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SWM

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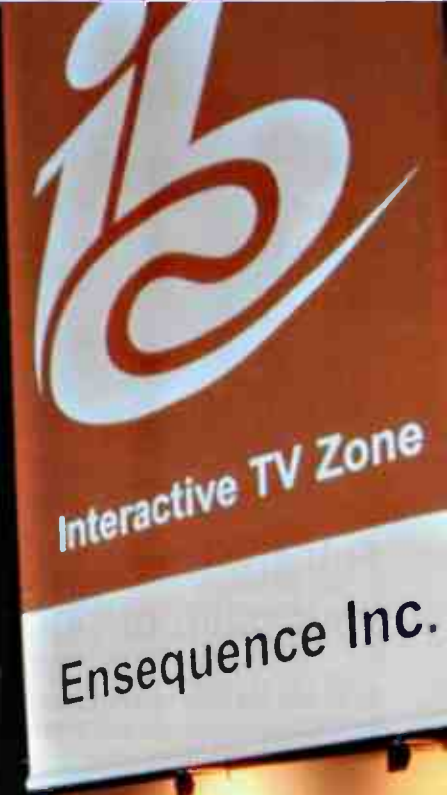
In The Ed's Shack
Building A TVC101
Video RX/TX Controller
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IBC 2005
report



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BROADSTONE
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Directors: Stephen Hunt & Roger Hall

Editorial Department

☎ 0870 224 7810
Fax: 0870 224 7850

Editor
Kevin Nice G3UNR, BRS95787
kevin.nice@pwpublishing.ltd.uk

Production Editor
Donna Vincent G7TZB, M3TZO
donna@pwpublishing.ltd.uk

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

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

Art Department
☎ 0870 224 7820
Fax: 0870 224 7850

Art Editor
Stephen Hunt
steve@pwpublishing.ltd.uk

Layouts
Bob Kemp
bob@pwpublishing.ltd.uk

Typesetting
Peter Eldrett
peter@pwpublishing.ltd.uk

Sales Department
Fax: 0870 224 7850

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

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

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

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

Finance Department
☎ 0870 224 7840
Fax: 0870 224 7850

Finance Manager
Alan Burgess
alan@pwpublishing.ltd.uk

Finance Assistant
Margaret Hasted
margaret@pwpublishing.ltd.uk

Website
www.pwpublishing.ltd.uk

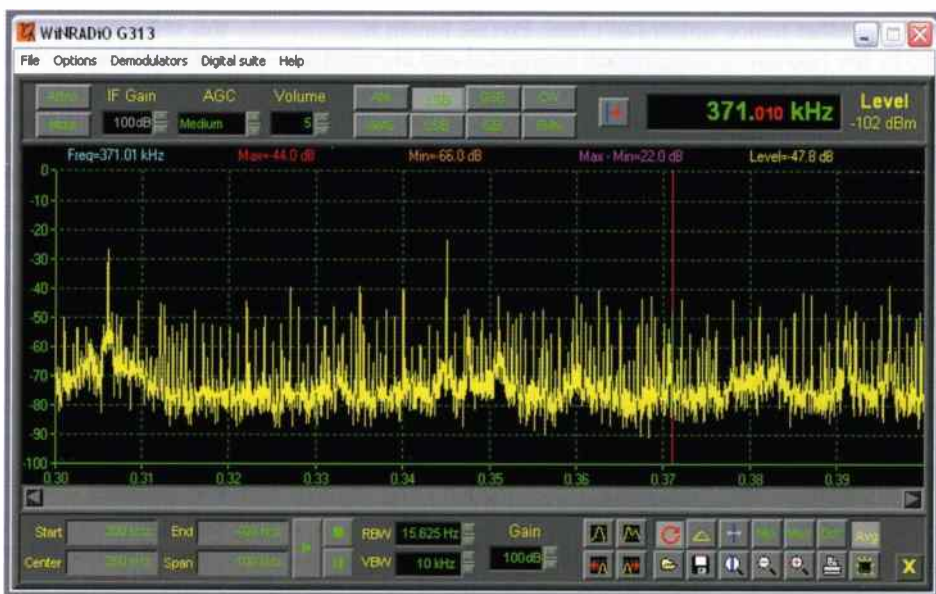
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● SDR the WiNRADiO way!



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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!

Share your thoughts

Coming Up Next Month

in January 2005 SWM

- Roberts RD1 DAB Receiver Reviewed
- The TVC101 Controller In Action - In The Ed's Shack
- DXTV SPECIAL with Keith Hamer & Garry Smith
- Beginners Series - Getting Started continues
- Very Special Readers' Offer
- Keep on top of the world of monitoring with SWM
- and much more...

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SWM Author Info

To provide you with a ready reference here are the contact details of all our regular authors.

Amateur Bands

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

Attention 123!

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

Bandscan

Bandscan America

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

Bandscan Australia

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

Bandscan Europe

Martin Peters,
11 Filbert Drive,
Reading RG31 5DZ.
E-mail: martin.peters@pwpublishing.ltd.uk

Decode

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

DXTV

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

Info In Orbit

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

LM&S

Martin Peters,
11 Filbert Drive,
Reading RG31 5DZ.
E-mail: ims@pwpublishing.ltd.uk

Maritime Beacons

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

Off The Record

Oscar,
c/o SWM Editorial Offices
E-mail: off.the.record@pwpublishing.ltd.uk

Propagation

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

Satellite TV News

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

Scanning

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

ShackWeb

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

Sky High

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

SSB Utilities

Ben Hogan,
c/o SWM Editorial Offices.
E-mail: ssbutils@pwpublishing.ltd.uk

SWM Services

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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

CD Offer

I'm truly staggered! We've had an overwhelming response to our software CD offer in last month's SWM. As we'd never run an offer like this in the past, it was difficult to estimate the level of response of an offer based purely on readers' convenience. The estimated response level has been doubled, so I'm pretty sure that it was a success and something that we're likely to repeat. I'm keen to hear any specific comments, good or bad, from those of you who have taken up the CD offer. I've already seen some on-line comments from critics who reside on the Internet SWM-R list. There are those who feel the offer was a "rip-off" and those who felt it was a superb idea in roughly equal numbers. Sadly, no one expressed any opinions in-between, but I guess that's to be expected.

Pirates

I was contacted recently by a somewhat aggrieved 5.5MHz pirate. This chap had decided to use the name of a member from an innovative band that began in the 1960s who had an incredibly successful album named after the far side of our non-man-made satellite.

It seems he was motivated to call me, so as to let me know that not all of these illegal users of spectrum, reserved for safety of live services are badly behaved - he seemed to think that's what Ben Hogan had implied in a recent 'SSB Utilities' mention. I appreciate the tip - thanks.

Whatever the state of their manners, language and indeed operating technique, there's one important point to be made here - their activity is illegal. For the record, *Short Wave Magazine* is in no-way sympathetic to this group of law breakers. The complainant was keen to tell me that many of these operators are licensed radio amateurs.

Now, I'm not going to comment on that but it occurs to me that there is no coincidence between the decline in the numbers of pirates operating in this portion of the h.f. spectrum and the uptake of M3 calls. As for the longevity of the misuse of the airwaves in the UK by these individuals. I'm led to understand that it could be much shorter than they would hope - you can't put r.f. into the ether and go undetected for long!

Floodgates Set to Open?

To r.f. obliteration by inappropriate methods of Internet distribution. It's just been announced in the USA, that the use of power lines like those that make up the national grid here in the UK are to be utilised for Internet access for end users. This move will no doubt reinforce the argument to do likewise here too. The use of this technique has huge potential for severe interference to the use of h.f. by broadcasters, utility services and radio amateurs.

It was in Washington recently that USA Federal regulators gave the go-ahead to technology that enables power lines to offer Internet access. They also adopted a rule that makes it easier for the Bell local 'phone

companies to replace their copper wires with optical fibre. **Michael Powell**, the chairman of the Federal Communications Commission, said the rules are aimed at speeding up the construction of high-speed networks.

His point was illustrated shortly after the FCC vote, when SBC Communications said it would "dramatically" speed up its plan to construct a Fibre-based network that reaches 18 million households.

Yet critics such as FCC Commissioner **Michael Copps**, argue the new rules will limit competition, keep prices unnecessarily high and confuse investors.

The power line decision was meant to address concerns about interference. The FCC set specific rules for power companies on how to avoid interference, especially with amateur radio operators.

The agency avoided the imposition of stricter rules regarding 911 emergency service, disability access and contributions to universal service, a fund that subsidises 'phone service in areas where it is expensive to deliver.

"By crafting a minimal regulatory framework", Powell said, the FCC is advancing a pro-competition agenda that will make high-speed Internet access a reality for almost every American. He noted that power lines go into nearly every home in the USA. Copps, who partly dissented with the decision, argued that the FCC's failure to address the stickier issues might actually hinder growth of power line technology. He said the threat of future regulation may make investors leery of getting involved.

"If we want investment in broadband over power line, we need certainty and predictability," he said. It seems to me that similar arguments will prevail on these shores too. With an essentially parallel set of circumstances this USA lead may be the catalyst for r.f. chaos. For more detail on the technology see 'PLT When Technologies Collide' in SWM April 2004.

Michael Copps also objected to a new rule that exempts optical fibre 'loops' in all residential neighbourhoods from an FCC requirement that guarantees open access to competing Internet service providers.

The local loop is the mass of wires that extend from the nearest central switching office of a local 'phone company to the homes and businesses it serves. The new exemption only applies to high-speed Internet service delivered by Fibre connections to homes. It expands on a prior rule that exempted new residential developments hooked up with Fibre.

Yet network operators still have to let rivals use copper wires and optical fibre to sell regular 'phone services to consumers. That rule stems from a major 1996 law whose aim was to foster competition in the local phone market. Another similar situation to the one here in 'blighty'!

We're watching just how the situation develops, with interest.

W4 73 de Kevin

QSL

THE BEST LETTER WILL RECEIVE A £20
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Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor at QSL, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

topqsl

Dear Sir

I have read SWM for about three years without fail. I enjoy 'LM&S' as well as the 'Off The Record' pages. I use 'LM&S' almost exclusively to confirm short wave logs and have been motivated to explore new stations such as number stations. My scanner is also getting more use now that I have more frequencies to hand.

I have been into s.w.l. since the age of 10 and am still going strong 11 years later. I have an amateur radio licence now thanks to a good friend who talked me into getting my M3 and I hope to progress even further in this interesting hobby.

My thoughts on the PC are that it is a tool to use in the hobby and should not be a substitute. I would be lost without my PC, as I can get s.w. schedules from the Internet, but I would never go so far as to listen to s.w. stations via the Internet. If the station does not beam to Europe I string a long wire up and try to find a usable frequency.

Thank for all your hard work. Keep it up!
PS: I have set up a website that may be of some use. It not only covers s.w.l. but amateur radio information as well as DAB Digital Radio of which I am also a fan - check out www.radiosgalore.co.uk
Andrew Abraham M3UOK

Many thanks for your letter Andrew. I'm pleased to learn that you enjoy the fruits of our labours. I'll take a look at your website - thanks for the URL. - Ed.

Dear Sir

As a radio listener for over 50 years I have to disagree with Ronald Evans in the February issue, QSL. Broadcast stations are certainly not dead and I hope that they won't be for many years to come. What makes him think that when a person reaches a certain age, they automatically live in the past?

I am nearly 60 years old and I enjoy listening to my DAB radio and despite what he says, I have found no problem with it. I also use a computer and connect to the Internet most days. He seems to have missed the point about broadcast stations, because I for one, have gained immense pleasure over the years trawling the bands to see what stations I can find.

I get no pleasure whatsoever in typing at a keyboard and instantly selecting a radio station - a child of three can do this. Could I suggest to Mr Evans that he takes a look at all aspects of the hobby of radio. He may be pleasantly surprised and who knows, he may get to like the glow of valves. Just because a piece of equipment has been superseded by a newer model doesn't mean that the older one cannot still be used and enjoyed. As for listening to Internet radio, no thanks and I hope that SWM won't go down that road either.

**David
Suffolk**

David, much like yourself, SWM keeps pace with current technologies and continues to keep links with radio past. I'm sure we'll keep you interested. - Ed.

Dear Sir

I read with surprise (and not a little incredulity) the letter from Ronald Evans in February's SWM. In fact, had it appeared in the forthcoming April edition, I would have thought it to be a spoof letter! Whilst I appreciate that the Internet carries a lot of comms traffic, Mr Evans can't seriously think that the h.f. bands are used only by third world countries.

The most technologically advanced countries put out the majority of short wave programmes. Why? Presumably because it is still the most cost effective means of getting a message out to a huge audience. As you, Mr Editor, quite rightly point out in your postscript, you can't beat the 'price/performance/portability' aspect for an awful lot of people. The BBC, VoA, VoR, DW, etc. can't all be wrong!

You've only to flip through a publication such as *Passport To World Band Radio* to see that h.f. broadcasting is alive and kicking. As long as they are broadcasting there will be hundreds (thousands?) of us listening.

Mr Evans mentions interference and jamming. Leaving aside jamming, he's missed the point about s.w. listening, i.e. the fun element of hearing a weak station from the other side of the world that is possibly meant only to be received locally to that station. If every station came through loud and clear, I'd probably find the hobby fairly boring!

As for fascinating articles about old transmitting stations, old valve equipment and so on, keep them coming - the more the merrier! They are part of our heritage and history. Without them and the pioneers who built and developed them, we possibly wouldn't have the Internet. Anyway, Mr Evans probably looks at a glowing valve every day, it's called a cathode ray tube!

So, at the risk of damaging SWM and PW sales, I suggest that Mr Evans switches to a computer magazine. He'll be much happier and less frustrated - until his computer crashes.

**Stephen Jones
Beds**

Fair points made Stephen, thanks. As for looking at radio past we won't be stopping coverage! - Ed.

Dear Sir

I am one of four amateurs/ex-amateurs and s.w.l.s in my family (I was G6ENT, before it got too expensive and I let my licence lapse) and still do a lot of listening on s.w., m.w., f.m., DAB and WorldSpace satellite radio, receiving some very unlikely DX stations (ones I shouldn't be able to resolve!) and am saving for a scanner (they are too expensive to ask for as a present, or buy out of my disability pension easily) as I can't do what I did as a youngster and build my own general coverage receiver or scanner and antennas from scratch, or by modifying an existing receiver.

Can anyone suggest where I can get plans and instructions to build/modify a battery powered receiver or hardware and software to use with a laptop, so I can receive l.w., m.w., s.w., v.h.f., amateur bands, etc., with the minimum number of 'boxes' or suggest a source of very cheap second-hand units. I am also looking for a means of receiving DRM, but again, plans and ready-built units are expensive and hard to find.

If we want to keep people interested in our hobby, we need more information and equipment at an affordable price - most scanners and DAB/f.m./m.w./l.w./s.w. receivers are still far higher priced than their complexity justifies and self-build kits seem to be very limited in capability, or rely on advanced soldering and microelectronics gubbins. It's time someone designed a modular scanner/general coverage receiver, using simpler components or cannibalised sub-assemblies from house-hold radio/TV receivers, which a typical GCSE-level youngster could build, like the crystal sets, f.m. and 2m receivers I built as a 10 year old.

**David Gordon
W. Sussex**

David, we ran a two part look at a cheap way to resolve DRM broadcasts in October and November SWM. This may be just what you seek. - Ed.

WRN Launches On Air Channel

The international transmission and broadcast specialist, WRN recently announced the launch of its latest innovation for radio stations wanting to get onto Sky. WRN's On Air is described as the UK's first fully serviced radio channel on the Sky digital platform.

The channel has been designed for stations wanting quick access to Sky digital but only for a limited period of time. This includes those stations already on the Sky grid but who want to be on the platform earlier than their official launch date. WRN's On Air channel is also the perfect place for large UK radio groups to test new formats or incubate a station, the smaller regional radio groups who see Sky as an essential broadcast platform but do not want to commit to a one year agreement or production companies who are producing and distributing stations for brand-owners. Even RSLs covering large sporting events can book space on WRN's On Air channel for the duration of their broadcast and instantly be available in over 7.4 million homes.

Richard Jacobs, WRN's Business Development Manager says: "We saw a need in the radio market to develop a flexible product for stations who want to be on Sky, but for a limited period only. Complete with an Electronic Program Guide (EPG) number, this stereo channel can be hired for the distribution of a station's "24/7" output from one month to one year. With WRN's On Air channel it is now incredibly easy to get on air".

WRN is a leading service provider to the UK and international radio industry and currently uplinks one in five of the non-BBC radio stations on Sky including RTE, Spectrum Digital, FCUK FM, Trans World Radio, Pulse Unsigned and Raaj Radio. WRN's On Air channel goes live on 15 November 2004.



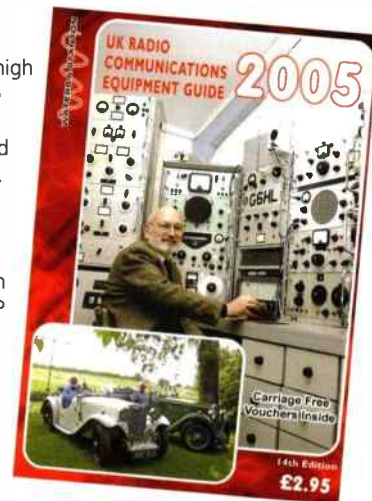
New Products

The new 2005 edition of the **Waters & Stanton** Catalogue is now available. With over 380 pages (priced at £2.95 plus £1.75 P&P), there's plenty to look at, including two vouchers for free carriage when making a purchase! The catalogue also includes short articles on microphones, antennas, amateur events and a DXpedition. So, whether you are looking for batteries, books, a receiver or a rotator, all can be easily found as products are listed alphabetically and are individually described.

Waters & Stanton have also been appointed UK agents for the famous Vibroplex range of American made Morse keys and keyers. Initially they will be stocking the four most popular products in the Vibroplex range.

Heil Sound have a new range of hand-held microphones of high quality to replace the microphones normally provided with transceivers.

Also, SGC are offering a free antenna coupler, worth £189, with an SG-2020ADSP transceiver, sold before 18 December 2004. There is a choice of two models: the SG-239 or the SG-211, which the customer can choose.



Due to economics in production, SGC have reduced the list price of their popular MAC-200 Master Antenna Controller from £339 to £259 retail, inc. VAT. Visit www.wsplc.com for more information on these products.

New Website

The Fareham and District Amateur Radio Club now has its own website, which can be found at



www.fareham-darc.co.uk The club still have some work to do with the site, but some interesting items are already available - take a look and see.

ML&S Open Day

Martin Lynch & Sons are pleased to announce their 15th Super Sale Open Day celebrating the opening of their new HQ and showroom in Chertsey, Surrey on **4 December 2004**.

Moving from London to Surrey was a major move for the ML&S Team, but the move has proved successful due to a combination of private parking for ML&S customers, a huge increase in showroom stock on display and more hands-on-deck to cope with the demand.

Martin and the 'Lynch Mob' have organised a Boot Sale in their rear car park, which is also accompanied by a Hog Roast, sponsored by Yaesu, Kenwood & Icom. ML&S are also announcing at least three important new product lines to their range:

- Barenco have for years appeared at all the major rallies selling their endless range of antenna hardware. For the first time you will be able to buy the hardware over the counter in the ML&S showroom.
- Tigertronics are best known for their excellent Signalink Soundcard interface, for which ML&S have sponsored the control software since day one. The full range is now available from stock, including the very popular SL-1 Signalink - see www.tigertronics.com
- New Communications Solutions (NCS) are a new US manufacturer producing very high quality 'Multi-Switcher' Rig controllers allowing operators with more than one rig in their shack to use just one microphone, keyer & TNC. It's something we have all tried building over the years and NCS have saved you the bother! See www.ncsradio.com

Representatives from Yaesu, Kenwood & Icom will be there together with the RSGB, PW Publishing Ltd., RAIBC and other club stalls. The new location has enough parking for up to 70 cars together with several public car parks within walking distance. For more details see www.hamradio.co.uk or call (0845) 2300599.

Order SWM Direct!

Some readers may be experiencing difficulties in finding copies of SWM in their local WH Smith stores or independent newsagent. So, as we don't want you to miss out on your favourite radio read, we'd like to remind you that you can buy current issues at cover price direct from us.

Simply send a cheque (payable to PW Publishing Ltd.), Postal Order or Credit Card details for the cover price (£3.25 inclusive of P&P, UK only, overseas customers please add £2.75) with your name and address to **Clive Hardy G4SLU** in the Book Store and your copy will sent out to you (**cash not accepted**). This service is also available for copies of PW (£2.95 and RA (£2.75 - both prices are UK only, overseas please add £2.75).

Additionally, if you've missed an issue of any one of the three radio magazines you can order Back Issues in the same way (stocks permitting). Back Issue prices are as follows: **SWM - £5, PW - £4.70 and RA - £4.50 (all inclusive of P&P)** to UK addresses, please add £1 extra for overseas orders (making a total of **SWM - £6, PW - £5.70 and RA - £5.50**) or call Clive for details of bulk postings. Alternatively, you may like to consider a subscription,

especially with Christmas approaching - see page 78 of this issue for details.

Book Store, PW Publishing Ltd., Arrowsmith Court, Station Approach Broadstone, Dorset BH18 8PW, Tel: 0870 224 7830, FAX: 0870 224 7850 or E-mail: clive@pwpublishing.ltd.uk



Braintree ARS Runs JOTA

This year the **Braintree Amateur Radio Society** ran the 47th World Scout JOTA for the Halstead Group. This was hosted by the 1st Steeple Bumpstead Scout Troop on a farm site very near to Steeple Bumpstead in Essex. Setting up on the Friday afternoon was hampered by heavy rain, but with perseverance the tents, masts and equipment were all in place for operation by the Friday evening.

Using the callsign **GB0SBS** many European contacts were made by the 80/40m station using a G5RV antenna. SSTV was also used by the 20m station using the club's 3-element beam and the v.h.f./u.h.f. station also had the capability for contacts with the ISS.

All through the weekend a large number of youngsters visited the stations and passed messages to other groups. The club were very pleased with the interest shown and are now looking forward to following up this interest with the Scouts at some stage in the future.



● Who wants to go next? Operator Dave G0DEC.
Photo Keith G4MIU.



● The JOTA station.
Photo Keith G4MIU.

The club were also visited by a local newspaper photographer and to add to the fun, the Scouts (and members of the club) gave much fuss and attention to the farm dog, a Labrador/Collie Cross called Ben, he enjoyed all the attention and proved he was an expert 'thief' when in the kitchen and kept the Scouts on their toes all weekend. All-in-all, and despite the mud, a great weekend. Visit www.badars.org.uk for more information about the club and the planned activities.

Colchester's Events

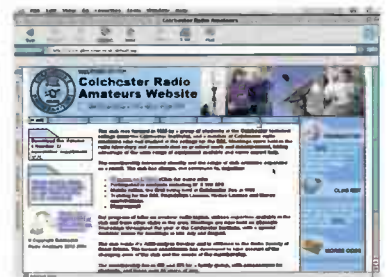
The **Colchester Radio Amateurs** club was formed in 1963 by a group of students at the Colchester technical college (now the Colchester Institute), and a number of Colchester radio amateurs who had studied at the college for the RAE. Meetings were held in the radio laboratory and concentrated on practical work and measurement, taking advantage of the wide range of equipment available and some expert help.

The membership increased steadily and the range of club activities expanded as a result. The club has always, and continues to, organise d.f. hunts on 1.8MHz; participated in contests including h.f. & v.h.f. NFD; mobile rallies, the first being held at Colchester Zoo in 1968; training for the RAE, Foundation Licence, Novice Licence and Morse examinations and many more!

The club's program of talks on amateur radio topics utilises expertise available in the club and from other clubs in the area. Meetings are now held on alternate Thursdays throughout the year at 1930 at the Colchester Institute or St. Helena's School, both in Sheepen Road, Colchester, with a special summer venue for meetings in late July and August.

The club holds its AGM early in October and is affiliated to the Radio Society of Great Britain. The formal constitution has developed to take account of the changing aims of the club and the needs of the membership. The membership fee is £20 and £25 for a family group, with concessions for students and those over 65 years of age.

More information from **James McGinty M0ZZO** at james@mcginty.net or by telephoning (01255) 242748.



Peterborough Radio Mast Collapses

Report by Doug Ash G1BWW

At 2300 Saturday 30 October the 176m Peterborough transmitter mast at Morborne collapsed. The mast, which is owned and operated by Crown Castle Communications is one of the major transmitter sites for national f.m. and DAB radio services. Large areas of Cambridgeshire, North Bedfordshire, East Northamptonshire and parts of Lincolnshire and West Norfolk lost BBC Radios 1,2,3 and 4, Classic FM and BBC Radio Cambridgeshire. Besides the transmitter antennas for the above radio services the mast also carried several microwave dish links and cellular radio services.



Picture courtesy Richard Moore

The mast was of straight vertical box construction, which was guyed at four levels. Three platforms also existed. Originally built as an infill station to bring 405-line television to the East Midlands, this mast had been in service since the late 1950s.

Currently the cause of the collapse is not known, but police are talking about a fire at the base. Fortunately, when it came down, the mast folded back on itself, avoiding a local public road, but leaving both sections embedded across the transmitter building's roof.

On the Sunday afternoon, NTL established a low power transmitter to provide Classic FM to the Peterborough area, this was located at the local Gunthorpe medium wave site.

At the station site on the Monday there was a lot of activity. The police having decided it was a crime scene would not allow anyone near the mast, guy points and transmitter building. Cellular 'phone company 'T mobile' had arrived with a temporary 'pump-up style' guyed mast mounted on an enormous truck, which they had brought over from Germany. This they were in the process of installing on the adjacent BT microwave link relay tower site, together with a cabin containing cellular radio equipment. Somehow they had managed to retrieve their small microwave dishes, which appeared undamaged apart from the burnt feeders.

Another team was standing by awaiting police clearance, prior to installing a 40m high temporary mast and an associated equipment cabin to try and restore national radio coverage as quickly as possible. It was also planned to install a temporary DAB transmitter on the BT relay tower.

By lunch time on Tuesday all four BBC national f.m. radio services were back on air on reduced power, but BBC Radio Cambridgeshire remained off air. This was obviously not considered so important as its Cambridge f.m. and a.m. transmitters provide coverage to a large part of the area. Due to the damage to the transmitter building and equipment it may be some time before all the normal services return to air at full power.

Other masts that have collapsed in the past include those at Waltham-on-the-Wolds in Leicestershire and Emley Moor in Yorkshire. The latter is first thought to have collapsed due to a build up of ice, but was later found to be due to stress vibrations caused by the wind.

Competition Winners



Well done to everyone who entered the SSE competition back in the September issue of SWM. Below are a list of the 13 winners and the prizes they have won.

Alan Curry, Cleveland AR8200 Mk3
Thomas Stanton, Maryport, Cumbria DJ-X2000
Frederick McGavin, Dublin, Ireland Scancat
Garry Molyneux, Leasowe, Wirral Scancat
John Williams, Stourbridge, W. Midlands Scancat
R. Manser, Hereford TH-F7E
R. Paxton, Hailsham, E. Sussex Icom R10
John Brand, Ipswich, Suffolk VR500
John Kench, Stroud, Glos X-Plorer
John Smith, Kingswood, Bristol MVT-7100
James Windsor Hargreaves, Liverpool Icom R5
M. Hadley, Birmingham PSR-225
Trevor Conlon, Co. Armagh, N. Ireland RD-500VX

Show Visitor

Bob Heil of Heil Microphone fame went to the Leicester Show back in October to promote his products on the **Waters & Stanton** stand and also to give his lecture on sound reproduction in the ham radio station titled *It All Starts at the Microphone*. Whist at the Show, Bob also took the opportunity of visiting the Icom stand to display his new Studio Quality microphone and boom assembly specifically designed for use with the new IC-7800 transceiver.



