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SWM

& Scanning Scene

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see Ed's Comments...

Reviewed -

Trunk Tracking Bearcat
Hand-Held BC246T Import

RIAT Report

Peter Bond Was There -
Read Details Inside

Sep '05
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- Nicad battery pack 4.8V DC 700mAh
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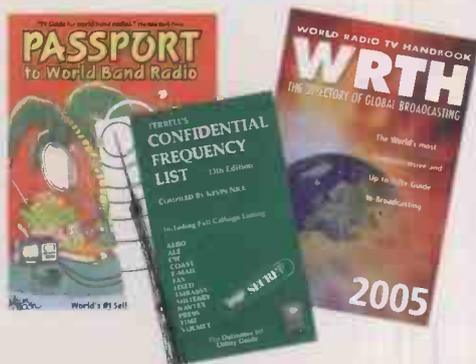
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RADIO BOOK STORE

see page 42



cover subject: Framed by Florida greenery, Space Shuttle Discovery lifts off Launch Pad 39B on the historic Return to Flight mission STS-114. On the mission to the International Space Station, the crew for the first time, performed inspections in-orbit of all of the Reinforced Carbon-Carbon panels on the leading edge of the wings and the Thermal Protection System tiles using the new Canadian-built Orbiter Boom Sensor System and the data from 176 impact and temperature sensors. Mission Specialists also practiced repair techniques on RCC panels and tile samples during a spacewalk in the payload bay. During two additional spacewalks, the crew installed the External Stowage Platform-2, equipped with spare part assemblies, and a replacement Control Movement Gyroscope contained in the lightweight Multi-Purpose Experiment Support Structure. Credit: NASA/Bill Ingalls

Share your thoughts

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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!

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Coming Next Month

in October 2005 SWM
*contents subject to change

- SBS-1 Virtual Radar - Reviewed - ATC in your own home!
- Uniden UBC72XLT hand-held scanner reviewed
- DRM Update - Laurie Hallett Investigates the latest developments
- Computers and Radio continues - put that PC to work in your shack
- Keep on top of the world of monitoring with SWM...and much more!

Bumper Scanning & Airband sections!

SWM Services

Subscriptions

Subscriptions are available at £36 per annum to UK addresses, £44 Europe, £54 Rest of the World. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £62 (UK) £76 (Europe) and £93 Rest of the World.

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 £5.00 inc P&P each and photocopies are £3.00 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 £2 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

Success at Last!

In last month's SWM I reported that I had witnessed an aborted launch for the United States National Aeronautical and Space Administration (NASA) space shuttle *Discovery* mission STS-114. I observed both by receiving a NASA TV data stream via the Internet (I don't have a Ku-band TV facility at the moment), and by listening directly to the mission 'bigloop' directly off air from the L-band Inmarsat downlink.

Some of my fellow satellite monitoring colleagues from the #hearsat Internet relay chat (IRC) channel who are located around the world, as discussed in 'Ed's Shack' earlier this year in SWM May, were sharing what they'd also heard both in text on the IRC channel and by using a *TeamSpeak*, audio server due to the generosity of group member 'xBr'. The *TeamSpeak* server is intended for use by on-line computer game players and allows multiples users to send and receiver audio to and from the group. It makes sharing of multiple signals a pretty simple task and is ideal for our type of application. The codecs used by the *TeamSpeak* software produce very compact data, so can be used with slower connections such as dial-up and even mobile 'phone GPRS data links. Good news indeed!

The server and client software is free to download and can be found at www.gotamspeak.com you'll find versions for both *Windows* and *Linux*.

On the launch day I found the use of the *TeamSpeak* application invaluable, as I was having problems with my u.h.f. preamplifier. This problem was preventing me monitoring the u.h.f. satellite utilised by the KING support units in the vicinity of Kennedy Space Centre on the eastern Florida coast.

It later turned out that I had a faulty coaxial interconnecting lead with a floating braid whisker shorting the preamp output to earth! This fault meant that I was only able to monitor Inmarsat with my Timestep helical antenna and preamp - see SWM September 2000.

The 26 July arrived and things were looking good. The valve sensor problem that had ensured the previous attempt of 13 July being cancelled at the final count was fixed, the weather that halted things on the 25th was now acceptable. Could this be the day? We all waited, watched and listened with excited anticipation. Would this be the day that NASA put the space shuttle back in space, saved their reputation and guaranteed continued budget?

The mission was to be a very busy one with a massive workload for all the crew of *Discovery*. The NASA supplied press pack tells me of 15 main objectives to be completed - a schedule that was to be increased later.

Good Practice

The earlier aborted take-off served as good practice for the actual launch, as I'd never monitored the build up to shuttle departure before. The whole thing was a learning exercise with lots going on to keep the workload up! The experience was a great deal of fun and I thoroughly recommend the activity, as it's very rewarding indeed. It's highly likely that we'll all be present on the #hearsat channel next launch so you know where to go to share the experience.

It was at 1221 that the u.h.f. frequency for the launch support net was discovered to be 261.725MHz. They were

running through a radio check to ensure the circuit was working. Launch was due at 1439. The audio from the 261.725 channel was fed on to the *TeamSpeak* server. This was pleasing as I was not receiving the signal direct. It's possible to record the audio with the *TeamSpeak* client software so I was doing just that. The files can be found on my website www.geckos-haunt.org/STS114/

I was searching for the Inmarsat downlink frequency that was to be used by the TAL 'bigloop' and so was 'satcom'. Neither of us found anything for a while. Eventually we heard the familiar sound of the TAL loop on 1538.450MHz at 1404 with 35 minutes to go. The *TeamSpeak* feed was added. I was tuned in but all was quiet on Inmarsat. It is of course the nature of these kind of missions that the comms are sporadic with traffic only when there's something to say - so unlike broadcasting!

As the minutes passed there were various comments from the IRC members about what we were hearing. The point of no return was passed, with mission control confirming that there were no issues preventing launch. The report of a nitrogen purge on engines came next and then away! *Discovery* had lifted off!

My thanks go to Hazmat, xBr, Stockholm, pjm, string, gonzo, Stockholm, Brian-DK, Sycho, Snoop55, satcom, Elburn, EKD514, tigger and not forgetting ojo who turned up just as it was over due to a meeting for making the whole experience worthwhile.

Ended Safely

Discovery made it into orbit, docked with the *ISS (Zarya)* and remained in space until Tuesday 9 August. There had been a landing opportunity, which had been considered the day before but weather on the ground at KSC lead to the mission controllers choosing to postpone. It is clear that the preferred landing site is KSC as the shuttle doesn't then require addition transportation. Unfortunately, the weather on Tuesday ensured that the landing took place at the Californian Edwards Air Force Base after a journey of some 9.4 million kilometres with touch-down timed at 1212. The whole mission was a success though the shuttle fleet has been grounded until the problems with the loosening of the inter-tile packing material has been resolved. Once in space, an additional task was for the loosened material to be removed to prevent potential difficulties on re-entry to the earth's atmosphere.

Mission Objectives

The STS-114 mission's top priority was to inspect all of the reinforced carbon-carbon heat protection material on *Discovery's* wing leading edge panels and to downlink data from the 176 wireless impact sensors, mounted inside the wing panels, for evaluation on the ground. The on-orbit inspections will be carried out using a variety of methods, including umbilical well and hand-held photography of the external tank after it is jettisoned, and an Orbiter Boom Sensor System (OBSS) with lasers.

Second on the list of priorities was inspecting all of the Shuttle's silicon-based tiles. The third highest priority, to transfer water from the Shuttle to the Station for use by the crew. Other mission objectives included (in order of priority):

- Perform Detailed Test Objective 848 - Orbiter Thermal Protection System Repair Techniques



A View to Earth

A camera on the *International Space Station* captured this image of the docked Space Shuttle *Discovery*'s payload bay. There is a vacancy in the payload bay, as the Multi-Purpose Logistics Module *Raffaello* temporarily has been docked with the orbital outpost's Unity Node in order to accommodate the transfer of a large amount of supplies.

Image Credit: NASA



- Transfer critical mid-deck items from the Space Shuttle to the Space Station
- Perform removal and replacement of the Control Moment Gyro-1 (CMG-1) using the Station arm
- Return the failed CMG-1 to the Lightweight Mission Peculiar Equipment Support Structure Carrier (LMC) using the Station arm
- Berth the Multi-Purpose Logistics Module (MPLM) *Raffaello* to the Station's Unity module using the Station arm; activate and check out the MPLM
- Transfer critical items from the MPLM to the Station
- Return the MPLM to *Discovery*'s payload bay using the Station arm
- Install the External Stowage Platform-2 (ESP-2)
- Transfer and install the Human Research Facility-2 rack in the Station's Destiny lab
- Transfer mandatory cargo
- Transfer required cargo
- Remove and replace Hyzod cover on Node 1 nadir hatch window
- Remove and replace S0 Global Positioning System (GPS) antenna No. 2
- Install Video Stanchion Support Assembly (VSSA) at the external camera port No. 9 location
- Install the external television camera group No. 3 to the VSSA on camera port No. 9
- Perform Materials International Space Station Experiment (MISSE) Passive Experiment Container (PEC) 5 deployment
- Perform MISSE PEC 1 and 2 retrieval
- Perform orbiter mid-deck payload operation activities to support powered payload daily status checks
- Perform critical USA and Russian daily Space Station payload activities as required to prevent loss of science
- Remove the ESP-2 Flight Releasable Grapple Fixture (FRGF) and return in the Starboard Tool Stowage Assembly (may be deferred if the spacewalk is behind schedule)
- Perform Joint Airlock flush with scrubber/filter
- Transfer remaining cargo
- Perform mid-deck sortie payload activities
- Reboost the Space Station with the Shuttle to no more than 357km (192.8 nautical mile) average orbital altitude
- Perform spacewalk get-ahead tasks
- Perform USA/Russian payload research operations
- Perform Space Station Structural Life Validation and Extension
- Rotate Resupply Stowage Platform to evaluate the redesigned drive pins and verify the ease of on-orbit rack tilting (only if crew time available)
- Perform imagery survey of the Space Station exterior during the Shuttle fly-around after undocking (if propulsive consumables are available)
- Perform Detailed Test Objective 805 operations

Launch

As with all previous Space Shuttle launches, *Discovery* on STS-114 had several modes available that could be used to abort the ascent if needed due to engine failures or other systems problems. The Shuttle launch abort philosophy aims toward safe recovery of the flight crew and intact recovery of the orbiter and its payload. These abort modes include:

Abort-To-Orbit (ATO)

Partial loss of main engine thrust late enough to permit reaching a minimal 105 by 85 nautical mile orbit with orbital manoeuvring system engines.

TransAtlantic Abort Landing (TAL)

Loss of one or more main engines midway through powered flight would force a landing at either Zaragoza, Spain; Moron, Spain; or Istres, France. For launch to proceed, weather conditions must be acceptable at one of these TAL sites.

Return-To-Launch-Site (RTL)

Early shutdown of one or more engines, and without enough energy to reach Zaragoza, would result in a pitch around and thrust back toward KSC until within gliding distance of the Shuttle Landing Facility. For launch to proceed, weather conditions must be forecast to be acceptable for a possible RTL landing at KSC about 20 minutes after lift-off.

Landing

The primary landing site for *Discovery* on STS-114 is the Kennedy Space Centre's Shuttle Landing Facility. Alternate landing sites that could be used if needed due to weather conditions or systems failures are at Edwards Air Force Base, California, and White Sands Space Harbor, New Mexico. This mission's flight ended with a landing at the Californian Edwards Air Force Base after a journey of some 9.4 million kilometres!

That's it from me for this month. I'm sorry but this extended 'Ed's Comments' has not left space for 'QSL'. Reader's letters will be back as normal next month.

9/14/05 73 Kevin

Stand Up!

Do you have a NEIM1031 In-line module laying on your shack bench? If so the latest product from bhi will help to improve your use of it and make for more comfortable working.

The 1031-STD is a quality stand made from high impact clear acrylic for mounting the NEIM1031 Noise Eliminating In-line Module. The NEIM1031 simply sits vertically or horizontally in the stand allowing you to see and operate all the controls much more easily.

The stand comes boxed and includes Velcro strips for mounting the NEIM1031 securely to the stand. This is particularly useful if you wish to use the module with an extension speaker and headphones as it allows you to raise the module's position in the stand so you can get access to the Headphone Socket.

Priced at £9.95, the 1031-STD is available now from bhi Ltd direct or any of their authorised dealers.

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New SOTA Association

A new SOTA Association was launched in Switzerland on 1 August 2005. This new addition brings the number of SOTA associations around the world to 13.

The first activation was carried out on

Lagern HB/ZH-010 (866m a.s.l.), using the special callsign **HB9SGS/P** (SOTA Group Switzerland). The first summit-to-summit QSOs between Switzerland and a UK association were made by **Richard Newstead GW3CWI/P** and **Tom Read M1EYP** using **MC1SWL/P**, the club callsign of the International Short Wave League.

Richard and Tom were activating Arenig Fawr **GW/NW-011**, 854m a.s.l., and

the contacts were made on 40m s.s.b. using a Yaesu FT-817, 40W linear amplifier and an inverted-V dipole antenna.

Space Observation with Amateur Radio

A newly formed Amateur Radio group called SOAR (Space Observation with Amateur Radio) is aiming to get the regulations surrounding airborne experiments changed. Project SOAR intends using meteorological balloons to carry Amateur Radio experiments to altitudes in excess of 90,000 feet. Planned payloads will include cross-band repeaters, ATV, APRS to name just a few. Each flight will be tracked from the ground and then recovered upon landing.

Current licensing restrictions do not allow the use of Amateur Radio equipment in airborne vehicles. Project SOAR is currently communicating with the CAA and Ofcom in an attempt to get the conditions relaxed. The group is actively seeking change that will allow experiments of this nature in balloons and other non-commercial craft.

SOAR

If the conditions surrounding airborne vehicles are relaxed, it will enable the group to provide payload space to other groups for experiments. It's envisaged that strong links will be made with schools and educational establishments with the inclusion of 'SOARSATS', which are small ping-pong ball sized experiments similar to those already in use in the USA.

The project leader, **Peter Badham G0WXJ** is keen to hear from any UK based groups or individuals who are interested in becoming part of the project. Contact details and further information is available on the SOAR website at www.eham.org.uk or direct via E-mail to info@eham.org.uk



The first activation of the Swiss SOTA Association was carried out on Lagern HB/ZH-010.

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Attention! Past & Present Members

The West Bromwich Central Radio Club (WBCRC) are calling all past and present members of the club (1980 - 2005) to join them on Saturday 1 October 2005, to celebrate their 25th Anniversary. A reunion will take place between 1200 and 1800 at the Horse & Jockey, located between Stoney Lane and St Clements Lane, West Bromwich, not far from Dartmouth Park.

So, if you are a lapsed member past or present, WBCRC would like to hear from you to make or re-make your acquaintance and hopefully find out what you have been up to in recent years. You may have news about other members who have lost touch over the years for a variety of reasons or just be curious to find out more yourself.

In order to make proper arrangements regarding numbers, if you are able to attend the reunion, please contact **The Secretary, Ian Leitch G0PAI** via E-mail: info@gx4wbc.co.uk or tel: 0121-561 2884, no later than Sunday 18 September.



Sky Gnome

World Radio Network (WRN) welcomes the launch of the Sky Gnome—the new wireless listening device from Sky. The Sky Gnome is an innovative portable and wireless device that will enable customers to listen to Sky around the home, including the 80 free-to-air radio stations available on Sky digital.

Richard Jacobs, WRN's Business Development Manager said: "This is great news for all radio stations on Sky digital because it frees them up from the set-top box and allows listeners to tune in around the house and even in the garden. With over 80 radio stations on Sky digital, the Sky Gnome offers people the biggest choice of digital radio in the UK".

The WRN currently uplinks almost one in three of the non-BBC radio stations available on Sky Digital making it the UK's number one independent satellite transmission provider for stations on the UK's number one satellite platform. Radio stations using WRN to get onto Sky digital include Virgin Radio, RTE, EWTN, Trans World Radio, Pulse Unsigned, Radio London, Radio Caroline, Gaydar Radio, Desi Radio, Spectrum Radio, Raaj Radio and Amrit Bani.

WRN's own international news and current affairs station is on Sky Digital channel 872 and the time share channels On Air (channel 938) and RADIO (934).

ISS Repeater Switched On

The International Space Station cross-band or u.h.f./v.h.f. f.m. voice repeater has recently been switched on. The downlink is 145.800 f.m. ± 3 kHz doppler shift and the uplink is 437.800 f.m. ± 10 kHz doppler shift. Please bear in mind that the crew members John and Sergei may be listening and pick-up the microphone to talk to you.

The ISS repeater can be worked with very simple equipment. To receive it on 145.800, an f.m. handheld with a quarter-wave whip is all that's required. On 430MHz you need to be able to transmit about 2 or 3W f.m. into a quarter-wave whip.

To find out when the ISS is within range go to the Online Satellite Predictor at www.amsat.org/amsat-new/tools/predict/ Select Show Predictions for ISS and enter your approximate Latitude and Longitude coordinates or IARU QTH Locator.

Limerick 430MHz Repeater

The new Limerick repeater has completed its testing phase and was installed on site in Co. Limerick on the 13 July.

Paul EI6FE, President of Limerick Radio club while mobile near Shannon had the first QSO with the installers on site. This was more by chance than an inaugural ceremony!

Good 430MHz coverage is expected in West Clare, most of Limerick and parts of East Kerry, Tipperary South Riding and North Cork. Low power 'rubber duck' hand-held access should be available in Shannon Town and Limerick city.

The repeater is permanently linked to Limerick R5 144MHz only. There may be mobile or base station access in Mallow, Blarney, Tralee and Tipperary Town. Please send reports to Mike via E-mail at: ei9feb@eircom.net.

Family Radio Contracts

Family Radio, the Christian non-profit, non-denominational, educational organisation, has transferred its Hot Bird satellite uplink contract to WRN, the London-based international transmission service company. WRN is now providing the USA based broadcaster with a 128Kb/s stereo channel and two 64kb/s channels on the Hot Bird 6 satellite, which gives extensive free-to-air digital coverage of Europe, North Africa and the Middle East.

Matt Tuter, International Representative for Family Radio Network said: "We needed to work with a company that provided more than just the satellite connection, rather, a company that took pride in their quality of service. From our past interactions with WRN we knew the quality of service would be high".

Richard Jacobs, WRN's Business Development Manager, said: "We are delighted that such an important international broadcaster as Family Radio has transferred its Hot Bird contract to us. We look forward to providing Family Radio with a fantastic service for many years".



Family Radio was established in 1958 under its official name: Family Stations Inc. and aired its first broadcast on February 4 1959, over radio station KEAR FM in San Francisco. Since then the ministry has built a number of powerful a.m. and f.m. stations throughout the United States and various places around the world as well as a shortwave facility and several smaller educational facilities and translators.

WRN uplinks a number of major international broadcasters to the Hot Bird 6 satellite via its unique radio multiplexer, located at its central London Broadcast Centre. Other clients include Radio Canada International, RTE Ireland, Radio Sweden, YLE Radio Finland and Adventist World Radio.

Thanks From Scarborough

The Scarborough Special Events Group wish to thank all licenced Amateurs and listeners who supported their GB2HQ event. Applications for the Enigma Award were received from hundreds of stations in the United Kingdom, across Europe and Africa. By using the settings displayed on the group's website www.sseg.co.uk and downloading software from the internet, many listeners were able to decipher the Enigma message to read 'Sixty Years Have Passed'.

The photo here shows Chairman Roy Clayton G4SSH handing over a cheque of £610 to Ian Dent, Officer in Charge GCHQ Scarborough, for the GCHQ Charities Fund. Also present were secretary Kevin Prince G0NUP and Treasurer John Earnshaw G4YSS.



New Bearcat Scanner

The latest addition to the Bearcat range is the UBC30XLT, which is being billed as the mini scanner with maxi features! The UBC30XLT civil airband scanning receiver features full coverage of the civil air band, 144MHz amateur band and other services up to 174MHz. Plus, it adds f.m. broadcast receive so you'll never be short of a listening choice.

The UBC30XLT has 200 memories, which offer flexible scanning and Uniden's legendary ease of use means this scanner is perfect for either the beginner or advanced user.

The UBC30XLT costs £69.95 and is available direct from Nevada, Tel. 0239 231 3090 or via the website at www.nevada.co.uk



Air Tattoo - Success!



The combination of glorious weather, a first class flying display-including the European airshow debut of a pilotless aircraft-helped create an unforgettable Royal International Air Tattoo over the weekend of 16 & 17th July.

Among the highlights of the airshow was a display of the pilotless Boeing ScanEagle. The public display by the secret surveillance aircraft was the first in Europe and live images from the craft were beamed down on to large screens situated in the showground.

Other highlights included a display by four Royal Navy Sea Harriers, the last time they will appear at the Air Tattoo before being retired and the Italian aerobatic display team the Freccia Tricolori, who once again produced a precise yet flamboyant display of typical Latin élan. There was also an elegant appearance by a brightly-coloured B757 belonging to parcel delivery company DHL.

Four C-130 Hercules, one from each of the RAF Lyneham squadrons flew a moving missing man formation in honour of their comrades who died when their Hercules crashed in Iraq earlier this year. Among those watching the tribute were a number of Tattoo volunteers based at RAF Lyneham, including the Station Commander **Group Captain Paul Oborn**, all of whom found it particularly poignant.

There was also a unique flypast by The Red Arrows and three historic Spitfires, which lent a nostalgic touch to the Reds' traditionally immaculate jet formation flying. Aerobatics display pilot **Will Curtis** set a new aircraft 'limbo' world record, flying his Sukhoi SU-26 beneath 12 ribbons held aloft between poles by lines of trusting volunteers standing either side of the runway.

This year, the Air Tattoo was held for the first time in support of the Royal Air Force Charitable Trust and delighted Tattoo director and co-founder **Tim Prince**. "It is most heartening that in our first year under the new Trust, the team has put on a fantastic airshow. I believe it has been a success for our many stakeholders, including the various international air arms, the many aircrew, our hardworking volunteers, the Royal Air Force and, of course, the people who matter the most-the public. "There were many highlights over the weekend but if I had to choose one, it would be the wonderful joint flypast by the Red Arrows and the Spitfires-the combined sound of the jet aircraft with the propeller-driven Spitfires was music in the air. "The airshow has been a wonderful advert not only for the Royal Air Force but also for the Charitable Trust."

rallies

August 28: The Milton Keynes Amateur Radio Society's Annual Rally is taking place at St. Paul's School, Chaffron Way, Leadenhall, Milton Keynes, starting at 0900. Talk-in on 145.550MHz. The rally location is 4km from J14 of the M1 and 0.5km from the local Maplin store. **Dave M0BZK** on (01908) 647662 or visit www.mkars.org.uk

August 28: The Torbay ARS Communications Fair is to be held at Churston Ferrers Grammar School, Greenway Road, Churston, Nr. Brixham, Devon. Doors open 1000 and the entrance fee is £2. There will be a free car park, trade stands, catering and a raffle. More information from **Colin G4FCN** on (01803) 812117 or **Peter G4VTO** on (01803) 864528.

August 29: The Huntingdon Amateur Radio Society are holding their Annual Bank Holiday Monday Rally at the Ernulf Community College, St. Neots, Cambridgeshire (near Tesco superstore on A428). Doors open 1000 and admission is £1.50. There will be hot and cold refreshments available. Features hall and car boot on hard standing. Talk-in on S22. **Peter Herbert M5ABN** on (01480) 457347 (between 1800 and 2200), E-mail: peteherbert@aol.com

September 4: The Telford Radio Rally is to be held at a new venue - the Shrewsbury Agricultural Showground, home of the well-known West-Mid-Show. **Martyn Vincent G3UKV** on (01952) 255416.

September 4: The Suffolk Data Group are holding their Rally & Computer Rally on the raceway centre green at the Foxhall Stadium, Foxhall Road, Ipswich, Suffolk IP4 5TL. Traders and booters from 0800, where there will be plenty of boot pitches, pay on the day and only £8. Doors open at 0930 and the entrance fee is just £1 - accompanied under 14s free. There will be a large car park adjoining the stadium with hot refreshments available. Talk-in on S22. Visit www.sdgrally.org for more information.

September 10: Waters and Stanton Open Day will be held at Lowes in Matlock. Sell your gear free of charge. Just book with Peter Waters on 01702 206835.

September 11: The Lincoln SWC Hamfest is to be held at the Newark Showground, at jn of A46, A1 and A17 at Newark. Doors open at 1000. There will be all the usual rally favourites, plus craft, classic cars and possibly fly-in by WWII Auster V reconnaissance plane, FAM. Further information at hamfest2005@mail.com or from **Roger** on (01522) 693848.

September 18: The South Yorkshire Repeater Group will be holding the Great Northern Hamfest today. This is a move from its usual November slot. The rally will take place in the Metrodome Leisure Complex, Queens Road, Barnsley, South Yorkshire. Doors open at 1100, 1030 for disabled visitors. The leisure complex is in the town centre and is less than 3km from J37 M1 motorway, five minutes walk from train and bus station, (follow the brown Metrodome signs from all directions). The venue is on one level with excellent disabled facilities. Features will include all the usual trade stands, component and specialist interest groups and a large Bring and Buy. Plus tables allocated to radio amateurs to sell there

own equipment at a nominal charge. For further information, inc bookings please contact the Hamfest Manager, between 1800 & 2000, **Ernie Bailey G4LUE**, 8 Hild Avenue, Cudworth, Barnsley, South Yorkshire, S72 8RN. Tel: (01226) 716339 Mobile (07984)191873.

***September 30/October 1:** The Leicester Amateur Radio Show will be held at the Donington International Centre, Castle Donington, Leics, close to J23A and J24 of the M1. Doors will be open from 0930 to 1530 on Friday and 0930 to 1630 on Saturday. Look out for the PW Publishing Ltd stand where there will be some great offers. Contact **Geoff G4AFJ** on (01455) 823344 for more details. www.lars.org.uk

October 7/9: The RSGB HFC2005 will be held at Gatwick Worth Hotel, Crabbet Park, Turners Hill Road, Crawley, West Sussex RH10 4ST. There will be multiple lecture streams covering topics from I.f. to v.h.f. with sessions aimed at beginners, improvers as well as the more experienced. There will be a large bar and lounge area in which to mingle with the other delegates. www.rsgb-hfc.org.uk

October 9: The Blackwood & DARS are holding their rally at the Newport Centre, Newport. Newport Centre is 1.6km from J25A of the M4 (J26 travelling west to east). Doors open 1030 for disabled visitors and 1045 for everyone else. There will be the usual attractions, including trade stands, special interest groups, Bring & Buy, talk-in on S22, prize draw, catering and bar facilities. Entrance fee is £1.50. **George 2W1JLK** on (01495) 724942 or **Dave GW4HKB** on (01495) 228516.

October 9: The Exeter Amateur Radio Society are holding their Rally/Table Top Sale at the Moose Hall, Spinning Path, Blackboy Road, Exeter. Entrance is just £1 and tables are £10. Doors open 1000 till 1500. More information from **Steve Webber M3WRS** on (01392) 498934/495690.

October 9: Great Lumley Amateur Radio & Electronics Society Rally will be held at Great Lumley Community Centre, Front Street, Great Lumley, near Chester le Street, County Durham - just off the A1(M). Doors open 1030. There is free parking plus easy access as well as good, inexpensive food and drink. There will be a Bring & Buy in two sections - junk and good buys. Admission £2, free of charge to under 14s accompanied by an adult. **Nancy Bone G7UUR** on 0191-477 0036.

October 23: The Galashiels & District ARS's Annual Open Day and Rally will be held in The Volunteer Hall, St. Johns Street, Galashiels, Scottish Borders. Doors open 1100 (1045 for disabled visitors) and admission is just £2. There will be trade stands, a Bring & Buy and refreshments. Details from **Jim GM7LUN** on (01896) 850245 or E-mail: mail@gm7lun.co.uk

* PW Publishing Ltd. will be in attendance.

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.

Golden Antenna Award

Victor Goonetilleke 4S7VK President of the Radio Society of Sri Lanka (RSSL) has recently been awarded the Golden Antenna Award for the outstanding work that he and RSSL members did during the Tsunami disaster. Every year the town of Bad Bentheim in Germany presents the Golden Antenna award to a radio amateur or an amateur radio group that utilises technology in connection with humanitarian work.

The prize winner or winners are invited to the German-Dutch Amateur Radio Days and their travel and accommodation costs are paid. The jury evaluating the nominations includes the President of IARU Region 1 and the President and Chair of the Dutch and German amateur radio societies.



KENWOOD

Listen to the Future



Nestled in the palm of your hand, Kenwood's TH-F7E is incredibly small — just 58 x 88 x 29 mm (WxHxD). How could so much be packed into such a super-compact design? Impossible! But it's true. This little wonder is an FM dual bander (144/430MHz) with dual-channel RX capability, 16-key pad, multi-scroll key, and no fewer than 434 memory channels. Other attractive features include a built-in ferrite bar antenna for AM broadcasts, LCD with backlight, and a lithium-ion battery. Small enough to slip into a pocket, the TH-F7E allows you to roam freely while enjoying the clear, reliable communications for which Kenwood is renowned. And despite its smart looks, it's tough enough to meet MIL-STD criteria for withstanding the rigors of outdoor use, while delivering superb performance.



- Receives 2 frequencies simultaneously, even on the same band
- 0.1~1300MHz(B band)
- FM/FM-W/FM-N/AM plus SSB/CW receive
- Bar antenna for receiving AM broadcasts
- Special memory channel RX mode (10 channels)
- 1200/9600bps packet compatible (ext.TNC)
- 434 memory channels, multiple scan functions
- 16-key pad plus multi-scroll key for easy operation
- 7.4V 1550mAh lithium-ion battery (std.) for 5W output and extended operation
- Built-in charging circuitry for battery recharge while the unit operates from a DC supply
- Tough construction: meets MIL-STD 810 C/D/E standards for resistance to vibration, shock, humidity and light rain
- Larger frequency display for single-band use
- Automatic simplex checker
- Battery indicator
- Internal VOX
- MCP software (Free download from Kenwood website)

144/430MHz FM DUAL BANDER

TH-F7E

5W Model

- 5W output (144/430MHz): DC 7.4V operation
- FM/FM-W/FM-N/AM plus SSB/CW receive
- Continuous RX: 100kHz to 1300MHz (B band)
- Simultaneous reception of 2 frequencies
- Tough construction: MIL-STD 810 C/D/E
- 1200/9600bps packet Compatible



USA Import CloseCall Equipped Uniden BC246T - Reviewed

Impatient as ever to get his hands on the latest offering from Uniden, Martin Peters decided not to wait until this new hand-held trunk tracking scanner was on sale in the UK and imported one himself.



Every so often a product comes along that is so innovative it causes a ripple effect across an entire market. The latest clutch of scanners from Uniden may be poised to do just that. They contain a feature that promises to be so popular with scanning enthusiasts that it threatens to sweep the competition aside whilst rendering another sector of the market obsolete.

CloseCall

The name of this feature? Well, Uniden are coining the phrase 'CloseCall' and what it does is to tune the scanner near-instantaneously, to any strong local transmission, displaying the frequency whilst letting you monitor the audio. In simple terms - no tuning required! This feature is the holy grail of many enthusiasts who like to turn up at a

venue and tune into the on-site communications. Up until now, a high sensitivity frequency counter, tethered to a portable scanner was required to achieve this.

Fort Lauderdale's Optoelectronics have, for many years, produced an array of frequency counters, which can measure and display the frequency of nearby broadcasts. Their so-called near field receivers permit the user to hear the audio of f.m. transmissions and, in some cases, read off the frequency. In my opinion, these units are primarily intended for use as laboratory test gear and not primarily with the scanning community in mind.

Uniden have produced an all-in-one scanner, near field receiver and frequency counter in one handy, affordable package.

Mention must be given to Alinco DJ-X2000 scanner, which was the first device to attempt a 'CloseCall' type feature. Anecdotal evidence suggests that whilst Alinco's FlashTune did work, in practice you would have to be almost on top of the transmitter to get it to trigger. How does the Uniden compare? Read on.

Flagship

The flagship of the three scanners, which include the innovative feature is the BC246T, released in the USA late last year.

As the BC246T is not yet available here in, Europe, I ordered mine from a store in California for \$200 about £110. The scanner comes supplied with a linear (transformer based) mains adaptor/charger, unusable in the UK without an autotransformer, as it's intended for 110V mains input; two 1800mAh NiMH AA size cells; a helical (rubber duck) antenna, about 150mm in length; a cable for connecting the set to a PC, and a detachable belt clip and wrist band. Finally, a couple of booklets containing frequency listings for emergency communications - again, applicable to the USA.

At 70 x 32 x 118mm, the UB246T is far from the smallest scanner around; bigger than the Icom R5 but smaller than the Yupiteru MVT-7100. With its two-tone grey plastic-encasing, the BC246T feels reasonably robust with build quality noticeably higher than previous offerings from Uniden. At 218g, its weight suggests that there's not a lot of fresh air inside.

