

# short wave magazine

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*JW-Commercially Speaking*  
**HF-2050 REVIEWED**

# SHACKWARE SPECIAL

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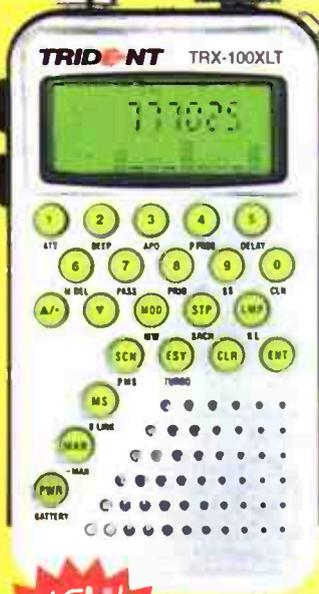
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World Radio History

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Vol. 58 Issue 03 March 2000  
ISSN 0037-4261  
ON SALE FEBRUARY 24  
Next issue on sale March 23

## SHACKWARE SPECIAL by Jerry Glenwright



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Computers in the shack don't always look this way! If you can find one, the HF-2050 is a worthwhile addition to any serious listener's shack.

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There's never been a better time to buy a computer - even the second-hand scene is awash with staggeringly cheap computers of all descriptions. Jerry guides us though the computer maze.

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You don't always need the latest high-spec expensive PC. Jerry says you should take time out to shop around, visit Bring & Buys and car boot sales - you'd be surprised at what you can find!

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### 38 SHACKWARE - THE COLUMN

Self explanatory, this one.

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- AIRBAND SPECIAL
- COMMERCIAL CLASSIC
  - JW on the Harris RF-590A
- and much more ...



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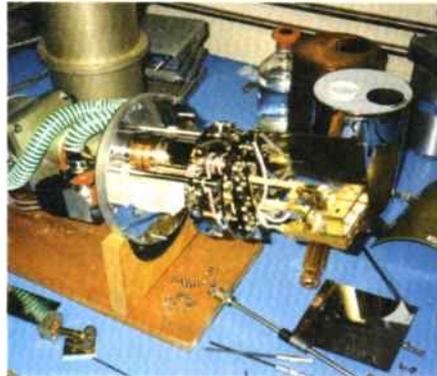
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## 23 IN MY EXPERIENCE

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## 40 THE TECHNOLOGY OF JODRELL BANK

Last month we delved into the history of Jodrell Bank. This month, Dr. Alastair G. Gunn guides us through the state-of-the-art technology employed.



**Don't miss the World Wide Radio Guide Peak Time Short Wave Schedule on page 12**

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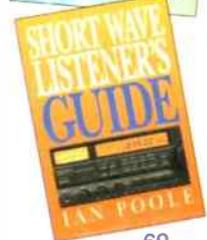
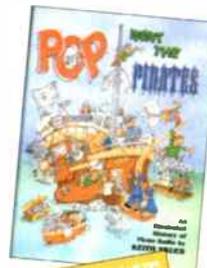


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### Components For SWM Projects

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. The printed circuit boards for SWM projects are available from the SWMPCB Service. **Badger Boards, 12 Hazelhurst Road, Castle Bromwich, Birmingham B36 0BH, Tel: 0121-681 4168.** A small catalogue containing components, projects and p.c.b.s is available, free, to anyone sending **Roy or Sue Martin** an s.s.a.e.

### 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 £2.99 each and photocopies are £2 per article. Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate. A complete review listing for SWM/PW is also available from the Editorial Offices for £1 inc P&P.

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### Technical Help

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

# ed's comments

**W**elcome to the March *Short Wave Magazine*. Our feature

packed issue is of a 'ShackWare' bias, as you'll no doubt have noticed by now. Jerry Glenwright guides you through the potential minefield of the computer/radio mix.

There is no doubt that owning and using a computer is becoming much more prevalent in society as a whole. A technical hobby like ours though, almost demands that a computer is a member of the listeners arsenal, there really is much that can be done with a suitable machine.

I'll leave it to Jerry to explain, but if you are one of those who's not convinced, read on with an open mind. I'm sure you won't regret it.