The microphone will be available at the end of the year, but the price is as yet unknown. A similar microphone is being designed for the new FT-9000 transceiver to be released in 2005. Full details of these products and the full range of Heil microphones and headsets can be obtained from Waters & Stanton on (01702) 206835 or take a look at their website www.wsplc.com

UK Amateurs Gain 7.1 - 7.2MHz

The Radio Society of Great Britain (RSGB) and Ofcom are pleased to announce that all necessary procedures required for early access to the 7.1 and 7.2MHz spectrum for all UK radio amateurs have been finalised and that access is allowed from 0100UTC on Sunday 31 October. Early access is granted on a Secondary (non-interference) basis using a maximum of 400W p.e.p. for full licensees, 50W p.e.p. for Intermediate licensees and 10W p.e.p. for Foundation licensees.

Notices of variation for the Foundation, Intermediate and Full licences were published on the Ofcom website back on 27 October. It is recommended that for the time being only voice and Morse code modes are used between 7.1 and 7.2MHz.

Band planning issues on 7MHz will be kept under regular review and will be dependent on the number of administrations granting early access to this band, prior to full Primary access on 29 March 2009.

CRI & WRN

China Radio International (CRI) has signed a contract extension with WRN following a visit by a high-level delegation to the London headquarters of the international broadcaster and transmission service provider. WRN will continue to provide an increasing range of transmission and distribution services to CRI, ensuring that listeners around the world can tune into programmes produced in many languages by China's international radio station.

The delegation was led by **Mr Xia Jixuan**, CRI's Vice-President. Other delegation members included **Mr Dong Weimin** from the Chinese Ministry of Finance and **Mr Zhao Gang** from the Chinese State Administration for Radio Film and TV.

WRN has worked closely with CRI for more than five years since signing an initial Collaboration Agreement in Beijing in 1999. WRN works on CRI's behalf distributing its daily programmes to reach both new and existing listeners around the world using a.m. and f.m. transmissions that augment CRI's traditional short wave broadcasting from China.

China Radio International's daily programmes can be heard on f.m. in Berlin and Moscow and on a.m. in London, St. Petersburg, across Western Europe, South West Russia, Ukraine and Romania. WRN identifies the most appropriate transmitters, undertakes local negotiations and monitors the output on behalf of CRI.

Furthermore, CRI's daily programmes in English, French, German and Russian can be heard on WRN's international news radio networks distributed around the world via satellite, cable, local f.m. relays, wireless applications and the Internet.

After the signing ceremony, **Mr Karl Miosga**, Managing Director, said: "I am delighted that CRI continues to place its trust in WRN to distribute its content world-wide giving more listeners the opportunity to easily tune into the important Chinese perspective".



Mr Xia Jixuan, Vice President of CRI (left) and Mr Karl Miosga, Managing Director of WRN (right) congratulate each other after signing a contract extension at WRN's London headquarters.

rallies

December 5: The Bishop Auckland Radio Amateurs Club (BARAC) will take place at Spennymore Leisure Centre. Please note that this venue is ideally suited for both trader and disabled visitors as it boasts good parking and access to a large ground floor hall. There will be the usual radio, computer and electronics, plus a Bring & Buy stall as well as catering and bar facilities. More tests are available on demand. As you can imagine, there is a lot to do for all the family within the confines of the Leisure Centre for those of the family not interested in radio. Doors open 1100 (1030 for disabled visitors) and admission is just £1 (under 14 free of charge with adult). Talk-in on S22. More details from Rally Organiser **Mark GOGFG** on (01388) 745353 or Deputy Rally Organiser **Brian G7OCK** on (01388) 762678.

2005

March 13: The Wythall Radio Club are holding their 20th Annual Radio & Computer Rally at the Woodrush Sports Centre, Shawhurst Lane, Hollywood, Nr. Wythall, Birmingham. Book early as this is a popular rally. Trader booking forms can be obtained from **Chris G0EYO** on (07710) 412819, E-mail: g0eyo@blueyonder.co.uk or visit www.wrcrally.co.uk

March 20: The Cambridge & District Amateur Radio Club have now confirmed the date for their rally, which is to be held at Britten Arena, Wood Green Animal Shelter, King's Bush Farm, London Road, Godmanchester. Doors open at 1000 and entrance fee is just £2 (concession for OAP/disabled, children free). There will be free parking for up to 2000 cars, along with a bar and restaurant on-site. There will also be a Bring & Buy and a Talk-in on S22. More information from **John Bonner G0GKP** on (01954) 200072, E-mail: j.bonner@ntlworld.com or from **Ian Alexander G4AKD** on (01954) 782974, E-mail: g4akd@thersgb.net

April 3: The Northern Mobile Rally (Harrogate Rally) is to be held at the Harrogate Ladies College, Clarence Drive, Harrogate, N. Yorkshire. There will be all the usual facilities plus a Bring & Buy, catering and transport for any disabled visitors, etc. More information from Rally Manager **Gerald Brady G0UFI** on (07734) 478080 or visit www.harrogaterally.co.uk

April 10: The Yeovil ARC have booked the Digby Hall, Sherbourne for their 21st QRP Convention, the popular get together of QRPers from the South and West of England. Doors open at 1000 and car parking is free in the town centre car parks, which adjoin the hall. Follow the black and white Town Centre signs, off the A30 Yeovil to Salisbury Road. There will be two talks in the morning and another after visitors have enjoyed the excellent food available and browsed the many trade stands. Also, the Construction Challenge will be adjudicated and certificates will be presented to winners of the QRP Convention CW Funrun, which takes place prior to the Convention on the evenings 14-18th March, 1900-2100. Rules available from G3ICO. E-mail: george@mudford.fstnet.co.uk

Ordio Rewind

Morphy Richards are ahead of the game along with other leading manufacturers by releasing one of the first Pause and Rewind DAB Radios. The Ordio Rewind DAB Radio includes a pause and rewind facility enabling the listener to either temporary stop the programme or skip back 10 minutes.

So, if you missed the beginning of a programme, an important telephone number or just want to listen to your favourite track again, just push the rewind button. To catch up with real-time, there is a live button to push. A screen displays the channel and programme details above the volume knob.

The radio also features f.m. and RDS with 14 pre-sets. A sleek design in a matt silver finish, the Ordio Rewind DAB, is easy to use and will look good in any stylish home. It also comes with mains or a battery option making the radio portable too. This is the very latest radio with Pause control.

The Ordio Rewind is perfect for those interruptions from the telephone or front door, etc. Priced at £149, for stockists call **Nevada** on 02392 313090 or visit: www.nevada-radios.co.uk for more information.



Bandscan

Australia

- **Greg Baker** PO Box 3307, Manuka, Australia
- **E-mail:** greg@worldgraphics.com.au

Radio Australia (RA) has a new website. It looks fabulous but although I've blundered around it for some time, I still cannot find a complete frequency schedule. Clearly this site isn't designed for s.w.l.s. For European listeners RA suggests 9.475, 9.500, 11.660 and 11.750MHz during European dark hours.

Martyn Gardiner from Portsmouth confirms the first three of these frequencies and **Michael Beesley** has had success a little further up the dial on 13.630, 15.160, 15.415 and 17.750MHz. These latter frequencies appear to be aimed a little closer to Australia across the Pacific (13.630 and 15.160MHz) and Asia and the Middle East (15.415 and 17.750MHz). *SWM* readers can have a look for themselves at www.abc.net.au/ra

ABC Short Wave

The Australian Broadcasting Corporation (ABC) has three domestic short wave stations: Roe Creek near Alice Springs transmits on 4.835MHz during the local daylight and 2.310MHz at night. Katherine uses 5.025MHz during the day and 2.485MHz at night and Tennant Creek 4.910MHz during the day and 2.325MHz at night. The Northern Territory is UTC+9.5.

Radio New Zealand

In stark contrast to the Australian government in its funding of RA, the New Zealand government has increased Radio New Zealand International (RNZI) funding. In the latest move, RNZI has ordered a Thales DRM 100kW short wave transmitter scheduled to begin operation in early 2006. The RNZI station says that its existing analogue transmitter is nearing the end of its serviceable life and that the new transmitter will be used initially alongside the old transmitter before eventually replacing it as RNZI's transmitter into the Pacific.

The RNZI DRM system will be used to transmit signals for re-broadcast across the Pacific on its dozen or so partner radio stations; the current analogue transmitter will continue to deliver a standard a.m. s.w. signal to individual listeners. RNZI is at www.rnzi.com

Christian Vision

Christian Vision transmits as Voice International from Australia in English on 6.115MHz 1800-2100, 11.955MHz 0900-1100, 13.635MHz 1100-1800 and 13.685MHz 0900-1400UTC. Voice

International's studio complex, dubbed the Asia Pacific Broadcasting Centre, is in Maroochydore, north of Brisbane.

English and other services are relayed by satellite from Maroochydore to its ex-RA Cox Peninsula transmission site and re-broadcast on short wave to Indonesia, South East Asia, the Indian sub-continent and China. The all singing, all dancing Voice International Australian website is at www.voice.com.au The more restrained Christian Vision website is at www.christianvision.com

HCJB

HCJB broadcasts from Kununurra in Western Australia. Its English language broadcasts towards China are on 15.525MHz at 2230-0100; towards Indonesia, Malaysia and Thailand on 15.425MHz at 1100-1230; towards Eastern Australia, New Zealand and the South Pacific Islands on 11.750MHz at 0800-1100; towards the Indian subcontinent and Indonesia on 15.560MHz at 0100-0300UTC and on 15.390MHz at 1430-1600.

On the Internet you can contact HCJB at www.hcjb.org and reception reports for Australia can be sent to english@hcjb.org.au or by mail to **The Voice of the Great Southland, GPO Box 691, Melbourne 3001, Australia**. One IRC would be appreciated to help cover postage costs.

Reception Reports

Martin Gardiner from Portsmouth has pulled in RA on several occasions at 2000 on 9.500MHz with a very strong signal. At 1510 on 11.660MHz RA produced a readable signal and 9.475MHz was much weaker with lots of noise. By 1600, 11.660MHz had faded somewhat. Martyn was using an Icom R8500.

Michael Beesley from Romsey in Hampshire has also heard RA on 9.475MHz at 1445, SINPO 45444; on 13.630MHz at 0730, 45444; 9.500MHz at 1930, 25222; 15.160MHz at 0730, 43543; 17.750MHz at 0730, 25432 and 15.415MHz at 0730, 42542.

Michael has also pulled in RNZI on 9.885MHz at 0830, SINPO 44544; 11.820MHz at 0530, 44433 and 11.820MHz again at 0630, 35222. He has received Voice International 13.685MHz at 1100, 35522.

John Parry 5B4AFR on Cyprus has pulled in an Australian weather service station for the west coast of the continent. John says that the transmission was directed at shipping and gave wind direction and velocity. The frequency was u.s.b. 12.362MHz at 1330, SIO 343.

Weather Stations

John Parry's reception report above will have been for the Australian Bureau of Meteorology weather station VMW broadcasting from Wiluna, which is right in the centre of Western Australia. VMW broadcasts on 4.149 and 16.528MHz during local daytime, 2.056 and 6.230MHz during local night time and 8.113 and 12.362MHz at anytime.

Western Australia is UTC+8. VMW's sister station is VMC in Charleville in Queensland. It covers the eastern part of the continent and waters. VMC broadcasts on 4.426 and 16.546MHz during local daytime, 2.201 and 5.607MHz during local night time and 8.176 and 12.365MHz at anytime. Queensland is UTC+10. Maps and schedules are available through www.bom.gov.au/marine/marine_weather_radio.shtml

Royal Flying Doctors

The Royal Flying Doctor Service (RFDS) in Australia maintains a network of short wave transmitters mainly for travellers in Australia's outback. The stations are in Western Australia through five stations on the two frequencies 5.300 and 5.360 as well as 2.792MHz at VJB Derby, 2.280MHz at VKL Port Hedland, 2.280MHz at VJT Carnarvon, 2.280MHz at VKJ Meekatharra and 2.792MHz at VJQ Kalgoorlie.

In central and eastern areas of the continent, the RFDS operates on 2.020 as well as 5.410 and 6.950MHz at VJD Alice Springs; 4.010, 6.890 and 8.165MHz at VNZ Port Augusta; 4.055 and 6.920MHz at VJC Broken Hill; 4.980 and 6.845MHz at VJN Charleville; 5.110 and 6.965MHz at VJI Mt Isa; and 2.260, 5.145 and 7.465MHz at VJN Cairns. The RFDS is at www.flyingdoctor.net

Other News

DMG Radio Australia (part of the *Daily Mail* group of companies) has sold its 57 regional radio stations to concentrate on its state capital stations. The DMG website is at www.dmgradio.com.au

The former Minister for Communications, **Richard Alston**, seems to have fallen on his feet. He has snared the job as chairman of the board of Broadcast Services Australia (BSA). BSA is a contractor to subscription television and telecommunication companies and delivers infrastructure projects, services and equipment to broadcast and telecommunication industries; it is at www.bsa.com.au

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

LM&S

Long, Medium & Short Wave Bands

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

It seems that hardly a month goes by when I don't have to report the closure of yet another short wave or external service. This month is no exception.

Quite the contrary. At least three international broadcasters are using end of season plan changes at the end of October and March as their cue to bow out of (or at least, drastically cut back on) international broadcasting via short wave.

There's no need to remind you of Swiss Radio International's recent demise. Add to that two more. It's goodbye to Belgium's Radio Vlaanderen International, or at least, a large chunk. According to a press release on their website, RVI will drastically reduce its medium and short wave services from the end of March 2005. Radio broadcasts in English, French and German will be scrapped altogether, retaining only a presence on the Internet. Broadcasts to southern Europe are set to continue but are likely to comprise of relays of the domestic service.

Then there's a report that Radio Cairo was to scale back its overseas broadcasting this November. Portuguese and a number of other language streams were due to disappear but English, French and Spanish have, for the meantime, a stay of execution.

Add to this, the recent close down of

Listeners:-

- A Phil Townsend, London
- B Sheila Hughes, Morden
- C H Richards, Lincolnshire
- D Howard Grundey, Penzance
- E Simon Hockenhill, Bristol
- F Thomas Williams, Truro

Long Wave Table

kHz	Service	TX Location	Country	Power (kW)	Listener
153	Deutschlandfunk	Donebach	D	500/250	A B C E (*)
153	Radio Romania	Brasov	ROU	1200	C*
162	France Inter	Allouis	F	2000/1000	B C D* F*
171	Medi 1	Nador	MRC	2000	E*
171	Radio Rossii	Bolsakovo	RUS	600	A C* E
177	Deutschlandradio Berlin	Zehlendorf	D	500	A C E
183	Europe 1	Saarlouis	D	2000	A B* C D* F*
189	Rikisutvarpid	Gufuskalar	ISL	150	C* E*
198	BBC Radio 4	Droitwich	G	500	A B C D*
207	Deutschlandfunk	Aholmig	D	500	A C E
207	RTM A	Azilal	MRC	400	C* E*
207	Rikisutvarpid	Eidar	ISL	100	E* F*
216	Radio Monte Carlo	Roumouties	F	1400	A C D* E F*
225	Polish Radio 1	Solec Kujawski	POL	1000	C* E* F*
234	RTL	Buidweiler	LUX	2000	A B C D* F*
243	Denmark Radio 1	Kalundborg	DNK	300	A B C E F*
252	RTE Radio 1	Clarkstown	IRL	500/150	A C D* E F*
252	Algiers Radio 3	Tipaza	ALG	1500/750	C*
261	Radio Rossii	Taldom	RUS	2500	C* E*
261	Radio Horizont	Sofia	BUL	40	E*
270	Czech Radio 1	Uherske-Hradiste	CZE	650	C D* E* F*
279	Belarusian Radio 1	Sasnovy	BLR	500	B* E*

* = dark

Tropical Band Table

MHz	UTC	Service	Country	Listener
3.210	0427	VWCR, Nashville	USA	C
3.255	0401	BBC World Service	G/AFS	A B
3.350	0429	Radio Exterior Espana	E/CTR	C
3.915	1705	BBC World Service	G/SNG	A B C
3.955	2100	Radio Korea International	KDR/G	A
3.965	1820	Radio Taiwan	TWN/F	A
3.965	1919	Radio France Int'l	F	C
3.975	1904	Radio Budapest	HNG	A C
3.985	1932	VIRI	IRN	A
4.005	1922	Vatican Radio	CVA	A B C
4.810	1837	Voice of Armenia	ARM	C

Sudwest Rundfunk's 6.030 and 7.265MHz outlets and Sri Lanka's decision to cease short wave relays of its domestic service and I think you'll agree that it's been a pretty grim month.

Welcome to **Mr H Richards**, who has put his Grundig receivers to good use and submitted an entry to 'LM&S'. Thank you. Hello, too, to **Howard Grundey G7ESM**, who kindly sent in what I hope, is the first of many contributions to the column.

Howard wrote from a campsite in Penzance where, after some unsuccessful attempts at two-way communication, he reverted to his favourite hobby - short wave listening. Thanks for the logs and QSLs, Howard. Your suggestion of printing a band plan has gone to the boss. Sounds like it may be a runner. I look forward to hearing from you again soon.

Howard and **Simon Hockenhill** both made a point of welcoming recently joined contributor **Scott McMurray**. After my tongue-in-cheek remarks regarding what most twenty-somethings get up to in their spare time, Simon advises that he

maintained a full social calendar and managed to participate in the hobby. It's just a question of balance.

Simon also notes the return of Radio Havana Cuba following a spell off-air as a result of damage caused by the recent hurricane activity. WYFR's transmitter site in Okeechobee also took a direct hit and the station has been several weeks in getting back up to strength.

Vic Prier, Fred Wilmshurst and Freddy McGavin all have suggestions for Thomas

MHz	UTC	Service	Country	Listener
4.835	2120	RTM Bamoko	MLI	B
4.845	2115	DRTM Nouakchott	MTN	B
4.860	1842	All India Radio, Delhi	IND	C
4.890	2134	Vatican Radio	CVA	C
4.915	2200	GBC 1 Accra	GHA	B
4.940	1958	Voice of America	USA/STP	C
4.975	1756	Radio Uganda, Kampala	UGA	C
5.025	2133	Radio Tashkent	UZB	A C
5.050	0135	VWCR, Manchester	USA	C
5.070	0043	VWCR, Nashville	USA	C

Dxers:-
A Simon Hockenhill, Bristol
B Vic Prier, Seaton
C Michael Casey, Manchester

Williams' mystery station on 11.520MHz. Fred reckons it's USA-backed Radio Free Asia broadcasting out of Tajikistan. The broadcasts are parallel with 7.530MHz.

Alternatively, Vic says this is a Chinese music jammer with RFA being its intended target. A period of trawling the bands revealed 12 additional frequencies carrying similar broadcasts including 9.850, 9.355, 7.540, 7.530 and 11.700MHz. Thanks for the detective work. Anyone with similar queries is invited to send them and maybe we can clear one or two up for you.

Meanwhile, Freddy E-mailed me from Dublin. He's 99% sure it's the Voice of Indonesia, parallel with 9.525, 11.785 and 15.150MHz. Thanks for the pointer, Freddy, and good to hear from you.

So, take your pick. I'm inclined to go with the music jammer theory. What legitimate broadcaster would go to all that time, trouble and expense merely to simulcast hours of nondescript music across the various bands without so much as a 'hello'?

Radio New Zealand International has secured a contract with Thales for a DRM-capable short wave transmitter for its international service. The new 100kW short wave transmitter will be operational in early 2006.

RNZI's current analogue short wave transmitter is nearing the end of its serviceable life. The new transmitter will work alongside it and then replace it completely as RNZI's transmission facility into the Pacific.

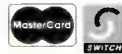
The scheduled date expansion of the 40m amateur band for UK amateurs was 31 October. The band, hitherto 7.000-7.100MHz, was due for a doubling in size, with the top end of the band extended to 7.200MHz.

This new sub-band is released to Radio

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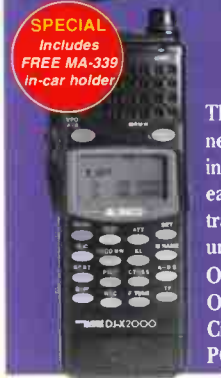
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Off^{the} Record

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Welcome once again to the thinking person's anti-establishment broadcast radio column. I believe we can identify two distinct types of rebellion. There are those who simply get a kick out of being disruptive and causing trouble. We have all witnessed examples of the mindless vandalism of 'The Great Unwashed'. Then there are those who have intelligently examined how the establishment is conducting itself and discerned that things are not right and need to be changed.

I believe that most free radio projects fall into this latter category. The establishment, by nature, resists change, but often falls into patterns of maintaining self-interest at the expense of doing what is best or right for the majority. Throughout history, we have seen examples of fundamental changes for the better being effected by protest groups that are technically outside the law or frowned upon by the powers that be.

In recent decades, free radio has succeeded in forcing the regulating authorities to examine what they are doing and make changes, but there is still work to be done and the scrutiny should be ongoing. It is possible to build an argument that in some ways the situation today is worse than it was 40 years ago. I believe that it is healthy for a sensible and responsible free radio movement to exist.

Free Radio & Campus Radio

I am always happy to receive correspondence from readers and be guided as to what topics you would like me to discuss. **Andy** from Somerset sent an E-mail raising a number of interesting points. He suggests that "Surely the whole ethos of free radio is to provide programming for the listener's tastes, instead of having it dictated by advertisers, management or other groups". He goes on to speak in positive terms about the long-term RSL stations, praising in particular one from his area called Apple AM, which broadcasts from Taunton Hospital on 1431kHz.

There have been many debates about what defines or constitutes free radio and I would be interested to receive other opinions and thoughts, though I think it is fair to say that any station that is licensed by the regulator is unlikely to qualify. This does not

mean that these campus stations may not have some good programming in some cases of course.

Any station that raises revenue by advertising has to figure out how best to integrate the publicity into the rest of the programming. There can be no getting away from the fact that every station has to have management of some sort. Even if it is very loose and free-form, someone will be deciding what the station's sound is like (even if it is down to each individual presenter) and then the listener is free to accept or reject the station.

Over the years, the policy of allowing virtually no stations has been replaced with a strategy of filling up all the frequencies with mostly vacuous dross. Long-term RSL stations are mostly intended for very small areas such as hospitals, educational establishments and military barracks. It seems to me that the original induction loop system is ideally suited to this type of broadcasting and there is no need for them to broadcast as LPAM or LPFM stations, radiating over a radius of many kilometres.

Some of these frequencies could be used for much better stations, broadcasting to the general public. Incidentally, a 'Campus of Convenience' is where a station teams up with a suitable establishment in order to get one of these licenses and then broadcasts to a wider audience in the coverage area, but this never happens of course.

Pirate Radio From A Ship

One of the most interesting stories just recently, even though it is all taking place away from the UK, has been the goings on surrounding the 603kHz a.m. station in the Aland Islands in Scandinavia. It is unfortunate that much of the newsworthiness stems from the fact that there appears to be a major rift that has developed between some of the individuals that were supposedly working together to get the project up and running.

It would seem that the 300kW licence is in the name of Roy Sandgren, who is one of the partners, but he has been declaring that he has terminated his partnership with the other two, Klaus and Mike (Spenser), but the fact is that these two are broadcasting on the frequency and are insisting that Roy cannot pull out of the agreed partnership. There is disagreement over the languages that can be

used on the broadcasts and even the station name cannot be agreed upon, with Roy calling it Radio Scandinavia 603 AM and the others using the name Pirate Radio 603 AM.

Broadcasts are originating from a ship called the *MV St Paul*, which bears a remarkable resemblance to the *Ross Revenge* and the curious situation is that according to the man who we believe has the licence in his name, the broadcasts are unlicensed and illegal. There have been reports that the locals have been enjoying the broadcasts and rumours have been emerging that another 10kW licence may be available in the area for the frequency of 765kHz.

In the event that these gentlemen are unable to resolve their differences, it would be good to see two stations on-air legally, each given a chance to show what they can do. If this is a case of the local authorities observing a situation and attempting to offer a solution then they are to be commended.

Recent Reports

Looking at 48m, Radio Merlin has been heard testing again after a very long absence and Mark Perry's station Meridian Radio has made a number of broadcasts. Jolly Roger Radio has announced that their engineers have installed new and better transmitters and they continue to relay Britain Radio International programmes. Other active stations include WMR, Valley Wave, Diamond, Pandora, Sunshine, The Ghoul, Crazy Wave and WNKR.

Over in the Netherlands, a station called Radio Satellite was raided by the Dutch authorities in mid-October and transmitting equipment was confiscated. Other Dutch stations noted with broadcasts (as opposed to irritating fleeting CB style transmissions) include Sky Wire, West Coast, Mike Radio, ROZ, Alfa Lima, Tower with Veronique, Antonio, Mazda and Magic AM. Anyone tuning around on the higher frequencies may have stumbled across the likes of Radio Waves on 11.401MHz or Space Shuttle on 13.865MHz.

That's about it for this time. Have a happy holiday period and remember that it is a good time to listen round the bands for increased activity, with stations doing Christmas and New Year specials. Speak to you again in 2005.

WINRADIO G313i

Software Defined Radio- Reviewed

Jack Weber makes his SWM debut with a comprehensive review of the latest offering from Australian radio manufacturer WINRADIO.

As someone who enjoys the smooth spin of a well-balanced tuning knob and the warm glow from a back-lit dial, I was slightly uncertain about my first meeting with a software defined radio where there's nothing more interesting than a mouse, keyboard and computer screen to interact with. I needn't have worried. It took all of a day to persuade me that this was the future of radio and within a week I was using little else.

