective false-colour image and you can have processing algorithms applied to show cloud-top temperature and storm system displays. Any of these images can be animated, the choice is all but endless! The main requirement is to rename the files, if necessary, to ensure recognition by the software.

Files are placed together in the same folder and renamed if necessary. I used the *C1D, C2D* and *C3D.gif*, and placed them in the 'my documents' folder for easy access. One file (for example *C1D*) is then loaded using 'File', 'open join' - and then watch the magic! The remaining files are loaded automatically. I produced Fig. 3 with these three files. An even easier method, available to registered users, involves a sequence of simple file transfers, discussed in the main part of this review. The combined image can be saved using 'File', 'save as' - in the folder of your choice.

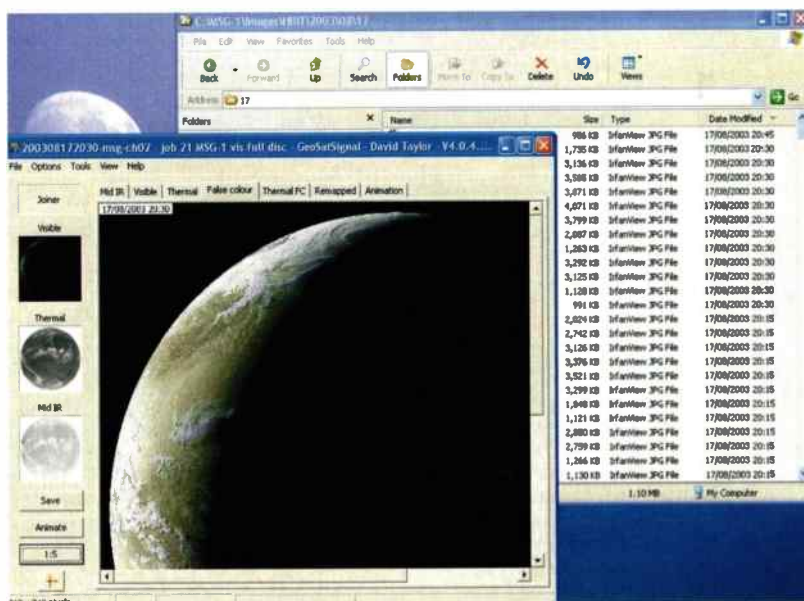


Fig. 1: Sample screen of GSS-4, and Windows Explorer displaying MSG-1 files.

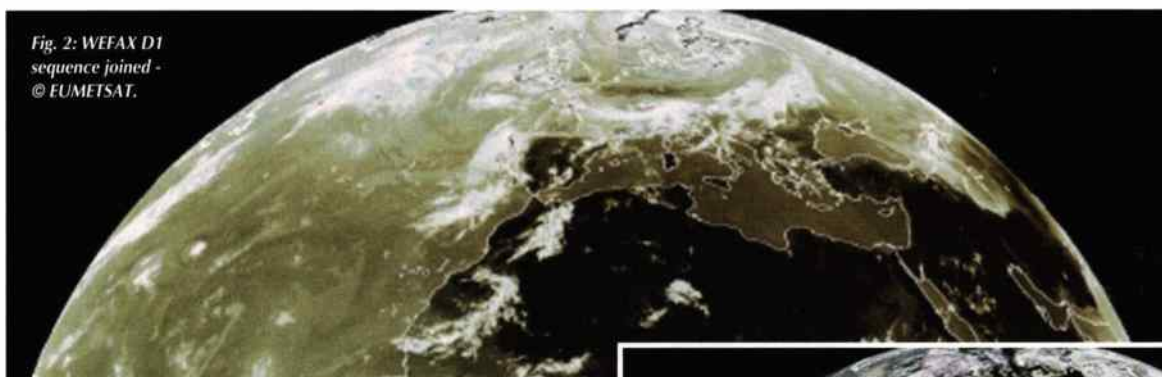


Fig. 2: WEFAX D1 sequence joined - © EUMETSAT.

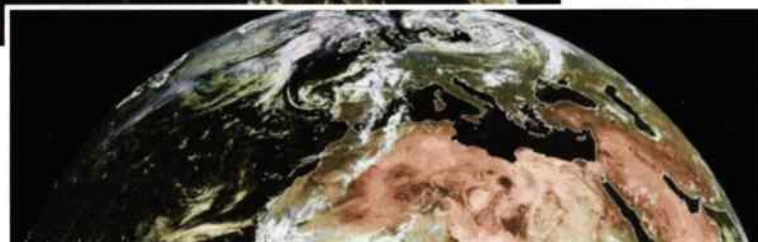


Fig. 3: WEFAX CxD formats from 16 August joined together - © EUMETSAT.

MSG-1 Starts Here

On to the main part of this review, *MSG-1* image processing. Using *Explorer*, you can locate *MSG-1* image files (HRIT, LRIT and FSD formats) for any day, and identify the sequence of saved channels. The program *MSG Data Manager* provides the channel-saving options. I currently save all channels for a few days.

If, unlike me, you don't have the receive computer running 24 hours-a-day for continuous *MSG-1* data collection, but instead switch it on first thing, and off last thing each day, then your first and last image sets for each day may be incomplete. I sometimes leave the system on overnight - particularly when doing practical astronomy.



Fig. 4: MSG-1 6 September 1400 channel-2 (visible image © EUMETSAT).

What happens next depends on the program's settings. The window labels on *GSS-4* say 'drop a file' and show three options: visible, thermal and mid-IR, and also the 'joiner' window (for combining WEFAX images). You can actually drop the file in any window and the software will place it correctly. Drop a visible-light channel (use 1, 2 or 3) into a window and within a second or so it will be displayed. You are effectively running a 'default job' (call it job 0) and the parameters of the job can be changed.

Many Processing Options

You can view the current (default) job settings via 'Options, default job/job setup'. One option (in 'Job setup') is to display in colour or greyscale. The default is 'colour: normal', so after copying the file across, you should first see the image displayed in the upper visible window and then automation cuts in. The program looks for comparable thermal and near-IR images within the same directory in the Explorer window, and if it finds them, will automatically load and convert the visible-light image to colour. The display seen in Fig. 1 was done by merely dragging a channel-2 late evening image across to *GSS-4*, with the default setting for colour. No more adjustments of individual channels are required to create your masterpiece!

Depending on the actual visible-light channel chosen (1,

2, 3 or 12), you obtain a slightly different colour image due to the difference in spectra between the channels - see Fig. 4 and Fig. 7. You can select one of the other (infra-red or water vapour) channels; the selected image remains displayed. Returning to the automated colour image, you can maximise the window to see the full-screen display.

There is a set of tabs across the top of the window: 'water vapour', 'visible', 'thermal', 'false colour', 'thermal fc', 'remapped' and 'animation'. Looking at Fig. 5 you can see the thermal false colour image that can be produced from, for example, channel-9 (infra-red). Depending on the image loaded, the tabs display different pictures. The remaining buttons down the left side of the display offer 'overlays' (bottom button), a 'zoom' option, 'animate' and 'save'. The 'overlay' option will superimpose country outlines, or remove them as required. The 'animate' option is outstanding - but pause first! You could simply click on the button - and the software would take over. You would be starting the 'animate' option in the current job. Select 'options', 'job set-up' (as before), but now click the 'animate' tab at the top. This is where you can select your preferred parameters. I used 15 minute intervals (because this is the rate of HRIT image collection) and seven pictures. Now, when you select 'animate', each potential frame is collected and processed and the result saved according to these settings (under the 'options', 'job set-up' tab). The resulting 'avi' file is likely to be enormous - mine was 17MB from just seven frames. If you use the channel 12 image - well, you can imagine! Worth deleting when completed.

Another extremely powerful option - 'remapping' - is performed with one or two clicks in the 'job set-up' tab. Open the 'options', 'job set-up' tab and click 're-mapping options', 'enable'. Check that the selected projection is 'orthographic'. The current image, or the next transferred image, will be processed to produce the re-mapped image - and this is viewable by selecting the 'remapping' tab - see Fig. 6.

It is worth familiarising yourself with the settings available under 'options' in the main menu. This includes the 'common set-up' parameters that affect all parts of the program, the 'job set-up' list and 'default job'.

Specify Your Job

A job is a set of preferences that you can change for a specific type of image. There are 40 individual jobs available, for which completely independent settings can be

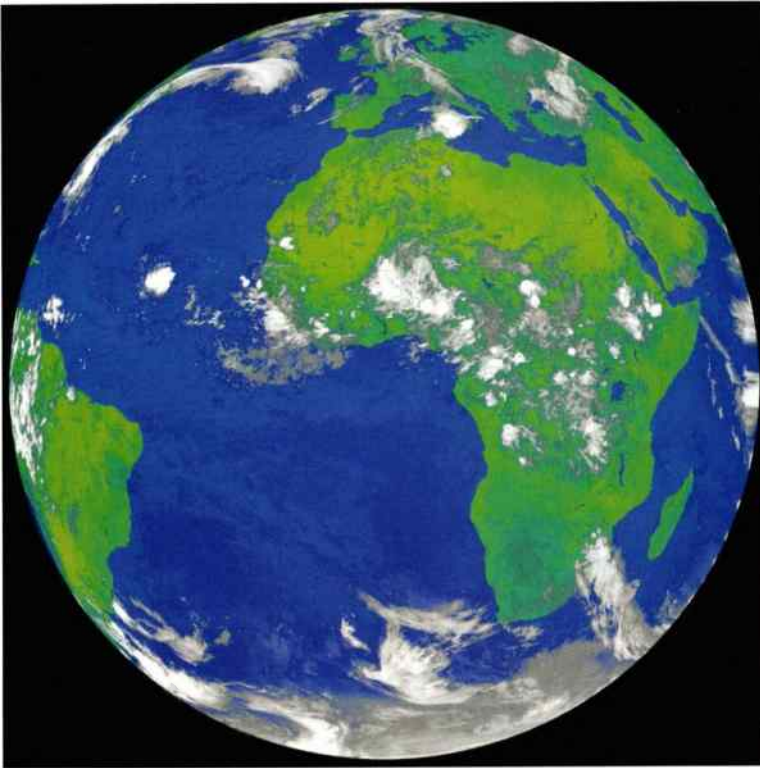


Fig. 5: MSG-1 6 September 0015 channel-9 (enhanced infra-red image © EUMETSAT).

specified. This means that you can define your own preferences for different image products. There is a direct link between *MSG-DM* and *GSS-4* jobs: each window in *MSG-DM* can be allocated an individual job - via 'set-up', 'advanced set-up'. It is easy to allocate (for example) *GOES-9* visible-light to job 24. You can then set your preferences for this image. I set up my preferences for every image received in the HRIT, LRIT and FSD windows, using an incrementing job number.

David provides a list of recommended settings for selected image formats such as infra-red. My preferences include country outlines because land can often be difficult to identify in infra-red images, especially when under cloud cover. To do this, select 'options', 'default job' and then 'job

number'. You can edit the details for this job in 'options', 'job-setup'. This procedure is simple and can be used to define preferences for processing all image formats including visible-light, infra-red and foreign satellites. The *GSS-4* software is extremely flexible, allowing you to label each job for easy

reference. With so many satellite image formats potentially available - including twelve from *MSG-1* and three each from *GOES*, *GMS* and any other satellites - it is worth some planning. For each job you can define settings under the labels 'processing', 'animation' and 'general'.

False-Colour & Fire

GeoSatSignal-4 provides two separate false-colour options: 'False-colour' and 'Thermal False-colour'. The first refers to visible-light false colour. The False-colour tab provides the option to combine thermal and visible channel information in various ways. The 'Thermal false-colour' tab only processes a thermal channel. Settings are on the 'Options',

'job set-up' menu. With 'false colour' set to 'normal' and the colour look-up table (CLUT) set to 'LUTLandSea', the resultant image, see Fig. 5, enhances land and sea areas in their own colour ranges. You can switch between thermal and thermal false colour to see how various features are identified. This is a powerful analytical tool - yet easy to use.

There is a choice of look-up tables for different spectral image types. Because the infra-red channels provide images during day and night, they are suitable for animation at any time. *MSG-1* provides mid-infra-red information in channel 4, so it is possible to process that information to look for local hot-spots (fires) and to show these as a red overlay on false-colour images. Set the 'Fire' option in 'job settings' and the program loads channel-4, processes it, and provides the hotspot overlay on the 'False-colour' image. Mid-Africa typically shows some fires.

Extras

The basic version of *GSS-4* is free. Registration is required for some of the advanced features, such as extended animations, *MSG-1* support, weather chart overlay, and drag-and-drop. If you use the Internet for data retrieval, download the free AutoGet file utility from the *GeoSatSignal* web page designed for registered *GeoSatSignal* users.

Summary

It has always been a pleasure to use and review software from David Taylor. David goes far more than 'the last mile' to satisfy the most discerning of users, as anyone who monitors the SatSignal mailing list will be aware. David has faced the challenge posed by EUMETSAT of writing software, sometimes even without sample data, and has

Fig. 6: MSG-1 6 September 1400 channel-2 re-mapped (image © EUMETSAT).



produced virtually bug-free software at first version. In two or three instances I thought of enhancements that I would like, such as country outlines on infra-red images. David has sometimes added the enhancements the same day.

Potential users should be aware that I have not spent time exploring all the features built into *GSS-4* because development is ongoing. A complete description of every facility would occupy a large tome. Users can be certain that with *GSS-4* they have probably the best software available for *MSG-1* image processing, and can feel happy registering it to gain access to the extra facilities. *GSS-4* is probably one of the most comprehensive programs of this type. An *MSG-1* user might ask: Is this essential software for *MSG-1*? In my opinion, no. The essential program is *MSG-Data Manager*. If, however, you wish to make the most use of your already bought *MSG-1* reception system, you should seriously consider this program - don't spoil the ship for a ha'p'orth of tar!



Fig. 7: MSG-1 HRV (high resolution visible) 3 September 1130.

MSG-1

image EXPOSE

Lawrence Harris presents the first ever collection of MSG-1 images to be published.

Weather satellite, WXSAT imaging is all about receiving and decoding signals from weather satellites - usually direct from the satellites themselves. If you have already set up your own receiving station, your interest may be in keeping in touch with developments and checking out how others with similar systems are doing - this is the theme of my monthly column 'Info In Orbit'. If you do not have any equipment but are thinking about setting up a station your interest may be in finding out what is available and how much it costs. This feature provides a description of the main image formats available - via *HotBird-6* - from *MSG-1*, see Fig. 1. For the first time, a complete collection of real images from *MSG-1* can now be published.

Much has already been written about *MSG-1*, the newest of the geostationary satellites. It is one of a constellation - see Fig. 2 - of geostationary WXSATs currently in orbit and is the first of the new generation of all-digital satellites designed to transmit the new HRIT/LRIT format images. You will not find *MSG-1* in Fig. 2 because it is still undergoing tests and not therefore formally operational. Test transmissions to European trial users started on 30 April - they will continue for several months.

Imaging Channels

The 12-channel Spinning Enhanced Visible and Infra-Red Imager (SEVIRI) is the radiometer that produces the spectral channel data subsequently transmitted to the Ground Station. It is able to produce all 12 channels of data every 15 minutes. Although the HRV channel samples half of the earth's disc at 1km resolution, the other channels produce a full disc image at 3km sampling. The following description of each High Rate Information Transmission (HRIT) channel explains how the images can be interpreted.

All 12 channels are transmitted in the HRIT data stream and were received at my station on 22 August from the 0800 time slot, with a few from more appropriate slots.

Visible-light channels 0.6/0.8 μ m: Cloud detection, scene identification, cloud tracking, aerosol observation, vegetation monitoring. The channels are similar to the comparable channels on the NOAA meteorological satellites. HRV is a broadband visible channel that compares with *METEOSAT-7*'s visible-light channel, but with a sampling interval of 1km compared to 2.5km.

Near-infra-red 1.6 μ m: Enables snow and cloud discrimination and identifies cloud phase (ice or water).

Provides some aerosol information (particles suspended in the atmosphere).

Infra-Red 3.9 μ m: Another NOAA channel - used for the detection of low clouds and fog, sea and land surface temperature at night and for fire detection. On *MSG-1* the band has been widened to improve the signal-to-noise.

Water Vapour 6.2/7.3 μ m: Two channels - originating from the *METEOSAT* series broadband water vapour channel. Measures upper- and mid-tropospheric water vapour, cloud and water vapour tracking, cloud height allocation. The two channels help identify different cloud layers.

Infra-Red 8.7 μ m: Based on the NOAA HIRS (high resolution infra-radiation sounder) on NOAA satellites. Provides quantitative information on thin cirrus clouds, and helps identify ice and water clouds.

IR 9.7 μ m: Responds to total ozone concentration in the lower stratosphere, tracking of ozone patterns to indicate stratospheric winds.

IR 10.8/12.0 μ m: Similar to the split-window thermal channels on NOAA meteorological satellites. Surface and cloud temperatures; used together they help reduce atmospheric effects made during these measurements.

IR 13.4 μ m: Carbon Dioxide absorption to be used for estimating atmospheric instability.

LRIT - Low Rate Information Transmission

With our unexpected ability to receive the high resolution image stream from *MSG-1* (*METEOSAT-8*) via *HotBird-6*, the desire to receive LRIT is perhaps somewhat mooted! These channels are all subsets of the HRIT stream and are at a lower resolution.

FSD - Foreign Satellite Data

MSG-1 continues the long established practice of relaying images obtained by the satellites of other nations (foreign satellites) within the transmission schedule of the LRIT formats.

Some of the images have been slightly enhanced for improved presentation. All images originate as full-disc, but I have selected sections that I believe are of special interest for more detailed displays. The GOES WXSATs provide a wonderful panoramic view of the continents and the Pacific ocean - and every three hours!

Finally, I am grateful to EUMETSAT and Gordon Bridge for the use of Fig. 25 showing the timetable schedule for future MSG and other satellites in EUMETSAT's overall plan. It is clear that MSG is destined to provide consistently high quality imagery for many years to come.

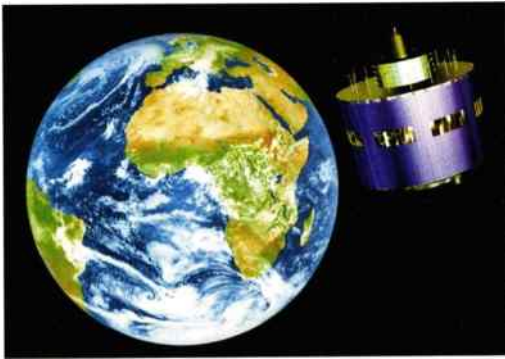


Fig. 1: Artist's impression of MSG-1 in orbit. © EUMETSAT 2003.

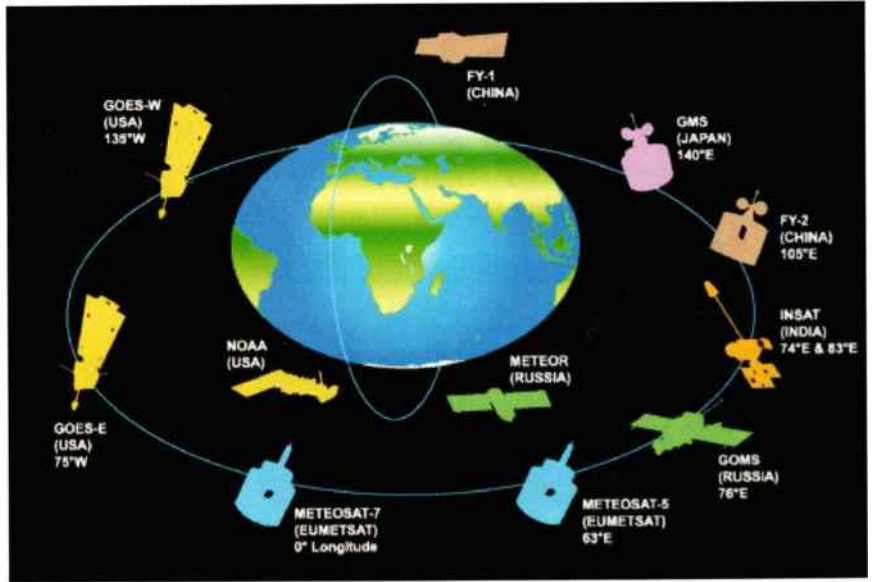


Fig. 2: Geostationary Weather Satellites. Courtesy World Meteorological Organisation.



Fig. 3: Channel 1. © EUMETSAT 2003.



Fig. 4: Channel 2. © EUMETSAT 2003.

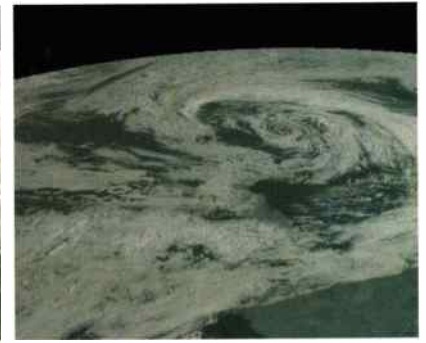


Fig. 5: Channel 12 HRV (high resolution visible). © EUMETSAT 2003.



(far left) Fig. 6: Channel 3. © EUMETSAT 2003.



(left) Fig. 7: Channel 4. © EUMETSAT 2003.

(below, left) Fig. 8: Channel 5 7 September 1500. © EUMETSAT 2003.

(below) Fig. 9: Channel 6 7 September 1500. © EUMETSAT 2003.

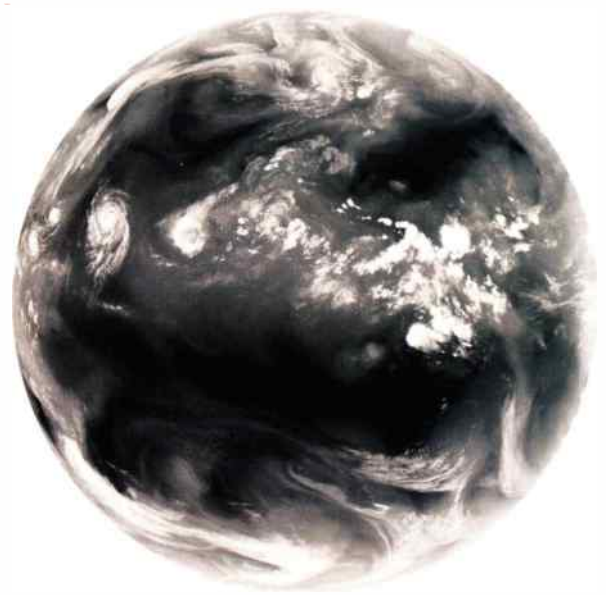




Fig. 10: Channel 7. © EUMETSAT 2003.



Fig. 11: Channel 8. © EUMETSAT 2003.



Fig. 12: Channel 9. © EUMETSAT 2003.



(far left) Fig. 13: Channel 10.
© EUMETSAT 2003.



(left) Fig. 14: Channel 11.
© EUMETSAT 2003.



Fig. 15: Five LRIT channels. Channel 1, 3, 4, 5, and 9. © EUMETSAT 2003.

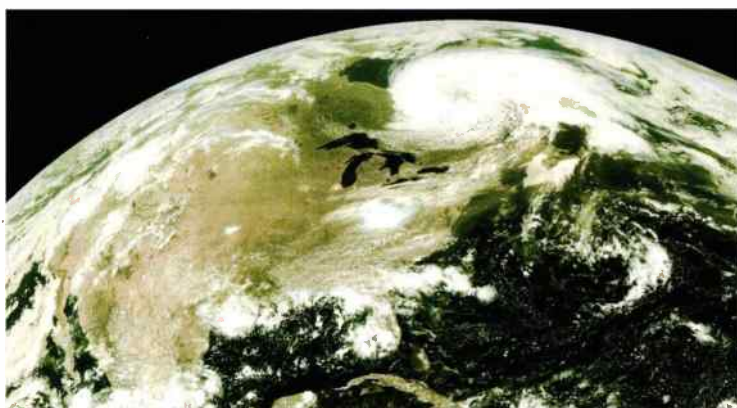


Fig. 16: GOES-12 (east) visible, 22 August 1800. © EUMETSAT 2003.

Fig. 17: GOES-12 infra-red 22 August 1800.
© EUMETSAT 2003.



Fig. 18: GOES-12 water vapour 22 August 1800. © EUMETSAT 2003.





Fig. 19: GOES-10 (west) visible, 22 August 1800. © EUMETSAT 2003.



Fig. 20: GOES-10 infra-red 22 August 1800. © EUMETSAT 2003.



Fig. 21: GOES-10 water vapour 22 August 1800. © EUMETSAT 2003.



Fig. 22: GOES-9 (GMS position) visible 15 August 0000. © EUMETSAT 2003.



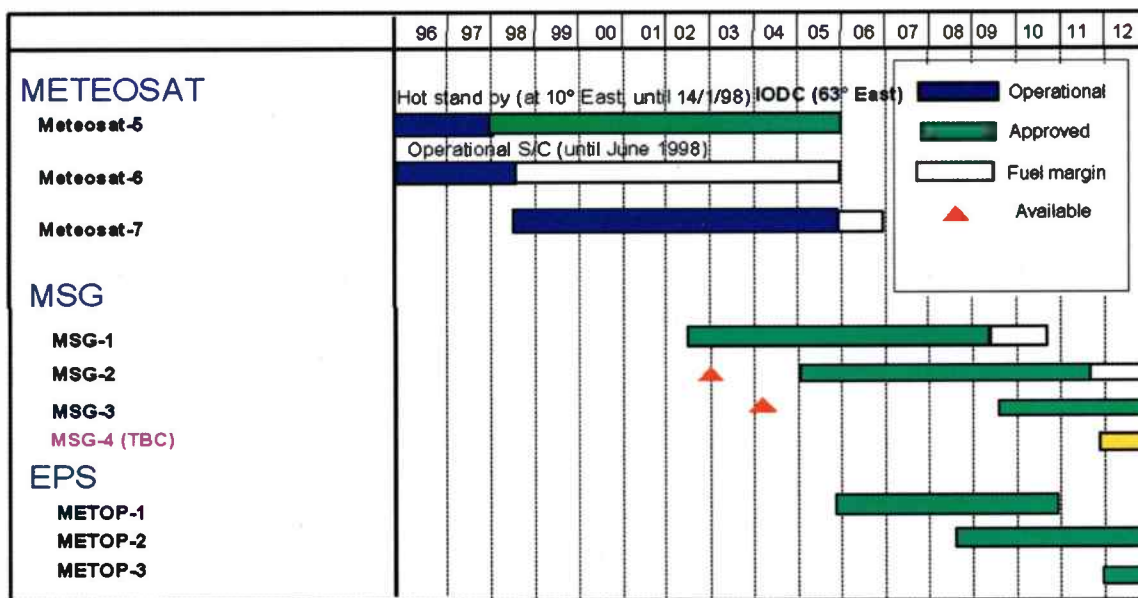
Fig. 23: GOES-9 infra-red 15 August 0000. © EUMETSAT 2003.



Fig. 24: GOES-9 water vapour 15 August 0000. © EUMETSAT 2003.

MSG in EUMETSAT's overall Satellite Systems

Fig. 25: EUMETSAT's Satellite Programme



24hrs

With the POLAR Weather Satellites

The first WXSAT - Television Infra-Red Observation Satellite - TIROS - was put into polar orbit in 1960. As of 2003, we have many polar orbiting and geostationary WXSATs, with more scheduled for launch during the next ten years.

Polar orbiting WXSATs operate in a different manner from geostationary WXSATs to fulfil a different role. The idea of a polar orbit is that on every circle of the earth, the satellites pass quite close to the polar regions, while the earth rotates below. By careful adjustment of the launch parameters, a satellite can be inserted in just the right orbit so that each time it passes over a given location - say London, UK - it does so at about the same local time. All of the American NOAA satellites do this; for example: NOAA-17 passes over during late morning, travelling from north to south and about twelve hours later it passes from south to north. This means that during every pass, solar time and therefore ground illumination is similar to that experienced during the previous and following days; we call this a sun-synchronous orbit.

Such precision orbit adjustment is done after studying computer models of different orbits to identify the orbital height, inclination of the orbit to the earth's equator and the time of day of the launch. By adjusting these parameters for each launch, a constellation of satellites was placed around earth to provide coverage of the entire planet every twenty-four hours. The Americans have done precisely this with the NOAA constellation and with suitable equipment, we can tune into all of the operational satellites for free.

The NOAA WXSATs are in orbits staggered around the globe to provide regular coverage of the whole planet during a 24-hour period - and at high picture resolution. In this special feature I'll look at a typical 24 hours of polar satellite passages.

Satellites & Pass Times

These WXSATs provide a series of images from south-bound passes during the night, followed by a complimentary series of north-bound passes about twelve hours later. A typical set of pass times is shown, together with the maximum elevation (maxel) reached during each pass. On a day-to-day basis, corresponding pass times change by a few minutes and there is a corresponding change in the maximum elevation. Overall, the high pass of each set remains at the same local solar time - hence the description sun-synchronous. This sun-synchronous property is a consequence of the orbital inclination and orbit height. All the NOAA WXSATs have similar orbits - but they are carefully spaced around the solar day.

After midnight, NOAA-16 and NOAA-17 are the



Fig. 1: NOAA-14 1756 22 August 2003
h.r.p.t. image - the evening twilight zone.

first operational satellites to pass over our (or any) location. However, at this time NOAA-17's north-bound pass is really the last (or penultimate) pass from the previous day. You can see the orbital characteristics for the polar WXSATs presented in **Table 1**. For consistency, let's start with NOAA-16.

NOAA-16

The category p.m. primary refers to the designation of NOAA-16 as the main operational afternoon WXSAT because it passes north-bound over Britain during the early afternoon. The first southbound satellite pass of the day starts at 0041 on the selected day. A glance at the table shows that the satellite transmits h.r.p.t., but not a.p.t. The latter is due to a hardware failure on board the satellite. This specific pass only reaches a few degrees elevation over the eastern horizon, so we would normally ignore this pass because it would be very low. The h.r.p.t. signal provides five channels carrying high resolution imagery; good quality colour images can be synthesised by combining some of these. Free software is available to further process these images.

Because this is night time, the visible-light channels are virtually blank. During the period around the

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These latest headphones reduce ambient noise dramatically, yet you can still hear external sounds! Two microphones pick up noise and are then fed to a differential amplifier which cancels the noise. It's all built into the headphone and requires just a single AA cell. Can be switched out and used as normal headphones as well. The difference is dramatic! Use on an aircraft & cut out the background noise. Supplied with 1/4" stereo jack and 3.5mm adaptor.

£99.95 B

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

WATSON HP-200 & HP-100



HP-200

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



HP-100

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

EVOKE-1 DAB RECEIVER NEW



The Evoke-1 is a true DAB receiver with full Band III reception of all UK DAB broadcast modes 1-4.

*Frequency range: Band III (174-240MHz) UK only

*6 preset memories *High visibility LCD with 16x2 char.

*Pwr: 12V AC mains pwr adaptor (supplied) *Size 210x175x110mm

£99 B

EVOKE-2 STEREO DAB/FM RADIO NEW



The Evoke-2 is a battery powered stand-alone DAB and FM radio.

*Frequency range: Band III (174-240MHz) UK only & FM 87.5-108MHz *6 DAB & 6 FM preset memories *Up to 55 DAB stations *High visibility LCD with 16x2 char.

*Pwr: 230V AC-9V DC external or 6x C cell batteries (10hrs approx) *Size 290x185x100mm

£159.95 B

DR-101 PERSONAL DAB RECEIVER NEW



One of the world's smallest DAB receivers. Enjoy almost CD quality broadcasts from some of the biggest names in broadcasting - BBC 1-7, Virgin, Capital, BBC World Service and many more.

*DAB Band III (174-240MHz) *FM 87-108MHz *Large full graphic 4-line display *Stereo Headphone output *2x AA Alkaline batteries (6 hours) *Size: 69x88x22mm *Weight: 40g

£169 B

DR-201 PERSONAL DAB + MP3 NEW



The DR-201 is a fully portable all-in-one digital radio, FM radio & MP3 player.

*DAB Band III (174-240MHz) *FM 87-108MHz *MP3 player & 64Mb memory built-in *Large full graphic 4-line display *Backlight *USB connector *Stereo headphone output *Windows 98/ME/XP compatible *2x AA alkaline batteries

£229.95 B

HENRY KLOSSTIVOLI MODEL TWO NEW



This new stereo version uses the same tuner technology as the Model One but with several additions.

*Mixing input permits audio from PC to be mixed in with radio *Subwoofer output *Balance control *Bass ports located in the rear allow vertical standing *Size: 114x212x150mm *Weight: 4kg total

£169.99 B

HENRY KLOSSTIVOLI MODEL PAL NEW



The Tivoli Model PAL (Portable Audio Laboratory) provides the same sound quality as the Tivoli Model One but in a portable compact unit. There is an auxiliary input for a CD, MP3. *Rugged rubberised small footprint case *Heavy duty, long throw 2.5in spkr driver *Internal Ni-MH batt pack (20hrs) *Size: 95x160x95mm *Weight: 1kg (Available in 8 different colours)

£129.99 B

YUPITERU MVT-7300 "COMPACT SIZE SCANNER"



- 521kHz - 1320MHz
- NFB, WFM, NAM, WAM, USB, LSB, CW
- 1000 memories
- 500 Pass channels
- 16 tuning steps
- 8.33kHz airband spacing
- 3x AA 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
- 4x AA Ni-Cds
- 12V DC/230V AC mains
- Telescopic Antenna

£369 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 NEW



- 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

£159 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

£99 B



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



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

"BUDGET VALUE"

£69 B

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

£419 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

£299 C

AOR AR5000A/AR5000A+ NEW



The new AR5000A now offers a frequency coverage of the entire radio spectrum that is practical to cover. The +3 version offers even more with synchronous AM (USB/LSB/DSB) AFC & Noise Blanker.
*10kHz-3GHz *AM, FM, USB, LSB, CW *2000 memories *45 CH p/s scan speed *Audio 1.7W (8 Ohms) *Supply: 12V DC @ 1A *217x100x260mm *3.5kg

AR5000A
£1599 C

AR5000A+
£1799 C

OPTOELECTRONICS SCOUT



The Scout frequency recorder automatically stores frequencies as it locks onto them
*10MHz-1.4GHz *Input: 50 Ohm
*Sens: <3mV @ 150MHz *Measurement: 10mS *Records: 400 freqs *Display: LCD *Bargraph: 16 segments *Supply: Int Ni-Cads *Battery life: 8hrs *AC adaptor AC90
*Size: 94x70x30.5mm
*Weight: 240g

£379.95 B

OPTOELECTRONICS X-SWEEPER NEW



Top-of-the range product from optoelectronics, a fully featured nearfield receiver that displays nearfield analogue signals in spectrum format.
*30MHz-3GHz *FM Analogue *64x128 graphical display with white LED backlight *20 memory banks, 100 freqs in each *Sens: 100uV @ 500MHz *Pwr: 8xAA alkaline or AC adaptor (optional) 12V DC 350mA
*Size: 203x108x22.5mm

£1699.95 C

bhi NEIM1031 NEW



NOISE ELIMINATING IN-LINE MODULE
* Noise attn 9-35dB * 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 in impedance 10K * Line in 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
*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

£99.95 B



NES-5
*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

£79.95 B

YAESU VR-5000 "DESKTOP RECEIVER"



- 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

£569 C

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 "THE EDITOR'S GOT ONE!"