A glance at the front panel reveals 17 rubberised buttons - many of them, dual-function - nestling between the speaker grill and the two-line, back-lit alphanumeric liquid crystal display.

Sturdy BNC

The top panel sports a sturdy BNC antenna socket and a 3.5mm jack socket for use with commonly available Walkman-type stereo headphones. Dual-concentric rotary controls adjust volume and squelch levels whilst a click-stop rotary provides tuning and a means by which to scroll through the various menu settings.

The left hand side hosts the Function/Menu button whilst on the right a the d.c. voltage input socket for an external supply/charger and a four-pin socket, which allows computer control.

Within the battery compartment there's a two-position slider switch. Its function is to block the voltage from the external charger from reaching the batteries; a must, if you have conventional dry cells installed - nice touch.

The frequency coverage is as follows: 25-54, 108-174, 216-225, 400-512, 806-869, 894-956 and 1240-1300MHz. No military airband is included. Reception modes are a.m., n.f.m. and f.m. At first I thought that n.f.m. was intended for communications reception so f.m. would be for listening to TV sound, audio senders etc. Not so. f.m. and n.f.m. are both narrowband, with n.f.m. being the narrower of the two. So no listening to BBC1 sound, I'm afraid. I fail to see the point of providing TV band coverage without the appropriate reception mode.

Being an old hand at this scanning malarkey, yours truly inserted some batteries, switched on and expected to master 80% of the features before referring to the manual. No way! The initial lack of intuitiveness of this radio almost had me throwing it - grenade-like - out the window.

Half an hour later and I'd discovered how to directly input a frequency. Don't use the Enter key, use the Hold key. Of course - how silly of me!



clever, but useless over here.

Similarly, the reverse repeater function is pre-programmed with the USA bands and offsets - shame.

TrunkTracker

Another handy feature - but only if you're in the USA - is TrunkTracker, which automatically follows stations as they hop from channel to channel within their trunked system network. Unfortunately, the variants of trunking this scanner can deal with do not include any used here in the UK, except for one user in the London area. Finally, the scanner can be configured to scan the emergency weather frequencies as used in the USA.

So much for the worthless functions. What about the included features you can take advantage of? Well, apart from searching and scanning and the 'CloseCall' feature, of which, more, later, you can load up to 2500 memory channels.

Another novel feature is the near-instantaneous decoding of CTCSS and DCS tones. Most scanners scroll through either CTCSS or DCS tones, one after another, finally settling on the actual tone used. This can take up to 20 seconds, by which time the target transmission may have disappeared. The BC246T locks onto and displays either type of coding in a fraction of a second - a really neat feature.

You can lock out unwanted channels - pagers, data, birdies etc - up to a total of 200.

The display not only presents frequency and mode information, but also the aforementioned CTCSS

or DCS code; whether the Priority, Keylock or Attenuator functions are enabled, a Battery Low indicator, and which Systems and Groups (explanation coming up), if any, are being received.

You can program as many priority channels as you wish and, if enabled, the radio will check all of these together every couple of seconds.

Unfortunately, there is no signal strength meter. I personally find a meter to be a handy for a number of reasons and the lack of this facility is a major flaw. Although the display is nicely back-lit, the buttons are not illuminated, a strange decision. Is this scanner designed for use in poor lighting conditions or not?

Completely Alien

The BC246T uses a completely alien (to me, anyway) system of allocating memory channels. Instead of having, say, 10 banks of 100 channels, the Uniden pools all its memory channels together for you to allocate to as many different so-called Systems and Groups as you wish. Once you get your head around this concept, it actually makes good sense.

Imagine you wanted to program in the amateur radio repeaters for your area in to the memory channels of a conventional scanner. You might fill 25 channels, which leaves 75 channels of your HAM bank vacant. The BC246T, however, allocates only those channels you fill to the bank - or System - of your choice, leaving the remainder for later



Impressive Speed

From the displayed frequency you can search up and down or tune around using the click-stop rotary control. Search speed is impressive and spans 1MHz in about a second, at 12.5kHz step size.

There are a number of built-in options and features, which are tailored for the USA market and therefore of no use to us here in the UK. Apart from the 110V adaptor, the scanner itself comes pre-loaded with hundreds of emergency service channels, where, even in the USA, 99% of which would be out of range. Anyhow, these can all be deleted at a stroke. No problem. Then there's the ten pre-programmed so-called Service Searches; everything from Family Radio Service to Railroad. As far as I can tell, these are permanently incorporated in the firmware so cannot be overwritten. To the rescue come ten user-defined search bands into which you can enter your own parameters.

There's an option called Pager Screen, which automatically locks out commonly used pager frequencies. I don't suppose USA pagers use frequencies allocated here, though.

The Repeater Find function attempts to tune the scanner to a repeater's output when it detects a signal on the input frequency, thereby allowing you to hear both sides of the conversation. Presumably, the scanner 'knows', which frequencies (in the USA) are inputs and is also able to jump by the required offset to capture the repeater output. Very



use, thereby making the most efficient use of on-board resources.

The scanner uses an arrangement of Systems and Groups. Up to 200 Systems can be set up with up to 20 channel groups per system. A typical set-up might be a System called HAM. Within this system you could assign a number of groups; say, one called 6m, another called 2m, a third might

be 70cm. Frequencies from each band would be programmed into the appropriate group. A single key can be assigned to Systems for quick access, and also to Groups in order to engage and disable them.

As there's no memory channel numbers, there's a helpful utility that allows you to check what percentage of memory is in use. Memories can be assigned as alert channels. When activity is detected, the scanner can notify

you with a beep and or illumination of the display backlight.

Another great feature is 'Search & Store'. Whilst in 'CloseCall' or search mode, every time the scanner settles on an occupied channel, the information is written to a memory. The only downside to this feature is that the audio is muted so you can't listen live while the radio does all the work. I would have preferred the option to simply turn down the volume.



CloseCall - The Deal?

So, what's the deal with 'CloseCall'? The feature allows the scanner to lock onto any local a.m. or f.m. transmission within its frequency coverage; display the frequency and any sub-audible tone information; automatically store any hits into memory, if required, or let you hear the audio.

A transmission has to be about 20dB stronger than the general local r.f. noise floor to trigger the system. Out in the countryside a cyclist, a hundred metres or so away, using a PMR446 walkie-talkie, would be considered easy prey. However, in the middle of town, where the ether is buzzing with a fog of 'cell phone transmissions, pagers and the like, the puny transmission from our cycling friend would be far less significant.

It's possible to lock out individual channels, which inhibits the scanner locking onto pagers or data transmissions, but these locked-out channels will still contribute to the noise factor. Another option is to lock out entire bands, in which case, a certain amount of filtering probably does take place. I have locked out all frequencies above 800MHz in the hope that cellphone transmissions do not hinder the scanner's ability to lock onto something more interesting.

I took the BC246T out for a spin in the car and connected it to a dual-band mag-mount on the roof, intended for 2m/70cm amateur radio operations. After initialising the 'CloseCall' feature, I headed east into deepest Reading. The first thing that triggered the scanner was Berkshire Ambulance on 166MHz. The mast was about 500m away. Fantastic! Next up; several taxi companies, both base station and mobile units were heard. In most cases, a quick visual inspection of my surroundings would reveal the source of the transmission: a communications mast or a taxi office, somewhere within a few hundred metres.

Not surprisingly, the best range obtained was from transmissions emanating from aircraft. Several civil aircraft were heard whilst traversing overhead at 30,000 feet and a clutch of much lower (but out of visual range) light aircraft. Most impressive!

One minor irritation: When the scanner locks onto activity you need to press any button to read off the frequency. As the software is upgradeable, I'm hoping that this requirement will be abandoned.

More Popped Up

Driving through the town centre, various in-store security systems popped up; and yet more taxis. That afternoon I got dragged to a garden centre in Oxfordshire. Within seconds of parking up I was listening to a couple of youngsters on PMR446 and the in-store staff on 164MHz. My freshly charged 2500mAh AA cells lasted well over six hours. The Battery Save facility offers to provide more economical use of power but I didn't try this out as I was too busy listening.

With this powerful tool you can intercept in-the-clear communications from your establishment or target of choice with the minimum of effort. You can elect to have

'CloseCall' only running, or in the background whilst the scanner continues with other monitoring functions.

I consider scanners fitted with the 'CloseCall' feature to be a significant step forward in consumer scanner technology, and I for one, cynical old hack that I am, will be holding onto mine. I imagine Optoelectronics, and others who specialise in frequency counters and near field receivers, will be deeply concerned by Uniden's latest scanners as I wouldn't be surprised if they resulted in a serious

downturn in sales.

As a bonus, a 'secret' series of button pushes on power-up turns the scanner into a real time frequency counter. Just press HOLD, 0, 3; then with your fourth hand, press the power switch.

If you have a computer with an RS-232 COM port then I can recommend that you buy some software to drive this scanner. It makes loading and alpha-tagging the radio's memory channels, and administering the band limits and numerous other options so much simpler. There are presently two contenders that I am aware of: the official control software which you can download from Uniden's website - www.uniden.com and a package called ARC246, available from www.butel.nl I elected to trial the latter. A cut down, time-limited version is available for free. With it, you can upload and download all the memory channels, general settings - even the welcome message.

The Bad News

The bad news is that the UBC246T and its ilk are not yet available for sale in the UK or Europe. The European version of the baby brother BC78 is available now, sold in the UK as the UBC78. However, it's more expensive than its stateside cousin and, guess what? The 'CloseCall' feature is missing! Sad, as I understand that the materials cost a mere \$1!

It can only be a matter of time before Uniden acquire CE approval for their new products. We can all look forward to that time.

SWM



Scanning Scene

- **Dave Roberts** *do SWM Editorial Offices, Broadstone*
- **E-mail** *scanning@pwpublishing.ltd.uk*

The type of event that had been predicted for so long eventually occurred on the 7 July, although bombs in London are not a novel experience I'm afraid. It was interesting to note that the mobile 'phone systems were either overloaded or shut down in certain areas during the emergency.

Initially, there was speculation that some of the devices may have been detonated by mobile 'phone but it now looks as though the attacks were perpetrated by suicide bombers. In any case we, as listeners, can expect to hear some almost forgotten frequencies in occasional use as the authorities pull in all their surveillance and operations staff to mop up the terrorist cells. This may be an interesting time to own a receiver especially as the murderers may be considering other attacks and detonation techniques.

Consider the use of the USA FRS radios to detonate explosive devices in Iraq. There may not be a better time to monitor all the PMR446/FRS/GMRS type frequencies as these people may be testing their radios. If we all keep eyes and ears tuned for activity that may be suspicious, who knows, it may be that another attack can be prevented.

Take Your Radio

I prefer to either cut my own hair or get a mate to do it, preferably one who didn't learn the trade while serving a prison sentence. It saves the inevitable conversational question from the young bird when you go to a proper 'hairdresser', "Had yer 'ollidays yit?" Well have you?

I know that it's the end of August by the time you are reading this but if you haven't or if you are contemplating a few days out please consider taking your radio with you. Most people travel by car on high days and holidays and with a vehicle in your possession you have electrical power and a platform for antennas. What more could anyone ask for when it comes to radio.

Starting at the top i.e. the antenna. I always have a selection available in the car. Why? Well, if I find myself in a country area with time on my hands, a large antenna, although more obtrusive will haul in signals from more locations than the small glass mounted antenna on the side window.

The larger spike may be either a tri-band amateur antenna (50, 144 and 430MHz) terminated in a PL-259 plug that mates with an SO-239 socket mounted on the built in roof rail of the car, or a smaller whip suitable only for higher frequencies. The larger antenna is a pretty good scanning antenna I can tell you.

The coaxial cable from the socket runs into the vehicle and terminates in a PL-259 in the cabin. This allows me to connect a scanner (via a BNC adaptor) or an h.f. receiver to the line. If h.f. is needed the tri-

bander can be replaced either with a suitable h.f. whip or a wire antenna tied up to a tree or similar structure.

Not being particularly affluent I have to choose my car with great care. I live in a very remote area with poor roads and need a four-wheel drive car just to get home from shopping sometimes. I had owned the same make and model when living in Canada and was pleased to find that they were available in the UK. The 'Canada' car had two extra power outlets for accessories, my new one has four including one in a compartment that the handbook refers to as a locker for remotely mounted radio equipment. That's lucky.

The power outlets' circuitry can carry a maximum of 20A current. This, of course, means that the vehicle can power a couple of radio receivers and a d.c. to 240V a.c. inverter to run a laptop computer. A drain of 20A will soon make that battery as flat as a hedgehog on a motorway but with judicious power use, any vehicle can serve as a viable monitoring facility.

In urban areas or in locations where I don't want to be obtrusive I'll use the glass mounted antenna that looks just like a cellphone antenna. If a second antenna is required then the small whip can be plugged in. Alternatives that I have available in the vehicle include a tiny magnetic mount antenna and a 'decal' antenna about the size of a tax disc holder that is better than nothing at v.h.f. and sticks inside the windscreen.

What About The Receiver?

So, that's the antennas sorted. Now - what receiver(s) to run in the car? If monitoring is to be done 'on the move' it's essential that all the equipment in the car is securely installed to prevent it becoming a hazard.

In my car the main receiver is an old C5900



- **Keeping your ears tuned by monitoring and reporting any suspicious activity heard on your scanner could help prevent attacks like the ones in London on 7 July.**



- **Are mobile 'phones becoming a detonation device for potential bombers?**



- **Use your scanner on the move in conjunction with FTRUNK to be part of the action (see text).**

oddmans tray in the centre console.

The C5900 covers from about 40 to 1300MHz with some gaps with a.m. receive available. Plenty of memories make it a useful receive station and a handy transceiver on 50/144/430MHz. It's great to listen to military air while on the road.

Although the C5900 is a permanent installation, occasionally an extra receiver or two is required in the vehicle. For mobile applications I prefer a proper mobile set with appropriate audio output, I find that the few mW of audio from a hand-held just don't cut the mustard when it comes to listening if the scanner is competing with engine and road noise. Therefore I use either my old AR2002 or a COM 215 base scanner that, both run from 13.8V d.c.

The AOR needs no introduction being about 20 years old with good coverage but has only 20 channels while the COM215 has 200 channels but pre-programmed a.m. and f.m. bands. Both these receivers have one thing in common - the external speaker socket is a standard 3.5mm jack fitting.

Although Uniden, Yaesu, and AOR, to name a few, all have the same size output sockets, for some reason Kenwood units are built with the earphone/output socket being 2.5mm instead of 3.5mm. If there's one thing that you need it's the ability to plug headphones into any of your radios and not have to fiddle around with adaptor plugs, most of which don't work properly anyway.

The other reason that you may need the 'audio out' socket is because you might wish to run the audio into a laptop running the *Xcorder* program. A single frequency or a whole scan bank can be loaded and left to record into the computer.

If the machine is hidden under some junk on the back seat or something then all the audio can be recorded and monitored covertly, you don't even need to have the volume up on the computer. It will all be there when you arrive at your destination. This is, of course, a method used by some 'private' detective types who will use a similar set-up to monitor and record conversations on those awfully insecure cordless phones on 31MHz.

Another reason for running a computer in the vehicle is for logging any interesting frequencies that you may discover. Please consider using Pretty Good Privacy (PGP) encryption to store what is found as, in case of a security compromise, you certainly don't

want any old Tom, Dick or Bill poking through your chosen frequencies and their users!

scanner/transceiver that boasts a separate control head. The actual radio sits in the radio compartment of the car and the control head is attached to the dash using Velcro. The speaker and mic live in an

want any old Tom, Dick or Bill poking through your chosen frequencies and their users!

Any scanner that supports full computer control as opposed to just input data, is a boon on the move. Yet another reason to run a laptop in the car is the fact that should your interests include MPT1327 trunk tracking you'll be able to run the excellent *FTRUNK* program in conjunction with a computer controlled scanner and be very much part of the action. In addition to all this the computer will also support the *PDW* pager decoding program. So I guess you have realised by now that I tend to use a computer in my car.

Also having an amateur radio licence, I can run packet radio when I arrive at a destination and if I



- **Single frequency monitoring is a good way to tune in to the services like the coastguard.**

feel like it - I can then decode RTTY, WEFAX, SSTV or other data signals. Just one more thing - my computer links to my mobile 'phone via an infrared port and the 'phone is utilised as a computer modem.

So you don't have a laptop for the car and you don't feel like buying one. I don't blame you but without storing frequencies in the radio when not in use where do you keep them - in that little black book? It's not terribly secure is it.

If you've got a mobile telephone? Then store them on that, in the 'phone book area. Under the 'Name' section enter the service whose frequency you are storing and under the number you can store the frequency using the star * key as a decimal point. Just don't try phoning them!

Single Frequency Monitoring

Sure the name of this column refers to scanning but how about single frequency monitoring. Some people have an interest in a particular service or user of the spectrum and in addition to the scanner(s) on the shelf there may be a requirement for a single frequency monitor to fulfil a particular purpose. Here I have an interest in marine band channel zero, the frequency used exclusively by coastguard

Interesting Frequencies

Here are a selection of frequencies I think you should have in your scanner's memory banks:

and rescue services.

Some years ago I was fortunate to find a brand new Navico RT6500B for sale on a trestle table at an RSGB rally held at Hatfield House. The radio was boxed and I think I paid about £35 for it. I took it home and disabled the transmitter circuitry. Since then it has been bolted under a shelf in the shack and it sits on Channel 0 monitoring the local traffic and it has been worth every penny.

If a listener has an interest, for example, in fire brigade monitoring or perhaps listening to a local shop watch scheme it may be a cost effective option to purchase a second hand or 'New Old Stock' (NOS) commercial transceiver on the correct frequency band and mode and just get it programmed up for the correct frequency, hook it up to an antenna and some voltage and use it as a single frequency monitor. It's even simpler if the radio is crystal controlled as once the receive frequency is known the crystal frequency and type can be ascertained from either Chris Lorek's *PMR Conversion Handbook*, which is the nearest thing to a holy book that I possess or from resources on the Internet.

One listener that I knew purchased an ex police Pye PF1 portable receiver unit at a rally. There were a number of them on sale for £1 each and he rifled through the box until he found one on the channel of his local police. He bought it and an old Pye Nightcall base/power unit and used this to monitor his local police until Airwave replaced the u.h.f. scheme in his area last year. He had about 20 years of use for the cost of two pints of old ale. Now that's a bargain as well!

Single frequency monitoring can also be a good indicator of propagation conditions. Monitoring the coastguard channel 16 (156.800), using a decent antenna will always let you know how the v.h.f. band is faring as each coastguard station broadcasts maritime safety information at regular intervals and they always state where they are.

If you hear transmissions for a location that is not normally audible you can bet that a search of the v.h.f. band will reveal other distant transmissions as well. Don't be put off if your monitoring station is located far from the sea.

When I lived on the border of Oxfordshire and Buckinghamshire border I could always hear Thames Coastguard and occasionally the French equivalent in Boulogne and you can't get much further away from the sea than that. The antenna in use was a straightforward 1/4 ground plane for the 144MHz band that had been made by Garex and I wish that they still made them. It was a really well made unit and a first rate scanning antenna.

MHz	Mode	Comments
75.300	n.b.f.m.	An interesting one this. It was heard last year in use by some sort of Defence convoy trundling down the M6
86.3125	n.b.f.m.	This can be used for rebroadcasting purposes
121.500	a.m.	This is the civil air distress frequency
121.750	n.b.f.m.	Soyuz spacecraft downlink
123.100	a.m.	Airband Search and Rescue
123.450	a.m.	Used by commercial air pilots to chatter to each other
130.165	n.b.f.m.	Another ISS/Soyuz frequency
138.700	a.m.	Airband Search and Rescue
143.625	n.b.f.m.	On a lighter note this is the old frequency used by Yuri Gagarin, the first man in space to natter to his mates in Russia Believe it or not it is still in occasional use on the <i>International Space Station</i>
145.800	n.b.f.m.	An amateur band channel but it's used by the <i>International Space Station</i> . Usually, you hear AX25 packet data on it from the ISS but they use it a fair bit for amateur contacts
147.350	n.b.f.m.	Rescue Channel 96 Used for linking channels
147.475	n.b.f.m.	Rescue Channel 92/94
147.875	n.b.f.m.	(sometimes a.m.) Police Channel 21. The boys in blue are on Airwave but some of their cars will still have this simplex channel on board
147.9125	n.b.f.m.	(sometimes a.m.). As above. This is just another simplex police channel called 22. All as channel 21
152.850	n.b.f.m.	Rescue Channel 93
155.350	n.b.f.m.	Rescue Channel 91/94
156.000	n.b.f.m.	This is the Coastguard Channel 0. Also used by Coastguard Rescue helicopters
156.125	n.b.f.m.	Rescue Channel 62a
156.175	n.b.f.m.	Rescue Channel 63a
156.225	n.b.f.m.	Rescue Channel 64a
156.800	n.b.f.m.	The marine band calling and distress frequency (Channel 16) people use their marine band sets almost everywhere
157.175	n.b.f.m.	Rescue Channel 83a
157.200	n.b.f.m.	Rescue Channel 24a
157.275	n.b.f.m.	Rescue Channel 85a
158.650	n.b.f.m.	This is rescue channel 53a. In use with air assets so it's well worth allocating a memory to it
160.725	n.b.f.m.	Rescue Channel 62b
160.775	n.b.f.m.	Rescue Channel 63b
160.825	n.b.f.m.	Rescue Channel 64b
161.775	n.b.f.m.	Rescue Channel 83b
161.800	n.b.f.m.	Rescue Channel 24b
161.875	n.b.f.m.	Rescue Channel 85b
243.000	a.m.	Double the civil frequency for military distress
259.700	a.m.	This is the frequency that the space shuttle uses in launch when they are headed for orbit and docking with the space station
282.800	a.m.	Military airband rescue!
406.025	n.b.f.m.	Emergency Position Indicating Rescue Beacon (EPIRB) frequency. These beacons also transmit on 121.500 a.m.
410.050	n.b.f.m.	Used by the Royal Air Force when mobile in a convoy
410.200	n.b.f.m.	A shuttle Extra Vehicular Activity (spacewalk to you and me) frequency
414.200	n.b.f.m.	Another EVA frequency
417.100	n.b.f.m.	Another EVA frequency
443.825	n.b.f.m.	MOD Police Convoy frequency
449.400	n.b.f.m.	RAF convoy channel
451.325	n.b.f.m.	Old police u.h.f. simplex channel supposed to still be in sporadic use
452.375	n.b.f.m.	This is the old police channel 75/76. It's channel 75 when in use as a single frequency simplex channel and 76 when it's paired with 466.275 and used with a base station

576. At the receiving end of the link the process is reversed with the same apparatus except the chart is replaced with heat-sensitive paper and the sensor is replaced by a miniature heater.

Over the Air

Having described the basic Group-1 FAX system, we now need to look at how this signal can be used on the h.f. bands. In line with the simplicity of the rest of the system, the transmission method is also very simple. The signal from the sensor is connected to a radio transmitter and set so that the carrier frequency varies in-line with the signal from the sensor. The standard used on h.f. moves the carrier frequency by 800Hz with the lowest frequency used for 'black' and the highest one for 'white'. If the FAX system is being used to broadcast a black and white document you will usually find that the system set-up so that either only full black or white is sent - there are no intermediate grey values.

When used for photographs the FAX system operates in a linear manner with all values between full black or white available. At the receiving end the varying carrier signal is converted back to a control voltage for the FAX machine. The FAX system's tolerance to interference and general h.f. problems is helped by the fact that the transmissions take quite a long time. It's not unusual for a detailed h.f. FAX weather chart to take 15 minutes to send. Because of this, interference spikes appear just as small marks on the final print and severe fading as lines across the chart.

In spite of the interference and propagation issues, conditions have to be quite poor before the chart becomes unreadable. The most damaging propagation problem comes from multipath signals that occur when there are multiple transmission paths between the transmitter and receiver. When the signal is refracted through different parts of the ionosphere these multipath signals travel different distances and they experience differing transmission delays. The multipath delays can either cause a ghost image next to the main image or, in severe cases, results in what looks like smudging of the image. Unfortunately, there is no fix for multipath, other than to try another frequency. That's the reason why primary h.f. FAX stations use multiple operating frequencies.

Synchronisation

As Group-1 FAX systems are relatively slow at sending charts an automated reception system has been developed so that charts can be received unattended. The system employed is both simple and effective. When you listen to an h.f. FAX signal you'll soon note that each transmission starts with a special sequence of events. The first part of the process is to send a tone, which is normally 300 or 675Hz. This is the start tone and is used to signal the IOC of the transmission. After the start tone you will hear a regular pulsing sound. This is the drum synchronisation routine. The frequency of the pulse indicates the drum speed whilst the start of the pulse is aligned to the 'starting edge' of the paper.

When the sequence is complete the receiver should be completely aligned with the correct IOC, drum speed and ready to start reception at the edge of the paper. At the end of the transmission a 450Hz stop tone is transmitted and the receiver reverts to monitoring mode. Providing your receiver doesn't drift off frequency this simple system will allow the error free reception of charts over an extended period.

Practical Systems

Having taken a detailed look at the workings of h.f. FAX, let's move on to some practical reception systems that you can set-up using a basic receiver and a home PC. To receive FAX signals you first need a standard h.f. communications receiver with s.s.b. reception mode. By using s.s.b. the shifted frequency FAX signal can be made to appear as an audio tone varying between 1.5 and 2.3kHz. Because we normally use upper sideband (u.s.b.) for data signals the relationship between black and white is reversed, i.e. 2.3kHz is black and 1.5kHz is white. This is not a problem as most of the software packages can adjust accordingly. One of my favourite FAX packages is *JVComm32* that's available via UK agents **Pervisell** at their website: www.pervisell.com

The trial version of *JVComm32* includes all the modes and features of the full version, but inserts the word Demo at intervals on the received pictures. The software is simple to download and install and has plenty of help information included in the main package. Once the program is installed and you've connected your receiver via the soundcard, you can try your first FAX chart. Best place to start is Hamburg Met on 7.878MHz as this normally runs 24/7. If the station is active you will either hear a steady carrier or the characteristic grating sound if a transmission is in progress. Make sure that *JVComm32*'s receive mode is set to FAX and that the FAX mode is set to h.f. FAX. Now you can fine-tune the signal by making sure the black and white peaks align with the tuning display.

To verify that everything is ok, try pressing the 'Play' or manual start button, when you should see the image slowly building-up line by line. *JVComm32* starts with the automatic reception set as the default mode so the program will automatically stop at the end of a transmission and automatically restart for the next transmission. When you start manually (by pressing the Play button) you may well find that the edge of the chart is in the wrong place. You may also find that the chart is skewed - don't worry this is normal and easily fixed. To reset the edge of the picture you just need to place your cursor over the part of the picture that contains the edge and double-click. If all goes well you should find that the image immediately realigns.

You only need to use this edge correction when you run a manual start because the automatic start sequence normally looks after the picture detection for you. Correcting the skew of the received image is something everyone will probably need to do. This is because accurate timing is essential with all FAX reception and slight variations in the accuracy of your computer's internal clock can cause significant skewing of the image. However, *JVComm32* makes correction very easy. The first step is to receive a FAX picture from a reliable station such as Hamburg Meteo. Once the picture is complete and the FAX program goes back to standby you need to click on the Tools icon in *JVComm32* and choose the slant correction tool.

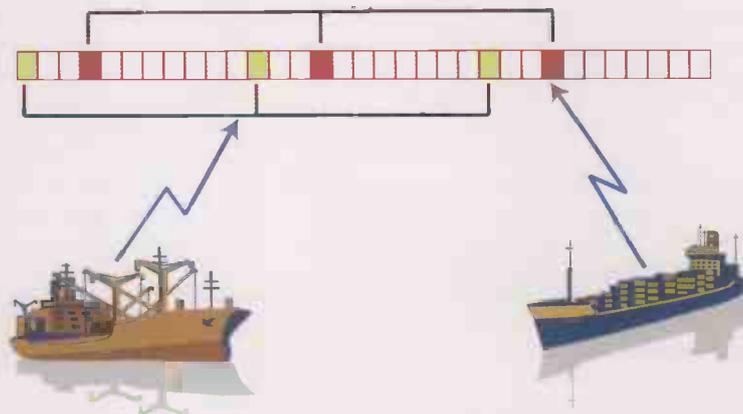
After selecting slant correction, all you have to do is to use the mouse cursor to draw a line that's as close to parallel with the slant in the picture as you can. As soon as the line is complete *JVComm32* calculates and applies the correction automatically. When you've completed the calibration you should be able to receive pictures from a number of different sources without any further correction. Over time you will probably need to carry-out another correction but it should be pretty infrequent. At this point you have a working FAX station and you can explore the h.f. bands to find lots of interesting FAX charts. If you're looking for more stations to monitor I can recommend Marius Rensen's excellent website that's dedicated to every aspect of h.f. and weather FAX reception - have a look at: www.hffax.de

SWM

ais monitoring

Monitor ship movements in real time. Mike Richards gives you the background to the maritime Automatic Identification System (AIS) and how to set up your own monitoring system.

The maritime Automatic Identification System (AIS) has been rapidly growing in popularity with *Short Wave Magazine* readers since I first mentioned it a few months ago. In this feature I'll give you some more background on the system, keep you up to date with the latest developments and show you where you can find more information. Later, I'll show you how to set up a monitoring station with some tips on software and hardware solutions for the listener.



● Self Organising TDM in action.

Origins

The AIS system has rapidly gained credibility in the maritime world and has been recognised as offering additional safety for those at sea. As a result the system has been approved and is included in the Safety Of Life At Sea (SOLAS) portfolio. This is the international convention that regulates the mandatory safety measures that apply to commercial shipping throughout the world. The latest ruling states that AIS transponders must be fitted and used on the vast majority of commercial vessels and certainly those over 20m in length or carrying more than 150 persons.

Tugs are also specifically included if they are greater than 8m long with more than 600hp. For the listener this is great news as it means that most commercial shipping will have AIS so, there's likely to be lots of radio traffic for us to monitor. As you will see later on, volume production has resulted in the prices dropping such that self-contained AIS units are now available for smaller craft at reasonable prices. I think we can safely say that AIS is now well established as

a commercial system and so is worth investing some time and money.

What is AIS?

The AIS system is an ingenious combination of radio and digital technologies that brings together on-

board ship electronics, GPS navigation and sophisticated digital radio techniques to produce a very powerful system as you will see. All modern shipping and a large proportion of private vessels now use the sophisticated Global Positioning System (GPS) to aid navigation and provide automatic updates on current position. GPS receivers have become very cheap and it's possible to pick-up sophisticated units for less than £100.

With the relaxation of the GPS (in)accuracy controls, the system has become more accurate for general use and provides positional accuracy to within a few metres. For most larger vessels the GPS information is directly linked to the on-board computers to provide the crew with a real time moving chart display of their position. The on-board system is also able to capture radar information and overlay that on the chart so giving the crew a very clear picture of what's happening around them. However, all this information can't tell the crew how other ships are moving, where they're heading and a host of other useful information. This is where AIS steps in to provide much more detail.

The AIS system broadcasts the vessel's positional information along with callsign, speed, direction, and a host of other information as I'll show you later. This can be received by all ships within approx 30-40km and is extremely useful for for improving safety in busy waters - around ports or narrow shipping channels. The sophisticated radio system that supports AIS enables all ships under-way to transmit their position every few seconds whilst using just two v.h.f. radio channels.

The main elements of an AIS installation are the dedicated transceiver, specialised AIS encoder and the link to the ship's on-board computer systems. The transceiver is set-up to



● The new AIS receivers from KATAS.

operate on the two dedicate AIS channels, 161.975MHz (Ch. 87B or AIS 1) and 162.025MHz (Ch. 88B or AIS 2). The transmission mode employed is 9.6kb/s Gaussian Minimum Shift Keying (GMSK) f.m. modulation using HDLC packet protocol. The GMSK technique is used widely on the mobile 'phone networks and is a very efficient modulation system for handling digital information over v.h.f. links. From a listener's viewpoint it comes with just one disadvantage - the data has very high energy content at low frequencies. In a typical scanner these low frequencies are often filtered-out so you lose some of the data. It's not too much of a problem and I'll cover it later in the article.

Self Organising

One of the aspects that separates digital radio systems from analogue ones, is the amount of intelligence that's built into the networks. The requirement for AIS was to develop a sophisticated, but highly reliable, system that could operate using as little as possible of the v.h.f. marine radio spectrum. The problem here is that you could have hundreds of ships all trying to provide positional data every 2-10 seconds on just a couple of standard v.h.f. channels! Although each AIS signal burst is only a few milliseconds in duration it's difficult to see how collisions could be avoided. The solution employed for AIS is to use a new technique that's known as Self Organising Time Division Multiplex (SOTDM). The processing required to support SOTDM is contained within the AIS unit and is managed by adding some additional data to each transmission.