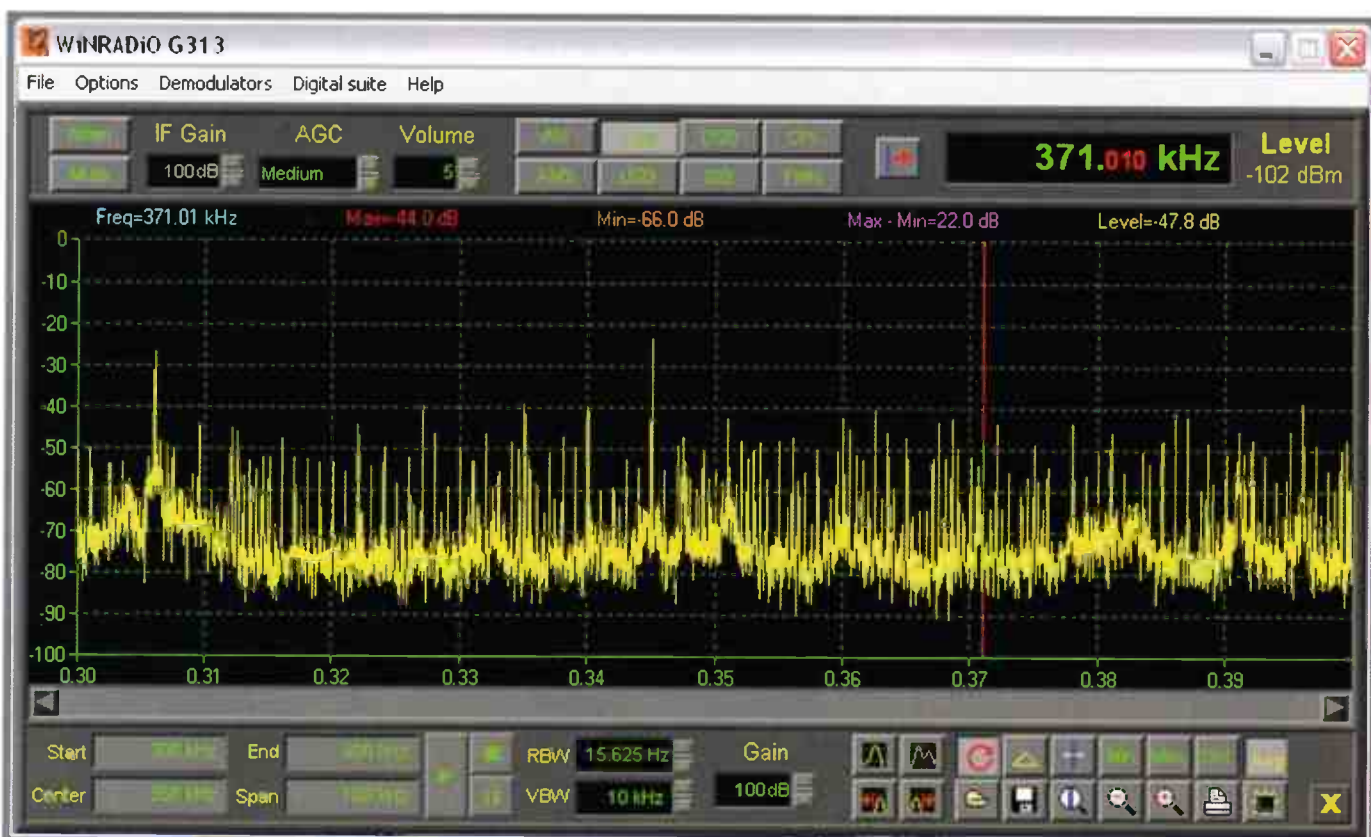
All that was nearly a year ago when I got a WINRADIO G303i receiver, largely on the strength of John Wilson's review in these pages. When its successor, the G313i came out, I was immediately keen to try it.

The essence of any software defined radio (SDR) is that the signal gets digitised before any of the i.f. filtering or

The benefits are flexibility and performance. You're never stuck with just a few filters, nor even just a few modes. Additional demodulators can be added as software plug-ins, while all the i.f. filtering is infinitely variable, allowing you to adjust the characteristics to suit any eventuality. At least, that's the principle. In practice, the radio can only do what the hardware can handle and what the software has been programmed to do, so different SDRs offer very different features and performance.

Some Options

Military and telecommunications users have various highly specialised SDRs to choose from. For the rest of us, there are



● The Spectrum Analyser can replace the whole control panel allowing you to use the plot for tuning the receiver. Here it shows a plot of the spectrum between 300 and 500kHz with numerous NDBs (Non-Directional Beacons) visible.

demodulation is carried out. This means that all these complex processes are taken out of the realm of noisy, temperature-dependent analogue electronics and turned into mathematics. Crystal filters, i.f. transformers and frequency changers disappear and become calculations performed by a programmable d.s.p. (Digital Signal Processing) chip.

currently four options. Australian company WINRADIO makes the G303 (reviewed by John Wilson in *SWM* February 2003) plus the new G313 being reviewed here. Both models are freely available in the UK. There are also two American models: the SDR-14 from RF Space Inc (reviewed by Kevin Nice in *SWM* September & October 2004) and the SDR-1000 (available as transceiver or

receiver) from FlexRadio Systems. Both are on sale in the USA, but not yet in the UK, except as a personal import.

Each is configured differently, but what all four have in common is that they use a conventional desktop PC to do some or even most of the digital donkey work. If you already have a PC, you're ready to plug in an SDR and experience a completely new type of radio.

Like its predecessor, the G313i comes as a standard two thirds length PCI card that fits inside the computer. Installation is very simple and as soon as you restart the PC, Windows will recognise that new hardware has been fitted and prompt you to load the driver software. This comes on a CD-ROM along with the control application that's used to operate the receiver.

The recommended hardware specification is a 1GHz Pentium IV or Athlon with 256MB RAM. That's modest by current standards, but will exclude some older PCs that still have plenty of life left in them. I fitted the card into an IBM machine with a 2.66GHz Pentium IV and 512MB of RAM. As expected, this coped effortlessly. In fact, I was able to run both the G313 and G303 receivers simultaneously without any problems.

With the G303, the computer's soundcard was used for all the demodulation and filtering. This kept the price down but made setting up more fiddly and risked compromising the audio quality. For this model, WinRADiO fitted an on-board d.s.p. so you don't need a soundcard at all. There is simply one input - a 50Ω SMA socket (with optional BNC adapter) to take the antenna, and one output - a stereo mini-jack providing line-level audio. This needs amplification to run a speaker or even headphones so you could use a sound card for that. Alternatively, a good pair of powered PC speakers or a hi-fi amplifier will do nicely.

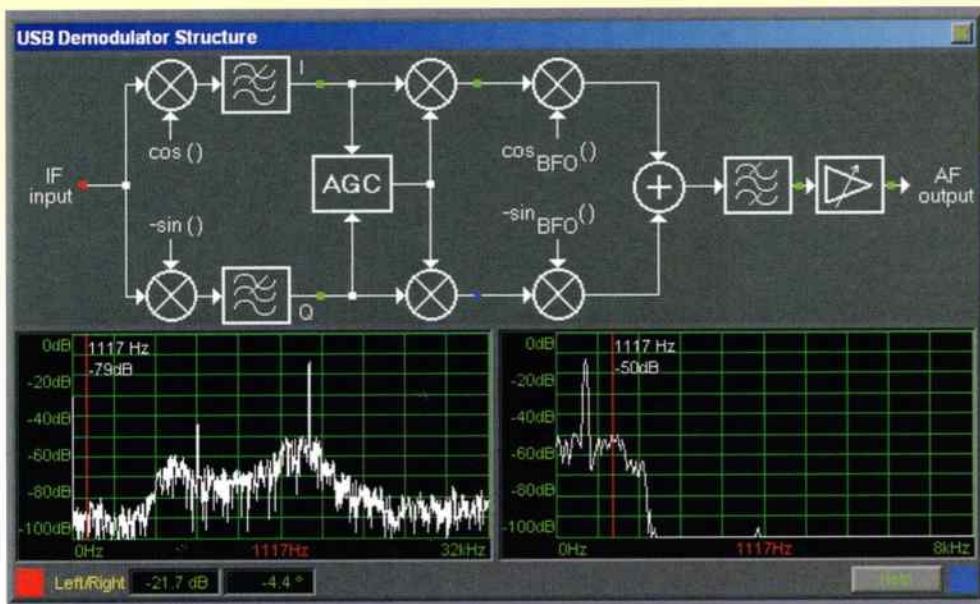
Once everything is connected, you can double-click the receiver's icon to launch the software and display the front panel, which is laid out to resemble a physical, though quite unusual, communications receiver. Top left is the frequency display, below that a real-time scope showing a 20kHz chunk of spectrum centred on the receiving frequency. Around it are all the controls for selecting demodulator modes and adjusting the i.f. selectivity. Top right there is an 'S'-meter, with the scanning controls and the main tuning knob below. Down the right-hand side are the r.f. and i.f. gain controls including squelch, plus a clock and the power switch at bottom right. Finally, next to this switch are two yellow arrows, which open up the receiver's wide-band spectrum analyser.

More Controls

The control panel is exactly the same size as the G303's, but is packed with considerably more controls. Mostly this has been achieved at the expense of dead space, though some controls are slightly smaller. It's a tightly packed layout, but not at all difficult to use. After all, with a virtual panel there's no need to leave finger room around each button and knob.

Wherever a numerical setting is displayed, there's a small three-part control next to it. This consists of two arrows, which usually raise or lower the value by one, plus a narrow slider in between. Clicking on the slider lets you rapidly shift the value up or down in graded steps, e.g. the i.f. bandwidth slider moves in 100Hz steps down to 200Hz and then in steps of 10Hz below that. Easier to use than to describe, these sliders are one of the best interface features on this radio.

In its basic form, the G313i tunes from 9kHz to 30MHz. There's also a version (G313i/180) that goes up to 180MHz. In either case,



● For each mode, the G313 can display a block diagram of its demodulator with two real-time spectrum analysers, which you can use to observe the signal spectra at different points in the circuit.

you can tune the whole range in steps as low as 1Hz. There are so many ways to tune the set that I won't even try to list them all, but they range from clicking on the tuning knob to typing in the numbers, and from using the keyboard arrow keys to twiddling the scroll wheel on your mouse. Many can be further modified by holding down the Shift, Alt or Control keys.

There's also a group of step-tuning buttons, with 20 preset steps ranging from 1Hz to 100kHz. If you want a step size that isn't provided, you can enter this directly and it will appear, correctly sorted into position, in the step sequence, although it won't be saved when the receiver is switched off. To add permanent entries, you need to define and save specific step sizes for different bands. However, these can only be used in those bands and only when you select Auto-Step mode.

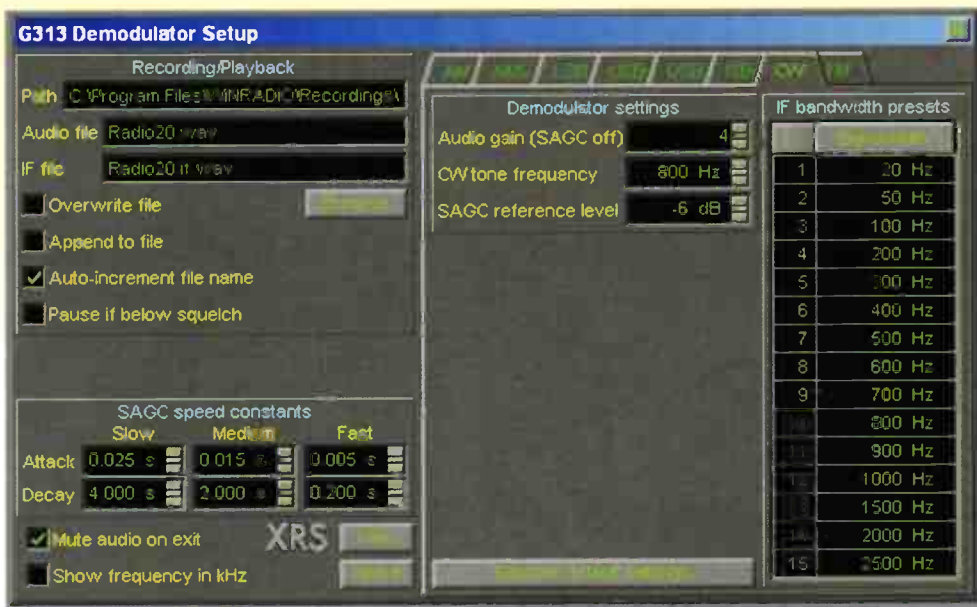
With so many tuning options, most preferences should be covered. Like me, you'll probably try them all and quickly settle on a handful of methods that suit your needs. It may not have the comfortable feel of a tuning knob, but compared to the fiddly keypads on some receivers, this radio is fast and easy to use.

There's a Tune-To-Peak button, which will find the strongest signal peak within the current i.f. passband, and an a.f.c. button, which will track a drifting signal. Both require a good unambiguous signal to lock onto. With reasonably strong a.m. and f.m. stations they work fine, but neither is reliable on s.s.b. A very welcome pair of buttons has been added to let you select kHz or MHz as the display units. Also new are four v.f.o. buttons. These can be used to remember four frequencies and switch rapidly between them. Unfortunately, they don't remember the mode or i.f. settings, which would have made them even more useful.

The main memory facilities don't suffer from this limitation and are really rather good. Frequency entries can be stored, complete with mode, i.f. and squelch settings plus an 11-character name and 31-character comment. Although each memory file is limited to a thousand entries, you can save as many files as your disks will hold. Within a file, each entry can be assigned to one or more groups, which can then be used for scanning.

Entering, editing and recalling memory entries is very straightforward. You can step through them or type a number directly into the control panel. Alternatively, you can open up a memory file and see the entries as a clickable list. Empty memories are automatically skipped when stepping through a file and don't appear in the listing either. The only improvement that I would like to see is the ability to import lists of frequencies and settings from a database, spreadsheet or text file.

Let's turn now to the i.f. section, which is where many of the G313's most innovative features are to be found. The heart of this



● The Demodulator Set-up window lets you assign values to all the i.f. presets and a.g.c. settings for that mode. This is also where you can select a.f. or i.f. recordings for playback.



● The DRM Demodulator plug-in appears as an integral part of the main panel with its own real-time bandscope and recorder. Transmission data and scrolling text appear below the bandscope.

section, and the most visually dominant feature of the panel, is the real-time spectrum analyser. Significantly larger than on the previous model, this shows a span that can be zoomed between $\pm 2\text{kHz}$ and $\pm 10\text{kHz}$, centred on the tuned frequency. The current i.f. passband is always marked in grey.

Simply Sizzles

One of the things you'll notice immediately is how fast this receiver's sampling is. The spectrum display simply sizzles with activity. Mostly this is noise of course, but you can tone down the spikiness by adjusting a low-pass filter on the bandscope's input to give the degree of smoothness you want.

Above the bandscope is a row of buttons for selecting demodulator modes. These have been pruned down compared to the range offered on the G303, but sensibly so because there was redundancy there. What you now get is a.m., a.m.s. (synchronous a.m.), l.s.b., u.s.b., d.s.b., i.s.b., c.w. and f.m.

One advantage of any d.s.p.-based i.f. is the degree of control

it provides over the i.f. bandwidth. Here, you get 15 buttons with sensible preset values that change according to the mode in use. If they're not right for you then each one can be customised to whatever value you want from 1Hz up to a maximum of 15kHz. Alternatively, you can type a value into the i.f. bandwidth box or use the arrows and slider to shift the value. If you've only been used to switching between a handful of crystal filters, this ability to smoothly change the bandwidth to any setting will be a revelation.

What really makes a difference though is the combination of smoothly variable i.f. with a spectrum analyser. Being able to see the i.f. - not only in relation to the signal you're listening to, but in the context of surrounding interference - while at the same time being able to hear the overall interaction is what really seduced me away from the old ways of listening.

The G313 takes this big step further because the real-time bandscope has now become interactive. At either edge of the grey passband there's a red line, with another down the centre. You can pick these up with the mouse and simply stretch, squeeze or move the passband exactly where you want it. Bear in mind that these are steep-sided digital filters, which means that you can snuggle the passband very close to any interference before breakthrough occurs. And the benefits aren't just in dealing with interference. For any signal there's a trade-off between opening the i.f. too wide and letting in excessive noise, or narrowing it too much and destroying the intelligibility. Being able to adjust it smoothly means you can always find the precise sweet-spot that gives best reception.

A tuneable notch filter has been added, which is very effective at

eliminating heterodyne whistles or in-band interference. It appears in blue on the bandscope and can be re-sized or moved with the mouse just like the i.f. filter. Note that this is an actual i.f. notch filter, not the commonly found a.f. notch, which simply removes the audible effects of a heterodyne. A noise blanker has also been added, but I found this disappointing. It had little effect either on lightning crashes or local electrical clicks unless turned up to the point where the threshold was too close to actual signal levels.

I also wasn't overwhelmed by the i.f. shift control. Being able to shift the i.f. passband is of great value with s.s.b. or ECSS reception (using s.s.b. to receive an a.m. signal) as it can improve the tone of the audio and reduce interference. In this case it frequently made the audio worse or introduced a whistle, which made me wonder if it wasn't simply detuning the receiver.

The 'S'-meter, like the one on the G303i, offers a choice of dBm, μV or 'S'-units, presented both in an analogue display and a digital read-out. If you've set a squelch level, it's shown as a colour change in the meter dial, which is a brilliant way of judging how

close the actual level is to the squelch threshold.

Several changes have been made to the metering modes. You now have a choice of seeing Peak, RMS or Range readings. The latter displays two needles showing the highest and lowest levels within the current i.f. passband. In other words, you're seeing the dynamic range of the passband rather than a measure of variation in the signal you're tuned to, which is what you might expect.

Having a Peak option is more useful than the Peak-to-Peak that was offered on the G303 because it can be applied to 'S'-units and dBm, whereas the p-p measurement was only possible when measuring μV . But probably best of all among the 'S'-meter changes is the addition of an Averaging mode. This is used to smooth out the meter's movement by displaying a moving average of the signal level over a user-defined period between 1 and 99 seconds.

Scanning Modes

Three scanning modes are provided on the G313 - Search, Range and Memory. Search mode will step forwards or backwards, using the current step size and stopping at any signal that exceeds the squelch level. You can specify whether it's to stop indefinitely or pause and, if pause, whether it will remain there for a fixed period or until the signal disappears.

Range mode is essentially the same except that you need to pre-define one or more frequency ranges together with their mode, squelch and step values. It is, in effect, a saved Search Scan, but with one important added feature - that any stations found by a Range Scan can automatically be stored in memory. They can then be called up individually or the memory entries could simply be used as a list of stations found during an unattended scan. One annoying limitation of Range Scanning is that, having defined a number of ranges, you can't pick which one to use. Scanning always has to run through all the ranges from first to last. So if, for example, you had set-up scan ranges for all the short wave broadcast bands and then wanted to scan just the 49m band in the evenings, and the 16m band in the afternoons, you wouldn't be able to. They'd all have to be done every time.

As the name suggests, Memory Scan goes through a block of memories, pausing or stopping on each one that has a signal above the squelch level. Individual memories can be excluded from the scan or you can restrict the scan by assigning memories to groups. The basic scanning speed is a respectable 40 channels/second, though it can be faster for some step sizes or slower if the computer's CPU is overworked.

Let's turn now to the receiver's other r.f. spectrum analyser, the one that's hiding behind those two yellow buttons. This one's not a real-time scope, but a wide-band device that can scan any frequency range up to the full coverage of the receiver in steps ranging from 15.625Hz to 8kHz.

Either single-shot or continuous loop scanning is available, with the option to display Max, Min, Difference (Max-Min) and Average plots. You can set a marker at any frequency and plot signal strength relative to the level at the marker. Plots can be printed or saved to disk and recalled later to allow monitoring of long-term trends. Placing the cursor anywhere on the plot displays a read-out of frequency and signal strength at that point.

During a scan, the receiver is muted. Once it's finished, you can use the spectrum plot as a tuning control just by clicking or dragging the mouse over the display. There's also a set of buttons, which will find the highest peak or step between successive peaks. You have a choice of two display modes for the spectrum analyser: It can either extend down from the bottom of the control panel or open upwards to obscure the main panel. In this form, a basic set of mode and gain controls appears in the analyser window so you can operate the receiver from within the analyser.

Significant Feature

A very significant feature in the G313 is the introduction of an a.f. and i.f. recorder. It's i.f. recording that is potentially the biggest revolution made possible by SDR because it allows you to save a

whole chunk of spectrum and then 're-receive' any signals within it using different modes, filter settings or whatever. Leading this field at the moment is the RF Space SDR-14 which can record up to a 150kHz strip of spectrum at once. The G313 is limited to just 20kHz, even so it's quite a magical feature despite the restricted bandwidth and a slightly clumsy implementation.

Both audio and i.f. recordings are saved as WAV files which means you can play the audio recordings with just about any audio player software. Recorded i.f. obviously needs demodulation so the files have to be played back through the receiver. Unfortunately, the G313i doesn't allow the recording of the the demodulated audio from an i.f. playback, which means that you'll still need an external recorder of some sort if you want to keep audio clips. I'm not sure if there's some technical reason why this can't be done, but decoding one WAV file while playing another should be well within the capabilities of the system.

If you're recording i.f., you can play around with modes and bandwidth without affecting the recording, as that won't have any mode imposed on it until it's demodulated during playback. If you're making an audio recording, however, the mode and i.f. controls freeze up so you have to stick with the settings that were in force when you started the recording. Again, there doesn't seem to be any obvious reason for this limitation.

When you play back an i.f. recording, you have full access to all the modes, i.f. settings, notch filter, squelch and so on. Pretty much everything in fact except for the hardware a.g.c. which is derived from the incoming signal before it's digitised. The one minor bug is that the notch filter functions normally and appears as a blue band on the real-time scope just as you'd expect, but the effect of the notch isn't visible on the waveform the way it would be in live demodulation. Despite that minor point it's an amazingly useful and powerful tool.

The i.f. recordings use up about 440MB of hard disk space per hour (just over 10GB/day) while a.f. recordings need a quarter of that. With hard disks of 80GB or more as the norm now, it's quite practical to record i.f. for long periods, even overnight, and demodulate the station later.

Two improvements that would make the recorder very much more useful would be time stamping as well as multiple timers to start and stop recording. The receiver already has a clock, selectable for UTC or local time, as well as a running timer on the recordings, so it should be trivial to provide an option for continuously displaying time of day on recordings. It would make unattended monitoring very much easier.

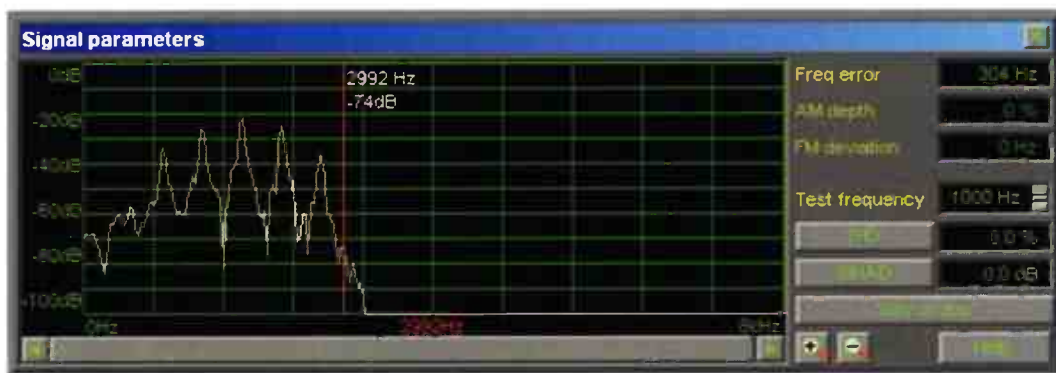
So much for a basic description of the G313i. What about its performance? Well, for a start, there's no need to worry about internal spurious or interference from the PC getting into the card. Fitting a 50 Ω terminator onto the antenna socket, I scanned the receiver from 9kHz to 30MHz with the squelch set to -135dBm (the receiver's claimed minimum discernable signal is -136dBm). The result was superb - just one peak at 32kHz stuck its head above the squelch threshold. Few receivers at any price can match that.

Sensitivity is at the high end of the range for communications receivers so high-gain antennas might well cause overloading problems. I used a Wellbrook ALA1530 broad-band loop and experienced no difficulties except with my local high power stations (I'm 15km from Brookmans Park, which carries Radio 5 Live, TalkSport, Virgin and Sunrise Radio at powers ranging from 125 to 400kW). Mixing products between these stations peppered the spectrum right up to around 3.5MHz. With the 18dB attenuator switched in, things improved considerably but a few products were still audible.

Listening across the bands from i.f. to the top of h.f. revealed no other real problems. Time and again, the finely-tuned selectivity allowed me to pull stations out of a jumble of adjacent signals in a way that not many conventional receivers could manage. It's often possible to bring the passband edge to less than 500Hz from a strong carrier before it becomes intrusive. Of course, an interfering sideband can still get through so it's no magic wand, but continuously variable i.f. together with the interactive realtime scope is an amazingly useful combination for digging out awkward signals.



● The spectrum analyser showing part of the 20m amateur band with average (yellow) and maximum (red) levels as recorded over the course of one minute.



● The Signal Parameters window lets you measure various aspects of a signal and also contains a real-time audio spectrum analyser. Here it's showing a FAX signal from Hamburg Meteo on 7.880MHz.

Listening to stations that are immediately adjacent to DRM transmissions clearly showed the benefits of good filtering. For example, BBC World Service via Antigua on 5.975MHz was being destroyed at times by Deutsche Welle's DRM signal on 5.980. On my AOR AR7030+, switching to l.s.b. made BBC intelligible, but not easy to listen to with heavy splatter from the DRM wall of noise. On the G313, results were significantly better, especially as the notch filter can be positioned to sharpen one edge of the i.f. filter even more.

With less extreme interference, even quite weak stations can be improved by switching to a.m.s. mode. I'd been unimpressed by the Synch detector on the G303, but on the newer model I find that I am using it regularly to improve both the clarity and

stability of a.m. stations. It's vastly better at holding onto a signal and, when it no longer can, it doesn't make such annoying noises. If it was sideband selectable it would be even better.

Also much improved is the audio a.g.c. (now called software a.g.c.). It still produces occasional clicks on sudden level changes, but nowhere near as often or as harshly as it used to. This was another feature that I kept routinely turned off on the G303, but use most of the time on the G313. Be prepared to spend a bit of time setting the software a.g.c. reference level, the audio level (with s.a.g.c. off) and the volume setting, as the default values may not be appropriate to whatever amplifier you use on the output. Getting these settings right makes a big difference to audio performance.

WinRADiO gives no figures for audio distortion, but subjectively I would say it's not at the hi-fi end of the scale. Its main characteristic is a quite forward and compressed sound (even without s.a.g.c.). This isn't necessarily a bad thing as it contributes to intelligibility on weak signals, but it's not ideal for relaxed listening. Comparing it against the AR7030+ (which has unusually good audio), it was clear that with a steady signal and little interference, the AOR always sounded much nicer. When the listening got tough, though, it was the G313 that held tenaciously onto a readable signal long after the AOR had given up the struggle.

On the amateur bands, s.s.b. reception also revealed the G313's ability

to get meaning out of weak signals. Again, the AOR sounded sweeter, but the G313 dug deeper. If you're listening to two-way s.s.b., this radio has another trick up its sleeve in the form of RIT (Receiver Incremental Tuning), which lets you store an offset to compensate for the two sides not being on exactly the same frequency. Once it's set, a button click tunes the receiver back and forth between the two stations.

Map The Band

Abandoning the usual tuning methods, I opened the receiver's spectrum analyser and set it to map the l.f. NDB band around 400kHz. Within a few seconds a forest of narrow spikes appeared

on the screen showing dozens of these beacons. Zooming the view to a convenient size, I was able to click between them far more quickly and easily than if I'd been tuning blind. It's that combination of simultaneously seeing and hearing the signals that is so powerful.

Because you can save or print your spectrum scans, any long term search for intermittent signals, such as numbers stations, should be very much easier. On the amateur bands, the spectrum analyser quickly provides an overview of activity across the whole band so you can tune directly to active channels. But if you're looking for signals whose carrier frequently goes on and off (e.g. amateur or some utility stations) then you should do several scans and use the Max or Average plots otherwise you'll miss any station that's off at the precise moment its frequency is scanned.

Bear in mind also that if you're using the spectrum analyser for tuning, you need to set the Resolution Bandwidth (RBW) low and the Video Bandwidth (VBW) high. I initially assumed the VBW affected only the on-screen display and not its underlying data, and was puzzled by the large frequency errors I was getting. Now, I just leave the RBW at 15.625Hz and the VBW set to 10kHz - scanning may take a bit longer but it ensures that the plot can be used for fairly precise tuning.

Digital Listening

As a change from analogue listening, I tried out the receiver's DRM Demodulator plug-in. This is available as a download from The DRM Consortium website www.drmtx.org for a price of 60Euros. Once it's installed, you'll find it in the radio's Demodulators menu (there's no room to add extra buttons to the front panel so plug-ins are always accessed through menus). When selected, it installs itself as an integral part of the radio's control panel, replacing the bandscope and associated i.f. and demodulator controls.