- 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

£1199 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

PALSTAR R-30HF NEW



The R-30HF is a compact, high performance, long, medium & short wave receiver covering the range 100kHz to 30MHz
*Modes: AM LSB USB CW
*Memories: 100 channels
*Supply: 12V DC
*Size: 210x65x195mm
*Weight: 1kg

£449 C

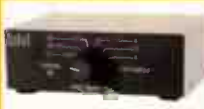
WINRADIO G303i NEW



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, (USB & DSB, Pro Demodulator Option only) *Antenna: 50ohm (SMA) *Dynamic Range: 95dB *IP3: +8dBm

£440 C

bhi I042 SWITCH BOX NEW



The bhi I042 Switch Box - No more swapping of wires. Allows up to six pieces of equipment to be connected to one bhi noise eliminating module/speaker or even a standard external speaker.
* 6x inputs: 3x loaded (8 Ohms spkr level), 1x output (to spkr/module) * Sockets 3.5mm mono Size *c/w 2x 3.5mm mono - 3.5mm mono leads

£29.95 A

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

MFJ-784B DSP FILTER



£259.95 B

The MFJ-784B Tunable DSP filter automatically eliminates all heterodynes, 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: THGR22BN

£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

£375 B

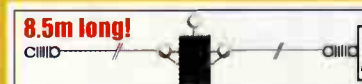
WATSON FC-130 "MICRO COUNTER"



- 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



8.5m long!
£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

WORLD RADIO & TV HANDBOOK NEW



The 58th Edition of the most respected source book on international broadcasting. Features more than 680 pages of International Radio Station listings, worldwide TV station contacts & addresses, broadcaster websites and email addresses. A section is devoted to a survey of SW receivers and accessories.

£19.99 A

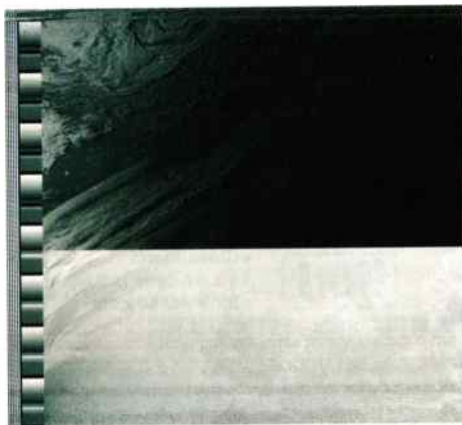


Fig. 2: NOAA-15 1832 13 September 2003 channel vis-2. An a.p.t. image showing the switch from channel 2 (visible) to channel 3 (near infra-red) during evening passes.

summer solstice there is a glow of solar illumination near the northern part of the pass because the satellite is passing over partly illuminated ground. The next pass (listed at 0221) is the main pass of the night, having the highest elevation and provides fascinating infra-red imagery. At the height of summer and in the depths of winter, the thermal image channels show significant detail because of the range of temperatures across the image. The sea is cooler and therefore lighter, than the land in summer, but is warmer and

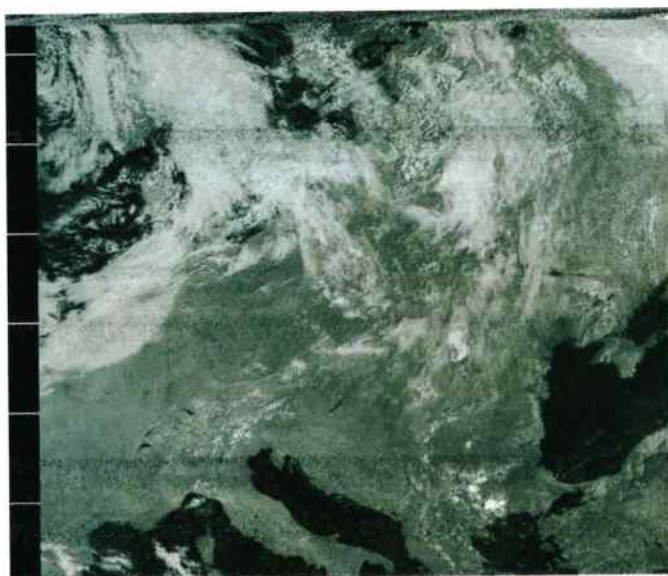


Fig. 3: NOAA-17 0933 22 August 2003 channel vis-2.



Fig. 4: NOAA-17 1113 22 August 2003 channel vis-2 showing successive passes of NOAA-17 and the image overlap.

therefore darker, than the land in winter. This characteristic is, of course, the same for all the NOAA WXSATS.

Daytime passes of NOAA-16 are fully illuminated due to the carefully adjusted pass times. The first north-bound pass (on this selected day) is at 1036, again over the east. Even in winter, the ground is illuminated. The main pass is usually the second one of the day, but because the first pass was very low (only 7° elevation) the next pass still reaches only 32° elevation in this instance. In winter, the northern end of the daytime passes of NOAA-16 is over ground under low levels of illumination. The infra-red channels, however, continue to provide full coverage.

NOAA-12

This is the oldest of the active satellites. NOAA-12 is listed as the standby morning satellite, but is still transmitting a.p.t. and h.r.p.t. The term standby means that when NOAA-12's footprint (the region on earth where the satellite's signal can be received) overlaps that of any other satellite transmitting on the same frequency, NOAA-12's 137MHz band signal (usually



Fig. 5: NOAA-15 0826 14 September channel vis-2 showing the morning pass while still dark over the Atlantic.

137.50MHz) will be switched off to avoid interference. Such periods normally last a few weeks. During footprint overlap, the h.r.p.t. signal remains active because no mutual interference in the 1700MHz band normally occurs between satellites.

The first NOAA-12 pass after midnight is at about 0343, so in summer, there will be some low level of illumination seen in the visible channels. The high pass at 0521 is, on this occasion, nearly overhead. A similar swath of illuminated ground will be seen, but with less illumination than the corresponding NOAA-16 pass a couple of hours earlier. NOAA-12 overnight/early morning passes show an interesting seasonal effect. The twilight zone has a characteristic shape that any good satellite predictions program will show. During the summer and winter solstices the northern and then southern polar regions are in daylight. During the equinoxes, we have 12 hours of daylight and 12 hours of night. At the equinoxes, the twilight zone - the boundary where the sun is rising or setting - is almost straight; this can be seen on the various WXSAT night-time, visible-light images.

NOAA-12 northbound passes are over ground during mid-afternoon when the sun is dropping in elevation. Consequently, in summer we see reasonable daytime images, but in winter they are of low contrast - appearing washed out. NOAA-12 provides both h.r.p.t. and a.p.t., so low cost equipment can be used to watch these seasonal changes.

NOAA-14

Although NOAA-14 continues to transmit h.r.p.t. it is not fully functional. Images periodically lose synchronisation, resulting in many passes that provide images with large unusable sections. When synchronised images are received, such as on Saturday 13 September at 0830, they can be of good quality.

NOAA-14's orbit is displaced relative to that of NOAA-12 as can be seen by looking at the respective (typical) start times of the first south-bound pass of the day. The highest morning pass would be at about 0800. By this time the sun is high enough to provide decent visible-light images (when synchronised). The afternoon (north-bound) visible-light images consequently show a low overall ground level illumination, with dark regions further east. As always, the infra-red channels, when synchronised, are of good quality.

NOAA-15

Some really good images - both a.p.t. and h.r.p.t. - have been received from NOAA-15 because of its orbit pass times. A typical first (southbound) pass at 0547 usually provides early morning sunshine and the highest pass (in this case at 0727) can show instances of solar reflections off rivers and seas - a phenomenon known as sun-glint. Afternoon passes are typically received from 1600 and the maximum elevation pass of the day, at around 1800, provides a good indication of the evening's weather.

NOAA-17

The first pass of NOAA-17 after midnight, is really its last north-bound pass of the previous day. It is a far westerly pass, rising perhaps a few degrees above the western horizon. If you have an unusually clear western horizon, with suitable equipment you could receive both a.p.t. and h.r.p.t. and these can be the most interesting of the day's passes - being at the limits of reception and showing regions at the extremes.

The main southbound passes of NOAA-17 happen well

Table 1:

WXSAT	NOAA-16	NOAA-12	NOAA-14	NOAA-15	NOAA-17	FENGYUN-1C	FENGYUN-1D
Class	p.m. primary	a.m. standby	a.m. standby	a.m. backup	a.m. primary	Chinese c.h.r.p.t.	Chinese c.h.r.p.t.
Inclination	98.9°	98.6°	99.2°	98.5°	98.7°	98.6°	98.7°
Orbit/24 hrs	14.1	14.25	14.13	14.25	14.2	14.1	14.1
Time	0041	0343	0534	0547	0940	0620	0709
Max El	10°	15°	7°	16°	23°	30°	11°
Time	0221	0521	0713	0727	1120	0800	0849
Max El	59°	87°	46°	87°	63°	50°	64°
Time	0402	0701	0854	0907	1300	1623	1030
Max El	28°	19°	34°	18°	13°	20°	27°
Time	1036	1331	1529	1537	Start	1802	1705
Max El	7°	8°	6°	9°	13°	85°	8°
Time	1213	1507	1705	1713	2106	1945	1842
Max El	32°	39°	27°	41°	59°	15°	34°
Time	1353	1647	1844	1853	2247		2023
Max El	51°	39°	63°	35°	25°		48°

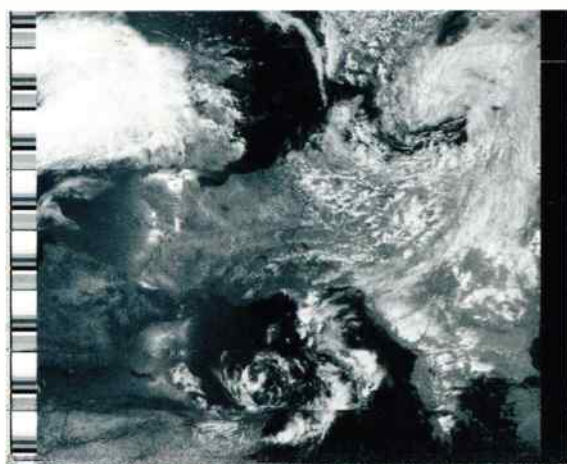


Fig. 7: NOAA-14 1448 7 June 2003 a.p.t. mid-afternoon image.

after local sunrise; it is designated as the primary morning WXSAT. The last pass of the southbound sequence happens during the afternoon. Evening (northbound) passes start around 1930, with the main pass at about 2100. The final pass is often after midnight.

FENGYUN-1C

This older Chinese WXSAT transmits colour h.r.p.t. and the telemetry stream can be decoded using a modified h.r.p.t.



Fig. 8: FY-1D 0909 31 August 2003 enhanced using David Taylor's software.

reception system. FY-1C has a weak signal though a larger dish can compensate for this. Pass times are comparable with those of NOAA-14. The higher elevation passes are better for reception.

FENGYUN-1D

This WXSAT provides a much better signal strength than that of FY-1C. Pass times follow

Getting The Pictures

The theme of this specific feature is the availability of a considerable number of image transmissions from the group of seven polar WXSATs. To receive and decode these telemetry streams you need suitable equipment. Check out 'Info In Orbit' for a summary of the process of getting all of these pictures from the WXSATs.



Fig. 6: NOAA-12 1609 13 September enhanced colour showing late afternoon pass.

Table 2: Frequencies

Polar WXSAT	MHz (h.r.p.t.)	MHz (a.p.t.)
NOAA-12	1698.0	137.50
NOAA-14	1707.0	-
NOAA-15	1702.5	137.50
NOAA-16	1698.0	-
NOAA-17	1707.0	137.62
FENGYUN-1C	1700.4*	-
FENGYUN-1D	1700.4*	-

* c.h.r.p.t.

Credit: All NOAA images are published courtesy NOAA.

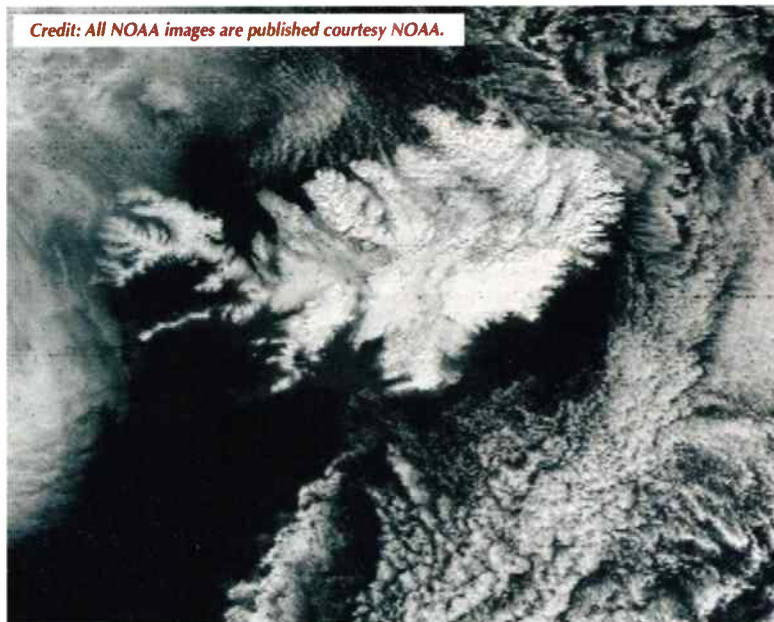


Fig. 10: Memories! RESURS image showing Iceland at 1300 on 16 April - but which year? This Russian WXSAT transmitted a.p.t. for some years before failing.

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



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 CHEQUES/SPREAD 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 CHEQUES/SPREAD 3 CHEQUES OF INTEREST FREE! **£136.33**



DRX-701ES New DAB Digital Radio Tuner

- 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

£249.99 P&P £10

PAY BY CHEQUES/SPREAD 3 CHEQUES OF INTEREST FREE! **£85.66**

Available in Black or Silver



DRX-702ES New DAB Digital AM/FM Radio Tuner

A ground breaking combination of DAB digital and analogue tuner technologies. Beautifully styled with a machined aluminium front panel, cool blue LED indicators and backlit LCD, delivering stunning audio performance and improved usability. Seamlessly integrating the latest DAB technology with hi-fi specification AM and FM radio.

- Advanced FM Features: Fast autotune, using RDS to filter out weak duplicate stations, and then select stations by name – just like DAB. You can even assign names to non-RDS stations.
- Latest DAB Technology: Selectable station ordering, 99 presets, fast autotune, scrolling LCD text and date and time display.

£329.99 P&P £10

PAY BY CHEQUES/SPREAD 3 CHEQUES OF INTEREST FREE! **£113.33**

Available in Black or Silver

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
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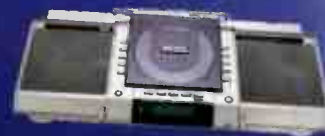
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World Radio History

Timestep's HOTBIRD FOR MSG SYSTEM



Breaking with tradition and due to hardware failure, it is now possible to receive WXSAT images from the new *MSG-1* satellite relayed via broadcast satellite *HotBird 6*. Lawrence Harris examines the package offered by Timestep to enable reception of these transmissions.

For many years, the standard equipment required to receive signals from WXSATs has included an antenna (for either the 137 or 1690MHz band), a receiver (for a.p.t., h.r.p.t., WEFAX or PDUS) and some form of decoding system. The WXSAT scene and the fascinating pictures receivable from many satellites are regularly discussed in my 'Info In Orbit' column. This review covers the most recent addition to the hobbyist's hardware inventory for WXSAT monitoring - *MSG-1* pictures being transmitted from the *HotBird 6* satellite, for which Timestep's satellite television reception system, including the receiver card, has been designed.

HotBird 6, like the ASTRA satellites, is one of many satellites transmitting television and data channels from geostationary orbit beaming at Britain and Europe, to untold millions of users in its region of coverage. The sequence of events that led to the use of *HotBird*'s EUMETCast system has already been told. It started with the unexpected failure of a solid-state amplifier onboard *MSG-1* during a power-up test. The concern that resulted was that the powering up of the remaining solid-state amplifiers might result in further failures that could cause significant, possibly unpredictable consequences. The decision was therefore taken by EUMETSAT to use an alternative transmission mode to disseminate image and other processed data received by *MSG-1*'s imaging systems, to earth stations, using a transponder on *HotBird 6* instead of using *MSG-1*'s own transponder - as originally planned. At a stroke, anyone with a fairly standard satellite television receiving system could, in principle, tune into *HotBird* and receive data from the telemetry transponder. It is almost as simple as that. To receive actual data, rather than mere television, some reasonable reception standards have to be achieved and you need a computer. The best solution to these variables is to buy a complete system 'off-the-shelf' that has been tested thoroughly, this is where Timestep's new *MSG-1/HotBird 6* system comes into the equation.

What Is Required?

For *MSG-1* data, the total system required to produce images comprises the hardware to receive and process the signal into data files and software to convert these files into images. This review covers the hardware package retailed by Timestep. The reception/processing computer and software must be obtained separately - as must the approval by EUMETSAT and the UK Meteorological Office. Fortunately these things are not complicated.

Since May, many experimenters have shown just what can be achieved using relatively small dishes and combinations of computers. There is, however, much to be said for following or improving on the official recommendations. The reference specifications for *MSG-1/HotBird 6* reception were drawn up by EUMETSAT after extensive tests and include specifications for the receiving system (dish size and electronics), together with the computer system required for effective processing. These are as follows:

Dish - Satellite off-set antenna, minimum diameter 0.85m.

Computer - This specification was originally issued
- 1.5GHz CPU, Pentium 4 (or faster)
- 512MB RAM
- 40GB hard-disk 7200r.p.m.

5VPCI bus (compatible with the recommended graphics card, monitor, keyboard and mouse).

The specification is taken from *MSG1 EUM-TD15.pdf*, a document published by EUMETSAT - available from their website www.eumetsat.de/ - that details the specification of the hardware required for *MSG-1* reception. A later suggested specification has upgraded the CPU speed to 2GHz. My personal experience has been that a 2.4GHz CPU with 1GB of RAM can keep up with the intensive work required in a single-computer reception/decoding situation. However, this discussion is dealt with separately in my monthly column. I'll add that I strongly recommend a dual-computer reception/decoding system for this work. In this preferred system, one computer receives and stores the satellite data files, a second computer takes the files via a network connection and processes them. The load is then shared.

Card (receiver) - DVB PCI Sat Receiver card - TechniSat SkyStar 2.

EUMETSAT comments: "The TechniSat SkyStar 2 is a PCI plug-in board containing a complete DVB Receiver. It comes with driver and software for *Windows 95/98/NT/2000/XP*. The current version of SkyStar 2 is only compatible with a 5V bus. The TechniSat SkyStar 2 card is recommended for EUMETCast reception equipment. Other makes of DVB may operate successfully but, of those tested, SkyStar 2 was chosen by the telecommunications provider T-Systems as the most effective."

That completes EUMETSAT's *MSG-1/HotBird 6* reception specification. The Timestep *MSG-1/HotBird* system offers a selection of required items so that if, for instance, you already have a dish that you believe you can use, that could be omitted from the list. Personally, my preference is always to buy a complete system where possible.

If you merely wanted to use the card as a simple TV display system only, the computer specifications are, by today's standards, minimal: Pentium III, 500MHz processor with 128MB RAM, and most current Operating Systems, including *Windows 98SE, ME, NT and XP*. Although the TV display software will work with this relatively low specification, for our purposes, this is way too low.

The Package

A lightweight, rather large flat pack was delivered and then carefully opened. The dish, LNB, feed with fittings and the PC card receiver and software were all present and well protected by wrappings. The LNB converts the 11GHz satellite signal down to 1GHz, then amplifies it ready for the receiver card. Grandson Joseph was very excited to see the dish because he has already seen the h.r.p.t. dish outside (the one that moves!) and the WEFAX dish, so he knew all about them. We located all the bits and pieces and identified them with the diagram sheet that was included.

Construction

Fitting the feed arm and LNB was straightforward, with the single exception of a plastic fitting. There were two plastic fittings included for the LNB and one was definitely not required. After some thought and an exchange of E-mails with someone who had already performed this construction, I concluded that the surplus fitting was included for a different size of LNB. In less than an hour, the unit was



Dish and LNB - various

outside.

I already had a mount for the dish; you may need to ensure one is included. The ground mount is also easy to assemble. The bolts are fairly large and can be gently tightened with a suitable spanner. If you want to add some corrosion-free years to the system, wipe the bolts and nuts with an oily rag, or smear them with car servicing grease - (*Copper loaded grease such as Copperslip is ideal for this purpose - Ed*). I have found this to be very effective. The dish has pre-drilled holes that allow the supplied metalwork to be fixed to the curved surface at the back - see **Fig. 2**. It is finally adjusted by setting the angle (elevation) of the dish. At this stage, it is ready for cable connection.

Having a WEFAX system in operation, I already had a considerable amount of good quality cable, with another large batch from my unused PDUS (high resolution images from *METEOSAT-7*) system. Consequently, I did not need more cable. If you are setting up a new system you may wish to include sufficient low-loss cable in your order - see the price list.

Using low-loss 50Ω cable, I fitted new F-type connectors to the dish end, sealing the connection to the LNB with self-amalgamating tape. This is easily obtained from most radio dealers advertising in *SWM*. The cable was already fed into the house and the connector was clean and functional.

Installing The SkyStar 2TV Card

The next job is the fitting of the PC card. You may have already fitted one of these but for those who haven't, the first thing to do is to shut down the computer. Fitting a card is not a difficult job but, it requires certain precautions. Disconnect from the mains supply and then remove the main case to get access to the motherboard. Locate the PCI slots and note which ones are occupied. There is a pictorial description of this process in the manual on the CD that's provided with the card. Ideally, you should use a slot that is isolated - that is, has no card immediately to either side. The card may get hot in use so air circulation is vital. Some people have even added a fan to cool the card further. If you have no clear slot, consider re-positioning those present. You may have a video card and sound-card installed. Your receiving PC is unlikely to need a sound card if it is dedicated to *MSG-1* reception; it can be removed if required to free up a slot. Most computers have four or five PCI slots so with minimal re-positioning you should be able to ensure that one slot has a decent gap on either side. Before handling a card, ensure that you are free from static electricity by resting your hands on any of the grounded parts of the computer. At this stage it is isolated from mains earth because you've disconnected the power lead!



If you intend using a previously unused slot first remove the blanking tab from the back panel. Avoid touching conductors on the card and grasp it by the edges and then very carefully insert the SkyStar 2TV card into the slot. PCI slots are polarised - they have a design fitting that should stop you inserting them in the wrong position. The card should be firmly seated so that the gold connectors are fully inserted. The screw hole should then line up with the hole on the computer's locating rail where the fixing screw fits. Install the screw and replace the cover.

When re-assembly is complete, re-connect the fittings, the keyboard, mouse and any other cables, including the new satellite cable. The F-type connector on the cable from the LNB can be fitted into the socket on the back of the PC card and then the retaining nut carefully tightened to make a firm connection.

DVB Software Installation

The computer can now be powered up. When it has finally loaded the Operating System (I used *Windows-XP*), this should detect the new card and ask for an installation CD. The Timestep system includes the CD with the PC TV card; insert this now. The process worked flawlessly for me; I also installed the programs that were included on the CD. The CD manual describes the process of setting up the programs using the included *setup.exe* application. The TechniSat software enables the card to receive data and TV broadcasts, allowing you to monitor channels from many satellites - when the dish is aligned. For *MSG-1* data, we want to receive *HotBird* satellite television. We can check the various channels on offer from *HotBird* and then reconfigure for the *MSG-1* data channel.

I followed the instructions provided by EUMETSAT, added *HotBird 6* to the satellite list, and then meticulously edited in the required settings. Having set up the software, it is then dish wagging time to locate the satellite. Before



starting on the physical location of the satellite signal, re-check your software settings. This review concentrates on the effectiveness of the receiving system so it does not include a detailed description of the setting up process required for *MSG-1* data.

Dish Adjustment

You could test the system out on an *ASTRA* satellite before looking for *HotBird 6*. The SkyStar card comes with these channels already programmed, so to validate the system you could select an unencrypted one and then get searching! I didn't do it this way. I decided to go straight for *HotBird 6*. I programmed in the transponder frequency and other data, as described in the EUMETSAT publication, and arranged for my wife Marion and grandson

Joseph to monitor the signal strength. This is indicated as a red (no signal) through yellow (some signal) to green (good signal) with a percentage level. Using the general direction of my wall-mounted *Astra* dish as a guide, I started with the *HotBird 6* dish roughly positioned. The elevation setting was made based on my latitude. The search basically involved a slow sweep across part of the sky followed by small adjustments up, and then repeating the scan.

This search is tedious, but has to be performed whatever system you use. You can obtain satellite finder devices that should make life easier - for a basically one-off job! It took me about ten minutes before there

was a shriek that the signal level had changed from red. Once the approximate position was found, it was a matter of optimising the direction for maximum signal.

Systems such as this are not generally designed for precision adjustment of elevation and azimuth. They are mostly adjusted by loosening and tightening bolts (for the elevation) and horizontal rotation of the base (for azimuth). Patience and more patience is required. The only problem that I found was whilst adjusting the dish in elevation. The metalwork is shaped to allow bolts to tighten the sides of a shaped groove. If the dish is pointing from the side of the main beam, signal strength can vary as you tighten the bolts, giving an unexpected increase/drop in strength as you adjust the nuts. If this happens, you can pause and try marginally rotating the dish on its mount, in order to maximise the signal. Then the elevation adjustment should be independent of the degree of tightening of the bolts!

When you finally get your signal you are well on the way. Unless you are in a very unfavourable situation, you should try to receive the signal away from trees, branches, buildings and any other physical obstructions. Numerically, try to achieve about 70% or better on the signal strength meter. If the strength varies during period of seconds, the dish may be seeing the effect of branches waving in the wind. If this happens, try moving the dish a few metres elsewhere. Although mine is currently working mostly satisfactorily, I propose to raise it about 2m on a pole to clear occasional ground level obstructions. Optimise the position and then check the DVB viewer on a *HotBird*

channel - included in the package. I looked at the cycling channel - and decided it was not for me!

Special T-Systems Software

After dish alignment using the DVB software, the T-Systems' *Tellique* software is installed. It replaces components of the TechniSat software when you install it. Turning the DVB card into a channel through which files are received from



LRIT - MSG-1 channel 15 (3) infra-red © EUMETSAT 2003



HRIT - MSG-1 Mediterranean HRV image 23 July 1230 © EUMETSAT 2003

EUMETSAT and stored on your computer.

To receive *MSG-1* original data files, you must have the T-Systems (*Tellique*) software installed. This software can be obtained from EUMETSAT at moderate cost - 60Euros. It must be installed according to the instructions supplied. When you register your wish to receive the data and have completed the registration form, you should be accepted and receive an E-mail from EUMETSAT giving you your password and user name. These are entered into the *Tellique* software - following EUMETSAT's instructions in the file listed earlier. Your personal reception will be enabled by EUMETSAT and the software should allow the files to reach your system. When every setting is correct, the data coming from *MSG-1* via *HotBird 6* should be stored as a set of files.

Fine - but you also have to have software to decode these files to produce the images! The choice of software for producing images from these files is currently limited - because this situation was never anticipated. Discussions on decoding software are outside the scope of this review but those monitoring the Internet mailing forums or reading my column regularly will know that David Taylor has produced a program for this purpose.

The Pictures Flow!

Your permission to receive data from *MSG-1* means that if you receive the data you can see it. The permission itself does not cause the files to appear as images. To produce the end result I used *MSG Data Manager* to convert the files on my receive computer into images stored on my processing computer. I receive both *HRIT* and *LRIT*. *HRIT* will replace *PDUS* in due course and *LRIT* is a generation ahead of *WEFAX*. My system works extremely well and the dish size provides some insurance against possible hardware degradation over time. A couple of sample images from my system are included. The picture (data) flow is very high. We see some 3GB of data per day, possibly more, possibly less depending on your settings.

Conclusions

At the time of writing - late July - there are a number of outlets where a *HotBird* satellite television system can be bought, but my personal preference would always be to buy from a specialist dealer who is familiar with the somewhat unusual application that we have! If you ask a dealer listed in the back pages of a newsagent's magazine rack about whether their system will reliably receive the *EUMETCast* telemetry stream from *HotBird-6*, I suspect that you will get a blank look! Ask *Timestep* and you are likely to be told the relative merits of different sized dishes and given more information about the long-term reception benefits of using EUMETSAT's specified hardware. I suggest always buying from the experts.

Finally, we must remind ourselves of what this is all about. Previous *METEOSATs* have provided Primary Data images for users. To receive it live you required (still require) a large dish (I used a 1.8m) and a *PDUS* receiver. The *PDUS* images are excellent. The cost and hassle of setting up the system was worth it to me even though many of the images were eventually encrypted. *MSG-1* has provided us with better images at a fraction of the cost and minimal impact on our environment. We can look forward to at least a few years of *HRIT/LRIT* data using this type of system. Enjoy!

Approximate Pricing

SkyStar II receiver PC card v2.6	£45.00 (Retail price £59.95)
SkyStar II USB version receiver Recommended instead of the PC Card	£109.00 (Retail price £159.00)
MTI Blue Label LNB	£12.50
10m low-loss cable F-type plugs fitted	£10.00
Triax 880mm dish (recommended by Eumetsat)	£42.50
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600mm perforated dish	£20.00
Ground stand for perforated dish	£18.00
TechniSat SatFinder LevelMeter, high quality moving coil meter, including 2.5m patch cable	£19.95

My thanks to Dave Cawley of *Timestep* for providing the review system. You can appreciate that I declined to return it!

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in orbit

In this year's weather satellite 'WXSAT Special', I have presented a selection of topics that I hope will be of interest to all hobbyists. The annual challenge is to help kindle an interest in WXSATs for the newcomer who has just picked up this magazine to see what short wave radio and WXSATs are all about, while hopefully remaining of interest to the established hobbyist who may have been collecting images for 15 or more years.



Fig. 1: NOAA-12 4 September 2003 1630 from David Taylor.



Fig. 2: NOAA-15 1832 10 August 2003 from David Taylor.

This year's 'Special' carries three articles: a description of the sequence of pictures that can be received from the polar orbiting WXSATs during a typical 24-hour period, a review of David Taylor's remarkable *MSG-1* image processing software *GeoSatSignal-4* and finally,

a feature that includes - possibly for the first time - virtually every image format transmitted by *MSG-1*.

Weather Satellites - 1960 to 2003 - Still going strong!

A friend of mine recently asked me what we used to do before computers were invented? I told him that for me, that time was back in 1966 when, as a student living in Plymouth, I did not have access to a computer, but a student friend who was doing a mathematics course did - and he was able to compute the orbit of a newly discovered comet for me. When I started my career in 1968, I immediately found myself learning to program an IBM mainframe; this did not lend itself easily to personal projects!

We have been able to monitor WXSATs since the 1960s, although realistically, you had to be a fairly well resourced amateur to pick up and decode the early signals! Although we think of reception of the 137MHz band as routine, widespread use of v.h.f. radio was, at that time, in the future.

Rapid progress in electronics meant the availability from the mid to late 1980s, of the first moderately priced computers. This completely revolutionised the hobby.

I became aware of WXSAT transmissions during the mid-1970s, after a colleague of mine at the Radio and Space Research Station showed me an article about constructing an antenna to receive signals from the TIROS satellites. It also described how to modify a standard kit-type f.m. receiver to receive WXSAT signals.

With these items we could tune to, and try to process, the 137MHz band TIROS-NOAA signal. The resulting extracted (de-modulated) signal could then be fed to an oscilloscope where the persistence of vision should allow a picture to be built up over a period of a few minutes.

In those days (circa 1975) my computing facilities still comprised the mainframe IBM on

which I could request processing time. A submitted job would be run during the next 24 hours and the results would appear in a tray - hardly a system for WXSAT decoding!

Ulrich G. Kliegis of Germany reminded me how the oscilloscope that stored the growing picture was controlled: "X- and Y-deflections were accomplished by D/A (digital to analogue) conversion of the address counters. To avoid fly-back streaks of the spot, the counters worked alternating up and down, resulting in a triangle waveform for both directions, making best use of the bandwidth. The whole thing was controlled by a Z80, running at a whopping 2MHz. The display buffer was mapped into the Z80s address space". So that is what we were doing!

In 1985, my new employers accepted my suggestion that our Information Technology Centre should purchase a complete WXSAT

reception system from a small company called Timestep Electronics, utilising the BBC computers that we already had. A few weeks later this was up and running. I used it to provide students and adults with an introduction to satellites in action. It proved extremely popular despite the incredibly low resolution available from the BBC computer. We could just identify countries, including Britain,

amongst the cloud formations.

During the next decade, the explosion in the growth of home computing enabled thousands of hobbyists to receive signals from several American and Russian satellites. As at mid-June 2003, there are unfortunately no operational Russian WXSATs (the METEORS, RESURS and GOMS), but we can receive the American NOAA satellites and the geostationary METEOSATs operated by the European organisation EUMETSAT.

At the end of this column each month I provide a summary of the frequencies on which we can receive a.p.t. automatic picture transmission (a.p.t.), high resolution picture telemetry (h.r.p.t.), WEFAX, Primary Data and



Fig. 3: Morning sun-glint from early NOAA pass 14 September - Dave Ball.

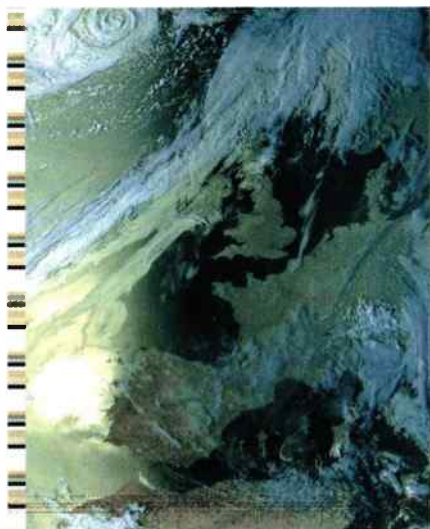


Fig. 4: Evening sun-glint from NOAA-12 1610 13 September - Dave Ball.

the new images from *MSG-1*. This is to show how many potential sources of live WXSAT transmissions are available.