As well as the AIS data, the transmission also includes a note of the current signal periodicity plus a mini-schedule of future transmissions. This information is used by the AIS units on nearby ships to build a customised schedule that's designed to avoid collisions. With over 2000 time slots per minute the system is able to organise itself to avoid collisions. In cases where the ship density puts the system near its limits the radio system will limit itself to processing only the strongest signals so automatically rejecting collisions from distant vessels. This is a remarkably effective system with all the fail-safe features you need to help enhance safety at sea - the prime reason for the system's existence.

Information Available

Although the original idea of AIS was to provide enhanced positional data to help navigation, the range of information available from modern systems is immense thanks to the link between the AIS and the ship's on-board computers. The current AIS specification has two operating classes (A and B), but only class A is presently in commercial operation. The current Class A specification requires ships to transmit AIS information every two to ten seconds whilst under way and every three minutes whilst at anchor. The standard output power for the AIS signals is 12.5W.

The information broadcast includes: Maritime Mobile Service Indicator number (MMSI) - this helps identify the vessel. Navigation status, i.e. at anchor or under way; Rate of turn - right or left, 0 to 720 degrees per minute; Speed over ground - with 0.1kt resolution from 0 to 102kts; Position accuracy - typically a ship would be using differential GPS. to improve accuracy with Latitude and Longitude - both to 1/10000 minute accuracy; Course over ground - relative to true north to 0.1°; True Heading - 0 to 359° derived from gyroscopic input; Time stamp - The

universal time to nearest second that this information was generated.

In addition to the above data, the class A units will send the following supplementary information every six minutes: MMSI number; IMO number - unique reference identification type indicates the ships construction; Radio callsign - international callsign assigned to vessel; Name - Name of ship, 20 characters are provided; Type of ship/cargo - there is a table of possibilities that are available; Dimensions of ship - to nearest meter; Location on ship where reference point for position reports is located; Type of position fixing device - usually GPS but there are other systems; Draught of ship - 0.1-25.5m; Destination - 20 characters are provided and Estimated time of Arrival at destination - month, day, hour and minute in UTC .

Class B AIS

The Class B specification I mentioned earlier has been designed to make AIS more affordable and therefore encourage smaller boat owners to fit AIS systems. The requirements are less stringent and the reporting rates/information is less. The current Class B exceptions are: Reports every 30 sec. when the speed is under 14kt; There's no transmission of an IMO number or callsign; No transmission of ETA or destination; Navigational status; Text safety messages - and Application identifiers need only be received; No need to transmit rate of turn information or of the maximum present static draught .

The complete specification of the Class B AIS is still being worked-on at the time of writing, but one of the problems with early implementations is the supply of non-compliant AIS devices. If the cheaper AIS devices don't adhere to the SOTDM collision avoidance system, they have the potential to screw-up commercial use of the two AIS frequencies and so compromise the entire system. More website references are given in the separate panel of Web resources.



● The New AIS Engine from AIS Marine.



● A peek inside the new KATAS range.



● A self contained AIS transponder and GPS receiver.

Typical Station

Now let's look at a typical monitoring station, as I take you through the options for setting-up your own setup and look at some of the hardware and software systems

available. For monitoring live, local traffic there's no substitute for direct off-air monitoring, but there are a few points you need to appreciate before you can get started. The first is to remember that the AIS service is based in the v.h.f. marine band (about 160MHz) so, suffers all the directional and range problems associated with that band. In addition, the maximum power used by AIS equipped vessels is just 12.5W.

These limitations are intentional and part of the design of AIS because it's primary purpose is to allow mariners to see the location, size and track of nearby traffic. The AIS power/frequency combination provides a useful range of about 30-40km at sea. This is fine if you live within that sort of range of shipping activity but no so good if you're inland. If you live away from the coast you can still monitor AIS, but

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

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Deluxe SW ATU 0-30MHz. SO239 fittings.

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PL-259 to PL-259 patch lead (0.6m).....£5.99

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BNC SO239 adapter.....£3.95

SP-1 TWO WAY COMBINER (PRO)

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

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PL-259 - PL-259 patch lead.....£6.99

BNC socket - PL-259 plug.....£3.49

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

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voice synthesizer.....£49.99
 Digital recorder.....£49.99
 DSP.....£89.99
Special package price VR-5000 + DSP unit £549.00

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

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ARC780XLT "BuntelSoftWare" (works 95/98/ME/NT/XP).....£39.99

ICOM IC-R5



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BATTERIES AND CHARGES INCLUDED

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500 channel. 25-1300MHz. (25-550/760-1300MHz) AM/FM/WFM selectable. Includes power supply. ★ VFO frequency tuning ★ Direct search/limit search ★ "Automatic frequency storing" ★ Attenuator for strong signal overload ★ Includes 240V PSU

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A brand new state-of-the-art scanner with 8.33kHz spacing on airband. Covers 25-960MHz (with gaps). Includes battery and charger. 8.33kHz tuning. Backlit display along with alpha-numeric tagging.

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RRP £129.95
 Optional cigar lighter lead.....£14.99

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M-75 SCANNER PRE-AMP

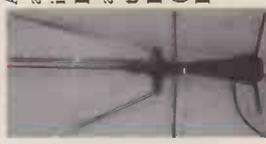


Superb BNC in-line amplifier to boost signals! Fits on top of your scanner and away you go. (Powered by PP-3 battery - not supplied). Freq: 24MHz - 2GHz. Gain (+)10dB to (+) 20dB fully adjustable.

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BNC-BNC patch lead.....£6.99
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O-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). PL-259 converter available.....£3.99

£59.95 P&P £7.00

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Compact - indoor/outdoor scanning antenna. (50MHz-2.6GHz). Superb glass fibre construction. Ideal in areas affected by "nosey neighbour syndrome". This antenna can be put in the loft or outside on the building. SO-239 socket (PL-259 plug needed) 1.3m long (mast clamps supplied). 50MHz-2.6GHz and under 1.3m long

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A high performance wideband discone offering superb performance from 0.2-2500MHz. Transmit range: 6m, 2m, 70cm (power handling 200W). Fitted with low loss 'N' type socket. Supplied with mounting brackets. (N-plug & coax not supplied). Features 8 horizontal/8 vertical elements.

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Comments from John Griffiths P&P £11.00
 Putting the DC-2000 up gave me a tremendous boost to all signals with the ancient RB-2000 coming alive! Signals were well received and I found that I wandered out of airband.

DC-2000 (Discone covering 0.2-2GHz).....Now £39.99

O-TEK INTREPID 2000

An amazing vertical (glass fibre) colinear antenna. Quality construction with incredible performance. For the serious scanner enthusiast.

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accessories have always been our speciality

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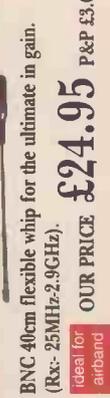


Two way combiner. One antenna feeds two scanners (without mismatch).
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£64.95 P&P £5.00

BNC - BNC patch lead 1m.....£6.99
 BNC plug - SO-239 socket.....£3.99
 BNC socket - PL-259 plug.....£3.49

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40cm flexible whip for the ultimate in gain. (Rxc: 25MHz-2.9GHz).
 ideal for airband

OUR PRICE £24.95 P&P £3.00

REGULAR GAINER RH-770



20cm long, flexible (25MHz-2GHz).
 BNC fitting.

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A fully adjustable desk top stand for use with all hand-helds. Fitted coaxial lead with BNC + SO239 connections.

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3 for £30.00 P&P £7.50

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UBC-278 CLT



88-108MHz (WEM) 500kHz-1720kHz (AM). 108-956MHz with gaps.

PRICE £79.99

Del £10.00

you'll need to think about some different options. For those up to about 80km from the coast, a different antenna may help, whilst those more distant may have to rely on Internet-based services to see what's going on.

Antennas

Unless you're fortunate enough to live close to the coast, antennas will make a big difference to your success with AIS monitoring. For those close to the coast, one of the many vertically polarised v.h.f. antennas should be adequate! If you're specialising in marine band then you should get a

dedicated marine band vertical, though units from chandlers tend to be quite expensive because they are designed to remain effective in a hostile salt water environment. However, the investment may be worth it if this is your area of special interest because the antenna will last for years. Most SWM readers will probably want a wider range antenna that can cover a lot more than just the marine band. In that case a good choice is one of the many discone designs. Generally the stainless steel models survive particularly well - mine has been working reliably for the last 12 years!

One point to watch - make sure that the antenna to cable

interface uses a good quality connector - 'N' types are great, but PL-239s are not weather proof and will often fail rapidly in an external environment. If you happen to live in a marginal area you may find that you can receive AIS though the use of a beam antenna. There are not a lot of these about commercially because the majority of maritime work uses omni-directional antennas. There are a couple of choices available to crack this one. You could use one of the many antenna design programs that are available on the Internet to design and build your own marine band beam.

Alternatively, if you can get your hands on an old amateur 144MHz beam, you could try some modification to it (shortening elements slightly). The simple and crudest way to do this would be to proportionally reduce the length of all the antenna elements. To convert from 145 to 160MHz you would have to multiply the existing element length by 0.91 to calculate the new length. When reducing the element lengths make sure you keep the elements symmetrical, i.e. take the same amount from each end of every element. Apologies to the purists out there, but this is a quick way to check whether or not it's worth designing/buying a dedicated AIS beam antenna.

Scanners

After having read the background to AIS above, you'll have noticed that the system employs a baseband modulation

system known as GMSK. This is a very efficient system ideally suited to the high speed (9.6kb/s) data transfer required by AIS. The snag comes from the fact that the GMSK signal has significant very low frequency content. As many consumer v.h.f. scanners are optimised for speech, these lower frequencies are filtered-out in the audio stages of the receiver.

As v.h.f. paging systems use a similar modulation system, most of the work required to overcome this problem has already been done. In essence you need to make a relatively minor mod to your receiver to create an output that's taken from the demodulator before the audio filtering is applied. This output is known as a 'discriminator out' and some of the more advanced scanners will have such an output. There are a host of websites that contain full details of how to add a discriminator output - a good place to start is the following: www.discriminator.nl/index-en.html

Or you might like to use dedicated receivers and there's no substitute for a dedicated AIS receiver if you're likely to do a lot of AIS monitoring. Fortunately for us, these are just starting to hit the markets and the prices are coming down. Most of these will be marked as 'not suitable for navigational use', a statement simply to cover the fact that they're not fully compliant with IMO requirements. So, although they can't form part of a regulated installation, these receivers are ideal for our use.

The firm KATAS forms part of Ships Electronic Services Ltd., and can supply the full range of communication equipment for installation on-board ship. At the time of writing KATAS were about to launch their new range of AIS receivers and have kindly sent me a couple of prototypes for review. I'll have more details in a later 'Decode'. Though the receivers have been primarily designed for use by marine technicians to help with testing and fault location, they are ideal for use as a dedicated AIS receiver for the enthusiast. As you can see from the photos, the receivers are extremely compact and measure just 85x65x27mm. Power requirements are very modest and supplied from the computer's USB port.

Although the AIS 1 and 2 receivers use a USB connection, it's only required to supply power, no other connections are used so, it can work with either USB or USB2. The two receiver types are defined by the AIS channel described earlier. Antenna input is handled via a quality 50Ω BNC connector and is designed for direct connection to a marine antenna. The only other connection is the 3.5mm jack that carries the recovered AIS signal and should be connected to the Line-in of your computer's soundcard.

Good Match

The receiver's output signal is approximately 800mV peak-to-peak from a 600Ω source so should be a very good match for most Line-input connections. Please make sure you don't connect to the Microphone input as it will certainly cause overload! The AIS 1 & 2 receivers have been designed to be used with the *Shipplotter* software that I'll cover later. When the system is powered-up ready for action, you just need to set the squelch levels, using a miniature rotary control mounted next to the BNC socket. To help with squelch settings the receivers have a multi colour LED on the top panel. A red light shows that the squelch is open, but the signal (or noise) is either too short or long to be an AIS signal.

A green light indicates that AIS length bursts of signal are being received whilst no light means the squelch is closed. Adjusting the squelch is just a question of rotating the control so that the LED is off most of the time, but responding with green flashes as AIS signals are received. As this KATAS receiver's have been designed specifically for AIS



● A Commercial AIS Controller.



● The ship listing screen in use within Shipplotter.

reception the decoder is optimised for this mode and is well matched to the *Shipplotter* software. Looking inside, the KATAS receiver's are very well built and their compact size and easy power make them ideal for mobile monitoring.

One of these receivers, a laptop PC and a simple whip antenna and you can drive off to a local hilltop/cliff or harbour and monitor stacks of activity. The specialist design of the decoder and the interface designed to work with *Shipplotter* make this well worth considering if you have a prime interest in AIS. At the time of writing the expected price is £249 inc VAT. As soon as the receivers are formally launched full details will be available via the KATAS website at: www.katas.co.uk

The firm NASA Marine, have been producing well priced marine and other radio kit for a few years now so it's no surprise to find that they're active in the AIS market. The first product from NASA was the excellent AIS Radar which is a complete AIS receiver and radar-like display unit aimed at the smaller boat owner. The AIS Radar creates a radar display that uses a local GPS input to set the centre of the display and then uses received AIS messages to plot the location of local vessels. AIS Radar is a very simple but effective way to add AIS to an existing installation. Priced at around £250 it's pretty good value.

Following-on from the AIS-Radar is a new stand-alone AIS engine, which looks very interesting. I haven't had the chance to use the AIS engine as yet, but it looks to be ideal for the listener. The engine is supplied in black-box format with an antenna input and a D-type connector for the digital output. Rather than delivering a raw AIS signal, the AIS Engine formats the received data into standard digital format that is then supplied via the 9-pin connector. To handle the received data, NASA has included the *SeaClear II* software that's also available as freeware. At around £125 the NASA AIS Engine is remarkable value especially as the receiver is dual channel and keeps a watch over both AIS frequencies. AIS reports are sent on both channels so dual watch isn't essential, but it does ensure you achieve the very latest data.

Software

To complete the picture and make use of AIS information, you need some software to run your PC. The leading software for casual monitoring of AIS appears to be *Shipplotter*. This program can decode AIS directly via a soundcard input, but can also accept serial port inputs from units such as the NASA AIS Engine. The software is available as a fully functional 21-day trial and the full version is available for just 25 Euros. As well as being a very capable AIS decoding program, *Shipplotter* has a very flexible chart interface that makes the inclusion of custom maps very simple.

You can generate your own maps by visiting the Mobile Geographics site as shown here: www.sailwx.info/maps/shipplotter.phtml The site has comprehensive instructions to help you build the map and save in the correct format for use in *Shipplotter*. I've also recently discovered another very good site that has been uploading detailed marine charts ready processed for use in *Shipplotter*. These can be found at: www.solentwaters.co.uk/Chart%20Files/

If you'd like to try plotting AIS data using satellite pics as the backdrop, then the following site has all you need to produce customised maps. <http://emit.demon.co.uk/map2.php> Using *Shipplotter* is extremely simple as the default settings are usually fine for most situations, especially if you are decoding via a soundcard. Once you are connected up and in a position to receive AIS signals you should use the View menu to select

Signal mode. This will bring-up a signal monitor screen where you can check that you're receiving audio and that the levels are within limits. If all is well, it's time to start plotting the data on a map. Using the File menu load-up a chart for your local area and make sure the green button has been depressed to start the *Shipplotter* AIS processor.

You should soon see AIS plots appearing on the chart. When you've got a few plots you will see that you can click on a plot to see more information. If you right-click you will also get a much more detailed view of all the relevant data for that ship. Using this menu you can decide whether or not you want to plot the vessel. You can also use the Lookup facility to trace ever more information about the ship from the ITU site. The *Shipplotter* software has a host of other features and I will be covering these in more detail in my regular 'Decode' column.



● *Shipplotter* in action in look-up mode.

Out of Range?

If you don't live in an area where you can receive AIS signals directly, you can still enjoy the hobby. The *Shipplotter* software includes a sharing facility that automatically connects to a remote server and downloads AIS data uploaded by other users living within range of the sea. Although it's early days yet for this service, there's a surprisingly large amount of information



available so, you can always monitor AIS. This is a great facility from *Shipplotter* and I'm sure other servers will soon appear to supplement the existing data. An alternative is to join one of the on-line AIS data providers. The one I use is AISLive as they provide a comprehensive facility and the public area has free access:

www.aislive.com/AISLivePortal/DesktopDefault.aspx

You have to register and you can view the public areas at will. If you know of any other sites that provide AIS data either for free or at a modest cost please let me know so I can pass it on.

SWM

● *Shipplotter* plotting on a detailed chart.

Web Resources

If you'd like to find out more about AIS there is a host of information available via the Internet. However, I've found the following to be particularly good:

IMO AIS Resolution - Performance Standards:

www.navcen.uscg.gov/marcomms/imo/msc_resolutions/MSC69-22a1-12.pdf

IMO AIS Resolution - Operational Use of AIS:

www.navcen.uscg.gov/marcomms/imo/msc_resolutions/MSC69-22a1-12.pdf

IALA - AIS Operational Issues:

[www.navcen.uscg.gov/enav/ais/IALA_AIS_Guidelines_Vol1_Pt1.%20OPS%20\(1.3\).pdf](http://www.navcen.uscg.gov/enav/ais/IALA_AIS_Guidelines_Vol1_Pt1.%20OPS%20(1.3).pdf)

IALA - AIS Technical Issues:

[www.navcen.uscg.gov/enav/ais/IALA_AIS_Guidelines_Vol1_Pt2.%20TECH%20\(1.1\).pdf](http://www.navcen.uscg.gov/enav/ais/IALA_AIS_Guidelines_Vol1_Pt2.%20TECH%20(1.1).pdf)

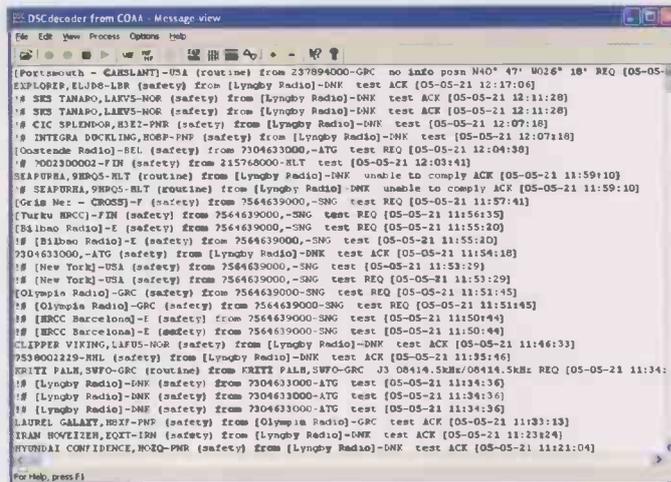
Australian Maritime Safety:

www.amsa.gov.au/Shipping_Safety/Fact_Sheets/Automatic_Identification_System.asp

Decode

- Mike Richards G4WNC, 49 Cloughs Road, Ringwood, Hants BH24 1UU
- E-mail decode@pwpublishing.ltd.uk Web www.mikespage.btinternet.co.uk

As this is the Decode Special issue I'm going to dedicate the space to a close look at the Digital Selective Calling system (DSC) that's prevalent on the maritime frequencies. Rather like the AIS described elsewhere in this issue and a number of other radio based systems, DSC is one of the components of the Global Maritime Distress and Safety System (GMDSS). This is an internationally agreed protocol that brings together a wide range of complimentary technologies and systems to provide the best possible safety at sea. The trigger for all the agreements was the *Titanic* disaster where so many more lives could have been saved through the more effective use of available technologies.



● A set of DSC messages received using DSCDecoder.

GMDSS Link

In a distress situation, one of the problems facing the crew is how to get a distress signal out to summon help whilst also trying deal with the situation and perhaps save lives. In the days of the *Titanic* it was the devotion of the radio officer sticking at his post hammering out CQD and SOS calls on his Morse key that saved the

day. But as crew numbers reduce and technology moves on, there has to be a better way. One of the solutions was to implement an automated calling system using a digital code to identify the vessel, to which is added a position from the GPS and an identifier for the message type. This is the fundamental requirement of DSC systems.

With the current DSC configuration, all a member of the crew has to do, is

to hit the Distress button and the DSC kit will repeat an 'all-ships' call on the distress frequency. At the receiving end of the link vessels are required to permanently monitor the emergency channels with DSC equipment. Should a distress call be received an alarm will sound to alert the crew and call them to the radio. In addition to providing a much needed automatic distress call, DSC has a huge potential as a selective calling system for all manner of purposes as I'll explain later.

How Do They Do That?

Let's take a closer look at DSC to obtain a better understanding of how it works. The signal format used to support DSC has a number of similarities with SITOR because it runs at 100baud and uses a 170Hz tone spacing. Whilst it sounds very much like a SITOR signal it is actually quite different. At the heart of DSC is a 10 bit error correcting code as opposed to the 7-bit system used for SITOR. Whilst the 10-bit code provides good error correction, additional protection is provided through the use of a checksum that is added at the end of the message. The additional protection is required to bring DSC up to the levels of integrity you would expect for a distress system. if you want to take a listen to DSC you can try monitoring 2.177MHz or pay a visit to the digital sounds page on the WUN Club site at: www.wunclub.com/sounds/index.html

Each DSC message follows a strict format with a dot sequence to start followed by a phasing sequence. The message body is then completed with the addition of the checksum. The whole message takes around 6 seconds for the h.f. version of DSC. To make the system work in a practical situation there has to be a simple way to identify a ship that can be sent within a DSC message. The solution is to employ the Maritime Mobile Service Indicator number (MMSI). Great care has been taken by the maritime community to control the use of MMSIs and full public access databases can be found on the main ITU website.

The MMSI can be thought of rather like the vessel's 'phone number because the nine-digit number is unique to each vessel. It is common practice to programme the MMSI into all the ships radio equipment to make sure all communications are 'badged' to the MMSI. For use with DSC the MMSI provide the essential unique identifier for distress calls.



● A typical DSC equipped radio.

No need for the ship's name! The use of MMSI as a 'phone number has spread far beyond distress activities and has become the normal for everyday calls.

If a vessel needs to make contact with another vessel or a shore station it will do so using DSC and the MMSI. In fact the system has developed to the point where simple messages can be included such as the preferred operating frequency and the current position. If you want to look up the MMSI for a ship you can at the following Website: www.itu.int/cgi-bin/htsh/mars/ship_search.sh

Fishing boats have taken DSC to a new level on v.h.f. in the way they use group-calling to broadcast to select groups of boats. This can be very useful for keeping your own fleet up-to-date with fish locations without spreading the news to the opposition! Another feature of some commercial systems uses DSC equipped radios rather like transponders to find out the position of another vessel. With this system you put out a call to the required vessel with the appropriate message and the distant equipment will automatically respond with the ship's GPS-derived position.

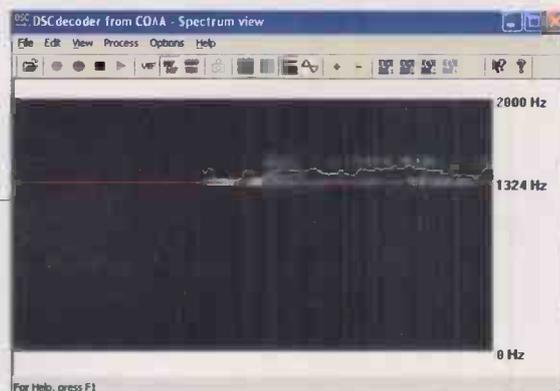
Monitoring DSC

Despite the rapid spread of DSC as an operational system there are remarkably few decoders available for listeners. You will normally find DSC included in most of the up-market decoder packages such as *Wavecom* or *Hoka* but few others. For most listeners the best place to start is either with the *Skysweeper* range or a relatively new offering from COAA - the developers of *Shipplotter*. If you have an older PC you could go for the excellent *RadioRaft*, as this also includes DSC decoding. But before you can start monitoring you need to know where to look and there are a number of active frequencies spread throughout the h.f. bands.

The main frequencies to listen to are: 2.177, 2.187, 2.1895, 4.2075, 6.312, 8.4145, 12.577 and 16.8045MHz. As the modulation system employed is frequency shift keying (f.s.k.) you should set your receiver to u.s.b. and tune approximately 1.8kHz lower than the above frequencies. Using *Skysweeper* for DSC monitoring is very simple and the included help file provides some useful guidance. *Skysweeper* includes automatic tone scanning so once you start the mode you only have to tune approximately and the decoder will do the rest. If you want a very simple solution *Skysweeper* could be the best bet. *DSCDecoder* from COAA is well worth a look as it is available as a fully functional trial for 21 days, so you have plenty of time to play before you have to part with any cash.

DSCDecoder is also undergoing a very rapid development cycle at the moment and new features are being added regularly. The current version (4.3 at the time of writing) is packed with features to help bring this mode to life. It now features Autotune so, like *Skysweeper*, you only have to get your tuning fairly close to the correct frequency and the decoder will do the rest. One of the special features required of any DSC decoders is the ability to very quickly lock-on to a signal. This is necessary because the entire transmission lasts just a couple of seconds so there's not much time for synchronisation. When setting-up

your DSC decoder you need to take care to make sure you avoid overload and it's best to set the recording level too low rather than too high.



● The waterfall tuning display of the *DSCDecoder* software.

Get Moving

To get things moving, I suggest you begin with 8.4145MHz as this seems to be one of the most active DSC frequencies. Depending on when you're listening, you may have to wait a while before you hear a signal, so just be patient. If you're using *DSCDecoder* there are a couple of tuning display options available that you can use to make sure you're receiving a workable signal. The basic Signal mode shows a couple of oscilloscope type displays that are useful for showing audio overloading (watch-out if the scope trace has a flat top). The second option is the waterfall display as this is useful for getting tuning spot-on. I particularly like the new *DSCDecoder* mainly because it has so many refinements that are designed to bring DSC monitoring to life. One of the features of DSC signals is that they often contain positional data. Whenever *DSCDecoder* spots this information it has the ability to plot the received message on a map.

The map system used is the same as that employed by *Shipplotter*, so you have a wide range of customisation opportunities. Although you can use the Mobile Geographics site to create your own maps, the uploaded commercial charts that have been made available through the Solentwaters site are excellent. A further refinement is the automatic look-up facility built into *DSCDecoder*. Provided you are connected to the Internet *DSCDecoder* will capture any MMSI numbers in the DSC message and search the ITU site for the ship's name and callsign. This appears automatically in the decoded text and you may not even realise what has happened it's so well implemented.

NAVTEX Bonus

If you go the *DSCDecoder* route you will also get a novel NAVTEX decoder. The NAVTEX system built into the *DSCDecoder* is able to receive and catalogue messages much as you would expect from a conventional decoder but it can also plot on a chart. Not all NAVTEX messages contain positional information, but those that do are automatically plotted. Not only do you get navigation hazards noted but also restricted areas and a host of other fascinating data. As with the DSC plots you can use any of the *Shipplotter* compatible map systems so the range is huge. This is certainly the first consumer decoder I've encountered with this capability and it works a treat.

Finally

Just as I was completing this 'Decode' I discovered another DSC decoding program. This can be found on the following site: www.pangolin.co.nz/gmdss/dsc.php This is development software so probably has a few problems but it looks interesting and well worth a try. I'll give a further report once I've had a chance to play. If you know of any other decoding packages that can handle DSC I'd be delighted to hear from you so I can pass on the details via the column.



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66-512MHz with gaps, 100 memories

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SONY ICF-SW-7600G

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*Audio output 380mW
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*Weight 608g



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Mizuho Active Loop Antenna

UZ-77 Ultra Loop

*530kHz - 1600kHz
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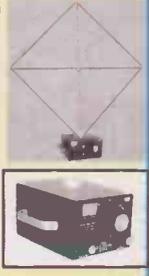
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The G8 Summit - Scotland 2005

Radio monitor and aviation enthusiast Kevin Paterson brings us his perspective, together with some impressive photos, of the recent mass arrivals at Ayrshire's Prestwick airport in readiness for the G8 summit.

During the final weeks of June and the beginning of July, Scotland hosted what appeared to many as a USA led invasion, as the American Military Machine started to prepare for the arrival of their commander and chief. Despite many other world leaders attending, none of the other nations had anywhere near the same impact on the west coast as the United States.

The reason for these world leaders descending on Scotland was to attend the world famous G8 summit. The G8 stands for Group of eight nations. These eight nations happen to be the eight wealthiest, industrialised and powerful states. The G8 however is not a formal institution and therefore does not have various elements that one might expect such as a secretary, a headquarters or a constitution.

The G8 Summits are not a policy-making forum. They are opportunities for the leaders of these states to network and build relationships to discuss complex international issues and crises, to allow for a more powerful collective response.

● **USAF special forces.**



Therefore, G8 Summits have always been a focus for protests and counter summits. Following the Peoples' Global Action call for a united global day of action in 1998, the Summit protests have, however, grown and strengthened, forcing the G8 Summits to more and more remote locations with ever increasing security costs. This increasing security was highly visible throughout the duration at Prestwick Airport, along the west coast of Scotland, and at Gleneagles.

Each year, one of the G8 members becomes the President of the summit, and thus is obliged to host the summit within their country. This year, Prime Minister Tony Blair was appointed the position of G8 president, and decided that the ideal location would be the Gleneagles Hotel, Scotland. For the Scottish contingent of plane spotters, photographers and radio enthusiasts, this event would prove one that could not be missed, and one that realistically, will not take place on our doorstep for a long time to come.

Build Up

As with all USA presidential visits, the American Secret Service and other agencies begin preparing the area weeks in advance. This was apparent when I personally spotted a group of 'American Agents' loitering around Prestwick airport, several weeks earlier. The haircuts and accents were enough confirmation for me regarding their occupation. This was reinforced when my brother overheard two of the men talking in the terminal toilet, regarding the arrival of Air Force One advance.

Things remained quiet at Prestwick with the routine Ryanair flights and cargo operations. There had been a wide scale debate over whether Air Force One would actually fly into Prestwick, with several other places being suggested such as Edinburgh, RAF Leuchars and even RAF Machrihanish! Any doubts began to fade away when three USAF C17 Globemaster (callsign REACH) aircraft landed at Prestwick on Thursday 30 June. Arriving in quick succession, three helicopters were quickly unloaded from these giant aircraft, and wheeled over to the Navy hangars at HMS Gannet. These helicopters were of course the presidential fleet consisting of two VH-3s (Sea Kings) and one VH-60 (Blackhawk).

Two days later on the

Saturday, more American hardware appeared in the form of 5xMH53 Pave Low Special Operations helicopters, using the callsign **KNIFE 81-85**, from RAF Mildenhall (352nd Special Operations Group) These helicopters were supported by two Combat Shadows, using the callsign **SHADOW**, (MC130s), which made cargo runs between Prestwick and RAF Mildenhall throughout the day. By the end of the day, there was enough Special Operations hardware and personnel to start a small war! It was becoming clear that Air Force One would without a doubt be landing at Prestwick.

The final confirmation came on Monday lunch time. Just after 1200 on a glorious sunny day, a USAF C-5B Galaxy (callsign **REACH**) came out of the clear blue sky and touched down at Prestwick. As with the C17s the previous week, the Galaxy was quickly taxied to a clear space for the unloading to begin. This time, instead of helicopters coming out, it was the full Presidential motorcade including armoured limousines and Secret Service GMC Suburbans. These were quickly escorted off the main apron and over to the secure area at HMS *Gannet*, which at this point was guarded by a ring of Armed police and sniffer dogs.

The relatively inactive HMS *Gannet* station had been fully reactivated for this event, to provide housing for all of the American aircrews and security personnel. I think this was possibly the busiest that HMS *Gannet* has ever been since it opened in 1947!

The following day saw the arrival of the RAF contingent,

which consisted of five Chinook helicopters. On a normal day this kind of mass helicopter movement would seem rather impressive, but when the Chinooks taxied past the American Pave Low

helicopters on the parking ramp, they appeared rather small and insignificant. The callsign of **HOBBIT COMBINE** made up for it though.

During the several days before the delegates arrived in Scotland, the presidential helicopters conducted several test/rehearsal flights to ensure everything was in working order. Under the callsign of **NIGHTHAWK** flight, the two VH-3 and two MH-53 helicopters flew the pre-designated route from Prestwick to Gleneagles. Incidentally, the route happened to over fly my shack, which allowed for some good photographs without having to leave the house. It's not every day that this kind of hardware flies over your listening station!

● Russian support aircraft taxiing.

Security

With International Terrorism being a major world issue and something that was made even more apparent by the tragic events in London recently, security was always going to be high at both the arrivals airport, and at the summit venue itself. Prestwick Airport was literally covered with uniformed police officers from around the country. The wide variety of vehicles was staggering and included Armoured Land Rovers, off road dirt bikes and mobile CCTV units.

During the summit itself, police spaced at no more than about 20 metres apart, surrounded the Prestwick airport perimeter fence. When you consider that the fencing is many kilometres long, it does not take long to realise that there was a huge quantity of police officers involved. There were also large convoys of riot vans and cars patrolling the

● Presidential motorcade arrives.





● USA secret services stake out Prestwick airport.

area, with armed patrols being spotted throughout the day. Conspicuous 'men in black' who were either armed police or secret service marksmen were spotted at obscure positions around the airport. Several were spotted on the control tower itself, some of who were lying down and were clearly scanning the area for potential threats, ready to unleash some serious firepower if required. It is rather intimidating standing taking pictures knowing that people are looking down on you through a rifle scope. Unfortunately, these are the times that we live in.