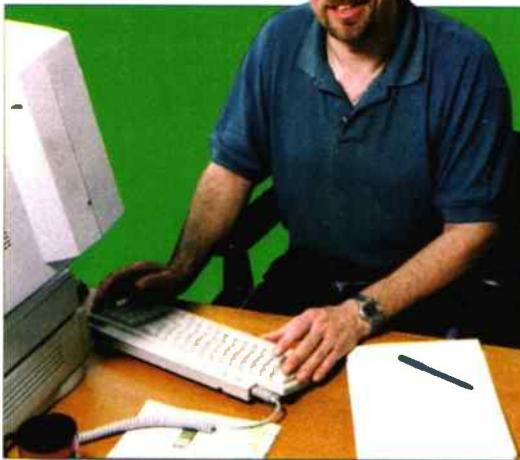
## POCOM?

Of interest to those of you who hold amateur radio or CB licences, is the news that SSL have again been successful in winning the contract from the RA for the distribution of said licences for the period 1 April 2000 to 31 March 2003. That's what I've just gleaned from a Radiocommunications Agency Press Release that landed on my desk. To throw us all off the scent, SSL have changed their name. The operation will be now known as Post Office Customer Management with the snappy acronym POCOM identifying them to their customers. The icing on the cake for SSL/POCOM is that with the commencement of the new contract they will be responsible for issuing "Ship Radio Licences".

## Installing Antennas

I finally got around to fixing a permanent mast at home last weekend. As is always the case the job took lots longer than anticipated, mainly due to the hardness of my garage wall. My 'monster' cordless drill wasn't up to the job. Oddly my mains powered drill with a less powerful motor was much better, seemed to be the higher frequency 'hammer' action. Trouble is it left my hand tingling and my 16mm masonry bit in tatters. Worthwhile exercise though, the antenna farm is starting to flourish.

First to get raised in the air was a helical beam for 1540MHz aimed at a bearing of 200°. Then the discone was fitted atop of the 2in pole. It's not at any spectacular height, only some 8m, but it has a clear view all around and is working well, thanks to some high quality low loss feeder. The subject of a recent healthy discussion between G1TEX and myself concerning the skimping and penny pinching tactics of some of our fellow enthusiasts regarding quality of coaxial cable and importantly, connectors. Believe it or not, there are some people who actually save a few 'quid' by fitting a 'budget' PL-259, BNC, N-Type plug or whatever and as a result ruin their whole receiving set-up. True - but crazy, eh? Why spend hundreds or even thousands on a radio and then spoil its performance for the sake of a (relative) pittance? It is all too often that this kind of thing happens with very disappointing results. Unfortunately, the early arrival of darkness called a halt to proceedings. I'll



have to wait till next weekend to sort out the h.f. antenna.

## Compact Antennas

By strange coincidence I received the following message in my 'mailer 'In Box' from Jacques d'Avignon, regarding one of the antennas that I'll be installing. Like Jacques I am sold on the performance of

this outstanding antenna, though I'm looking forward to comparing it with the larger wire antennas that I now have to make room for. Here's what Jacques had to say.

"Just a short note to tell you that I have had the opportunity of trying out Wellbrook's ALA1530 loop during a DXpedition and this is a superb antenna. The loop was set-up up on the ground and allowed me to hear clearly NDBs in the 200-400kHz range at distances that varied between 500 and 1200 nautical miles. Not bad for a one turn loop!

This loop was also used for m.w. and s.w. and in many cases the results were comparable to a 150m antenna!

During the same weekend, we also tried a prototype of an antenna amplifier/splitter from the same manufacturer and we were **very** impressed by the quality of this product. I believe that this splitter is now available as a AS1030. This splitter had no intermod problems at all nor any hint of intemed was detected."

Well that's why I've been using the ALA1530 over two years - outstanding antenna!

## SMC Focuses On Commercial Business

Now I have some good news for the hobby radio trade.

Notice has been received that in order to concentrate their resources upon growing commercial markets, SMC regrettably announce the closure of their retail division. There is to be closing down sales at both their shops in Southampton and Axminster. All remaining stocks will be sold at near cost, cost or at a loss.

SMC say that they will continue to support and guarantee the equipment that they have supplied and will also continue to manufacture the Fairhaven and Lowe range of receivers, which will still be available from other dealers.