Current WXSATs

All the WXSATs - except *NOAA-14* - have continued to operate as in previous months. *NOAA-14* has a recent record of providing unreliable images due to a failure of the synchronising process, resulting in images that are mostly unusable.

Like others, I have been taking a few passes each week to monitor *NOAA-14's* current status, but apparently missed a mid-August recovery. **Thomas Scheelen** of Denmark E-mailed me in late August pointing out that "In the last two weeks *NOAA-14* had resumed synchronised image transmissions". Thomas noted that *NOAA-14* provides a strong signal and corresponding good image quality.

The next *NOAA-14* pass that I took was indeed good, and it remained so for a few days. Then it failed again, only to resume normally a few days later. This provides an interesting challenge for **Douglas Deans'** weekly WXSAT Status Report, published in the WXSAT groups on the Internet!

American LRIT tests

Darrell Robertson is the Satellite Direct Readout Program Manager of the NOAA Satellite Services/Direct Services Division. On 24 August he reported that "NOAA successfully conducted a live GOES LRIT data transmission test during the second daily 'vacant' time slot in the GOES East WEFAX



Fig. 8: NOAA-17 1103 9 September from Kevin Hughes.

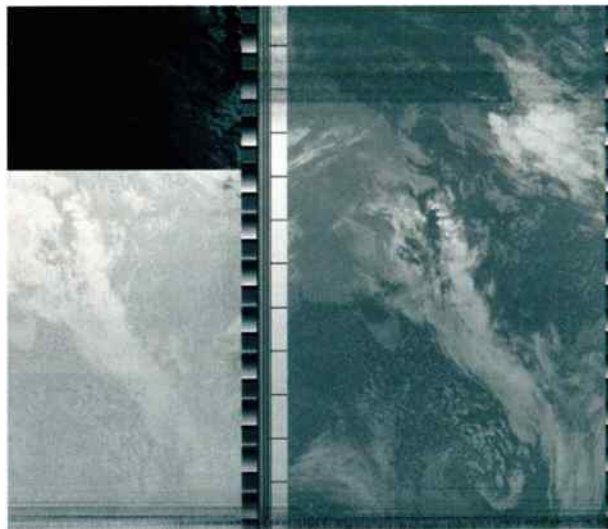


Fig. 5: NOAA-15 18 August from Dave Night in Australia.

schedule".

Future GOES LRIT daily test transmissions are scheduled and daily timeshare transmissions of LRIT and WEFAX are planned to start in early October. It is not often that Europe appears to lead in this field; those of us in the *MSG-1* test programme have been receiving LRIT for some months.

NOAA-N Seriously Damaged

On 6 September, during work being carried out on the *NOAA-N Prime* spacecraft that is being developed and made ready for launch in 2008 for the National Oceanic and Atmospheric Administration (NOAA), the satellite was dropped.

Lockheed Martin, the contractor in charge of the construction and test of the satellite in Sunnyvale, California, together with NASA and NOAA immediately formed teams to investigate the accident and assess the impact on the timeline for launch. The 4m long spacecraft was about one metre off the ground in an upright position, when it slipped from a fixture, as it was being turned from a vertical to horizontal position.

"NASA and NOAA are understandably concerned about this accident, because the *NOAA-N Prime* spacecraft is vital to the continuity of the polar-orbiting environmental satellite program. We are waiting for an assessment of



Fig. 6: Dave's QFH WXSAT antenna.



Fig. 7: NOAA-17 1227 8 September 2003 from George Newport.

the damage from the investigation teams. We will have a better idea of the extent of the impact on our satellite programs when the results are available", said retired Navy Vice Admiral Conrad C. Lautenbacher, Undersecretary of Commerce for Oceans and Atmosphere and NOAA administrator.

NOAA's Satellite and Information Service operates two polar-orbiting operational environmental satellites (POES), that are critical for monitoring weather and climate. *NOAA-N Prime* is now under guard, and Lockheed Martin and NASA have secured the original records.

NASA develops the POES for NOAA on a funding basis. NASA's Goddard Space Flight Centre in Greenbelt performs program management for the development of the satellites. My understanding of the actual cause of this accident, as of mid-September, was that a number of bolts had apparently been removed from the supporting structure without the action being documented.

METEOSAT-5 Running Out Of Fuel

METEOSAT-5 had its Indian Ocean Data Coverage (IODC) work extended until the end of 2005, but is nearing the end of its life due to the amount of fuel remaining. The satellite's position is adjusted from time to time, 0° inclination being the perfect (and rarely achieved) location.

By the end of 2002 its orbital inclination was a significant 5.4°, and, due to low levels of hydrazine fuel, it was no longer possible to

perform inclination correction manoeuvres. There was about 5.1kg of fuel remaining, but 4kg are required to de-orbit the spacecraft at the end of its life (for safety reasons). By then *METEOSAT-5* will be about 14 years old. (Information courtesy of John Tellick of RIG).

Correspondent's Pictures

How quickly the days of summer fade into autumn. The fully illuminated visible-light images of the mid-day *NOAA-17* and *NOAA-16* passes have reduced almost to a level where a touch of image enhancement is useful. Personally, I welcome the shorter days because



Fig. 9: NOAA-17 10 September Hurricane Isobel from David G. Brooks.

my other hobby is astronomy, and the longer nights are therefore useful. The evening infra-red images from MSG-1 have become an essential monitoring requirement for me. Several correspondent's pictures illustrate these notes.

David Taylor operates an a.p.t. reception system and, not surprisingly, processes his images using SatSignal! He sent Fig. 1 with the comment "It reminds me of the classic weather forecast statement: "A depression just off

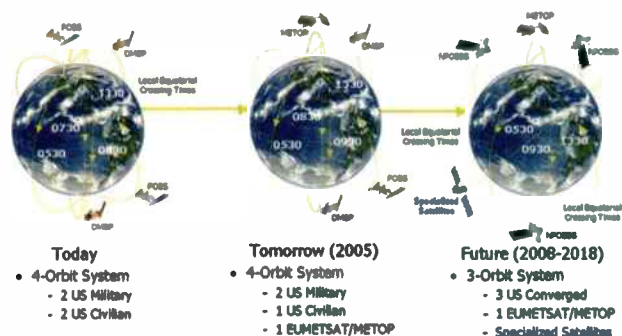


Fig. 12: NOAA-DMSP Satellite Convergence Timescale.

Iceland...". David's image shows the front approaching Britain in early September. David received the image in Edinburgh using a Paul Hayes QFH (quadrifilar helix antenna), a RIG RX2 receiver, and processed by his own SatSignal. Figure 2 shows the storm clouds which brought a dramatic end to the heat wave for Britain and France.



MSG-1 high resolution visible-light image. Eumetsat 2003.

In my article on page 29 about receiving images from the polar orbiting WXSATs during a typical 24-hour period, I mention the dramatic effect of sun-glint, the reflection of the sun off the surface of stretches of water. To catch the sun at the right angle, a WXSAT has to be in the right place and passing at the right time.

Dave Ball sent me two images: Fig. 3 shows morning sun-glint stretching from the North Sea all the way down the Atlantic past North Africa.

Figure 4 shows a NOAA-12 late afternoon pass in mid-September. The picture captures perfectly the sun-glint reflection off the Atlantic ocean seen by the WXSAT's sensors at this time.

Dave Night posted a picture taken from his WXSAT station in Australia where he has monitored the NOAA satellites. His picture from NOAA-15 - see Fig. 5 - shows the switch-over from the visible-light channel to the near-infrared channel during the satellite's passage. The eastern coast of Australia can be seen in the right-hand, infra-red image. I have slightly



Fig. 10: DMSP 14 August 0121 (before blackout).

enhanced image contrast for publication. Dave uses a quadrifilar helix antenna, seen in Fig. 6.

George Newport

continues his active monitoring of a.p.t. transmissions. He uses the WXTOIMG program to process his images, including Fig. 7, received using his Paul Hayes QFH antenna feeding a Timestep Proscan receiver plus pre-amp.

Kevin Hughes sent Fig. 8, received from NOAA-17 during the presence near Britain of another

high pressure area. Clear skies over western Europe enabled some really good a.p.t. images to be received.

David G. Brooks has been imaging many of the tropical storms and hurricanes from his Barbados station. Hurricane Isobel was giving cause for concern during mid-September - see Fig. 9 - when he noted: "When you look at that eye, how big it is now - some 80km wide - the island Barbados that I live on is only 34 x 32km and could fit in there a few times over".

Barbados that I live on is only 34 x 32km and could fit in there a few times over".

North American Blackout

Dramatic pictures were received by the Defence Meteorological Satellite Program (DMSP)

satellites during the August blackout that hit eastern America. NOAA made pictures available from satellite images taken before and after of the historic blackout of the Northeastern United States, that plunged millions of people into darkness.

NOAA processed the night lights data taken by the DMSP satellites, operated by the Department of Defence (DoD) program run by the Air Force Space and Missile Systems Centre (SMC). The DMSP designs, builds, launches and maintains satellites monitoring the



Fig. 11: DMSP 15 August 0103 during blackout.

meteorological, oceanographic and solar-terrestrial physics environments. The satellites are comparable with the NOAA WXSATs, and the two programmes will be merged later this decade.

DMSP satellites have been collecting weather data for US military operations for almost four decades. The National Performance Review that was initiated during the Clinton Administration reported that converging the Department of Defence and Department of Commerce polar-orbiting systems would result in a more cost effective and higher performance integrated system. As a result, in May 1994, a convergence plan was submitted to the US Congress and Fig. 12 shows a graphical presentation of the resultant convergence plan.

Frequencies - high and low resolution image telemetry.

a.p.t. (automatic picture telemetry - polar, low resolution images)

- 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-12s a.p.t. may be switched off.
- METEOR 3-5 (Russian) failed.

h.r.p.t. (high resolution picture telemetry - polar images)

- NOAA-12 and NOAA-16 transmit h.r.p.t. on 1698.0MHz.
- NOAA-14 transmits on 1707MHz.
- NOAA-15 transmits on 1702.5MHz.
- NOAA-17 transmits on 1707MHz.
- FENGYUN-1C and -1D transmit on 1700.5MHz.

WEFAX: METEOSAT-7 (geostationary) transmits WEFAX on 1691 and 1694.5MHz and Primary Data on 1691.0MHz.

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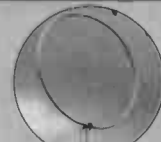
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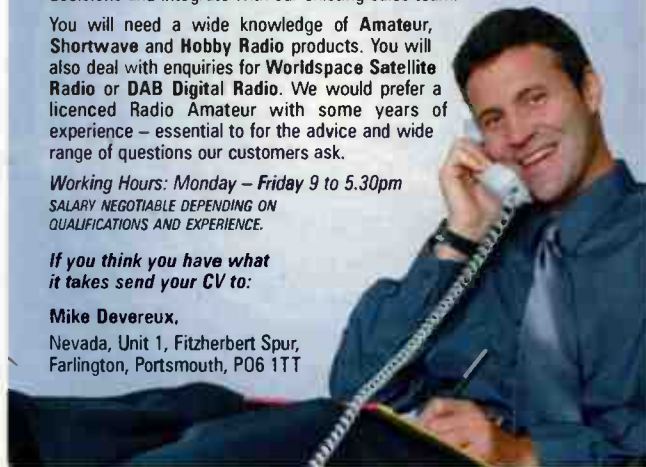
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Our man Hardy attended the recent Gatorade IronMan half triathlon challenge in an official capacity. The event turned to be out a success in spite of Clive's involvement.

Some people are just mad! Stark raving bonkers! Devoid of all sense, almost beyond hope. But not beyond shelling out £150 to spend a few hours on a Sunday in August doing a bit of swimming, bike riding and running centred around Sherborne Castle in Dorset. All with the hope of doing it all again in Hawaii as the prize! So, who were these insane types? They were the thirteen hundred plus entrants to the Gatorade IronMan half triathlon challenge, an event which took place on August 31 on a course of over 112km. Swimming for 1.92, cycling for almost 90, then running for nearly 22km. Pure hard work, and I was there amongst them.

I was up before the crack of dawn to travel across Dorset for a briefing at 0500. I wasn't a competitor, but one of the team that supplied and operated the radio communications for the event with RAYNET, the Radio Amateurs emergency NETWORK.

For 50 years groups of radio amateurs all over the country have been working alongside local emergency services and other organisations with radio communications at major incidents. Way back in 1953 radio amateurs assisted with radio communications during severe flooding of England's east coast. After the event they realised there would be future needs for their skills and equipment, and so

The look of intrepidation before the 2km swim, 90km hike, 22km run.



Swim - Over 5000 spectators came to watch at the Castle in Sherborne.



© Francis Cree & Martin Poynter-Smith.

RAYNET was formed. Now there are groups in every county.

It may seem strange in this day and age that there is a place for amateur radio at the scene of major disasters but RAYNET can set up radio links and provide the personnel to work them that will free up the emergency services to perform their primary function - the protection of life. The importance of amateur radio's contribution to these events is recognised in the licence conditions. Fortunately, major disasters are rare but that doesn't mean that RAYNET is inactive. Quite the contrary, RAYNET maintains its skills by providing radio communications at many large events such as charity walks, cycle rides, and in this case, the Ironman Triathlon. If you're wondering why the organisers of these sort of events call on RAYNET to help, then ask yourself who

else could do it? Regardless of the fact that the cost of employing anyone to do the job would be prohibitive, where else can you find a large enough group of people with the necessary skill and equipment to provide the radio coverage and message handling for a sporting event such as this? Outside of the crown services, who have other priorities, you'd be very hard pushed.

Back To The Track

Due to the size of the Ironman event and the fact that it wasn't the only commitment for RAYNET that day, amateurs from several RAYNET groups joined forces with Dorset RAYNET to cover IronMan. They even 'roped in' people like me just for the day. Although quite a few of my amateur friends are RAYNET members, this was my first direct involvement with RAYNET in action. My task was the liaison between RAYNET Control and the race officials.

The running and swimming at Sherborne Castle was within an area of a couple of square kilometres, but the cycling on public roads was over a course, the farthest point of which was over 20km from the main arena. So what was needed was communication with the whole route including regular updates of the locations and identities of the leading competitors. Also required were links to the four St. John Ambulances providing medical cover. With some nice hills on the cycle route to get in the way of radio signals it was clear that coverage couldn't be achieved with a few hand-held radios. So how was it done?

More Effort

The main event area was in the grounds of Sherborne Castle about 60m a.s.l., fairly level and open. Coverage of that was easily achieved using hand-held radios on 433.775MHz.

The cycle route needed a little more effort. Although the terrain was quite hilly and the distance from end-to-end was about 20 kilometres, the highest point on the circuit was very conveniently located in roughly the middle of the route. Up on that point, known as Revell's Hill and some 260m a.s.l., G8RPI parked his Land Rover equipped with pump-up mast, collinear and Icom IC-2350. This gave



Richard Allen - Team TRI UK GATORADE - Top Brit Finisher (2nd Overall) on the run.



Richard Allen - Team TRI UK GATORADE - Top British Finisher (2nd Overall) on the bike.



Cyclist heading through Dorset countryside.



© Francis Crees & Martin Paynter-Smith.

coverage of the route using both v.h.f. and u.h.f. but due to the terrain, there was no communication with RAYNET control back in the arena. Not a problem. The IC-2350 has the facility to repeat cross-band. What it receives on v.h.f. it transmits on u.h.f. and vice versa. The RAYNET operators on the route used hand-helds on 144.650MHz. The signals from those hand-helds were received by the Icom and re-broadcast on 458.500MHz. But as I said before, the signals from G8RPI didn't reach RAYNET control in the main arena. The solution was to put another Icom 2350 in a box, powered by a lead acid battery and connected to a collinear on a 10m mast, on high ground overlooking the main arena. That station could receive G0API's signals on 438.500 and re-broadcast them on 144.675 which RAYNET control could receive. In this way RAYNET control was in contact with all of its personnel, either on v.h.f. or u.h.f. across the entire course.

Setting up repeaters usually involves much bureaucracy, but RAYNET has the authority to set up temporary links like the ones used during the IronMan Triathlon.

RAYNET operators were placed at ten points along the route. Because the cyclists travelled the course twice and part of the course was within the castle grounds, only 42km of road were used. Nonetheless, there was still a fair gap between some points. The course used most of the two main roads between Sherborne and Dorchester and the main points were at critical junctions where the route left or regained the main roads. Signs put up early that morning warned anyone trying to access the roads from minor junctions that the roads were closed. Surprisingly, or so I thought, was that traffic was allowed to flow in the opposite direction to the cyclists on most of the course. Fortunately, none of the competitors collided with oncoming traffic, so my concerns didn't materialise.

As well the static units around the cycle route, the organisers asked for RAYNET to provide comms with the cars that would be leading the first male and first female

competitors. Had RAYNET be given more than the hour or so notice before this was required it might have been done using APRS (see SWM December 2002). However, despite the short notice Dorset RAYNET supplied the operators as requested!

A couple of mobile RAYNET operators on motorcycles were able to move up and down the route to keep an eye on things, and act as tail-end Charlie behind the last rider when parts of the road were re-opened to normal traffic.

The good location of the second repeater overlooking the main arena was also shared by the Police control vehicle. Similar to RAYNET, the police used u.h.f. hand-held radios at the main site and set up their comms vehicle to provide a cross-band link onto a v.h.f. frequency giving access to county wide coverage via the main hill top sites. This enabled the police units beyond u.h.f. range of the comms vehicle, such as the motorcycle escorting the cyclists, to access the radio net by v.h.f. from anywhere within the county.

To make sure I knew as much about what was going on I equipped myself with a police u.h.f. hand-held transceiver, (Dorset currently use the Motorola MT600 - some with MASC encryption. Early 2004 will see their demise as the Airwave digital trunked radio system will be rolled out in Dorset over the first few months of the year). It was useful to have access to more than one radio net as



© Francis Crees & Martin Paynter-Smith.

sometimes there was so much traffic on the RAYNET channels I could only obtain the position of the front of the cycle race from the police motorcycle. I used the callsign 'Raynet Liaison' for the police channel and my own call on the amateur frequencies. The inter-agency communication was also enhanced by the fact that the operator in the police control was also a radio amateur and RAYNET member.

Fortunately, I had the assistance of my wife **Chris M3SHE**, who handled much of the u.h.f. comms between us and **Bob G6DUN** back in RAYNET control whilst I was monitoring the v.h.f. traffic. Having three radio channels to use between us, enquiries to and from the race officials and questions from the public about almost everything - I'm convinced that the wearing of fluorescent yellow and carrying a radio identifies you to the public as the fount of all knowledge - we were kept pretty busy.



Lucky Berlage of Belgium fuelling on the run.

The cycle route.

Who Else Was There?

St. John Ambulance supplied four ambulances for the event. St. John usually use their own radio comms and control vehicle equipped with radios and pump-up masts unfortunately for *Ironman*, the Dorset St. John control vehicle was busy at the Great Dorset Steam Fair near Pimperne. Even if they'd had that control vehicle, it was uncertain that they could have maintained radio comms with their ambulances along the whole cycle route. So it was over to RAYNET again. Four operators, one for each vehicle, travelled with the ambulances. Only two ambulances were expected, but once again an extra two RAYNET operators were found somehow! St. John Ambulance performed a very important function and were needed at several locations along the route. Happily there were no serious injuries. The worst was within yards of the start of the cycle race when one cyclist ran into the back of another who had stopped to retrieve a dropped water bottle, flew over the handlebars and, on landing, broke a collar bone. Cramp and cuts and bruises accounted for the rest of the injuries, and gave the county ambulances from nearby Somerset as well as Dorset plenty of work to do.



© Francis Crees & Martin Poynter-Smith.

In addition to RAYNET another group using radio comms was an inshore rescue service. They supplied and manned over a dozen safety craft, a mix of canoes and Rigid Inflatable Boats (RIBs) to ensure the welfare of the swimmers. The swim took place in the lake and should have started at 0600.

Unfortunately, when the hour arrived it wasn't possible to see much of the lake as it was covered in mist. Very beautiful to the eye, but the lack of visibility made it unsafe to let anyone start swimming. It wasn't until gone 0700 that the sun had burnt off the mist and it was safe to start. The layout of the lake meant that parts of the swim course were out of sight to the ground based control point, hidden from view by the trees which line much of the bank. With such an important safety of life role it's important for the safety

boats' radio comms on the marine inshore channel to work at all times. To avoid any possibility of communication problems between their hand-helds on 161.225MHz - wet trees can make wonderful attenuators at that sort of frequency - the control point's antenna was placed atop a telescopic mast, well in the clear.

Mixing With The Media

Much of my time was spent with the race commentators who were wandering hither and thither to follow the action. They were equipped with radio microphones - nothing spectacular, just the usual licence free 174MHz stuff - which linked to the public address system around the arena with one frequency between them. The capture effect of f.m. meant that if both had their microphones turned on then only the one with the strongest signal got through. Better than two competing voices blasting out across the arena!

Swim Start - 1500 Athletes head off together.



Television coverage at the main arena was provided by Sky, using cameras and microphones with radio links back to their Outside Broadcast van equipped with satellite links parked in the middle of the site. We weren't able to pinpoint the frequency of the camera transmitters, but on previous occasions their digital output has been found around 180MHz. The size of the rubber duck antenna on the back of the camera was consistent with a frequency in that 'ball park' area.

Surprisingly, one group that didn't have any sort of communication system, radio or otherwise, were the race marshals on the cycle route. This created some difficulty when decisions, particularly about the precise time to re-open roads taking account of the delayed race start, had to be made. Without communication with their controllers the marshals couldn't contribute much to the decisions, and their function was effectively taken over by RAYNET. An unexpected responsibility that was smoothly taken on board. Radio amateurs are nothing if not multi-skilled! It did highlight just how important radio communication is for an event of this type.

The final link in the radio chain probably wasn't appreciated as being one by its user. The leader of the race was followed around the running course by an official on a push bike using a mobile 'phone with hands-free kit to talk back to the commentator. Let's hope he wasn't on pay-as-you-go! I think we'll suggest using PMR446 radios for next time!

The Finish

The event, having started at 0730 was completed by the winner in around four hours. Most competitors finished during the next three hours. This included probably the most well known competitor outside of the triathlon world,

cancer sufferer **Jane Tomlinson** who finished the course in around six and a half hours, a good hour quicker than she'd expected.

From the start to the finish of the event over 30 radio amateurs were involved. They arrived at their points in plenty of time for an early start. The hardware was totally reliable and

a good job was done well. All this under the watchful eye and command of its County Controller Bob G6DUN, Dorset RAYNET had provided the service as required and on time. The people and radios performed as expected. The sun shone and I certainly had an enjoyable day. So much so, that I've now joined RAYNET.

I don't think there's much doubt that RAYNET will be doing the same job next year. Rumour has it, that next year's event will be a full triathlon with all the distances doubled! Whatever happens, I'm sure the radio amateurs of RAYNET will be up to the task.



Jane Tomlinson - finishing.



Francis Tomlinson with...

The joy of finishing.



Amateur

Bands

- **Clive Hardy** SWM, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW
- **E-mail** clive@pwpublishing.ltd.uk

Let's hope that as you're reading this the band conditions, which have been described by some amateurs as 'terrible' for several weeks, are back to a more DX friendly state. Whether or not the conditions have actually been any worse than the season and sun spot cycle are likely to cause is one for the experts. Perhaps the comments tell us how little we know about the factors affecting h.f. communications.

Considering that the human race has only been messing about with radio for around a hundred years it's not surprising that there are huge gaps in our knowledge. There's always going to be plenty of scope for research into the whys and wherefores of radio communication and that makes it such a fascinating subject.

A Day At The Races

Elsewhere in this issue is the story of my day of being a member of the Radio Amateurs Emergency Network - RAYNET. The organisation has been around since the early



Having swum & cycled over 89km Ironman competitors leave the transition area to run a half marathon.

1950s providing radio communication in support of the emergency and other services and I was enlisted to help with the Ironman half triathlon event in Sherborne at the end of August. A good day was had by all. The

article describes the event from a radio amateur's point of view and explains what I learned about some other radio users at the event.

It's A Hard Life

The Atacama Desert, which makes up a good part of the north of Chile, is often described as desolate and 'moon like'

so, it's fair to say that it isn't very hospitable. Nonetheless, a couple of Polish amateurs will be there for the first eight days of November using the rather long callsigns of CE3/SP9PT/M and CE3/SP9EVP/M. Look out a couple of days before for some similar calls, but with the CE3 replaced by CE0Y and the /M suffix removed. Then the operation will be from Chile's southern Pacific Isle de Pascua, better known to most of us as Easter Island. Activity will be from 3.5 to 50MHz

using c.w. and perhaps some p.s.k., RTTY and SSTV.

Just off Tunisia's eastern coast in the Gulf of Gabes are the Kerkennah Islands, where about 20 operators will be active as TS7N between 19 November and 1 December. Altogether they'll be operating five stations - all bands and all modes.

Sticking to c.w. and using low power on all bands, **Bud AA3B** will be using the callsign V26K from Antigua & Barbuda. Dates for the operation are 26-30 November.

Tales Of The Unexpected

There was more than one change in the licence conditions on 26 July when the Morse test requirement for h.f. operation was dropped. Missed by many was the change in permitted power output on part of the 1.8 to 2.0MHz band, more commonly known as Top Band or 160m.

The maximum power allowed output between 1.950 and 2.000MHz went up from 32 to 400W. However, it was all a mistake,

due to a printing error. A notice from the Radiocommunications Agency on the 8 September asked amateurs to stick to the lower power level whilst new corrected documentation was prepared.

Bradford Amateur Caught

According to a recent Radiocommunications Agency press release a radio amateur in Bradford was caught earlier this year transmitting on frequencies outside of the amateur bands.

When what I thought would be a simple enquiry to the RA about his callsign directed me to another, then another agency for an answer and that answer wasn't an amateur callsign, but one of the type used by illegal operators on the 27MHz band raising concerns about the veracity of the report. There's not much doubt that unemployed Darren McMahon, 35 years, of Bradford, was convicted at his local Magistrate's Court on 7 August 2003 for installing and using a couple of transceivers modified to operate on illegal frequencies, but was he an amateur?

We are used to the daily press being incapable of differentiating between licensed radio amateurs and radio enthusiasts and it's a source of great annoyance when amateur radio gets bad press due to inaccurate reporting. But the RA getting it wrong? Surely not!

The explanation is in the Data Protection Act. Because Mr McMahon has chosen to use the option of 'details withheld by licensee's request' against his M3 call it means that, despite his conviction, the RA can't release that information.

The Show Must Go On

One of the most popular radio rallies in southern UK, was the Longleat Rally. Usually held on the last Sunday in June, sadly for the last time in 2002, it was immensely popular. Always attended by many traders large and small, the added bonus of Longleat House and its attractions being right next to the rally meant there was something for everyone. A friendly family atmosphere was guaranteed. Sadly, when the venue ceased to be available, the organisers decided not to look for another. However, a new group has stepped in to rescue the situation.

The Severnside Television Group, which runs GB3ZZ and GB3XG amateur television repeaters in Bristol, has secured a site for a new West of England Radio Rally. Just 6.4km from Longleat in the town of Frome (pronounced Froom), it will be held at the same time of the year as the old rally, the first being on Sunday 27 June 2004, starting at 1000.

The organisers are hoping it will carry on where Longleat left off and there's no reason to think it won't. The venue is a town centre hall used for exhibitions, markets and concerts with plenty of free parking. If the on-site bar and cafeteria don't suit, there's a good selection of interesting shops and pubs in the town. I'll see you there.

For more information visit www.westrally.org.uk



DX

Television

● Keith Hamer & Garry Smith

17 Collingham Gardens, Derby DE22 4FS

Sporadic-E propagation was noticeably more tame during August but intense tropospheric enhancement made up for it during the first half of the month.

Reception Reports

A Sporadic-E opening on August 17 produced an intense seven-hour opening from 0900. Between them, **Peter Barber** (Coventry), **Stephen Michie** (Bristol) and **Simon Hockenhuil** (Bristol) identified Italy (RAI UNO), Spain (TVE-1), Portugal (RTP-1), Germany (ARD), Czech Republic (NOVA), Hungary (MTV-1 and RTL KLUB), Croatia (HRT), Corsica (Canal Plus), Austria (ORF-1), Slovenia (SLO-1) and Slovakia (STV-1).

Late on the 18th, **Peter Barclay** (Sunderland) experienced an Auroral-E opening which produced unstable pictures and severe ghosting from Norway and Sweden. An interesting evening opening into Portugal on the 20th produced RTP-1 on Channels E2, E3 and E4, the latter being the low-power repeater at Valenca do Douro in the north of the country.

Between 1800 and 2000 on the 23rd, Simon Hockenhuil logged Austria, Estonia (ETV), Finland (YLE-1), Norway (NRK-1), Sweden (SVT-1), Switzerland (SF-1), Slovenia, Germany and Italy.

Perseids Meteor-Shower

The *Perseids* raised a few pings, observed on the 8th and 12th by Simon, but these were too weak and brief for any identification. The presence of Sporadic-E often masks the effects of the meteor reflections.

Tropospheric DX

A massive build-up of high-pressure lasting over a week produced some spectacular highlights including Icelandic FM and Spanish TV in Band III. Several DXers commented that Lopik E4 (The Netherlands) attained levels never experienced before.

Tropospheric activity on the 9th wiped out local Channel 5 transmissions on E35 according to Stephen Michie with ZDF appearing at a high level. Dutch local RTV Oost on E22 maintained local strength for a while. Other Dutch outlets were showing the PM5544 and FuBK test cards. Stephen advises that VRT TV1 (Belgium) air 'live' pictures of Alpine resorts with weather information during the morning. Many other countries, including Switzerland, Austria and Slovenia, show similar scenes.

Peter Barclay received several 'firsts' during intense tropospheric enhancement which built up from the 5th. These included (Denmark) E11, WDR (Germany) E46 and E57 and the Dutch regional station, TV Gelderland on E32. On the evening of the 8th, Peter discovered a



Fig. 1: George Garden's TV antenna system.

mysterious encrypted signal co-channelling ARD-1 on E50. Canal Plus Belgique seems the likely source. Severe storms reached the north-east by the 10th, wiping out reception.

George Garden (Edinburgh) was rewarded with the presence of Scandinavian signals on the 7th. Norwegian signals received included TV Norge E34, E51 and E59, TV2 E47, NRK-1 E8 and E35, NRK-2 E41 and an unidentified station on E28 completely overriding Durris!

At 1954, Sweden (SVT-2) E30 was present from the 1000kW Göteborg outlet. By 2155, TV2 (Denmark) was seen on E35 (Nibe) with strong colour and sound with its TV2 logo in the top-left corner of the screen. Several Norwegian FM stations were also heard during the opening.

George's rotatable antenna installation is shown in Fig. 1. The antenna system comprises of a 4-element f.m. array, a 9-element vertical log-periodic for DAB reception and a Triax 100-element wideband u.h.f. array at the top of the mast.

Test Cards

Two countries have introduced a PM5534 test card, modified for DVB-T broadcasts in which the lower black identification band has been extended and features a vertical white line shuttling from left to right.

In the Icelandic version, the top identification 'RUV' remains but the clock is omitted and so has the lower identification 'ISLAND'. The test card from Estonia includes the clock and date. The top identification reads 'ETV TALLINN'.

Peter Barclay received a multi-burst pattern



Fig. 2: Sweden with its second-network 2 logo, received by George Garden.

accompanied by a tone on R1 with the signal peaking to the north-east. This must have been Lithuania as Latvia and Estonia both use the PM5534 test card, and also the FuBK in the case of Estonia. At 1455, colour bars were shown until the station opened for programmes at 1600.

The accompanying music was apparently from a BBC-2 Ceefax tape from the mid 1980s; it used to be the first piece on one of their more lively, musically-inspiring compilations containing some bright jazz/funk tracks, one of which had previously been used on Channel 4 trade tests in 1982!

Tom Crane (Hawkwell) confirms that YT-1 (Ukraine) is using the G-204 test card. It was seen at closedown at 2130 during a recent opening.

Gordon MacKenzie claims the BBC are to replace the low-definition sample Ceefax pages shown during the night with a test card. This is welcome news, as the sample pages offer no useful function, apart from causing eyestrain and allowing the BBC to delude themselves into thinking that they are providing a 24-hour service! Nowadays there are very few TV sets without teletext facilities fitted as standard.

Service Information

Germany: Analogue transmissions in the Berlin area finally ended at 0700 on August 4, making it one of the World's first DTT-only regions. The process has not been too painful for the viewing public as most main household sets were already receiving either cable or satellite. All national analogue terrestrial channels throughout Germany are planned to end in 2006.

Slovenia: 'Videostrani' (a sequence of sample text pages) is shown daily at 0730, 1135 and after closedown at around 0035 by SLO-2. It is also shown before programmes begin at around 0500 and at closedown (around 2230) by TV-3.

Russia: 'Pervyy Kanal', the former ORT network, has a new logo which features a sloping striped '1' inside a dark square. The '1' closely resembles that of the Ukraine!

This month's Service Information was kindly supplied by Stephen Michie and **Lionel Michelland** (France).

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**. You can also contact us by sending an E-mail to **GarrySmith@dx-tv.fsnet.co.uk** or to the SWM address shown at the top of the page. 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: Last month we featured the BBC 'Bat's Wings' Identification Symbol from 1953. This time we have the accompanying Clock caption. 50 years on and the BBC no longer have a Clock caption on any of their Identification Symbols!



Satellite

TV News

● Roger Bunney 35 Grayling Mead, Fishlake, Romsey, Hants SO51 7RU

The last column was too early to include US President Bush 'Stars and Stripes' waving appointment with the US Marines Corp. at their Californian, Miramar base. An informal President made a stirring speech to the men and mixed freely without the obvious company of his usual security. Pictures were received here at 1920 over the 'CNN NEWSOURCE' feeder - 11.563GHz-Horizontal (SR6111+FEC 3/4) on *NSS-7* @ 21.5°W. So all was fine at 1920. About an hour later the lights went out in Brooklyn, in fact the North Eastern seaboard from the Canadian border, West to Ohio and South to Pittsburgh, this major power outage caused by successive 'trip-outs' on their national grid from a fault condition near the Canadian border. A quick check showed that the Globecast teleport uplinking over *Atlantic Bird-1 (AB-1)* @ 12.5°W had gone dark. Back to *NSS-7* which was still alive with 'CNN NEWSOURCE' circuits - CNN operate out of Atlanta, Georgia and their teleport was too far South to lose power. Over a powerless New York City both WCBS-TV and the WNYW-TV news 'choppers' were relaying pictures to their news facilities kept running standby generators. The New York CNN News Bureau was still operational and relayed the chopper feed to Atlanta and their affiliates around the USA would have taken pictures that still retained power. CNN-NY continued on-air with news updates (corner ident 'NY-1') but between updates a degree of studio difficulty was apparent as the crew compiled a power outage profile, relying mainly on 'phoned-in' reports from affiliate stations. The news choppers relayed pictures of people packing the streets tramping homewards - it being late afternoon in NY city. Eventually the Globecast AB-1 bouquet at 11.014GHz staggered back on-air - but even the transatlantic fibre connection would have also been lost for NY area terminations.