● On patrol!

To the relief of many, the authorities kept open one of the popular spotting locations at Prestwick Airport. The area was closed to traffic and at many times, the police actually outnumbered the spotters. The police were more than friendly and I get the impression that they were happy to have people chatting and being civilised, compared to the reception that their colleagues were receiving in Stirling. There was a fear that the American security forces would not allow the spotting location to be kept open, but thankfully this did not happen. Before being allowed into the area, police officers did search the camera bags, but everyone was more than happy to co-operate, as this was an event not to be missed.



● UK police armed unit keeping a watchful eye.

Airborne security was provided in the form of an E-3 Sentry AWACS (Airborne Warning and Control Systems) aircraft. Using the standard callsign of MAGIC, the fighter controllers took over the Scottish Military Central position, operating on 292.675MHz. Several breaches of the restricted airspace did occur, however none of these posed a threat.

The Army Air Corps also provided airborne security capability by utilising four Gazelle helicopters. Going by the callsign EAGLE, these aircraft carried out reconnaissance operations for the duration of the summit. Operating from both Prestwick Airport and RAF Leuchars, these helicopters spent most of the day in the sky, being tasked to various locations.

me had always been the arrival of Air Force One. This was the big one that everyone wanted to see with it being probably the most famous aircraft in the world.

With the radio scanning the various Prestwick ATC frequencies, the anxious wait was soon to come to an end, as SAM 28000 was heard calling up Prestwick Director. The backup jet was going to be landing first. Soon after, the magnificent aircraft appeared in site on its approach to land. For those without a radio, it was assumed to be Air Force One, and soon people were rushing about grabbing cameras and 'phones. It was soon clear to the non-radio enabled spotters that this was not Air Force One, as it taxied past the reception area and parked up. Without delay, heads soon turned again as Air Force One was heard calling up on Prestwick Director.

It was fascinating to watch how quickly the armed protection around the airport stepped up their appearance and vigilance as soon as Air Force One was within sight of the airport. Snipers appeared on various locations around the airfield including one on top of a red/white box at the side the main runway. No doubt, there were several other snipers around the vicinity that could not be seen. After landing, Air Force One was trailed along the taxiway by two Secret Service vans, sat inside which were two fully kitted and armed assault teams. These teams dismounted from their vehicle to add to the physical security around Air Force One while George Bush and the First lady disembarked the aircraft.

Witnessing Air Force One landing truly was an unforgettable experience. Between the graceful touchdown and the significance of those onboard, it truly was something that every aviation enthusiast should experience at least once. In a strange twist of fate, as I type this, Marine 1 and the presidential escort of two MH53 Pave Lows, have just flown over my house en route back to Prestwick. I would be interested to find out what President Bush had to say about the wind farm in which he has just flew over.



● AF2 - SAM 28000 almost down.

Final Thoughts

Despite the world-wide protests regarding the G8 summit, from an operation view point the summit was a success. All of the members and invited guests arrived and departed the country without incident. Prestwick Airport handled this complex operation to the highest standard possible, and I am sure that this event will aid the airport in any similar future endeavours.

From a military aircraft enthusiast viewpoint, this truly was a one-off event. It will be many years before the next G8 summit is held within the confines of the United Kingdom, and possibly even longer until Scotland is in the limelight for the event. Given the turbulent times in which we live, the overall operation clearly shows the high standard of the UK security services and police forces.

Until the next G8 Summit, happy monitoring.

SWM

● All pictures - Kevin Paterson

The Arrivals Day

It seemed like months ago that I initially began preparing for this event. Researching details of past G8 summits, sorting out frequencies and even upgrading my camera lens. Now, in an almost surreal moment, I was standing at the perimeter fence waiting the arrival of the most powerful man in the world, USA President George Bush.

There were plenty of arrivals during the day before Air Force One, including two Japanese Air Force 747 Jumbo Jets. These were all great to see however, the excitement for

Frequencies

121.800	Prestwick Ground
118.150	Prestwick Tower
120.550	Prestwick Approach
119.475	Prestwick Director

Callsigns

HOBBIT	RAF Chinook
EAGLE	AAC Gazelle
KNIFE	USAF MH-53 Pave Low (352 SOG: RAF Mildenhall)
NIGHTHAWK	Presidential Helicopters + MH53s on Escort Duties
MARINE 1	VH-3 Carrying the President

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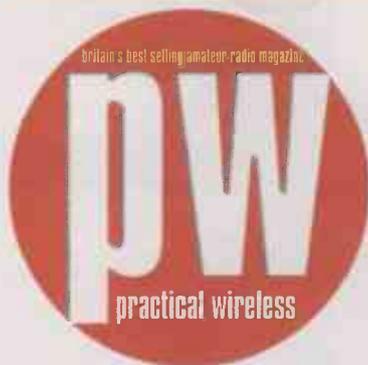
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- The new heavy duty dual-band submersible Yaesu VX-6R hand-held is tested by Richard Newton GORSN.

PROJECT BUILDING

- Finish building the PW Mellstock. Tony Nailer G4CFY shows you how to finish off the the 70MHz a.m. transmitter project using alignment and measurement techniques.

ANTENNAS

- Martti Nissinen OH4NV presents an article on the Windom Antenna.

BUILDING BLOCKS

- Using favourite circuits to your advantage - Rob Mannion G3XFD shares his tried and tested method of using building block circuits to construct simple projects.

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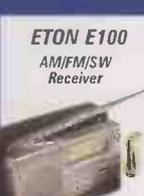
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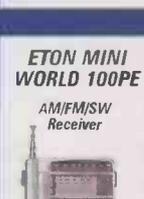
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COMPUTERS & RADIO PART 4A

The possible applications for the combination of radio receiver and computer running various programs are limited mainly by imagination. This month Jack Weber continues his investigation into the many benefits of the marriage.

Radio technology has moved on dramatically over the years, so it's hardly surprising that most modern receivers have much better performance than their predecessors, even if they do sometimes fall short in terms of ease of use. But it's not simply that a modern receiver can do the same job better, it can also do a lot of new things that hadn't even been dreamed of when earlier generations of radio were in use. This has become increasingly true in the last few years as computer technology has begun to merge with traditional radio to create novel forms of reception.

In this feature, I'll try to offer a taste of some of the possibilities that have been opened up by the sort of analyser software that I've been discussing in this series. It's hardly a comprehensive list, but it may suggest some new and unexpected ways of using your receiver in conjunction with your computer.

One example of a transmission mode that could have been made for the software spectrum analyser is ultra-narrow bandwidth communication. This is a technique that's used for communicating with interplanetary space probes and submerged submarines and is also being used by amateurs for extreme low power (QRP) contacts. It's stunningly efficient, but it wouldn't easily be possible

without spectrum analysis software because the signals can't be heard, they have to be seen.

Simple Idea

The idea is very simple - every radio signal occupies a certain bandwidth and you won't properly receive it unless you can recover that full frequency range. However, noise is always present in the atmosphere as well as in your receiving equipment. In general, the noise level is directly proportional to the bandwidth that you're receiving. Double the bandwidth of your receiver's i.f. filter and you'll double the noise you let through. Ideally then, you need to match the receiver's bandwidth to the signal - any less and you won't get the full message, any more and you reduce the signal-to-noise ratio. What this means in practice is that if the signal requires a large bandwidth then it has to be that much stronger in order to fight a lot of noise, but if you can make the signal very narrow then it has less noise to overcome so a weaker signal will work just as well.

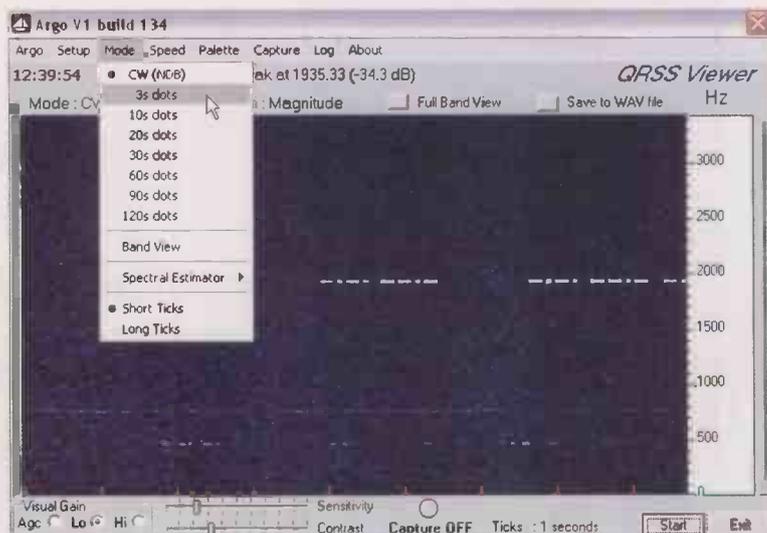
This, in a nutshell, is why low-bandwidth Morse code gets through better than high-bandwidth speech. If we could reduce the bandwidth requirement still further then the signal could be read even more reliably and the power requirements would be even lower. There's a limit though to how narrow we can make any i.f. filter. Certainly, anything below a few hundred hertz is not easy. That's where spectrum analysers come in because the fast fourier transform (FFT) calculation behaves like an array of filters that can easily be made as narrow as a fraction of 1Hz.

The only problem with cutting down the bandwidth is that the rate of communication has to be slowed down too. Imagine a Morse code letter S - three equally spaced dots - if each dot lasts for half a second and they're separated by half second gaps, then the dots repeat every second. Or, to look at it another way, the carrier is being modulated by a 1Hz square wave, which will generate sidebands at ± 1 Hz. Taking account of the harmonics needed to produce reasonably clean pulse edges, you'd need a bandwidth of at least 20Hz or so for good reception. That's pretty narrow but, if we wanted to make it even narrower, the only way to do it would be to slow the keying down still further.

This notion has led to the development of various ultra-narrow modes that are best received visually by a spectrum analyser where you can read the dots and dashes directly from the screen. The simplest of these is QRSS. The name derives from QRS (the Q-code term for "Send more slowly") with an extra S to denote Slow QRS. A typical keying speed is three seconds per dot, but 10 or 30 second, or even longer, dots are also used if an even narrower bandwidth is required. A variation on this is DFCW, which stands for Dual-Frequency c.w. This has dots and dashes of the same length, but transmitted on very slightly different frequencies to give an irregular square wave. These modes have been used by amateurs to achieve very long distance contacts on just a few microwatts of power.

QRSS signals aren't at all common, but you may spot

● Fig. 1: Argo is an application that's been designed specifically for reading QRSS and DFCW modes. It comes with a range of settings optimised for all the most common keying speeds, as well as normal c.w.



them around 137.7kHz in the l.f. amateur band and very occasionally on other bands. The *Spectran* software is a good choice for viewing these signals. Alternatively, the same authors have produced *Argo* (see Fig. 1), an excellent program that's based on *Spectran*, but has been specifically designed for QRSS and has preset settings for all the common speeds. There's the list of URLs at the end for details of where to download all the programs mentioned here.

Doppler Shifts

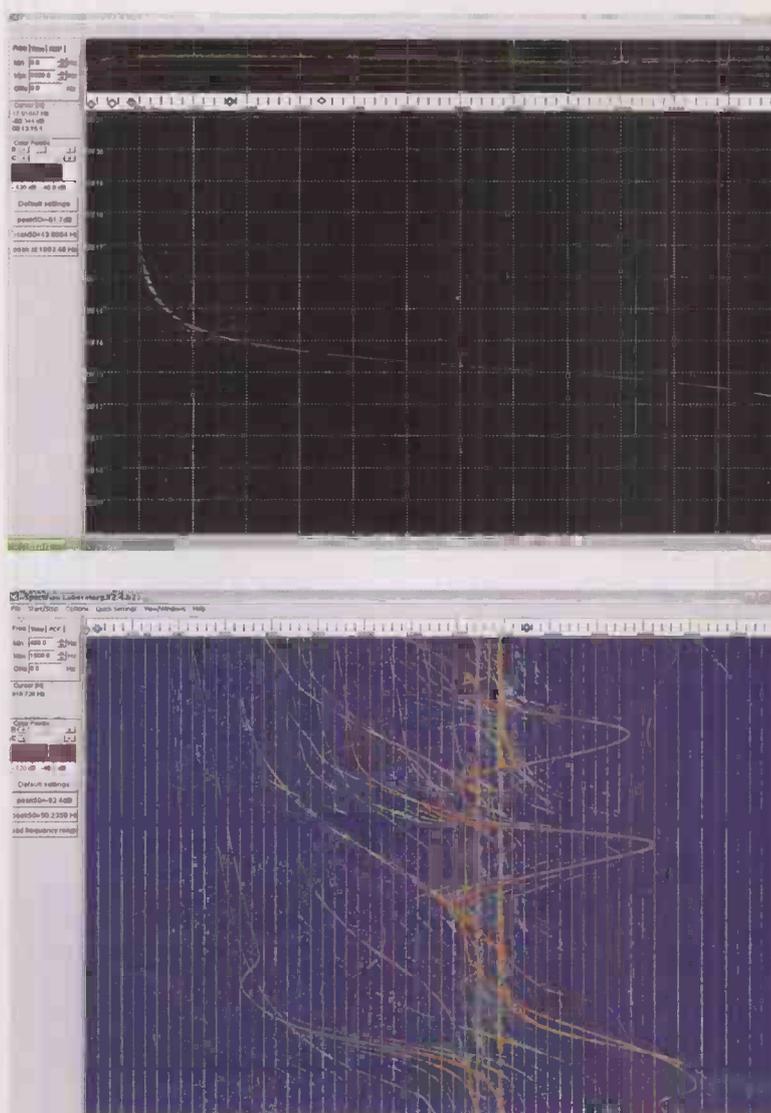
Because the FFT provides a clear visual display of frequency changes it's very useful, as we've seen in previous articles, for looking at the stability of a transmitted signal. This same ability also makes it ideal for measuring the doppler shift that results when the transmitter and receiver are moving relative to one another. This isn't normally very noticeable at lower frequencies, but can become a serious problem at high frequencies and high speeds. The plot in Fig. 2 shows a signal from the *International Space Station* on 145.80MHz as displayed in *Spectrum Laboratory* commonly referred to as *Speclab*. In this picture there's a massive shift of about 6kHz between the start and finish of the trace. (The full shift in between the *ISS* appearing over the horizon and then going down again was about 10kHz, but the receiver I was using had a maximum s.s.b. bandwidth of 6.5kHz so that's all that could be displayed).

Knowing the frequency and the shift allows you to work out the relative velocity between transmitter and receiver. The formula is

$$v = c \times \Delta F / F$$

Where *v* is the relative velocity between transmitter and receiver, *c* is the speed of light, ΔF is the doppler shift and *F* is the transmitted frequency. The plot in Fig. 2 shows that the *ISS* was moving away from me at the end of this trace at about 7.2km/s. The same effect is visible on other rapidly moving transmitters including any non-geostationary satellite. Since *Speclab* can constantly find the peak signal within its frequency range, it should be possible, with a little programming, to use the spectrum analyser to control another receiver and keep it locked onto any doppler shifted signal.

A variation on this doppler phenomenon occurs when both transmitter and receiver are stationary and the signal is being reflected by a moving object. This is the principle behind doppler radar. I shan't go into much detail on this because it's already been covered by Dennis Wort in the January 2005 edition of *SWM*. Briefly though, signals above about 25MHz have a short enough wavelength to be reflected by aircraft. So if you observe a steady carrier from a transmitter that's far enough away for its signal to pass through a sizeable chunk of airspace, but close enough to provide good signal strength, you may see its waterfall trace overlain by curving lines which are the doppler-shifted reflections from planes. Fig. 3 shows the plot of a TV vision carrier on 471.25MHz with numerous aircraft reflections. The doppler trace of any plane following a straight path will appear as an S-shaped line starting above the transmitter frequency and ending below it. Other shapes generally result from rapid changes of speed and direction. Several of the lines in Fig. 3 come from aircraft taking off and banking steeply, hence the more complex patterns. Incidentally, if you've tried looking for these reflections and had trouble finding them, do check other frequencies because the effect seems quite unpredictable. For example, I get strong reflections on one channel from my local TV transmitter, but



none on any of the other channels being transmitted from the same mast.

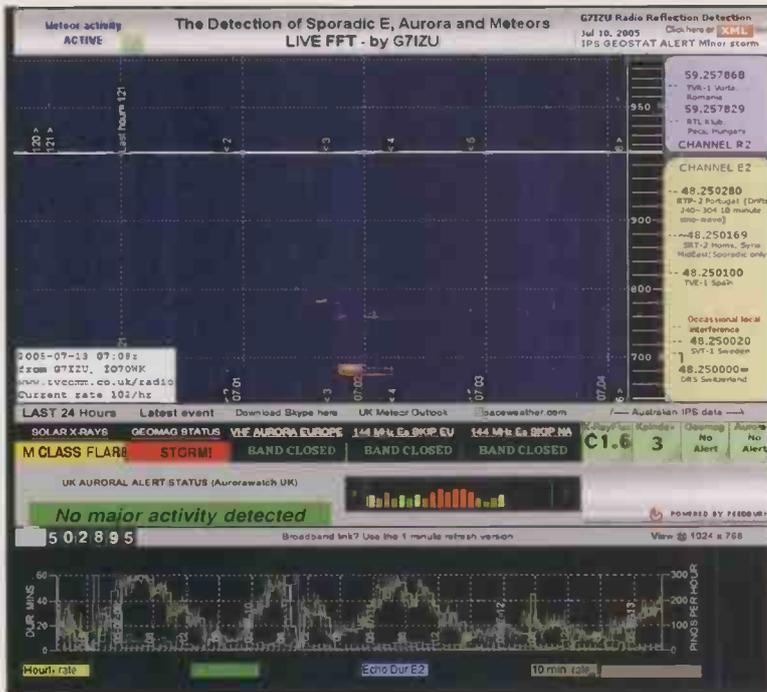
Meteor Monitoring

These reflections aren't confined to aircraft. All sorts of things from re-entering spacecraft to flocks of birds could produce similar echoes. Also, the ionised trails left by meteors when they hit the atmosphere act as efficient reflectors of v.h.f./u.h.f. signals. Meteor-scatter is often used by amateurs as well as by f.m. and TV DXers to allow long-range communications, but there are also some monitors who turn this on its head - not using meteors to enhance reception, but using DX reception to study meteors. Typically, they'll monitor over-the-horizon TV signals such as continental Band 1 stations using *Speclab* software to observe reflections and gauge the number of meteors. Have a look at the excellent website of Andy Smith G7IZU who provides real-time spectrum plots, Fig. 4, as well as useful background information and links.

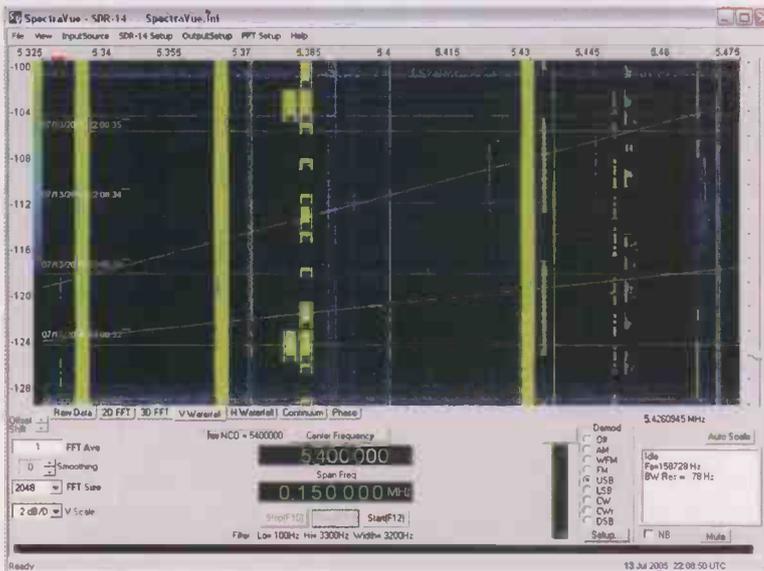
Incidentally, this site is a good demonstration of just how powerful *Spectrum Laboratory* can be in the right hands. The software contains its own programming commands which can be used to perform all sorts of automatic actions and calculations. Andy Smith has used these to create routines that not only update the website automatically, but also count the number of meteor echoes per hour. It's worth looking at his techniques if you want to try your hand at

● Fig. 2 (top): Amateur station NA1SS on board the *International Space Station* using its normal downlink frequency of 145.800MHz. Orbiting the Earth every 92 minutes, the *ISS* often shows a big doppler shift of its signal.

● Fig. 3 (below): With a very busy patch of airspace above, there are plenty of doppler echoes to be seen here. This is the vision carrier of TV Channel 21 on 471.250MHz. The vertical parallel lines come from the 50Hz frame rate. The software is *Spectrum Laboratory* fed from an Icom IC-R8500.



● Fig. 4: The Radio Reflections site of G7IZU includes a live FFT that's updated every minute to show meteor echoes on the signals of several continental TV stations. At the time shown here, it was registering 102 meteors per hour.



● Fig. 5: Two ionosondes (the diagonal lines) scanning the h.f. bands at different speeds. They're easily heard, but being able to see the signals makes it possible to work out their timing and scan speed.

automating *Speclab*. Or, of course, if you fancy taking up meteor monitoring yourself - there are details of how to get started on his website.

Ionosondes

We've all heard them, but how many people have really tried to monitor ionosondes? These are the automated ionospheric sounders that appear across the h.f. bands, sounding like a fast "thweeep" as they scan rapidly upwards in frequency. They were invented in 1925 and have been used ever since for checking the state of the ionosphere and predicting propagation conditions. In effect, an ionosonde is a radar that transmits upwards, measuring

the strength and time delay of the echo that comes back from the ionosphere in order to measure the intensity and height of the ionised layers. As it transmits, it sweeps its frequency across a wide swathe of h.f. to produce an ionogram - a graph showing the height of reflection plotted against frequency.

There are at least a couple of hundred active ionosondes around the world. They don't all sweep the same frequency ranges - some start at 2 or 3MHz, others as high as 8MHz, the top frequency is often 16, 20 or 30MHz, but there are all sorts of non-standard ranges too. Most scan at a rate of 100kHz per second, but others travel more sedately at 50kHz per second. Some repeat their scan every few minutes, others only once an hour. All ionosondes used to be analogue, but many are now digital and are often called digiondes.

Identifying an individual ionosonde is difficult but, with patience, there are some patterns that can be uncovered in the signals by looking at when they cross a specific frequency. You could check frequency transits with ears and a stopwatch but it's so much easier on a waterfall display, where the ionosonde appears as a straight line moving diagonally across. From this you can see when it crossed a particular frequency and also, from the slope of the line, what its scan rate was. Knowing those two things, you can work backwards or forwards to find when it started its scan and when it will cross any other frequency. Some schedule information can be found on the Internet, but it's often hard to track down as there doesn't seem to be an overall list. Beware also of quoted start times because they often refer to the notional time when a sweep would have started at 0Hz. Actual transmission will begin a little later depending on the sweep rate and actual start frequency.

Ideally, you need a spectrum analyser that's wideband and scrolls quickly. Programs like *Speclab* and *Spectran* will do, but it's easier with a wideband device like the RF Space SDR-14 which shows ionosondes very clearly like the trace Fig. 5. Set the FFT size to its smallest value in order to maximise the scroll speed of the waterfall and make sure that the PC clock is accurately set. The data obtained from ionosondes requires considerable computer processing before it yields meaningful scientific information, but simply seeing the lower and upper frequencies at which ionosondes first appear and then fade out will give some idea of the local Lowest Usable Frequency (LUF) and Maximum Usable Frequency (MUF).

To be continued next month.

Useful Sources

Argo and *Spectran* are available as free downloads from www.weaksignals.com

Spectrum Laboratory (Speclab) is available free from <http://people.freenet.de/dl4yh/spectra1.html>

Spectrogram is available free from www.visualizationsoftware.com/gram.html

The SDR-14 spectrum analyser is made by RF Space Inc. Details at www.rfspace.com

G7IZU's Radio Reflections website is at www.tvcomm.co.uk/radio

The experiments with monitoring Australian medium wave carriers are described in *Medium Wave News* April 2005

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*UK airspace from March 2005 and for all categories of flights in all other airspace from March 2008

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Sky High

● **Peter Bond** do Editorial Offices, Broadstone

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After the cold, cloud and heavy rain of 2004, this year's arrival days were mostly basked in warm sunshine. In fact, warm was a bit of an understatement, especially for Wednesday and Thursday with temperatures well into the upper '20s', that in the old days would have caused the *Sun* newspaper to use the headline 'Phew Wot a Scorcher'.

A number of well documented Brize radar frequencies were noted in use, plus the primary frequencies for RIAT 2005 were as follows:

Tower	130.675/337.575
Radar/Director	23.55/277.35
Ground	119.15/259.975
Delivery (Mon)	124.55
ATIS (Brize)	254.475

Despite my primary objective being photographs, with the help of others I managed to compile a reasonable list of the in-bound callsigns for Wednesday to Friday. Even so there was a lot of juggling of camera, radio, pens, etc, so if anyone spots any errors please let me know. An abbreviated report follows.

Wednesday

As expected, Wednesday dawned sunny and warm. Having got up at 0600, two movements were soon heard close together, which I assumed were out of Brize Norton as Fairford did not open to RIAT movements until 0900, (I was staying 7km east of Fairford). They in fact turned out to be two U-2s departing Fairford using the callsigns DRAGON 55 and 51. The first movement RIAT arrival of the day was at 0910 and was USA Navy E-6B callsign SHADO 01.

There was then a delay of almost an hour before the next movement, a pair of German

Phantoms, callsign GAF 3833A & B. The next arrival of interest was a U-2 using the callsign PINION 99 which made an opposite direction landing on Runway 09 - typical! The chase vehicle 'DRAGON MOBILE' was reported as using the frequency 139.9 for contact with the aircraft. For other callsigns/movements of note, see **Table 1**.

I always thought that Hawk was a 7th BW, B-1B callsign? It was nice to see a Greek Air Force TA-7C plus the RF-4C, especially as it had a special scheme on the tail. The marks showed a Phantom, surprise, surprise, wearing a long cape and a hat peering through a spyglass from which a laser type beam was burning a hole through the rear fuselage, quite intriguing. Unfortunately, for some of the day there was a thin veil of high cloud, which just took the edge off the photos, (we photographers are never happy!). It wasn't the busiest of days with only 52 aircraft noted but still some very nice aircraft and colour schemes - I did like that SU-22!

Thursday

Thursday was very warm with the temperature close to 32°C and very high humidity. For once all the big brollies at Fairford were being used to keep the sun off instead of the rain! It was by far the busiest day with regular movements from 0850 onwards. By the time I left, around 1830, I'd noted around 115 movements with six more noted later from our digs in Lechlade. A few selected callsigns are on **Table 2**.

The Italian Harriers were also reported as using the callsign WOLF 01. All in all it was a good day with an interesting variety of aircraft and a few

more nice colour schemes. Both the 12 Squadron and 13 Squadron Tornados had interesting tail markings.

Friday

A much cloudier start to the day until it started to break up around 1130. Most of the in-bound aircraft were RAF planes with just a few arrivals from NATO Air-Arms (see **Table 3**).

Oops!

As I had to work early on the Saturday, I decided to leave early on Friday, especially as it was mainly only rehearsals left on the movements list. Walking to the car with the radio still on, we stopped for a few moments on the Kempsford Road to watch the start of the Typhoon practice display, with my camera in my bag of course! About two minutes into the display he performed a loop and came out of it much lower than I'm sure he intended with an attitude and a sink rate that made a few hearts in the crowd miss a beat. He was also quite a little south of the display line almost on the edge of the runway.

The aircraft looked as though it was going to pancake into the ground but just managed to stop

Callsign	a/c	Airforce
BACKY 77	KC-135R	USAF/916 ARW
KOP248	Mil-8	Lithuanian AF
DIXIE 01	Tornado IDS	GAF/WTD-61
DRAGON 31	U-2S	9 RW
ROMANIAN AF 810	AN-26	90 FMT
MERCURY 1 - 5	Jetstreams (5off)	
AME 3562	CN-295	Spanish AF
I2165	ATR-42	Italian Coast Guard
I5030	TAV-8A/B	Italian AF/GAI
BEAST 01 FLIGHT	F-16BM	R NETH AF/323 SQN?
ROM 455	Mig-21 x 4	Romanian AF
SEAHAWKS	HAWK T.1 x 4	FRADU

● **Table 2**

Callsign	a/c	Airforce
TESTER 77	Twin Squirrel	ETPS
I0108	Atlantic	Italian AF/41 STORMO
TRIPLEX 2	Typhoon T.1	RAF/29 (R) SQN
BLAZER	Harrier GR.7	RAF/1 SQN

● **Table 3**

Callsign	a/c	Airforce
AIR FORCE 1	VC-25A	USAF/89 AW
SAM 28000	VC-25A	USAF/89 AW
SAM 9060	C-32A	USAF/89 AW
REACH	C-5B	USAF/60 AMW

● **Table 4**

Call	a/c	Airforce
FAF 73356 A - C	Mirage 2000C/D	FAF/EC02.05
SKULL 22/23	B-52H	USAF/2BW
HACK 01	F-16C	USAFE/52 FW (Could be HAWK?)
NAVY TIGER 01	Merlin HM.1	RN/814 SQN (Grey Tiger marks)
HAWK 29	B-1B	USAF/28 BW
FINNFORCE 151	F-18C	USAFE/31 FS
PLF 666	SU-22UM-3K	6 ELT (Full Tiger scheme)
POLISH AF 056	CN-259M	13 ELTR
CAHOUNA 1/2 ?	A-10A	USAFE/81 FS
REDSKIN 51 FLIGHT	AH-64D	R NETH AF/301 SQN

● **Table 1**

the sink rate about five or six metres above the runway, no I am not joking, it was **that low!** The pilot had rapidly pushed the engines to maximum power with full afterburners and there was that fraction of a second lag when I was sure he would either bang out or go into the deck. Fortunately, the sheer raw power of the engines just got him out of the manure, although I suspect that a change of trousers might have been necessary! The Tower controller, (almost certainly on the instructions of the Flying Display Committee), immediately said 'STOP STOP STOP' and the display was aborted. The aircraft then climbed to hold and



● **A Polish Tiger SU-22 that came to RIAT 2005.**

burn off fuel and then was given clearance to land.

I don't know how close you can get to a prang without it actually happening but on a scale of 1 to a 100, this was a 99.5! Whatever the cause, (it would be wrong of me to speculate, although most people have already formed an opinion), the pilot has to be commended for not ejecting in circumstances in which I am sure some lesser pilots would have pulled the handle. Very simply, he saved his aircraft, his life and possibly the lives of others on the airfield. A happy ending, but only just! The Typhoon, (with the same pilot) went up again to practice later in the day but noticeably with certain manoeuvres cut out of the routine.

My thanks must go to **Richard Argati** and especially to **Michelle Eccles** from the RIAT Media Office for their help.

Finally

Sadly one of the main themes, NATO **Tigers Roar 05** turned out to be a bit of a *Tigers Whimper*. The expected selection of spectacular Tiger/Big Cat colour schemes were noticeable by their absence. Only three aircraft arrived with any form of coloured Tiger marks on them, a 230 Squadron Puma and an Army Air Corps Lynx from 671 Squadron but the third was an excellent Tiger scheme on the Polish Air Force Sukhoi SU-22. (See photo).

There was also a Navy Merlin which had a very low profile two tone grey Tiger scheme. I was told later that the USA KC-135R from 916th ARW had Tiger marks applied once it was parked in the static, the crew apparently

spending nearly all day on it! As it is well documented on several airshow websites that the Belgium AF, French AF, French Navy, German AF, Netherlands AF, etc., all have aircraft painted up in Tiger marks, it's a bit puzzling as to why they weren't they at RIAT 2005? There are already several stories and rumours about this subject on the Internet but this column is not the place for speculation.

All-in-all, I thoroughly enjoyed my three days in the sunshine at RIAT arrivals. It was good to see that some liaison had taken place and ATC were bringing the helicopters down the runway rather than a cross field arrival. Much better for all of the photographers in the Park and View area! You have to accept that we are never going to see the numbers of

aircraft that were present in the heyday of the 1990s, but around 250 aircraft still makes this easily the best military air show in the world.

G8 Summit

With thanks to **Angus** and **Andy** who are new SWM correspondents, I can report on some of the aircraft movements at Prestwick connected with the World leaders G8 summit at Gleneagles that started on 6 July.

30 June: Three USAF C-17As arrived carrying the USA President's Helicopters. REACH 928 was carrying a VH-3D Sea King, REACH 929 a second VH-3D and REACH 941 carrying a VH-60D Sea Hawk. The aircraft are all from the USA Marine Corps unit HMX-1 that is the Presidential Flight.

1 July: Russian Air Force Illushin IL-62M arrived using the callsign SDM 9031. All three of the Presidential Helicopters made a local test flight using the callsigns Nighthawk 71 and 72.