Everything worked well, with scrolling text or the multimedia page popping up where available and audio holding steady even when the signal/noise ratio was down to 15dB. It's undeniably impressive hearing short wave that's free of fading and audible interference, but I'm not a fan of low bit-rate audio. DRM sound is always edgy, tending to sibilant, and often sounds as if it's phasing slightly, which makes it wearing to listen to for any length of time.

That's not WINRADIO's fault and they deserve credit for ensuring that a DRM demodulator (and this one is as good as any) is available for the G313. Being able to incorporate such a radically different transmission mode with nothing more than a software download demonstrates how powerful the SDR concept really is.

Home Straight

With space running out, I should just mention some of the receiver's more specialised functions. Next to all the mode buttons is one labelled Test. When you click this it opens the Signal Parameters window where you can measure various aspects of a received signal such as frequency error (difference between the signal peak and the tuned frequency), a.m. modulation depth and f.m. deviation. It also includes a real-time a.f. spectrum analyser, which is useful for checking the frequency of tones in digital mode signals.

The Signal Parameters window also contains diagnostic buttons to let you measure the receiver's THD (Total Harmonic Distortion) and SINAD (Signal to Noise And Distortion), but you'll need a high quality signal generator to do that. If your signal generator is up to the level of a certified laboratory standard, it can also be used to re-calibrate the frequency accuracy and S-meter levels even more critically than they already are. That's probably best avoided if you don't have the right kit and expertise, but it's easy enough to restore the factory settings if you need to.

Checking WWV on 15.000MHz, the tuning error on my receiver was -23Hz, a bit more than the claimed 1ppm, but excellent nonetheless. MSF on 60kHz was spot-on, as was BBC Droitwich (which is locked to a rubidium frequency standard) on 198kHz.

Frequency stability from cold switch-on was rock-solid too with a drift of 5Hz at most and down to 1Hz after an hour. That's a level of accuracy you won't find on many receivers below £3000.

At this point reviewers often ask the question "Would I buy it?". In my case, the answer is "I already have". The G303 was an eye-opener and this model is even better. It's probably the best receiver that I've ever used and certainly justifies upgrading from the G303. But don't be put off buying a G303 if funds are tight, it's also an excellent receiver. *Those of you with a lap-top PC don't despair, as WINRADIO have just announced an external version of the G303 - see SWM Feb. 2003 for JW's findings on the G303 - Ed.*

Unfortunately, there are some disappointments such as the Noise Blanker, i.f. shift and all-or-nothing scan ranges. And there are some signs of sloppiness too. For example, when you specify either scanning ranges or Auto-Step settings, you're presented with a list of the modes that were present on the G303, not on this receiver. Such things should never have got through the software checking process. There is also a long (and growing) list of new features and improvements that I would like to see added. Fortunately, with an SDR none of these changes requires any hardware fiddling. So, let's hope that WINRADIO will live up to the promise of SDR and offer prompt upgrades to build on what is already an excellent foundation.

The WINRADIO G313i is available in the UK direct from **Radixon Ltd. Evesham Marina, Evesham, Worcestershire WR11 3XZ** Tel: **0870 446 0449** or www.winradio.co.uk and is priced **£599.95**. The optional extension to 180MHz costs an additional **£149.95**. Also available are various i.f. output and reference oscillator add-ons.

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WINRADIO's Reply

As there were some specific problems that appeared to be simple software bugs we passed a copy of the G313i review to WINRADIO. Following are comments from Founder and Managing Director, **Milan Hudecek**

The 'G303 modes list' bug you've highlighted has in fact already been spotted and fixed. A new software update will be released next week on the WINRADIO website - www.winradio.com - where the latest G313 application software is always available as a free download.

Indeed, you were detuning the receiver.

Regarding the i.f. shift, you are used to a conventional receiver i.f. shift, where the i.f. filter passband only contains one useful signal (the one you intend to listen to), hence the b.f.o. can move along with the shift.

With the G313i, the overall 'roofing' i.f. filter passband is 15kHz, and usually contains more than one signal peak - and it is indeed intended to, so that you can see as many signals as is reasonably possible inside the real-time spectrum.

So, when you grab the selected (greyed) i.f. filter passband with a mouse, you can drag it over any of the signal peaks you see in the spectrum scope, and so tune the receiver to it - by moving the filter to the signal rather than the signal to the filter. Try it in a.m. mode first (by dragging the centre vertical line of the passband), to get a handle of it. You will see that dragging the i.f. passband over a signal peak is indeed the same as if you tuned the receiver to the signal.

In the s.s.b. mode, the situation is similar, but the difference between i.f. shift in a conventional receiver and this one is that we do not shift the b.f.o. frequency together with the i.f. passband shift. The reason is that if we did this, then the b.f.o. would remain locked to that one particular signal peak, and then you could not tune to and listen to any other peak in the spectrum scope.

So, in the G313i, the 'i.f. shift' is implemented as a kind of a 'surveillance mode', which allows you to shift the passband over any arbitrary peak within the displayed spectrum and so conveniently tune the receiver to it in a graphical way.

I hope this clarifies the issue.

The 2004 International Broadcasting Convention

A report by Martin Peters from this year's Amsterdam based annual International Broadcasting Convention (IBC).

The IBC is a huge affair, showcasing the wares of over 1000 exhibitors, it sprawled over all 11 halls of Amsterdam's RAI convention centre and, this time around, attracted over 40000 visitors - a 12% increase on last year.

It's fair to say that the bulk of the show concentrates on TV content creation, i.e., studio and (post) production hardware and software, but there was plenty more for those interested in radio, too.

DRM

As mentioned in October's Ed's Comments, the Digital Radio Mondiale (DRM) consortium had a presence where they used the occasion to unveil their latest ideas and a clutch of DRM-related products.

The most exciting of these (because it's available now and it doesn't cost the earth) is the *Digital World Traveller* by Coding Technologies. This pack of cards sized device, plugs into the USB port of a PC or laptop and provides DRM - as well as conventional a.m. and f.m. reception. The supplied software permits simple on-screen station selection, and a so-called expert screen displays signal parameters.

A demonstration during the DRM press conference included perfect reception of RTL and Deutsche Welle. The price? 199 Euro + VAT - about £160.

Also on show was the world's first combined DRM/DAB tuner, simply termed a 'digital tuner', so as not to confuse the public!

An illustration of DRM reception whilst on the move had to be postponed as some of the in-van equipment had been stolen the previous night!

Added Value

Ever more countries and stations are buying into to the DRM ethic but content generally parallels that which is already available on analogue a.m. However, a dedicated Germany-based English/German-language music station is slated for a not-too-distant launch.

For added value, the BBC World Service transmissions include a

sub-stream, which downloads news headlines - in both textual and voice format - to the PC's cache. These can be called up at will with a click of the mouse.

A major threat to DRM's success is the menace posed by the prospect of Power Line Communications, that is, Internet delivery over the mains electricity system. Its widespread adoption would result in a significant increase in noise levels across the medium and short wave spectrum, ensuring DRM's strangulation at birth.

Still with digital, the DAB stand at the show was bristling with products, old and new. Due in the shops this Christmas is a range of DAB-capable radios, which are able to store programming in an on-board memory for later retrieval. Alternatively, just press the pause button whilst listening live, answer the 'phone, etc.; then continue listening on your return.

Christmas 2005 will see a more sophisticated version, developed by British-based RadioScape, whereby an Electronic Programme Guide on an I.c.d. is used to select programmes, recorded onto a card memory, which can later be transferred to an MP3 player, if desired. High quality recording consumes around 1MB per minute so a 128MB memory card will accommodate a couple of hours' listening.

Alternatively, the radio can be connected to a PC or laptop via the USB port where you can elect to record to the hard disk, enabling you to store entire series or several days' continuous output.

New Visuals

Also on show in Europe for the first time was DMB-T, or Terrestrial Digital Multimedia Broadcasting. This technology uses an extension of the Eureka-147 transmission system used by DAB and permits robust reception of television programmes on hand-held and mobile devices. As I walked around the stand, portable receiver in hand, the system looked pretty convincing.

South Korea rolls out its service later in the year. By comparison, its European counterpart, DVB-H (Digital Video Broadcasting - Hand-held) is still in its infancy.

Also looming large at the IBC (quite literally) were some truly

awesome high definition TV screens. The European system comprises 1080 lines but to take advantage, footage shot on high-definition cameras is required. Added to which, a dedicated tuner is needed to demodulate the transmissions.

High definition is becoming almost mainstream in the USA, whilst over here, only a small number of experimental transmissions over the Eutelsat and Astra satellites provide something to watch. This is set to change - the BBC is committed to producing all new programming in high definition by 2010 - so start saving now for the next big thing.

Superior Quality

Pace Micro Technology's press release included their new dedicated satellite radio receiver - available next summer. The audio quality of digital satellite radio surpasses that of DAB, but potential listeners can be discouraged from tuning in for a number of reasons. Pace's DSR210F free-to-air set-top-box is small, can share a dish with another Sky receiver and announces the station name and other details on its display. When hooked up to a decent hi-fi, the result will be outstanding.

Finally, a 3D screen, which doesn't require the wearing of special glasses, caught my eye. As I unsuspectingly walked past the stand, a vodka bottle almost literally jumped out of the screen at me. Uncanny. On closer inspection, it's a low definition display and is primarily intended for the purposes of advertising. Most effective.

What else was at the show? Well, everything - from the manufacturers of the foam pop filters for microphones with station logos, to heli-cams for hire, to virtual studios and tapeless cameras for trouble-free news gathering. Oh yes, and lots and lots (and lots) of Heineken.

If you've got more than a passing interest in broadcast media, I can recommend a visit to the show. Entrance is free for trade and the press but you can buy tickets for a few tens of Euros. Next year's shindig will be held over 9-13 September and I recommend you book your hotel now if you intend to stay overnight. For more information visit www.ibt.org

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Software CD	Nov

Don't forget we still have stocks of SWM back issues for 2004, as well as 2003, 2002, 2001 and 2000, but hurry as stocks are limited. To order back issues, please use the order form on page 78 of this issue or call the Credit Card Hotline number on **0870 224 7830**. Back issues are available for **£5 including P&P**.

MAKE SURE YOU NEVER MISS AN ISSUE OF SWM - SUBSCRIBE NOW!

In The Ed's Shack

The TVC-101 Video Controller Part 1 - The Build

Are you struggling to control your microwave video receiver card? Kevin Nice builds a superb solution to the problem of tuning and displaying the monitored frequency.

Whether you are a serious microwave video enthusiast, or if you just dabble in this interesting aspect of the monitoring hobby, you will find that using the ubiquitous far-eastern built Comtec receiver card - supplied by the likes of G1MFG - is a little tedious when it comes to selecting and determining the operating frequency. For those who don't realise, the Comtec card as supplied is tuned by the setting of p.c.b. dual-in-line pin (d.i.p.) switches and a look-up table.

This method is fine if you just want to monitor a fixed frequency for a lengthy period. Or for that matter, if you have sub-miniature fingers and think in binary. For most of us however, you need an additional unit to create the effects of the d.i.p. and display the frequency in a human readable way.

In step, the so called video controller. The purpose of the controller is to allow the operator to interact with the rather less than user-friendly receiver card. This is achieved by sending data to the receiver card's (or transmitter card if you are an ATV enthusiast), I²C bus to control the on-board synthesiser.

In my opinion, the ultimate is to mimic a v.h.f. scanner or a modern h.f. set with memories. This then provides manual tuning with a knob, direct keyboard entry of frequency, scanning of memory banks or searching in fixed steps of a chunk of spectrum.

Well known supplier of video microwave modules G1MFG used to sell a rudimentary video controller. This controller provided limited, but vastly improved functionality to the Comtec 1.2 or 2.4GHz receiver cards. We

reviewed a video receiver, which comprised a controller and receiver card in *SWM* January 2003, though this is no longer available.

Overcomes Limitations

The TVC101 controller, which is designed and sold by microwave authority **Carl Rabe G6NLC**, overcomes the limitations by providing the kind of functionality I just mentioned. Briefly this controller offers the following:

Support for both 1.2 and 2.4GHz operation and S-Band LNB operation in conjunction with a 1.2MHz receiver board, if you have one connected.

A real tuning knob for that real tuning experience and ease of use. Plus, there's a x10 step size tuning while the enter button is held down.

Soft menu operation via a large 20 character x 4-line liquid crystal display.

Four Independent, fully programmable v.f.o.s - two for receive and an additional two for transmit. Each v.f.o. has independently programmable step sizes from 250kHz to 10MHz.

Up/down variable speed and step size band scanning between programmable limits with pause and stop functions.

A sensitive Video Detector with programmable video sync. detect time. There are eight memories that store all v.f.o. information. The memories can be scanned and there's the ability to skip locations.

Easy scrolling menu selection of functions and programming options

The band edge limits are programmable for both receiver and transmitter with i.f. offset on the receiver.

The TVC101 also provides relay outputs for controlling a video recorder's Start and Stop functions. The control actions are confirmed with an audible beep. The power supply required is a convenient 12V d.c. All the operating parameters are automatically stored in non-volatile memory when the TVC101 is powered down so, you can carry on just where you left off, just like a real radio!

The Kit

My first thoughts are that this is a very well put together package. The materials are all

supplied in a 200mm square self-seal bag with groups of items bagged together inside. Bulky connectors, p.c.b. headers, knobs and a large capacitor (C20 - 4700µF) are bagged together, as are the discrete resistors and capacitors. Likewise there's a bag of semiconductors, one of nuts, bolts, washers and spacers, one for the switches and relays. The rotary encoder is supplied in its own packaging, as is the liquid crystal display module. Finally, the professional grade, double-sided, PTH, silk-screen printed p.c.b. featuring solder resist mask both sides is sandwiched by the controller, magnificent front panel label and connector function label. This whole kit just oozes quality and professionalism.

The supplied documentation could not be more complete. I am reminded of my time in the electronics manufacturing industry. Actually, this package put some professional build schedules to shame - it really is a credit to those who put it together.

The kit is supplied with a plastic sloping case to house the finished assembly. Another brilliant touch.

There is however, a potential problem. The lid/front panel needs drilling and the display aperture has to be cut out. This doesn't have to be a problem if you happen to have the tools or you know someone who has. But, it will limit the number of people who buy this kit with confidence in my view. That said, the spectacular aforementioned label, which is a multi-layer self-adhesive affair featuring both back-printed legends and a clear window for the display, will mask any small errors. Again though, the suppliers have done well to avoid such mishaps, as there are detailed 1:1 scale dimensioned drawing of the hole and cut-out positions included in the package. This proved to be very useful indeed. Rather than mark out the panel to be drilled, I cut out the drawing and fixed it to the case sloping front. This greatly simplified making out. I simply used a scribe to mark through the template. Once this was done I drilled all holes including the corners for the display aperture. Surprisingly, there were no centres marked on the drawings.

Building It

Enough of the mechanical details. The electronic assembly was pretty straightforward. Made so by the outstanding 8-page build

instructions.

I just wish my eyesight was as good as it was 25 years ago when I was doing this all the time! I just have to use a magnifier these days if I'm to identify the components correctly. A word of caution to those who are not comfortable about soldering fine pads in tight spaces. This is not a kit for you. I ended up filling one of the i.c. socket vias when soldering the adjacent s.i.l. resistor pack so that had me reaching for my trusty RS solder sucker from the years when I could see fine detail properly. The p.c.b. assembly exercise took about five hours from opening the packet to powering up the board for the first time. In all it was a pretty uneventful affair, no dramas, no mismatch of material or instructions! A real pleasure to build.

The final part of the assembly process involves ensuring clearance between the l.c.d. module and the wire side of the p.c.b. As it's mounted on 3mm spacers there is a good risk of short circuits. It is necessary to bend eight metal tags flat on the module and closely crop the soldered ends of components in the vicinity.

I took much care in this area but still had a paranoid fear of shorting. So much so, that when applying power for the first time and observing no display I had that pit of the stomach dismay. It wasn't helped by my 40A bench p.s.u. choosing that exact moment to mess around.

This had me re-examining the space between the main p.c.b. and the display module. I powered the board back up with the two unbolted and separated as much as possible. This time, I placed an ammeter in series with the power lead and discovered that the unit was drawing 68mA, i.e. the correct nominal amount. Hmm! Still no display activity though. Then it dawned on me. The preset, RV4, is used for setting the display contrast. It is normal that these components are shipped in their mid-way setting. I turned the pot through its range and 'hey presto' right at one end of the travel of RV4 the display became readable. What a relief!

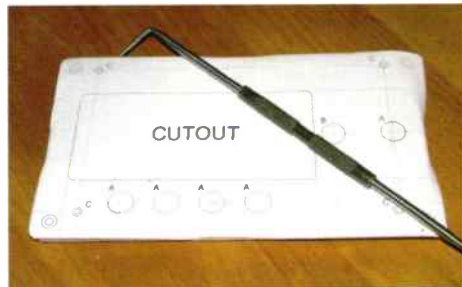
I then reread the paragraph that explains how the EEPROM needs initialising - obvious if I'd thought about it - it certainly explained the odd display characters that again raised my concerns. Procedure completed, we're ready for next month's look at how the TVC101 performs. See you then.

continued next month...

More details of the TVC101 are available at:
www.atvcontroller.dsl.pipex.com The TVC101 kit cost £95 plus £3.50 P&P



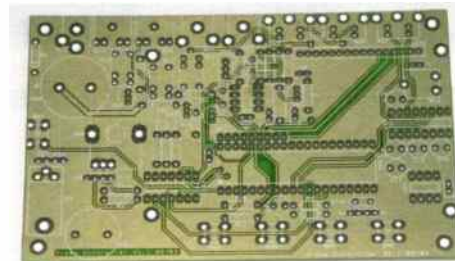
● The complete kit of parts.



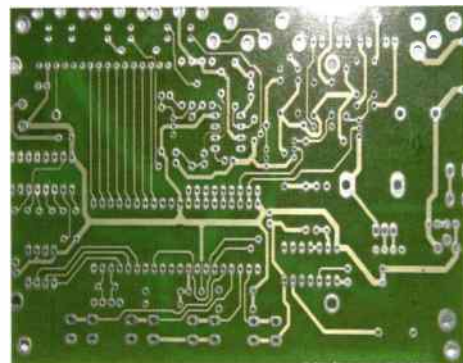
● The case lid needs drilling and cutting. I've used the supplied drawing as a template.



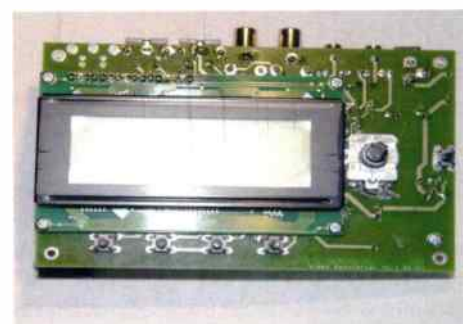
● You can use a hand-drill but it's easier if you have the use of a pillar drill.



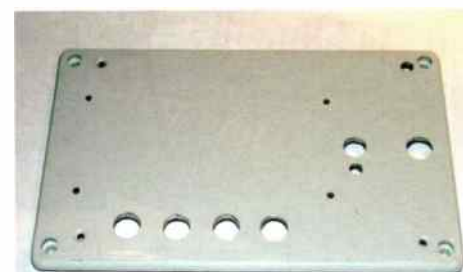
● (above and below) A top quality professional p.c.b. is at the heart of this video RX/TX controller.



● Five hours of assembly gives you this...



● ...and this.



● The lid after drilling all the holes. Note the problem top right!

WR-G313i

High Performance HF Receiver

- 9 kHz-30 MHz frequency range (optionally extendable to 180 MHz)
- Software-defined DSP demodulation
- Excellent sensitivity
- High dynamic range
- Continuously adjustable IF bandwidth
- Excellent suppression of internal spurious
- Real-time spectrum analyzer
- Graphical IF shift and notch filter
- Noise blanker
- Audio and IF recording and playback
- Test and measurement facilities



The WinRADIO WR-G313i receiver is a software-defined high-performance HF receiver (9 kHz to 30 MHz, optionally extendable to 180 MHz) on a PCI card. The front-end is a DDS-based double-conversion superhet, the last IF stage is implemented in software resident in the on-board DSP.

This receiver is intended for government, military, security, industrial, surveillance, broadcast monitoring, and demanding consumer applications.



The receiver is extremely sensitive, making it possible to comfortably read CW signals well under -130 dBm input level, yet featuring a respectable 95 dB dynamic range making the receiver resistant to strong signal overload.

The high sensitivity is also matched by that of the S-meter: The calibrated S-meter shows the received signal levels in dBm, μ V or S-units, down to the receiver noise floor. The IF bandwidth of the receiver is continuously adjustable from 1 Hz to 15 kHz, in 1 Hz steps.

Several WR-G313i receivers can reside in a single PC (as many as there are free PCI slots), which provides an ideal solution for high-performance multi-channel surveillance and monitoring systems.

As the last IF and demodulation processing are entirely software-defined, this means that additional demodulation or decoding modes can be easily added by a mere software change.

In addition to audio recording, the receiver can also record a 20 kHz wide spectrum at the IF level, making it possible to thoroughly analyse a signal, and experiment with a weak signal with different filter settings for the best results.

Apart from the antenna and audio interface or power supply, the receiver is a complete package. Every modern PC can handle this powerful receiver.

Check out our latest "G3" software-defined receivers to find out why users and reviewers are raving about them!
<http://www.winradio.co.uk/g3>

Distributed in the UK by:

Radixon Ltd.

Evesham Marina, Evesham,
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Tel: (0870) 446 0449

Email: info@radixon.co.uk

WinRADIO

www.winradio.com
World Radio History

Digital Radio European

There can be few people in Europe who aren't aware of digital broadcasting - be it digital terrestrial television, digital satellite or DAB radio, bits are in these days, when it comes to entertainment. For example, recent reports suggest that more than 50% of the UK public is now receiving digital television in their homes. Jason Walsh looks at a lesser-known digital broadcasting technique already in use - DRM.

Amid the fuss over DAB, DTT and digital satellite, another digital broadcast technology has quietly debuted: DRM, Digital Radio Mondiale. Radio enthusiasts, like readers of *Short Wave Magazine*, are all well-aware of DRM, but what about the European listening public?

With the possible exception of north America, which also has so-called 'XM' satellite radio, Europe is the most saturated radio market in the world.

Traditional broadcasts on short wave, long wave, medium wave and f.m. sit alongside radio delivered by cable and now DAB and through digital television platforms. Any household in Europe can now access literally thousands of radio stations. When Internet radio is factored in, you have a diversity of voice that would make Ronan O'Rahilly blush. For once this isn't an issue of radio spectrum capacity, it's about the ability of an entirely new technology to find a place in the lives of media-saturated Europeans.

International Digital Radio

The basic concept behind the DRM system is, according to the DRM consortium, to "propel the a.m. broadcasting bands below 30MHz - short wave, medium wave and long wave - to the next level". In practice this means that DRM is a universal, non-proprietary digital a.m. radio system, which offers near-f.m. quality sound on the a.m. bands.

DRM is a fine technical achievement, but can it survive when faced by the reality of the European marketplace?

Sirrol Evans of the DRM consortium thinks so: "DRM is a complimentary technology to DAB - they're not in competition".

This is a laudable sentiment, but the reality is that most listeners simply do not care how they receive radio signals - what they do care about is receiving good programming in



● **Andrew Buckhurst**, senior vice president of external communications and investor relations at RTL.



high-fidelity with the minimum of grief and hassle. The halcyon days of radio, when people would go to all sorts of lengths

to receive radios Caroline and Luxembourg are long gone. If the public feels that it is already well served by DAB and f.m. radio, DRM will flounder. If however DAB and f.m. have not brought enough variety to the airwaves, DRM could carve a niche for itself.

The DRM specification calls for exactly the kind of end-user system that we're already familiar with through DAB and DTT: users will find that listening to stations broadcasting on short wave will be a simple matter of pressing a button.

Of course, radio enthusiasts are an altogether different audience, as **Jonathan Stott** from BBC Research and Development pointed out, "Ultimately the interface is down to the manufacturer of the radio and therefore enthusiasts

continued on page 42

DRM

ML&S martin lynch & sons

Suppliers of Communications Equipment

For full specifications and more detailed information (including PDF's) on ANY of the equipment listed,

Outline House
73 Guildford Street
Chertsey
Surrey KT16 9AS

new icom IC-R20 "dualwatch" receiver



Aimed as the successor to the IC-R10, the IC-R20 has many advanced features incorporated into its clean stylish design including dual watch: built in digital (audio) recorder function: wideband coverage in all modes: high speed scan capability and a standard Lithium Ion battery. The IC-R20 will appeal to such users as scanner hobbyists, security/surveillance companies, government agencies and other professional users.

Specifications:

- Total of 1250 memory channels
- Standard Lithium-ion battery that allows up to 11 hours of continuous receive capability (FM mode, single receive)
- Operation and charging from an external power source
- Built-in ferrite bar antenna for AM and earphone cord antenna for FM broadcasts
- Noise reduction functions.
- VSC, CTCSS and DTCSS tone squelch
- Useful bandscope
- Optional CT-17, CI-V controller for PC remote control

- Dial speed up function: When rotating the tuning knob rapidly, the tuning speed automatically speeds up.
- Scan pause setting (2-20 seconds and hold) and scan resume (0-5 seconds and hold) setting.
- Auto power off (30-120 minutes and busy). Busy setting turns off the IC-R20 when signal is received for 3 minutes.
- Various key lock functions. All. No SQL. No VOL and Normal lock settings.
- Rotary selector and up/down buttons are reversible.

Accessories:

- BP-206 (Spare) LI Battery pack.....£39.99
- CP-18 Cigarette lighter plug and cable.....£19.99
- CS-R20 Cloning Software for IC-R20 comes with USB lead and CD Rom. Windows 98, ME, 2000 & XP.....£45.18
- CT-17 RS-232 computer interface.....£99.99
- SP-13 Personal earphone.....£9.95

For further details please see www.hamradio.co.uk

handheld scanners



ICOM IC-R5

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

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The Scanner that transmits! Covering 100kHz - 1300MHz AM/FM/WFM plus SSB (100kHz - 470MHz) with Lithium Ion battery and Charger plus Transmit (8 Watts) on 2 metres and 70cms. An ideal scanner for radio amateurs!

PC Programmable. Requires PG-4P at £31.95

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NEW LOW PRICE



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YAESU VR-500

100kHz-1300MHz AM/FM/WFM/LSB/USB/CW. This amazing little scanner is an ideal pocket communications receiver with keypad entry!

PC Programmable. Requires ADMS-3 at £39.95

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MAYCOM FR-100

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MAYCOM AR-108

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

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Icom technology brings you wide band, all mode coverage from 100kHz to 2GHz. The IC-R8500 includes SSB (USB, LSB), CW, AM, FM and WFM modes. The IC-R8500 is not a scanner - it's a professional quality communications receiver with versatile features from high speed scanning to computer control.

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For further details please see www.hamradio.co.uk

The ML&S Open Day - 4th December

For more details nearer the time, check it out under 'News' on our web-site.



To celebrate the fourth London store that Martin has opened, make a date in your diary for this very special one-day Saturday Bonanza. The main distributors will of course be there and we are trying to arrange a boot sale in our HUGE car park to the rear of the building. We know it's a bit chilly in December but if you have a ton of bits and pieces, load up your car and bring it down to the new ML&S site. No charge for display and FREE Hot coffee for everyone! Spaces first come, first served.

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World Radio History

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This amazing desktop scanner is the only scanner to offer true dual receive. Coverage is from kilohertz to gigahertz offering all modes and has optional DSP for enhanced shortwave reception.