Radio Marti - SWM readers will be familiar with this CIA funded propaganda radio station transmitting to its target audience in Cuba. TV Marti is a lesser known 'service' that transmits propaganda into Cuba using a high band (Band 3) transmitter on a blimp some 10,000ft high anchored to Cudjoe Key Florida. The CIA funded TV service being jammed, the latest trick is to uplink the TV Marti programming out of the USA onto the Spanish *HISPASAT 30°W* satellite which in turn downlinks into Cuba using Ku band, for its estimated 20,000 satellite equipped viewers with illegal dishes. I anticipate the Cubans will easily jam the input uplink circuit from the Cuban mainland, this may result in TV Marti being linked into Europe, a secondary hop then accesses the satellite from Europe (which the Cubans cannot jam) for the downlink cross-patch into Cuba. We therefore may see TV Marti content - but if the CIA use a transatlantic fibre patch - we'll see nothing!

On 31 August and Seville v Athletic Madrid was hot news and *Eutelsat W1*, 10°E carried a 3-channel sports bouquet @ 10.989GHz-V (20040+3/4) comprising the main Madrid Match on 1 channel and local rallies from Mallorca and Zaragoza (?). Each channel was clearly identified, a) 'RACING MALLORCA'; b) 'ZAR DEP AT 19:30' and c) 'SEV - AT. MAD 19:30 GMT'. The final match detailed is Seville v. Athletic Madrid possibly intended for Sky Sports - it wasn't scrambled, football fans take note and check this slot again! Mid August and another football match was played out in torrential rain from 'DARRIC' - possibly from the Balkans - another evening match over *W1* - 10.962GHz-H (5632+3/4).

September 6 and 'CBS - TEL AVIV' carried a long VT packaged report on *W2* - 12.556GHz-H (5632+3/4), a Palestinian car had been zapped by an Israeli gunship killing two important politicians. The report was originated in 16:9 widescreen NTSC and ended with a colour bar pattern with ident 'CBS NEWS T.A.'

Roy Carman (Dorking) received a 'SATLINK' downlink *W1* - 12.740GHz-V (5632+3/4) August 19th, a bomb on a packed bus, four weeks later it's still happening.

Alerted by **Alan Richard** (Nottingham) I checked out the downlinks from *Telecom 2D*, 8°W early September. At 12.547GHz-H (6111+3/4) I found a Globecast bouquet with RTG, Conraky, French Equatorial Guinea and MBI, Mozambique with service ident 'GLOBECAST NE ch.1' or '...ch.2' respectively. The former offered varied programming,

news, etc. whereas MBI concentrated on religion. 12.553GHz-V (6109+3/4) was a 4-ch bouquet with identified as 'SERVICE 1' and 'SERVICE 2' both carrying programming for Telediffusions Gabonaises out of Libreville. 'SERVICE 3' gave the TV channel from CRTV, Yaounde, Cameroon. 'SERVICE 4' provided an unknown radio channel. At the top end of Telecom band was RTNC - Radio-Television Nationale Congolaise out of Kinshasha @ 12.746GHz-V (6109+3/4) - RTNC was last seen back in August 2002 during the 'African Nations' conferences on *NSS-7*. All programming was in the French language from several French colonies. The Gabonaise TV channels at times produced a picture quality resembling a multi-generation VHS tape copy - perhaps going to only 1.5MHz definition with dropout, line pulling and other video artefacts! But their appearance on 8°W provided an early Autumn bonus to the usual run of satellite feed material. Apparently a very rare Ethiopian TV had also been seen on the 12.553GHz feeder earlier in September though it hadn't been seen onwards from September 10th. *Europe*Star* @ 45°E also carried an offering @ 11.627GHz-V (1320+7/8), the sudden appearance of these African channels coincides with a major conference in Paris relating to Africa and its problems.

Noting the radio channel in 'SERVICE 4' above, a note from **Edmund Spicer** (Littlehampton) - himself very active with radio LPAMs in Sussex including 'CHR' St. Richards and the RSL 'WICK-FM' - advises that warehouse outlets Macro and Homebase have their respective satellite radio programmes downlinking from *TelStar-12*, 15°W within the 11.501GHz-H (6600+3/4) transponder co-sharing with Loran Skynet and Tech-TV. Mention of 'WICK-FM' 87.7MHz RSL and Edmund notes that the station took the IRN clean feed (for news 'on the hour') from *Sirius-2*, 5°E - 12.111GHz-H (27500+5/6) using an old 900mm mesh dish and 0.7dB noise LNB, reception was perfect.

September 3 is usually remembered for England's declaration of WW2 against Nazi Germany in 1939 but September 3 2003 was the day that the UK balloon attempt to fly into near space was taking place. **Alan Richards** reports, unfortunately as the balloon was filled with Nitrogen a tear became evident along a seam, it deflated and was beyond repair. The September 3rd 'weather window' was the final period that the balloon could fly this year and the flight has now been postponed until 2004. But the media circus were on site for live pictures of the hoped for launch in deepest Cornwall, using capacity over *Eutelsat 2F3*, 21.5°E. Launch was around dawn with inflation a few hours earlier, optimum for the 2F3 early morning pass which offers two windows daily at about 0500 and 1700 when its inclined orbit passes through 21.5°E nominal. BBC downlinked on two frequencies, ITV, SKY, BBC SW and two others including SisLINK and historic news with two feeds running PAL analogue! BBC SW also appeared on the 28°E slot with additional coverage - or as events transpired provided updated news and inquest debate as to 'what went wrong!' The 2F3 feeds used 11.041, 11.11.049, 11.065, 11.081, 11.089GHz-H with both 12.510 and 12.549GHz-H in Telecom band - all 5632+3/4. The 28°E feed ran 10.817GHz-V (22000+5/6).

Sky News have been using *W1*, 10°E frequently though in the past weeks their leased 'BT-TES 35 UKI-407' service identifying as 'SKY TG24' has been appearing regularly. August 25th and TG24 was running colour bars (no programme feed), 1715 - 11.099GHz-V, September 8th and once more but 11.081GHz-V (always 5632+3/4) with no picture modulation - curiously that same evening TG24 was lurking with 'MOBILE LINKS' on 10.989-V (6109+3/4) - no pictures and 'FLY ATLAS 1' - 11.090-V (5632+3/4) carrying a live news report in Arabic (but with an English language crew at work). The past weeks have held the UK's press attention with reports of the Dr. Kelly/Iraq weapons enquiry in London, the 10.972GHz-V (4167+5/6) slot over 10°E was carrying early morning live 'street' reports from outside the courts into breakfast programmes.

Finally, for those enthusiasts of the Irish turf - RTE horse racing has been carried over the Globecast bouquet @ 12.5543GHz-H in early September - the parameters not advised but try SR 5632 or 6111 + FEC 3/4 for starters.



Prince Charles and Camilla enjoy the Highland Games at Mey, Caithness (W1).



US Marines base, Miramar, Southern California, President Bush present his fast draw technique (NSS-7).



New York Power outage, WCBS news-chopper (NSS-7).



New York Power outage WNYW news-chopper (NSS-7).



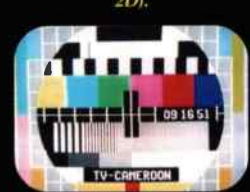
Terrorists blow a Baghdad water main, a fire truck is stranded in the newly created swimming pool! (W1).



Test pattern from the Sky News London sat truck (W2).



Mozambique TV ex Maputo - sports programme (Telecom 2D).



Cameroon TV ex Doula (Telecom 2D).

- **Graham Tanner** 64 Attlee Road, Hayes, Middlesex UB4 9JF
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I understand from various enthusiast sources that the RAF expects to take delivery of another two C-17A aircraft during the final few months of 2003. I have no information about the exact delivery dates from the USA, but by the time you read this, one should have been delivered and the sixth example should have arrived by Christmas.

I have no idea what the selcall codes will be for these aircraft and I would welcome any h.f. reports of RAF flights using 'Ascot 6000' series callsigns, especially if they contain details of selcall codes. There is a list of RAF C-17A selcall codes on page 33 of *SWM* June 2003.

Back in the Summer I wrote an article about the C-17 *Globemaster 3* aircraft and gave some suggestions and ideas as to how you might identify a C-17A by its callsign. In that article I included a listing of selcall codes used by USAF C-17As and explained how they ran in sequence and that the next series of aircraft deliveries would re-use an earlier set of selcall codes. At the time that the article was written, it was only a theory, based upon a single report of a single C-17A flight shortly before I sent the article to the editorial offices.

I am happy to report that the theory has turned out to be correct. The USAF has assigned a block of just 50 selcall codes to their fleet of C-17A aircraft. If you list the 50 codes in ascending order you can match them to the first 50 aircraft and the same set of selcall codes are used by the next 50 aircraft.

My theory was that the third set of 50 aircraft would re-use the same set of codes

again and this has now turned out to be the case. In recent months I have seen several reports of aircraft from the latest batch of aircraft to be delivered and the selcall tie-ups for these aircraft have all been as expected.

For those of you who still have the June 2003 issue, the chart of tail-numbers and selcall codes on page 33 is now proven to be correct.

KC-135 Selcalls

August 2003 *SWM* contains a 'Sky High' special - part of this was devoted to the USAF KC-135 aerial refuelling aircraft. On page 29 of that issue, there is a partial listing of selcalls known to be used by KC-135s and other Boeing 707/C-135 variants.

The article says that the selcall listing represents just a small percentage of the entire C-135 fleet and asks why have so few been fitted with selcall equipment. Well, in fact, a large percentage of the fleet have been fitted, it is just that so few tie-ups are known.

The *Pacer CRAG* program of the late 1990s saw the fitting of various updated avionics (including selcall equipment) to the 'front-line' fleet of aircraft first, followed by the various Air Guard and Air Force Reserve fleets. Nowadays there are very few C-135 aircraft which do *not* have selcall equipment. Having the equipment fitted does not necessarily mean that it is always used, or is always serviceable.

As a rule, USAF aircraft only use the selcall equipment for communications with civilian ATC agencies and none of the Air

Force aeronautical communications networks (e.g., HF-GCS) is equipped with selcall code generating equipment. Furthermore, flights around Europe of the continental USA do not need to rely upon their selcall equipment, so a malfunctioning unit is not much of a concern to the crew.

The real use of selcall equipment comes when crossing vast distances where h.f. is the only viable means of communications (for example, crossing the Pacific or Atlantic oceans). In these situations, a functioning selcall 'box' is almost essential.

As Peter Bond admits in the article, the list of selcalls only represents a small percentage of known selcall codes, however in common with other US transport types there appears to be a limited number of different selcall codes which are used for multiple aircraft.

If you look at the selcall list on page 29 of the 'Sky High' special article you will see that both aircraft 60-0315 and 63-7991 have the same selcall code (JQ-BD). I am aware of at least two other aircraft using this code.

One distinctive fact about selcall codes used by KC-135s is that they all begin with either the letter 'J' or 'K'. Reports of USAF flights with selcall codes starting with these letters are more than welcome, as various other sources can be used to confirm which aircraft operated the flight.

More Space Shuttle News

In the middle of September NASA announced some more news regarding the next launch of the Space Shuttle. Earlier this year they said that the earliest possible date for a launch was in December 2003, but admitted that this date was likely to slip until March or April 2004.

They are now saying that the launch may slip until the latter half of 2004. NASA also plan to use more ground-based cameras for future launches, and even plan to install cameras on the SRB tank to provide real-time images of the launch.

It seems that we may have a longer than anticipated wait for the next Shuttle launch, but it sounds like we will be able to see images of the launch that have never been seen before.



USAF Globemaster.

Scanning

Scene

● **Dave Roerts** c/o SWM Editorial Offices, Broadstone
● **E-mail** scanning@pwpublishing.ltd.uk

With the Airwave digital communications system for the police being 'rolled out' across the UK, keen police monitors are finding that their favourite channels are now silent. One of the UK's largest forces is set to head down the TETRA path later this year. The Thames Valley force are starting on that route this November.

Those of you in north Oxfordshire will be the first to notice that your channels are becoming silent. The system is set to hit Oxford in December with Reading and Wokingham disappearing from the speaker in January. The system should be fully operational in June 2004 with Aylesbury and High Wycombe being the last to go digital.

Having said that, it appears that at the moment most forces are still stuck with analogue comms when it comes to their air assets. The air-to-ground frequencies are 138.01625, 138.08750, 138.09375, 138.100, 138.105, 138.10625, 168.29375 and 138.30625, all f.m. Those not in the digital age yet will still be using the local v.h.f. and u.h.f. channels plus maybe 450.625, 450.675, 451.150, 452.100, 452.150, 452.000, 452.050 and 452.175.

In practice, it's still worth scanning the u.h.f. 450-454 area for this sort of traffic as the aircraft may come up on any u.h.f. channel from time-to-time. Most police aircraft also have access to ambulance and fire service frequencies as well. It's all done using the 'NAT' system manufactured by Northern Airborne Technology.

The NAT is a radio control system mounted in the centre of the cockpit instrument cluster in the 'helo and allows simultaneous monitoring of numerous radio channels. NAT are based in Kelowna, British Columbia, Canada, an area that has suffered horribly in forest fires this August.

Mobile Control Unit

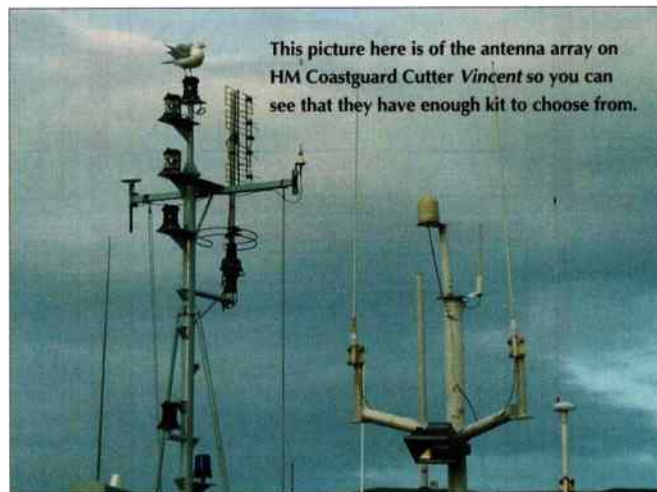
Following on from the visit that I made to the Scottish Ambulance Service at Inverness, I was recently able to take a gander at the inside of their new Mobile Control Unit. Built onto a Mercedes chassis this highly expensive vehicle contains all the equipment required to conduct operations on a local basis.

Apart from the usual radio equipment fitted in all ambulances, the Control houses its

own radio system, computing equipment with on-board mapping, Internet access as well as video briefing and normal office equipment. Staffed by a specially trained crew, this mobile control facility is equipped with a pump-up radio mast.

The unit will run on mains power where its deployment is to a location that affords this facility. Should this not be possible, then there is a hefty generator housed in the rear of the truck capable of providing the required power.

Operator comfort is also catered for with the provision of a pretty meaty air conditioning unit. This vehicle is just one



This picture here is of the antenna array on HM Coastguard Cutter Vincent so you can see that they have enough kit to choose from.

example of emergency services throughout the UK becoming more 'battle prepared' than in the past.

Suicidal Hobby

I was recently first on the scene at a road accident where a loony driver had dumped his old Astra GTE in a ditch after transitting the crown of the road at over 90mph. After ascertaining he wasn't hurt, I gave him a lift to his destination.

Shock had kicked in and he started telling me about his uninteresting life. To cut a long story short, he was keen on the apparently suicidal hobby of paragliding and he mentioned that the drivers of these paragliding 'thingies' use v.h.f. radios to talk with their mates. This wasn't news but he went on to say that in common with some microlight pilots they sometimes use v.h.f. amateur 2m kit to talk with each other. It's much cheaper to buy widebanded f.m. v.h.f. kit than to purchase purpose built a.m. airband equipment at many times the cost of

the ham gear. As they don't need to talk with any air traffic control (*unless they're on the boundary of restricted airspace - Ed.*), the fact that 2m radios are f.m. just doesn't matter. As they are operating illegally they can natter much more informally than if they were on airband.

Matey couldn't recall the exact frequencies (by this time he thought his ribs were cracked) but he did say that they were somewhere on 143MHz. If you see any of these characters aloft, then search in 143MHz and they may well be audible.

Customs & Excise

Also heard from time-to-time are HM Customs & Excise (C&E), albeit they are using some sort of digital encryption that doesn't sound like the APCO 25 protocol that they are thought to have purchased. C&E used to have a frequency of 440.775 f.m. I don't know whether this is still their channel, but I travel the length and breadth of the UK and in the last two weeks I've heard this channel in use with identical noises both in the very north of Scotland and in the south of England near London.

The transmission lengths sound as though they are the equivalent of a conversation and I've received 'em using different hand-helds all over the place. When near the coast the signals seem to coincide with the presence of a coastguard cutter, so maybe they are directing some sort of ops from the ship, who knows? They aren't likely to say - are they?

Mobile Laws

More laws are coming into force to confuse the police and give motorists something else to worry about. This time it's mobile 'phone legislation. It seems that from December it will be an offence for a driver to use a mobile 'phone in a vehicle

without hands-free operation.

Although the legislation doesn't apply to 'push-to-talk' devices or receivers, it has inadvertently done a favour to users of small hand-held scanners. Why? Because from Total garages you can buy a hands-free kit for your 'phone that costs just under a fiver. It looks like a bit of a Heath-Robinson machine, but the core is a small microphone that is popped on the speaker of the 'phone (or scanner) and a small audio amplifier that draws current from the cigarette lighter plug, boosts the volume and outputs it to a small speaker that can be stuck conveniently anywhere in the vehicle.

It looks a bit odd clipped into the air vent on the dash but works fine. Called the Universal Hands Free Mobile Phone Car Kit by DSL it is a real boon for those of us who have a scanner with limited audio output. Even if your receiver is too large to fit in the 'phone holding clip, the gadget can easily be cannibalised to suit your radio. All for under five pounds.

Propagation

forecasts

- Jacques D'Avignon VE3VJA
- E-mail: Jacques@pwpublishing.ltd.uk

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.

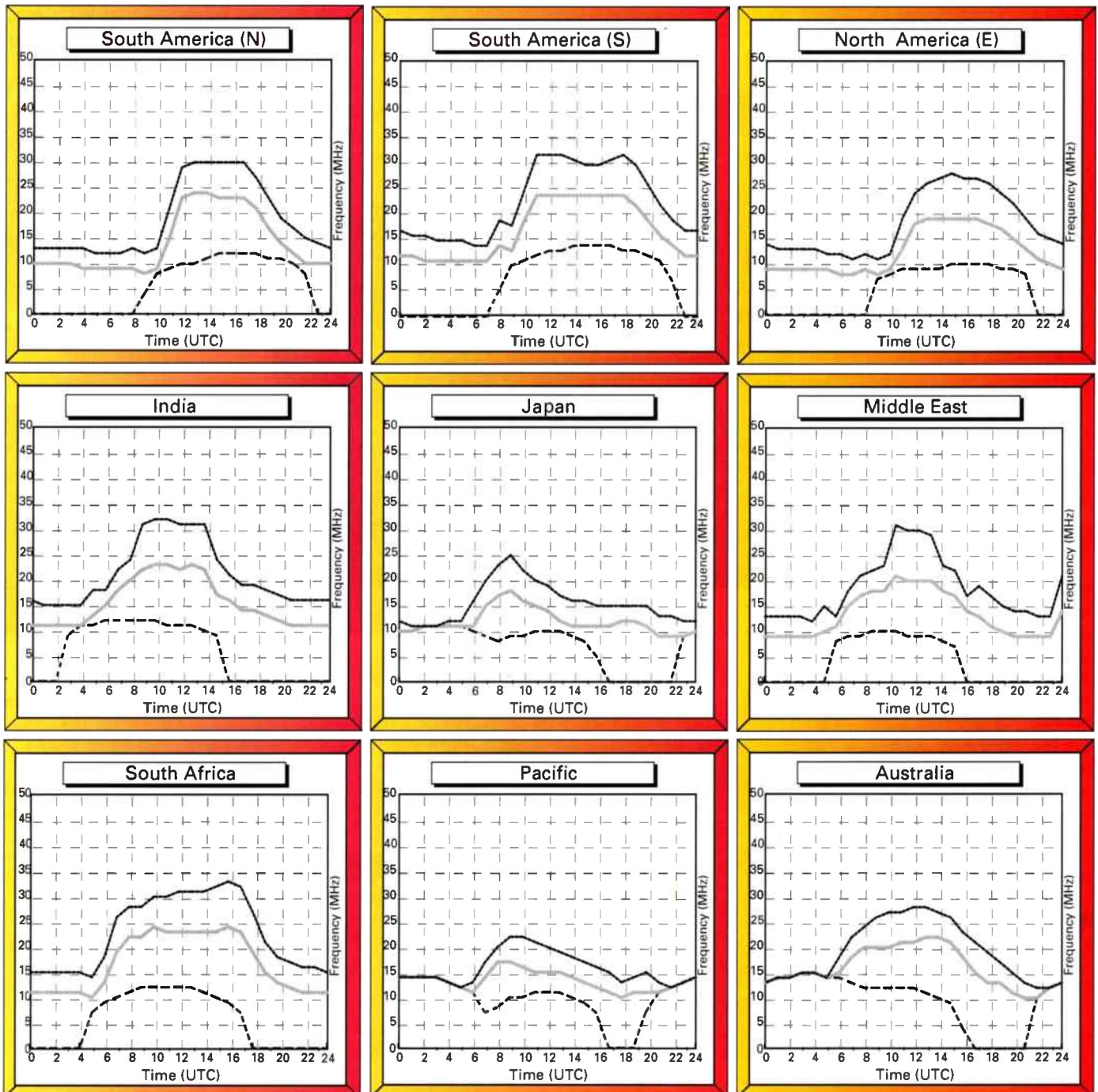
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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.

November 2003
Circuits to London

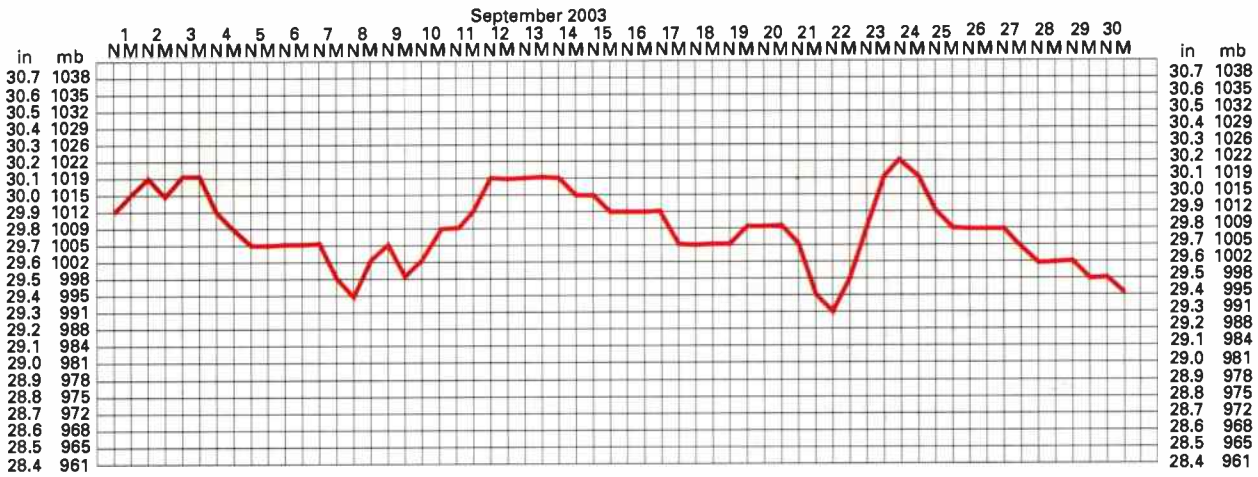


SK9984

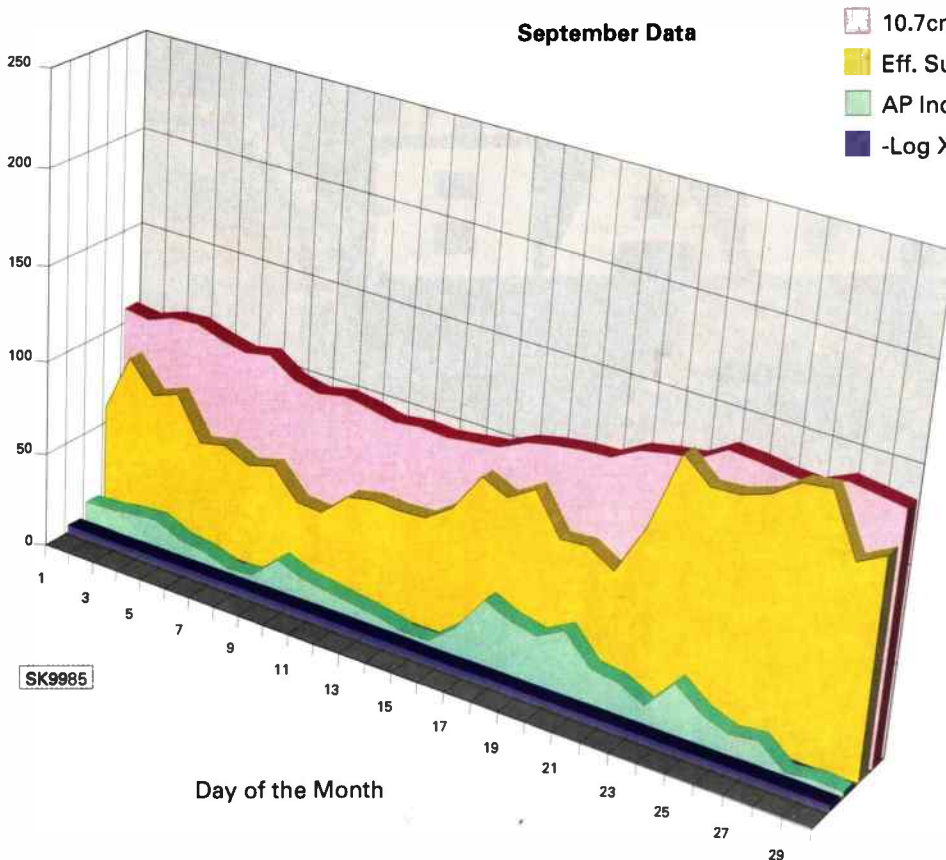
Propagation Extra

● **Kevin Nice** G7LZC/M3SWM,
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Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, September 2003.



September Data



- 10.7cm Flux
- Eff. Sunspot No.
- AP Index
- Log X-Ray

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.

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It's always nice to hear of people returning to the hobby and recently I received a very encouraging E-mail from **Nigel Rushbrook**. Nigel has returned to the hobby after an absence of ten years and started by buying a copy of *Short Wave Magazine*. The good news for SWM's editorial team is that he reckons the current version is even more interesting than he remembers!

The first job for Nigel was to try decoding some c.w. using a freeware program he found on the 'net. This is when Nigel encountered one of the not so good things about modern technology - interference. Nigel's set-up comprises a Sony IC7600 receiver with an old Toshiba laptop. Nothing particularly wrong with the Toshiba/Sony combination - quite a reasonable starter system and I'm sure many listeners have used similar systems. In his note, Nigel asks if there are any standard tips for reducing interference - other than using a microphone!

Noting that he is using a laptop, the first point that comes to mind is the power supply. Most laptop computers used switch-mode power supplies mainly because they are very light so being ideal for mobile/portable use. Unfortunately, many of these units are very noisy, particularly the older ones. It's really easy to see if this is the root cause of the problem - just run the laptop on its batteries with the mains unit disconnected from the mains outlet.

It's important to disconnect the laptop from the mains outlet, because most of these power units are permanently on, so you have to disconnect from the mains to shut them down! If it is the power supply causing the problem, then you have a couple of choices:

a) run the laptop on batteries when trying to decode or -

b) spend more money and lots of hours trying to tame the power supply .

I know which option I'd go for!

The other really important point and this applies to all receiving systems you can manage. The adage: **rubbish in = rubbish out** very definitely applies here! The other point to note about antennas is to make sure both the antenna and the feeder are kept well away from potential sources of interference. Prime candidates to cause interference are power lines, televisions and computers.

Incidentally, if you haven't already discovered it, the best program around for c.w. decoding is *CWGet*. Not only does it work really well but it's free! If you want to give it a try take a look at the DXSoft website at: www.dxsoft.com/

Basic RTTY

Another reader has written asking for help with basic RTTY decoding. In this case, the interest focuses on receiving RTTY weather broadcasts for UK and Europe. At the time of writing the reader was using *TrueTTY* with a

laptop PC. Although *TrueTTY* is a perfectly respectable program, I would recommend changing over to one of the decoding programs that include SYNOP decoding.

By way of a reminder, most of the data transmitted by the RTTY weather stations uses one of the standard encoding formats to carry the data. The SYNOP format is probably one of the most common and certainly carries information that is most useful to the amateur. Although you can manually decode the data, it is an extremely time consuming process and not to be recommended!

To help, modern decoding programs have come to the rescue and packages such as *Skysweeper* and *JVComm32* include full plain text decoding as standard. Both *JVComm32* and *Skysweeper* can be found on the UK Agent Pervisell's website: www.pervisell.com

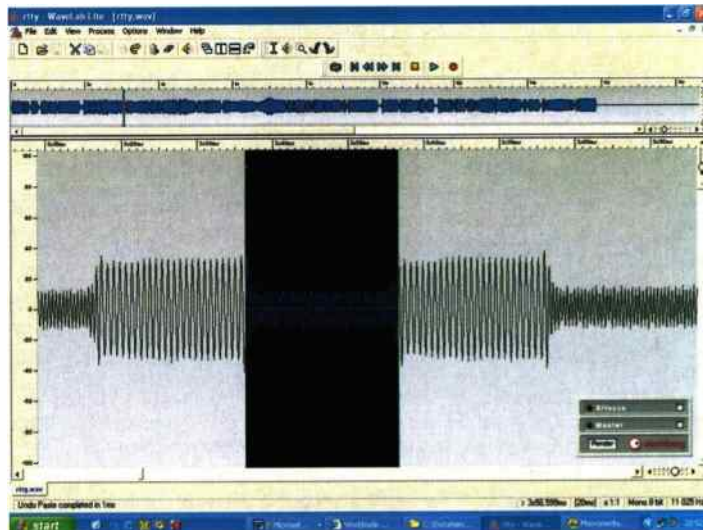
Printer Problems

Since I mentioned the problems with my Epson printer a few months back, I've had lots of other enquiries so thought I'd better give you an update. This 'advice' applies to lots of popular Stylus models and certainly printers in the 740, 760, 860, etc. series. All of these printers have a software head cleaning counter that increments every time you go through the head cleaning cycle. The purpose of the counter is to raise an alarm when a critical number of cleans have occurred such that there is a risk of the surplus ink storage-sponge overflowing.

When the counter hits its critical level, you'll



Steinberg's WaveLab displaying a RTTY signal.



Using WaveLab to measure the period of a data.

find that all the lights flash and nothing you can do seems to get the printer back to normal! At this point Epson expect you to pack it up and take the printer to a dealer for service. However, there is an alternative, as it is possible to reset the counter via software yourself. To carry out this reset, you'll need a nifty software package that gives you access to the printer's internal counters.

You will find the program you need in lots of places on the web so I'd recommend just doing 'Google search' for "sscserv.zip". When you've found the file, unzip it and run the *SSCSERV* program that's extracted. This utility will let you do all manner of thing to your printer, but beware, the program is a bit fragile and is liable to crash if you try and adjust several features at once. I would recommend just resetting the cleaning counter (called Protection Counter) and count your blessings that you have a working printer again!

Don't forget to clean-out the surplus ink sponge or you will have 'yukky' ink oozing from your printer you will normally find the sponge at the front left of the printer chassis.

More Analysis

In past 'Decode' columns I've covered many different analysis tools for examining utility data signals but this month I've discovered a new tool that really makes it easy to freeze and examine a data signal. I came across the new tool through my interest in music and computer based recording. Steinberg's *Cubasis* is one of the standard software packs that's used by many people setting-up their own home studio and I had recently changed over to this system. Not only is the recording software package very comprehensive but it comes with a stack of extras and it is one of these that caught my attention.

The program is called *WaveLab Lite* and is a cut-back version of a very sophisticated digital editing program. Although not as feature rich as its big brother, *WaveLab* feature lots of the same processing algorithms so you get the benefit of a professional class



Latest Version of the MRP40 Morse Decoder.

editing engine with plenty enough tools for data signal analysis. Because the program is designed to be able to handle very large, high quality music files that can run into hundreds of megabytes, utility signals are a real cinch!

As the digital editing program has been designed for musicians rather than engineers, the interface is really friendly and easy to use. Depending on where you get the software (more on that later) installation is usually fully automated. Once installed, run the program and you will be presented with the main window. Use the file menu to open a suitable data file. If you want something to try, take a visit to the WUN Club Digital Sounds page at: www.wunclub.com/sounds/index.html

You should find that the file loads very quickly whereupon you are presented with a dual display. The small window at the top shows a compressed view of the signal, whilst the large main window normally shows a magnified view of the signal. You may also have an **Effects** and **Master** window open, we don't need these, so minimise them using the toggle at the top right of their panels. Zooming the signal is just about as easy as you can get there's no need to set FFT parameters or any of those complex settings

found in some systems. All you do is put your cursor on the slider in the bottom left corner of the display and drag it to the right to zoom-in or the left to expand.

It couldn't really be much easier than that. You will note that the program itself provides a very clean display you don't have to mess with different FFT settings at all. What really amazed me about *WaveLab* was the wonderfully clear and stable display of data signals. Most of the analysis tools I've tried only just seem to be able to handle data signals and any detailed measurement can be quite tricky. I've included a few

examples in the column so you can see for yourself.