Barry Gardner and John Lightfoot of SMC are on record as saying they will deeply miss their many friends and loyal customers, whom SMC have served since 1958. Having consulted our archive copies, I find that SMC's founders Western Electronics began advertising in SWM in April '69 with an eighth of a page insertion. In the November '74 issue SMC (at this time South Midlands Construction Ltd.) began trading from the Western's previous Osborne Road, Totton, location, with G3NMM, Hal Perkins' Western Electronics company relocating to my home town of Louth in Lincolnshire in April 1976.

I wish to extend my commiserations to those who find themselves without employment as a result of this move by SMC. I'm sure that SMC customers will find that they'll have no problems obtaining their radio desires via our many advertisers.

73  
NNNN

*Kevin Nice*

**Dear Sir**

Just a quick note to say how much I had enjoyed Keith Elgin's article in the February 2000 edition of *SWM*. The article was full to bursting with useful information and a joy to read. Please can we have more?

I don't like to knock people, but *SWM* has been missing articles of this quality for some time. It was particularly nice to see some frequencies mentioned as well. In short, well done to you and Mr Elgin - keep it up :-)

By the way, I posted a message to the mil-scan listserv on the Internet saying how good the article was and I have had three replies agreeing with me so far, so I told them not to write to me, but to write to you requesting more. I hope you don't mind.

Best Regards.

**Paul Jackson**  
Manchester

**Dear Sir**

Due to my disability I have decided to start short wave listening as a hobby (European and foreign commercial stations, etc.). I was fortunate enough to purchase a second-hand Matsui MR4099, but being a Novice, I hope you can help me with three minor queries.

Firstly, could you recommend a portable interior and exterior antenna I could use instead of the telescopic one attached to the receiver. I don't want to erect a permanently sited antenna, I enclose a list of frequencies used on my receiver.

Secondly, in the LM&S column, each station report is graded by what is called SINPO, could you tell me what this means and how the number system works.

Finally, being a Novice, do I log all stations I receive? If so, could you tell me what information do I log about each individual station.

**Wayne Davies**  
Mid Glamorgan

*I suggest a 5-10m length of wire hung from an upstairs window to check whether you see an improvement over the whip. If you do, then that's all you need. Regarding SINPO code, see LM&S this month. It is usual to log time, date, frequency, signal report, station id, mode and any comments to remind you of what you heard. It is up to you. I know listeners who record a portion of what they monitor for future reference. If you wish to obtain QSL cards, then you'll need to provide a report to the station that convinces them that you actually heard their transmissions. - Ed.*

**Dear Sir**

I have a Yupiteru MVT-9000 scanner and have rigged up a long wire antenna, via a length of coaxial cable. The antenna is about 10m long, about 5m above the ground slung between the house and a tree, and is orientated approximately North-South.

Strong h.f. stations (i.e. Shannon Volmet) are received clearly and I can also make out Gander Radio for example, but on other frequencies, i.e. Ian Johnson's frequency list (SSB Utilities, *SWM*, Feb 2000) there is just a lot of noise.

While I understand that the Yupiteru is not a dedicated h.f. receiver, I am keen to get as much out of it as possible. Would the installation of an antenna tuning unit improve reception?

Thank you for any advice you can give me.

**Roy R. Smart**  
Midlothian

*Roy, this may be stating the obvious, but the use of the frequencies you mention is sporadic. It may be that you are just missing the traffic. The antenna you mention is more than adequate as demonstrated by Shannon and Gander reception. The installation as you describe would not benefit from an a.t.u. - Ed.*

Have you joined the *SWM* E-mail list yet? Here's a brief look at what goes on. To join in simply send a blank E-mail to

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and you automatically subscribe.

**Subject: [SWM-R] IOM LW radio 279**

\*\*\*Brought to you by e-mail via the *SWM* Readers Mailing List\*\*\*

Do you expect the following claims on the web site regarding the reception area to be achieved?

"We believe the 279 Long wave signal will reach as far as Paris, Brussels and Amsterdam, but plan to boost reception still further by broadcasting on satellite and short wave to other parts of the world."

"We plan to use a network of former BBC World Service transmitters which will send the station's signal into Australasia and North America, as well as some FM stations in other places such as the Cote d'Azur," Rusling explains. "It's very important that the station be seriously 'international' and not just a station broadcasting to the UK."