2 July: Five MH-53Ms from the 21st SOS arrived from Mildenhall using the callsigns, KNIFE 81 - 85. Two MC-130s also from Mildenhall made several return flights to Prestwick using the callsigns, SHADOW 61 and 62. A separate report indicated that the aircraft used 259.1 for Air to Air, can anyone confirm that? There was also a Russian Air



Force Illushin IL-76 which arrived using the callsign RA 78842.

● **An Unusual Lithuanian Mil-8 drops in.**

3 July: MH-53M, KNIFE 81 departed back to Mildenhall. The Presidential aircraft flew, once again using the callsign NIGHTHAWK.

4 July: A C-5B arrived carrying the USA President's motor vehicles, callsign REACH???

5 July: MAGIC 80 (AWACS) appeared to be keeping an eye on the G8 summit. It was heard



● **Also seen at RIAT'05 was this Greek RF-4C.**

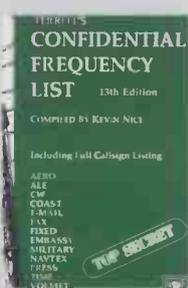
calling several agencies on 340.9 (TAD 022). It was also up on 270.025 (TAD 020) talking to NIGHTHAWK 01 discussing identified targets. Boulmer traffic called MAGIC 80 but were refused routine traffic due to an on-going operation. Five RAF Chinooks arrived, one source has suggested the callsign was HOBBIT. Judging by the well documented security problems with protesters deviating from the march route on 6 July, it seems that one of the Chinooks tasks was to support the significant Police presence.

Unfortunately, my correspondents could not stay after the 5th but I am grateful to **Jim L** who sent me a list of aircraft present on 8 July when most of the VIPs departed (see **Table 4**). Sadly not many callsigns were noted. (The 352nd SOG MH-53s and the Presidential helicopters were also still present).

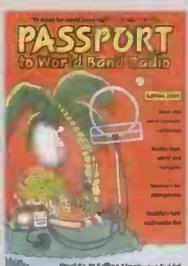
There were also two Boeing 747-47s from the Japanese Defence Force, 2 Illushin IL-62s, an IL-76 and an IL-96 from the Russian Air Force. Airbus 319s from the Italian and French Air Force, plus Airbus 310s from the Canadian, French and German Air Forces. Also noted was a French Air Force Falcon 900 and a Boeing 737-7ED from the South African Air Force, (a long way from home for a B737). Also seen at a distance were two Gulfstreams which were thought to be USAF C-20s. Any additional information would be welcome.

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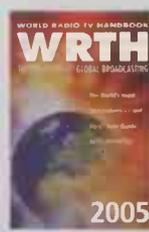
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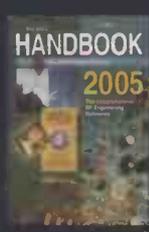
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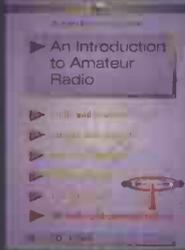
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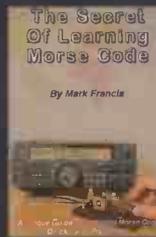
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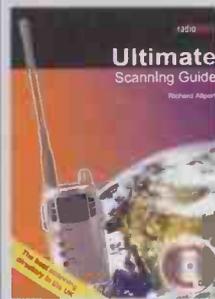
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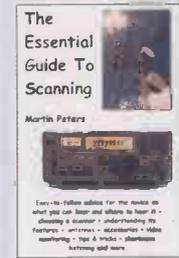
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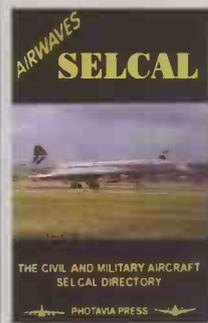
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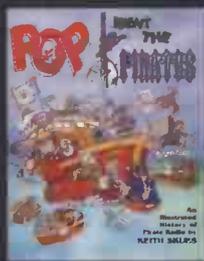
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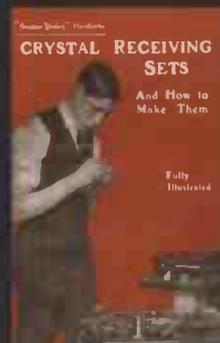
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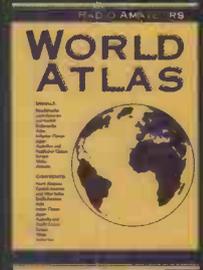
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- Jacques D'Avignon VE3VJA
- E-mail: Jacques@pwpublishing.ltd.uk

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.

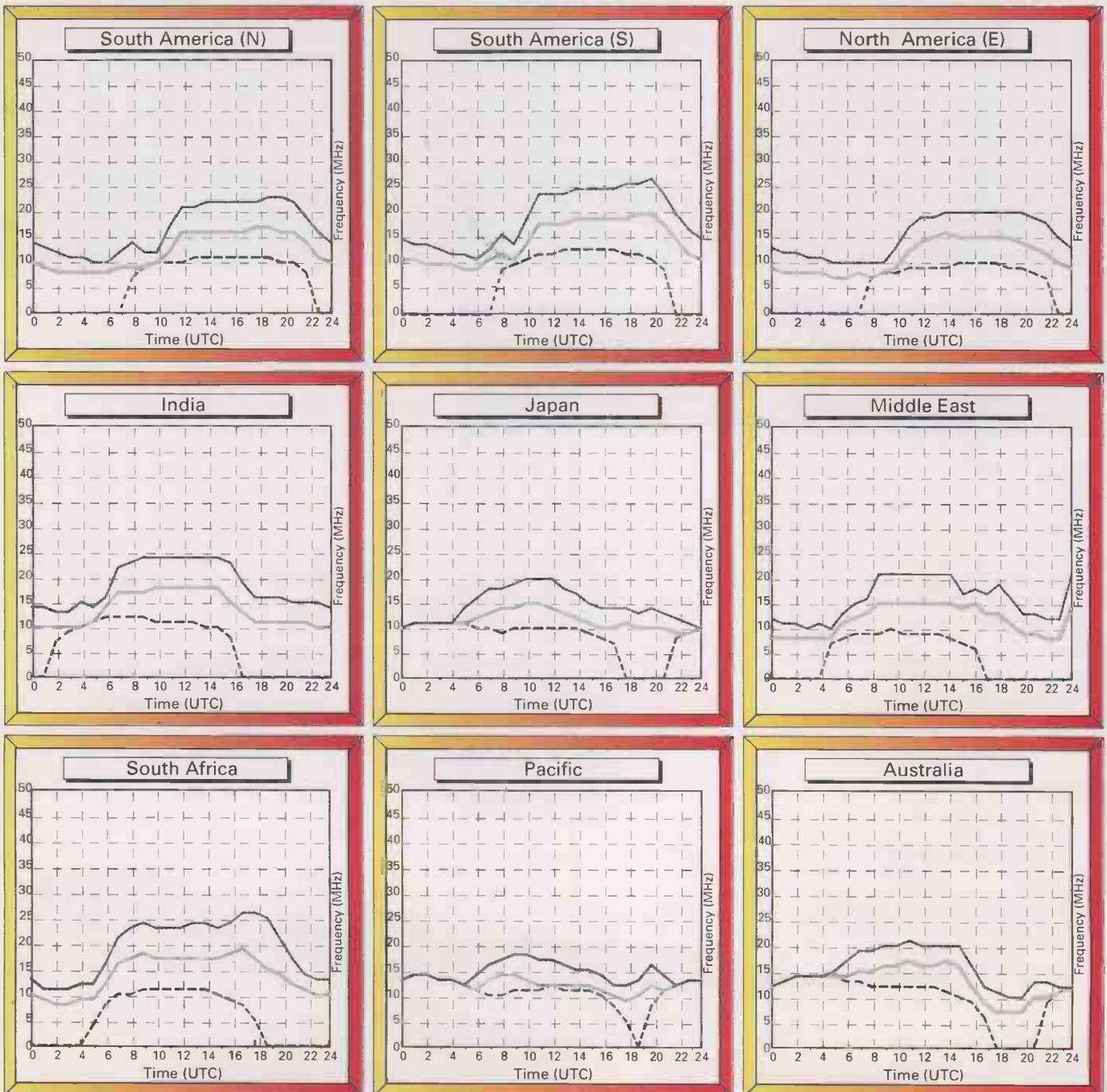
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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.

September 2005
Circuits to London



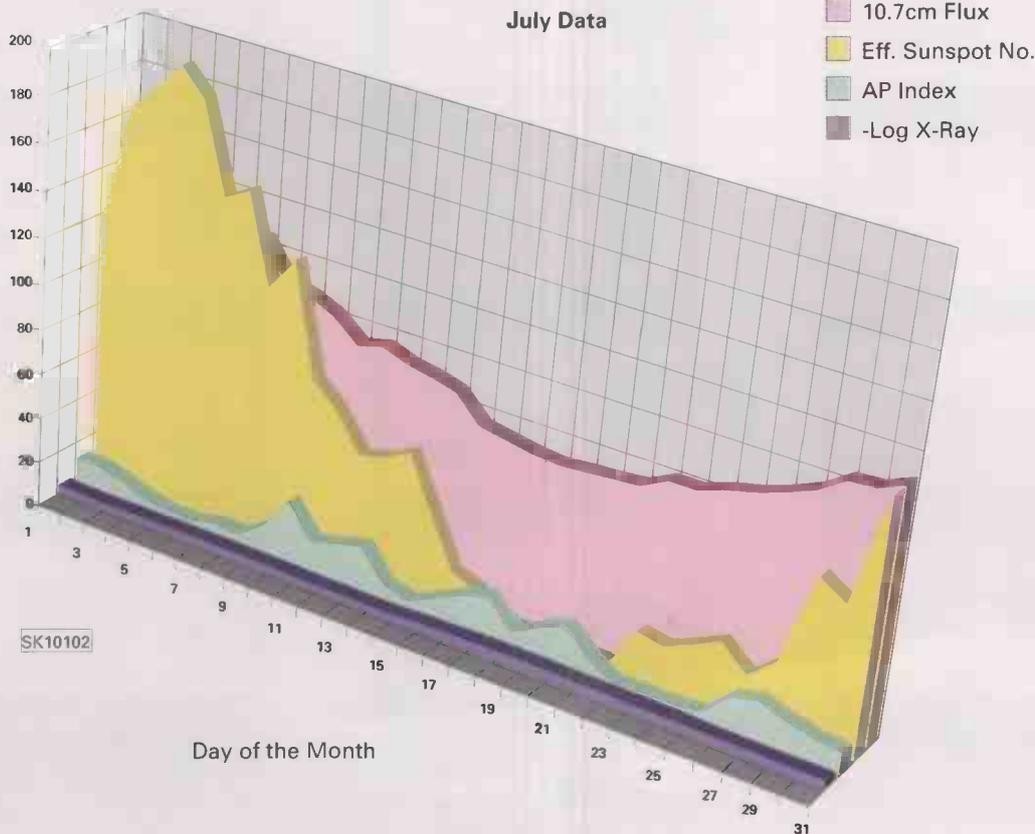
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Propagation

Extra

- **Kevin Nice** G3UNR, BR595787
SWM Editorial Offices, Broadstone
- **E-mail** kevin.nice@pwpublishing.ltd.uk

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, July 2005.



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.

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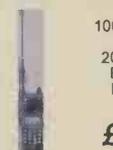
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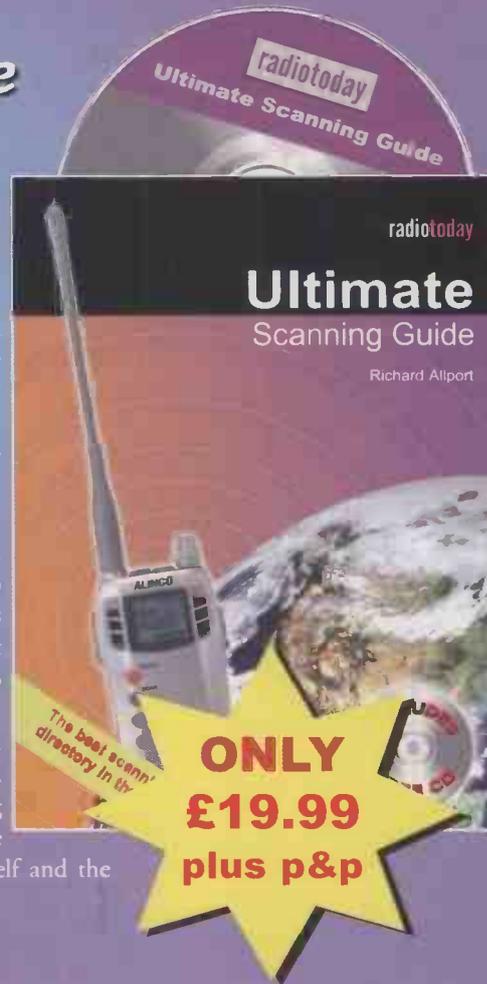
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This CD has been assembled by Tom Perera W1TP who is a leading expert on Enigma machines and frequently gives lectures and demonstrations on the subject. Tom also travels the world locating examples of WW-2 Enigma Cipher Machines and has recently found the fascinating Russian Cold War era "Fialka" cipher machine which is also detailed on the CD.

At 642MB there is far in this CD than can be displayed here. This is simply a mountain of material for anyone interested in the subject of Enigma machines and thoroughly recommended.

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● **E-mail** info.orbit@pwpublishing.ltd.uk ● **Website** www.astronomer.plus.com

On Sunday 3 July came early reports of the weather satellite (WXSAT) NOAA-17 not transmitting a.p.t. (the low resolution picture transmissions that amateurs and others all over the world monitor). This significant event - and its fix - are summarised this month. Also discussed are NOAA-18 operations, the new RIG and GEO journals, and other WXSAT matters. Also - an experimental larger scale image or two!

On 16 July NOAA-14's scan motor unexpectedly sprang back to life. Since failing in April 2004 NOAA-14 had lost imaging capability. Suddenly we have it back - but only those with high resolution reception hardware can monitor this transmission - see the frequencies box at the end.

Current WXSATs

There was a series of 'now-it's-on/now-it's-off' experiences for those monitoring a.p.t. from

NOAA-17. I think that the earliest report came from **Geoff Hamilton** on the **weather-satellite-reports** forum. **Nigel Heasman** in Cyprus reported that NOAA-17 had been transmitting during the earlier (0804 pass, but was off after that. **Douglas Deans** suggested attempting to detect any form of carrier or similar v.h.f. signal from the WXSAT, but this proved negative. Significantly, h.r.p.t. (the high resolution image stream) was unaffected. The following pass also failed to provide a.p.t. Similar reports came in from around the world; **Craig Anderson** failed to receive a.p.t. in New Zealand. Meanwhile the NOAA WXSATs status page (see link below) showed nothing unusual was planned
<http://noaasis.noaa.gov/NOAASIS/ml/status.html>

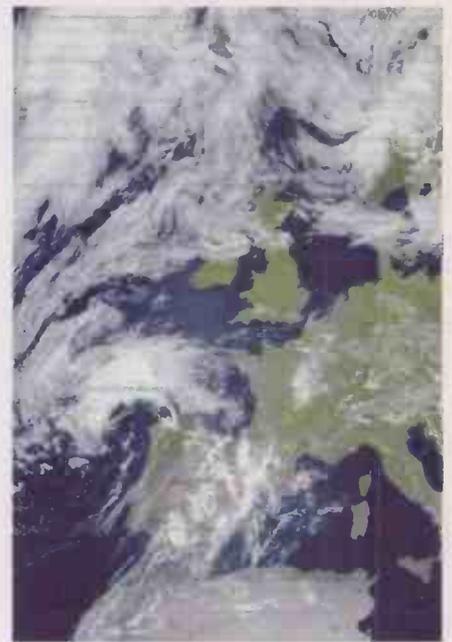
Douglas E-mailed **Darrell Robertson** of NOAA to ensure that he was aware of the new situation. Darrell responded "As suspected, our tireless engineers were working on the problem and found it to be in the stored command table. It is an automated process that

puts in the command to turn off the a.p.t. Our scheduling office is looking into the problem. The good news is that at 1408 we will be turning the a.p.t. back on. We would have done it during the last pass but the stored command table would have turned it back off just outside the station circle so we opted to wait and fix it right the first time".

Much to our relief, NOAA-17 was soon back in full operation. Memories of the early failure of NOAA-16's a.p.t. remain fresh!

NOAA-18 Special Operations

We are used to NOAA-12 and -15 periodically coinciding due to their footprints overlapping. Each uses the same a.p.t. frequency, so NOAA operations staff switch off NOAA-15's a.p.t.; the WXSATs use different h.r.p.t. frequencies (see list at the end), so these events have no impact on this transmission. It is worth noting that one might have expected NOAA-12 - as the older satellite - to be switched off, but NOAA responded positively to the user community's request that NOAA-15's a.p.t. be switched off instead, due to the improved illumination experienced by NOAA-12.



● **Fig 2: NOAA-18 a.p.t. 1331 on 27 June from Kevin Hughes.**

NOAA-18 is set to replace NOAA-16 as the 'afternoon' WXSAT, so is in a similar orbit, though slightly displaced. As of mid-July, it had a mean motion (number of orbits per day) of 14.1086, while that of NOAA-16 was 14.1225. Consequently, the two footprints periodically overlap, with NOAA-16 slowly 'overtaking' at regular intervals. By design, these overlaps are extremely close to the extent that the h.r.p.t. frequencies would interfere unless the receiving station has a dish of suitable size to resolve the signals; this is not normally the case, particularly with amateur stations - hence the frequency change.

"Because of projected frequent and planned r.f. conflicts with N16, N18 will have its STX assignments swapped on 28 June", explained Darrell Robertson of NOAA. "The swap will entail making STX-3, currently a playback STX, into the h.r.p.t. transmitter and reassigning STX-1, the current h.r.p.t. transmitter (also true of N16) to playback operations. Additional transmitter re-assignments for a variety of spacecraft and transmitter types are planned for August of 2005".

We can expect this periodic (h.r.p.t.) frequency change to continue.

UK Interference Map

Last month I referred to the survey carried out by **Nick Hewgill** and I, via his website, designed to collect data from NOAA-18 a.p.t. monitors. Fig. 1 shows a map displaying the results of this data. My thanks to Nick for processing the results.

Kevin Hughes is one of many that normally receive severe interference on the current NOAA-18 a.p.t. frequency, but he did manage to receive Fig. 2 on one occasion. I installed crystals in my receiver but the interference remains severe. I monitored the h.r.p.t. signal for the same pass, of which Fig. 3 shows just Britain and Northern Ireland.



● **Fig 1: Map of interference sites reported by British monitors of NOAA-18 a.p.t.**



● Fig 3: NOAA-18 h.r.p.t. 1335 on 27 June - close-up of Britain and Ireland.



● Fig 4: NOAA-18 h.r.p.t. image of Paris on 22 June.

Images Of European Cities

During some clear skies over Britain and Europe in early July, I was zooming in on several European cities imaged by my h.r.p.t. system when it occurred to me that a few examples showing the best that can be achieved by these systems would probably be of interest. Although this plan has been temporarily thwarted by the failure of the azimuth and elevation (Az-El) motor on my h.r.p.t. system, I hope to have this repaired within a few weeks so that I can continue the project.

All the NOAA WXSATs provide h.r.p.t. image data, though being of the highest quality, this requires much more expensive hardware (and software) to collect and process the data. Consequently there are far fewer h.r.p.t. stations than a.p.t. stations across the world. The telemetry stream is transmitted in the 1700MHz band and there are several active satellites providing h.r.p.t. (or similar) data - see list at the end. The onboard NOAA hardware that actually generates the data is a six-channel imaging radiometer detecting energy in the visible and near-infra-red portions of the spectrum. This instrument (the scanner) measures reflected solar (both visible and near-i.r.) energy, and also radiated thermal energy from land, sea, clouds, and the intervening atmosphere. The instrument provides a nominal spatial resolution of 1.1km at the nadir (the point below the spacecraft). A continuously rotating elliptical scan mirror scans the Earth $\pm 55.4^\circ$ from nadir. The mirror scans at six revolutions per second, providing continuous coverage.

The resolution therefore varies across the scan line, being highest - 1.1km - at the nadir.

Consequently images have to be corrected for distortion across the image width. I have therefore carefully selected high elevation passes over selected cities so that each is seen at its best. Just before my tracking motor failed, I had collected a few images, one of which included Paris, as seen in Fig. 4. I am hoping that this can be reproduced at a size large enough to show the detail seen on my monitor. I used *SatSignal* to produce the picture. Fig. 5 shows Corsica, just a small portion of a large h.r.p.t. image of the region covered by a high NOAA-17 pass.

Southern Asia Heat Wave

Earth does seem to be experiencing climatic change, despite some politicians apparently choosing to ignore the evidence. Flash floods in Britain have been amongst our own recent experiences as has the occasional heat wave with record breaking temperatures. Those monitoring earth via satellite images have an unequalled opportunity to see these events. Weather features abroad have had even greater impacts. A pre-monsoon heat wave left India, Pakistan, Nepal, and Bangladesh baking for much of June 2005 - see Fig. 6. In this image, light blue to dark blue represents 20° to 35°C , the reds represent 35° to 40°C and yellow represents above 50°C !

The top surface temperature, created from data gathered by the *Moderate Resolution Imaging Spectroradiometer (MODIS)* on NASA's *Terra* satellite between 25 May and 1 June 2005, shows the start of the heat wave. In 2005, searing heat, shown in yellow, spread across India's northern plains and along the southern base of the Himalayas in Pakistan and Nepal.

NASA image by **Jesse Allen**, based on data from **Zhengming Wan**, MODIS Land Surface temperature Group, Institute for Computational Earth System Science, University of California, Santa Barbara.

Chinese Geostationary WXSAT

China's new geostationary WXSAT *FENGYUN-2C* is providing images on a regular schedule, though they are currently available in a rather large format. **David Taylor** sent me the compressed version - see Fig. 7 - of a 133MB image from the Chinese web site from 6 May at 0400. It was processed to a false-colour image by his new *GeoSatSignal5* software, using the brightness information for the visible channel and the far infra-red thermal information to control the colour of the image. The satellite is positioned over China at about 105°E .

Interference To Satellites - By Satellites

With discussions continuing about the interference levels suffered by UK monitors of NOAA-18's a.p.t., those who receive a.p.t. data from NOAA-12 and NOAA-15 periodically experience interference from older NOAA satellites. There are currently three elderly NOAA satellites that can cause serious interference on 137.500MHz - NOAA 6,

NOAA-9 and *Tiros-N*. Although powered off some years ago, it is believed that the batteries - now flat - are being partly charged on entry into sunlight. Under these circumstances it seems likely that the onboard electronics are switching the spacecraft into 'safe' mode. When the satellite's orbit produces passes that coincide (fully or partly) with, for instance, NOAA-15, the varying carrier from the 'off' satellite affects the monitored signal causing unwanted interference.

NOAA changed the process used to terminate the life of their satellites, in order to try and ensure this problem ends. From NOAA-11 onwards, they have adopted a more thorough way of switching off non-operational satellites. Of course, we still have to wait for the earlier ones to die!

WXSAT Groups News

Quarterly journals were published from both **GEO (Group for Earth Observation)** and **RIG (Remote Imaging Group)** around early July.

Firstly RIG; with the previous journal not having been published since 2003, this edition has been awaited by the membership. It appears in a new A4 format to allow the clearer reproduction of high resolution images. There is currently no formal editor, but **Andy Eskelson** has accepted the post of Assistant Editor. Articles have been contributed by Andy, discussing vortices, WTOC.TV (located in the USA) and by **Henry Neale** discussing his early experiences in remote imaging. I contributed two articles on a freelance basis. The *Beagle-2* project is discussed in a feature based on published media information. **Dave Cawley** wrote about the 2004 Satellite Direct Readout Conference, together with background comment and personal views. NOAA's formal version of Conference proceedings is published as well. Dave also wrote about 'The rise and fall of amateur direct reception of weather satellites', describing the development of amateur interest in WXSAT monitoring since its inception. Dave's final article is about the 'Death of GOES WEFAX', and notes that "When GOES (WEFAX) is finally switched off at the end of this year, 5000 users will be without valuable prediction data" - a sobering thought! Large reproductions of members' a.p.t. pictures are included to illustrate the incredible detail available from this form of image reception. The switch to A4 format was a wise move allowing the best possible presentation for results from this hobby that is shared by so many people.

Next up, GEO; the June edition of the GEO Quarterly magazine is their sixth consecutive publication, and produced by **Les Hamilton**. It is, as always, extremely well produced with an established A4 format. News and reports are divided into three columns and nicely broken with illustrative images. Most of the feature articles have large scale images, often full page and sometimes in colour. The content reflects a variety of topics associated with weather imaging, including images from *SICH-1M* (now within weeks of orbital decay), an update on WXSAT operations from **Peter Wakelin**, and 'Meteorological Charts and Satellite Images'



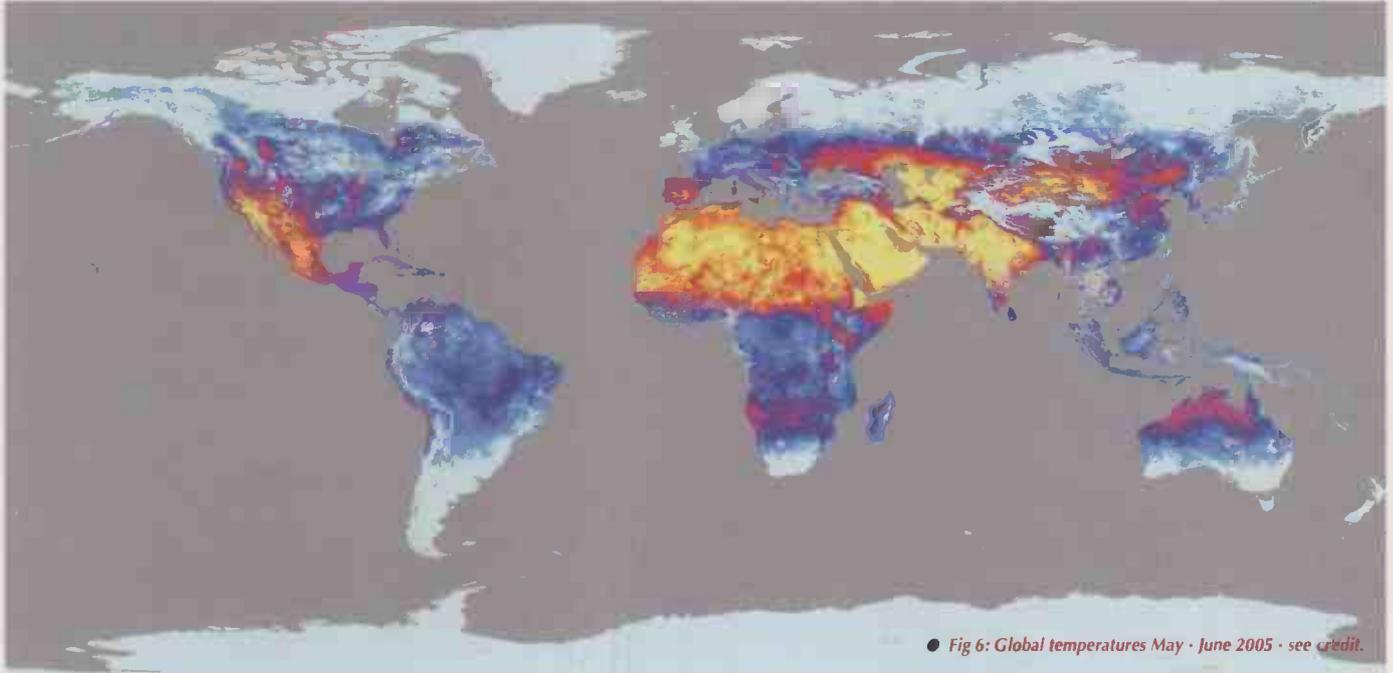
● Fig 5: NOAA-17 h.r.p.t. 27 June at 1022 showing Corsica.

article about unusual cloud plumes over Scotland - amongst others! The GEO shop is managed by Clive Finnis and its products are described for members.

Internet Site Update

The Asia Pacific Network Information Centre is based in Queensland, Australia, and provides regular FY-2C images. Start by selecting the 'latest' image to see an example of what is available

unable to settle on a steady position. I posted queries to the WXSAT forum and quickly established that the potentiometer within the unit had probably developed a fault and would need to be replaced. I obtained the part from Yaesu and anticipate my favourite engineer doing the replacement in a week or two. Updates next month! Meanwhile, I had hoped to make several more clear sky, near overhead European 'city' passes by h.r.p.t. so this feature will have to wait.



● Fig 6: Global temperatures May - June 2005 - see credit.



● Fig 7: FY-2C 0400 on 6 May processed by David Taylor from the original.

from Robert Moore. A fascinating article on RAM disks by Arne van Belle is included, and the Tsunami, with images and detail about the event and its effects. Ruud Jansen's trip to Brazil, some educational visits and exhibitions with Francis Bell, and several other major features appear. Lindsay Vincent contributed the front cover image from NOAA-17 of 4 February, showing a 'southern cyclone' that actually rotated clockwise for several days! As well as preparing the articles for publication, Les also wrote features including a piece explaining about ships' trails, an introduction to *Digital Atmosphere Workstation*, and a joint

<http://203.126.254.162/marine/fy2c.html>

OzAbove - Balthasar Indermuehle has set up his Timestep system, along with David Taylor's software on the site. New images are uploaded no later than five minutes after LOS, for NOAA WXSATs and FY-1D - www.ozabove.com

Víctor González runs an a.p.t. station on the Canary Islands. He has a set up a web page of NOAA images, updated daily, at: <http://personales.ya.com/metbee/>

Motor Troubles Again

It started to happen again in June. My Az-El rotator developed an unusual noise and behaviour when driving through about 14° elevation, but within a couple of weeks this developed significantly. By early July the motor would track for a minute or two and then apparently hunt as if

Frequencies

a.p.t.

MHz	WXSAT
137.50	NOAA-12
137.50	NOAA-15
137.62	NOAA-17
137.9125	NOAA-18

During overlap periods with NOAA-15, NOAA-12's a.p.t. may be switched off.

h.r.p.t.

GHz	WXSAT
1.6980	NOAA-12
1.6980	NOAA-16
1.707	NOAA-14
1.7025	NOAA-15
1.707	NOAA-17
1.698	NOAA-18
1.707	NOAA-18
1.7005	FENGYUN-1D

Transmitting normally as from 16 July

Should be transmitting here, or here.

WEFAX

METEOSAT-7 (geostationary) transmits WEFAX on 1.691 and 1.6945GHz, and Primary Data on 1.691GHz until the end of 2005.

METEOSAT-8 HRIT, HRIT and other formats transmitted via HotBird-6 at 13°E on transponder 117 - 10.85344GHz as EUMETCast data.

SWM UK Radio Club Listing

If you want to meet with others with a radio passion, then please use this guide to assist...

JERSEY

JERSEY ARS, GJ3DVC. Meets at the German Signal Station, Rue Baal, La Moie, St. Brelade. Details from Mrs Anne Mourant MJOBUJ. Tel: (01534) 734948.

SOMERSET

PRESTON COMMUNITY SCHOOL ARC, GOPCS. Details from Craig Douglas G0HJU. Tel: (01395) 711131.

TAUNTON & DARS, G3KWZ. Meets at the Memorial Hall, Trull, Taunton. Details from David Rosewam MOCIF.

WEST SOMERSET ARC, G00WX. Meets at the West Somerset Community College, Minehead, Somerset. Details from Robert Bonar G10NW/M30KW. Tel: (01643) 863462.

WINCANTON ARC, G0WRA. Meets at King Arthur's Community School, West Hill, Wincanton. Details from Mr G.A. Fingerhut G0ENW. Tel: (01363) 370506.

YEovil & DARC, G3CMH, G8YEO. Meets at the British Red Cross HQ, 72 Grove Avenue, Yeovil, Somerset. Details from George Davs G3ICO. Tel: (01935) 425669.

ESSEX

BARKING RADIO & ELECTRONIC SOCIETY, G3XBF. Meets 19.30-22.00 on Thursday evenings at Parkside Community Centre, Goodmayes Lane, Ilford, Essex. Details from Bill Cheverie G0QJK. Tel: (0208) 478 4758, E-mail: bilcheverie@btconnect.net Website: <http://www.barkingradio.org.uk/>

BRAINTREE AND DISTRICT ARS, G3GX. Meets 2000 on 1st and 3rd Mondays in the month at the Braintree Hockey Club, Church Street, Barking, Braintree. Details from John Button M5AUB. Tel: (01376) 325857, E-mail: club@badars.org.uk Website: <http://www.badars.org.uk/>

CHELMSFORD ARS, G0MWT. Meets 1915 for 1930 start on the 1st Tuesday in the month at Marconi Social Club, Beehive Lane, Chelmsford, Essex. Details from Maryn Medical G1EFL. Tel: (01245) 469008, E-mail: Info2005@g0mwt.org.uk Website: <http://www.g0mwt.org.uk/>

CHELMSFORD SCARF, M50DS. Scout Amateur Radio Fellowship. Details from the Secretary, E-mail: Info@chelmsford-scarf.co.uk Website: <http://www.chelmsford-scarf.co.uk/>

CLACTON RADIO CLUB, G3CRC. Meets at 2000 on the 1st Wednesday in the month at the Clacton-on-Sea Sailing Club, Holland Haven, Holland-on-Sea. Details from Geoff Asford GA0ZQ. Tel: (01225) 429117.