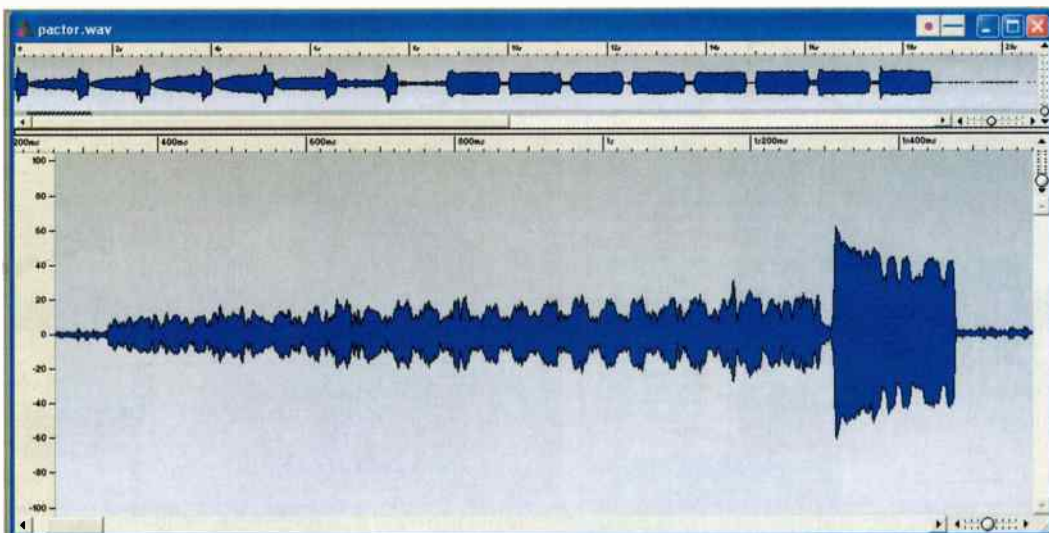
Looking at a standard RTTY signal for example, *WaveLab* can easily show the individual data elements. I also tried *WaveLab* with the faster Pactor signals and again a very clear display was produced and it was easy to zoom-in to clearly show the basic signal waveform. Measuring baud rate using *WaveLab* was really simple as you just had to zoom in to show the data elements, then measure the period of the shortest element. Once you have the shortest element period you just divide this into one to get the baud rate. In the case of the RTTY example the period of the smallest element is 20ms or 0.02 seconds and $1/0.02 = 50$ baud.

I found the simplest way to measure the period of any part of the signal was to use the cursor and left mouse button to highlight the section of interest. When you do this *WaveLab* conveniently displays the characteristics of the selected part of the signal in the bottom right of the display. Getting hold of a copy of *WaveLab lite* is a bit tricky because it is not distributed as a product in its own right, but generally comes bundled with other packages.

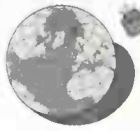
If you've recently bought a Terratec soundcard you may find it included with the software bundle. An alternative would be to get a copy of Steinberg's *Cubasis VST v4.0* as *WaveLab lite* is usually included with this program. Other sources I'm aware of are: If you know of any other sources please drop me a note so I can pass on the good news.

MRP40

I started with c.w. and I'm going to finish on that these as well. I've just received a note to say that the latest version of the excellent Morse decoder, *MRP40*, has just been released. One of the attractions of the new version is the facility to automatically format unspaced words. This can be really useful for clarifying Morse from poor quality sources. To get a demo or download an upgrade visit the *MRP40* website at: www.polar-electric.com/Morse/index.html



The *WaveLab* power enabled analysis of Pactor signals.

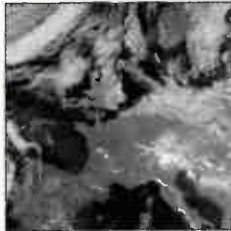


RIG
Remote Imaging Group

Weather satellites are passing overhead daily and geostationary satellites image 24 hours per day.

With fairly simple equipment, you could be receiving images from these weather satellites in your own home.

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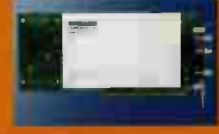
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- **E-mail** skyhigh@pwpublishing.ltd.uk

I am very pleased to report that after 20 days without a fully working computer I am at last back in business, after a re-format of the hard drive and days spent re-installing everything from scratch. You don't realise how much data and software you have until you have to re-load it all!

A quick piece of information some of you may find helpful, it may be obvious to others. If you are using *Windows 2000 Professional* make sure you download the latest updates and *Windows Service Pack 4*. I was using *Service Pack 2* and I have noticed some subtle but definite improvements with *SP4* loaded.

Yeovilton

On 19 September I made a trip to Yeovilton for the airshow arrivals, needless to say it was the only cloudy gloomy day that week, as the photos show. Arriving at 0845, I was just in time to see a Belgian Air Force ERJ-135 depart and I have to admit this was the first of these that I had seen. Unfortunately I missed the call sign.

Only a few items of note. The usual mass airfield assault by helicopters were supported by two 899 Squadron Sea Harriers, (FIST 1/2), plus a 4 Sqn Harrier using the call sign NINJA, they used the 4 Sqn air/air frequency 277.45 for liaison. Two German Navy Tornados arrived as German Navy 4555A/B, both wore very nice special schemes.

A Dutch AH-64D from Gilze Rijen called as REDSKIN 23. There was a very spirited flying display practice from a pair of Lynx using the call sign SKUA FORMATION alongside a Merlin using the usual EXCALIBER call sign. The Lynx display was so spirited that they were asked to do it again by the Flying Control Officer, but this time to tone it down a bit!

Sadly the show is a shadow of its former self and the reputation from years gone by as the third best military show in the UK after the RIAT and Mildenhall is no more. There were a couple of nice items, but military visitors were limited with the show being bulked out by veteran and vintage aircraft plus dare I say it, some micro-lights. Some Naval Air Arms were noticeable by their almost complete absence including the French and the Americans.

Whilst the USA's involvement in Iraq may give them an excuse, surely the French could have made the short hop over from Landivisiau with a couple of Rafafels? All I saw was one French Lynx! By the time I left on

Friday evening I had counted just 12 visiting aircraft from Foreign air-arms.

I only noted the basic ATC frequencies as I was on the lookout for interesting call signs, frequencies noted were:

MHz	Use	Comments
121.275	Tower	UK Air Show Common
122.1	Tower/Ground	NATO Tower Common
127.35	Approach	Yeovilton
134.55	Approach/Deps	UK Airshow Common
311.325	Ground	Yeovilton
369.875	Approach	Yeovilton
372.65	Tower	Yeovilton

Selcalls (C-135)

This year's C-135 'Airband Special' has generated a number of items of correspondence, not least about C-135/Selcall tie-ups. My thanks go to **Ray C** for his letter and detailed list of recent Mildenhall movements, he writes: "Almost two years ago my firm re-located to Cambridge and consequently I moved to the village of Icklingham just a few km from Mildenhall. The approach to runway 29 is easily seen from my house and consequently 18 months ago I bought myself a scanner and joined the enjoyable world of airband monitoring. I read your special about the C-135 with great interest as Mildenhall has regular visits by this type, I noted your comments about the C-135 Selcalls and I have a question specific to this subject. I am hoping to start h.f. listening shortly, but I know little about Selcalls and how they work, is it possible to give me an insight through your column?"

Well, I believe it has been some years since I tackled the subject of Selcalls, so perhaps it is time for a refresher for 'Sky High' readers, especially for those relatively new to the hobby such as Ray.

Aircraft that are Selcall equipped usually are expected to travel over large expanses of barren land or more usually over the Oceans of the world where long distance h.f. communications are used. Essentially, Selcalls are a means for a ground controller to alert the flight crew that they wish to communicate with them, rather than the crew having to listen to background h.f. noise all the time.

A four letter code is entered into the controllers Selcall Encoder and this is then transmitted via a specific h.f. frequency, for example 5.616MHz which is heard in use daily for North Atlantic traffic. The four letter

code will be received by all the aircraft on the frequency, but only the one with that code selected will have their Selcall two tone chime alert activated.

The transmission of the Selcall chime is denoted by the familiar ping-bong sound heard on the frequency, once alerted the crew will turn up the volume and listen out for a voice communication.

The Selcall code database is managed by ARINC on behalf of the International Civil Aviation Organisation (ICAO). There are currently around 15000 Selcalls allocated to around 2000 various operators. The four letter code is made up of two elements or pairs of tones, letters one and two and letters three and four, each form a tone, both pairs of letters must be arranged alphabetically ascending.

So you can have a Selcall such as GJFS (British Airways Boeing 777) but you cannot have GJSE. Over recent years I have seen a couple of reports of Selcalls not following this sequence, but I personally have not heard any evidence to prove that. Duplicate letters are not permitted in each pair or tone (AABB), as this would not be recognised by the aircraft's Selcall de-coder. As a further restriction the same tone cannot be used in both the first and second pair, in other words you cannot have a code of ABAB or CDCD.

Each of the many pairs of letters makes a different tone, the first tone is transmitted for one second and there is then a delay of a fifth of a second before the second pair of letters are transmitted for one second also. Up until 1985 there were 12 letters/tone codes available making up a total of 2970 code permutations. The letters were A, B, C, D, E, F, G, H, J, K, L and M, the letter I was not used.

With air traffic on the increase, this number of codes soon became woefully inadequate and in 1985 a further four letters/tones were made available, they were P, Q, R and S, along with I the letter O was not used. This increased the number of available Selcall code permutations to 10,920 allowing much more flexibility of the system. Nevertheless it is still less than the current total allocation and to solve this problem for many years duplicate Selcalls have been issued.

In theory, when duplicate Selcalls were issued they were allocated to aircraft that operated in different parts of the world and therefore were unlikely to both appear on the same HF MWARA Network. As people sell aircraft to new operators and routes change inevitably there will be occurrences where two

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 <p>TRX-200 £199.00</p> <p>Covers 100 kHz 2149 MHz. NFM, WFM, AM, CW, USB, LSB. 1000 Memory Channels. Alpha numeric tagging. Bandscope. Programmable voice inversion.</p>	 <p>FR-100 £99.00</p> <p>Covers 66 - 470MHz 150 Memory Channels. Menu driven. Supplied with flexible antenna, wrist strap. Powered by 3 x AA batteries.</p>	 <p>AR-108 £69.00</p> <p>Covers 108 - 136.975MHz & 136 - 180MHz. Key Lock. Power saving. 99 Memory Channels. Selective channel steps. Dual channel switch.</p>	 <p>GPS-MAP-76S £395.00</p> <p>Handheld Marine GPS Unit. Barometric Sensor. Electronic Compass. Blue Chart Cartography.</p>
 <p>GPS-V Deluxe £495.00</p> <p>Navigational System. Built in Routable base map. Comes with CD-Rom. Allows upto 19MB of downloads. 500 Waypoints with names & Graphics.</p>	 <p>Street Pilot III Deluxe £849.00</p> <p>Satellite navigation system. Colour display. Voice navigation & direction. Covers all of Europes roads, streets, lakes etc.</p>	 <p>bhi NES10-2 £99.00</p> <p>Noise eliminating speaker with built in DSP Filters 8 Selectable noise cancelling levels.</p>	 <p>bhi NEIM1031 £129.00</p> <p>Noise eliminating in-line module. DSP Through your own external speaker.</p>

SWM UK Radio Club Listing

If you want to meet with others with a radio passion, this guide will help you make contact with fellow enthusiasts in your area!

NORTH WEST

CHESHIRE

CHESTER & DRS, G3GZ. Meets at the Burley Hall, Waverton, Chester. Details from Bob Campbell G4CMI. Tel: (01244) 378699.

HALTON RADIO CLUB, M0BZ. Meets at the Play Centre, Norton Hill, Windmill Hill, Runcorn. Details from Alan Parker 2E1DSF. Tel: (01928) 790228.

MACCLESFIELD WIRELESS SOCIETY, G4MWS. Meets at the Peck Horse Bowling Club, Abbey Road, Macclesfield. Details from Mrs Hazel Parrott.

MID CHESHIRE ARS, G3ZTT. Meets at the Cotesbrook Village Hall, Cotesbrook Nr. Tarporley, Cheshire. Details from Neil Reilly G0VOK.

NORTH CHESHIRE RC, G0BAA. Meets at the Morley Green Club, Moberley Road, Wilmslow, Cheshire. Details from Jill Gourley G0OZJ. Tel: 0161-485 5036.

RADIO OFFICERS ARS, M0RDA. Details from Mr J. Bell G0CMM.

UWMF GROUP WESTERN, G83MP. Meets at the Morley Green Club, Moberley Road, Wilmslow, Cheshire. Details from Gordon Adams G3LEQ. Tel: (01565) 652652. FAX: (01565) 634560.

WARRINGTON & DARS, G0WRS. Meets at the Grappenhall Community Centre, Belfhouse Lane, Grappenhall, Warrington, Cheshire. Details from John Riley G0RPG. Tel: (01925) 762722.

WIDNES & RUNCORN ARC, G0FWR. Meets at the Scout Hut, Castle Road, Halton Castle, Runcorn, Cheshire. Details from Martin Tust G4LLQ. Tel: (01928) 714843.

CUMBRIA

CARLISLE & DARS, G4ARS. Meets at the Morton Community Centre, Wigton Road, Carlisle. Details from Mr J.A. Erniss G3XWA. Tel: (01228) 27463.

EDEN VALLEY RS, G0AMT. Meets at the BBC Club, Penrith. Details from John Rowe G0VMP. 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, M0BEE. Details from Mr N. Williams M0CRM.

GREATER MANCHESTER

BURY RS, G3BR5. 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, G3GKJ. Meets at the Eccles Liberal Club, Wellington Road, Eccles, Manchester. Details from Chris Hanson G5WRG. Tel: 0161-773 7859.

THE MANCHESTER WIRELESS SOCIETY, G5MS. Meets at the Simpson Memorial Community Hall, Moston Lane, Moston, Manchester. Details from Ian M0IPR. 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.

OULDERS HILLS ARS, G0UQA. Meets at the Oulder Community School, Hudsons Walk, Oulder Hill, Rochdale. Details from Carolyn Hope G7WFF. Tel: (01706) 522687.

ROCHDALE & DARS (RADARS), G0RCC. Meets at the Barnfield & Fieldhouse, Cricket Club, Barnfield Village. Details from John Cannell G70AJ. Tel: (01706) 376204.

SOUTH MANCHESTER RAD & COMP CL, G3FVA. Meets at the Sale Cricket Club, Dewe Road, Sale, Cheshire. Details from Chris Ward G4H0N. Tel: 0161-483 5174.

STOCKPORT RS, G6UQ, G8SRS. Meets at the T.S. Hawkins, Stockport Sea Cadets HQ, Pearmill Ind. Est., Stockport Road, West Howe, Lower Bredbury, Stockport. Details from David Sirmock M1ANT. Tel: 0161-456 7832.

TRAFFORD ARC, G0TRC, G1TRC. Meets at the Watch House, Cruising Club, Canal Bank, Stretford, Manchester M32 8WE. Details from Roger May G4YLQ. Tel: (01457) 866675.

TRAFFORD RADIO GROUP, G0TRG. Meets at 17th Stretford Scouts HQ, Barton Road, Stretford, Manchester. Details from Jon Mossman G7JWK. Tel: 0161-865 5609.

WEST MANCHESTER RC, G4MVC. Meets at the Astley & Tydesley Miners Welfare Club, Mearley Road, Astley, Tydesley, Manchester. Details from Jeffrey Moran M0BGU. Tel: (01204) 497694.

WIGAN & DARC, G0HRW. Details from Mr D.H. Barkley G0DPJ. Tel: (01942) 237162.

ISLE OF MAN

ISLE OF MAN ARS, G03RH. Meets in the Sea Cadets Hall, Tromode Road, Tromode, Douglas. Details from Dave Waiton M0B0X. Tel: (01624) 816308.

LANCASHIRE

BURNLEY & DARS, RS87674. Meets at Barden High School, Barden Lane, Burnley, Lancashire. Details from Bill Scriver G0BQC.

CENTRAL LANCS ARC, G0PDK. Meets at the Priory Club, Broadfield Drive, Leyland, Lancs. Details from Steve Shearing M1ACJ.

DARWEN ARC, G4US. Meets at the Darwen Catholic Club, Wellington Fold, Darwen, Lancashire. Details from Len Jackson G0NPJ.

FLTS CW CLUB, G0PFX. 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 Brian Watson G0RDH. Tel: (01524) 424522.

PRESTON ARS, G3KUE. Meets at the Lonsdale Club, Fulwood Hill Lane, Fulwood, Preston. Details from Eric Eastwood G3WQJ. Tel: (01772) 686708.

ROLLS-ROYCE ARC, G3RR. Meets at the Club Room, Rolls-Royce Sports Ground, Barnoldswick. Details from Mr J.A. York G3KJY.

ROSSENDALE ARS, G1RRS. Meets at the Old Fire Station, Burnley Road, Rawtenstall, Rossendale, Lancs BB4 8EW. Details from Ken Slaughter. Tel: (01706) 830308.

THORNTON CLEVELYS ARS, G4ATH. Meets at the Frank Townsend Centre, Beach Road, Thornton Clevelys, Lancs. Details from Mr J.E. Duddington G4BFH. Tel: (01253) 853554.

MERSEYSIDE

LIVERPOOL & DARS, G34HD. 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, G2QA. Meets at St. Marks Church Hall, Scarsbrick, Lancs. Details from Don Atkins M1BUL.

WIRRAL & DARC, G4MGR. Meets at the Irbly Cricket Club, Mill Hill Road, Wirral. Details from Brian Black.

WIRRAL ARS, G3NWR, M0CIARC. Meets at the Club Room, Ivy Farm, Anrove 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, Gunney Street, Cleveland TS11 8EG. Details from Malcolm Brass G4YMB. Tel: (01287) 638119.

STOCKTON & DARG, G400G. Meets at the Billingham Community Centre, Billingham, Cleveland. Details from David J. London G0VGB. Tel: (01642) 896395.

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BISHOP AUCKLAND RC, G4TTF. Meets at the Stanley Village Hall, Rear High Road, Stanley, Co. Durham. Details from Mark Hill G0GFG. Tel: (01388) 745353.

DERWENTSIDE ARC, G4PFO. Meets at the Steel Club, 36 Medomsley Road, Consett, Co. Durham. Details from Mr G. Dray G7GUJ. Tel: 0191-370 2023.

GREAT LUMLEY AR & ES, G4ELZ. Meets at the Community Centre, Great Lumley, Chester-le-Street, Co. Durham. Details from Nancy Bone G7UUR. Tel: 0191-477 0036, mobile (07990) 780920.

PETERLEE RADIO CLUB, G0KVJ. Details from Andrew Pennell G0NSK.

HUMBERSIDE

EAST YORKSHIRE ARS, G0EOR. Meets at the Northern Foods Sports & Social Club, Millhouse Woods Lane, Cottingham, E. Yorks. Details from David Taylor G4EBT. Tel: (01482) 876702.

GOOLE R & ES, G0OLE. Meets at the West Park Pavilion, Goole, South Humberside.

GRIMSBY ARS, G3CNC. Meets at Cromwell Social Club, Cromwell Road, Grimsby, South Humberside. Details from Mr G.J. Smith G4EBK. Tel: (01472) 887720.

HORNSEA ARS, G4EXT. Meets at The Mill, Alwick Road, Hornsea, North Humberside. Details from Jeff Southwell G4GVJ. Tel: (01964) 533331.

HULL & DARS, G3AMW. Meets at the SWL Centre, Club Room, Gothland Close, Walton Street, Hull. Details from Mr R. Hatton.

RAYWELL PARK SCOUTS ARS, G4CMT. Details from Mr A.D. Russell M0AXU.

SCUNTHORPE STEEL ARC, G4FUH. Details from Alistair Butler M1ECF.

NORTH YORKSHIRE

DARLEY ARC, G0FOS.

HAMBLETON ARS, G0JQA. Meets at the Mencap Centre, Northallerton, N. Yorks. Details from Ian Brockwood G0JQA. Tel: (01609) 775598.

QUEEN MARY ARS, G6QM. Meets at Blazefield, Pateley Bridge, Harrogate, North Yorks HG3 5DR. Details from Frank Hams 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, G0RCS. 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 G3JUR. Tel: (01723) 377296.

SCARBOROUGH SE GRP, G3000. Details from Roy Clayton G4SSH. Tel: (01723) 862924.

THE VINTAGE & MILITARY ARS, RS183536. Details from H.A. Aspinall.

YORK ARS, G3HMM. Meets at the Guppy's Enterprise Club, 17 Nunney 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 G4DFG. Tel: (01904) 421392.

NORTHUMBERLAND

NORTHUMBRIA ARC, G4AAX. Meets at the Old Telephone Exchange, Cresswell Road, Ellington, Morpeth, Northumberland. Details from Mr D. Starsfield G0EUV. Tel: (01670) 513026.

SOUTH YORKSHIRE

FINNINGLEY ARS, G7MAH. Details from John Fennell G4HOY. Tel: (01709) 872522.

MALTBY & DARS, G4SKM. Meets at the Centenary Hall, Clifford Road, Hellaby, Rotherham. Details from Keith Johnson G1PQW. Tel: (01709) 798098.

MEDBOROUGH & DARS, G4BTS. Meets at the Harrop Hall, Mexborough, South Yorks. Details from Mr R.T. Sheppard G0KSK. Tel: (01709) 586329.

SHEFFIELD ARC, G0INF. NRAE/RAE tuition provided. Meets at the Sheffield University Staff Club, 197 Brook Hill, Sheffield. Details from Mrs Irene Glossop G0SFI.

TYNE & WEAR

HOUGHTON-LE-SPRING ARC, G3NMD. Meets at the Dumbire Royal British Legion, Dumbire, Fenhouses, Tyne & Wear DH4 6LJ. Details from Foster Aungles G0ABF. Tel: 0191-584 4673.

SOUTH TYNESIDE ARS, G0WQK. Meets at the Boldon Scout Hut, Grey Horse Car Park, Front Street, Boldon. Details from William Wilson M0BWR. Tel: 0191-421 9921.

TYNEMOUTH ARC G0NWM. Meets at the Linskill Centre, Linskill Terrace, North Shields, Tyne & Wear. Details from Mr G.N. Thompson G0SBN.

TYNESIDE ARS, G3QZM. Meets at the St Teresa's Club, 200B Heaton Road, Newburn-Upon-Tyne NE8 5HP. Details from Mr J. Pickersall G0DZG. Tel: 0191-265 1718.

WEST YORKSHIRE

DENBY DALE & DARS, G4QDQ, G8PKM. Meets at the Pe Hall, Denby Dale, West Yorkshire. Details from Mr J.P. Morley G4FSQ.

HALIFAX & DARS, G2UG. Details from Mr S.P. Ortmeyer G4RAW. Tel: (01422) 203062.

KEGHLEY ARS, G0KRS. Meets at the Cricket Club, Ingrow, Keghley, West Yorkshire. Details from Mr I. Townsin M1BGY. Tel: (01274) 723951.

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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, G3RNO. Meets at The RAOB Club, Westgate, Otley, West Yorkshire. Details from Jack Worsnop G0SNV. Tel: (01274) 836197.

PONTEFRAC & DARC, G3PFC. Meets at the Carleton Community Centre, Pontefract, West Yorkshire. Details from Colin Wilkinson G0NQE. Tel: (01977) 677006.

SPEN VALLEY ARS, G3SVC. Meets at the Old Bank WMC, Mirfield, West Yorkshire. Details from Mr J.R. Widdie G0FOI. Tel: (01274) 875038.

WAKEFIELD & DARS, G3WRS. Meets at the Ossett Community Centre, Prospect Road, Ossett, W. Yorks. Details from Ian Roberts. Tel: (01924) 216502.

WAKEFIELD RPTG GP, G0KNR. Details from Mike Charlton G60XZ.

WHITE ROSE ARS, G3NEP. Meets at the Moortown RUF, 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 Chevys House, 77 High Street South, Dunstable, Beds LU6 2SF. Details from Phil Seaford G8XTW. Tel: (01525) 384419.

SHEFFORD & DARS, G3FJE. Meets at the Church Hall, Amptwell, Shefford, Beds. Details from John West. Tel: (01462) 812739.

ST SWITHUN'S ARC, M0AVJ. Meets at St. Swithun's Church, Rectory Rooms, Sandy, Beds. Details from Kelyn Derton G0WDD. Tel: (01767) 883179.

CAMBRIDGESHIRE

CAMBRIDGE & DARC, G2XV. Meets at the Coleridge Community Centre, Rodegund Road, Cambridge. Details from Ron Huntsman G3KBR. Tel: (01223) 501712.

DUXFORD ARS, G82WMM. 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, Farset Road, Fletton, Peterborough. Details from Alan D. Ralph G8XLH.

HUNTINGDONSHIRE ARS, G0HSR. Meets at the Medway Centre, Medway Road, Huntingdon. Details from David Leech G7DUJ. Tel: (01480) 431333.

MARCH & DRAS, G3PMH. Meets at the British Legion Club, Rockwood Road, March, Cambs PE15 8DP. Details from Mr J. Brentwate G3PWW. Tel: (01353) 658895.

PETERBOROUGH R & ES, G3DQV. Details from Mr V. Edwards G8NGZ.

WISBECH AR & ELEC, CLM, M5ARC, G4POL, G8NED. Meets at RAFA Club, Old Market, Wisbech. Details from Alan Briggsland M0DUUJ. www.werec.org.uk

DERBYSHIRE

BOLSOVER ARS, G4R5B. Meets at the Blue Bell, High Street, Bolsover, Derby. Details from Cain Morns G0RXT. 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 Maron Sharlow G3SZJ. Tel: (01332) 556875.

EREWASH VALLEY ARC, G0PCK. Meets at The Sitwell Arms Public House (between Horsley Woodhouse and Woodside). Details from Peter Russell M0AQJ.

MOUNT ST. MARY'S ARC, G4MSM. Meets at the College, Spinhill, Sheffield. Details from Rev. P. McArdle G0DAG. Tel: (01246) 812230.

NOTTS & DERBY BORDER ARC, G4NID. Meets at Marpool United Reform Church, Chapel Street, Marpool, Ilkeston. Details from Graham Bromley G4UTN. Tel: (01773) 634308.

NUNSFIELD HOUSE ARC, G3EE0. Meets at the Nunsfield House, Boulton Lane, Alveston, Derby. Details from William F. Smith G7PJJ.

STH DERBYS & ASHBY W ARC, G0SRC. Meets at the Moira Repton Centre, 17 Ashby Road, Moira, Swadincote, Derbyshire DE12 6DJ. Details from Mrs B. Walley. Tel: (01283) 760222.

STH NORMANTON, ALFRETON & DARC, G0CPO. Meets at the New St. Community Centre, New Street, South Normanton, Derbyshire. Details from Peter Gething M0CQL. Tel: 0115-955 5766.

GLoucestershire

CHELTENHAM ARS ASN, G5BK. Meets at the Presbury Library, Presbury, Cheltenham. Details from Ivan Wilson G4BGW. Tel: (01452) 731956.

CHELTENHAM CLUSTER SUPP GP, G8TDX. Details from Mr A.M. Davies G0HDB. Tel: (01684) 72178.

GLOUCESTER AR & ES, G4AYM. Meets at the Churchdown School, Churchdown. Details from Mr A.J. Maron. 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 LISTENING G0WML. Details from Adnan Deare G7KGG.

HEREFORD & WORCESTER

BROMSGROVE & DARC, G3VGA. Meets at the Avoncroft Arts Centre, Bromsgrove, Worcs. Details from Mr J.F. Burford G4OAZ.

BROMSGROVE ARS, G4TUI. Meets at the Ukeby End WMC, Bromsgrove, Worcs. Details from Barry Taylor G0TGP. Tel: (01527) 542266.

DROTWHICH ARC, G4PYD. Meets in the Community Hall, Drotwhich Spa, Worcs. Details from Hector Wragg M1BUIV. Tel: (01905) 794399.

HEREFORD ARS, G3YDD. Meets at the Civil Defence HQ, Magistrates Court, Gao Street, Hereford. Details from Tim Bridgman-Taylor G0JWJ. Tel: (01432) 279435.

KIDDERMINSTER & DARS, G0KRC. Meets at the Sutton Arms, Sutton Park Road, Kidderminster, Worcs. Details from Mr A.W. Saunders G00ZB. 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, G0ERA. 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. Cdr. Adnan Utting G1WZQ.

BEAUMANOR ARC, G8BMR

DEMONTFORT UNIVERSITY, G3SDC. Open to past & present students. Details from Mr R.G. Tittarington. 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 Giresse Cottage, Groby Road, Leicester LE3 9QJ. Details from Mr S.P. Hay G3VHH. Tel: 0116-224 2598.

LOUGHBOROUGH & DARC, G3RAL. Meets at Hind Lays College, Shephard, Loughborough, Leics. Details from Chris Walker G1ETZ. Tel: (01509) 504319.

MELTON MOWBRAY ARS, G4FOX. Meets at the St. John Ambulance Hall, Astorby Hill, Melton Mowbray, Leics. Details from Mr R. Winters G3NVK. Tel: (01664) 633669.

NATIONAL SPACE CENTRE ARS, M1NSC. Details from Mr J. Heath G7HIA.

TAMWORTH ARS, G8TRS. Details from Mr A.I. Dyson G0HUW. Tel: (01827) 830437.

WELLAND VALLEY ARS, G4WVR. Meets at The Village Hall, The Green, Great Bowden, Leics. Details from The Secretary.

Coningsby. Details from Peter Hanson G0VNY.

RAF WADDINGTON ARC, GORAF. Meets at Pyewipe 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 Olive Ironmonger G6HYF. Tel: (01790) 752712.

NORTHANTS

KETTERING & DARS, G5KN. Meets at The Liacs Public House, 39 Church 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 Tinnern, Social & Athletic Club, Cotswold Avenue, Duxton, Northampton. Details from Norman Miller G0GBZ. Tel: (01327) 349188.

NORTHAMPTON SCOUT ARG, G6NDS. Meets at Overstone Scout Activity Centre, Northampton. Details from Ian Rivett G8WPU.

PARALLEL LINES CG, GAUPL. Details from Mr P.S. Udsay G4CLA.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM, G3EWM. Meets at the Haywood Road Community Association, Haywood Road, Mapperley Road, Nottingham NG3 6AD. Details from Ron Hague G4XOU. Tel: 0115-919 9177.

DUKIERES ARS, G4XTL. Meets at Ambleside Community Centre, Ambleside, New Olterton, Notts. Details from Colin Foster G7DXX.

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 G0RDP. Tel: (01623) 631931.

NORTH NOTTS DATA GROUP, G0WNN. Details from Tony Jenkins G8TBF.

SIEMENS ARC, G8ZK, G8GQ. Meets at the GPT Sports Ground, Beeston, Nottinghamshire. Details from Chrs Ancher G4VFK. Tel: 0115-943 3387.

SOUTH NOTTS ARC, G0QAU. Meets at the Fairham Community College, Farnborough Road, Clifton, Nottingham NG11 9AE. Details from Gary Bishop G0MWJ. Tel: (01509) 672846.

WORKSOP ARS, G3RWC. Meets at the Club House, 59-61 West Street, Worksop, Nottingham N80 1JP. Details from Tony Calvert G4GDS. Tel: (01302) 743130.

SHROPSHIRE

OSHESTRY & DARC, G4ATY, G10RA. Meets at the Sweeney Hall Hotel, Sweeney, Oswestry. Details from Ant Astley G5OAJA. Tel: (01691) 860545.

SALOP ARS, G3SR, M1AXW. Meets at The Tepest Club, Rainily Lane, Abbey Forge, Shrewsbury. Details from John Burnford G0GTN. Tel: (01743) 249943. E-mail: john.burnford@gvirgin.net

TELFORD & DARS, G3ZME. Meets at the Dewley Bank Community Centre, Dewley, 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 G4HBT.

CANNOCK CHASE ARS, G8SW. Meets at the Four Crosses Inn, Watling 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, Sanford Street, Lichfield, Details from Roger Smethers G3NLY. Tel: (01543) 672762.

MOORLANDS & DARS, G4NHT, G1MAD. Meets at the Creds 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 G0WJU. Tel: (01905) 724531.

MID WARWICKSHIRE ARS, G3UDN. Meets at the St. John Ambulance HQ, 61 Emrose Road, Warwick. Details from Bernard Pittaway. Tel: (01926) 420913.

RUGBY ATS, G4APD. Details from Tony Humphries G0OLS. Tel: (01455) 552683.

STRATFORD-UPON-AVON & DRS, G5OQA. Meets at the Home Guard Club, Tiddington, Stratford-upon-Avon, Warcs. Details from Ron Horsley G0MRH. Tel: (07970) 148204.

WEST MIDLANDS

ALDRIDGE & BARR BEACON ARC, GONEQ. Meets at the Aldridge Central Hall Community Centre, Middlemore Lane, Aldridge W59 8AN. Details from Mr C.J. Baker G0NOL. Tel: (01922) 636162.

COVENTRY ARS, G2ASF. Meets at the John Church Hall, Brinklow Road, Coventry. Details from Binley 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, G0SPM. 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 Barr, Birmingham. Details from Mr G. Nichols. Tel: (01922) 635376.

MIDLAND ARS, G3MAR. Meets at Unit 22, 60 Regent Place, Hockley, Birmingham (jewelry quarter). Details from John A. Crane G0LAL. Tel: 0121-628 7632.

SANDWELL AMATEUR RADIO CLUB, G0CWC. Meets at Sandwell ARC, Broadway, Oldbury, Walsley, West Midlands B68 9DP. Details from Stuart Collins M0BTO. Tel: 0121-561 4663.

SIERRA HOTEL ARCG, G00BS. Details from Warwick M. Hall G4WVH.

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 G0PAL. Tel: 0121-561 2884.

WEST MIDLANDS POLICE ARC, G0COP, G1WMP. Details from Steven Jones G6LRL.

WILLENHALL & DARS, G4FTW. Meets at The Liberal Club, Villiers Street, Willenhall, West Midlands. Details from Dave Bradbury. Tel: (01902) 411252.

WOLVERHAMPTON ARS, G8TA. Meets at the Electricity Board Sports Club, St. Marks Road, Chapel Ash, Wolverhampton. Details from Mrs J. Smith. Tel: (01902) 751936.

WORDSLEY RC, G4MRA. 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 Elerton G3NVC.

BURNHAM BEECHES RC, G3WIR. Meets at the Farnham Common Village Hall, Victoria Road, Farnham Common, Bucks. Details from Mrs Eileen Chislett G6ELL. Tel: (01628) 625720.

MAIDENHEAD & DARC, G3WVK. Meets at the Red Cross Hall, The Crescent, Maidenhead, Berkshire. Details from Neil Savin G0SVN. Tel: (01628) 626210.

NEWBURY & DARS, G5XV. Meets at the Rugby Club, Monk's Lane, Newbury. Details from Mark Slade M0CUK. Tel: (01488) 638965.

READING ARC, G3ULT. Meets at the Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading. Details from Mamooh Shanon G0JMS. Tel: 0118-972 3504.

BUCKINGHAMSHIRE

AYLESBURY VALE RS, G4VPS. Meets at the Harwick Village Hall, Aylesbury, Bucks. Details from Mr L.I. Cropley G0DFC.