**SAVE
£235!**

- Frequency coverage: 100 KHz-2599.99998 MHz
- Modes: CW, LSB, USB, AM, AM-N, WAM, FM-N, WFM
- Real time band scope
- DSP Bandpass, notch and noise reduction filters (optional)
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- World Clock
- Digital Voice Recorder
- Case Size: 180 (W) X 70 (H) X 203 (D) mm
- Weight (approx): 1.9 kg

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VR-5000+3

- DSP-1 Digital Signal Processor £94.95
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- DVS-4 Digital Voice Recorder £29.95

Total RRP: £864

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or 36 x £22.87

- Or 'bare-bones' VR-5000....Only £489.95

JRC NRD 545

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Features

- Digital Signal Processing by One-Chip DSP
- Wide-Band (30 to 2,000MHz) Converter Unit (Option)
- Remote Control by Personal Computer

Specifications

Frequency range: 0.1 to 29.999999 MHz
 Type of reception: USB, LSB, CW, RTTY, AM, FM, WFM (with option board installed)
 Frequency memory: 1,000 channels
 Receiving system: Triple superheterodyne
 Image rejection: 70dB or more
 IF rejection: 70dB or more
 Dimensions: 330W x 130H x 285D (mm)
 Weight: Approx. 7.5kg

Available from stock at only £1395

or 48 x £41.28 p/m.

Accessories

CHE-199 30MHz-1999MHz internal converter	£299.95
NVA-319 Matching deluxe filtered speaker	£179.95
RS232 Interface	£64.95
TCXO High Stability Reference oscillator	£89.95
PC-545 Controll Software	£9.95
ST-3 Deluxe headphones	£79.95

AOR 5000A

FREE PSU!



This is the finest communications receiver AOR have produced and has all the features needed for Commercial users and Scanning enthusiasts. There is also The plus version with extra enhancements. Offering good short wave reception as well as excellent VHF/UHF performance. With FREE PSU. PC Controllable.

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AOR SDU-5600



ML&S £979

Enhance your monitoring with visual spectrum and waterfall displays of activity up to +/-5MHz from the centre frequency, updated in real time up to six times per second. A range of receivers are supported including the AR-ONE, AR5000, AR3000A, ICOM R8500 and many others. An RS232 port is also provided for PC control.

AR-8600MkII



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Buy Now Pay Autumn 2005!

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ML&S PRICE: £279

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ARA 100 HDX	£349.95
ARA 200 HDX	£349.95
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New discone to clip on top of any bnc scanner
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NEW! GDH-50

Wide Band Discone

TX: 50/144/432MHz @ 50W

RX: 50MHz - 1500MHz

Length: 1360mm

Weight: 910g

Diameter: 530mm

Suitable mast: 60mm

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Will also work on 2M & 70cms TX(50 W)

Magnetic Long Wire Balun.....£19.95

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This Amazing Antenna at only

55 inches long is an ideal

companion for any receiver

covering 600kHz - 460MHz.

PRICED **£129.99**



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Entry Level DSP Noise Cancelling Speaker for AM & FM Reception

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The new address is Outline House, 73 Guildford Street, Chertsey, Surrey, KT16 9AS and it's located between junctions 11 & 13 of the M25. By car, it's just 1.2 miles from junction 11 or you can come off at junction 13 (Staines turn-off) and follow the signs to Thorpe Park. Follow the first sign past Thorpe Park to Chertsey Town Centre then, after a sharp right bend, Guildford Street is on the right. It's split into three sections and if you enter the street from the Windsor/London Street end, you turn right opposite the Royal Mail sorting office.
 By rail, Chertsey Railway Station is literally only 800 yards away in the same street.
 By plane, Heathrow is just 6 miles away.



will be catered for as well as people who just want to push the button and listen to the programmes. One interesting possibility would be that this could be done with the same equipment".

The flexibility to which Stott points, is one of the key reasons for changing to any digital platform. Bits are, by their very nature, almost infinitely malleable. This allows not only for different receiver interfaces, but also the fact that the DRM signals are malleable themselves. DRM audio can be broadcast in four different modes of robustness suitable for different kinds of broadcast (music, speech, etc.) over

different distances. Included alongside the signal will be data and text such as programme information or news. This additional content can be displayed on receivers, further enhancing the listener's experience.

In the initial period, the main market for DRM receivers, and indeed DRM stations, will consist of non-traditional listeners: enthusiasts, expatriates and the third world audience.

These audiences tend to go for the big international broadcasters and it comes as no surprise to see Radio France Internationale, Deutsche Welle, the Voice of America, Vatican Radio, Radio Kuwait and the BBC all already broadcasting DRM signals.

Indeed, international broadcasters from Tunisia, Germany, China, the United States, Finland, the UK, Japan, Spain and Australia are all represented in the DRM consortium. Whilst commercial broadcasters solely concerned with the bottom-line may take some persuading, publicly-funded international broadcasters have been able to invest in developing and improving DRM without terrifying shareholders with tales of an unproven technology. What they bring to DRM as a platform is not just programming - more important than that is the rock-solid credibility of broadcasters like the BBC, DW, RFI and VOA. What they won't bring is massive European audiences.

The international and public-service broadcasters are more or less certain to make use of DRM, but the technology will only be a success if the public take up the platform, and the key to that is going to be commercial broadcasts.

Commercial Interests

One major commercial broadcaster in Europe seriously looking towards DRM is Radio Télévision Letzebürg. Despite Radio Luxembourg itself finally ceasing transmissions in English in 1992, and again closing their Atlantic 252 long wave station, co-owned with the Irish public service broadcaster Radio Téléfís Éireann, Radio Luxembourg, or rather the RTL Group, remains one of the largest commercial broadcasters in Europe with interests ranging from the

German television network RTL, to M6 in France and Five in the UK. As well as this, RTL also own a raft of other television and radio station across Europe, notably in the Benelux, France and Germany.

Andrew Buckhurst, senior vice president of external communications and investor relations at RTL, is enthusiastic about the possibilities of DRM:

"RTL is a member of the DRM consortium, and we're already broadcasting in DRM to France, call it a test-transmission if you will, but it's already on the air and we have plans to do the same in Germany next year".

What about the possibility that the European radio market is saturated at the moment with the existence of analogue, DAB, Internet and satellite radio?

"In terms of the end-consumer, the technology is not an issue. What we want to see is radios that pick up digital signals regardless of whether that signal is DRM or DAB.

"It's not about the technology in that sense, it's about making sure that we all participate in a digital world".

A combined DAB/DRM receiver is almost guaranteed to be developed, but none are available at present. The most common way to listen to DRM right now is through a computer connected to a receiver, however standard radio equipment is already available. The Germany-based Mayah Communications currently manufacture a receiver called the DRM 2010, see *SWM Dec. 2003 - Ed.* Looking not unlike a small, portable short wave receiver the DRM 2010 can receive MPEG4 AAC and AAC+SBR encoded signals in all

four robustness modes, alongside traditional analogue a.m. signals in the long, medium and short wave bands, as well as analogue f.m. stereo. Meanwhile Thales, Telefunken and Nautel are all producing DRM-capable transmitters.

Buckhurst is clearly enthused by the possibilities of DRM: "Well, RTL is probably the leading commercial broadcaster in the DRM consortium. Many of the other participants are international and public service broadcasters like Europe 1, Deutsche Welle and the BBC, but the opportunity is there".

SWM asked if RTL is likely to launch new European services exclusive to DRM: "At present we're doing simulcasts. That's where we are right now".

On the question of market reception Buckhurst notes a chicken-and-egg situation: "The question is do we broadcast now and offer the listeners DRM programming, or do we wait until there are more DRM-enabled radios out there?"

Either way, RTL has clearly made a commitment to the technology unmatched by other commercial broadcasters.

Meanwhile there are other commercial stations closer to home who stand to benefit from a successful digital platform on the a.m. bands. In the context of the UK, the key opportunity is likely to be for Virgin.

Virgin Radio launched with an a.m. signal on 1215kHz back in the early 1990s but has failed to obtain any f.m. licences outside of London where it broadcasts on 105.8MHz.

The mono a.m. broadcasts are far from ideal for a music station and Virgin has been attempting to get a stereo signal out by any means necessary. Thus far Virgin has experimented with satellite and cable radio and Internet streaming.

At present Virgin also broadcast on DAB as part of the Digital One multiplex, but coverage is not quite nation-wide. Virgin's DAB signal now covers great swathes



of the UK, but there are notable blind spots including in Northern Ireland, Wales, Scotland and parts of the north of England. Clearly Virgin could stand to benefit from the success of a digital a.m. platform, and they're not the only broadcaster.

"There are opportunities for off-shore broadcasting to the UK" said Andrew Buckman of RTL. "We would certainly consider English-language broadcasts".

Unsurprising sentiments - apart from having broadcast into the UK from both Luxembourg and the Irish Republic in the past, RTL, in the guise of CLT-UFA, bid to obtain a UK licence for 279kHz long wave.

Long Odds

One major benefit of DRM could be to bring the long wave frequencies back into common use. A much-maligned part of the radio spectrum, long wave's low-frequency ground wave is ideal, not only for international broadcasting within Europe, but also for DRM, as Jonathan Stott from the BBC points out: "Ground wave propagation is much easier to deal with from the perspective of DRM. A lot of work has gone into getting the sky wave to work properly. Of course, it does now, but the ground wave was less of a challenge".

Two long wave frequencies immediately spring to mind as interesting: 252 and 279kHz.

The frequency 252kHz is operated by the Irish public service broadcaster Radio Téléfís Éireann, but has been used for commercial purposes in the past, notably the failed sports-talk station TeamTalk 252 and before that, the RTÉ/RTL joint venture, Atlantic 252.

Atlantic 252 is a particularly instructive example. Launched on 1 September 1989, Atlantic 252 developed a significant listenership throughout the 1990s, in the end failing only through poor commercial decisions and some signal quality issues in the south-east of England. Although a technology cannot stop bad judgement, DRM has the potential to forever smash the perception of long wave as having poor fidelity.

RTÉ has been using the 252kHz frequency to carry Radio Éireann (RTÉ Radio One) since late, un-lamented, TeamTalk 252 folded. This allowed RTÉ to close its Tullamore medium wave transmitter in July 2004 for the first major repairs to its mast in thirty years. However, the Tullamore site will go back on-air as this edition of SWM hits the shelves. RTÉ showed no interest in the long wave frequency when it was awarded to Ireland in 1978, so only time will tell if RTÉ plans to stay on this frequency.

279kHz was provisionally awarded to Isle of Man International Broadcasting PLC in 1999. Based in Ramsey on the Isle of Man, Isle of Man International Broadcasting plans to launch a music service on the frequency called Music Mann.

Current plans for the Music Mann service call for an analogue transmitter with a power of 500kW. The station believe their analogue signal will reach as far as Paris, Brussels and Amsterdam and plan to augment this by broadcasting on satellite and short wave. Of course, the radio world doesn't stand still and since the licence was awarded in 1999 DRM has become a reality.

Music Mann has been somewhat bogged down in legal challenges to the award of its licence from local residents.

Whether this is genuine concern about the effects of the transmitter such as noise or non-ionising electromagnetic radiation or simple NIMBYism is hard to know.

Had IoMIB not faced a legal challenge it is likely that Music Mann would already have commenced broadcasting, however IoMIB intends to begin test transmissions toward the end of this year. In April 2004 IoMIB won a judgement in its favour in the Manx High Court.

Paul Rusling, Music Mann's chief executive told SWM, "We are looking at DRM but we will launch with analogue double-sideband".

Rusling is interested in the technology, but has concerns about the market reception, and indeed size of the potential digital audience: "DRM will certainly give long wave and short wave a boost and we will commence broadcasts in DRM when receivers become generally available.

"The companies who have sunk their shareholders money into DAB are now getting excited as they hope to break through the 1 million receivers barrier in the next few months - but that's less than 1% of all radios in the country. Long wave, by contrast is already on about 75% of all radios, so we are rather more excited by that and the huge wide area coverage that's possible".

That said, Music Mann's management team includes luminaries from Radio Luxembourg, Scottish Radio Holdings and their director of engineering, **Derrick Connolly**, served on the DTI Broadcast Specification Committee and other

industry bodies, so it seems unlikely that the ambitious broadcaster would ignore the possibilities of going digital.

Waves Of The Future

It seems clear that DRM is a technology to be reckoned with but its success is far from guaranteed. International broadcasters will use it to send higher-quality signals over short wave, but the success of this kind of initiative will be dictated by the availability of low-cost DRM radios, particularly in the third world. On the other hand, broadcasters like the BBC World Service have a history of exploiting new technologies - sometimes at the expense of traditional broadcast methods.

These are tough times for international broadcasters and perhaps the greatest success of DRM would be for it to ensure that the short wave bands are not slowly abandoned in favour of satellite, DAB and f.m. rebroadcasts. Perhaps unsurprisingly, no-one at BBC Research and Development or the BBC World Service was willing to speculate on the possibility of DRM allowing short wave signals to aimed at the North America to be resumed.

As far as DRM's potential for commercial success goes, it will be dependent on the ability of the public to buy suitable receivers and the broadcasters ability to provide popular programming.

Sirol Evans and Andrew Buckhurst show that clearly both the DRM consortium and RTL have this in mind: equipment manufacturers must produce and market easy-to-use radios capable of receiving all digital signals, regardless of whether they're DAB or DRM.



SWM

Infoⁱⁿ Orbit

● **Lawrence Harris** 55 Richville Road, Shirley, Southampton SO16 4GH
● **E-mail** info.orbit@pwpublising.ltd.uk **Web Site** www.astronomer.plus.com

There's never a dull month with the weather satellites! This edition includes the background to the event that knocked out *METEOSAT-8* for a few days in early October. I am indebted to the Helpdesk staff at EUMETSAT for their provision of internal documents to help unravel the events of that week. The latest progress with *METOP* is described and a new feature on the American scene seems appropriate as explained later.



● **Fig. 1: The MSG satellite - in good hands**
(picture courtesy EUMETSAT 2004).

METEOSAT-8 Rescued!

Monday morning, 4 October (coincidentally an anniversary of the launch of the world's first satellite) and *METEOSAT-8* data stopped. Like others, I spent some time checking out my dish and its electronics, receiver and computer. Outside, I connected up my satellite finder kit to the dish and found that just moving my hand in front of the dish proved the presence of the signal.

By an amazing coincidence, there was a problem with my computer. The software had decided to look at the unused DVB PCI card instead of the USB receiver and of course there was no signal. I confess that it took me over an hour to discover this software problem, but after changing back to the USB receiver, there was still no data. Later I received the *METEOSAT-8* update:

"Due to a technical anomaly on *METEOSAT-8* spacecraft at 0615 Monday 4 October 2004,

all the SEVIRI services as well as GERB and Search & Rescue services from *METEOSAT-8* were interrupted". SEVIRI of course refers to the imaging telescope and associated system that produces HRIT and LRIT imagery.

Later notices repeated the same phrase and it became clear that something unexpected had happened. "The result of the preliminary analysis of the consolidated timeline of events was that the most likely cause is a power transient, triggering an automatic protective general de-configuration of the spacecraft. The symptoms clearly indicate an anomaly not previously observed on the spacecraft.

The work of the EUMETSAT Operations team focused on operational procedures to ensure the spacecraft's safety. These procedures were completed successfully on the Monday evening at 1630, giving initial confirmation to the conclusion of the initial investigations". On the Tuesday, "a detailed



● **Fig. 2: Arne van Belle setting up *METEOSAT-8* reception.**
Note the small dish size.

timeline for the procedure to return the satellite to its operational configuration was established and subsequently, the start of the return to nominal *METEOSAT-8* operations was authorised. The spacecraft platform has been successfully reconfigured". On Wednesday, the plan was to reconfigure the payload, including SEVIRI.

We (the users) have to remember that prior to launch, many possible failure scenarios are

anticipated and detailed notes written about their identification and rectification. Spacecraft designers incorporate a 'safety' mode to which a spacecraft is designed to enter whenever certain parameters reach critical levels.

The all-British scientific satellite *Ariel-6* (UK-6) had this experience (or rather our team did!) when, on one occasion, we found everything switched off except for the beacon. Recovery procedures are then followed, ensuring that all on-board systems are functional. There is always the possibility that a system failure might damage some equipment.

Consequently, the exact duration of recovery operations is difficult to estimate due to the nature and type of the spacecraft's automatic reconfiguration. For *METEOSAT-8*, being in the eclipse season, care had to be taken that the spacecraft configuration finally achieved at the end of the day would be suitable for the forthcoming eclipse. By the time the systems were re-activated, SEVIRI had been without thermal regulation for an extended period of time, so this was also a factor.

Following the successful reconfiguration of SEVIRI and the communications payload, images of near-nominal quality once more became available from *METEOSAT-8*. Dissemination via EUMETCast started just a few days later with the 1000 repeat cycle. Search & Rescue was re-activated and re-activation of GERB was scheduled. That process completed recovery from the automatic spacecraft de-configuration (safe mode) that had taken place. The cause of the anomaly was still under intensive investigation by EUMETSAT with the support of Alcatel Space and ESA ESTEC.

"The deconfiguration experienced was one of the most complete possible, and would normally be associated with an on-board subsystem failure with possible associated spacecraft safety impact. However, so far the complex re-configuration process has not

revealed permanent damage to any spacecraft subsystem".

The benefit of subscribing to *METEOSAT-7* images on the EUMETCast transmission from *HotBird-6* became evident during this period. With *METEOSAT-8* HRIT and LRIT images unavailable for those days in early October, *METEOSAT-7* was an excellent substitute. *METEOSAT-6* and *METEOSAT-7* images remained available throughout the *METEOSAT-8* outage. EUMETSAT point out that when the full MSG system is available after the launch and commissioning of

MSG-2, the in-orbit spare MSG spacecraft would be activated in the event of such a failure occurring on the prime spacecraft, minimising the operational service outage.

There had been some concern that the GERB (Geostationary Earth Radiation Budget) instrument detectors might have been put at risk during the spacecraft shut-down, but the rapid reaction of the GERB team at EUMETSAT to put GERB in a safe configuration following the shut



● **Fig. 3: Rob Hollander explaining the QFH antenna used for a.p.t. reception.**

down may have saved the day - the detectors appear to be operating normally.

My E-mails to EUMETSAT requesting more detailed information about the nature of the problem went astray, but **Pamela Schöbel-Pattiselanno** of the EUMETSAT User Service very kindly responded to a differently addressed E-mail. She

explained the nature of the original problem and kindly forwarded some relevant internal communications on which the preceding notes are based. My grateful thanks for all the information! I plan to include a picture of the EUMETSAT Helpdesk team when one becomes available.

Dutch WXSAT Activities

David and Cecilia Taylor attended the Dutch group Werkgroep Kunstmanen's September meeting in Utrecht. David kindly provided me with details of the meeting's events and the pictures shown here.

"After the short business section, several of the group gave informal reports on the status of their projects. **Arne van Belle** described *METEOSAT-8* reception, processing and animation using just a single 400MHz PC - albeit with some very careful optimisation! **John Tellick** briefed members on the latest from EUMETSAT and **Francis Bell** spoke about the GEO group and its progress so far.

David Taylor described some of the newest data from EUMETCast - the Sea-Ice and Sea-Surface temperature data. After lunch, there was a chance for members to discuss informally. David commented "Many thanks as well to the members of the Werkgroep Kunstmanen for making us so welcome, and allowing the intrusion of the English language into their meeting!"

The meeting was well attended and the very practical theme - particularly the miniature receiver - is evident in these pictures.

METOP Progress

Europe's first polar-orbiting meteorological satellite - *METOP* - is now scheduled for launch at the end of 2005. EUMETSAT awarded the contract for launch of the satellites to Starsem, the European-Russian joint venture company. The state-of-the-art design of Europe's *METOP* satellites include new instruments.

The Service and Payload Modules of the first satellite were successfully fitted together at the industrial contractor Astrium, in Toulouse, France in readiness for the start of satellite-level tests. These tests on the prototype satellite were successfully completed in June. Tests on the payload continue until the end of July 2005,



● **Fig. 4: David Taylor demonstrating his software.**

when the flight acceptance review ends and the launch campaign begins.

METOP - Meteorological Operational satellite - forms the space segment of the EUMETSAT Polar System (EPS). The EPS Programme, in co-operation with the National Oceanographic and Atmospheric Administration (NOAA) of the United States, includes a series of three European polar-orbiting satellites that will measure atmospheric temperature and moisture.

Some of the *METOP* data - that from the European instruments developed by EUMETSAT - is likely to be encrypted. **Wayne G. Winston**, the Direct Readout Coordinator of the Direct Services Division, NOAA, points out that in order to comply with US policy, US instruments flying on *METOP* (and that, significantly, includes AVHRR) will not have encrypted data streams.

John Tellick of GEO advises that *METOP* data - both LRPT and AHRPT - will be encrypted, but amateurs should have access to that data under the same conditions as for the MSG LRIT/HRIT data access policy (now EUMETCast data access). *METOP* data is expected to be

included in the EUMETCast data stream in the future.

The American Scene

The American magazine *Monitoring Times* recently ended its coverage of satellite monitoring and mine was one of several columns dropped, after running for many years and despite the significant changes now taking place in this field. I am not aware of any American magazine covering WXSAT activities, so for American readers of *SWM*, I plan to include specific coverage of items related to USA weather matters, because *SWM* is available in the USA.

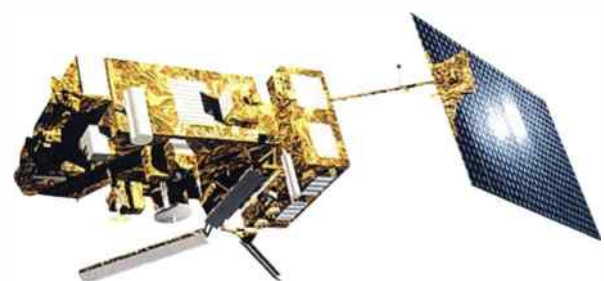
NOAA has organised the 2004 Satellite Direct Readout Conference to be held on 6-10 December in Miami, Florida. The purpose of this Conference is to continue discussions initiated during the 2002 Satellite Direct Readout Conference for the Americas and to expand the scope to include all users world-wide.

This year's Conference theme is: "A Decade in Transition". The goal is to meet users who receive data directly from NOAA's environmental satellites and provide a forum to help them prepare for upcoming changes as NOAA transitions into new technologies for direct broadcasts. The Conference program has been published and I hope to include a summary of the proceedings at a

future date. Meanwhile, as a tribute to NOAA's unparalleled record of WXSAT operations achievement, I have dug out **Fig. 7**, showing a TIROS satellite prior to launch, all those years



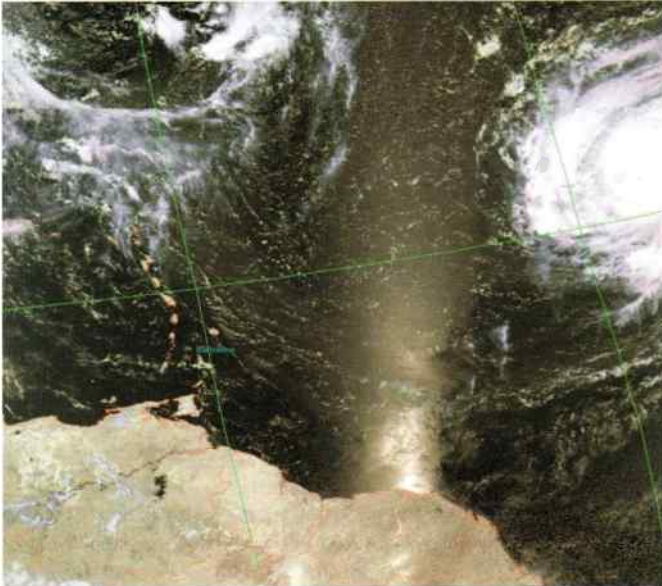
● **Fig. 5: Miniature METEOSAT-7 receiver from Jaap Rusticus.**



● **Fig. 6: METOP - Europe's polar satellite making progress (courtesy EUMETSAT 2004).**



● **Fig. 7: Where it all started: TIROS 1V on the launch pad at Cape Canaveral, Florida in February 1962.**



● **Fig. 8: NOAA-1719 September from David Brooks, Barbados.**

David Brooks of Worthing, Christ Church, Barbados, West Indies produced Fig. 8, from NOAA-17. The picture includes the equator and French Guiana. David Taylor saw this image and notes "the Kourou launch site is clearly visible".

Review Comments

Last month's 'Info In Orbit Special' included three software reviews: a selection from David Taylor's WXSAT suite, Craig Anderson's *WXtoIMG* and the Italian *MSG Sys Demo* from Luca de Angelis. To be scrupulously fair, I invited the three authors to read and comment on my reviews, noting that my reviews were not intended to be comprehensive, but more introductory. I am pleased to report that all replied positively to my invitation.

Luca asked me to mention that recent regulations require payment of additional VAT (at 20%) so now the prices are: Full version: Euros 720.00 (£480.00) and the Light version: Euros 240.00 (£160.00).

Craig pointed out that the MSA option in his program uses both channels to determine the most likely areas of sky, land and sea and David asked me to clarify that although *MSG Animator* is available at £34.95. It is also available as part of the *MSG-1 Toolset Plus* suite that includes *MSG Data Manager*, *MSG*

Animator and *GeoSatSignal* at £99.50. Licenses are usually delivered the same day.

Group Activities - RIG & GEO

RIG News - Summary From Adrian O'Hea

"Rig attended the Leicester Amateur Radio Show at Donington Park in early October and were fortunate to have a prime site - the RIG banner was the first thing you saw! Many thanks to the RIG members, past and present, who came to the stand. The encouragement and goodwill received was very much appreciated by the committee (all attended Donington). There were some useful discussions on the Journal format and the way forward for RIG.

Sales from the RIG shop went well and we had several enquiries regarding components and kits. We are responding to those now. The RX2 receiver is temporarily out of

stock, but a new batch is being kitted up. The RX2 is still the ideal introduction to the world of WXSATs for the 'home builder'. RIG will be attending the NOAA Conference in December (mentioned earlier) to represent RIG's interests and show the good work we do".

GEO News - Summary From Les Hamilton

"GEO celebrates the anniversary of its establishment as a limited company on November 25 this year, when it can look back on a year of great achievement. The group has produced an acclaimed magazine, *GEO Quarterly*, devoted to weather satellites and Earth imaging (the fourth issue will be distributed to members around late November. The group also organised a highly successful Symposium, that attracted world-wide interest, at the National Space Centre, Leicester. GEO also supported the AMSAT-UK Colloquium with displays of live *METEOSAT-8*

reception, then put in an attendance at the September get-together of their Dutch counterparts, *Werkgroep Kunstmanen*.

Such is GEO's stature in the world of weather satellites that they have been invited to make a presentation at the NASA/NOAA Direct Readout Conference in Miami, Florida in early December and Francis Bell will present this.

A second Symposium, which will include GEO's first AGM, is already booked for the National Space Centre on 30 April 2005. Details should be available in the March edition of the *GEO Quarterly*, as well as on the group's website: www.geo-web.co.uk/join.html You can complete a membership form and read about GEO, its activities and article titles in *GEO Quarterly*. UK membership is £12 for one year (probably increasing in the New Year), representing the best value anywhere for a magazine devoted to weather satellites and Earth imaging".



● **Fig. 9: NOAA-17 1031 11 October from Kevin Hughes.**

Frequencies

a.p.t.

NOAA-12 and NOAA-15 transmit a.p.t. on 137.50MHz. During overlap periods, NOAA-12's a.p.t. may be switched off. NOAA-17 transmit a.p.t. on 137.62MHz.

h.r.p.t.