COLCHESTER RADIO AMATEURS, G3CO. Meets 1930 on alternate Thursdays at the Colchester Institute or St Helena's School, Sheepen Road, Colchester, Essex. Details from Frank R. Howe G3FL. Tel: (01206) 851189, E-mail: cra@mcginty.net Website: <http://www.g3co.com.co.uk/>

DENGIE HUNDRED ARS, G0UIT, G7SDH. Meets at 1930 on 2nd and 4th Mondays in the month at the Henry Samuel Hall, Mayland, Essex. Details from Mark Barnaby 2E0JQ. Tel: (01221) 829545, Mobile: (07959) 401993, E-mail: 2E0JQ@chars.org.uk Website: <http://www.dhars.org.uk/>

ESSEX REPEATER GROUP, G83DA. Details from Murray Niman G6YB. Tel: (01245) 242617, E-mail: oliv.ward@btinternet.com Website: <http://www.essexrepeatergroup.org.uk/>

ESSEX RAYNET GROUP, G6ZVV. Details from Nigel Hull G6ZVV. Tel: (07850) 243459, E-mail: nigel@essexraynet.co.uk Website: <http://www.essexraynet.co.uk/>

BaeSYSTEMS BASILDON RADIO CLUB G0GEC. Meets at BaeSystems Social Club, Gardiners Lane, Basildon, Essex. Details from Peter Shepherd. Tel: (01268) 887402, E-mail: peter.shepherd@baesystems.com

HARLOW & DARS, G6UT. Meets 2000 on Tuesdays at the Mark Hall Barn, First Avenue, Harlow, Essex. Details from Len Brackstone G7JFF. Tel: (01279) 864973, Mobile: (07931) 207184, E-mail: g6ur@qsl.net Website: <http://www.qsl.net/g6ur/>

HARWICH AMATEUR RADIO INTEREST GROUP, G0RGH. Meets 2nd Wednesday in the month at the Park Pavilion, Barrack Lane, Harwich, Essex. Details from Tony Free G4EYE. Tel: (01255) 586065, E-mail: g0rgh@amsat.org Website: <http://members.lyccs.co.uk/harw/>

HAVERING & DARC, G4HRC. Meets 2000 on Wednesdays at the Fairlytes Arts Centre 51 Billet Lane Hornchurch, Essex. Details from Oliver Tillet G3TJ. Tel: (01708) 746677, E-mail: g4hrc@hotmail.com Website: <http://www.haveringradioclub.co.uk/>

LOUGHTON & EPPING FOREST ARS, G4ONP. Meets 1945 on alternate Fridays at All Saints House, Romford Road, Chigwell Row, Essex. Details from Marc Uitchman G10TC. Tel: 0208-5121645, Mobile: 77431 456058, E-mail: info@efars.org.uk Website: <http://www.efars.org.uk/>

SOUTHELD & DISTRICT RADIO CLUB, G5QK. Meets 1945 on Wednesdays at the Alexandra Yacht Club, Clifton Parade, Southend-On-Sea, Essex. Details from Alan Radley G10TM. Tel: (01268) 741229, E-mail: alanradley@0800alial.com

STANFORD-LE-HOPE & DARS, G4SLH. Details from Ken Thompson G4PAD. Tel: (01375) 671238.

SOUTH ESSEX ARS, G4RSE. Meets 2000 on 1st and 3rd Wednesdays in the month at the Paddocks, Long Road, Carvey Island, Essex. Details from Betty Maynard G6LUO. Tel: (01268) 695474, E-mail: southessex.ars@btinternet.com Website: <http://www.southessex.ars.btinternet.co.uk/>

VANGE ARS, G3YCW. Meets 2000 on Thursdays at St. Gabriels Centre, Rectory Road, Phob, Basildon, Essex. Details from Doris Thompson. Tel: (01268) 552606, E-mail: info@vars.freewire.co.uk Website: <http://www.vars.freewire.co.uk/>

KENT

BREDHURST RX & TX SOC., G0BRC. Meets at Rock Avenue Working Mens Club, Rock Avenue, Gillingham, Kent. Details from Mr T.M. Wheeler G7MIM.

CRAY VALLEY RS, G3RCV, G1RCV. Meets at the Progress Hall, Admiral Seymour Road, Eatham, London SE9. Details from Bob Treacher BR532525 via www.cvs.org

DOVER RADIO CLUB, G3YMD. Meets at the Dover Grammar School for Boys, Astor Avenue, Dover. Jim Cairns M1BK1. Tel: (01304) 852773.

EAST KENT RADIO SOCIETY, G0EKR. Meets at St. Nicholas's Church Hall, Henne Bay, Details from Paul Nicholson G3VJF. Tel: (01227) 743070, FAX: (01227) 742288.

HILDERSTONE ARS, G0HRS. Meets at Hilderstone A.E.C., Broadstairs, Kent. Details from Mr G. Shaw M0AQA.

HOME COUNTIES ATV GRP, G6HT. Meets at the Binfield Club, Binfield (near M4/J10). Details from Mr A. Brooker G4WZG.

MAIDSTONE YMCA ARS, G3TRF. Meets at YMCA Sports Centre, Melrose Close, Maidstone, Kent. Details from Colin Wilson G0VAR. Tel: (01622) 736636.

MEDWAY ARTS, G5MM, G8MWA. Meets at Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham. Details from Mr J. Haie G3FTH.

NORTH KENT RS, G4CV. Meets at The Pop-In-Parlour, Graham Road, Bexleyheath, Kent. Details from Mr A.V. Fribbers G8MLQ. Tel: (01474) 365694.

SWALE ARX, G4SRC, G6SRC. Meets at the Ivy Leaf Club, Dover Street, Sittingbourne, Kent. Details from Gordon Powell M0AKA. Tel: (01795) 665559.

THE MORSE CLUB, G00XE. Meets at The Five Wents Memorial Hall, Swanley/Hextable Road. Details from Ken M3CA. Tel: 0208-306 3544.

WEST KENT ARS, G3WKS. Meets at St. Marks School Hall, Tunbridge Wells, Kent. Details from Malcolm Sheppard G4PWG. 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 ARS, G3YRC. Meets at the Bradwell Community Centre, Bradwell, Great Yarmouth, Norfolk. Details from Mr A.D. Besford G3NHU.

GRESHAM'S SCHOOL ARC, G3XPX. Details from Rev. R.N. Myscroug G3PXO.

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 ARC, GB2MC. Details from Tony Smith G4FAL. E-mail: g4ai@connectfree.co.uk

SUFFOLK

BURY ST. EDMUNDS ARS, G2TO. Meets at the Curford School Curford, Bury St. Edmunds, Suffolk. Details from George Woods G3LPT.

FELIXSTOWE & DARS, G4ZFR. Meets at the Orwell Park School, Nacton, Near Ipswich. Details from Paul Whiting G4YQC. Tel: (01473) 642595.

FRAMLINGHAM COLLEGE ARC, M0CBB. Tel: (01728) 727232.

IPSWICH RADIO CLUB, G4IRC. Meets at the Golden Hind, Nacton Road (3rd Wednesdays) at The Hollies, Bucklesham Straight Road, Ipswich. Details from Keith Gaunt G7OY. Tel: (01394) 420226.

LEISTON ARC, G4XFS. Meets at Leiston Town Athletic Assn., Victory Road, Leiston, Suffolk. Details from Paul Cattermole M3MIG. Tel: (01728) 746044.

LOWESTOFT DRS, G3JRM. Meets at The George Barrow Hotel, Oulton Road, Lowestoft. Details from Phil Holden G0JSG. Tel: (01502) 585448.

MARTLESHAM RS, G4MRS. Meets at the BT Laboratories, Martlesham Heath, Ipswich, Suffolk. Details from Darren Hatcher. Tel: (01473) 644475.

SUDBURY & DRA, G0SWI, G7SRA. Meets at the Old School, Wells Hall Road, Great Cornard, Sudbury, Suffolk. Details from Bryan Pantton G1TW.

SUFFOLK DATA GROUP, G87MM. Details from Peter Pryke G8HUE. Tel: (01473) 631313.

NORTH WALES

CLWYD

CONWAY VALLEY ARC, G6WTM. Meets at the Studio, Penrhos Road, Colwyn Bay, Clwyd. Details from Mr R.W. Evans G6PWC. Tel: (01745) 855068.

MOLD & DRC, G4XHRG. Meets at the Mold Rugby Club, Mold, Flintshire. Details from Les Chesters M0WELC. Tel: (01244) 545369, E-mail: mwelc@thersg.net or Eddie Hewins G3GSL. Tel: (01352) 780334.

NORTH WALES RS, G6WNR. Meets at the Old YMCA, Queen's Drive, Colwyn Bay, Clwyd. Details from Ted Shipton G0WDSJ. Tel: (01745) 336939.

WREXHAM ARS, G4W4WM. Meets at the Community Centre, Maesgwyn Road, Wrexham. Details from Mr P. Moran G4OWER.

GWYNEDD

MEIRION ARS, G4ALZP. Meets at the Royal Ship Hotel, Doigella, Gwynedd. Details from Genevise Chavasse G4WURJ. Tel: (01341) 421028.

PORTHMADOG & DARS, G6W0VI. Meets at The Yacht Club, The Harbour, Porthmadog, Gwynedd. Details from Mr G. Cadwaladr M41DFN.

THE DRAGON ARC, G4W4TA. Meets at the Ebenezer Church Hill, Fford Craig, Llanfaiwlw, Isle of Anglesey. Details from Stewart Rolfe G0WTF. Tel: (01248) 362229.

POWYS

POWYS ARC, G4H4VN. Meets at the ATC HQ, Park Lane, Newtown, Powys. Details from Mrs Jean Brown 2W1CEZ. Tel: (01686) 640814.

SOUTH WALES

DYFED

ABERFORTH YMCA, G4W4SZ. Meets at the Hut B17, The Airfield, Aberporth. Details from Mr G. Carruther G4WHQJ. Tel: (01239) 811205.

ABERYSTWYTH & DARS, G6OARA. Meets at the Scout Hut, Plasrannau Avenue, Aberystwyth. Details from John Woodward G46DK. Tel: (01970) 890657.

CARMARTHEN ARS, G4W4YCT. Meets at The Aelwyd Care Home, Carmarthenshire County Centre, Tregrug Road, Llangunnon, Carmarthen SA31 3BS. Details from Mr W.D.

Hughes G4WZL. Tel: (01267) 231359.

CLEDDAU ARS, G6W0VG. Details from Trevor Perry G4W4XK. Tel: (01646) 600725.

LLANELLI ARS, G6W0EJ. Meets in the Furnace Community Hall, Furnace Square, Llanelli. Details from Roy Jones G6W0ZK. Tel: (01554) 820207.

PEMBROKESHORE RS, G6W0JE. Meets at Furzy Park Community Centre, Furzy Park, Haverfordwest, Pembrokeshire. Details from Ian M. Jones M0WOCAB. Tel: (01437) 763028.

GWENT

ABERGAVENNY RS, G4W4FL. Meets at the Hill Residential College, Pen-y-Pound, Abergavenny, Gwent. Details from Glyn Hughes G6W0DY. Tel: (01633) 483186.

BLACKWOOD & DARS, G6W6G. Meets at the Oakdale Comprehensive School, Oakdale, Blackwood, Gwent. Details from John Evans G6W8TI. Tel: (01495) 225178.

EBBW VALE COLLEGE RS, G6W0IV. Meets at the Gwent Tertiary College, Ebbw Vale Campus, College Road, Ebbw Vale, Gwent. Details from Mr T. Hayden G6W0HON. Tel: (01495) 305192.

NEWPORT ARS, G6W4EZW. Meets at the Brynglas Community Centre, Brynglas Road, Newport, Gwent. Details from Paul Nicholls.

PONTYPOOL ARS, G6W3RNH. Meets at the Settlement, Rockhill Road, Pontypool, Gwent. Details from Graham Smith G6W0LZ.

MID-GLAMORGAN

BRIDGEND & DARC, G6W4LNP. Meets at the Club Brynmryn, Brynmryn, Bridgend. Details from Alun Huimes. Tel: (01856) 721574.

HOOVER (MERTHYR) ARC, G6W3RDB. Meets at the Hoover Sports Pavilion, Hoover Ltd., Pentrebrith, Merthyr Tydfil, Mid Glamorgan. Details Robert Cummings G6W0RVG.

MID GLAMORGAN ARC, M0W0CA. Meets at Aberkenfig Sports & Social Club. Details from Mervyn Carey G4W4VE. Tel: (01656) 734668.

SOUTH GLAMORGAN

BARRY ARS, G6W3VL. Meets at Sully Sports & Leisure Club, South Road, Sully, S. Glamorgan. Details from Richard Montmore G4B4VJ. Tel: (01446) 738756.

HIGHFIELDS ARC, G6W4FO. Meets at the Highfields Physically Handicapped Centre, Allensbank Road, Cardiff. Tel: (01222) 561542.

WEST GLAMORGAN

PORT TALBOT (BS PLC) ARS, G6W3EP. Meets at the British Steel PLC Sports & Social Club, Margam, Port Talbot, West Glamorgan. Details from Mr J. Channock M0WAGE.

SWANSEA ARS, G6W4CC. Meets at the Applied Sciences Building, Swansea University. Details from Frank Burrow G6W8BME. Tel: (01792) 390233.

SCOTLAND WEST & WESTERN ISLES

CENTRAL REGION

FALKIRK & DARS, G6M0FC. Meets every Monday at 1930 in the 62nd Fort Valley Scouts Hall, Denny Road, Larbert, Nr. Falkirk. Details from David, M0DPRAM. Tel: 07950 305655, E-mail: shortwave@btolynonder.co.uk

STIRLING & DARS, G6M6X. Meets at Bandedeath Industrial Estate, Throsk, Nr. Stirling. Details from John Shery G6M0AZC. Tel: (01324) 824709.

DUMFRIES & GALLOWAY

WIGTOWNSHIRE ARC, G6M4RV. Meets at the Aird Unit, Stranraer Academy, Stranraer, (entrance from Cairnport Road). Details from Ellis Gaston. Tel: (01776) 820413, website: www.gm4rv.co.uk

STRATHCLYDE

AYR ARC, G6M0AYR. Meets at the University of Paisley, University Campus, Beech Grove, Ayr KA8 0HN. Details from John Shankland M41JAS. Tel: (01292) 445599.

CENTRAL SCOTLAND FM GROUP, RS38728. Details from Thomas Stalker G6T7ZU. Tel: (01698) 816793.

DALRY ARC, M0M0AAG. Meets at The Turf, In Dalry Court, Hill Street, Dalry. Details from Alex McKeeman M0M0ABM. Tel: (01294) 823295.

DUNJON & DARS, G6M0CD. Meets at the Edward Street Community Centre, Edward Street, Dunoon. Details from A.B. Horton G6W0BUL. Tel: (01369) 840217.

HELENSBURGH ARC, G6M4HEL. Details from G. Capstick G6T0AF. Tel: (01436) 675922.

INVERCLYDE ARC, 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 G6M4OSS. Tel: (01560) 483800.

LARGS & DARS, G6M0VKG. Details from Mr J. Clough G6M0MOD. Tel: (01475) 529843.

LORN ARS, G6M0LRA. Details from Mrs S McLennan G6M0EVR. E-mail: gm0evn@dsi.ppx.com or G6M6MLH QTHR.

MID LANARK ARS, G6M3PKK. 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 G6M0HUJ. Tel: (01360) 312954.

PAISLEY ARC, G6M0PYM. Meets at the Paisley YMCA Hall, 5 New Street, Paisley PA1 3JL. Details from John Quigley G6M0TQA. Tel: 0141-889 6860.

SCOTTISH DIGITAL COMMS. GRP, G6M7VSR. Details from Stuart Clark G6M1VBE. Tel: (01698) 894803.

WEST OF SCOTLAND ARS, G6A4GG. Meets at the Multi Cultural Centre, 21 Rose Street, Glasgow. Details from Hon. Sec.

SCOTLAND EAST & HIGHLANDS

BORDER

BORDERS ARS, G6M0BRS. Meets at the St. John Ambulance Hall, Berwick-upon-Tweed. Details from A.M. McCreadie G6M0BRY. Tel: (018907) 50492.

GALASHIELS & DARS, G6M4YEQ. Meets at the Focus Centre, Galashiels. Details from Jim Keddie G6W7LUN.

HELLO ARS, G6M4KHS. Meets at the Abbey Row Community Centre, Kelso. Details from Margaret Chalmers G6M0ALX. Tel: (01573) 262372.

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 Duncan. Tel: (01224) 896142.

BANFF & DARC, G6M0PYC. Meets at the Princess Royal Park Football Ground, Conference Room (Deveronvale F.C.), Banff. Details from Steve Roberts G6M4HVS. Tel: (01888) 551377.

MORAY FIRTH ARS, G6M3TKV. Meets at the Grant Arms Hotel, Fochabers. Details from Geoff Crowley G6W7SJC. Tel: (01542) 882818.

HIGHLAND REGION

FORT WILLIAM ARC, G6M0FRC. Details from R. Johnstone G6M1GVY. Tel: (01397) 703046.

INVERNESS ARC, G6M4TFP. Meets at The Emergency Operations Centre, Inverness (except July and August). Details from R.F. Goodall G6M0OGZ. Tel: (01463) 811701.

LOTHIAN

COCKENZIE & PORT SETON ARC, RS177035. Meets at The Thornree Inn, Lourge Bar, Old Cockenzie High Street, Cockenzie, E. Lothian. Details from Mr Bob Glasgow G6M4LYZ. Tel: (01875) 811723.

LOTHIANS RS, G6M3HAM. Meets at the Holyrood Room, Royal Etchick Hotel, Etchick Road, Edinburgh. Details from Toby Sigoun M0M0TSS on (07739) 742367.

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 G6M7RKH. Tel: (01950) 460306.

TAYSIDE REGION

DUNDEE ARC, G6M4AAF. Meets at the Dundee College, Graham Street Annex, Dundee. Details from Martin Higgins M0M0DUN, c/o Dundee ARC, 60 Duns Crescent, Dundee DD4 0RZ.

PERTH & DARG, G6M4EAF. Meets at the Perth Sports & Social Club, 18 Leonard Street, Perth. Details from Ron Harless G6M3DRI. Tel: (01738) 643435.

STRATHMORE & DARC, G6M3GBZ. Meets at 2231 Sdnr Ait, 1 Lochside Road, 1 Forfar. Details from Graham Scattergood M0M0BSX. Tel: (01307) 468824.

N. IRELAND

CO. ANTRIM

ANTRIM & DARS. Meets at the Greystone Community Centre on the Ballycraig Road in the town of Antrim. Details from David Hutchinson G14JUM or visit www.gf4sw.co.uk

BALLYMENA RC, G3IFFF. Meets at 70 Nursery Road, Gracehill, Ballymena, Co. Antrim. Details from Jeffrey Clarke G14HCN. Tel: (01256) 659769.

CARR

LM&S

Long, Medium & Short Wave Bands

- **Martin Peters** 11 Filbert Drive, Reading RG31 5DZ
- **E-mail:** lms@pwwpublishing.ltd.uk

Hello and welcome to 'LM&S'. This month's listings refer to stations monitored during June. Several of you lamented the fact that the short wave listings have not been available in their entirety within the SWM itself, with readers being directed towards the Internet in order to get the complete picture: frustrating for those of you who do not possess this luxury, I agree. I imagine this is all down to pressure of space on the column from other articles and features, but, here to explain all and hopefully allay your fears, is the man himself. Over to you, Kevin.

Well, Martin has indeed correctly identified the problem with a magazine such as SWM and that is the lack of space to provide everything that everyone wants in every issue. This is not a new topic to be discussed within these pages, so I won't dwell on it here. To keep this brief, I was faced with three options. These were, to drop some of the tables, to squeeze everything in to the space now used for LM&S, i.e. four pages, or to retain the type size and therefore ensure readability by hosting the overflow on the website. It was my view that the latter would be the best compromise. For those of you that don't have access to the Internet at home, don't forget that your local library offers the service, or perhaps you have a cybercafe near you. I'd be interested to hear from anyone who can suggest a better alternative as I'm open to changing what we do if that's what readers want. - Ed.

Bernard Curtis has been experimenting with his home-brew loop antenna (cunningly crafted from two Corn Flakes packets). With careful positioning of loop and Ocean Boy receiver, Bernard was able to pull in a raft of stations not usually heard on his base station receiver with its associated long wire. Time, perhaps, to remind ourselves of the versatility of portable radios on medium and long waves, with their ability to instantly null out interfering stations by merely rotating the set.

This mechanism can also help to minimise local interference. Harry Richards wrote in with a cautionary tale regarding his FreeView set-top-box. Harry tracked a pulsing, 'Woodpecker' - type of interference which he traced down to the set-top box, the only cure was to switch it off completely.

Those of you looking forward to owning a receiver will be interested to learn of a new module - the RS500 - launched recently by RadioScape. The device can receive DRM as well as DAB, FM with RDS, and long, medium and short wave. It will form the heart of the world's first "affordable, integrated, multi-standard, digital radio receivers", according to RadioScape's press release.

Add to that, the ability to pause, rewind and record to an integral memory card, and you have an extremely versatile receiver - all for a projected price of under £150. Modules should be available any time now.

Resumed

The Voice of America (VOA) resumed broadcasts to Uzbekistan on 12 June 12 following the recent unrest there. The station ceased broadcasting to Uzbekistan just last year when research revealed that Uzbeks watch television in significant numbers. As a consequence VOA had been beaming in TV since December 2003.

According to Director David Jackson, VOA decided to resume their radio broadcasts because of the Uzbek government's tightening of controls on foreign television broadcasts.

The schedule is as follows: 1500-1530 on 11.515, 11.780 and 15.390MHz.

VOA hopes to offer the new Uzbek-language radio broadcasts on medium wave and FM in the future.

The 2005 Commercial Radio Pocket Book is now available on-line for download from www.crca.co.uk Those of you without broadband

Tropical Band Table

MHz	UTC	Service	Country	Listener
3.210	0214	WWCR, Nashville	USA	A B
3.240	0315	Trans*World Radio	MCO/SWZ	A
3.345	2131	Adventist World Radio	AFS	F
3.255	2130	BBC World Service	G/AFS	A D
3.320	2212	Radio Sonder Grense	AFS	B
3.345	2143	Chappel Africa	AFS	A B D
3.350	0210	Radio Exterior Espana	E/CTR	A B
3.915	2140	BBC World Service	G/SNG	A B D
3.955	1825	WYFR	USA/G	B C D
3.955	2104	KBS World	KOR/G	B E
3.965	1821	Radio Taiwan	TWN/F	B C
3.975	1905	Radio Budapest	HNG	A B C D E
3.985	1926	V of Islamic Rep of Iran	IRN	F
4.005	2116	Vatican Radio	CVA	A B F
4.025	2338	Laser Hot Hits (pirate)	?	E
4.635	1946	Radio Tajikistan	TJK	B
4.760	2210	ELWA Monrovia	LRB	F
4.770	2153	FRCN Kaduna	NIG	B F
4.770	2018	WYFR	USA	F
4.780	2000	RTD Djibouti	DJI	B
4.785	2100	R. Progresso, Porto Velho	B	F
4.800	2124	CNR1 Shijiazhuang	CHN	B
4.820	2139	Xizang Lhasa	CHN	B
4.830	2045	R. Progresso, Porto Velho	B	F
4.835	2131	VLBA Alice Springs	AUS	B F
4.840	0022	All India Radio, Mumbai	IND	B
4.860	1915	All India Radio	IND	F
4.905	2136	Xizang Lhasa	CHN	A B
4.910	2139	ZNBC Radio 1	ZMB	A B F
4.915	2030	GBC 1 Accra	GHA	B F
4.920	0016	All India Radio, Chennai	IND	B
4.920	2133	Xizang Lhasa	CHN	A B
4.930	2116	Voice of America	USA/STP	A B D F
4.940	2000	Voice of America	USA/STP	B F
4.976	2050	Radio Uganda	UGA	F
4.985	0200	Radio Brasil Central	B	B F
5.005	2050	RNGE Malabo	GNE	A B F
5.025	0012	Radio Reheide	CUB	A B E
5.025	2053	Radio Tashkent	UZB	B E
5.030	0054	University Network	USA	E
5.030	2214	Radio Burkina	BFA	A B
5.070	0153	WWCR, Nashville	USA	B E
5.085	0151	WWRB, Manchester	USA	B E

DXers:-

- A Eddie McKeown, Newry
- B Michael Casey, Manchester
- C Bernard Curtis, Stalbridge
- D Simon Hockenhill, Bristol
- E Tim Allison, Middlesbrough
- F Freddy McGavin, Dublin

Long Wave Table

kHz	Service	TX Location	Country	Power (kW)	Listener
153	Deutschlandfunk	Donebach	D	500/250	A B C D
162	France Inter	Allouis	F	2000/1000	A B C
171	Radio Rossi	Bolsakovo	RUS	600	A C
177	Deutschlandradio Berlin	Zehlendorf	D	500	A C D
183	Europe 1	Saarlouis	D	2000	A B C
198	BBC Radio 4	Droitwich	G	500	A C
207	Deutschlandfunk	Aholmung	D	500	A B C D
207	RTM A	Azilal	MRC	400	D*
216	Radio Monte Carlo	Roumoules	F	1400	A B C D
225	Polish Radio 1	Solec Kujawski	POL	1000	C* D*
234	RTL	Beidweiler	LUX	2000	A B C
243	Denmark Radio 1	Kalundborg	DNK	300	A B C D
252	RTE Radio 1	Clarkstown	IRL	500/150	A B C D
261	Radio Rossi	Taldom	RUS	2500	C* D*
270	Czech Radio 1	Uherske Hradiste	CZE	850	A B C*
279	Belarussian Radio 1	Sasnovy	BLR	500	C*
279	Radio Rossi	Mayy	RUS	50-500	C*

* = dark

Listeners:-

- A Phil Townsend, London
- B Thomas Williams, Truro
- C Eddie McKeown, Newry
- D Simon Hockenhill, Bristol

or other high bandwidth Internet connectivity can order up a paper copy by calling the Commercial Radio Companies Association on **020-7306 2603**.

Following on from my mention of the launch of Holland-based **Radio Seagull** and **Radio Waddensee** on 1602kHz, the radio stations have announced their intention to broadcast from a ship.

The vessel they have acquired, the ex-lightship **LVB**, will house studios and offices, not to mention the transmitter and antenna. It's envisaged that the ship will anchor just outside Harlingen harbour when calm weather permits.

Besides ongoing duties as a radio station platform, the ship will be used for training by the Maritime Academy and the Sea Cadets. Finally, room will be set aside to accommodate exhibitions, seminars, and other group activities.

More information, along with the first pictures will follow soon on the following website www.radioseagull.net

As mentioned in a previous 'LM&S' columns, Liberia's **Star Radio** relaunched with FM transmissions to Monrovia back at the end of May. Now, as expected, short wave transmissions have begun. These are generally well received here in the UK so take a listen between 0700-0900 on 9.525MHz and 2100-2200 on 11.965MHz.

For the record, Star Radio broadcasts for 17 hours a day with news, current affairs and other programming and is operated with help from the not-for-profit Hironelle Foundation.

In an eleventh-hour move, cash-strapped **Radio Slovakia** now seems likely to retain its international service.

The broadcaster had announced its intention to close down its short wave foreign language service and cut 84 jobs in a bid to save money. However, the Parliament-appointed Radio Council thought otherwise and insisted that some form of foreign-language service should continue.

One suggestion was that the Radio Slovakia

could reduce its output but a spokesman for the station maintained that with just thirty minutes a day in five foreign languages, the service was already at a minimum.

Jaroslav Reznik, Slovak Radio's director-general, confirmed that short wave broadcasting would continue in the short term but added that he could not say for how long this would be possible.

After Dark

Finally, you can now listen to **Radio Tatra International** courtesy of a relay on 1350kHz from Kuldiga in Latvia. The 50kW facility had suffered storm damage in late 2004 but is now operational once more. After dark reception in the UK is reportedly quite passable.

That'll do it for now. Keep those contributions coming in, as always, by the 10th of the month. See you next time.