CHESHAM & DARS, G3MDG, G1MDG. Meets at the White Hill Centre, Chesham, Bucks. Details from Mr T.J. Thirwell G0FWV. Tel: (01442) 832169.

CHILTERN ARC, G3CAR. Details from Roy Page G4YAN. Tel: (01494) 534216.

MILTON KEYNES ARS, G3HU. Meets at Bletchley Park Museum (The Green Room, B Block Annex), Wilton Avenue, Vechley, Milton Keynes. Details from Mrs J. Battersby M1EPL (Secretary) on (01908) 565636 or Frank Collins M0RPM (Chairman) on (01234) 713148.

MILTON KEYNES SCOUT ARS, G0SMK. Meets at The Quames, M.K. Scout Campsite, Cosgrove. Details from Mr P.A. Orchard G0RYZ. 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 Chewer G0QKQ. Tel: (01708) 474443.

BROMLEY & DARS, RS89030. Meets at the Victory Social Club, Keehill Gardens, Hayes, Bromley. Details from Alan G. Messenger G0TLK.

CLIFTON ARS, G3GHN. Meets at the Kidbrooke House, Community Centre, 90 Mycenae Road, London SE3 7SE. Details from Mr J. Vesney G7BKH.

CRYSTAL PALACE & DRC, G3VCP. Meets at the All Saints Church, Parish Rooms, Beulah Hill, London. Details from Bob Burns G30OU. Tel: (01737) 552170.

DARENHILL VALLEY RADIO, G0KDV. Meets at the Crockenhill Village Hall, Swanley, Kent. Details from Mr K.W. Halls G8VJG. Tel: (01322) 663022.

ECHFORD 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 G0PQB. Tel: 0208-953 2164.

HAVERING & DARS, G4HRC. Meets at the Fairlytes Arts Centre, 51 Bilet Lane, Hornchurch, Essex.

RS OF HARROW, G3EPF. Meets at the Harrow Arts Centre, Uxbridge Road, Hatch End, Middlesex. Details from Mr C. Fnel G4AUF. Tel: (01895) 621310.

SILVERTHORNE RC, G3SRA, G2HR, G9CSA. Meets at the Chingford Adult Education and Community Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. Details from Dave Chrsty G0KHC. Tel: 0208-504 2831.

MITCHAM & DISTRICT ARS. Meets at the ATC Hut, Commonsme West, Mitcham, Surrey CR4 4HB. Details from Mr M. Knott G0WCR.

SOUTHGATE RC, G3SFG. Meets at the Winchmore Hill Cricket Club, Fis Lane, London N21 3ER. Details from Mr D.F. Berry G4DFB.

ST. DUNSTONS COLLEGE ARS, G4SCD. Details from Sam Kennard G40HX. Tel: 0181-690 1274.

SURREY RADIO CONTACT CLUB, G3SRC. Meets at the T.S. Terra Nova, 34 The Walkdens, Croydon, Surrey. Details from Maurice Fagg G4DDY. Tel: 0208-669 1480.

WEST LONDON ARS, RS95599. Details from Robin Clay G0VJL.

WHITTON ARC, G0MIN. Meets at the Whitton Community Centre, Percy Road, Whitton. Details from Ian Clabon G00FN. Tel: 0208-894 9131.

HERTFORDSHIRE

BISHOPS STORTFORD ARS, G5GZQ. Meets at the Royal British Legion Club, Windhill, Bishop's Stortford, Herts. Details from Tony Judge G0PQF. Tel: (01279) 506933.

DACORUM ARTS, G7RIH, G0WH. Meets at the Guide Meeting Rooms (next to the Royal British Legion), Queensway, Hemel Hempstead. Details from Ian Hamilton G0TCD. Tel: (01442) 211925.

HODDESDON RADIO CLUB, G0TSN. Meets at the Rye Park Conservative Club, Rye Road, Hoddesdon, Herts. Details from Don Platt G3JNU. Tel: 0208-292 3678.

MIMRAM CONTEST GP, M0ABC. Details from Alan Holdsworth G80U. Tel: (01707) 392950.

RADIO SCOUTING TEAM, G8ZRS. Meets at Tolmers Scout Camp, Tolmers Road, Cuffley, Herts EN6 4JS. Details from Mill Lvens G2CKB. Tel: (01992) 558493.

STEVENAGE & DARS, G3SAD. Meets at the Stevenage Day Centre, Chels 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 Crane 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, G0VZS. Details from Derek Gilbert G0NFA.

CATERHAM RG, G0SOR. Details from Mr P.N. Lewis G4APL.

COULSDON AMATEUR TRANS. SOC., G4FJR. Meets at St. Swithuns Church Hall, Grovelands Road, Purley, Surrey. Details from Andy Bners G0KKT. Tel: (01737) 552139.

DORNING & 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 G0SWE.

KINGSTON & DARS, G3KIN. Details from Mrs Mary Ashdown G0GQV.

READING ATS, G5UK, 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, Gender Green Lane, Sutton, Surrey. Details from John Puttock G0BWW. Tel: 0208-644 9945.

THAMES VALLEY ARTS, G3TVS. Meets at the Thames Ditton Library, Watts Road, Gigg Hill, Thames Ditton, Surrey. Details from Cdr. J. Pezger G3ENI. Tel: (01483) 284279.

WIMBLEDON & DARS, G3WM. Meets at St. Andrews Church Hall, Herbert Road, Wimbledon, London. Details from James Bell M0COIN. Tel: 020 8874 7456.

SOUTH & SOUTH EAST

BRIGHTON & DRS, G4GQR. Meets at the Roast Beef Bar, Brighton Racecourse, Elm Grove, Brighton. Details from Mr P.J. Feilmingham.

CROMBROUGH DARS, G0CWR. Meets at the Plough & Hoops, Walshes Road, Jarvis Brook. Details from Mrs M. Clark. Tel: (01892) 663666.

EAST SUSSEX AMATEUR TV GROUP, RS178475 was G83VX. Details from Keith Ellis G8HGM. Tel: (01323) 720220.

SOUTHDOWN ARS, G3WQK. Details from Jim Hams G4DVR. Tel: (01323) 728479.

THE ORZ ARG OF SUSSEX, G83VX. Meets at the Coach Station, Warring Road, Eastbourne. Details from Stuart Constable M0CHW. Tel: (01435) 863020.

HAMPSHIRE

ANDOVER RAC, G0ARC. Meets at the Village Hall, Wildern, Andover. Details from Mr R.S. Coleman G0W7D.

BASINGSTOKE ARC, G3TCR, G8JYN. Meets at the GEMS Social Club, Uster Road, Basingstoke, Hants. Details from Bob Brown M0CJJ.

FAREHAM & DARC, G3VEF. Meets at the Portchester Community Centre, Westlands Grove, Portchester, Hants. Details from Andrew Sinclair G0AMS5. 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.

HORNDLEAN & DARC, G4FBS. Meets at Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. Details from Stuart Swan G0FYX. Tel: (01705) 472846.

ITCHEM VALLEY ARC, G0NVR. Meets at the Scout Hut, Brickfield Lane, Chandlers Ford, Eastleigh, Hants. Details from Sheila Williams G0VNI. 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 G3UZV'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. Byth G0PPI. Tel: (01329) 232386.

THREE COUNTIES ARC, G4WWR. Meets at the Bramshot Parish Inst. & Club, Healdley Road, Liphook, Hants. Details from Darman Kamm G7RFV. Tel: (01428) 724456.

WATERSIDE ARS, G4JYN. Meets at the Agglemore Scout HQ, Agglemore, Hythe, Southampton. Details from Tony Horton G0JUG. Tel: (01703) 841794.

ISLE OF WIGHT

BRICKFIELDS ARS, G0BAR. 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, G0BRA. 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, G5LDO. Meets at the Grove House Club, George Street, Summertown, Oxford. Details from Mr D. Walker G3BLS. Tel: (01865) 247311.

VALE OF WHITE HORSE ARS, G5RPF, G4VWH, G6VWH. Meets at The Fox, Steventon. Details from Ian White G3SEK. Tel: (01235) 531559.

WEST SUSSEX

CROCHESTER ARC, G2MIN. Meets at the St. Pancras Hall, Crochester. Details from Graham Swann G0WSD.

CRAWLEY ARC, G3WGC. Meets at the Tigate Forest Rec. Centre, Hut 18, Tigate Forest, Crawley, West Sussex. Details from Mr J.S. Spence G0FFI.

HORSHAM ARC, G4HRS. Meets at the Guide Hall, Denne Road, Horsham, West Sussex. Details from Alistair Watt G3ZBU. Tel: (01403) 253432.

MID SUSSEX ARS, G3ZMS. Meets at Marie Place, Leylands Road, Burgess Hill, West Sussex. Details from Mr C. Chicks 2E1DCC. Tel: (01444) 244689.

T.S. VINDICATRIX ASN, G0WVB. Details from Don Still G000C.

WORTHING & DARC, G3WOR. Meets at the Landing Parish Hall, South Street, Lancing, West Sussex.

WORTHING & DISTRICT VIDEO RG, G83VR. Details from the Treasurer. Tel: (01903) 211919 (w).

WILTSHIRE

CHIPPENHAM & DARS, G3GVC. Meets at the Sea Cadet HQ, Chippenhams. Details from Jon Ange G4LZG. Tel: (01249) 462610.

SWINDON & DARC, G3FEC. Meets at the Eastcott Community Centre, Sevenake St., Swindon. Details from Den Forest M0ACM.

TROWBRIDGE & DARC, G2BQY. Meets at the Southwick Village Hall, Southwick, Trowbridge, Wilts. Details from Ian Carter G0GRJ. Tel: (01225) 864698.

GORDANO ARC, G6BRG. Meets at The Ship, Redcliffe Bay, Porthead, 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 David Coxon G0GHM. Tel: (01275) 790448.

SEVERNSIDE TV GROUP, G83ZZ. Meets at NBARC, Filton, Bristol. Details from Paul Stevenson G8YMM. Tel: 0117-965 5386.

SHIREHAMPTON ARC, G4AHX. Meets at the TS Enterprise Sea Cadet Unit, Station Road, Shirehampton. Details from Mr R.G. Ford G4GTD. Tel: 0117-965 6253.

SOUTH BRISTOL ARC, G4WAW. Meets at the Whitchurch Folk House, East Dundry Road, Bristol. Details from Mr L.F. Baker. Tel: (01275) 834282.

THORNURBY & SOUTH GLOS ARC, G4ABC. Meets at the United Reform Church Hall, Rock Street, Thornbury, Bristol. Details from Stan Greenhill G0RYM. Tel: (01454) 413177.

WESTON-SUPER-MARE RS, G4WSM.</

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, Maripool Hill, Exmouth.

NORMAN LOCKYER OBSERVATORY ARC, G0AXC. Meets at the Norman Lockyer Observatory, Salcombe Hill, Sidmouth. Details from Ron Harrison G0NOC. Tel: (01395) 515349.

NTE (PAIGNTON) ARS, G0OSH. Meets at Paignton Community College, Upper School, Waterleaf 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 Oway G3RMA. Tel: (01803) 556425.

UNIVERSITY OF PLYMOUTH ARS, G0LOP. 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. Marmot G0GFL. Tel: (01258) 860741.

BOURNEMOUTH RS, G2BRS. Meets at the Kinson Community Centre, Kinson, Bournemouth, Dorset. Details from Chris R. Elie M5AGS, Broken Ridge, Fir Tree Close, St. Leonards, Ringwood, Hants BH24 2QW. Tel: (01202) 893126.

CHRISTCHURCH ARS, G0MUD. Meets at the Siemens Plesey Sports & Social Club, Grande Road, Somerford, Christchurch, Dorset. Details from Mr K.P. Hams G7WSN. Tel: (01202) 484892.

FLIGHT REFUELLING ARS, G4RFR. Meets at the Flight Refueling Social Club, Merley, Wimborne, Dorset. Details from Martin Axon 2E1DFZ. Tel: (01202) 693334.

POOLE RS, G4PRS. Meets at the Bourmesther & Poole CFE, Constitution Hill Site, Poole, Dorset. Details from Phil Mayer G0XVL. Tel: (01202) 700903.

PORTLAND ARC, G0VOP/G7VOP. Meets at Clifton Hotel, Grove Road, Portland. Details from Kerry Morris G1WIK. Tel: (01305) 788591.

SOUTH DORSET RS, G3SDS. Meets at The Memorial Hall, Chickerell, Weymouth, Dorset. Details from John Rose M0BQQ. Tel: (01305) 832057.

SWANAGE & PURBECK ARC, M0BLI. Meets at Kings Arms, Langton Meads, Dorset. Details from Peter Wakefield M1WCH/M3WCH. Tel: (01929) 424413.

WESSEX AMATEUR WIRELESS CLUB, G1WAW. Details from Ken Powell G1NOC. Tel: (01202) 549376.

JERSEY

JERSEY ARS, G3JVD. Meets at the German Signal Station, Rue Baal, La Moye, St. Brelade. Details from Mrs Anne Mourant M0BJU. Tel: (01534) 734948.

SOMERSET

PRESTON COMMUNITY SCHOOL ARC, G0PCS. Details from Craig Douglas G0HJD. Tel: (01935) 71131.

TAUNTON & DARS, G3XZW. Meets at The Memorial Hall, Trull, Taunton. Details from David Rosewar M0CFC.

WEST SOMERSET ARC, G0OWX. Meets at the West Somerset Community College, Minehead, Somerset. Details from Alan Elliott G7RSU. Tel: (01843) 707207.

WINCANTON ARC, G0WRA. Meets at King Arthur's Community School, West Hill, Wincanton. Details from Mr G.A. Fingerhut G0EHW. Tel: (01963) 370506.

YEOVIL & DARC, G3CWH, G8YEO. Meets at the British Red Cross HQ, 72 Grove Avenue, Yeovil, Somerset. Details from George Davs G3ICD. Tel: (01935) 425669.

ESSEX

BRAINTREE & DISTRICT AMATEUR RADIO SOCIETY, G4JXG. Meets at the Baintree Hockey Club, Church Street, Bocking, Braintree. Details from Keith Farthing 2E0ARS. Tel: (01376) 347736.

CHELMSFORD ARS, G0NWT. Meets at the Marconi Social Club, Beehive Lane, Chelmsford, Essex. Details from David Bradley M0BQC. Tel: (01245) 602838. E-mail: cars@g0mwt.org.uk

CLACTON RADIO CLUB, G3CRC. Details from Mr D. Fitzpatrick M0CHL.

COLCHESTER ARS, G3VOC. Meets at the Colchester Institute, Sheepen Road, Colchester. Details from Frank R. Howe G3FU. 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, G6UT. Meets at the Mark Hall Barn, First Avenue, Harlow, Essex. Details from Len Brackstone G7UFF. Tel: (01279) 832700. FAX: (01279) 864973.

HARWICH ARS, G0GRH. Meets at the Park Pavilion, Barrack Lane, Harwich. Details from Eugene Kraft G4FTP.

LOUGHTON & EPPING FOREST ARS, G4ONP. Details from Marc Litchman G0TCC. Tel: 0208-502 1645/(07803) 023501.

SOUTH ESSEX ARS, G4RSE. Meets at the Paddocks, Long Road, Carvey Island, Essex. Details from Mrs Betty Maynard G6LJU. Tel: (01268) 695474.

SOUTHEAST & DRC, G5QK. Meets at the Alexandra Yacht Club, Clifton Parade, Southend-on-Sea, Essex. Details from Alan Riedley G0TTC. Tel: (01268) 741229.

STANFORD-LE-HOPE & DARC, G4SHL. Meets at the St Joseph Parish Rooms, Scratton Road, Stanford-le-Hope, Essex. Details from Ken Thompson G4PAD. Tel: (01375) 671238.

VANGE ARS, G3YOW. Meets at the Barnstable Community Centre, Basildon, Essex. Details from Mrs D. Thompson. Tel: (01268) 552806.

KENT

BREDHURST RX & TX SOC., G0BRC. Meets at Rock Avenue Working Mens Club, Rock Avenue, Gillingham, Kent. Details from Mr T.M. Wheeler G7MM.

CRAY VALLEY RS, G3RCV, G1RCV. Meets at the Progress Hall, Admiral Seymour Road, Eltham, London SE9. Details from Richard Perzyna G8TB. Tel: (01689) 602948.

DOVER RADIO CLUB, G3YMD. Meets at the Dover Grammar School for Boys, Astor Avenue, Dover. Jim Camms D1BKH. Tel: (01304) 852773.

EAST KENT RADIO SOCIETY, G0EKR. Meets at St. Bartholomew's Church Hall, Heme Bay, Faversham. 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 M0AQ4.

HOME COUNTIES ATV GRP, G6HCT. Meets at the Binfield Club, Binfield (near M4/J10). Details from Mr A. Brooker G4WZ.

MAIDSTONE YMCA ARS, G3TRF. Meets at YMCA Sports Centre, Melrose Close, Maidstone, Kent. Details from Colin Wilson G0VAR. Tel: (01622) 736636.

MEDWAY ARTS, G5MMW, G8MWA. Meets at Tunbury Hall, Catton Close, Tunbury Avenue, Walkerslade, 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. Frihans G8MLQ. Tel: (01474) 365694.

SWALE ARS, G4SRC, G6SRC. Meets at the Ivy Leaf Club, Dover Street, Sittingbourne, Kent. Details from Gordon Powell M0AKA. Tel: (01795) 665559.

THE MORSE CLUB, G0XOKE. 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 Hill, Tunbridge Wells, Kent. Details from Malcolm Sheppard G4FWG. Tel: (01892) 652272.

NORFOLK

ANGLIA TELEVISION ARS, G0TVX. 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. Bedford G3NHU.

GRESHAM'S SCHOOL ARC, G3P3O. Details from Rev. R.N. Myerscough G3P3O.

KINGS LYNN ARC, G3XYZ. Details from Derek Franklin G0MLQ.

NORFOLK ARS, G4ARN. Meets at Norwich Aviation Centre, Norwich Airport. Details from John Wadman G0VZD. Tel: (01953) 604769.

NORTH NORFOLK ARG, G82MC. Details from Tony Smith G4FAL. E-mail g4ar@connecttree.co.uk

SUFFOLK

BURY ST. EDMUNDS ARS, G2TO. Meets at the Cufford School Cufford, Bury St. Edmunds, Suffolk. Details from George Woods G3LPT.

FELDESTOWE & DARS, G4ZFR. Meets at the Orwell Park School, Nacton, Near Ipswich. Details from Paul Whiting G4YQC. Tel: (01473) 642595.

FRAMLINGHAM COLLEGE ARC, M0C8B. Tel: (01728) 272732.

IPSWICH RADIO CLUB, G4IRC. Meets at the Golden Hind, Nacton Road (3rd Wednesdays at The Holmes, Budecham Straight Road), Ipswich. Details from Keith Gaunt G7CY. Tel: (01394) 420226.

LESTON ARC, G0TUQ. Meets at Leston Town Athletic Assn., Victory Road, Leston, 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 G0J9S. Tel: (01502) 585448.

MARTLESHAM RS, G4MRS. Meets at the BT Laboratories, Martlesham Heath, Ipswich, Suffolk. Details from Darren Hatcher. Tel: (01473) 644475.

SUDBURY & DRA, G0SHW, G7SRA. Meets at the Old School, Wells Hill Road, Great Comard, Sudbury, Suffolk. Details from Bryan Pantton G1TWY.

SUFFOLK DATA GROUP, G87MOM. Details from Peter Pryke G8HUE. Tel: (01473) 631313.

NORTH WALES

CLWYO

CONWAY VALLEY ARC, G6WTM. Meets at the Studio, Penros Road, Colwyn Bay, Cwyd. Details from Mr R.W. Evans G6WPK. Tel: (01745) 855068.

HALKYN & DARS, G6XHG. Details from Mr D. Austin G6W1XG.

NORTH WALES RS, G6WNR. Meets at the Old YMCA, Queen's Drive, Colwyn Bay, Cwyd. Details from Ted Shipton G0WDSJ. Tel: (01745) 336839.

WREXHAM ARS, G6W4M. Meets at the Community Centre, Messingway Road, Wrexham. Details from Mr P. Moran G6W0WR.

GWYNEDD

MERION ARS, G6W4ZP. Meets at the Royal Ship Hotel, Dolgellau, Gwynedd. Details from Genesve Chavesse G4URUJ. Tel: (01341) 421028.

PORTHMAUDG & DARS, G6WMI. Meets at The Yacht Club, The Harbour, Porthmadog, Gwynedd. Details from Mr G. Cadwaladr MW1DFN.

THE DRAGON ARC, G6W4TTA. Meets at the Ebenezer Church Hall, Lon Fael Craig, Llanfairpwllteli, Isle of Anglesey. Details from Stewart Rolfe G6WCTF. Tel: (01248) 362229.

POWYS

POWYS ARC, G6W4HVN. Meets at the ATC HQ, Park Lane,

Newtown, Powys. Details from Mrs Jean Brown 2W1CEZ. Tel: (01686) 640814.

SOUTH WALES

GYFEO

ABERPORTH YMCA, G6W4SZV. Meets at the Hut B17, The Airfield, Aberport. Details from Mr G. Carnuther G6W4HJ. Tel: (01239) 811205.

ABERYSTWYTH & DARS, G6W0ARA. Meets at the Scout Hut, Plasnewydd Avenue, Aberystwyth. Details from John Woodward G6W6DK. Tel: (01970) 890657.

CARMARTHEN ARS, G6W4YCT. Meets at The Aelwyd Care Home, Carmarthenshire County Council, Tregynwr Road, Llanunio, Carmarthen SA31 3BS. Details from Mr W.D. Hughes G6W4ZXL. Tel: (01267) 231359.

CLEDDAU ARS, G6W0SYG. Details from Trevor Perry G6W4XQ. Tel: (01646) 600725.

LLANELLI ARS, G6W0EZZ. Meets in the Furnace Community Hall, Furnace Square, Llanelli. Details from Roy Jones G6W0JKZ. Tel: (01554) 820207.

PEMBROKESHORE RS, G6W0EJE. Meets at Furzy Park Community Centre, Furzy Park, Haverfordwest, Pembrokeshire. Details from Ian M. Jones MWOCAB. Tel: (01437) 763028.

GWENT

ABERGAVENNY RS, G6W4GFL. Meets at the Hill Residential College, Pen-y-Pound, Abergavenny, Gwent. Details from Glyn Hughes G6W0DQY. Tel: (01633) 483186.

BLACKWOOD & DARS, G6W6GW. Meets at the Oakdale Comprehensive School, Oakdale, Blackwood, Gwent. Details from John Evans G6W8TH. Tel: (01495) 225178.

EBBW VALE COLLEGE-RS, G6W0IHW. Meets at the Gwent Tertiary College, Ebbw Vale Campus, College Road, Ebbw Vale, Gwent. Details from Mr T. Hayden G6W0HCN. Tel: (01495) 305192.

NEWPORT ARS, G6W4EZW. Meets at the Brynagas Community Centre, Brynagas Road, Newport, Gwent. Details from Paul Nicholls.

PONTYPOOL ARS, G6W3RNN. Meets at the Settlement, Rockhill Road, Pontypool, Gwent. Details from Graham Smith G6W0OLZ.

MID-GLAMORGAN

BRIDGENG & DARC, G6W4LNP. Meets at the Club Brynnyrn, Brynnyrn, Bridgend. Details from Alun Hulmes. Tel: (01656) 721574.

HOOVER (MERTHYR) ARC, G6W3RDB. Meets at the Hoover Sports Pavilion, Hoover Ltd., Pentrebach, Merthyr Tydfil, Mid Glamorgan. Details Robert Cummings G6W0RVG.

MID GLAMORGAN ARG, MWOCNA. Meets at Aberkenfig Sports & Social Club. Details from Mervyn Carey G6W4VSE. Tel: (01656) 734668.

SOUTH GLAMORGAN

BARRY ARS, G6W3VKL. Meets at Sully Sports & Leisure Club, South Road, Sully, S. Glamorgan. Details from Richard Mortimore G4B4VJ. Tel: (01446) 738756.

HIGHFIELDS ARC, G6W4LFO. Meets at the Highfields Physically Handicapped Centre, Allensbank Road, Cardiff. Tel: (01222) 561542.

WEST GLAMORGAN

PORT TALBOT (BS PLC) ARS, G6W3EOP. Meets at the British Steel PLC Sports & Social Club, Margam, Port Talbot, West Glamorgan. Details from Mr J. Chinnock MW0AEG.

SWANSEA ARS, G6W4CC. Meets at the Applied Sciences Building, Swansea University. Details from David Williams G6W4BNJ. Tel: (01792) 519046.

SCOTLAND WEST & WESTERN ISLES

CENTRAL REGION

FALKIRK & DARS, G6M0FRC. Details from Scott Waterall G6M0BKU.

STIRLING & DARS, G6M0NK. Meets at Banded Industrial Estate, Throsk, Nr. Stirling. Details from John Sherry G6M0AZC. Tel: (01324) 824709.

OUNFRIES & GALLOWAY

WIGTOWNSHIRE ARC, G6M4RIV. Meets at the Aird Unit, Stranraer Academy, Stranraer, (entrance from Cairnpollard). Details from Neil Macdonald G6M4LQS.

STRATHCLYDE

AYR ARC, G6M0AYR. Meets at the Citadel Leisure Centre, Ayr. Details from Peter Sturgeon M6M0BQP.

CENTRAL SCOTLAND FM GROUP, RS3B728. Details from Thomas Stalker G6M7TZU. Tel: (01698) 816793.

DALRY ARS, M6M0ARG. Meets at The Turf, In Dalry Court, Hill Street, Dalry. Details from Alex McKeenan M6M0ABM. Tel: (01294) 823295.

DUNOON & DARS, G6M0C0D. Meets at the Edward Street Community Centre, Edward Street, Dunoon. Details from A.B. Horton G6M0BUL. Tel: (01369) 840217.

HELENSBURGH ARC, G6M4HEL. Details from G. Capstick G6M70AF. Tel: (01436) 675922.

INVERCLYDE ARG, G6M0GNK. Meets at the Cardwell Bar, Cardwell Road, Gourcock, Strathclyde. Details from Andrew Givens G6M3YOR. Tel: (01475) 638226.

KILMARNOCK & LOUDOUN ARC, G6M0ADX. Meets at the Hurford Community Centre, Cessnock Road, Hurford. Details from Steve Campbell G6M40SS. Tel: (01560) 483800.

LARGS & DARS, G6M0VKG. Details from Mr J. Clough G6M0MDD. Tel: (01475) 568584.

LORN ARS, G6M0LRA. Details from T. Olsen G6M0EOW. Tel: (01866) 2580.

MID LANARK ARS, G6M3PKX. Meets at the Newarthill Community Ed. Cent., High Street, Newarthill, Motherwell, Lanarkshire ML1 5GU. Details from John Neary G6M0XFK. Tel: (01698) 822860.

MILTON OF CAMPSIE ARS, G6M0MOC. Meets at The Red Cross Hall, Kirkintilloch. Details from John MacKenzie G6M0HJU. Tel: (01360) 312954.

PAISLEY ARC, G6M0PYM. Meets at the Paisley YMCA Hall, 5 New Street, Paisley PA1 1XU. Details from John Gugley G6M0TQA. Tel: 0141-889 6860.

SCOTTISH DIGITAL COMMS, GRP, G6M7VSR. Details from Stuart Clink G6M1VBE. Tel: (01698) 884803.

WEST OF SCOTLAND ARS, G6S4AGG. Meets at the Multi Cultural Centre, 21 Rose Street, Glasgow. Details from Hon. Sec.

SCOTLAND EAST & HIGHLANDS

BORDERS

BORDERS ARS, G6M0BRS. Meets at the St. John Ambulance Hall, Berwick-upon-Tweed. Details from A.M. McCreadie G6M0BPY. Tel: (018907) 50492.

GALASHIELS & DARS, G6M4YEQ. Meets at the Focus Centre, Galashiels. Details from Jim Keddie G6M7LUN.

KELSO ARS, G6M4KHS. Meets at the Abbey Row Community Centre, Kelso. Details from Margaret Chalmers G6M0ALX. Tel: (01573) 226372.

FIFE

GLENROTHES & DARC, G6M4GRC. Meets at the Football Pavilion, Station Road, Thornton, Fife. Details from Alexander Adam G6M0FVD. Tel: (01592) 874374.

GRAMPIAN

ABERDEEN ARS, G6M3BSQ. Meets at the Red Cross HQ, 22 Queens Road, Aberdeen. Details from Robert Ouncan. Tel: (01224) 896142.

BANFF & DARC, G6M0PYC. Meets at the Princess Royal Park Football Ground, Conference Room (Deveronvale F.C.), Banff. Details from Steve Roberts G6M4HWS. Tel: (01888) 551377.

MORAY FIRTH ARS, G6M3TKV. Meets at the Grant Arms Hotel, Fochabers. Details from Geoff Crowley G6M7SJC. Tel: (01542) 882818.

HIGHLAND REGION

FORT WILLIAM ARG, G6M0FRG. Details from R. Johnston G6M1YGV. Tel: (01397) 703046.

INVERNESS ARC, G6M4TFE. Meets at The Emergency Operations Centre, Inverness (except July and August). Details from R.F. Goodall G6M00GZ. Tel: (01463) 811701.

LOTHIAN

COCKENZIE & PORT SETON ARC, RS17703S. Meets at the Thromtree Inn, Lounge Bar, Old Cockenzie High Street, Cockenzie, E. Lothian. Details from Mr Bob Glasgow G6M4UYZ. Tel: (01875) 811723.

LOTHIANS RS, G6M3HAM. Meets at the Orwell Lodge Hotel, Polwarth Terrace, Edinburgh EH11 1NH. Details from Thomas G. Mann, Sec.

ORKNEY

ORKNEY ARC, RS181749. Details from Mrs Terry Penna. Tel: (01856) 741233.

SHETLAND ISLANDS

LERWICK RC, G6M3ZET. Meets at the Islesburgh Community Centre, King Herald Street, Lerwick, Shetland. Details from Ian C. Millar G6M7RDK. Tel: (01950) 460306.

TAYSIDE REGION

DUNDEE ARC, G6M4AAF. Meets at the Dundee College, Graham Street Annex, Dundee. Details from John R. Nicholson G6M0MFE. Tel: (01382) 858700.

PERTH & DARG, G6M4EAF. Meets at the Perth Sports & Social Club, 18 Leonard Street, Perth. Details from Ron Harkess G6M3THI. Tel: (01738) 643435.

STRATHMORE & DARC, G6M3GBZ. Meets at 2231 Sqdn ATC, 1 Lochside Road, Forfar. Details from Graham Scattergood M6M0BSX. Tel: (01307) 468824.

NO. IRELAND

CO. ANTRIM

ANTRIM & DARS. Meets at the Clotworthy Arts Centre in the Castle Grounds in Antrim. Details from David Hutchinson G6M4FUM or visit www.gn4sw.co.uk

BALLYMENA RC, G6I3FFF. Meets at 70 Nursery Road, Gracemill, Ballymena, Co. Antrim. Details from Jeffrey Clarke G6I4HCN. Tel: (01266) 659769.

CARRICKFERGUS ARG, G6I0LX.

International Radio Clubs

G9137/G4AIE 23 College Park, Homcastle, Lincolnshire LN9 6RE. E-mail: bill.mackie@zetnet.co.uk or visit www.iswl.org.uk

Secretary John Din, 59 Woodend Road, Coalpit Heath, Bristol BS36 2LH. FAX: (01454) 887880. E-mail: membership@rig.org.uk

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.org 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 GW40XB, 1 Jersey Street, Haford, Swansea SA1 2HF. E-mail: gw40xb@net.ntl.com

International Short Wave League (ISWL-G4BJC)

Information from Honorary Secretary Bill Mackie,



8RP. Tel: 0239-225 0463.

Radio Amateurs Invalid and Blind Club (RAIBC - G4IBC, GBOIBC, GB1IBC)

Enquiries to Honorary Treasurer/Membership Secretary Mrs Shelagh Chambers, 78 Durlay 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



Royal Navy Amateur Radio Society (RNARS - GB3RN, G3CRS, G1BZU)

Enquiries to Secretary Philip Manning G1LKJ/M3LKJ, 1 Waverley 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

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Shack

Web

- **Jerry Glenwright** c/o SWM Editorial Offices, Broadstone
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Hello and a warm welcome to 'ShackWeb'. As ever, there's a lot to pack in so let's press on with an E-mail from **Roy Merritt** of Dorchester who says "I don't have much time to play with radios and computers, but I do want to do some decoding - mainly aircraft and ACARS. I wondered if you had reviewed a PDA? These pocket computers show an impressive spec, but is it enough? For a quick look at PDAs go to www.totalpda.com".

As regular readers of ShackWeb's predecessor column 'ShackWare' are well aware my true love lies with hand-held PDA machines and their potential for providing pocket and 'on the move' listening/decode stations. Combined with a quality pocket receiver (my own is the Sony SW100 which tunes the long, medium and short wave bands in 5Hz steps), you can build a portable shack that will see you through holidays, business trips and the like, or days out in unfamiliar locations where you can address your natural inquisitiveness about the topography and determine what the local receiving conditions are like - yes, I know, I'm hopelessly 'geeky'!

There have been many types of hand-held computers over the years and I've owned (and continue to own) a few of them. Some are all but useless when it comes to the shack - simple novelties - but in recent years, technology advances have produced PDAs with awesome power, easily up to the task of decoding the simple data modes off air.

My first hand-held, bought in 1985 for £14 (which I could hardly afford) from a second-hand shop, was the Tandy TRS80, a miniature machine more like a calculator than a computer. However, under its diminutive lid was a BASIC interpreter, 4KB of RAM, a 24 character l.c.d. screen and a QWERTY keyboard which was tiny, but usable.

Also available was a similarly small printer and a cassette interface for program and data storage and retrieval. I adored the machine! Tandy published several books of programs to support it, several of which I bought over the years. On the web, one of the better TRS80 pocket computer sites can be found at www.trs-80.com

It wasn't until a few years later that another hand-held came my way. The Psion's Series 3, a clamshell-style computer with built-in organiser and business software, was beginning to sell rather well and I was commissioned by a publisher to write a book about getting the most from it. The book sold very well off the back of the enthusiasm for the computer and as well as royalties I got a free Psion Series 3.

Although a very nice little computer, I can't say I found the Psion very useful. I'm not

terribly organised and don't particularly want to be either, so an electronic organiser in my pocket was...well, next to useless! No good for decoding either! Those with access to the Psion hand-held, should point their browsers at www.pSIONarchives.com/series_3.html for information and software.