NOAA-12 and NOAA-16 transmit h.r.p.t. on 1698.0MHz. NOAA-14 transmits on 1707MHz (no imagery). NOAA-15 transmits on 1702.5MHz. NOAA-17 transmits on 1707MHz. FENGYUN-1C and -1D transmit on 1700.5MHz.

WEFAX: *METEOSAT-7* (geostationary) transmits WEFAX on 1691 and 1694.5MHz and Primary Data on 1691.0MHz. *METEOSAT-8* HRIT, HRIT and other formats transmitted via *HotBird-6* at 13°E on Transponder 117- 10853.44MHz as EUMETCast data.

- Ben Hogan, *do SWM Editorial Offices*
- E-mail ssbutils@pwwpublishing.ltd.uk

The winter is now well and truly upon us with the long nights presenting a truly excellent opportunity to turn on the radio and make the most of the enhanced propagation conditions on the h.f. bands that occur during this dark season.

The bands between 4 and 10MHz are worthy of increased attention. In October several frequencies in 3, 4 and 5MHz were active with communications concerning the rescue and recovery of the Canadian submarine HMCS *Chicoutimi* that had issued a distress call on Tuesday 5 October.

The transmissions were in the clear and were easily audible throughout the UK. They were also incredibly easy to find. Operations were monitored on the usual rescue frequency of 5.680MHz with additional channels being brought into use as required.

Interestingly, the sub was known as HMS *Upholder* until a few days before the incident having only been handed over to the Canadians the week before. As HMS *Upholder* the vessel had been involved in the rescue of crewmen from a British Aerospace tug, *Vanguard*, off the Island of South Rona, Scotland the previous month. On this occasion, the comms were also audible with *Vanguard* reporting that she had become holed after hitting a rock. At the time of writing BAe staff are attempting to recover the 65m tug.

Routine Maintenance

While on the subject of winter, it's certainly not too late to give your antennas some routine maintenance if you haven't already done so. As my antenna system is all wire on h.f., all that this involves is dropping the line and checking the connectors for corrosion, giving all the joints and bolt threads a fresh coat of Vaseline and hoisting the lot aloft again. I never use silicon grease these days as I have found to my cost that most brands have an acidic content that will cause corrosion. Vaseline is cheap, harmless and very effective.

Pirate operators in the USA and Canada are now sending Slow Scan TV (SSTV) pictures to each other in and around the frequencies near 6.660MHz. If you have access to a computer and the Internet you should be able to download a freeware SSTV program to decode the signals that sound like an ever repeating tuneful cascade of tones. Why on earth these people involve themselves in this sort of illegal activity is beyond me, but they do. I have examined some of their pictures that they have

transmitted and they vary from harmless to disgusting.

Strange Signals

Some strange signals have been monitored in mid-western USA and Canada on 7.238MHz. Described as 'close spaced c.w. carriers' thought to be either from a specially modulated transceiver or perhaps from several transceivers at different locations. A more detailed examination of these mystery signals revealed that their actual frequencies were on 7.238063, 7.238150, 7.238412 with the strongest being on 7.238237MHz.

The Federal Communications Commission got on the case and they reckon that the transmissions came from somewhere north of Prescott, Arizona and west of Interstate 17. Then as suddenly as it appeared - it went! It seems, however, that identical signals have been monitored at different times throughout the 7MHz region. One to listen out for, the American monitors call it 'the buzzsaw', which fairly accurately describes the noise it makes.

Safe Highways

More from the United States. I for one have driven tens of thousands of kilometres throughout the USA and have never given a thought as to who might administer them. It is the Federal Highway Administration (FHWA), a division of the Department of Transportation. Basically, their job is to ensure that the highways are safe, efficient and constantly evolving to ensure that Americans can travel throughout their country with ease. This contrasts markedly with the UK where roads are often adapted to make them less easy to travel than they would be otherwise with 'traffic calming' (i.e. vehicle damaging) obstacles being built into our streets.

The FHWA have many communication modes available to them but, like many other American agencies, they keep an h.f. system ready for use should the need arise. One of their areas tests the h.f. system every Wednesday at 1400. It's worth trying to monitor the traffic.

On the hour they transmit on 4.821MHz and thereafter at 10 minute intervals when they change to the following frequencies in this order 5.255, 7.4195, 9.197, 10.891MHz and at 1450 they finish up on 13.434MHz with the test being terminated ten minutes later at 1500. All communications are u.s.b. and on occasions they may use some data traffic so I'm told.

Terrorist Related

For the last three years or so the increase in terrorist related h.f. radio traffic has exhibited a dramatic upturn. Although much of the equipment is purchased by the terror groups, a large amount is simply stolen at gunpoint from Non Governmental Organisations providing aid to these troubled regions. World Food Programme workers have been victims in the past as well as a number of UN organisations.

As an example of this, on 7 August 2002 an aid vehicle was stopped by three armed men near Salaar, Afghanistan on the Kabul to Ghazni road. They tried to remove the h.f. radio from the vehicle but couldn't manage it. One of the men tried to encourage his mate to shoot the foreigners in the vehicle.

There is obviously an ongoing concerted effort by these people to acquire communications gear of all types. Laptop computers are also finding their way to regions plagued by terrorist and warlord activity and there is evidence that they are being coupled up to radio equipment to provide radio based text communications.

During the last year there have been several instances of PSK31 transmissions being detected outside of the amateur radio band allocations. On at least one occasion a monitor tuned in only to discover that the traffic, although in rather poor English (even worse than mine) and couched in rather mysterious terms, concerned personnel movements, which were considered to relate to the Pakistan/Afghan border region.

The USA authorities, had for some years, reduced their h.f. monitoring facilities world-wide and the terror groups are, no doubt exploiting this omission. The USA authorities are, however, remedying the situation and h.f. monitoring is now, once again, on the up. However, some transmissions, such as PSK31, are extremely hard to find relying as they do on low power links.

The PSK31 program that I use for decoding this mode is called *Digipan*. It's freeware and is available from www.digipan.net I have certainly found it to be the easiest program of its type to install and get up and running and, trust me, I have tried many of them.

The PSK31 sound is reminiscent of a long ringing echo and to get a flavour of it tune to about 7.038MHz and listen to the amateur traffic. You'll then have an idea of what to listen out for. Typical transmission power is about 20-30W, well within the capabilities of a stolen vehicular h.f. set. There is a really strong body of opinion that this mode is being used by Islamic terror groups in remote areas.

North African Nets

Finally, there are several North African h.f. nets operating in the 5-7MHz region. For an idea of what they sound like try the 6.945MHz area (u.s.b.). A North African 'net can sometimes be heard there during the night hours. Traffic is in French and Arabic (my French is reasonable but my Arabic awful). Have a good Christmas.

● **Peter Bond** c/o Editorial Offices, Broadstone

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

A National Collective Training Exercise (CTE) was run at St. Mawgan between the 27 September and 8 October. This was Exercise Cornish Titan, which has also been reported to me as being called Exercise Fast Mover. Also run at St. Mawgan between the 28-30 September was an Air Power Demo. The CTE was primarily a Close Air Support/Forward Air Control exercise. This involves the progressive training of Forward Air Controllers to guide attacking aircraft to specific targets by using either a Controller on the ground or in the air, located in aircraft such as a Harrier GR.7 or an AWACS.

The primary callsign for the Ground Controller Operations was TOMBSTONE and a mobile Control and Reporting Point (CRP) was using the familiar callsign of CROWBAR. Targets are primarily in Wales, with a fair amount of traffic noted around the Sennybridge area. Aberporth range was also fairly busy. Here is a rundown of some of the exercise air traffic, it is in no way the complete picture and may include some visitors rather than participants. Aircraft noted arriving at St. Mawgan on the 27 September were:

Unfortunately, the three reports I received were all in some ways contradictory and even

Aircraft	Callsign	Unit
BAe 125 CC3	Ascot 1315	32 (R) Sqn Visitor
Boeing 707	NATO 47	NAEWF Visitor
Falcon 20	Warthog	FR Ltd
Falcon 20	Warthog	FR Ltd
E-3A	NATO 38	NAEWF
Sentry AEW.1	NATO 29	8/23 Squadron
Tornado F.3	Savage Flight	11/25 Squadron
Tornado F.3	Chariot 1-4	11/25 Squadron
Tornado GR.4	Vandal Flight	617 Squadron
Tornado GR.4	Trojan 1-4	617 Squadron

using some information from the 'net there are still some queries. One report clearly states that one flight of Tornado's used the callsign Totem 1-4 (11 Sqn) and there is evidence on the 'net to confirm this, but I have not been able to sort out where the callsign confusion happened - any ideas?

Noted arriving the following day on the 28 September were the following for the Air Power Demo:

Typical radio traffic: 28 Sept - two Tornado

Aircraft	Callsign	Unit
Typhoon T.1	Triplex 1/2	17 (R) Squadron
Merlin HC.3	Vortex 312	28 Squadron
Sea King	Renegade	845 Squadron
Sea King ASaC.7	Cyclops	849 Squadron
Hawk T.1A	Bobcat/Mustang	4 FTS
Harrier GR.7	COT 26	1 Squadron
Tornado GR.4A	Marham 60	2 Squadron
Tornado GR.4	Lossie 14	14 Squadron
Boeing 707	NATO 15	NAEWF (Visitor)

F.3s (TARGET 1/2) were noted operating out of Warton and acting as targets for Typhoon TARNISH 7. They worked the Aberporth range on 356.2 before tanking with TARTAN 24. Forward Air Control was initiated on frequency 247.1 using the callsign TOMBSTONE who is the Ground Control.

Some frequencies of interest noted during the exercise. 263.175 TAD 088, I have this listed as Neatishead/Portreath, but was used by CROWBAR on several occasions. 311.925 TAD085, this is a regularly used CROWBAR frequency. 359.625 TAD102, also another known CROWBAR frequency. I am not sure if it was a mistake, but REACH 8055 rather unexpectedly came up on this frequency for a brief period on one morning. Operational Training Area Hotel (OTA H) on 312.125 TAD 158. Also used regularly was AWACS ICF 364.2 TAD 014.

Other callsigns noted over the next few days: REDRAT 849 Sqn Sea King AEW.2 - SAXON 617 Sqn Tornado GR.4 - JACKAL 12 Sqn Tornado GR.4 - BLAZER 20 Sqn Harrier GR.7 - JEDI 1 Sqn Harrier GR.7 - LAPWING un-identified but thought to be a Forward Air Controller. Also heard but un-identified were: EXCALIBUR - SABRE - HARRIS. With thanks for the reports to **Mike L**, **Steve F** and an anonymous reader.

Mildenhall

Following on from last month's comments regarding the future of the Mildenhall Air Fete, it has been announced that next year there will be a Community Appreciation Day on 4 June. There will be up to 20,000 tickets available, which will be open to base pass-holders and their families and invited local residents.

Any flying will be performed by based aircraft, (presumably including Lakenheath). The flying is to be an hour long and will include some historic aircraft. Sadly, there is strong local speculation that the Air Fete as we knew it may never take place again.

The expected two weeks of extra movements passing through Mildenhall whilst

work was carried out at Ramstein, ended up being a period of just five or six days. The increase in the number of movements was not that significant, mainly C-5s, Amtran Tristars and some C-17s.

One callsign that is new to my records was noted during this period. DeCee 91, a KC-135R of the 756 AS (Andrews AFB), arrived on the 22 September. As Andrews Air Force Base is located in Washington DC, I think that the origin of the callsign is fairly obvious. A couple of reports had the spelling as DeeCee, but I can confirm that the five letter spelling is correct.

Yeovilton Show

At 0645 I set off for my annual pilgrimage to Yeovilton for the airshow arrivals day on Friday 17 September. Unfortunately, a cracked distributor cap 16km from home put paid to that trip with the engine misfiring badly, having heard the later reports of the weather perhaps it was divine intervention!

I am grateful to **Bill A** for this brief report. Bill comments that the weather on Friday and Saturday, (supposedly the tail end of one of the Florida Hurricanes), certainly played a major part and almost certainly affected the number of visiting aircraft from both the UK and Europe. A French Lynx on 283.525 who saw the weather ahead was heard to turn back for home as he approached the UK coastline.

Those who ventured out into the persistent drizzle for the Friday evening photocall found vast expanses of open space on the apron where the static should have been. One good thing was that many Hangers had been opened up and there was a good selection of based helicopters on display, which helped to bulk out the static and will have pleased the enthusiasts. The effects of the poor weather was a great shame for the organisers.

Bill also remarks that there seems to be a trend with this show that there are more



veteran/vintage aircraft taking part and less current military, the number of RAF and NATO aircraft present was noticeably small. There was a time when Yeovilton could attract NATO Naval aircraft that even the RIAT could not get, remember the Italian Navy AV-8s of a few years ago! The Saturday flying display went ahead in variable weather although there were a few longish gaps in the schedule.

By this time next year there will only be one Sea Harrier Squadron left, so hopefully they will pull out the stops for a farewell to the Harrier show! The report unfortunately did not contain any callsigns, I thought I would find them on one of the various newsgroups on the 'net, but surprisingly I had no luck whatsoever.

Hurricanes

I have had an E-mail from Terry who writes: "I have recently returned from a trip to stay with my Uncle in Florida. He lives in East Tampa, a smallish community that looks straight out across Hillsborough Bay to MacDill Air Force Base, (that's handy). What was meant to be a touristy holiday ended up with quite a bit of airband monitoring.

Fortunately, my uncle is also a radio enthusiast so I had access to his two base stations as well as my AOR hand-held. During my three week visit, there were two of the four Hurricanes to hit the region in a six week period, which made for some interesting listening and in the case of Hurricane *Charley* a few unnerving moments.

The Hurricane Hunters from the 53rd WRS (Weather Reconnaissance Squadron) at Keesler AFB were heard regularly working the

various Sectors of Miami ATC Centre using their primary callsign TEAL. The only other callsign I heard them use was STORM 21, which I am pretty certain was a 53rd WRS Hercules. At least one of their WC-130Js was based at MacDill for quite a few days during my visit. They regularly used the MacDill 6 AMW Command Post frequency, 311.0 (LIGHTNING Ops), I also heard them use their own Operations frequency 258.8 (ACCOUNTANT Ops) on a couple of occasions.

None of their old dedicated h.f. frequencies are in use anymore, most of their h.f. transmissions were on the USAF HF Global Network frequencies 6.739, 8.992, 11.175 with 15.016 used occasionally. When they were out over the Atlantic or the Caribbean they used the Caribbean element of the Major World Air Routes, usually calling New York on 6.577, 11.330 and 11.396.

Other h.f. communications were made to Cape Radio primarily on 10.780 and on two occasions 20.390. Some interesting transmissions were also monitored on the Federal HF Emergency Network on 10.493. Unfortunately, all the Hurricane reports from the WC-130s are now passed via Satellite link to the National Hurricane Centre, so no monitoring was possible.

With the predicted track of *Charley* being uncertain, (as it is with most Hurricanes), my Uncle and I had long discussions as to whether we should evacuate or not. His house is 600m from the sea front and storm surges of over 3m above Sea Level were predicted, (not good). Whilst keeping a weather eye on all the TV and radio reports, my Uncle said that if the based aircraft leave MacDill we will be going too!

On 12 August the Hurricane Hunters were very busy, the airwaves were also full of departing aircraft. Loads of F-16s were heard leaving Homestead (callsigns SABRE and FURY were noted), also several C-130s left Patrick AFB, KING 70 and 72 being two of them. Then, as expected, at least seven of the based KC-135Rs from the 91st ARS at MacDill, departed North for McConnell AFB, callsigns that I heard were BOLT 11, 12, 31 and 33.

Consequently, with winds already gusting to 50mph after a final check on the CNN weather, we gathered our 'grab bag' and headed 270km North through heavy traffic to stay with a friend at Lake City for a couple of days. As the storm moved Northeast across Florida, I heard a number of P-3 Orions, presumably leaving Jacksonville which were also heading for McConnell, I did not note the full callsigns but NAVY LL *** and NAVY LN *** were amongst them. (Apparently, at least 12 Orions and 5 C-5s were evacuated to McConnell along with others, it would have been a good couple of days to be under the Approach!).

Hurricane *Charley* made landfall at 1600 on the 13 August around 120 miles south of East Tampa, the worst reported storm tide was at Vanderbilt Beach at 4m above sea level. We returned after three days to find moderate damage to the house, (about \$2,000), but fortunately no damage from the storm tide". Thanks for the comprehensive report Terry, with his permission I have had to abbreviate it a bit.

This month's photo is a WC-130J of the Hurricane Hunters, landing at a very dull RIAT 2004

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Scanning

Scene

● **Dave Roberts** c/o SWM Editorial Offices, Broadstone
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I'm not very fond of water deeper than a hot bath. If I had been a Vietnamese dissident given the option of climbing on a leaky overcrowded tub bound for Hong Kong or doing 10 years in a 're-education' camp I would have still been there planting rice and chanting about Ho Chi Minh.

So, I very much appreciate the courage of the lifeboat crews who turn out in all sea conditions to respond to assistance calls from people in distress. It's a shame when they are messed around and sent out on false calls and it's downright dangerous for them too.

On 7 December 2003 Holyhead Coastguards received a distress message from an individual stating that he was on board a vessel called *Santa Monica* and that it was drifting towards rocks at Llandudno. Accordingly the coastguards and lifeboat turned out and there was no trace of any such boat in trouble.

On the 16 December a similar false call was received and two days later it happened again. On each occasion the lifeboat attended the location given (once in a force 7 gale) and eventually the radio calls were traced to the home of a local resident in Penmaenmawr. The man's home was searched and *voila*, a v.h.f. marine band transceiver was found, together with an admiralty chart and a GPS receiver. Of course he had no suitable licence to operate the equipment. Due to the fact that the chap had a history of mental illness, he didn't receive a custodial sentence when he was finally dealt with at court recently.

Some people just can't grasp the fact that as soon as you hit a transmit button you are literally shouting your location to anyone within range together with the technical characteristics of your radio set. In order, the most insecure means of communication are:

- Shouting
- Talking
- Whispering
- Using an analogue radio transmitter
- Sending a pager message
- Sending a letter

The unfortunate man in Penmaenmawr went for item d) to send false messages. No doubt he was surprised when he got nicked.

Welsh Rally

Talking of Wales, **Christopher** from near Swansea had his ears and radios tuned to the recent Welsh Rally. He heard the following frequencies in use:

MHz	Use
81.575	Medical Team
173.875	Unidentified User
450.225	Police
456.250	Rally Management
463.1875	Rally Base Comms - Margam Park
463.425	This sounded like a TV Crew trying to contact the cars and also passing reports etc.
119.700	Swansea Airport frequency, (a.m.)

From other sources I gleaned the following team frequencies:

Team	MHz
Citroen	163.275
Ford	164.275
Peugeot	162.725
Skoda	162.625
Subaru	163.625

And Bozian Racing (whoever they are - do they run a little Peugeot?) were on 163.250MHz.

Finally, the Marshall's had 8-channel sets on:

Channel	MHz
Ch.1	164.1875
Ch.2	164.125
Ch.3	164.0875
Ch.4	164.000
Ch.5	163.9875
Ch.6	159.6875
Ch.7	159.625
Ch.8	159.5875

Why not cut out and keep this for next year? Having said that, many of the frequencies appear to change at each Welsh Rally.

New Airwave Equipment

I received a call offering me a look in one of the new MM02 Airwave equipment cabins the other day. Did I want a peek at the kit? Has Batman got tight underpants?

After an hour long drive that was a tad tedious, I was faced with just a pair of large cabinets. One was the power supply and distribution kit and the other (shown below) is of the actual TETRA unit. Basically, it's a black coffin sized box placed on end with a few fans to cool it and minimal switching with computer data ports for fault and service diagnostics. The whole thing is hooked up to three stacks of dipoles on a nearby mast.

The equipment cabin is of a generic type that is prefabricated and deposited on a concrete base ready for the equipment to be installed and the power, BT links and antennas hooked up. At least if you see one you'll know what you are looking at.



The cabin that houses the MM02 Airwave TETRA kit.



The MM02 Airwave TETRA kit.

I know it's December, but I'm not going to go on about council gritter frequencies, well not this month anyhow.

Disappointing Show

I attended the Amateur Radio Show at Castle Donington and was slightly disappointed with the obvious decline in attendance of both traders and visitors. I examined the stands in no particular order and my progress through the hall was described as being like a pinball on acid.

My star purchase was an XT1000 p.m.r. base station. I really didn't want one, but the feller was knocking them out new for £30. The list price is well over £60 and I was still reluctant until a very tall chap with a north eastern English accent ambled up, bent down to talk with me (I'm over 6 feet so it just shows how tall he was) and mentioned that the XT1000 p.m.r. base station doesn't only scan, but it can easily be converted to give 99 channels on 70cm amateur band and will scan them and the PMR446 channels too!

He said the conversion was so easy and the details were on his website - www.delboys446.co.uk I was hooked and money changed hands. Sure enough the conversion is easy and I now have a scanning intercom-like base station that runs half a watt. I have now added a BNC socket so that I can hook it up to a 70cm beam. All for £30!

TV Interference

Aren't TV sets a pain? There's not very much of interest apart from the news and the odd documentary. Does your other half complain about your radio scanner causing patterning interference on the telly?

I noticed some patterns on the TV when I had left a scanner running and after having put up with it for a year or two something had to be done. The cure was remarkably simple. Considering I am using coaxial cabling to the antenna on the roof it seemed that the r.f. oscillator was causing TV interference on some frequencies, hence the patterns. It must be radiating from something.

Assuming that the screened antenna lead isn't the problem, the only suspect was the thin twin power lead from the power supply to the set. First, ferrite toroids were dug out of the parts box and two of them were applied to the wire. This made very little difference at all.

Then a flash of the previous night's 'beerspiration' hit me and I realised that if I reduced the length of the power lead to the absolute minimum this would cut the amount of power lead acting as a radiating antenna. This I did, simply by coiling up the unused length and securing it with cable ties. Result... no more interference and I can now watch *Balamory* (Childrens TV!) with a good picture!

Increased Threat

On a serious note, at this time of year there is clearly an increased threat of terror attacks in the western world. Mobile 'phone base stations only have about three to four hours battery back up if power fails and in case of

an attack you can bet that network congestion would make the system unusable for ordinary customers.

Think of alternative options to keep in touch with your family. The only source of news may be your radio receiver - have you got spare batteries? A reliable torch? A camping gas cooker if the power is out? It won't roast the turkey, but may make life more comfortable for a while. Happy Christmas.

Decode

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

This month I'm going to take a closer look at utility frequency lists and some DX techniques that you can use. If you search on the Web for Utility Frequency Lists you will find that there are thousands of them around. When I tried, I found about 650,000 hits on Google! One of the first points you need to get straight is to establish what you're expecting the frequency list to provide for you. Most new listeners use a frequency list to help them find something to listen to, though to be honest most of the main frequency lists are not a lot of good for this. The novice will often flick through the list looking for something interesting and then try and find it - usually without success.

One problem with many frequency lists is that they list as many stations as they can from all over the world. So, when it comes to listening to these stations, there are a number of factors that will determine whether or not you will hear anything. First and foremost is whether or not the station is transmitting at the time you're listening. Many of the stations listed will either transmit to a pre-defined schedule or on an ad hoc basis, whenever they have something to say.

A second important point to bear in mind, is whether or not the signal is intended to be received in your area. Many short wave stations use beam antennas and often limit their transmitter power to ensure reliable coverage of a particular geographic area. Whilst you can use your listing skills to pluck some of these signals out of the noise or take advantage of favourable conditions, if you're outside the designed coverage area it's unlikely that you'll be able to receive the station.

A good example of the time and coverage limitation is the NAVTEX network of stations that are based on 518kHz. There are hundreds of stations on the 518kHz frequency all over the world, but the operating frequency, antenna design and characteristics of the frequency limit the range to several hundred kilometres. You will occasionally pick up a station from far away, but this cannot be relied upon.

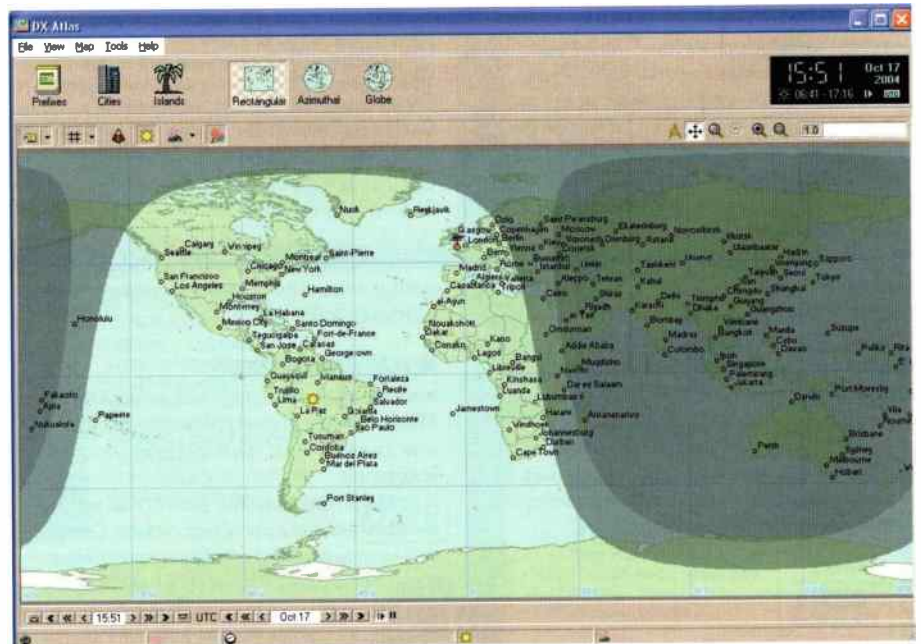
Most frequency lists are designed to help listeners identify a new signal, rather than to find something to monitor. If you want to use a frequency list to find stations you need to take into account the location of the station, the likely time of transmission and where the

signal may be beamed. Many listeners like to try and receive stations from a long way off (DX) and one great way to do this is to use what's known as 'grey-line' DXing.

Grey-Line DX

The grey-line DX technique uses the enhanced propagation that often occurs along the part of the atmosphere that's in transition between daylight and night - hence the name grey-line. The propagation enhancement occurs because the D-layer is,

equally useful for listeners and includes a very good grey-line display and predictor. The systems requirements are modest, minimum spec is a 166MHz Pentium with 32MB of RAM and *Windows 95* or later, so it should run on most PCs. Once you've downloaded the 3MB file, installed it and got the system running, the first job is to set your home location. Simply select Change Home Location from the Map menu and clicking on your location. There's no particularly need for precision for our purposes.



The computer screen showing the DXAtlas grey-line display system.

or has subsided on the side that's moving to darkness but hasn't had time to build up on the side that's moving to daylight. This phenomenon runs broadly from North to South and lasts generally for about an hour.

In spite of the reduced period however, grey-line DX is well worth catching and usually delivers some amazingly long distance signals. To help you spot countries that are on this line at the same time as you there are many handy software packages around. A good one to start with is *DXAtlas*, which is available for free download from the website: www.dxatlas.com

As the name implies, *DXAtlas* is a general purpose mapping program specially developed for radio amateurs. However, it's

After setting your location, you need to choose the type of map projection you prefer and for grey-line work I prefer rectangular projection, but it's up to you. To show the grey-line path you need to either click on the sun icon on the tool bar or choose grey-line from the Map menu. With either method, as soon as you do this, the map will be coloured, with night time shown as blue and a broad grey band to show the grey-line. It couldn't be very much simpler than this!