Medium Wave Table

kHz	Service	Location	Country	kW	Listener
531	RNE 5	Many	E	10-25	C
531	Swiss Radio (German)	Beromunster	SUI	600	B
540	RTM A	Tanger	MRC	300	C*
540	Radio Twee	Wavre	BEL	150	A C
549	Deutschlandfunk (DLF)	Nordkirchen/Thurnau	D	100	A
549	UCB Europe	Dundalk	IRL	70	B C
567	RTE 1	Tullamore	IRL	500	A C
576	Sudwestrundfunk (SWR)	Muhlacker	D	100	C*
576	RNE 5	Barcelona	E	100	C*
585	RNE 1	Madrid	E	600	C*
585	FIP	Paris	F	8	A B C
594	HR Skyline	Frankfurt	D	250	C*
594	RTM A	Qujda	MRC	100	C*
603	France Info	Lyon	F	300	B C*
603	RNE 5	Seville	E	5	C*
612	RTM A	Sebaa-Aioun	MRC	300	C*
612	RNE 1	Vitoria	E	10	C*
621	RTBF 1	Wavre	BEL	300	A C*
630	Tunis Radio	Djedeida	TUN	600	C*
639	RNE 1	Many	E	10-300	C*
648	BBC World Service	Orfordness	G	500	A B C
657	RNE 5	Madrid	E	50	C*
657	BBC Radio Wales	Wrexham	G	2	A B C
666	Sudwestrundfunk (SWR)	Rohrdorf	D	150	C*
675	Arrow Classic Rock	Lopik	HOL	120	A B C
684	RNE 1	Seville	E	600	C*
711	Radio Bleu	Rennes	F	300	A C
720	BBC Radio 4	Lisnagarvey	G	10	A C*
720	BBC Radio 4	London	G	0.75	A B C
729	RTE Radio 1	Cork	IRL	10	B C
738	RNE 1	Barcelona	E	500	C*
747	Radio 747	Flevoland	HOL	400	A B C
756	Deutschlandfunk (DLF)	Many	D	100-200	C*
765	Option Musique	Sottens	SUI	600	C*
774	RNE 1	Many	E	20-100	C*
783	MDR Info	Leipzig	D	100	C*
792	France Info	Limoges	F	300	C*
810	BBC Radio Scotland	Westerglen	G	100	C*
819	ERTU1	Batra	EGY	1000	C*
819	Sud Radio	Toulouse	F	20	C*
819	Radio Euskadi	Sar Sebastian	E	10	C*
837	France Info	Nancy	F	200	C*
837	COPE	Many	E		C*
855	RNE 1	Murcia	E	300	C*
864	La City Radio	Paris	F	300	A C
873	American Forces Network	Frankfurt	D	150	C*
882	BBC Radio Wales	Washford	G	100	A
900	RAI Uno	Milan	I	600	C*
918	Radio Slovenia	Domzale	SVN	600/100	C*
927	Radio Een/927 Live	Wolvertem	BEL	300	A B
945	France Blue	Toulouse	F	300	C*
954	Ondia Cera Radio	Madrid	E	20	C*
963	YLE Radio	Pori	FIN	600	C*
972	Nord Deutscher Rundfunk (NDR)	Hamburg	D	100	C*
981	RTA 2	Algeirs	ALG	600/300	C
990	Deutschlandfunk (DLF)	Berlin	D	100	C*
990	Radio Bilbao	Bilbao	E	10	C*
999	COPE	Madrid	E	50	C*
1008	Radio 10 Gold	Flevoland	HOL	400	A C
1017	Sudwestrundfunk (SWR)	Wolfsheim	D	100	C*
1035	Radio Nacional	Porto Alto	POR	100	C

kHz	Service	Location	Country	kW	Listener
1044	MDR Info	Dresden	D	20	C*
1044	Radio San Sebastian	San Sebastian	E	10	C*
1062	Denmark Radio P3	Kalunborg	DNK	250	C*
1071	Euskadi Irratia	Bilbao	E	50	C*
1080	SER	Many	E	5-10	C*
1098	RNE5	Almaria	E	10-25	C*
1125	Radio 21	Houdeng	BEL	10	A C*
1125	BBC Radio Wales	Llandrindod Wells	G	1	C
1134	Croatian Radio HR1	Zadar	HRV	600	C*
1179	Swedish Radio	Solvesborg	S	600/300	C* D*
1179	Radio Canada International	Solvesborg	CAN/S	600/300	D*
1188	Radio Twee	Kuurne	BEL	5	A C*
1206	France Info	Bordeaux	F	300	C*
1224	Radio Poplar	San Sebastian	E	10	C*
1242	France Info	Marseille	F	150	C*
1251	Radio 747	Hulsberg	HOL	10	C*
1269	Deutschlandfunk (DLF)	Neumunster	D	300	C*
1278	France Bleu	Strasbourg	F	300	C*
1287	SER	Many	E	5-10	C*
1314	NRK Europakanalen	Kvitsoy	NOR	1200	C*
1341	BBC Radio Ulster	Lisnagarvey	G	100	C*
1350	Radio Orient	Nancy	LBN/F	300	C*
1359	RNE 3	Madrid	E	600	C*
1368	Manx Radio	Douglas, 10M	G	20	C*
1377	France Info	Lille	F	300	A C*
1395	Big L Radio London	Trintelhaven	HOL	120	B C*
1404	France Info	Brest	F	20	C*
1422	Deutschlandfunk (DLF)	Hausweiler	D	1200/600	C*
1427	RTA	Fayat	ALG	40	C*
1440	RTL + China Radio International	Marnach	(CHN)/LUX	1200/300	C*
1476	Radio 1476	Vienna	AUT	60	C*
1494	France Info	Clermont-Ferrand	F	20	C*
1494	HB	Bastia	F		C*
1512	R Vlaanderen/Radio Een	Wolvertem	BEL	300/25	C*
1512	BSKSA	Jeddah	ARS	1000	C*
1521	Radio Castello	Castello	E	2	C*
1530	Vatican Radio	Vatican City	CVA	150/450	C*
1539	Evangeliums Rundfunk	Mainflingen	D	700/120	C*
1557	France Info	Nice	F	300	C*
1575	Radio Nouveaux Talents	Paris	F	5	C*
1593	Radio Cluj	Sibiu	ROU	7	C*
1602	Radio Vitoria	Vitoria	E	25	C*

* = dark

Listeners:-

- A Phil Townsend
- B Bernard Curtis, Stalbridge
- C Simon Hockenhull, Bristol
- D Tim Allison, Middlesbrough

Local Radio Table

kHz	Service	Svc area/TX site	kW	SWL
558	Spectrum	Crystal Palace	1	A B C
603	Capital Gold	Littlebourne	0.1	A C
630	BBC Radio Cornwall	Redruth	2	C*
630	BBC 3CR	Luton	0.2	A C
657	BBC Radio Cornwall	Bodmin	2	B C*
666	Classic Gold	Exeter	0.34	C
729	BBC Essex	Manningtree	0.2	A
739	BBC Hereford & Worcester	Worcester	0.037	A B C
756	Magic Maidwyn	Newtown	0.63	C
765	BBC Essex	Chelmsford	0.5	A C
774	BBC Radio Kent	Littlebourne	0.7	A
792	Classic Gold	Bedford	0.275	A C
801	BBC Radio Devon	Barnstaple	2	B C
828	Classic Gold	Bournemouth	0.27	C
828	Classic Gold	Luton	0.2	A C
828	BBC Asian Network	Wolverhampton	0.2	C
837	BBC Asian Network	Leicester	0.5	A C
855	BBC Radio Norfolk	Norwich	1.5	A C*
855	Sunshine 855	Lowdow	0.15	C
873	BBC Radio Norfolk	West Lynn	0.3	A
945	Capital Gold	Bexhill	0.7	A
954	Classic Gold	Torbay	0.4	C
954	Classic Gold	Hereford	0.16	C
963	Asian Club	Hackney	0.95	A C
972	Asian Club	Southall	1	A B C
990	BBC Radio Devon	Exeter	1	B C
990	Classic Gold	Wolverhampton	0.09	C
999	BBC Radio Solent	Fareham	1	A C
999	Valleys Radio	Ebbw Vale	0.3	C
1017	Classic Gold	Shropshire	0.63	A C
1026	BBC Radio Jersey	Trinity	1	B C
1026	BBC Radio Cambridgeshire	Cambridge	0.5	A C
1035	Kismet Radio	Crystal Palace	1	A B C
1116	Valleys Radio	Ebbw Vale	1	C
1116	BBC Radio Guernsey	Rohais	0.5	C
1134	KoolAM	Harlow	0.001	A
1152	LBC	London	23.5	C*
1152	Capital Gold	Birmingham	3	C
1152	Classic Gold Amber	Norwich	0.83	C*

kHz/Service	Svc area/TX site	kW	SWL	
1161	BBC 3CR	Bedford	0.1	A
1170	Swansea Sound	Swansea	0.58	C
1170	Classic Gold Amber	Ipswich	0.28	A
1242	Capital Gold	Maidstone	0.32	A
1251	Classic Gold Amber	Bury St Edmunds	0.76	A C*
1278	Palace Radio	London	0.001	A
1278	Classic Gold	Bradford	0.43	C
1296	Radio XL	Birmingham	10	B C
1323	Capital Gold	Brighton	0.5	A B C*
1359	Classic Gold Breeze	Chelmsford	0.28	A
1368	BBC Southern Counties Radio	Southburst	0.5	A
1431	Classic Gold Breeze	Southend	0.35	A C*
1431	Classic Gold	Reading	0.14	C
1459	Sunrise	London	125	A C
1458	BBC Asian Network	Birmingham	5	C
1458	BBC Radio Devon	Torbay	2	C
1485	BBC Radio Merseyside	Wallasey	2	C
1485	BBC Southern Counties Radio	Brighton	1	A G
1485	Classic Gold	Newbury	1	C
1503	Sound Radio	London	?	A
1503	BBC Radio Stoke	Staffordshire	1	C*
1521	Classic Gold	Reigate	0.154	A C
1521	Forest of Dean Community Radio	Colerford	0.1	B C
1530	Classic Gold	Huddersfield	0.74	C*
1530	Capital Gold	Worcester	0.52	C
1530	BBC Radio Essex	Southend	0.15	A
1548	Capital Gold	London	97.5	C*
1557	Classic Gold	Northampton	0.76	C*
1566	County Sound	Guildford	0.8	A C*
1566	BBC Somerset Sound	Taunton	0.6	C
1584	BBC Hereford & Worcester	Woolferton	0.3	C
1584	Turkish Radio	London	0.2	A C
1602	Desi Radio	Southall	0.07	A C

* = dark

Listeners:-

- A Phil Townsend, London
- B Bernard Curtis, Stalbridge
- C Simon Hockenhill, Bristol

Short Wave Table

MHz	UTC	Service	Country	Lang	SINPO	SWL	MHz	UTC	Service	Country	Lang	SINPO	SWL
0000-0600													
5.810	0054	EWTN	USA	Eng	35443	TA	15.290	0840	Radio Farda	USA/GRC	Far	34433	VP
5.850	0110	WHRI	USA	Eng	55343	TA	15.300	0747	Radio France Int	F	Fre	34434	RI
5.850	0505	WYFR	USA	Eng	34222	PP	15.300	0947	Radio France Int	F	Fre	44344	PP
5.890	0507	Vatican Radio	CVA	Eng	44444	PP	15.350	0753	Voice of Turkey	TUR	Tur	44433	RI
5.920	0110	WBOH	USA	Eng	33322	TA	15.380	0755	Saudi Radio	ARS	Ara	44434	RI
5.975	0112	BBC World Service	G	Eng	34322	SH	15.400	0756	BBC World Service	G/ASC	Eng	44434	RI
5.975	0551	Radio Japan	J/G	Eng	55445	PP	15.485	0850	BBC World Service	G	Eng	33333	PP
6.000	0345	Radio Havana Cuba	CUB	Eng	44444	TA	15.495	0804	Radio Kuwait	KWT	Ara	34333	RI
6.020	0142	China Radio Int	CHN/ALB	Eng	55535	MC	15.525	0908	Deutsche Welle	D	Pas?	34333	RI
6.036	0145	Radio Romania Int	ROU	Eng	54534	MC	15.585	0813	Vatican Radio	CVA	Eng	44444	TA
6.115	0242	Radio Tirana	ALB	Eng	45444	TA	15.605	0741	Radio France Int	F	Eng	35543	TA
6.140	0300	Voice of Turkey	TUR	Eng	45333	TA	15.630	0815	Voice of Greece	GRC	Gre	44433	RI
6.145	0040	Radio Japan	J	Eng	45544	TA	15.675	0821	Unid religious	?	Rus	44434	RI
6.175	0342	Voice of Vietnam	VTN	Eng	44444	TA	15.710	0825	Radio Prague	CZE	Spa	44444	RI
6.220	0018	Mystery Radio	?	Eng	35443	TA	15.725	0811	Radio Mi Amigo via IRRS	I	Eng	35433	TA
7.130	0016	Deutsche Welle	D	Eng	53443	TA	17.490	0600	China Radio Int	CHN	Eng	34433	GG
7.150	0241	Radio Tirana	ALB	Eng	44444	TA	17.490	0828	China Radio Int	CHN	Eng	44444	TW
7.160	0000	China Radio Int	CHN	Eng	43333	TA	17.515	0835	Vatican Radio	CVA	Rus	44444	RI
7.250	0125	Voice of Russia	RUS/ARM	Eng	55555	MC	17.535	0726	Kol Israel	ISR	Heb	44333	RI
7.305	0250	Vatican Radio	CVA	Eng	45433	TA	17.535	0830	Kol Israel	ISR	Heb	34333	TW
7.345	0013	Radio Prague	CZE	Eng	45443	TA	17.540	0837	China Radio Int	CHN	Eng	32432	RI
7.355	0514	WYFR	USA	Eng	35333	PP	17.580	0840	CPRS	CHN	Chi	43432	RI
7.385	0059	Christian Media Network	USA	Eng	43232	TA	17.610	0842	BBC World Service	B	Ara	33432	RI
7.385	0134	WPRI	USA	Eng	43443	MC	17.630	0844	Africa No 1	GAB	Fre	34433	RI
7.440	0009	Radio Ukraine Int	UKR	Eng	44434	SH	17.650	0846	China Radio Int	CHN	Chi	43433	RI
7.440	0311	Radio Ukraine Int	UKR	Eng	54444	TA	17.675	0852	Radio Japan	J/C/LN	?	34333	RI
7.460	0517	WHRI	USA	Eng	44444	PP	17.730	0957	Saudi Radio	ARS	Ara	44434	RI
7.465	0036	WWCR	USA	Eng	44333	TA	17.755	0859	Radio Farda	USA/GRC	Far	24232	RI
7.490	0037	WHRA	USA	Eng	55544	TA	17.900	0644	Radio France Int	F	Eng	44443	TA
7.520	0038	WHRA	USA	Eng	55444	TA	17.850	0731	Radio France Int	F	Fre	23421	RI
9.430	0105	Radio Slovakia Int	SVK	Eng	44222	TA	1800-1900						
9.505	0015	Deutsche Welle	D	Eng	43242	TA	9.920	1852	Radio Slovakia Int	SVK	Eng	55545	MC
9.560	0222	KBS World	KOR	Eng	43333	TA	9.945	1840	ORF Radio Austria Int	AUT	Ger	55545	VP
9.560	0513	China Radio Int	CHN	Eng	35211	TA	6.005	1845	Deutschlandfunk	D	Ger	45544	VP
9.570	0003	China Radio Int	CHN/ALB	Eng	55545	SH	6.055	1850	Radio Slovakia Int	SVK	Eng	44434	SH
9.580	0002	Int'l Radio of Serb & Mont	SCG/BH	Eng	44554	TA	6.100	1856	Int'l Radio of Serb & Mont	SCG/BH	Eng	41431	SH
9.605	0251	Vatican Radio	CVA	Eng	42332	TA	6.175	1835	Radio Japan	J/G	Jap	54555	BC
9.630	0069	Deutsche Welle	D	Eng	45433	TA	6.195	1840	BBC World Service	G	Eng	45444	RI
9.660	0301	Vatican Radio	CVA	Eng	43222	TA	7.155	1815	Radio Thailand	THA	Eng	43344	PP
9.665	0111	Voice of Russia	RUS/MDA	Eng	55555	MC	7.410	1834	All India Radio	IND	Eng	55445	MC
9.685	0517	Channel Athra	AFS	Eng	35533	TA	7.450	1850	ERT 3	GRC	Gre	55555	VP
9.700	0510	Deutsche Welle	D	Eng	44232	TA	7.590	1815	AFRIS	USA/ASI	Eng	23323	VP
9.755	0102	Radio Canada Int	CAN	Eng	54545	MC	9.325	1820	Voice of Korea	KRE	Ger	23222	VP
9.825	0017	Deutsche Welle	D	Eng	41331	TA	9.330	1853	Radio Damascus	SYR	Ger	44334	FM
9.845	0029	Radio Netherlands	HOL	Eng	44333	TA	9.345	1836	Kol Israel	ISR	Far?	44434	VP
9.890	0329	Voice of Russia	RUS	Eng	54433	TA	9.530	1801	Radio Canada Int	CAN	Eng	54444	FM
9.890	0534	BBC World Service	G	Eng	55334	PP	9.635	1806	Radio Romania Int	ROU	Eng	32422	SH
9.885	0110	Voice of America	USA/GRC	Eng	22332	HR	9.785	1838	Voice of Turkey	TUR	Eng	33333	FH
11.590	0043	Radio Vilnius	LTU	Eng	42332	TA	9.880	1825	Voice of Russia	RUS	Eng	53434	BC
11.700	0247	Radio Bulgaria	BUL	Eng	24232	TA	9.895	1820	Radio Netherlands	HOL	Eng	43434	BC
11.710	0500	China Radio Int	CHN	Eng	45433	TA	11.630	1815	Voice of Russia	RUS	Eng	54445	BC
11.760	0504	China Radio Int	CHN	Eng	43232	TA	11.720	1835	Radio Philippines	PHL	Eng	43344	FM
							11.755	1835	YLE Radio Finland	FIN	Fin	55545	VP
							11.830	1809	Radio Romania Int	ROU	Eng	43443	SH
							12.015	1802	Voice of Korea	KRE	Ger	44433	FM
							12.040	1800	Voice of Russia	RUS	Fre	55455	PP

MHz	UTC	Service	Country	Lang	SINPO	SWL
12.105	1830	Voice of Greece	GRC	Eng	55545	VP
13.730	1804	Radio Canada Int	CAN/D	Eng	25322	SH
13.820	1814	Croatian Radio	HRV	Eng	44333	FM
13.845	1835	WWCR	USA	Eng	25443	HR
15.100	1825	Radio Pakistan	PAK	Urdu	54444	FM
15.190	1816	Radio Pilipinas	PHL	Eng	44344	FM
15.345	1805	RTM Morocco	MRC	Ara	33333	RH
15.400	1805	BBC World Service	G/ASC	Eng	43343	RH
15.410	1805	Voice of America	USA/ASC	Eng	44434	VP
15.420	1815	Radio Canada Int	CAN/CHN	Eng	43333	BC
15.475	1800	Africa No 1	GAB	Fre	33233	RH
15.580	1805	Voice of America	USA/BOT	Eng	35444	HR
15.785	1820	WHRI	USA	Eng	54344	BC
17.670	1837	All India Radio	IND	Eng	44334	FM
17.680	1840	Voz Cristiana	CHL	Spa	55445	MC
17.720	1827	Radio Pilipinas	PHL	Eng	44344	FM
17.830	1805	BBC World Service	G	Eng	23222	PP
17.895	1805	Voice of America	USA/MRC	Eng	45333	VP
21.455	1825	WYFR	USA	Eng	55434	BC
21.655	1815	RDP Portugal	POR	Por	55334	BC
21.655	1859	RDP Portugal	POR	Por	44433	MC
21.700	1859	Radio Exterior de Espana	E	Spa	44544	MC
1900-2000						
5.775	1926	IFRS	I	Eng	45444	TA
5.990	1915	Radio Prague	CZE	Spa	45634	VP
5.960	1946	RAI Int	I	Eng	43433	TA
6.015	1920	Bibli Voice	G/D	Eng	44243	EM
6.025	1900	Radio Budapest	HNG	Eng	44544	SH
6.065	1946	Radio Sweden Int	S	Eng	55555	VP
7.105	1930	Radio Belarus	BLR	Eng	35544	FM
7.120	1943	Radio Netherlands	HOL	Eng	42332	TA
7.155	1900	Radio Thailand	THA	Eng	43334	GG
7.305	1895	V of Islamic Rep of Iran	IRN	Eng	43344	FM
7.280	1937	Radio Belarus	BLR	Eng	43344	FM
7.290	1931	Radio Belarus	BLR	Eng	22212	EM
7.380	1900	Voice of Russia	RUS	Eng	54444	BC
7.410	1930	All India Radio	IND	Eng	55434	VP
9.420	1945	Voice of Greece	GRC	Gre	55555	VP
9.425	1934	All India Radio	IND	Eng	22222	FM
9.440	1950	China Radio Int	CHN	Eng	43333	VP
9.445	1900	All India Radio	IND	Eng	42343	VP
9.500	1953	Radio Australia	AUS	Eng	34233	PP
9.645	1957	Vatican Radio	CVA	Eng	44444	PP
9.730	1922	Voice of Vietnam	VIN	Eng	22222	EM
9.775	1925	Voice of Armenia	ARM	Eng	55454	FM
9.845	1947	RAI Int	I	Eng	44444	FM
9.880	1940	Voice of Russia	RUS	Eng	55545	VP
9.885	1942	Radio Netherlands	HOL	Eng	43433	TA
9.950	1900	All India Radio	IND	Eng	45534	VP
9.950	1925	All India Radio	IND	Eng	24222	EM
9.975	1926	Voice of Korea	KRE	Eng	24222	EM
11.535	1931	Voice of Korea	KRE	Eng	45343	EM
11.590	1915	Kol Israel	ISR	Eng	55545	VP
11.620	1900	All India Radio	IND	Eng	32332	VP
11.655	1930	Radio Netherlands	HOL	Eng	53343	EM
11.680	1954	V of Islamic Rep of Iran	IRN	Eng	33333	FH
11.715	1940	Voice of Africa	LBV/F	Eng	45444	TA
11.860	1933	V of Islamic Rep of Iran	IRN	Eng	44344	GeG
11.940	1900	China Radio Int	CHN	Eng	34434	GG
11.975	1945	Voice of America	USA	Eng	44454	RH
11.995	1945	Radio France Int	F	Fre	43444	RH
12.040	1940	Voice of Russia	RUS	Fre	55555	PH
12.050	1940	Radio Cairo	EGY	Ara	53555	RH
12.070	1900	Voice of Russia	RUS	Eng	54445	BC
12.080	1915	Voice of America	USA/BOT	Fre	33343	RH
12.085	1915	Radio Damascus	SYR	Fre	44444	FM
12.180	1905	WWCR	USA	Eng	44454	RH
13.605	1924	All India Radio	IND	Eng	34233	EM
13.610	1927	Radio Damascus	SYR	Fre	43344	FM
13.780	1923	Deutsche Welle	D	Eng	44444	TA
13.820	1919	Radio Santic	D	Eng	45243	FM
15.205	1943	Voice of Africa	LBV/F	Eng	45433	TA
15.485	1925	Radio Kuwait	KWT	Ara	55545	VP
15.505	1925	Radio Kuwait	KWT	Ara	55534	VP
15.520	1922	Deutsche Welle	D	Eng	44433	TA
15.615	1905	Kol Israel	ISR	Eng	45433	TA
15.640	1915	Kol Israel	ISR	Eng	45534	VP
17.810	1944	Radio Netherlands	HOL	Eng	35433	TA
21.700	1952	Radio Exterior de Espana	E	Spa	35433	SH
2000-2100						
5.775	2021	IFRS	I	Eng	55444	MC
5.850	2000	Radio Canada Int	CAN	Eng	44444	GG
5.885	2015	Vatican Radio	CVA	Eng	55545	MC
5.930	2008	Radio Prague	CZE	Eng	55544	TA
6.050	2029	RAI Int	I	Eng	42342	EM
6.180	2018	Radio Japan	J	Eng	34333	TW
7.170	2057	Voice of Turkey	TUR	Eng	35333	SH
7.175	2016	Adventist World Radio	G/AFS	Eng	44343	FM
7.205	2020	V of Islamic Rep of Iran	IRN	Eng	54544	VP
7.250	2015	Vatican Radio	CVA	Eng	55555	MC
7.360	2045	WYFR	USA	Eng	55534	VP
7.475	2000	Voice of Greece	GRC	Gre	55534	VP
9.410	2055	BBC World Service	G/CYP	Eng	35433	SH
9.570	2000	Radio Exterior de Espana	E	Eng	44444	GeG
9.600	2004	China Radio Int	CHN	Eng	55544	TA
9.630	2030	BBC World Service	G/MRC	Eng	34423	VP
9.645	2032	Radio Romania Int	ROU	Eng	44444	TA

MHz	UTC	Service	Country	Lang	SINPO	SWL
9.680	2030	Radio Thailand	THA	Eng	55534	VP
9.800	2050	China Radio Int	CHN	Eng	44434	VP
9.890	2030	Voice of Russia	RUS	Eng	45444	GeG
9.925	2017	V of Islamic Rep of Iran	IRN	Eng	55444	TA
11.600	2003	Radio Prague	CZE	Eng	45444	GeG
11.635	2030	Voice of Africa	LBV/F	Eng	44444	FM
11.665	2022	Radio Netherlands	HOL	Eng	45434	GeG
11.765	2001	Radio Canada Int	CAN	Eng	45554	TA
11.790	2005	China Radio Int	CHN	Eng	55555	RH
11.820	2030	Saudi Radio	ARS	Ara	55555	RH
11.855	2030	BBC World Service	G/ASC	Fre	53444	RH
11.860	2014	V of Islamic Rep of Iran	IRN	Eng	55544	TA
11.875	2029	RAI Int	I	Eng	44243	EM
11.905	2042	Radio Tashkent Int	UZB	Eng	45333	TA
12.070	2008	Voice of Russia	RUS	Eng	33333	TW
12.085	2017	Radio Damascus	SYR	Eng	25332	EM
12.160	2030	WWCR	USA	Eng	44333	TA
13.635	2034	Voice of America	USA	Eng	44333	TW
13.670	2042	Voice of America	USA	Eng	44333	TW
13.780	2049	Deutsche Welle	D	Eng	44444	TW
15.150	2012	Voice of Indonesia	INS	Eng	25233	FM
15.195	2006	WYFR	USA	Eng	55354	EM
15.195	2058	Family Radio	USA	Eng	37222	TW
15.290	2034	Radio Exterior de Espana	E	Eng	35322	SH
15.325	2002	Radio Canada Int	CAN	Eng	55544	TA
15.375	2032	Radio Cairo	EGY	Eng	35222	FM
15.400	2050	BBC World Service	G/ASC	Eng	35433	SH
15.410	2000	Voice of America	USA/PHI	Eng	45444	HR
15.455	2040	Voice of Russia	RUS	Eng	33333	TW
15.720	2055	Radio New Zealand Int	NZL	Eng	33333	FM
15.785	2058	WHRI	USA	Eng	45433	TA
17.810	2009	Radio Netherlands	HOL	Eng	55243	EM
17.830	2055	BBC World Service	G/ASC	Eng	25222	SH
2100-2200						
5.775	2145	IFRS	I	Eng	45243	EM
5.800	2102	Radio Bulgaria	BUL	Eng	45434	SH
5.960	2105	China Radio Int	CHN/ALB	Eng	54534	SH
6.035	2137	Radio Japan	J	Eng	23141	TA
6.055	2134	Radio Japan	J	Eng	54444	TA
6.065	2132	Radio Sweden Int	S	Eng	45544	SH
6.100	2121	Int'l Radio of Serb & Mont	SCG/BH	Eng	45433	FM
6.180	2135	Radio Japan	J	Eng	43432	TA
7.120	2145	Radio Tirane	ALB	Eng	41431	TA
7.165	2141	Radio Romania Int	ROU	Eng	25232	EM
7.170	2114	Voice of Turkey	TUR	Eng	44444	FM
7.285	2118	China Radio Int	CHN	Eng	34444	TW
7.330	2157	Voice of Biafra	USA/AFS	Eng	44444	FM
7.420	2135	Radio Sweden Int	S/MIDG	Eng	25322	SH
7.420	2140	Radio Ukraine Int	UKR	Eng	44433	TA
7.500	2119	Radio Bulgaria	BUL	Eng	35232	EM
9.440	2118	Deutsche Welle	D	Eng	44444	PH
9.445	2159	All India Radio	IND	Eng	54444	TA
9.455	2158	Deutsche Welle	D	Eng	54444	TA
9.525	2118	Radio Budapest	HNG	Eng	44344	EM
9.535	2131	Radio Romania Int	ROU	Eng	44333	TA
9.545	2145	Radio Tashkent Int	UZB	Eng	41341	TA
9.600	2102	China Radio Int	CHN	Eng	44444	FH

MHz	UTC	Service	Country	Lang	SINPO	SWL
9.715	2109	Adventist World Radio	G/AUT	Eng	44433	TA
9.800	2135	China Radio Int	CHN	Eng	55354	EM
9.840	2121	Radio Exterior de Espana	E	Eng	34232	EM
9.855	2155	China Radio Int	CHN	Eng	44444	FH
9.990	2128	Radio Cairo	EGY	Eng	55544	TA
11.600	2136	Radio Prague	CZE	Eng	44444	FM
11.620	2115	All India Radio	IND	Eng	33344	RH
11.630	2110	China Radio Int	CHN	Chi	43444	PH
11.685	2130	Radio Australia	AUS	Eng	44344	FM
11.715	2105	All India Radio	IND	Eng	54444	FM
11.760	2107	Radio Havana Cuba	CUB	Eng	34233	PH
11.795	2126	China Radio Int	CHN	Eng	55555	EM
11.855	2136	Radio Japan	J	Eng	44444	TA
11.865	2105	Deutsche Welle	D	Eng	45434	GeG
11.905	2143	Radio Tashkent Int	UZB	Eng	25233	EM
11.940	2131	Radio Romania Int	ROU	Eng	33333	PH
13.760	2110	Voice of Korea	KRE	Eng	44444	FM
15.205	2124	Deutsche Welle	D	Eng	45233	EM
15.245	2144	Voice of Korea	KRE	Eng	44444	FM
15.380	2100	BBC World Service	G	Eng	33333	FM
15.475	2145	Voz Cristiana	CHL	Spa	45334	GeG
15.515	2145	Radio Australia	AUS	Eng	43434	FM
15.880	2126	YLE Radio Finland	FIN	Fin	11111	TW
17.680	2150	Voz Cristiana	CHL	Spa	44444	FM

MHz	UTC	Service	Country	Lang	SINPO	SWL
2200-0000						
5.840	2300	Radio Canada Int	CAN/S	Chi	55445	BC
5.955	2315	Deutsche Welle	D	Eng	44444	FM
7.175	2251	China Radio Int	CHN	Eng	33333	PH
7.265	2356	Radio Romania Int	ROU	Eng	44444	FH
7.410	2201	All India Radio	IND	Eng	55444	TA
9.320	2302	WINB	USA	Eng	33222	FM
9.390	2255	Radio Canada Int	CAN/S	Fre	44334	BC
9.440	2356	Radio Prague	CZE	Eng	42332	TA
9.445	2223	All India Radio	IND	Eng	44444	FH
9.700	2329	Radio Bulgaria	BUL	Eng	45443	TA
9.737	2240	Radio Nacional de Paraguay	PRG	Eng	55444	TA
9.830	2211	Voice of Turkey	TUR	Eng	55555	FM
9.910	2202	All India Radio	IND	Eng	54343	TA
9.925	2215	Croatian Radio	HRV	Eng	55555	FM
9.950	2202	All India Radio	IND	Eng	55555	TA
11.620	2203	All India Radio	IND	Eng	34332	TA
11.700	2328	Radio Bulgaria	BUL	Eng	45433	TA
11.715	2204	All India Radio	IND	Eng	44443	TA
11.940	2352	Radio Romania Int	ROU	Eng	44444	FH
12.140	2333	Voice of America	USA	Eng		

Satellite

TV News

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I wrote this column during the week of 11 July, the weeks prior to then had been very eventful. A combination of tragedy, triumph and perhaps of hope. Whilst typing, a news feed cut transmission. 'LINX UKI-832 SREBENICA' was uplinking out of Eastern Bosnia over *Atlantic Bird-1 (AB-1)* into the BBC London - 11.104GHz-Vertical, (SR 4226 + FEC 5/6), a report from a cemetery containing the human remains of a 1995 massacre. The search for the generals who ordered the massacre continues, in an attempt to bring them to trial in the Hague for war crimes.

AB-1 also had 'SETANTA SPORT' appearing as a caption within the Globecast bouquet - channel 4, 11.104GHz-Horizontal (20145+3/4). Channel 4 often carries sports such as golf into Europe. More circuits however, are encrypting or opting for 100% fibre optic carriage. June 26th and the wrestling epic 'WWE VENGEANCE PPV FIBER PATH 6/26' was carried over *AB-1* as a part fibre/part satellite circuit. Fibre offers secure carriage without the possibility of signal piracy, or being seen by satellite enthusiasts! If a fibre circuit isn't available, then the signal will hit the satellite airwaves. The Island Games were due to be running in the Shetlands, unlikely that a broadcast standard fibre feed was available in the countryside around Lerwick and its likely that one or more satellite uplinks were used, though I didn't find any!

George Bush arrived in Scotland 5 July for the G8 Summit, the conference opened on the 6th and news provider APTN were running 'APTN G8 PATH 1' - and '...PATH 2' - and '...PATH 3' over *Eutelsat W1*, 10°E at 11.099, 11.105 and 11.111GHz-V (4167+5/6) using the BT sat truck 'BT_TES_34'. These feed frequencies carried various live and recorded reports in of the days happenings. On that same day of course was announced that the UK would host the 2012 Olympic Games and jubilation was rife, this even fired up Japanese enthusiasm sufficient for them to send their reporter to Trafalgar Square and report on scenes of celebration, carried back to Tokyo via *Eutelsat W1*, 10.967GHz-V (4167+5/6) using the 'SNG' truck on 'BT_TES27 - UKI-34'. That celebration was to be very short lived!

Friday 8 July will not be forgotten. At 0850 bombs exploded on three commuter packed London underground trains! Later a fourth bomb exploded aboard a double deck bus. The death toll in the tubes was high, the bus had several remarkable escapes but the high visibility of the wreckage clearly displayed what 4.5kg of high explosive can do, the tube trains were hidden from sight and only the survivors emerging told initially of the carnage beneath the streets of London. By the afternoon the media were arriving in force along with the sat trucks, at 1715 some 13 satellite downlinks were running live across the 10.960-11.150GHz - *W1*, 10°E with only three of non-bomb content. Up on *Eutelsat W2*, 16°E 'NEON BROADCAST UKI-304' were up with bomb content and the 'CBS NEWS TRUCK Path 1' - '522130' - were running NTSC live reports in heavy rain at 12.540GHz-H (5632+3/4). The CBS report was delayed however when torrential rain fell, the link suffered severe rain attenuation and lost all carrier level, returning perhaps five minutes later with on the spot updates from three different reporters in succession. Even *Intelsat 903* @ 34.5°W was pressed into action carrying MPEG 4:2:2 news updates from London - 'RTE LDN HBR' - 11.137GHz-V, 5632+3/4. On 9 July 'SKY NEWS MALVERN' via 'SIS 8 UKI 716' late Sunday was present at Kings Cross with coverage of memorial flowers, the latest news from the station, inserted live into the 1800 news - 12.525GHz-H (5632+3/4). By 12 July security forces had moved to Leeds where the

bombers seem to have been based and Luton to a car used by the group had been parked. 'GLOBECAST NEW TV' were feeding live from the car park into BBC News and BBC 24 over *AB-1* (11.100GHz-V, 4226+5/6), curiously Sky News were also feeding live content simultaneously next to the BBC reporter. It's ironic that London and the UK marked the official end of WWII on 9 July. It also marked the firm resolve of English people never to give in to terror and oppression.

Despite the sadness and violence there was hope coming in the shape of *LIVE8* - at least for folks in Africa. A massive global awareness concert was held in Hyde park London on 2 July. there were live concerts around the globe totalling [LIVE] 8. Alan Richards caught two *LIVE8* feeds over *Intelsat 905*, 24.5°W - both encrypted 'LONDON HYDE PK' 11.646GHz-V (8681+7/8). In Jo'burg, South Africa an equivalent large concert was transmitted into other African TV networks via Globecast capacity on *Europe*Star-45°E* - the main feeder at 11.598GHz-V (5632+3/4) with complimentary picture content at 11.589GHz-V - 'GCA2'. Meanwhile, on a rugby field somewhere in S. Africa the 'ASBA CURRIE CUP' was being fought between the 'Eagles' and 'Sharks' from 1400, 11.526GHz-V, once victory was achieved and the next leg in the *Currie Cup* was reached, the feed went down to be replaced with a 3rd feeder from the 'LIVE8' Jo'burg spectacular at 11.525GHz-V - all *LIVE8* content ran SR5632 + FEC3/4. Nelson Mandela made an appearance to give his support. He's no stranger to the 'pop scene', having been high profile with the Jo'burg AIDS concert on 19 March - named '46664', Nelson Mandela's prisoner number.