After the Psion came Atari's Portfolio, a PC clone just a little smaller than a VHS video cassette, which also sported built-in software. The machine is nicely made, with a good screen, usable keyboard and add-on interfaces including parallel, serial and RAM modules, but the tiny on-board memory and slow processor don't really give it the required 'oomph' for decoding. Portfolios are abundant on the web, but one of the better sites is www.atari-portfolio.co.uk

From the Portfolio I progressed to a Poqet PC. The size of a VHS cassette and with a half-meg memory, mono CGA screen and very nice keyboard, the Poqet was the first of the hand-helds with the potency to perform as a shack peripheral. Mine was bought at second-hand from a reader of SWM. I had to home-brew a card-edge interface to access its serial port and for a time it was the answer to a would-be miniature decode station owner's prayers.

However, with use, it was obvious that the Poqet PC was lacking in vital areas (the screen for one) and while an excellent stop-gap, just could not perform sufficiently to provide moving decode. The interested and intrigued can point their browsers at www.bmason.com/PoqetPC

Eventually, and best of all, I bought a Toshiba Libretto, a truly fantastic PC in a package also the size of a VHS cassette. Featuring a then speedy Pentium P75 processor (unheard of at the time in anything that size, mine's overclocked to 120MHz), colour SVGA TFT l.c.d. screen, full complement of I/O ports - essentially, a true Pentium PC in a pocket package. I've used mine for all kinds of decoding and it works a treat.

Best of all, however, is linking it to a computer-controlled receiver where it makes the perfect partner. Visit www.xintechs.com/tips for some excellent information about the Lib and plenty of projects that will improve its already plentiful virtues.

And so Roy (deep breath after all that!), the machine to acquire if you want decode on the go is a Toshiba Libretto (in either L50, L70 or L100 guise). They can be had quite cheaply second-hand from a variety of sources - check the small ads in computer magazines or point your browser at www.ebay.co.uk and type Libretto into the search field.



To Err Is...A Pain!

It's inevitable I suppose, but write a column like 'ShackWeb', one in which you publish URLs, and sooner or later you'll make a typo and the website will be unreachable. I had a communication from **Cliff Dow** who pointed out that while all of the URLs in the last instalment were fine, one, genesis.infonline.net/scanner/ could not be resolved by him.

I tried it immediately after receiving the E-mail and can report that it works fine for me (see screen grab) so it could be that your browser (especially if you're using something other than *Explorer* on a PC) is incompatible, Cliff.

One difficulty, of course, is that the web is constantly changing and a URL published now might easily have melted away into the packet-switched ether by the time you come to try them. Rest assured that every URL mentioned in the column is pasted into the original text directly from the 'Address' field of my browser and only after it has resolved the address. That ought to mean that the URL is flawless but...well, with the best will in the world! So, don't be too disappointed if you read of something here you can't reach and do continue to send in your corrections and additions.

Jobs & Woz

The latest addition to my shack is an Apple IIe complete with disk drives and mono monitor. It's the first of these 6502-based Mac forerunners I've owned and naturally, acquiring it sent me scurrying off on a trawl around the web looking for resources and support - I wasn't disappointed!

The Apple being a largely an American phenomenon (American in origin and in the majority of its installed user base) there are many dedicated souls still supporting and using it and most of them, it seems, have a web presence. I'll save a complete discussion of the IIe and what it can do in the shack for a future instalment, so here's an excellent URL to be going on with should anyone feel like acquiring an Apple or trying one of the many emulators (it's a list of Apple FAQs and links): www.grin.net/~cturley/a2faq/Csa21MAIN3.txt

And Finally

That's it for this instalment. Please E-mail me with your own favourite and interesting websites. Until next time, good browsing and good listening.

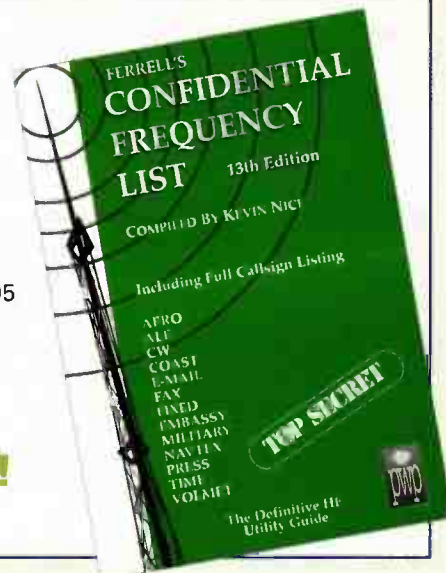
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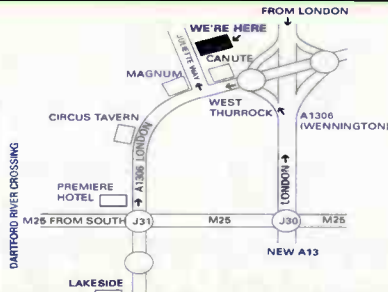
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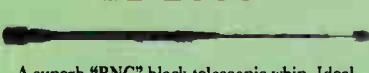


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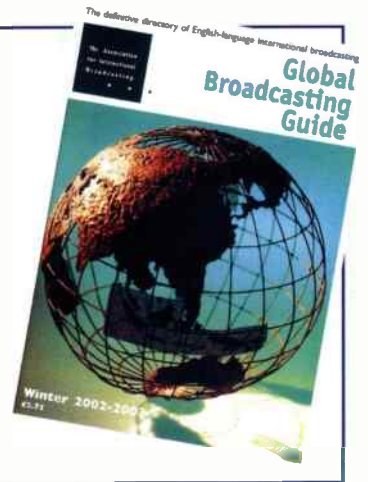
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OPTIONS (price / carriage)

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AR8200/8600		
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ASM8600 s-meter AR8600, see left panel.....	79.95	5.00
AR5000		
AS5000 4 way external aerial switch.....	99.00	3.50
CT5000 Internal CTCSS unit.....	79.00	3.00
DS8000 Voice inverter unit (analogue).....	69.00	3.00
CR5000 Tape recording lead for the AR5000.....	17.90	1.50

Full details may be viewed on the AOR web site www.aoruk.com

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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
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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.**



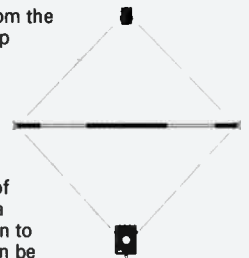
Compact, but achieving high performance, featuring an internal high-gain amplifier (13.5dB) and excellent overall strong signal handling (high IP₃ +30dBm). Very compact being constructed of metal loops and providing a quality finish, still the LA350 remains only half the diameter of other well known loop aerials. Supplied with two loops, 3.0 - 9.0 & 9.0 - 30MHz **£199.00 carriage £5.00**

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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 IP₃ 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

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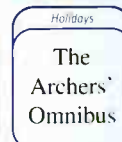
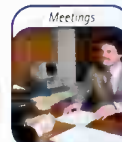
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Scanning Scene

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editorial



Welcome to the third edition of *Scanning Scene Extra* - a free magazine from *Short Wave Magazine*. Inside, Dave Roberts takes a long look at antennas for scanning, describing how to build and modify internal, external and covert examples. Dave also guides us through the history and equipment utilised by the British Army Mould network. Are you considering buying a new scanner, or perhaps updating? We've got an at a glance scanner selection chart to help you choose in this dedicated scanning publication.

So you don't have a radio but you're still curious, perhaps a look at some of the scanning websites presented on page 30 is the answer. Alternatively, you may just want to enter the *Scanning Scene Extra* Bumper Scanner Competition and possibly win one of the nine amazing scanning prizes. We hope you read and enjoy. Please remember that in the UK, listening to transmissions other than broadcast stations and radio amateurs is prohibited. Anyone using a scanner needs to exercise discretion.

Be careful and enjoy.

Kevin Nice - Editor

Scanning Scene EXTRA



Cover - A fascinating pastime
welcome to the world of scanning.

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Bumper Scanner Competition!

Win one of nine fantastic scanning prizes. See page 16 now! £3175 of prizes to be won.

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Scanning Scene

introduction

In this free supplement produced by the *Short Wave Magazine* Editorial team we aim to give you a quick look at the world of scanners and scanning. *Scanning Scene Extra* is a magazine for both newcomers and old hands alike. Hopefully there is something within its pages for all of you. Unfortunately, it is beyond the scope of this short form magazine to explain all the intricacies and details of a subject so vast as scanning. This short introduction is intended to answer some of the most fundamental questions.

There are books dedicated to the subject and these include frequency guides, explanations of radio communication systems in general and specifics related to monitoring specific services. What we intend to do here is provide a starting point. I hope to enable you to quickly get an idea of what the hobby of scanning is all about.

Also included in this guide is 'What Scanner', a tabular, at a glance guide to what the current range of scanning radios, hand-held and base station have to offer.

Is Scanning Legal?

You can legally buy and own a scanner. You can use it to listen to programmes from the world's many broadcasters, both radio and TV - though you won't see a picture with most of the radios listed. You may legally listen to radio amateurs in conversation with each other around the world on a variety of bands ranging from long waves to microwaves. For most of the population - that's it! Generally speaking, everything else is illegal including listening to CBers doing their thing too.

The actual position in law is something like this. You may not listen to any service or part of the spectrum unless you possess a licence to do so. The DTI have a leaflet, RA169, which explains. This document in turn refers you to the *Wireless Telegraphy Act*, section 5(b). It is this somewhat aged act that governs the monitoring and interception of

radio signal and traffic in the UK. There is another act of Parliament, the *Interception of Telecommunications Act*, that also governs radio interception and this relates specifically to cellular and other telephones systems.

So, it all looks pretty grim for SWM readers and scanner owners. However, this need not be the case. The key to this hobby is discretion. If you don't tell anyone what you've 'accidentally' picked up, then no-one will know! Using your scanner discretely and wisely allows you to gain maximum enjoyment and return on your investment from the latest radio technology.

It is also worth noting that, technically speaking, sharing information with others can be considered as incitement to commit an offence. So, the utmost care is required with this particular hobby but this need not restrict your enjoyment of radio listening.

It is worth noting however, that those who would bring a prosecution about, have far better things to do than hunting down casual users of scanners and other monitoring equipment.

If, on the other hand, your interest in interception is somewhat more sinister and you wish to turn anything you may hear into personal gain, then watch out!

So, everybody with an interest in radio monitoring, please take this advice - be careful and happy listening!

VY 73 Kevin



Without doubt the most important part of any radio system is the antenna. Dave Roberts looks at making your own, where to mount them and spotting other peoples'.

If your interest in radio began prior to the inception of scanning, then your first radio would probably have been an h.f. receiver with a length of wire sticking out of the back. Wire that you either looped around the picture rail or ran to a tree at the bottom of the garden. In either case, it didn't take too long to work out that you could hear stations from further afield if you made the antenna a bit better. In the case of your old h.f. receiver this probably meant adding more wire to the antenna and perhaps burying a decent earth.

Something Better

At some stage you will have bought your first scanning receiver and opened up a whole new world. The set would have probably been a hand-held with a



Some antennas recently found at a remote hilltop site. I'd be interested in knowing what they are for. Anyone have any ideas?

ScAntenna

rubber helical type antenna fixed on the top. With this scanner (was it a Realistic or a Uniden?) you listened to aircraft, the police and maybe a couple of local businesses. It sat with you while you were at home and on the desk or bench at work. When you drove home it rested on the dash and warned you of road accidents that might delay you.

After a while you just needed more, I know I did. Like me, I'm sure that you immediately started to consider what antenna to use. No need to worry about connecting it to the set. The set's BNC connector takes care of that, but just what to plug in became the priority. Times don't change and the same questions are still being asked by people new to the scanning hobby. Unsurprisingly, the answers are just the same too.

The first thing to remember is that generally, the very best indoor antenna is never as good as the very worst outside one. This is the case

whether the radio is operated in the home, workplace or car. It does not necessarily mean that you won't occasionally need to deploy an internal antenna. In fact in some circumstances it may be preferable to do so, bearing in mind possible planning constraints or even a desire to remain unobtrusive when scanning from a vehicle. For the most part however, we all need to make the most of our radio and to do this will require an antenna to be mounted outside.

How good are you at wielding that soldering iron? I'm not too bad but my eyesight can't handle small objects up close. Now that's a real pain when you consider that most radios have a BNC antenna connector fitted as standard with only a few utilising something a bit bigger - like an SO-239 socket. Ever tried soldering some coaxial cable connections to one of those BNC plugs? It's not easy with eyesight like mine. Even worse are the SMA connectors that are much smaller. I



reckon these connectors have all been made by the people that used to stand on the platform of my 00 gauge model railway waiting for the steam train to take them to the plug factory. Yes, their hands would be small enough. If you can handle the small soldering then by all means obtain a suitable BNC plug and solder a small length of RG58/U 50Ω coaxial cable to it.

Alternatives

If you can't solder then either a) get a mate who can to solder it for you or b) purchase a BNC to 50-239 adapter. This adapter costs around a pound and will plug into the BNC connector on the set and will then present you with an 50-239 socket. Next obtain a PL-259 plug that fits into the 50-239 and solder the coax to that making sure that when you do so that the coaxial inner is properly connected to the central pin duct on the plug. Ensure that the braid is properly soldered to the plug's outer section and most of all, be careful

that there is no short circuit between the two. Then plug the PL-259 into the 50-239 socket. At this point people who actually know what they're doing will be shouting at the page.

Firstly, those in the know will be concerned about the signal loss caused by having an extra adapter in-line and secondly, they'll be scratching their heads about my recommendation of RG58/U cable which is relatively thin and not particularly efficient. I **always** use a short length of such cable between the rear (or top) connection to the scanner or radio. This length of cable is made up as a patch lead with PL-259 plugs at each end. One end is connected to the radio (using an adapter if required) and the other end is plugged into an 50239-50239 adapter. This item is basically two sockets back-to-back and will only cost around a pound. To one end of this I then attach the antenna lead. Using a thin and easily flexible coaxial lead to connect into the radio prevents physical stress on the radio's antenna socket and will minimise the chance of

damage to the set. I have seen hobby radio kit that is hooked up directly to heavy duty coaxial feeder, such as RG213, and sometimes the radio is almost suspended by the efficient, but very stiff cable. Using thin coaxial patch leads in this manner will most certainly prevent the antenna socket becoming loose in the set or stop the radio's cabinet from cracking due to stress at the joint. The scanner will also be more controllable on the desk as a result.

Having made your patch lead, you now need to solder a PL-259 plug to the main antenna lead. This lead should be RG213 or similar cable that exhibits less signal loss than other, thinner, cables. Remember to use 50Ω cable and beware of tempting offers of cables at shows and rallies. They may be 75Ω TV type coaxial cable and this will not work at all well with scanning or amateur radio kit due to mis-matched impedance, though it's worth mentioning that many users will say the effect is negligible.

Having constructed your plugs, patch lead and

The h.f. propagation test vehicle and the roof mounted whip on it. Nice work if you can get it...



antenna feeder cable, you are ready to hang an antenna on the end of it. This is where you can use your imagination. Many years ago I made my first scanning antenna using five brazing rods, a small Nylon block about 50mm square and a metal washer. I cut the Nylon block so that it was about 25mm in depth. I then cut it so that it had eight equal sides when viewed from above and below. Working from the underside I carved out a hole to a depth of about 10mm

so that my steel washer would fit in it making sure that the washer's centre hole was in the very centre of the block. Then working from the edge of the eight sided block, I drilled a small hole in the centre edge of one of the sides just big enough to ensure that a brazing rod would push in and make a tight fit. I drilled an identical hole in every other edge. This meant that I now had a small drilled hole on every other edge of the block.

The holes appeared in the carved out centre. I drilled an identical hole in the top of the block, dead centre. I then cut all my welding rods so that they were 495mm long. Four of them were marked 35mm from one end and from that point they were bent at an angle of 45°. These four rods were inserted into the holes around the edge of my Nylon block with the short section prior to the bend being inserted in the Nylon. They were positioned so that the eight sided block stood happily on its new legs and when I was satisfied with the

positioning they were soldered to the steel washer that nestled inside the block's hollowed out cavity. Then I inserted the final rod into the top so that the end appeared in the centre of the steel washer when viewed from below. All that was needed then was to solder the centre of my coax to the end of the vertical rod and the braid to the steel washer. There it was, a quarter wave ground plane antenna ideal for v.h.f. 145MHz reception and transmission and very useful for general v.h.f. receiving and with useful performance at 400MHz frequencies too.

I used this antenna mounted in the loft for many years and was thrilled with it. A basic quarter wave ground plane antenna of this type

was sold by Revco/Garex for many years. Their construction was, of course, way better than mine. Many examples of this excellent antenna were in circulation and I lament the fact that a basic and effective antenna of this type is not made today. I had one and it sat on a pole attached to my home for ten years and such was the build quality that it was as good as new when it was removed. I used it for general scanning and



This tower carries everything from police, water company and a multitude of other service. Typical of a remote relay.



particular case the 145MHz, (2m) amateur frequencies were my band of choice, but the antenna also worked very well as a general v.h.f. high band receiving antenna, covering from about 120 to 175MHz quite effectively.

Sadly we're not all good at maths but everyone these days has access to a calculator. If you want to make a simple antenna to monitor a specific frequency band you'll need to know the wavelength. To work this out we have to divide the speed of light (roughly 300 million metres per second), because that's how fast radio signals travel, by the frequency.

Looking at the 145MHz frequency, for instance, all you do is divide 300 million by 145 million and it works out at 2.06 metres. That's your wavelength. Divide this by four to get the quarter-wave element length. Job Done!

Now calculating the element length for any frequency we want to monitor, or transmit on, is dead easy e.g.

77MHz (300 divided by 77 = 3.896 metres (the wavelength) divided by 4 (for a quarter-wave) = 0.97 of a metre. That's the element length!

2m/70cm amateur work. I gave it to a mate who just left it in his garage and eventually chucked it out. I wept!

Dedicated Antenna

Although a simple kind of antenna as described above is pretty good for high band v.h.f. reception and reasonable at u.h.f. it will never be as effective as a dedicated antenna for the band that you wish to monitor. The bits of brazing rod on my home-made antenna were cut to that specific length to make them efficient as quarter wave elements for the frequency band on which I intended to spend most of my time. In that

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Log periodic antennas



MLP32

SPECIFICATION

- ★ Frequency Range:
Transmit freq: 100-1300MHz
($\lambda/2$ /70/23cm)
Receive freq: 100-1300MHz
- ★ Forward Gain: 11-13dB
- ★ Forward to Back ratio: 15dB
- ★ Boom Length: 1.4mts
- ★ Elements: 16
- ★ Longest Element: 1.44mts
- ★ Connector: 'N Type'
- ★ Mast up to 2"
- ★ Power: 500 watts
- ★ VSWR: <2.0:1
- ★ Weight: 3 Kg

£99.95

MLP62

SPECIFICATION

- ★ Frequency Range:
Transmit freq: 50-1300MHz
($\lambda/4$ / $\lambda/2$ /70/23cm)
Receive freq: 50-1300MHz
- ★ Forward Gain: 10-12dB
- ★ Forward to Back ratio: 15dB
- ★ Boom Length: 2mts
- ★ Elements: 20
- ★ Longest Element: 3mts
- ★ Connector 'N Type'
- ★ Mast up to 2"
- ★ Power: 500 watts
- ★ VSWR: <2.0:1
- ★ Weight: 5 Kg

£169.95



The MLP log periodic antenna is constructed to the highest specification and are supplied to our military and commercial customers. They cover the whole stated frequency, have good front to back ratio and cross polarisation rejection. With an input VSWR of less than 2:1 and requiring just one coax feed, the MLP is one of the most popular antennas for the ham and scanner enthusiast alike.



Using this information anyone can now put together either a simple omni-directional quarter-wave ground plane antenna like mine for 145MHz. Alternatively using the same calculation a mobile type whip antenna can be made, or using two elements you can make a dipole which, if mounted horizontally, will be directional. From now on, the world is your oyster.

For most of us, though, constructing our own antennas can be a time consuming business that can end up being more expensive than a 'store bought' antenna.

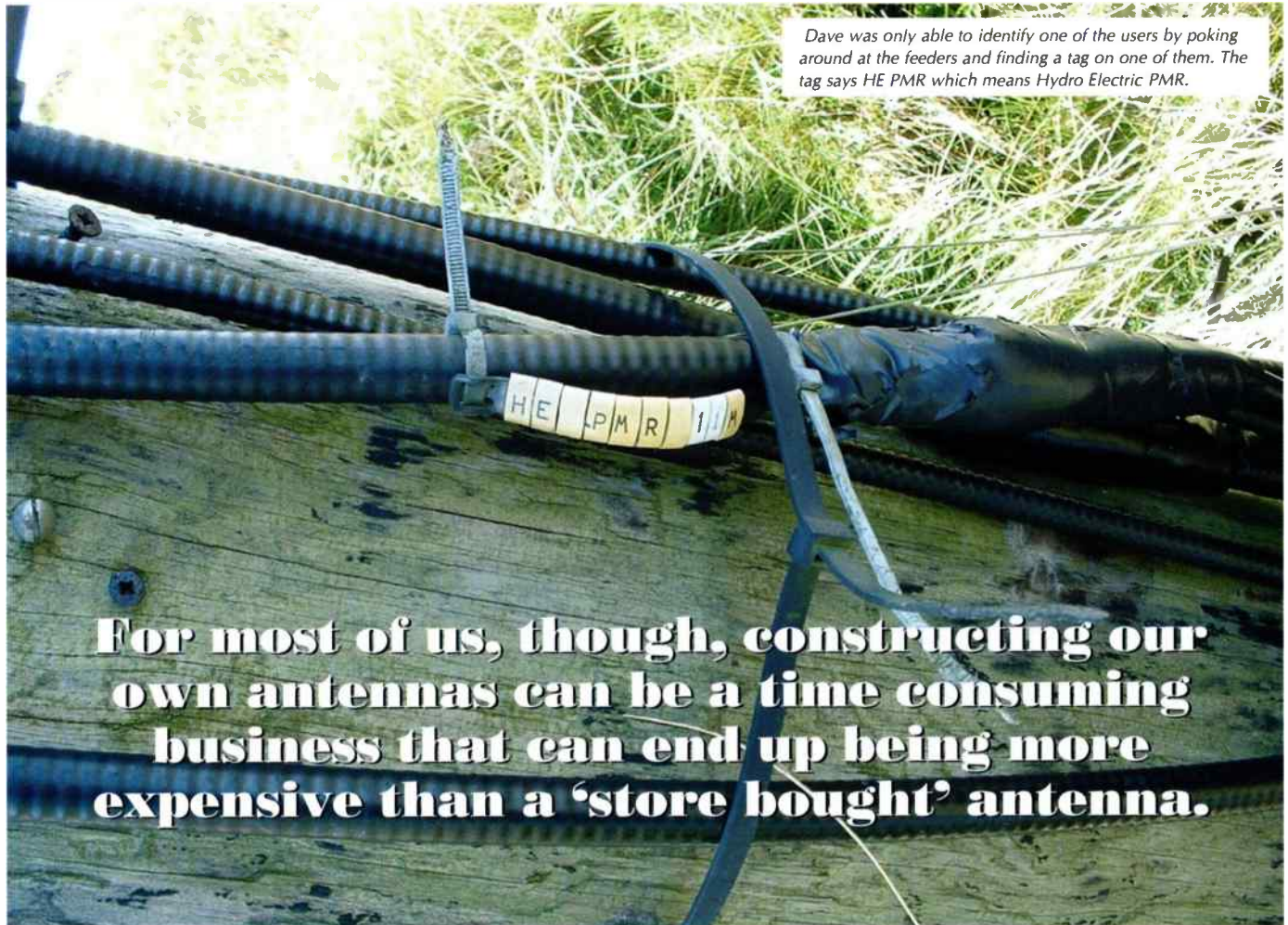
This is where you have to decide what the radio will be used for. For general purpose scanning, I have a discone mounted on top of a

meaning that the highest frequency on which it will receive effectively is ten times the lowest on which it will operate. So if the lower frequency is 50MHz, in theory the high limit for effective operation will be 500MHz. I believe that my discone is actually very useful within this range, signals that I receive outside these parameters are resolved because there is some metal in the air and frankly, it's better than nothing. Having said that, discones are ideal for general scanning I have mine connected to a Bearcat UBC9000XLT receiver.

This particular discone also can act as a transmitting antenna for 145, 433 and 50MHz so I'm told. As I have an amateur licence I can use

polarised. Most of the signals that we will be monitoring will use that polarisation (aircraft, vehicles, marine craft and hand-held units and base stations) so it makes good sense to receive the signals on a vertically polarised set-up so as to avoid any losses through cross polarisation.

In practice, nearly all antennas used for general scanning purposes will be vertically polarised. Low band v.h.f. reception via the discone is pretty good too with USA based ambulance, fire, police services and dishwasher repairmen rattling in when conditions allow but long range reception at these frequencies is more dependent on favourable conditions than the metal that you have in the air. My discone has now been aloft for



Dave was only able to identify one of the users by poking around at the feeders and finding a tag on one of them. The tag says HE PMR which means Hydro Electric PMR.

For most of us, though, constructing our own antennas can be a time consuming business that can end up being more expensive than a 'store bought' antenna.

10m pole in a field adjacent to my house. The antenna could easily have been mounted on the chimney stack but that has another antenna already in occupation.

Discones are omni-directional, in other words they receive signals equally from all 360°. Mine is claimed to have receive coverage from 25 to 1300MHz. Generally this type of antenna is believed to have what is called a ten to one ratio

this antenna as a standby for transmitting should the 'white stick' dual band 2m/70cm device on the chimney stack blow down. As for 50MHz performance, well I have had a contact with Morocco on that band using it so it can't be all bad. Discone antennas have generally consistent receive performance through a range of frequencies usually offering neither gain nor loss. They, like most scanning antennas are vertically

two years in an extremely hostile climate and it still seems to be just fine. Time will tell.

More Possibilities

Realising that I wanted to run two scanners simultaneously to monitor marine v.h.f., civil airband and other v.h.f. high band signals, it became necessary to install yet another antenna -

you simply can't have too many - Ed. My home is 70 or so metres above sea level, so a simple antenna would do the trick. Having some coaxial cable left over from another job and certainly not wanting to spend much money (I never do), I examined all the options including making something, but eventually came up with a cunning plan. Mobile CB antennas can only be described as pretty cheap. For less than £10, I acquired a mobile CB whip. When it arrived, I sawed off the whip so that it was reduced to about 460mm and then I removed the base loading by breaking into it and taking out the coil. Wiring the base of the whip direct to the 3/8in mounting gave me a quarter wave omni-directional whip for marine v.h.f. band. A generous application of self-amalgamating tape has ensured that the unit has kept out the rain for some years now. The whole kit and caboodle was mounted, using assorted clamps, to a bracket that originally only supported an outside light near the front door.

Another popular scanning antenna is the multi band 'white stick' (a description rather than a design for blind operators) type. These antennas are generally wires running inside ABS water pipe. Again vertically polarised these are generally marketed for either scanning or as antennas for amateur use. Depending on the model they are claimed to cover 2m, 70cm, 6m or any combination of all three. I have seen identical units sold as both scanning and amateur antennas. The only difference between the two apparently being the labelling. I believe that this type of unit is a good bet for amateur use on the amateur bands. I know that performance tails off outside the amateur bands for which they are made. The drop off is not too drastic and I have one of these white poles on my house but although it works fine on the v.h.f./u.h.f. amateur bands as well

as having acceptable performance on marine v.h.f. and on similar frequencies it doesn't really perform too well on low band. It's not designed to, so I shouldn't moan. If your intention is to just use the white stick for scanning, personally I'd give it a miss and stay with a discone.

The advantage that the trusty white pole has over the spiky discone is that it is a tad more discrete. Most folks in the UK live in towns or the



A remote hilltop site that carries a fair bit of comms kit.

suburbs and a discone in the air really informs the world that you are using a scanner. This can be a major disadvantage and the only option then may be to use something else. If absolutely necessary, you can put antennas in the roof space but this solution isn't going to work very well, especially when the roof is wet or snow bound. With any antenna the difference in performance may also be found to be seasonal. Signals that come

some surplus Racal white stick receiving antennas kicking around at rallies and on auction sites on the Internet. These are allegedly usable for frequencies between around 20 and 1300MHz. The length of the antenna is only half a metre and they normally come supplied with a mounting bracket. Selling for around £15, they appear to be excellent value. I have used one as have many other listeners and we have all been pleased with

them. Should you come across something similar you may want to check that you are looking at the right unit, the part number on the one that I have is 1649-100. If you put one or two of these tinkers aloft, trust me, no-one will notice them, since antennas that look massive on the ground diminish in size rapidly when in the air.

One of the larger wideband antennas that actually seem tiny when aloft is the log periodic type. Favoured by commercial and military

organisations, these antennas can operate efficiently over a wide frequency range, the larger types typically are specified from about 50 - 1300MHz. Being beam antennas, their response is directional. You'll need some sort of rotator or other method of turning them so as to point the antenna in the direction from where you want to hear signals. The length of the centre boom of these things can be around three metres which

Over the last three years, there have been some surplus Racal white stick receiving antennas kicking around at rallies and on auction sites on the Internet

romping in during the winter months may disappear during the summer. Should this occur take a look around your location. Are there any trees around? I'll bet there are. In the summer deciduous trees are shrouded with leaves and this can cause signal path problems to a nearby antenna. When the leaves are wet it's likely to get even worse.

Over the last three years, there have been

can't be described as small. They can cost as much as £300 and therefore represent a significant investment. Should you be tempted by the picture of one of these things in a catalogue it's well worth bearing in mind that all the pictures show them mounted so as to be horizontally polarised. Don't forget that much general radio traffic is polarised in the vertical plane, additional mounting hardware may need to be purchased to make the thing operate correctly vertically. In addition to the mounting pole, either a stand-off bracket or a non-conductive section will be required to keep the antenna away from the mounting pole. If this is not fitted the mounting system will interact with the antenna and that expensive log-periodic won't work at all well.

Opposite End

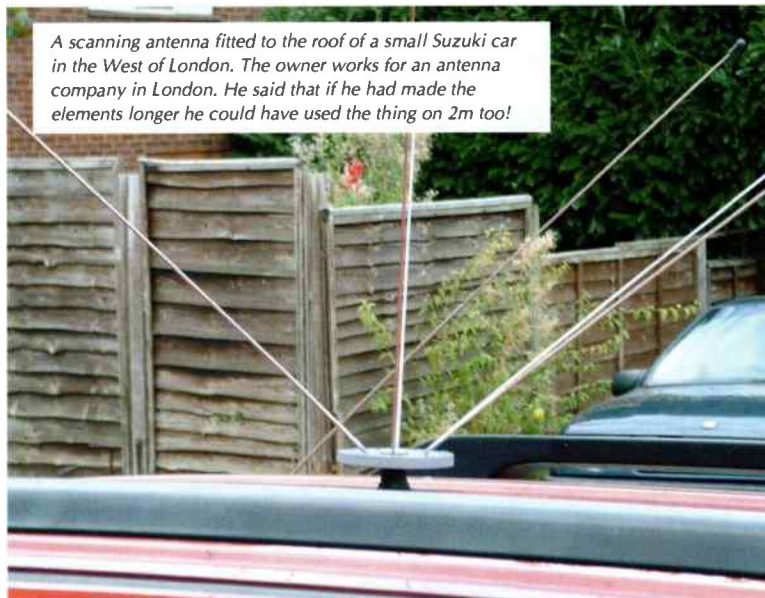
To consider the complete opposite end of the cost spectrum or for a temporary or 'jury rigged' system you can strip the braid back from some coax cable thus exposing the core. See to it that the exposed centre copper wire is of the correct

length for the frequency band that you wish to receive and blutack the thing vertically onto the inside of a window. At least you'll hear something. Or you could always buy a small mobile magnetic mount whip antenna and bung it on a filing cabinet or even a tea tray. It's better than nothing.

The next place that you may want to continue your monitoring pastime is in your vehicle. Personally, I don't like drawing attention to the vehicle by attaching too many antennas or gizmos to the outside. To do so may attract unwelcome attention from thieves, other low life or the authorities. The crooks will damage your vehicle and steal from it, other low life grunts may consider you to be some sort of official or part of the news media and subject you, or your property, to attack. The authorities will probably be curious and having stopped you will be looking for an excuse to justify their actions. This could include seizing all your gear and subjecting it to examination to establish whether any illegal frequencies are entered in any memories. As this definition includes everything apart from amateur, CB and broadcast frequencies you could be described as being in deep trouble. Don't believe me? Then just fit some very overt kit and watch

your world turn high intensity blue! Basically, you'll be able to get away with a maximum of two whip type antennas on your vehicle before becoming an object of interest to the aforementioned groups.

For the last twenty years any vehicle that has been used by me has had at least one scanner fitted. Every antenna configuration has been tried and the most basic one has, time and time again, proved to be the most effective. As in the case of



A scanning antenna fitted to the roof of a small Suzuki car in the West of London. The owner works for an antenna company in London. He said that if he had made the elements longer he could have used the thing on 2m too!

your home or office no internal antenna is going to be as good as an external one. Added to this your vehicle is generally made of metal and as that is the same stuff that Faraday Cages are made of, it stands to reason that generally, radio signals are going to have a bit of trouble getting in or out of a car or van.

Cars however, contain substantial areas of glass between the door line and the roof. This is why the scanner lodged on the dashboard top works after a fashion. Vans are a different animal and getting signals to arrive at an internal antenna in a van requires a bit of thought.

First, consider the antennas mounted outside. Believe me I've tried 'em all. Long whips, centre loaded whips, magmounts, gutter mounts and antennas fitted onto built-in roof racks. I even had one magmount that had something that looked like a spindly Christmas tree stuck on it. You know, I reckon that the best scanning antenna for mounting on the outside of a car is a small high band v.h.f. quarter-wave. No messing. Remember that when mobile in your car, it's unlikely that you'll be chasing the long distance signals. If you're like me you'll have enough trouble avoiding getting killed or maimed by other motorists to

pay too much attention to the strength of incoming signals. If you decide to park up then by all means deploy a base station antenna on a pole by the car or something but for actual mobile operating the short whip is great. In one of my 'long multi-band whip' phases, I realised that the received signals were fading due to flutter caused by the long element waving around as I drove along. Wind noise was noticeable and the long whip was putting strain on the vehicle's gutter to

which it was attached. Not good news! The same can be said for long antennas mounted on magnetic bases. I always had doubts about the antenna and magnet flying off the car when I was travelling at speed and this has actually occurred twice. Additionally, I always felt that it was asking for trouble to leave a magnetic mounted antenna on the vehicle when parked up and feeding a 2m long whip into the passenger space every time you stop at the supermarket is a pain. Additionally, the magnetic base can scratch the paintwork when being removed and if left on for any length of time, the inevitable result is rust

formation. For the last six years I've used a short whip terminating in a PL-259 plug and this is fitted to a gutter mount. Performance has been more than adequate with signals throughout 60 - 500MHz being easily heard. Two similar whips can be attached to the vehicle being careful to keep them at a distance from each other, preferably on opposite sides of the roof. If you require additional antennas or if you don't want any to be seen outside the car there are plenty of options.