As we're only interested in grey-line you might like to adjust the shading to make the line more distinctive. This can be done via the Tools/Settings menu by choosing the Contrast tab and moving the night slider to the right to make it darker. You can then play with the

Frequency/Range	User	Mode	Remarks
4000 - 4063	SHIP	USB	INTER-SHIP SIMPLEX / CROSS BAND WITH 8 MEZ DUPLEX WITH COAST ON 4438 - 4650 / SUPPL FOR DUPLEX ON USB CH 401-429
4063.3 - 4064.8	SHIP	DATA	6 SHIP OR BUOY CHANNELS (0.3 KEZ) FOR OCEANOGRAPHIC DATA TRANSMISSIONS
4065 - 4143	SHIP	USB	SHIP CH 401 - 427 DUPLEX WITH COAST STATIONS ON 4357 - 4435
4125	BOTH	USB	CHANNEL 421 - SIMPLEX SUPPLEMENTS 2182 FOR DISTRESS AND SAFETY
4146	BOTH	USB	SIMPLEX AND CROSSBAND FREQ WX & NAV WARNING FREQ MAY BE USED WITH CH 428/429 (4351/4354) FOR DUPLEX
4149	BOTH	USB	SIMPLEX AND CROSSBAND FREQ WX & NAV WARNING FREQ MAY BE USED WITH CH 428/429 (4351/4354) FOR DUPLEX
4154 - 4170	SHIP	MISC	5 CHANNELS SPACED 4 KEZ APART FOR FAX, DATA AND OTHER SPECIAL TRANSMISSIONS
4172.5 - 4181.5	SHIP	SITOR-A	4 MEZ SHIP RTTY BAND - PAIRED WITH COAST STATIONS OPERATING ON 4210.5 - 4219 MAY ALSO BE USED FOR CW WORKING
4177.5	BOTH	RTTY	SIMPLEX (CH 411) DISTRESS/SAFETY TFC ONLY
4182 - 4186.5	SHIP	CW	10 CALLING CHANNELS 5 KEZ APART
4187 - 4202	SHIP	CW	SHIP CW WORKING CHANNELS - 5 KEZ APART
4202.5 - 4207	SHIP	SITOR/CW	10 NON-PAIRED SITOR-A TRANSMITTING CHANNELS SPACED 5 KEZ APART. ALSO USED FOR SHIP CW WORKING FREQS
4207.5 - 4209	SHIP	DSC	4 SHIP CHANNELS 5 KEZ APART FOR DIGITAL SELECTIVE CALLING (DSC) 4207.5 MAY BE USED BY COAST FOR DISTRESS/SAFETY
4209.5	COAST	SITOR-B	NAVTEX BROADCASTS

Twilight slider to get the effect that looks best. Next area to update is the area/city display. In its default state *DXAtlas* shows the amateur callsign areas - not really want we want in this instance, so, go to the Map/Labels menu and choose Cities. I've shown a screenshot so you can see how the adjusted display looks.

One feature I haven't mentioned so far, is the time control features of *DXAtlas*. If you move your mouse cursor down to the bottom of the screen you can 'fast forward' and 'rewind' time to see how the grey-line changes over the days. This is great for forward planning - you can check the grey-line for the coming weekend and gear yourself up with all the station information you need so you can really dig out some

Super Frequency List there's a country search built-in. If you go to the Search and choose Country you can pick the target country of your choice and scan through the result to find some potentially interesting stations. This, I've found, is probably the fastest and most efficient way to identify

A screengrab of the WUN club's maritime frequency schedule.

Freq	Callsign	Station	Country	Modulation	Details
26151.0	LZW	Varna R	BUL	SSB	
122.5	CFH	CF Halifax, NS	CAN	DIG/FAX	TAZ 75 Baud
2054.0	VAC	COG Courtenay, BC	CAN	SSB	
2054.0	VAE	COG Tofino, BC	CAN	SSB	
2054.0	VAJ	COG Prince Rupert, BC	CAN	SSB	
2161.0	VCT	Tors Cove R, NFLD	CAN	SSB	QSK 2445.0 kHz
2510.0	VCT	Tors Cove R, NFLD	CAN	SSB	QSK 2763.0 kHz
2514.0	VCG	COG Riviere-au-Renard, QUECAN	CAN	SSB	QSK 2118.0 kHz
2514.0	VCM	COG Saint Anthony NFLD	CAN	SSB	QSK 2118.0 kHz
2514.0	VCP	COG Saint Lawrence, NFLD	CAN	SSB	QSK 2118.0 kHz
2514.0	VCS	COG Halifax, NS	CAN	SSB	QSK 2118.0 kHz
2514.0	VFF	COG Iqaluit, NUN	CAN	SSB	QSK 2118.0 kHz
2514.0	VOJ	COG Stephenville, NFLD	CAN	SSB	QSK 2118.0 kHz
2514.0	VOK	COG Cartwright, NFLD	CAN	SSB	QSK 2118.0 kHz
2514.0	VON	COG Saint John's, NFLD	CAN	SSB	QSK 2118.0 kHz
2530.0	VCO	COG Sydney, NS	CAN	SSB	QSK 2815.0 kHz
2538.0	VAR	COG Saint John, NB	CAN	SSB	QSK 2142.0 kHz
2538.0	VCM	COG Saint Anthony NFLD	CAN	SSB	QSK 2142.0 kHz
2538.0	VCP	COG Saint Lawrence, NFLD	CAN	SSB	QSK 2142.0 kHz
2538.0	VOJ	COG Stephenville, NFLD	CAN	SSB	QSK 2142.0 kHz

Using the Klingenfuss *Super Frequency List*, set to display the country list.

great DX in the limited time available.

If you want to get really smart with *DXAtlas* you can experiment with its extensive ionospheric display capabilities. If you combine *DXAtlas* with *Ionoprobe* you will have a very sophisticated propagation tracking tool that you can use to pin-point your DX targets. If you'd like me to cover that element in more detail drop me a line and I'll see what I can do.

Country Based

To make best use of your frequency list you need to find stations from a particular country. The method of doing this depends on the type of list you're using. If you are fortunate enough to have the Klingenfuss

Super Frequency List there's a country search built-in. If you go to the Search and choose Country you can pick the target country of your choice and scan through the result to find some potentially interesting stations. This, I've found, is probably the fastest and most efficient way to identify stations by country. If you just have the paper-based version of *Klingenfuss Guide to Utility Radio Stations* all is not lost as this includes a host of information designed to make life easy for the listener. One chapter in the *Guide to Utility Radio Stations* that's often missed is the Station List.

This is a list of all the stations in the main frequency list, but this time they're grouped by country. So, if for example, you're looking for stations in Canada you will find all the stations listed in one place along with callsigns and all the current operating frequencies - pretty impressive! As all the stations and operating frequencies are listed together, you can quickly flip through the advertised frequencies to find the one that gives the best results. This is much more efficient than trawling through a bare frequency list. It's this clever compilation of extensive utility information into a practical format that makes the Klingenfuss guide so valuable.

Frequency Offset

When you do get to the station you want don't forget to use the appropriate tuning offset - if you're unsure of what this is, or confused, read-on and I'll explain. You may recall that most RTTY/FAX and other data stations send their information by switching between two radio frequencies that are

spaced very close together - often just 200Hz. This method of sending data is known as frequency shift keying or f.s.k. and is probably the most common system. The use of two frequencies creates a problem - what do you quote as the frequency in a list. This question is solved by convention which suggests that we always record the 'Mark' or lower frequency. Whilst this is convenient, it doesn't fit too well with most short wave receivers.

If you are fortunate enough to have a receiver with a dedicated f.s.k. mode the frequency display will be automatically updated to show the mark frequency so you can tune to the designated frequency. However, the rest of us have to make do with receivers that are designed and calibrated for s.s.b. reception. When using an s.s.b. receiver, the display is set to indicate the frequency of the suppressed carrier of the s.s.b. signal. Then, to further complicate the process, we also decode the f.s.k. signals with computer software decoders that operate on the receiver's audio signal. For these decoders we want the Mark frequency of the utility signal to create an audio tone of around 1.7kHz.

If we were to tune our s.s.b. receiver to the frequency shown in the frequency list we would get an Mark audio tone of 0Hz, which is not a lot of good so, we need to retune our set until we get a Mark tone of 1.7kHz. If your receiver is set to the conventional upper sideband mode, you'll need to de-tune by 1.7kHz to get the required tone. The offset you require is therefore 1.7kHz.

With so many decoding systems featuring automatic frequency control, the actual offset is not at all critical. However, I would recommend that you keep close to this setting or you may find that you drift outside the optimum part of the receiver's filtering system and that can result in increased errors.

ICOM

Scanner

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- PC programming capability
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AUTHORISED DEALERS THROUGHOUT THE UK

Amateur

Bands

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

If you fancy getting out and about onto the hills, looking at spectacular views of this sceptred isle and being blown around a bit, then microwave operating is for you. Because microwaves are definitely line-of-sight frequencies, operating from a good elevated location is essential.

As a microwave operator you will know every suitable hill top in your area, have a mental image of the world in terms of locator squares rather than cities, towns and countries and plan your calendar around 'cumulatives' and activity days. There are five microwave bands commonly used by amateurs in the UK, these are: 1.2, 2.3, 3.4, 5.7 and 10GHz - although 1.2GHz is regarded as virtually d.c. by serious operators!

Plan Ahead

In early October I met **Paul Marsh M0EYT** who, ably assisted by **Tony G3PFM**, was operating on 5.7GHz from the Purbeck Hills in south east Dorset. One thing is obvious when it comes to microwave communication on the amateur bands, it's that there's more to operating at those frequencies than just setting up a station and calling CQ!

Microwave contacts don't just happen - planning is required. The day we were up on the hills was one of the RSGB's '432 and up' activity days, when other like minded souls were also making for the high ground. Paul's reasonably typical microwave equipment consisted of a transverter built from a DB6NT kit driven by an Yaesu FT-290 144MHz multimode, with an ex-satellite television dish as the reflector. The antenna is positioned at the focal point of the dish, or at higher frequencies, within the transverter with wave guide channelling the r.f. between it and the focal point.

Start On Two & Work Up

As well as the 5.7GHz station operated by Paul, there was a 144MHz rig connected to a 9-element Tonna horizontally mounted at 8m a.g.l. used to make initial contact with other stations. Yours truly was tasked with applying the strong arm rotational alignment.

Pointing the dish at the **GB3SCC** 5.7GHz beacon on Bell Hill about 25km away resulted in very strong signals being received. Confident that the equipment was OK, the attention then turned to 144MHz. Before seeking microwave contacts, several 144MHz beacons were monitored.

With **GB3ANG** some 650km away near

Dundee providing a strong signal, it appeared that 144MHz conditions at least were good. Good v.h.f. conditions don't necessarily mean good microwave conditions. Rain is the favoured weather condition for a good microwave path as the raindrops act as little antennas, spreading the signal out and in effect bending it. A little bit like fog diffusing the light from a car's headlights.

The further the distance some of the signal can be bent parallel to the earth's surface the longer the path that can be achieved. Although not raining where we were, there was plenty of it around. So much so that signals from the **GB3SCC** beacon were bouncing around in all directions and could be received whichever way the dish was pointed!

Finding Other Stations

The frequency 144.750MHz u.s.b. is the calling/talkback frequency for microwave operating and with the antenna pointing northwards, calling CQ brought a reply from **G8IFT/P** some 207km north of us in Birmingham. The microwave operating frequency was agreed and locator squares exchanged. *RadioDist* software running on a laptop calculated the bearing to **G8IFT**'s square. Out came a vital piece of microwave equipment, the compass, and within moments the microwave dish was pointed along the bearing.

Where Exactly Are You?

One of the major factors to consider when selecting a frequency for a contact is how close to that frequency your equipment is actually operating. That's because the transverter's local oscillator is derived from a crystal oscillator that has its frequency multiplied many hundreds of times. Any slight deviation of the crystal oscillator from its nominal fundamental frequency will be magnified by the multiplier chain many hundreds of times.

From the initial switch on of the transverter, it takes ten minutes or more for the oscillator to settle to some sort of thermal

equilibrium, so it isn't too easy to be certain of the exact frequency on which operation is taking place. To minimise that effect, Paul has fitted one of his transverters with a NiCad battery pack and charging circuit to keep the oscillator running permanently, which it has been doing for several months.

One method used to ensure both ends of the link are on the same frequency is for them to agree on a frequency that is a fixed amount e.g. 10kHz, from a beacon both can hear. The usual way to align the dishes for best results is for one station then the other to send a carrier or series of dits so that the receiving station can move the dish for maximum signal.

Although this technique was used with **G8IFT**, his signals were still very weak and after much use of 144MHz to sort out who would transmit on 5.7GHz, and what information would be sent, not to mention much moving of the dish to try an optimise the signal, sufficient information was passed



using c.w. to complete the QSO. Good to make the contact as it was good DX for the frequency, but a little bit like hard work!

Home On The Hill

Because the number of microwave stations is relatively small, regulars on the air are well known. One of those is **G8ALY** in Plymouth who is one of those microwave enthusiasts lucky enough to live at a suitably high location and can operate from home. He was contacted on 144.750MHz and the dish aligned on his bearing. Things were easier this time and signal strengths were sufficient for s.s.b. communication.

Even greater signal strength was achieved with **G0RRJ** in Andover. The contact was carried out using f.m., if only because it's easier on the ear than s.s.b. Just like h.f. DXers, microwavers use Internet clusters to monitor active stations. Probably the best site to look at is run by **ON4KST** at www.on4kst.info/chatghz/login.php The *RadioDist* software can be found at www.plicht.de/ekki/software/rdist.htm Other sites worth a look are www.db6nt.com www.downtownmicrowave.com www.g3pho.free-online.co.uk/microwaves/index.htm and www.microwavers.org

Propagation

forecasts

- Jacques D'Avignon VE3V9A
- 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.

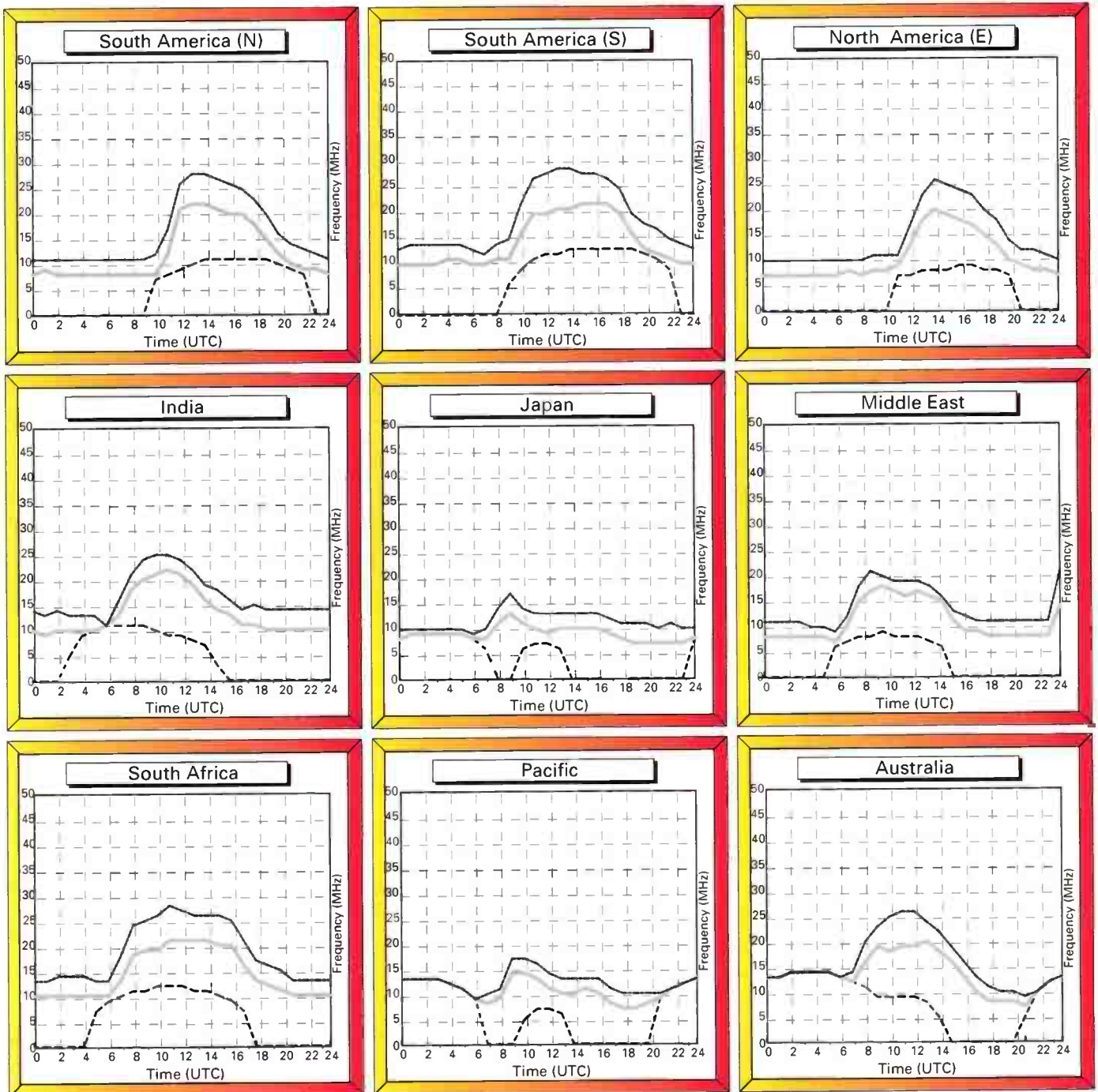
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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.

December 2004
Circuits to London



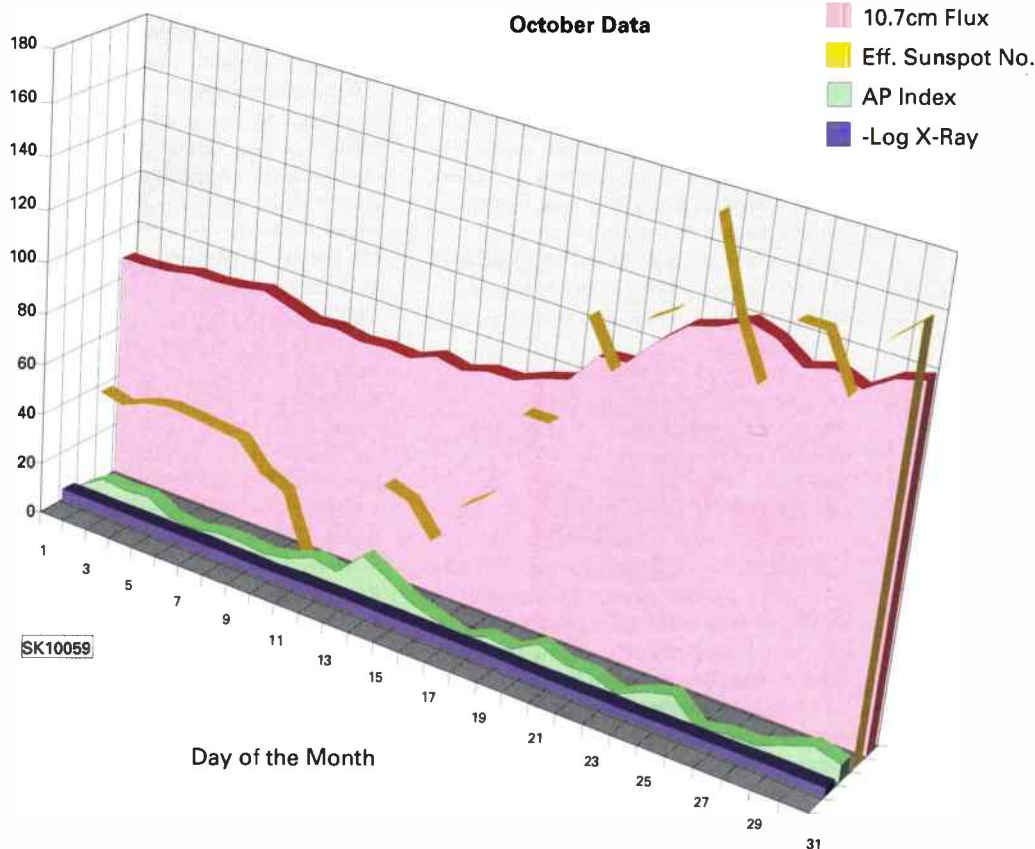
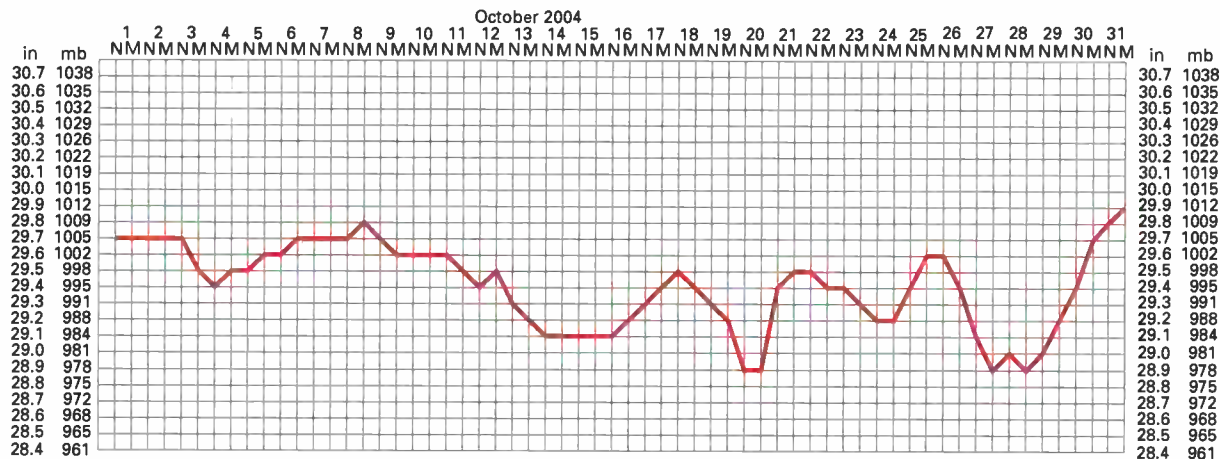
SK10058

Propagation

Extra

- **Kevin Nice** G3UNR, BRS95787
SWM Editorial Offices, Broadstone
- **E-mail:** kevin.nice@pwpublishing.ltd.uk

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, October 2004.



guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.

The K and AP indices are measures of geomagnetic activity.

The K index ranges from zero (very quiet) to nine (severely disturbed).

K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.

The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.

Attn' 123

● **Enigma** 17-21 Chapel Street, Bradford, West Yorkshire BD1 5DQ. Fax: (01274) 77004
● **E-mail** enigma@pwpublishing.ltd.uk

This month we've had a letter from **Robert Palmer** of Loughborough who has asked us a) which numbers stations spend the greatest time on-air and b) to explain what we mean by schedules. We'll try to answer the second question first, but it's important to realise that time on-air bears no relation to whether genuine messages are being sent. With many stations, traffic levels are impossible to determine. A lot depends upon the type of scheduling used and as many numbers monitors seem to be confused about schedules, we need to discuss this first.

Identifying a numbers station is only the first stage of serious monitoring. Being able to predict its appearance and even sometimes its messages is far more involved (and interesting), as schedules need to be identified first. We can't do this until we are familiar with a station's habits. To complicate things even more, different schedules of the same station may follow different habits! The challenge lies in disentangling all this in a methodical way appropriate to the habits concerned - not easy!

Some stations are far more flexible than others in their habits and much more effort needs to be devoted to them before we come up with results, but in the end, the sense of achievement is well worth the effort. Luckily, much of this work has already been done by ENIGMA and we (and now ENIGMA 2000) can provide details of scheduling which, say ten years ago, would have been unavailable. Research into scheduling is never complete and many less common stations still need far more attention and therefore willing monitors.

The vast majority of our present regular stations operate identifiable schedules, which have been analysed. We can therefore often predict with 100% accuracy the expected activities of many schedules, sometimes for a year or more in advance.

So what is a schedule? It is a pattern of transmissions consistent over a period and operating at regular set clock times (e.g. on the hour every hour, at 0630 and 1700 daily; at 1800 and 2000 Tuesdays and Thursdays at 2030 on the 9th of every month; at 0825 on 1st and 3rd Wednesday

of the month, etc.). An overall station schedule is an organised plan of a station's entire output over a specific and verified long-term period. Our research shows that many station schedules are planned to run for periods of years with little or no change. Generally these can be projected into the future with a good chance of success. Within a station schedule there are many transmission-related schedules. They are also mission related, some are mission specific, others may be used by different missions over different periods. Some schedules may send entirely dummy messages, others partly, but we have no way of knowing this!

Normally, whenever ENIGMA mentions schedules it is the transmission-related ones that we mean. Transmissions within any particular schedule are all fixed in a particular way, as follows:

- 1) Non daily: date of month and time(s) of day. Monthly.
- 2) Non daily: day(s) of week and time(s) of day. Weekly, fortnightly (not linked to calendar month), day of month (e.g. 1st and 3rd Tue and Thu) or week of month.
- 3) Daily: time(s) of day.

Of the above, category 2 is used by most stations (Family XI uses its own variant). Category 3 is at present used by E3, E3a, S17, M3 (some), M10 (partly), M16 and M23. Category 1 is rare and was used by S2 and V1.

Note that although most station transmission times remain constant throughout a schedule, some may adjust for local summer time. Only certain schedules within a station's whole output may do this, e.g. within Family I.

Schedule Types - there are several different ways of organising schedules, all geared to a specific need. Some need to send numerous message repeats, others may send no repeats at all. Some send a fixed number of same-message transmissions, others are much more flexible. Schedules are usually time and frequency linked, i.e. they consistently use the same time/s and frequency/s for their transmissions throughout their lives. However, some are time linked only. Others are linked to a series of times and

only have the message in common. The daily M29a schedule changed its message every Monday and its frequency every calendar month, while the same family's weekly G4 schedule changes both message and frequency with every calendar month.

There are five main classes of schedules (which we'll talk about in the next column):

- 1) Non schedules
- 2) Fixed schedules
- 3) Sliding schedules
- 4) Cyclic schedules
- 5) Dedicated schedules

As well as these, there are the dreaded Erratic Schedules to consider. Here transmissions do not always appear when and where they are expected, but generally conform to a pattern. For example, a 'daily' schedule may sometimes miss a day, seemingly at random. Erratic schedules tend to be associated with stations noted for poor technical quality or poor time keeping. Human error (forgetting to switch transmitters on!), power cuts, enemy sabotage, moving of site, other more pressing duties, inefficiency (drunkenness on duty!), poor maintenance, flooding, antenna blown down - all are possible causes. Examples of such stations include M1 (rarely), M10 (certain schedules only), M50, E17z, M53 (probably not accidental), E9/V8, V20, V21, etc.

E17z has for some years now been frustratingly erratic. At one time it appeared daily at 0820, but after the break up of the USSR, it became erratic, and it now appears whenever it feels like it, but always between 1300 and 1500 - usually in the 10MHz region. This schedule moved from the morning to the afternoon time slot, but retained its original schedule number 274. Being a breakaway member of the Russian Family I, which rigidly uses Schedule Numbers, it would appear that E17z so far has only ever used one schedule throughout its life. Its group count has been around 50 since its early morning days and after a while it became exactly 50, that's until a few weeks ago, when it appeared with a mammoth 306-group message! In the Numbers Station game we never know when to expect the unexpected!