The Russians have a powerful satellite at 40°E - the *EXPRESS AM-1*. Space enthusiasts might be worthy of checking this satellite slot for the occasional outside broadcast from Baikonur or other rocket launch sites in the Russian states. Two frequencies were used on 24 June to transmit live content from the launch pad - 11.168 and 11.186GHz-V (4000+3/4). The sat truck identifications were also interesting which were respectively *EXPRESS AM 3* and an impressive 'VISCOMSAT RUS-0010'.

I received a very wobbly left-hand written letter from Alan Richards near Skegness. He's laid up in bed with a very damaged right hand but has sufficient strength to operate the remote control on his satellite receiver. Alan found one of the very few British F1 Grand Prix satellite feeds last weekend from Silverstone over the Spanish *HISPASAT 30°W* satellite - via 'TRADIA' 11.471GHz-H (5632+3/4). I spent some time checking the air waves for F1 Silverstone without success, I did find the Hungarian F1 action - 'TES 35 BUDAPEST' - *Eutelsat W1*, 11.144GHz-V (5632+3/4) with both race action and presentation of silver cups.

Much of the UK fleet were at sea during *Trafalgar 200* and Roy Carman (Surrey) found *Intelsat 10-01*, 1°W as a major carrier of OB content both on preparation day and the actual fleet review itself on 11.517GHz-V and 'CBS NEWS' were also present with '536172' over on 16°E - 12.562GHz-H (both 5632+3/4). Curiously, earlier in the month, Roy notes that the Italian Fleet also put to sea for their own fleet review and 'Sail Pass' to impress the assembled political dignitaries including the Italian president, military top brass and their guests. The extensive OB coverage was carried over *Atlantic Bird-2*, 8°W - 12.578GHz-H (3056+3/4), linked via 'SatNet 42067'. The occasion marks the 87th naval anniversary of their sinking of the *Santo Stefano*, an Austrian battleship.



The Italian Fleet Review - Atlantic Bird-2.



Russian Rocket launch from Baikonur - AM-1.



The British celebrate Trafalgar 200 from the Solent - Intelsat 10-02.



NASA zaps a deep space comet with their exploratory probe Eutelsat



Live pictures ex-USA, SWAT teams capture the crook (W1).



BBC feed from Beirut covering local elections (AB-1).



Helicopter sinks in New York's East River, survivors are rescued (W1).



NASA test transmission (AB-1).

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Anyone who listens to the lower end of the r.f. spectrum will be all too familiar with the sound of static crashes. If you need to know what they sound like get up early and listen to the American amateurs on 3.5MHz at about 0400 in the autumn.

All through the band you'll hear them. Bursts of what sounds like white noise. Usually caused by lightning strikes, the best way to describe them would be as high amplitude but small duration pulses. Bearing in mind that the crashes that will be audible in the UK are often likely to be about a 1600km away you'll get the idea of just how many lightning strikes are pounding the earth at any one time.

If you have Internet access please consider looking at www.net-weather.co.uk This weather site has a page that shows lightning strikes throughout the UK and is updated every minute. It's linked from the main site and is very well worth a look.

If the crashes get too noisy I recommend unplugging the antenna and forgetting radio for a while. A direct strike will do much more than damage the radio but a nearby hit will probably cause damage to the receiver. Thunder storms are often accompanied by statically charged rain and this phenomenon can induce extremely high voltages in the antenna of any receiver be it v.h.f. or h.f.

About 15 years ago I became aware of the possibility of thunder storms in the area so I unplugged the v.h.f. and h.f. antennas. There was no lightning or thunder but it started to absolutely howl with rain. The room had no natural light and my desk had a table lamp for illumination. I could hear a ticking sound. It came from the region of the unplugged antenna feed.

A spark was jumping from the core of the N-type plug to the outer. This was static discharge from the antenna. If the receiver had still been plugged in there's no doubt that I would have sustained damage to the set.

Sorry to be a bearer of gloom and doom but when thunder is possible it is also a good idea to unplug any modems or satellite TV digital boxes that have modems therein as a

nearby strike will definitely kill them. It happened to me.

Incidentally, I built a small antenna mast on the exact point where the strike hit the ground. Working on the basis that it never strikes twice in the same place it should survive. (*But what about evidence to the contrary?* Ed).

Kinloss Rescue

A regular correspondent, Mr Burrill, writes with a query regarding my article on Kinloss Rescue published in June SWM. In the piece I mention that VT Merlin are operating a receiver site at Forest Moor at Nidderdale, near Harrogate, Yorkshire.

Mr Burrill wonders if this was the former Royal Navy 'Concrete Battleship' of the same name. He understood that the site was to be returned to civilian use as a psychiatric hospital. I know that this was one of the proposals for the site but I don't believe that this occurred.

HMS *Forest Moor* was formally decommissioned by the Royal Navy at a ceremony held on 30 October 2002. The station had first been used as an Intelligence Unit or 'Y' Station in the Second World War and was the Navy's first major h.f. receiving station. Rear Admiral Nick Harris presided over the ceremony. I attended a function with him shortly after the closure. I wish I'd known about *Forest Moor* then. I could have asked him something about the station.

Since closure by the Navy, the site has been operated by VT Merlin as part of a 15 year £220 million Public Private Partnership Programme to provide communications facilities for the MOD. In 2003 VT Merlin took over the contract for the UK Defence High Frequency Communications Service.

Six sites are used in the UK. They are at Forest Moor, Crimond, Inskip, Kinloss, Penhale Sands and St. Eval. There are also four overseas sites at Cyprus, Gibraltar, Ascension Island and the Falkland Islands. The h.f. operations are due to cease at ten other sites as a result of the contract. I hope that this answers Mr Burrill's query.



London Bombings

With regard to the recent London bombings it seems as though the murderers were all 'home grown' so to speak. As I write this a few days after the attacks it appears that at least one of the bombers had visited Afghanistan, presumably on some sort of terror murder course.

The Islamic terror networks have been using h.f. radios for some time now as I have previously mentioned in this column. They have used the PSK31 mode in particular. I am informed that another technique used is to hold the PSK, or other data contacts, on a frequency immediately adjacent to a strong broadcast station. The stronger signal masks their transmission to a certain extent but the data signal still gets through. Details of allied troop movements in Afghanistan have been passed to Taliban/Al-Qaeda groups in this way.

It seems likely that those terrorists who have attended these type of courses will have been given some instruction in communication techniques, perhaps involving radio communication. They may return to our country and 'play' with radio here or they may acquire equipment in order to monitor the broadcasts or communications of their 'brothers'. They are only too aware of the far reaching tentacles of the intelligence services with regard to communications monitoring and although much of the communications has been via E-mail, this is becoming an increasingly hazardous means of keeping in touch as the western powers 'Echelon' monitoring dictionaries are constantly being updated. The h.f. radio may well be the way that they choose to keep in touch especially if mobile 'phone networks are disabled by their operators.

Utility monitors have access to equipment and knowledge that few others possess. It is our duty to listen out for suspicious communications and report them to the police. These days the authorities are very aware of technically competent members of the public who possess skills that they themselves may not have immediately available.

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Amateur

Bands

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Thank you to everyone who responded to my enquiry about the reasons why so few M3 licence holders move on to Intermediate or Full licences. One thing that's clear from the replies is that there isn't one overall reason.

But if there could be a statistically average answer it would be that the M3 licence provides enough scope for the majority of its holders to enjoy the hobby and the incentives to move to the Intermediate or Full licence aren't that great. In many cases those are outweighed by the practicalities of obtaining those licences. As one respondent wrote - "You don't find many courses for the Intermediate exam on offer".

Almost all commented on the impossibility of enforcing the 10W limit, some suggesting that it wasn't a rule that too many complied with. Others, however, thoroughly enjoyed the challenge of working the world on such relatively low power.

From the replies, and talking to clubs that run courses, it does seem to me that those who want to obtain Full licences make that decision before starting out and the Foundation and Intermediate licences are just steps along that path. Those who use the Foundation licence as a means to dip their 'toe into the water' of amateur radio, and that's probably around 80% or more, tend to stay at that level.

Is this a problem? Not really, but it's a shame that so many M3s can't be tempted beyond the bread and butter aspects of amateur radio and into the more interesting and experimental areas. Those that have moved up the licence ladder all agree that it's well worth the little extra effort required.

The Way Forward? - 430.000MHz Repeaters

One of the results of the MOD wishing to make more use of the 430-440MHz amateur

band (of which it is the primary user) is that no new amateur repeaters are being allowed onto the band. So strictly is this being applied that a repeater that was shut down briefly for routine maintenance a few months ago was refused permission to be switched back into operation.

The authority to set up an amateur repeater is given by means of a *Notice of Variation (NoV)* to an amateur licence. Since the 'no new u.h.f. repeaters' rule came into force, NoVs are only issued on condition they are not used for systems, which simultaneously re-broadcast voice traffic i.e. repeaters.

The conventional repeater set up is a receiver on one frequency that passes its received voice audio directly to a transmitter, which simultaneously re-broadcasts the received audio on another frequency. The transmitter and receiver are co-sited and often share one antenna in an r.f. advantageous location.

The repeater is a self contained unit with no connection to other systems, other than the mains electricity for power. The key word in all of this, which defines a repeater as a repeater, is simultaneously. And it's that strict definition, which allowed that switched off repeater referred to before to get back on the air, except that it's not a repeater any more. Confused?

When Is A Repeater Not A Repeater?

Those of you familiar with *Echolink* or *eQSO* Voice over Internet Protocol (VoIP) systems will be aware of radio/Internet gateways. However, for those who don't know, have a look at **Fig. 1**, which shows two such gateways. The little blue boxes are interfaces that sit between radio and computer and switch it from receive to transmit as required.

Whilst **Fig.1** only shows one link, it's quite possible to have several gateways conferenced together. Bandwidth and its impact on data

transfer rate, affects the number of gateways that can effectively function in a VoIP conference at a time, but that doesn't concern us. What does is the inherent delay that comes with the conversion from analogue, to digital and back to analogue that using VoIP involves. Because of that, voice signals received by a gateway cannot be simultaneously transmitted by any other gateway.

So how would the set up of a transmit only gateway set up on, say, 430.025MHz, linked exclusively to a nearby receive only gateway set up on, say, 431.625MHz be described? Whilst in practice it would function in a manner that would seem to the casual observer to be a repeater, that small, but very significant delay in the transfer of the voice audio from transmitter to receiver means the re-broadcast can't be simultaneous. No simultaneous re-broadcasting of voice traffic, ergo, not a repeater. No contravention of the *NoV*.

So is this the end of the repeater network? Possibly. But only as we know it now and because a better option will be available.

Subject to the economics of bandwidth and IP addresses, it's likely that all repeaters may well end up changing to Internet gateway systems. It would certainly add to the flexibility of the repeater system.

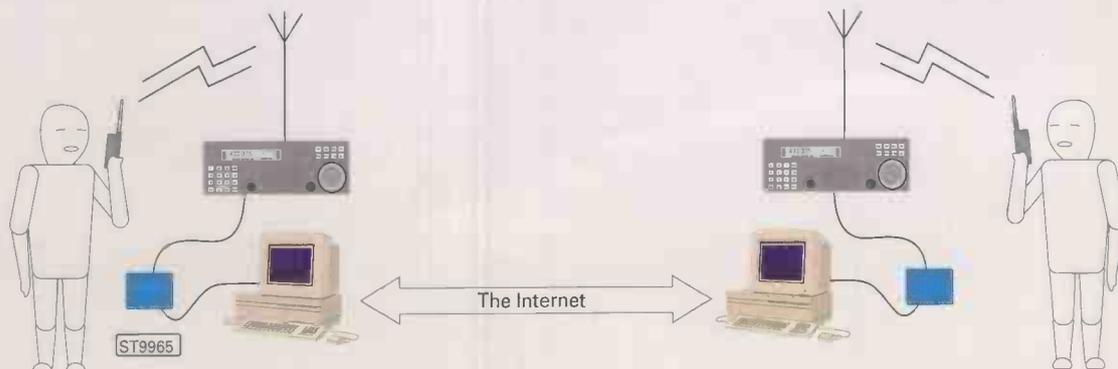
Island Hopping

Making a return from his visit in 2003, **Ric DL2VFR**, will be operating from various Danish islands using his own call prefixed **OZ/** from the 28 August to the 1 September. There are numerous islands for Ric to choose from in that particular group, which includes the major ones of Fyn and Zealand, on the latter of which Copenhagen is situated. Identifying which ones he will be visiting is a non starter.

After that, from the 3-12 September, Ric will move a little further north to Orust, the largest island off the west coast of Sweden. There are bridges linking all the above islands to the mainland and between the countries, so sea legs will not be required!

The 1-7 September is when **Bruce KD6WW** and **Mike K9AJ** plan to operate from islands in the west (Kitikmeot) region of Canada's Nunavut province, home to the magnetic North Pole and the Inuit people. Exact dates and locations of operations will be decided by the weather and solar conditions. Look out for **VY0/own** call.

Fig. 1.



Off^{the} Record

- Oscar c/o SWM Editorial offices
- E-mail off.the.record@pwwpublishing.ltd.uk

In London, the f.m. band continues to be crowded with numerous pirate stations among the licensed ones. There is always going to be bitterness between those who have gone through the process and cost of obtaining a licence and those who (for whatever reasons) choose to operate without doing so.

These days some of the licensed stations complain on air about interference from pirates. Recently, I listened to a 10 minute rant about it by one **James O'Brien** on his mid-morning show on London talk station LBC.

You can sort of understand the resentment I suppose and it was interesting to hear some of the points he made, including the implication that one reason the authorities were sometimes slow to remove these stations is that they are run by gangs of rather nasty organised criminals who are into things like illegal arms and drugs. Pictures were painted of scenes like a caretaker being dangled over the sides of a tower-block roof by his ankles!

I don't know if the allegation is true or not, but if it is true then you could argue by thinking laterally that this is a good thing. Think about it, gangs of serious crime lords who normally dwell deep in the underworld, unseen and unreachable as they wreak havoc on our society.

Suddenly they decide to operate a radio station, which makes them easily traceable from their transmissions or from the events they promote. Sounds like very good news to me. Now the appropriate law enforcement agencies can easily apprehend them, charge them with these crimes and lock them behind bars for a very long time. That way we would no longer need to be concerned about them engaging in unlicensed broadcasting would we? Unless of course we are being lied to, which I have a feeling has happened before.

No Radio Caroline

Another interesting statement that Mr O'Brien made was that we are not now dealing with cuddly, friendly stations like Radio Caroline was in its day. The weird thing is that I remember in the days of the offshore pirates like Radio Caroline (and all the others) we were being told by the authorities that the existence of these stations would lead to untold horrors. Ships (other ones) would sink, aeroplanes would fall out of the sky and the earth would crumble to dust beneath our feet and swallow us all up.

That is the impression we were being given in order to justify hostile action against

free radio stations wanting to do something positive and constructive. In the event that today's pirates are as evil as they would have us believe the authorities would have to forgive us for thinking that they have cried wolf and lost their credibility.

Enforcement Changes

There have been reports going around about Ofcom making some changes to their investigation and enforcement systems including privatisation, re-structuring and the introduction of new detection technology. Of course what would really help would be fundamental changes to the regulatory structure and probably to the list of people carrying out the regulation.

The licensing process has not gone well so far ever since the first ILR licence in my opinion. Many pirates are there because they are bitter about being denied the opportunity to do their thing through legal channels, or because they believe the regulation should not be such that it blocks good creative ideas.

Detecting pirates is not difficult, a radio receiver will do that, and as far as I know the raiding teams have no difficulty pinpointing the location of stations with existing direction-finding equipment. After apprehending serious criminals for their crimes, the next priority should be to address any sources of genuine interference and technical problems.

Even though licensed stations may be perceived by pirates as being 'from the other side' and you can argue that the authorities sometimes seem to put these stations there as a weapon against pirates, I have always maintained that is essential for any free radio station to avoid causing interference. Those that do splatter over the likes of LBC should surely receive priority attention over the ones that operate responsibly.

I can't say if it is true, but there is a perception among some pirates that the raiders prefer to go for softer targets for an easier life and just to make up numbers. If that is true then it's cowardly and is not getting the job done.

In 2005 it seems to me we ought to have reached a stage where the authorities' paranoia about radio should be dwindling, especially with other forms of mass communication becoming commonplace. If changes are happening, let's hope they are the beginnings of a move towards regulation based on **behaviour** rather than denying a station the right to exist at all. We are told we live in a country that values freedom, unless of course that was another lie.

500 Euro Reward

Interference problems can sometimes be pirate-on-pirate. Even thinking back many years to a time when pirate broadcasters were considered to be friendly souls I can recall cases of stations moving uncomfortably close to each other frequency-wise and sometimes location-wise as well.

Short wave station Laser Hot Hits have been announcing that they are offering a reward of 500 Euros to anyone who can tell them exactly where Mystery Radio is broadcasting from. The stations have been causing problems for each other recently on 6.220MHz even though Laser is understood to have been broadcasting for many years from Ireland and Mystery, which has started much more recently, is believed to originate from somewhere in Italy.

It would appear the radio business can be more lucrative than I thought! In a further twist a new Laser transmission has appeared on 6.285MHz, which has annoyed WNKR since they often use that frequency. Incidentally, WNKR have reportedly carried out some DRM test transmissions recently on 48 metres.

A Few Reports

On medium wave the monthly broadcasts from Kristel AM 1179 appear to have been proving popular (especially with hippies!) and there have been occasional broadcasts from Enigma TKR on 846 and RFL on 819. On short wave the sunspot minimum, which we are told we are approaching, seems to be in evidence, with conditions often reported as being poor.

Radio Underground has been making fairly regular broadcasts with the station's excellent radio news and reports. Other stations such as Radio Pandora have been heard now and again.

There were reports too of Radio Grolschman making an appearance after a very long period of silence. Continental stations seem to be more active and numerous than British ones at present and it's interesting to see a few of them trying unusual frequencies.

A station called Pirate Music has been heard around 6.878MHz for example. With several stations using the 9.290 Latvian relay a couple of others have been trying their own transmitters on nearby frequencies. Alpenroos has been reported on 9.269 as far away as the USA and Orion Radio has tested on 9.265 as well as on 5.725MHz.

Radio Space Shuttle seems to be popping up on various different h.f. bands including recent reports on 15.810MHz. That's it for now, enjoy your listening and remember to contact me with any thoughts or information.

DX

Television

- Keith Hamer & Garry Smith 17 Collingham Gardens, Derby DE22 4FS
- E-mail dxtv@pwpublishing.ltd.uk
- Website www.test-cards.fsnet.co.uk

June proved to be quite eventful for Sporadic-E reception with a satisfying mix of signals from most European countries; Italy was visible most days according to the collective logs. Reception paths extended across the Atlantic and also to the Middle East during an intense opening on the 11th.

Reception Reports

Portugal has been identified twice on Channel E4 by **Peter Barber** (Coventry) on June 10 and 19th. This is either the 50W Valenca do Douro relay or Cume (Azores) on 180W. There are also reports of RTP-2 on E2 from Valenca do Douro.

On the 11th at 0820, **Paul Foley** (Newhaven) discovered Syria E2 airing a show from the USA with Arabic subtitles; audio was present. The highlight was at 1644 with video resolved on Channel R5 (93.25MHz) from BT Belarus. The channel is difficult to resolve due to FM pollution but Paul achieved it using his D-100 converter and careful tweaking of the fine-tuning. During high m.u.f.s the lower 'R' channels were ablaze with co-channel signals, with Belarus dominating all channels for much of the time according to the offsets.

Paul describes the opening as one of his most satisfying ever with R5 video resolved after a wait of twenty years! His receiving system helped - an impressive 20-element log-periodic antenna at 17m elevation feeding a D-100, an Icom R-8500 receiver and Thomson TF2503 multi-system TV.

Also logged were the following unidentified displays of Band I STL (studio transmitter links), with PI codes:-

56.8MHz, PI:5158

PS:RADIO/STUDIO_X/M_1584_/96.?????./550??

60.4MHz, PI:54FE RPZCENTR Paul was able to read the PI codes by using the D-100 to up-convert these frequencies to Band-2.

Earlier, at 1300, a transatlantic path between the Netherlands and the Caribbean had been established with Channel A2 video measured at 55.26MHz. Peter Barber also heard a Channel R5 vision carrier at around 1700 on the 11th, the second occurrence in just over a week.

Best Days

1 June: Signals identified between 0549 and 2000:-

Italy (RAI UNO) Channels A and B; Italy (TELE

A+ home shopping channel) E2; Italy (TVA) A; Spain (TVE-1) E2; Czech Republic (NOVA) R1 and R2; Slovenia (SLO-1) E3; Corsica (Canal Plus) L2 and L4; France (Canal Plus) L3; Portugal (RTP-1) E3; Ukraine (YT-1) R2 and R3; Belarus (BT) R1 and R4; Lithuania (L1) R2; Russia (ORT) R1 and R2; Ukraine (1+1) R2 and R4; Croatia

(HRT) E4; Finland (YLE-1) E3; Hungary (RTL KLUB) R2; Switzerland (TSR French-language network); Switzerland (SF-1 German-language network) E2 and E3; Sweden (SVT-1) E2, E3 and E4; Germany (ARD) E2; Hungary (MTV-1) R1; Denmark (DR-1) E3; Moldova (Moldova-1) R3; Norway (NRK-1) E3.

11 June: Signals identified between 0600 and 2355:- Spain (TVE-1) E2 and E3; Italy (TELE A+) E2; Italy (TVA) A; Italy (RAI UNO) A and B; Croatia (HRT-1) E4; Syria (ORTAS) E2; France (Canal Plus) L3; Hungary (RTL KLUB) R2; Slovenia (SLO-1) E3; Rumania (TVR-1) R3; Moldova (Moldova-1) R2 and R3; Belarus (BT) R1, R4 and R5; Ukraine (YT-2) R2; Hungary (MTV-1) R1; Austria (ORF-1) E2a; Slovakia (STV-1) R2; Germany (ARD) E2, E3 and E4; Switzerland (SF-1) E2; Ukraine (YT-1) R2; Latvia R4; Portugal (RTP-1) E2 and E3; Sweden (SVT-1) E3; Lithuania (L1) R2; Serbia (RTS) E3; Russia (RTR) R3; Denmark (DR-1) E3; Ukraine (1+1) R2.

Our thanks to **Stephen Michie**, Paul Foley, Peter Barber and **Peter Barclay** for submitting detailed reports.

Don't Give Up!

Many 'old hands' have voiced their disappointment about the current season. **Kevin Hughes** (Tamworth) E-mailed to say that he had finally encountered an opening on the 30th describing E2 pictures 'Clear as a bell - with sound'. **Tom Crane** (Hawkwell) reports a lull around mid-June but, to compensate, the highlight has been Jordan E3. So, if you are a newcomer to the hobby, don't give up just yet!

Well Prepared

Steve Reed (Nantwich) has erected a massive array (HS VF-7000) for Band I and f.m. DXing

(see Fig. 1). The other antenna in the picture is a Quadrifilar helix for weather satellite reception on 137MHz. Steve prefers identifying signals the traditional way, using on-screen methods, rather than using a scanner to measure offsets.

FM Reports

The band was awash with tropospheric signals from northern Spain on June 8, according to **Nick Gilly** (Whitchurch, Hampshire). The best stations were RNE 5 on 104.4MHz and RNE 3 on 94.4MHz (both Gamoniteiro), which attained RDS levels for much of the time. An unmodified Sony SA3ES receiver fed from a roof-mounted horizontal Triax FM5 antenna was used. Here is a rundown of stations identified between 0630 and 0800:-

MHz	Station
87.7	Cadena Dial (Santander)
88.9	Euskadi Irratia (Ganeta)
92.2	RNE Clasica (Gamoniteiro)
94.7	Euskadi Gaztea (Ganeta)
96.9	RNE 1 (Lierganes)
98.5	Kiss FM (Santander)
101.5	Onda Cero Radio (Bilbao)
101.7	RNE 1 (Paramo)
102.5	RNE 1 (Gamoniteiro)
104.8	Kiss FM (Aviles)
105.0	RNE 5 (Lierganes)
105.8	Kiss FM (Zaragoza)

South-west France was also heard during the session with Bayonne on 100.5MHz (France bleu Gascogne), 101.7 (Europe 1) and 103.9 (Sud Radio).

Stations in northern Germany were received 'loud and clear' on the 28th by **George Garden** (Edinburgh) during a tropospheric lift. The best frequencies were 91.1, 91.8 and 91.9 with classical music on 99.2 (opera music) 97.0, 102.0 and 103.3MHz. Other stations were heard on 92.4, 95.5, 96.3, 96.4, 98.5, 100.8, 101.5, 101.9, 104.4, 106.8, 107.1 and 107.3MHz.

Service Information

The Moroccan Laayoune E4 transmitter is still operational. The Tunisian (TV7) E4 outlet at Remada is also still in service. Stephen Michie advises that both Lithuania (L1) and Ukraine (YT-1) air an evening news programme called 'Panorama'. The Lithuanian programme is shown at around 1830 while Ukraine broadcasts theirs one hour later.

Peter Barclay (Sunderland) confirms that Ukraine (YT-1) transmits the G-204 electronic test card with a tone; it is preceded by a blank raster with tone.



● Fig. 1: Steve Reed's massive antenna for TV and f.m. reception.



● Fig. 2: A clear picture from Lithuania captured by Stephen Michie.



● Fig. 3: The BBC Tuning Signal, which was first transmitted on June 16 1956.

Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to: **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS**. We can also use off-air pictures stored as JPG files on PC disks and good-quality video recordings.

Finally this month, don't forget our new-look DXTV and Archive TV website at www.test-cards.fsnet.co.uk

Long Wave Maritime

● **Robert Connolly** 21 Eleaston Park, Co. Down, N. Ireland. BT34 4DA
 ● **E-mail** beacons@pwpublishing.ltd.uk

Beacons



● **British made Lokata 7 hand-held RDF receiver.**

This time around I will take a quick look at a hand-held RDF receiver. This is a British made Lokata 7 hand-held RDF receiver that I purchased in full working order from eBay for about £20. When new it was probably in the region of £120 to buy. These were commonplace on many yachts and other smaller craft in the days before GPS developed and could still be used today as a back-up system.

The unit is quite compact being around 178 x 152mm. The battery case on the bottom takes four AA batteries and beside it at the base of the handle is the headphone socket. The knob above the battery case is the tuning control and you can set the required frequency with this and it is displayed in the window above.

The tuning range is from 246.9 to 450.5kHz. So you will notice that it not only covers the marine beacons but also most of the aero beacon section of the band. This is due to the fact that yachtsmen often used aero beacons as fill-ins especially in areas where there were long distances between marine beacons. Also in that window is a small timer that runs up to six minutes. This was for using with beacon chains where you wished to receive beacons that were in a desired sequence order, for example beacon number one and four.

Located on the top is the prismatic compass that you read off the bearing that gives you the null. On the top of the inside of the handle is a combined power switch and null button. Pressing this button with your finger will power the unit up and then when it is pressed again will activate the nulling device.

Beside the side of the handle is the audio gain control and on the outside of the handle opposite the power button is a small l.e.d., which glows when you press the null button and goes out when the maximum null is reached. This l.e.d. also has a small sliding blue filter for use in the dark so that the operator's night vision is not affected.

Operation is Simplicity

Operation is simplicity itself. Keep the vessel on a steady course, switch the RDF receiver on, tune the desired beacon frequency, selected from nautical documents, and then after the beacon identification has been sent and the beacon tone comes on press the nulling button and rotate to the point of maximum null. The only thing the operator

has to be careful about is ensuring that they do not take a bearing to the beacon that is 180° out. The bearing is then drawn on the chart and at least another bearing taken from a different beacon using the same method and another line is drawn on the chart. Where the lines intersect on the chart shows your current position. While two bearings can be used three provides a slightly greater accuracy of your position. Obviously the system is not as accurate as GPS but it's close enough.

During some tests I carried out with the receiver using aero beacons to the south and east of my coastal location I estimate that there is about 5° of possible error in each bearing due to the frequency null width. Reception range is dependent on location, propagation and noise level at the receiving site but I had no problems using beacons at a 64km range across water from here.

Surprises

Now down to regular business. This last period was yet another one of surprises. At a time when propagation conditions should be getting poorer I managed to receive another four beacons for the first time. These were all from Arctic Russia and all on the same night in late May. They were NI, VG, TN, and KE.

In Redcar **Tony Moore** found conditions were still poor and when he recently took a receiver to Spain found that the QRM in the apartment wiped out beacon reception. **Giorgio Casu** from Sardinia logged the usual Black Sea beacons and just after he sent me his log he followed this up with another E-mail the next day advising that he was currently receiving KL Nos Kaliakra Bulgaria for the first time. My contacts across Europe

have not heard this one for a long time and it was not certain if it had been closed.

Giorgio's reception was verified by another listener located Denmark who monitored it until it appeared to be switched off! It looks like this one is not active all the time.

Roelf Bakker received the Ukrainian beacons from the 309.5 chain at his location in the Netherlands. Closer to home **Arnie Nessbitt** managed to receive KA Lithuania with his Yaesu FT-817 on several occasions during daylight.

Until next time, good DXing.

LW Maritime Beacon Chart

KHz	C/S	Location	Country	DXer
283.5	NA	La Entallada	Canaries	A* B* C*
284.5	MA	Cabo Machichaco	Spain	A D*
289.5	MY	Cabo Mayor	Spain	A
291.5	EI	Nos Emine Lt	Bulgaria	C*
291.5	KL	Nos Kaliakra	Bulgaria	C*
291.5	MN	Maslen	Bulgaria	C*
292.5	BA	Pt. Estaca Bares	Spain	A B C* D* E*
293.5	MH	Mahon	Balearic Isles	A*
294.0	FI	Cala Figuera	Majorca	A*
294.5	NI	Mys Nikodimskiy	Arctic Russia	A*
294.5	MU	Ostrov Mudyugskiy	Arctic Russia	A*
294.5	VG	Ostrov Zhizhinskiy	Arctic Russia	A*
296.5	FI	Cabo Finistare	Spain	A* B* C* D*
299.5	KN	Skrova Lt.	Norway	A* B* D*
300.0	GA	Malaga	Spain	A*
303.5	TN	Ostrov Baraniva	Arctic Russia	A*
303.5	KE	Ostrov Sverdrupa	Arctic Russia	A*
305.0	KA	Klaipede	Lithuania	A* D E*
305.7	DA	Dalatangi	Iceland	A* B* D* E*
309.5	Eya	Mys Yevpatoriyskiy	Ukraine	B* C*
309.5	TR	Mys Tarkhankutskiy	Ukraine	B* C*
309.5	SW	Mys Khersonneskiy	Ukraine	C*
312.5	BT	Mys Taran	Baltic Russia	A* D*
312.5	BK	Baltijsk	Latvia	A*
337.0	MY	Myggenes	Faeroes	A B D* E*
372.0	OZN	Prins Christian Sund	Greenland	A* B*
381.0	AB	Akraberg	Faeroes	A B D* E*
404.0	NL	Noslo	Faeroes	A B D* E*

Items marked * received during darkness.
 All others at dusk/dawn or during daylight.

- A) Robert Connolly, Kilkeel, N. Ireland.
- B) Roelof Bakker, Middelburg, Netherlands.
- C) Giorgio Casu, San Gavino Monreale, Sardinia.
- D) Arnie Nessbitt, near Whitby, England.
- E) Tony Moore, Redcar, England.

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Realistic PRO-2004 scanner, £50. Addonis 508 mic, £35. Silent key sale. Tel: D Crowson (01279) 815020 (Essex).

MFT-462B MULTIREADER, CW, RTTY, ASCII, AMTOR FEC, 12V DC, new unused, £180, sale £150 ono. Bargain. Tel: (01926) 854556 (Warwickshire).

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YAESU FRG-100 RECEIVER with FM. Hardly used, boxed as purchased, £265. Yaesu FT-747 TCVR with FM, 100 watts, with desk and hand mic, £245. Radio Shack PRO-2045 scanner,

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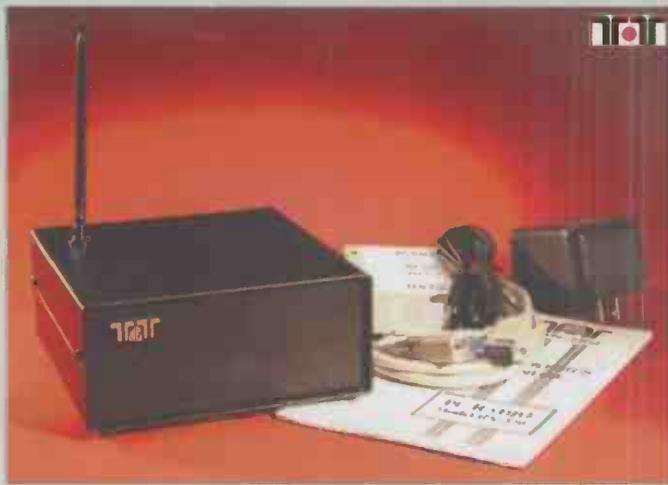
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