Inside A Vehicle

The simplest way to achieve an internally mounted system is to buy one of those tiny magnetic mount antennas of the type sold by antenna specialists and stick it somewhere inside the car above the mid door line. The bases on these types have tremendously strong magnets and they obviously work excellently when conventionally deployed outside the vehicle. They are really discrete as well. I wouldn't mount one up at the front of a vehicle but I've successfully stuck one inside the hatch of a car with the magnetic base fixed to the metal at the top of the hatch with the antenna element hanging down. It

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stuck well, worked well and as the antenna is all black, it was pretty difficult to spot. Many 'official' vehicles need discrete antennas too and I have seen most of the types that they have used.

I've experienced antennas mounted in wing or door mirrors these don't work too well, antennas fitted into white plastic domes fitted on the roofs of small vans so as to look like vents (they weren't too good either) but the best was a transit type van kitted out as a covert control/relay truck. No antennas were visible on it at all. The thing had one of those high top roofs. In reality it was a conventional height vehicle with a fibreglass high-top fitted. Inside the van it was apparent that it was a conventional van with a roof of normal height. The high top had been applied to mask all the antennas on the roof and being made of glass fibre it made no difference to the r.f. performance of the various whips.

Antennas that are fitted on a vehicle's roof will generally exhibit some directional characteristics. For instance, should a mobile whip be mounted on the gutter line or roof, at the nearside rear then the set-up will tend to favour signals from the direction of the front offside. The same goes for transmitting antennas. It doesn't make a tremendous difference but it's certainly worth a mention. There are also 'official' types that use communications antennas built into the vehicle's normal car radio whip..

On my travels, I've seen antennas made from very thin wire which is poked through the rear parcel shelf and sits there vertically with the coaxial outer attached to the vehicle metalwork. This type worked very well and with my nose pressed to the rear screen I could only just see it from the outside even when it was pointed out to me.

This kind of antenna is so easy to make. Firstly, obtain suitable stiff (piano) wire. I use the type that is sold in model making shops which is intended for operating the control surfaces on radio control models. It is very thin, tough and almost invisible. You'll also require a BNC panel mount socket, they cost about £1.50 each last bought some at the Donington Show. The socket is mounted on a small square metal panel with a hole in each corner for mounting. The underside of the component consists of a small copper tube which is the right size to accept the end of the modelling wire and which is an extension of the centre pin of the BNC plug. All you do is cut the wire to the required length. Then tag a blob of

solder on the bottom end. With a needle make a hole in the rear parcel shelf where you want the antenna to go. Push the wire through from the underside and then solder the wire into the rear pin of the BNC socket. Solder some coaxial braid or a length of shorted out coaxial cable to the square metal panel and attach this to a handy screw or bolt on the bodywork of the car. Push the panel mount up so that it's flush with the underside of the parcel shelf, then glue or staple it to hold it in place. *Voila*...one covert antenna. One saloon car that I travelled in had two such

Although some common types can be identified by a visual inspection, many antennas are a mystery to most of us

antennas mounted on the rear parcel shelf. They operated very well indeed considering their extremely low profile.

Antenna Watcher

I don't know about you, but I'm a confirmed antenna watcher, constantly peering at rooftops and vehicles for a view of an unusual antenna that, with a modicum of luck, I'll be able to identify with a view - or should it be an ear? - to monitoring signals emanating from it.

These days this occupation has become much more difficult than it ever was due to antennas now being concealed in white fibreglass tubes thus resulting in so very many antennas that all look the same.

Although some common types can be identified by a visual inspection, many antennas are a mystery to most of us. That said, it is possible to ascertain what use a particular antenna is being put by having a very close look (if possible) at the thing. I recently came across an isolated radio relay station housed in a green metal cabinet with an adjacent small mast with various antennas bolted on to it. There were no indications at all as to the site user but upon close examination of the antenna feeder coax it was apparent that the local electricity company were the site users. How could I tell? The company name was written on a tag attached to the cable.

Also I'm never afraid to ask anyone in the vicinity about antennas. Pictured is an unmarked

white van with a pump-up mast mounted in the centre. Fascinating! But who was using the thing and for what purpose? Approaching the chap with the thing, I simply explained that I was interested in all things radio and would he mind telling me about the kit in his van. It transpired that there were two vehicles at the location one was the Transit van that I had seen and the other was a Freelander that contained another pair of blokes. These guys were from a defence contracting company who were engaged in propagation survey work around the British coast, checking frequencies up to 10MHz. In the back of the van was a very expensive signal analyser manufactured by Fireberd and an even fancier office chair. The whole thing was being powered by an on-board generator. They were slightly cagey about their work and so I didn't push them for information but they were friendly enough.

Sometimes you can get caught out by asking for information. One afternoon I noticed a fellow hiking around a suburban street with a massive amount of radio kit in a rucksack which had two v.h.f. antennas plus a GPS type mounted on it. Intrigued by what he was up to, I approached him and asked. He started off by saying "Well it's like this I'm thirty five years old...", after about five minutes informing me of his parents early days he lapsed into a sort of talking trance. With eyes tightly closed he recited the story of his entire life. After about forty minutes he got to the bit about what he was doing (it was survey work) and the equipment he had in use. I could almost see the key going round in his back. Too stunned and polite to thank him and leave, I stood there in the drizzle until he got up-to-date and finished. He opened his eyes, shook his head as if recovering from a dream and wandered off. I went home and laid down for an hour.

Enhanced Enjoyment

Antenna spotting can certainly be educational and sometimes amusing and I recommend it to all scanning monitors. It will enhance your enjoyment of the hobby.

There are many different types of radio equipment employing various methods of reception and transmission but the one component that all these systems can't do without is the antenna. It's fun to learn about antennas and by keeping our eyes peeled we can learn so much from them.

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Audio Output: 100mW
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Weight: 320g (without antenna)
Size: 65x155x38mm
Memories: 1000 (10 Banks of 100)
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Dave Roberts introduces the multi-purpose UK wide Army communications network.

Just cast your mind back to 1987. In the previous seven years there had been riots in many of Britain's towns. Industrial disputes all too frequently degenerated into violence and 'head-case' extremists from every shade of the political spectrum sought to politicise almost every situation to their exclusive and usually jaundiced advantage. The government of the day were extremely occupied by the perceived threat from the Soviet Union and the Warsaw Pact nations. It was known that some special forces from these powers had infiltrated the UK. In addition to all this the Provisional IRA was operational with Active Service Units stationed in many places in Britain.



Moulded for Communications

“Chiefly the mould of a man’s fortune is in his own hands.” Francis Bacon said that and, as far as I know, this is the only reference to the reason why the British Military called their Home Defence radio system, Mould.



This then, is the era into which the military communications system known as 'Mould' was born. Conceived ten years previously, when the requirement for command communications within each Home Defence Region of the British Army was established, Mould's birth gave a much needed boost of confidence to military planners tasked with Home Defence, as well as to senior police officers who realised that the military would be operating in a supportive role should the effluent really hit the pan.

Clandestine Insertion

The (now sadly defunct) Pye company of Cambridge England were engaged as the main contractor. The requirement was to enable voice communications between both mobile and static locations within each Home Defence Region. Some of these Home Defence Regions encompassed a lot of real estate indeed.

The South West District started at Lands End and ended up at Bulford on Salisbury Plain. If you think that's a long way, consider the Scottish Region where the headquarters in Edinburgh needed to have 24/7 real time voice communications with The Orkney Islands, the Shetlands and the Western Isles. You'd be excused for wondering why these remote parts of Scotland were so important. Just consider that in the eighties the Soviet Air Force would probe our air defences over the north of Scotland on a daily basis. Soviet submarines were often discovered in British waters. Numerous islands and coves allowed for the clandestine insertion of illegal agents in the same way that these same areas are thought to be utilised by other smugglers today.

In addition to the varied geography of the British Isles the designers had to contend with projected traffic density. Clearly more populous areas would require the ability to handle heavier traffic levels than remote locations. The whole specification led the planners to believe that the only system suited to their needs would be a v.h.f. f.m. net, linking fixed and mobile stations through a mass of hilltop repeater sites. Which would be connected using v.h.f. or u.h.f. fixed links.

Northern Island was specifically excluded from the Mould system. Since 1968 there had been a large scale deployment of British troops in the Province and, of necessity, they already had their own secure communications infrastructure. It was deemed unnecessary to provide them with another, insecure, system.

Completed In 1988

Obtaining the use of hilltop sites was no easier twenty years ago than it is today. Mould equipment has shared sites with the local authorities, police, the Civil Aviation Authority and of course other military or Property Services Agency (as it was then) facilities including the United States Air Force.

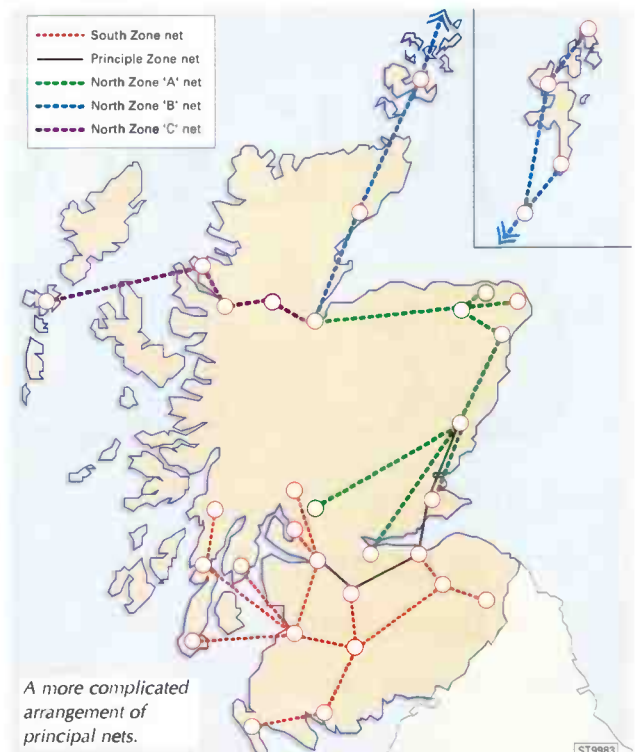
Although installing the repeater equipment at any site only took, at most, a few weeks, obtaining site clearance was an altogether more lengthy process with each site taking an average of two years to obtain clearance. Eventually 150 hilltops sites were in place containing 323 repeater units operating 200 links. In all 90 nets were operational by the time the system was



The two principal nets overlap between A and B and B and C. Between A and B parallel links are used because of path loss. Between B and C a single multiplex link is used.



TAOR nets which have to be superimposed on the principal nets. Net skipping is possible between principal and TAOR nets where they share common HTS.



A more complicated arrangement of principal nets.

completed in 1988.

Allocating frequencies to Mould was by the established method of frequency repetition separated by distance. Therefore a mould repeater in Cornwall may share its frequency pair with hilltop sites in Tyneside and the Orkney Islands. In this way the available frequencies were used economically resulting in only 227 v.h.f. and u.h.f. channels being needed to support the whole system.

requirement for Mould. Although it was found that most users preferred a straightforward voice contact to pass information, Selcall offered them an alternative. Selcall, utilising Fast Frequency Shift Keying at 1.2Kb, was fitted to each Pye Pegasus user radio with a simple add-on plug in unit. The radio then has its

Northern Island was specifically excluded from the Mould systems infrastructure.

The mainstay of the Mould is the network of hilltop sites many of which are located in remote locations subject to extreme weather conditions. One of the most distant locations on Fair Isle (you know where I mean, where they have those big woolly pullies!) was found to be inaccessible for maintenance for several months of the year and accordingly provision had to be made to ensure that interruptions to service would be minimal. In places such as these duplicate equipment was installed and configured so that the main and standby units were in use alternately. Should one equipment set fail then the remaining set would automatically be switched in line.



Selective Calling (Selcall) was also a

own four figure callsign allowing selective calling to that particular radio or group of which that radio was a part. The add-on unit has a six segment

l.c.d. and keyboard on the front. The radio operator can select a particular radio, or radio group, by callsign and then punches in the code for the message that he wants to dispatch. The send button then does the rest. The receiving station or stations then automatically sends an acknowledgement to the originating set.

This is all very well if there is a particular code for the message that you want to send but not so hot for other non-routine stuff. This is why the Selcall proved less popular with users than designers.



Remotely Interrogated

The Selcall system, however, enabled the hilltop sites to be remotely interrogated as each site, apart from having its own code, possessed a set of response codes that could indicate the status of the site

and equipment. This was pretty useful when managing a massive network of repeaters all over the UK.

Selcall also allowed Mould to send notification of intruder alarm activations, fire and power failure or associated problems at remote sites. Selcall is also utilised in this manner by other organisations who use remote hilltop repeaters such as some police forces. One particularly stormy night one police force discovered that some of their radio system had failed. Having identified the hilltop site that had gone off air they dispatched a police vehicle. A sorry sight met him. The once proud antenna mast was now a victim to gravity and to the crook with the hacksaw who had cut through ninety per cent of the thickness of each guy cable. When the wind blew hard, the mast came a-crashing down taking them and some other services off the air. This police force now uses a security system that signals the control rooms by Selcall. Mould engineers can



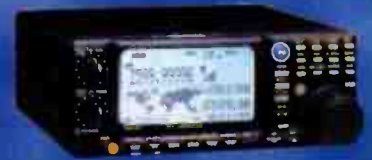
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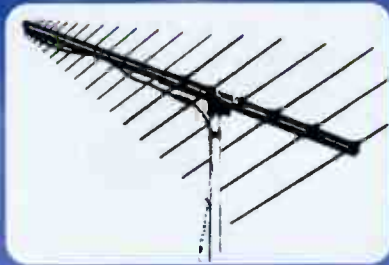


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4 MILES FROM BOURNEMOUTH INTERNATIONAL AIRPORT ON B3073
300 YARDS FROM CHRISTCHURCH RAILWAY STATION. FORECOURT PARKING FOR DISABLED

also use Selcall to link nets or take base transmitters off air.

Originally the Pye Pegasus v.h.f. low band radio was the mainstay of the system, with a power output of up to 15W f.m. Eighteen crystal controlled channels were available between 68 and 88MHz, 12.5kHz channel spacing was used and there were adapter kits to slide the basic radio into either a portable set up weighing over 9kg (well they are tough in the army) which included a NiCad battery pack, helical antenna and a battery charger. The vehicle kit enabled the Pegasus set to be slid into a vehicle mounting tray and hooked up to the 12V vehicle supply. This in itself is interesting because many military vehicles used 24V systems and this further establishes the Mould scheme as a non-combat but ruggedised system.



Pegasus also had a fixed location option where it ran from the mains via a 12V p.s.u. and a fixed base station antenna was used. Finally, there was an emergency set-up which employed the basic configuration with p.s.u. and charger but came supplied with a magnetic mount antenna. Later on, the Pegasus was supplemented by the Pye FM914 25W synthesised remote mounted set. Again operating at 12.5kHz spacing the 914 allows up to 250 channels to be programmed. These days other commercial, off the shelf, equipment is also in use.

Should any of the hilltop sites go off air irretrievably then there exists a number of Land Rover vehicles located around the country that are fitted with duplex 15W Pegasus sets together with v.h.f. and u.h.f. link equipment, generators and twelve metre pump up masts. The vehicles are intended to replace a hilltop site should the need arise.

The maintenance of the Mould hill top sites was originally tasked to the four Territorial Army Home Defence Signal Regiments of 2 Signal Brigade. All the equipment intended for users including mobiles, transportables and fixed sets were to be repaired and serviced by REME staff

but increasingly much of the general maintenance work is being carried out by civilian contractors.

Provision Of Security

As many of the u.h.f. link frequencies fall within the 70cm amateur band the sounds of Mould are not unknown to UK amateurs. The v.h.f. low band is home to most of Mould's frequencies. Most scanner users will have heard the distinctive sounds of the Mould system. Generally this consists of about two seconds of blank carrier terminating in a short burst of data. The transmitter then shuts down. When the system is in use call signs, clearly of a military nature, will be heard. Usually these communications merely contain test calls but in the past, when military exercises involving Territorial Army troops are ongoing, transmissions of a more lengthy nature can be heard.

Mould frequencies were audible everywhere in the specified 68 - 88MHz band but recently they are becoming more thin on the ground. Increasingly, like the rest of us, the military are using mobile telephones. They have the advantage that the infrastructure is not the responsibility of the MOD and this saves a small fortune in costs.

Finally, the decision was made to go the whole hog in this respect and therefore the Mould system will soon become a thing of the past. Why? In common with many other services the Ministry has concluded that their internal communications can be handled more cheaply, efficiently and securely by migrating to the controversial Airwave TETRA system operated by the private company mm02. An additional advantage is that, if deemed necessary, common talkgroups can be established between any of the users of Airwave enabling them to communicate as if they were on the same channel. As many readers of this magazine will be aware the Airwave system has been adopted by British police forces and is expected to be used by other



The mobile, motorcycle set and transportable all together.

Monitoring these exercises will illustrate that the Mould radio system is primarily intended to provide communications for military personnel involved in Home Defence. Much of the communications tends to concentrate on the provision of security at locations not normally patrolled or covered by security staff or at places where there is normally a security presence, which would have to be increased by importing troops to provide additional cover.

During these scenarios personnel deployed to provide security at a remote site can be assured that they have real time communications to their headquarters.

emergency services too. By the end of 2005 it is anticipated that the UK police will be all on Airwave. The military use of Airwave will only enhance interoperability between services enabling police and military to communicate with each other directly should the need arise.

Look for Mould on u.h.f. between 420 - 440MHz and on v.h.f. between 68 - 88MHz. There are many transmitters in use although the number is diminishing.

Francis Bacon also said, "Money is like muck, no good but it be spread." So perhaps the Military will call their new Airwave system 'Muck'.

SWM/SSE

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The RD500VX is a new kind of wideband receiver with sleek, robust styling, ...only 8 inches wide!



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The RD500VX gives wideband coverage with auto memory, skip list, priority channel, pause/hold, AFC, world time clock, and S-meter, and its HF performance is complemented with pass band shift, notch and peak filter, noise blanker, and smooth 5Hz tuning steps.

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We include Windows software to make it easy to gather information from document scanners, the Internet and other sources. The RD500VX can be linked to your PC to backup or download information, and a database is loaded into the receiver before shipping.

It also has a built in digital sound recorder and editor so a news flash or rare DX can be recorded. Up to 4 minutes of sound can be permanently stored!

Specifications:

Sensitivity (10dB S/N) HF SSB 0.2uV. IP3 +10dBm.
VHF/UHF NBFM 0.3uV. Scan speed 50/second.
Frequency range 0 - 1750MHz
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Fairhaven RD500VX Radio Database

RD500 General Facilities

1. Video and TV sound outputs.
2. Stereo FM with phono outputs.
3. USB and LSB modes
4. Pass Band Shifting
5. Synchronous modes.
6. Choice of bandwidths in most modes.
7. Stereo CW filters with 3 bandwidths.
8. Noise Blanker.
9. Clock and timers for recording programs etc.
10. Cassette switch controlled from squelch.
11. RS232 computer interface.
12. Data Slicer for decoding.
13. FM output for pocsac etc.
14. Tuning meter (centre zero)
15. Signal strength meter.
16. Notch and peak filter (Variable).
17. Peak hold AGC, user controllable.
18. 26 VFO's for temporary frequencies.
19. 55 thousand memories, (54 thousand more than the competition).
20. 234 groups.
21. 20 Text characters per memory.
22. Clear 'plain English' menu's on-screen.
23. Text searching with review of matches - find any station by name.
24. 99 Band set-ups with start and end frequencies.
25. Skip list.
26. Easy memory store and retrieve.
27. Edit entries, move groups, tag/untag, move/delete entries, without PC.
28. Priority channel.
29. PC Keyboard socket.
30. 8.33kHz, 9kHz, 12.5kHz steps etc., or user definable.
31. 5Hz minimum steps. (Not 5 kHz!), really smooth tuning.
32. Hold, pause, Stop or continuous scanning.
33. Auto tuning (AFC)
34. Auto memory write.
35. Definable pause and hold times.
36. Sound recording and playback with start and end point editor.
37. Whip antenna i/p for HF.
38. Mains Power supply.
39. Separate antenna inputs for different band ranges.
40. Antenna changeover output.
41. Stereo headphones and loudspeaker output.
42. Great HF (Shortwave) reception.
43. PC remote control software.
44. Database software, for backing up and editing.
45. File converter software, for importing files from the Internet etc.
46. Ability to import files from paper documents.
47. Remote control handset.
48. Large example database pre-loaded.
49. 20kHz to 1750MHz tuning range, superb sensitivity.
50. 2 year guarantee.

The RD500 is still the only wideband scanner that can store entire scanning directories in it's massive memory, and its HF performance, features and sensitivity are excellent.

No other radio comes close to its 55 thousand internal memories, and it has a great suite of Fairhaven PC software on CD

Support British electronics and get great technology for your £, this is one great piece of radio equipment that is made in the UK !

What the Press Say...

"Sometimes, when you pick up a piece of equipment for the first time, you know your handling quality kit. It's the nearest thing to perfection in a receiver that I've ever had the privilege of operating. In use, the Fairhaven is an absolute joy to operate. Putting it simply, it just plain works: it does what you'd expect it to do, and it does it very well. The Fairhaven RD500VX Radio Database is a truly great radio. It really is an insult to its massive capabilities to just call it a scanner: it makes a perfect main base station all-band, all-mode receiver, yet is small enough to fit under a dashboard for mobile use." - Giles Read, *Radio Active Magazine*.

"If you're after a 'do-everything' receiver having the advantage of a massive built-in frequency and user database, then take a very serious look at the RD500, you'll be pleasantly surprised. It's a receiver I'd be happy to use as my own." - Chris Lorek, *Radio Today*.
"I was impressed with the RD500 at our first meeting, and I'm even more impressed now. This is really innovative design and deserves success. I know of no other receiver which combines all the features found in the RD500." - John Wilson, *Short Wave Magazine*.

"A singular vision of how radios of the future might be conceived" Star ratings for sensitivity, dynamic range, RF intermodulation, IF filters, IF performance and audio quality:- 23 stars, - *WRTH Handbook*.

Which Scanner?

Your scanner selection guide

If you're thinking of buying a scanner, new or used, then it is important that you can make your purchasing decision based on facts. To help you spend wisely we've compiled the selection guide on the two pages overleaf.

The radios that feature in the guide are those that are currently available in the UK. Hand-held, base station and solely computer controlled receivers are all featured.

Vital information such as frequency range covered, modes available, numbers of channels, scanning speed and price are some of the vital information presented. Additionally, a reference to the review that has been published in an earlier issue of *SWM* is given to allow further in-depth information to be obtained on specific models of interest.

If you wish to obtain a copy of a full review, these are available from the *SWM* Book Store - contact information is given on this page.

Key to Which Scanner Selection Guide

- ✓ Included
- Optional
- * Transceiver



Abbreviations used in SSE

a.c.	alternating current
a.f.	audio frequency
a.f.c.	automatic frequency control
a.g.c.	automatic gain control
a.m.	amplitude modulation
B	Bell
c.w.	continuous wave (Morse)
d.c.	direct current
d.s.p.	digital signal processing
dB	decibel (logarithmic ratio)
dBd	decibel referenced to a dipole
dB _i	decibel referenced to an imaginary isotropic radiator (one dimensional antenna)
dB _m	decibel referenced to 1mW into a 50Ω load (standard units for radio measurement)
dBW	decibel referenced to 1W
f.f.t.	fast fourier transform (mathematical function used by d.s.p.)
f.s.k.	frequency shift keying
h.f.	high frequency
Hz	Hertz (cycles per second) unit of frequency
i.f.	intermediate frequency (in a superhet receiver)
IM	intermodulation
IP	intercept point
K	Binary multiplier x1024
k	Decimal multiplier x1000
kHz	kilohertz
λ	lambda symbol for wavelength
l.c.d.	liquid crystal display
l.s.b.	lower sideband
l.w.	long wave
M	mega x1,000,000
m	milli/1000
m.w.	medium wave
MHz	megahertz
MW	megawatt (1,000,000 watts)
mW	milliwatt (one thousandth of a watt)
MΩ	one million ohms
n.b	noise blanker
n.b.f.m.	narrow band f.m.
n.f.m.	narrow band f.m. (alternative)
p.s.k.	phase shift keying
r.f.	radio frequency
RX	receiver
s.s.b.	single sideband
s.w.	short wave
SINAD	ratio of signal plus noise to noise (used for performance measurement)
SINPO	scheme for recording reception quality
SNR	signal to noise ratio
t.c.x.o.	temperature controlled crystal oscillator
TX	transmitter
V	Volt unit of electrical potential difference
v.c.o.	voltage controlled oscillator
v.h.f.	very high frequency
W	Watt, unit of power
w.b.f.m.	wide band f.m.
w.f.m.	wide band f.m. (alternative)
Ω	ohm (unit of electrical resistance)

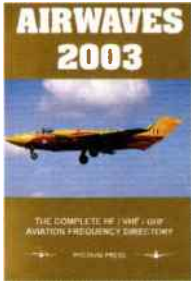
Books of Interest

There are numerous books covering all aspects of scanning, which can be obtained from the *SWM* Book Store.

A selection follows, a full listing can be found on page 72 of this month's *SWM*.

LISTENING

AIRBAND

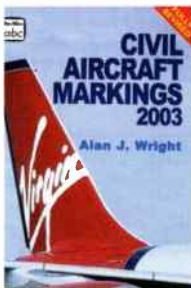


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Airband Radio Handbook (Haynes)
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Air Traffic Control (abc) 8th Edition
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Callsign 2003
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Civil Aircraft Markings 2003 (abc)
£7.99

Directory Of Aircraft Selcals 6th Ed.
£12.95

Flight Routings 2003 Williams
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Military Aircraft Markings 2003 (abc)
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FREQUENCY GUIDES

PROMA Scanning Scene CD
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Ferrell's Confidential Frequency List
Kevin Nice
13th Edition
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GENERAL SCANNING

Scanners 4 Scanning Into The Future
Bill Robertson
£9.95

Essential Scanning Guide Martin Peters
£6.00

Scanner Busters 3 D.C. Poole
£5.00

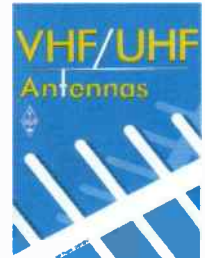
ANTENNAS

Antenna Toolkit (inc. CD-ROM) Joseph J. Carr
£25.00

More Out Of Thin Air (PWP)
£6.95

Receiving Antenna Handbook Joe Carr
£17.50

VHF UHF Antennas I.D. Poole
£13.99



FURTHER READING

Basic Radio Principles & Technology
Ian Poole
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Foundation Licence Now! R. Betts
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Amateurs Radio World Atlas
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Radio Amateurs Map of the World 2002
£7.00



To order any of the books shown here, please call 0870 224 7830 (between 9am and 4pm - outside of these times orders can be left on voicemail). FAX Orders can be sent to 0870 224 7850. E-mail orders are also accepted and can be sent to bookstore@pwpublishing.ltd.uk

Alternatively please use the postal order form on page 75 of November *Short Wave Magazine*.

Which Scanner?

Model	Coverage		Continuous Coverage	Hand/Base/Comp	Modes					Banks	Channels	Lock-out	Memories				
	Min. Frequency	Max. Frequency			a.m.	w.b.f.m.	n.b.f.m.	s.s.b.	c.w.				Total	Scan Speed (ch/s)	Search Bands	Search Speed (steps/s)	
Alinco																	
DJ-X2	0.522	1000	Y	H	✓	✓	✓			10			700	10			
DJ-X3	0.5	1300	Y	H	✓	✓	✓			10			700	10			20
DJ-X10E	0.1	2000	Y	H	✓	✓	✓	✓	✓	10	40		1200	5			25
DJ-X2000	0.1	2150	Y	H	✓	✓	✓	✓	✓	50	40		2000	5			30
AOR																	
AR5000A	0.01	3000	Y	B	✓	✓	✓	✓	✓	10	100		1000	45	20		45
AR5000+3	0.01	3000	Y	B	✓	✓	✓	✓	✓	10	100		1000	45	20		45
AR8200Mk3	0.53	3000	Y	H	✓	✓	✓	✓	✓	20	50		1000	37	20		37
AR8600Mk2	0.5	3000	Y	B	✓	✓	✓	✓	✓	20	50		1000	37	40		37
Bearcat																	
UBC60XLT-2	66	512	N	H	✓	✓	✓						80				
UBC120XLT	66	512	N	H	✓	✓	✓						100	100			300
UBC220XLT	66	956	N	H	✓	✓	✓			10	20	10	200	100			300
UBC280XLT	29	956	N	H	✓	✓	✓			10			200	100	10		300
UBC3000XLT	25	1300	N	H	✓	✓	✓			20	20		400	100			300
UBC278CLT	29	956	N	B	✓	✓	✓			5	20		100	25			25
UBC780XLT	25	1300	N	B	✓	✓	✓			10	50		500	100			150
UBC9000XLT	23	1300	N	B	✓	✓	✓			20			500	100			100
Fairhaven																	
RD-500VX	0.02	1750	N	B	✓	✓	✓	✓	✓	234			54682	50	99		50
Icom																	
IC-R3	0.495	2450	Y	H	✓	✓	✓			8	50		400	15	25		30
IC-R5	0.15	1310	Y	H	✓	✓	✓			8	50		1250	15	50		30
IC-R10E	0.5	1300	Y	H	✓	✓	✓	✓	✓	18			1000	6			17
IC-R8500	0.1	2000	Y	B	✓	✓	✓	✓	✓	20	50	50	1000	15	20		15
IC-PCR100	0.1	1300	Y	C	✓	✓	✓	✓	✓				Computer dependant				
IC-PCR1000	0.1	1300	Y	C	✓	✓	✓	✓	✓				Computer dependant				
Kenwood																	
TH-F7E	0.1	1300	Y	H*	✓	✓	✓	✓	✓	8			410		10		
Maycom																	
FR100	66	470	N	H	✓	✓	✓			5	20		100				
AR108	108	180	Y	H	✓	✓	✓						198	10			25
Yaesu																	
VR-120D	0.1	1300		H	✓	✓	✓			10		64	640	12	8		20
VR-500	0.1	1300		H	✓	✓	✓	✓	✓	10	100		1000	12	10		20
VR-5000	0.1	2599		B	✓	✓	✓	✓	✓	100	20	100	2000	15			15
Yupiteru																	
MVT-3300 EU	66	1000	N	H	✓	✓	✓			10	20		200	40	10		50
MVT-7100 EU	0.53	1650	Y	H	✓	✓	✓			10	100	500	1000	30	10		30
MVT-7300	0.521	1320			✓	✓	✓	✓	✓	10	100	500	1000	30	10		30
MVT-9000 EU	0.53	2000	Y	H	✓	✓	✓	✓	✓	20	50	500	1000	30	20		30

scanner quick reference chart

Features														Review			Model
Rechargeable	Charger	Rotary Tuning	Case	Battery Saver	Computer Control	Data Cloning	Trunking	Bandscope	AFC	Noise Blanker	DSP	Sync a.m.	Review	Current Model	Guide Price (£)		
✓	✓	✓	○	✓	✓	✓		✓					Aug-00	Y	170	Alinco	
✓	✓	✓		✓	✓	✓		✓					SSE 2002	Y	130	DJ-X2	
✓	✓	✓		✓	✓	✓		✓					Sep-96	Y	300	DJ-X3	
✓	✓	✓		✓	✓	✓		✓					Jul-01	Y	499	DJ-X10E	
✓	○	✓		✓	✓	✓		✓	✓	✓		✓	Jun-96*	Y	1799	AOR	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Jun-96*	Y	1999	AR5000A	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Jun-98	Y	439	AR5000A+3	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Nov-00	Y	719	AR8200Mk3	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y	80	Bearcat	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y	130	UBC60XLT-2	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y	150	UBC120XLT	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Apr-02	Y	180	UBC220XLT	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y	200	UBC280XLT	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y	159	UBC3000XLT	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Feb-02	Y	329	UBC278CLT	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y	325	UBC780XLT	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Aug-98	Y	899	Fairhaven	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y		RD-500VX	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Jun-01	Y	449	Icom	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Dec-02	Y	159	IC-R3	
✓	✓	✓		✓	✓	✓		✓	✓	✓			May-97	Y	259	IC-R5	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Sep-96	Y	1549	IC-R10E	
✓	✓	✓		✓	✓	✓		✓	✓	✓			May-99	Y	185	IC-R8500	
✓	✓	✓		✓	✓	✓		✓	✓	✓	○		Oct-97	Y	385	IC-PCR100	
✓	✓	✓		✓	✓	✓		✓	✓	✓			SSE 2002	Y	289	Kenwood	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y		TH-F7E	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Sep-99	Y	100	Maycom	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y	70	FR100	
✓	○	✓		✓	✓	✓		✓	✓	✓			SSE 2002	Y	159	Yaesu	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y	199	VR-120D	
✓	✓	✓		✓	✓	✓		✓	✓	✓	○		Jul-01	Y	599	VR-500	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Feb-98	Y	180	Yupiteru	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Apr-93	Y	269	MVT-3300 EU	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Oct-00	Y	259	MVT-7100 EU	
✓	✓	✓		✓	✓	✓		✓	✓	✓			Feb-97	Y	369	MVT-7300	
✓	✓	✓		✓	✓	✓		✓	✓	✓				Y		MVT-9000 EU	

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wideband scanning receivers

Awesome.

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 excursion scan
- Priority scan
- Any channel ship scan
- Battery save facility
- Facilities for cloning another set
- Built-in 24 hour clock
- Switchable attenuator

DJ-X2000 THE 'INTELLIGENT'
SCANNING RECEIVER

- Covers 100kHz - 2,149.99MHz
- 2000 channel memory
- Modes: 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
- Fight strength meter
- S Meter
- FM Stereo receive
- Tone level attenuator
- PC programmable
- 24 hour timer

 **£299.95**

 **£499**

with
8.33kHz for
airband

◀ **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
- 2 performance mode, easy and expert
- RX attenuator
- Auto power off mode
- Priority channel monitoring
- Squelch control
- Volume control

 **£129.95**

▲ **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 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

£129.95

NEW
LOW
PRICE



DJX-2000
INCLUDES FREE:
• Multi voltage 110V to 240VAC mains charger for easy use anywhere in the world
• 4.8V DC 700mAH NiCad battery pack
• Belt clip
• Carrying strap
• Flexible low profile antenna

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nevada

COMMUNICATIONS RECEIVER
VR-120D

Wideband Coverage: 0.1~1299.995* MHz AM/FM/Wide-FM

**Professional-Grade Monitoring
In the Field!**



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