WRTH 2005

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688 pages full of information:

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- TV by country
- Reference section with Transmitter Site Location Table, Standard Time & Frequency Transmissions, DX clubs, Internet Resources, and much more

Available December 2004

SOME COMMENTS ON WRTH 2004:

Again this year, I can recommend serious DX-ers to buy this "DX-ers Bible"! I have all Editions of the WRTH since 1961 in my collection and I am pleased to say that the 2004 Edition is the best!

Anker Petersen, Danish SW Club International

I just got WRTH for 2004. It is so well done, I can't believe it! As I flip thru, picking various stations and countries - it's all there. I thought last year's WRTH was the end of the line, it could not get any better - this 2004 is superb! *H Ragan, USA*

The WRTH 2004 is super! *J Slavik, Czech Republic*

WRTH is excellent as usual *L Reeves, USA*

I highly recommend the World Radio TV Handbook as a convenient place to look up addresses - and much else. I often grab my copy and find stuff fast *Glenn Hauser, DX Listening Digest*

WRTH 2004 is the first world class radio directory I ever came across *M Nanayakkara, Sri Lanka*

The bible for DXers is very, very good *P Bouças, S.Tomé and Principe*

A great reference work for all radio hobbyists - the World Radio and TV handbook 2004 *Adrian Peterson, AWR Wavescan*

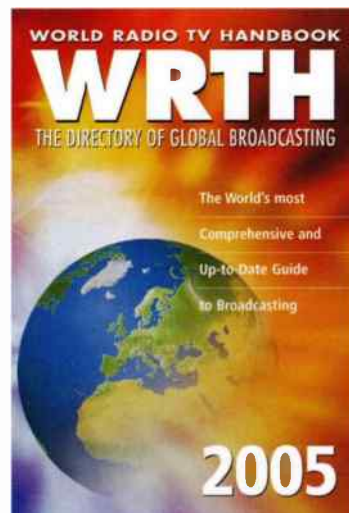
Still the best reference available *R. Balsler, UK*

Thank you for a fab book *P Louni, Finland*

WRTH is a real asset and treasure for me *J Azim, Pakistan*

WRTH is almost perfect. Long live WRTH! *G Revel, France*

Excellent publication *J Easterly, USA*

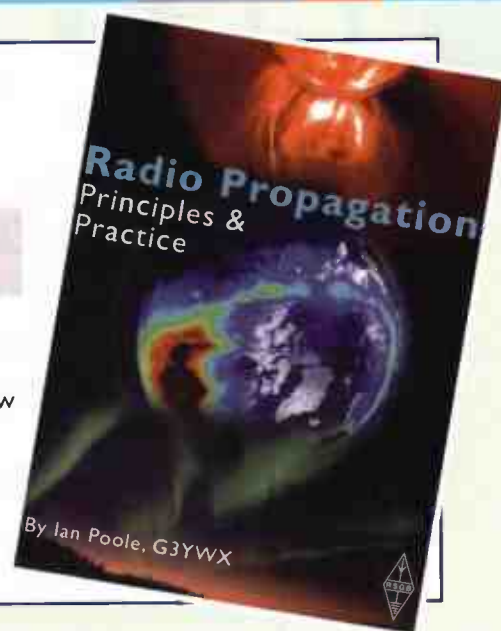


new additions

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the sun, ionosphere propagation (with all the important modes), ionospheric storms and aurora, how to predict and assess ionospheric propagation and much more. Order your copy from the Book Store now for **£14.95**.



Listening

Airband

	pages	price	code
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AIRBAND RADIO GUIDE (abc) 5th Edition	112	£8.99	ABRG5
AIRBAND RADIO HANDBOOK (Haynes)	190	£12.99	ABRHB
AIR TRAFFIC CONTROL (abc) 8th Edition	112	£9.99	ATC8
AIRWAVES 2004 (Photavia)	144	£10.95	AIR24
AIRWAVES SELCAL - CIVIL & MILITARY DIRECTORY (Photavia)	176	£11.95	AIRSEL
CALLSIGN 2004 (Photavia)	128	£10.95	CAL24
CIVIL AIRCRAFT MARKINGS 2004 (abc)	400	£7.99	CIVAIR
FLIGHT ROUTINGS 2004 Williams	180	£8.95	FR24
MILITARY AIRCRAFT MARKINGS 2004 (abc)	224	£7.99	MILAIR
NORTH ATLANTIC ROUTE CHART (US Dept.Transport FAA)740 x 520mm	£9.00	NAROUT

Frequency Guides

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KLINGENFUSS GUIDE TO UTILITY STATIONS 2005 - due Dec		£31.50	KFUTIL
KLINGENFUSS SHORTWAVE FREQUENCY GUIDE 2005 - due Dec		£24.50	KFSWFG
KLINGENFUSS SHORTWAVE CD 2005 - due Dec		£17.70	KFSWCD
PASSPORT TO WORLD BAND RADIO 2005 (due Dec)	TBA	£17.50	PASS25
RADIO LISTENERS GUIDE 2004	128	£5.45	RLG24
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RECEIVING (VALUE) STATION LOGBOOK (RSGB)	80	£4.95	RXLOG
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SCANNERS 4 SCANNING INTO THE FUTURE Bill Robertson	245	£9.95	SCAN4
SHORTWAVE COMMUNICATIONS 1991. Peter Rouse (PWP) - WSL	187	£4.50	SWCOM
SHORTWAVE RECEIVERS PAST & PRESENT 3rd Edition F. Osterman	450	£25.95	SWRXPP
THE SUPERHET RADIO HANDBOOK I.D. Poole (Babani)	104	£4.95	BP370
THE ESSENTIAL GUIDE TO SCANNING Martin Peters	108	£6.00	EGTS

store

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WEATHER SATELLITE HANDBOOK 5th Edition. Dr Ralph E. Taggart WB8DQT	192	£15.50	WSATHB
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Beacons

I was recently made aware of an error regarding my E-mail address that appears on this page and this has now been corrected. My apologies to those who had difficulty contacting me and had to resort to normal post and my thanks to the Editorial team for correcting this.

Beacon logs for this column over the last year or more have generally been based on what could be termed as fairly sophisticated receiving equipment and antenna systems. The newcomer to this area of the hobby, who has perhaps just started out in the s.w.l. world, may be a little put off in trying to receive some maritime beacons because of this.

With this in mind, I decided that I would try a session of back-to-basics to attempt to discover what could be received using minimal equipment. So, I dug out my trusty old Sangean ATS-803A and planned to use it with no external antenna, just its internal ferrite rod. To add to the challenge I also decided to try this experiment during mid-August around midnight.

Being a summer month, this would provide a greater challenge, as maritime beacons can sometimes be a little more difficult to receive at that time of year due to extended daylight hours, particularly those in the Faeroes. By the time you read this, the darker nights will have arrived and you can try earlier in the evening.

Listen Carefully

The usual listening rules for beacons apply, listen carefully to each frequency for at least a minute and on those frequencies where parts of chains, for example 300.5, 309.5 and 312.5kHz, remain listening for six minutes. In addition another rule applied, the directional effect of the ferrite antenna and to ensure that I was not going to null out any potential

beacons. This meant I had to turn the receiver to different compass points to ensure the target areas for particular frequencies. Failure to do so could have resulted in some receivable beacons being nulled out and not heard.

During the experiment I successfully logged a total of eight maritime beacons with the common Spanish ones and two out of the three Faeroes beacons being received fairly well. I also noticed that I was not subjected to as much Differential Global Positioning System (DGPS) interference as I would normally experience using my normal equipment set-up, due to the fact that the antenna and receiver gain is not as high. This proves that you do not need a very expensive receiver and high performance antenna and you can DX maritime beacons using a simple

Long Wave Maritime Beacon Chart

kHz	C/S	Location	Country	DXer
283.5	NA	La Entallada	Canaries	A* C* E* F*
284.5	MA	Cabo Machicharo	Spain	A* B*
285.5	AS	Castellon	Spain (Med)	E*
289.5	MY	Cabo Mayor	Spain	A* B*
291.5	EI	Nos Emine	Bulgaria	E*
292.5	BA	Estaca De Bares	Spain (N/W)	A* B* C* D* E* F* G*
293.5	MH	Mahon	Balearics	A* B* E*
294.0	FI	Cala Figuera	Majorca	A*
296.5	FI	Cabo Finisterre	Spain (N/West)	A* B* C* E* F*
299.5	KN	Skrova	Norway	A* C* D*
300.0	GA	Malaga	Spain (S/East)	A*
305.0	KA	Klaipeda Rear	Lithuania	A* C* G*
305.7	DA	Dalatangi	Iceland	A* C* D* G*
309.5	EYa	Yevpatoriyskiy Lt.	Ukraine	C* E* I
309.5	SW	M. Kherosnesskiy	Ukraine	A* E* I
309.5	WR	Ddesa/Vorontsovskiy Front	Ukraine	I
312.5	BK	Baltiysk	Baltic Russia	A* I G
312.5	BT	Mys Taran	Baltic Russia	A* I G
312.5	AT	Mys Aytodorskiy	Ukraine	I
312.5	DB	Doobskiy/Mys Doob	Russia	I
312.5	VR	Mys Zheleznyy Rog	Russia	I
314.0	SN	San Sebastian	Spain (North)	A* B* E
337.0	MY	Myggenaes	Faeroes	A* B* C* D* F* G
372.0	DZN	Prins Christian Sund	Greenland	A* C* F* G*
381.0	AB	Akraberg	Faeroes	A* B* C* D* F* G
404.0	NL	Nosio	Faeroes	A* C* D* F* G

Entries marked * were logged during darkness

All others at dusk/dawn or during daylight

receiver equipped for s.s.b. with a beat frequency oscillator (b.f.o.).

A b.f.o. is essential for receiving maritime beacons and as the logs in the chart on this page show, simple equipment can work quite well. Why not spend an hour one night and have a try. I would be interested in receiving your results.

Reception Reports

In Lancashire **Alan Gale** was pleased to report his reception of NA 283.5kHz for the first time, although **Tony Moore** reports that conditions in general have not been great at his location in Cleveland although BA 292.5 was audible every session. **Arnie Nessbit** has continued his experimentation with his crystal receiver and has reported receiving the Faeroes beacons MY, AB and NL in daylight. **Lionel Roithmer** in Gurnsey also successfully received these beacons.

In the Netherlands **Roelof Bakker** reports poor conditions, but he did manage to receive EYa from the Ukraine and DA from Iceland. **Giorgio Casu** reports receiving EYa and SW from Ukraine along with the rarely reported beacon, EI, from Bulgaria.

Bo Nensén sent an interesting set of logs from his location in Sweden including AT, DB from the Ukraine and Baltic Russia. Both these beacons used to be heard on a regular basis here, but I have not received them for

quite a while. He also successfully received VR from Russia, but despite the large antenna array available to him, he was unable to receive the remaining beacons in that chain: AT, IL, KA and AP.

Christmas is coming so, Seasons Greeting to you all and I hope that Santa brings you the radio equipment you want. Good beacon hunting for 2005 and as always I welcome you comments, questions and of course your logs. Please contact me if you require details of my popular easy to use 64-page beacon guide covering aero and marine NDBs across Europe and beyond.

Equipment Used

- A) Robert Connolly, Kilkeel, N. Ireland. Receiver: JRC NRD-525. Antenna: Datong AD-370 antenna and Timewave DSP-9+ filter.
- B) Robert Connolly, Kilkeel, N. Ireland. Receiver: Sangean ATS-803A with built-in ferrite antenna.
- C) Roelof Bakker, Middelburg, Netherlands. Active whip and active loop plus two tuneable pre-amplifiers. The output from the pre-amps is routed to a phasing unit and then into the main receiver, a Wandell & Goltermann SPM-3 selective level meter. The output from the SPM-3 at 1500Hz, is down converted to 500Hz. Here follows a Datong FL-3 filter and/or a LC-filter with a bandwidth of 25Hz. With exception of the SPM-3 and the FL-3, the station is home-made.
- D) Tony Moore, New Marske. Redcar, England. Receiver: Lowe HF-225. Antenna: Datong AD-370 Active Antenna Vert. Filter: Datong FL-2.
- E) Giorgio Casu, San Gavino Monreale, Sardinia. Receiver: Icom IC-756 Proll. Antenna: Wellbrook LF1010.
- F) Alan Gale, Lancashire. Receiver: AOR AR7030+ with 125Hz c.w. filter. Antenna: Wellbrook ALA100 Loop, Tuned Doublet, Wellbrook ALA1530, 12-AVQ Trap Vertical, Inverted L with UMB, Skysweeper 3.05 decoder software.
- G) Arnie Nesbitt, near Whitby, England. Receiver: Crys. Antenna: Sheep fence earthed by a water trough.
- H) Lionel Roithmer, Guernsey. Receiver: AOR AR7030+ 300/125Hz filters. Antenna: Maynard ATL-3 indoor loop, Wellbrook ALA 1530 loop outdoors.
- I) Bo Nensén, Örnsköldsvik, Sweden. Receiver: AOR AR7030+ with a 300Hz JRC c.w. filter (CFL-231) Antenna: Beverages 156° - 500m, 222° - 760m, 245° - 740m, 261° - 930m, 279° - 1270m, 296° - 1240m, 317° - 940m, 333° - 700m.

DX

Television

● Keith Hamer & Garry Smith

17 Collingham Gardens, Derby DE22 4FS

The first half of September was dominated by intense tropospheric conditions. Signals from Scandinavia, Germany and the Benelux countries penetrated many inland areas of the United Kingdom at both v.h.f. and u.h.f., making it one of the more memorable events for some time. By contrast, out-of-season Sporadic-E openings were short and sweet.

Reception Reports: Sporadic-E DX

On 7 September **Tony Jones** (Basildon) encountered RTP-1 (Portugal) on Channel E3 at 0915. The following day, **Tom Crane** (Hawkwell) logged TVE-1 E2 (Madrid) at 1000. **Peter Barber** (Coventry) encountered bursts of activity on E2 between 1030 and 1100 on the 16th. On the 21st, between 1455 and 1457, Croatia E4 was identified by its HRT-1 logo despite the weak signal. On the 23rd, Tom received a weak TVR-2 (Rumania) signal on R2 at 1450.

Paul Foley (Newhaven) identified MTV-1 (Hungary, R1) at 0733, on the 24th, followed by TVR-2 (Rumania) R2. A further opening on the 27th produced Spanish, German and Swiss stations on E2 and E3.

Tropospheric DX

On 2 September, Tom Crane logged the Danish TV-2 Varde 500kW transmitter on E33 at a distance of over 700km. Tom comments that TV Noord (Netherlands) E36 is showing a new logo consisting of an up-pointing arrow with a vertical bar of similar length to its right.

The Dutch NED-1 broadcasts from Lopik on E4 penetrated many inland areas of the UK, reaching **Vincent Richardson** (Dolgarrog) on the 3rd for two hours when weak pictures with 'KRO' in the top-left were seen. Needless to say, Dutch signals were much stronger in the

south-east, maintaining pristine-condition colour, sound and readable text over long periods.

On the 5th at 0630, **Tony Jones** (Basildon) discovered the NED-1 PM5544 test card on E4 from Lopik and the full complement of u.h.f. channels from Goes, i.e. NED-1 E29, NED-2 E32 and NED-3 E35. Belgian catches included RTBF-1 E8 and VRT TV1 E10 (both Wavre) and Ketnet E62 (Schoten). During the evening, French System L images emerged, i.e. France-2 L21 (Lille) and the Boulogne outlets TF1 L29, France-2 L34 and France-3 L37, the latter being the weakest and co-channel to Croydon Channel 5.

Tony adds that the multitude and brute force of Continental analogue signals disrupted the 'local' Crystal Palace digital multiplexes, with half the channels lost. By 1400, the BBC multiplex had disappeared, plus the one that supports digital channels 18-21, and radio channels 80 to 88 and 92.

On 7 September, using loft antennas, **Gordon Still** (Ruislip) resolved colour pictures from NED-1 on E4 and E6. Belgian signals from Wavre were also present on E8 (RTBF-1) and E10 (VRT TV1) with strengths peaking between 2150 and 2200. **Stephen Michie** (Bristol) reported Denmark E7 with 'TV Avisan' news and a subtitled soap on TV2 on E22 and E27. Various Dutch locals were also identified including RTV Oost E22 and E36, RTV Noord E36, TV Drenthe E25 and TV Flevoland E26. Among the Dutch and Belgian stations, **Simon Hockenhull** (Bristol) identified ARD (Germany) on E9 (Langenberg 100kW) and E11 (Teutoburgerwald 100kW).

Also on September 7 (and again on the 8th) **George Garden** (Edinburgh) captured an excellent display of Norwegian DX. Using an existing 9-element log-periodic DAB array, excellent results were obtained in Band III from NRK-1 E6 (Bjerkreim 15kW) and E9 (Bergen

140kW). At u.h.f., various networks were present including NRK-2 E41, TV2 E44 (Bokn 270kW) and E47 (Stord 188kW), TV Norge E51 and E52 with their 'N' logo. At a considerable distance, the Dutch service TV Noord was identified on E36 with schedules at 2000.

Despite shielding from the Peak District, **Tim Bucknall** (Congleton) encountered several Norwegian Band III outlets on the 9th. At one stage on E9 (Bergen), a co-channel signal emerged with the letters 'YLE' in large letters, suggesting Finland. Some caution is necessary with logos and captions as the same morning a Russian logo was seen here on E10 via the Belgian VRT TV1 network while footage of the school tragedy in Chechnya was shown. There is a Finnish E9 transmitter at Turku on the western coast, so it is a possibility.

In northern India, tropospheric conditions were excellent too with PTV (Pakistan) Lahore E5, Doordarshan (India) Kasauli E5, Amritsar E7 and Jalandhar logged almost daily by **Lt. Col. Rana Roy**.

Unusual Band I Tropo

Among the plethora of Scandinavian and German signals, several Band I stations, considered rare for tropospheric reception, emerged. **Peter Barclay** (Sunderland) managed a personal 'first' by receiving NRK-1 (Norway) E2. Another rare station was ARD (Germany) E4, possibly Flensburg 50kW. **Ian Milton** (Ryton) logged NRK-1 E4 on the 9th.

FM Reports

Writing from Edinburgh, **George Garden** said "the f.m. band was clogged by German stations on the 7th". Those identified by RDS included DLF on 107.1MHz and BREMEN 1 (both Bremen 100kW), NDR NDS 93.8MHz (Niedersachsen) and WDR-2 94.1MHz (Münster 25kW). BBC Radio Norfolk was identified earlier in the day on 104.4MHz from the Great Massingham 4kW outlet.

On the 8th, the path favoured Norway with KANAL 24, possibly a new station, heard on 100.1, 101.4 and 102.0MHz. Other Norwegians included NRK P3 on 91.1, 91.8 and 99.0MHz, NRK P1 on 88.0 and 94.2MHz. A new high-pressure system developed on the 15th and **George** identified signals from the BBC Radio Cymru 15.6kW outlet at Llangollen.



Fig. 1: An advertisement on NED-1 E4 from Lopik, received by **Gordon Still**.



Fig. 2: **Stephen Michie's** reception of the TV Oost news introduction.



Fig. 3: The BBC-TV Identification Symbol, which was modified to incorporate the existing Crystal Palace and Sutton Coldfield outlets plus the new Holme Moss transmitter that was brought into service on 12 October 1951.

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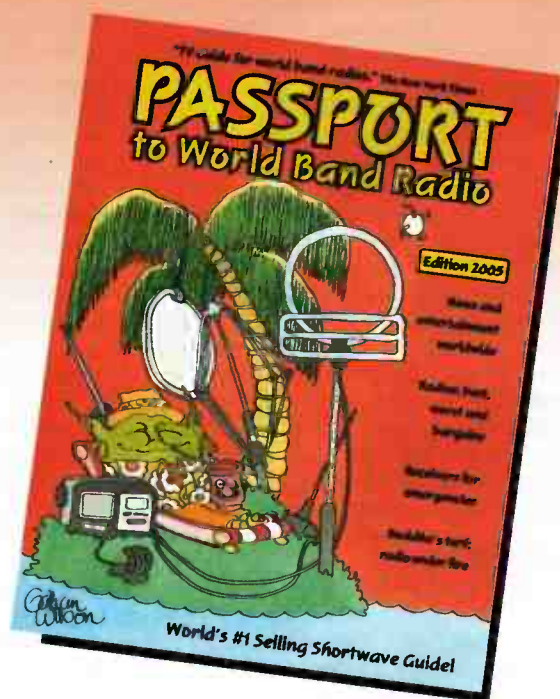
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Satellite

TV News

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

Egypt experienced explosions at the Red Sea resort of Elat. The local Hilton Hotel was damaged. Over the weekend of 9 October, rescue workers were still digging, the death toll was unknown. 'SHEN', an Israeli satellite comms. facility was busy over this period uplinking news content from the border control into Israel's TV network using *Eutelsat W2*, 16°E capacity, frequencies differing each day, but typically between 12.643-12.643GHz-H (SR5632+FEC3/4).

A second uplink identification was found within the menus as 'NAYEDET-Ch-2'. Another Israeli sat truck appeared during this period signing as 'RAMATTAM SNG4' over on *Eutelsat W1*, 10°E, 11.023GHz-H (3390+3/4) with the on-screen logo - RAMATTAM NEWS AGENCY GAZA' and the hidden ident 'RAMATTAN', no footage or live content was seen.

Meanwhile, further to the East, Afghanistan was holding their national elections over 9/10 October. The importance of these elections was matched by circuits established over 10, 16 and 45°E - 'CNN AFGHANISTAN' ran NTSC updates on the pre-election run up over 45°E - 11.539GHz-V (6109+3/4) whilst NBC utilised 16°E capacity as a primary link via their London bureau. Their flyaway equipment appeared as '536197' on frequencies between 12.533-12.562GHz-H (5632+3/4).

Most football matches, other than regional kickabouts, seem to be encrypted these days. But, 'BT5' on 15 September offered live action throughout the whole match between Millwall v Feren Cvaros (Hungary) in a Uefa league game. The audio carriers were found to all be carrying sound effects. The only commentary appearing on audio track 2 mono/right. BT5 downlinked at 11.081GHz-V (5632+3/4) on *Eutelsat W1*, @ 10°E.

For those sat-zappers with smaller dishes it's possible to monitor traffic both into and out of NBC New York, check out the 'DAD-5' downlink over on *Telstar-12* @ 15°W, 11.521GHz-H (3746+7/8), it's a pretty good signal into the UK and often carries circuits out of the Middle East.

As I type on a damp UK evening in early Autumn, a live news agency camera feed from a hotel balcony out of a night-time Baghdad over *W1*, 10°E is carrying a gun battle, the 'ratatata' of an AK47 and much heavier 'donkadonka' of a large machine gun, echoing around the streets.

There appeared over *W1* in early September a TV channel signing simply as 'IRAQ' at 10.992GHz-V (3100+3/4). Content was shots of vases and other artifacts with occasional Arabic captions, this sequence was a looped video. This was apparently an 'Arabsat Test'.

Noting Iraq output, Alan Richards (Skegness) reports that the 'ABC' feed out of Baghdad carried over *Intelsat 10-02* 1°W appears now at 11.656GHz-V (5632+3/4) but intermittently, warming up for the actual feed-time itself and then switching off afterwards, so no more of the locked-off pictures of Baghdad city during ABC operational downtime.

Our old friend Edmund Spicer (Littlehampton) has recently enlarged his receiving system with the addition of a Raven 700mm elliptical dish, which has three LNBS fitted switched into his Humax CI-1500 receiver via a remotely activated 4-way DiSEQC unit. Whereas we report only digital signals these days, Edmund digs back into the simpler times and notes that the French TV channels over on *Atlantic Bird-3*, 5°W, have changed their analogue audio parameters. All the mono audio on the French TV network channels are using 50µs rather than the earlier J17 audio compression, which had been in use since the mid-1980s. Apparently the better audio decoding found in 'modern analogue' receivers has improved sufficiently to drop

the earlier J17 standard. And for test card anoraks, Edmund has seen 4 x 'Telefonica' PM5544 test cards in the *Hot Bird*, 13°E slot - we're now talking digital - @ 11.221GHz-H (27500+3/4) - this may be a new feeder slot from Spain or perhaps new Spanish TV channels are about to appear?

Established readers of this column may recall reports of Balkans air surveillance pictures from both drones and piloted aircraft. These images appeared over the then *Orion* 37.5°W satellite but following widespread publicity, they hit the encryption button and the images went dark. Scanning over 15°W recently up popped an old favourite - the military downlinks. Unfortunately, they're still encrypted but if whilst checking 'DAD-5' as above, just pop along to 12.547GHz-H (19500+2/3) and you'll find your old favourites plus a few new ones! These are I list - CNN HDLN; C-12 MARS; AIR SCAN; CNN LIVE; QUAD UAV; AFDL; P-3/PENTAGON; FOX NEWS. The CNN Headlines, CNN Live and Fox News are obviously programming, the first two being on the original *Orion* bouquet. The 'P-3/PENTAGON' may be the new 'PENTAGON CHANNEL', this has been mentioned in recent media news as a channel featuring politics and activities in and around the Pentagon and Washington. The bouquet will register on your digital receiver, provide the channel identifications but the screen will remain annoyingly blank!

Sunday 29 September and a radio news flash, a bomb threat to the Greek Olympic Airlines, Flight 411, Athens to New York had led to the aircraft diverting and landing at Stansted in the UK, where it taxied to a remote part of the airfield with passengers and crew fleeing to safety. I had a quick scan over the Ku-hi section of *W2*, 16°E and found 'SKY NEWS' setting up with a camera shot of the airliner - before they aired the first live insert into Sky News. But security opted to leave the aircraft alone until after its scheduled arrival. A search followed which drew a blank - the slot - 12.554GHz-H. That evening, a live 'Q and A' with Tony Blair in Brighton prior to the Party Conference was on the *W2*, 12.510GHz-H slot with questions from a selected audience - however, he was caught out with questions concerning religious discrimination within the UK. It was 'SIS12 8MB+D' that carried this epic transmission. Usually, any live satellite news gathering content appears over *W2* from the NTV channel, a new one appeared near to end September, this identified as 'GBLA 4:2:2' and featured a bunch of happy Russian sailors spending money in shops - perhaps they've received back pay and were spending the roubles quickly. Despite the identification, standard MPEG-2 was used and not MPEG 4:2:2! These three transmissions all used the regular SR5632+FEC3/4 parameters.

A finale from Roy Carman (Dorking) who found live news content downlinking over *Hellasat-2*, 39°E. Seemingly, Greek customs officers boarded a small craft and recovered several small religious icons, a patrol cutter of the Hellenic Coast Guard was moored nearby. The following day another downlink carried more news updates of the same story. Later, Roy learned that the boats had been searching for a helicopter that had crashed into the sea. The two men were not as first thought to be smugglers with the icons, but were rescue divers that had recovered the religious icons from the downed aircraft. Aboard the helicopter had been the Patriarch of Alexandria, the reason for the religious icons being aboard the aircraft. The first day's news transmission was found at 12.660GHz-V (6111+3/4) - 'INA NEWS/www.ina.tv/UKI', the 2nd day the news update was carried over *Intelsat 702* @ 54.8°E @ 11.126GHz-V (3125+5/6) and a service identification - 'ALPHA SNG 2'.



The 'Tellytrack' horse racing channel operates an international and domestic service on 45°E.



Mount St. Helens smokes across Washington State, 10°E



Stansed and Flight 411 awaits the bomb search, 16°E.



German Army bullet riddled comms. building near Kabul, bullet proof cladding over windows, 16°E.



Alpha TV - The Alpha TV identification logo, Intelsat 705.



The torch lighting ceremony at Marathon for the Disabled Olympics, mid September over 39°E.



The Hellenic Coast Guard boat, centre of the search operation.



Rail crash at Kristiansand, Sweden.

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