"I think its very interesting to note that many of the big developments and changes in British radio have come about as a result of activity from outside the UK," said Rusling. "Lucky Luxembourg brought sweeping changes to the BBC over its half a century of serving music starved British audiences, then the offshore stations had their on effect, precipitating Radio One and commercial radio. In the 1980s, Laser gave radio another shake up, helping force out needletime restrictions and the 50-50 speech ratios from music stations, not to mention our dropping wavelength in favour of frequencies!"

**Mike Terry**

####

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To unsubscribe, send any message to: [<SWM\\_Readers-off@pwpublishing.ltd.uk>](mailto:<SWM_Readers-off@pwpublishing.ltd.uk>)

**Subject: Re: [SWM-R] AirNav Selcal Decoder**

\*\*\*Brought to you by e-mail via the *SWM* Readers Mailing List\*\*\*

Re Message from: Iain Gordon

>>

> Has anyone subscribed to this package and if so any comments/

>>

I've used it in demo mode and it works ok. From the Selcode received information as to the identity of the aircraft comes up, and also if the program is left on while you do something else, you can call up and play back the actual voice message which accompanied it to find out position, route, callsign etc. without having to continuously monitor the frequency - which is what Selcal was designed for.

I've already got the database in Airnav 3.1 so I'm a bit mystified why the subscription is as dear as it is.

**Best regards**  
**Richard**

####

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**Dear Sir**

I wonder...JW does a very nice job when it comes to the task of providing reviews of the best and worst of radio equipment. For the most part they have been receivers usually seen in ads within the pages of *SWM*, affordable and accessible to most.

Now, will he ever be able to do a review of some of the more exotic devices not generally available to the public, like, say the Rohde & Schwarz ESMC or EB200 wideband receivers, or Racal 3790 and 3720 series?

A trawl around the web a few days ago turned these up and I was quite amazed at their specification. I'm sure JW could use his contacts to obtain the above for a review for curiosity's sake.

Thanks for the great content of your magazine. Best wishes.

**Jonathan Dodds**

*Jonathan, my stance on this is simple. If there's a reader interest in a receiver, and a receiver can be obtained for review purposes, then you'll very likely see it reviewed. This month John looks at the rare and exotic HF-2050 from Rockwell Collins, which I was fortunate enough to borrow from a serious collector I happen to know, on the south coast. It is not always easy to locate the radio that JW has reviewed. Any help or further suggestions are most welcome. The Racal radios you mention are high on the priority list, I have someone working on a loan radio from within Racal. - Ed.*

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

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

TOP  
QSL

## Rally & Dinner Dance

The **Irish Radio & Transmitter Society's** Annual General Meeting & Dinner Dance is to be held on the **8/9th April 2000** in the Four Seasons Hotel, Monaghan. A big attendance is expected and there will be some special guests. The dinner dance starts at 2100 sharp and tickets are £20. The Hotel is running a special rate for the weekend which are £38 pps (per person sharing) bed and breakfast.

Doors open for the rally at 1130 on the Sunday, with the rally finishing at 1630. All the usual retailers will be in attendance, including large displays of computer equipment and a Bring & Buy. Refreshments will also be available in the Hotel along with full facilities for QSLing via the brewery.

More information from **Stephen Hand** on **(013657) 51479** (evenings), FAX: **(013657) 51200** or E-mail: **stephen@gi7uim.freeserve.co.uk** Alternatively, contact **Ken O'Reilly** on **(013657) 23283** or E-mail Ken at **kenoreilly@enterprise.net**

## New Premises

**Ronal Computer Ltd.** are pleased to announce new retail premises at **54a Ash Street, Southport**. **Charles O'Hara**, previously Office Manager at Bispham Road, will manage the shop. Trade and component sales will continue to be from Bispham Road with Ash Street concentrating on system sales, peripherals and consumables. More information can be obtained from Ronal Computer's web site at **http://ronal.freeserve.co.uk**

## Club Info

The **Bangor & District Amateur Radio Society** meet on the 1st Wednesday of every month in the Clandeboye Lodge Hotel, Bangor, at 2000. On Wednesday 1 March 2000, they are hosting talks entitled 'Air Traffic Control' and 'Analogue Electronics'. Visitors and new members are most welcome. More information from **Mike GI4XSF** on **028 4277 2383** or visit the club's web site at **http://welcome.to/bdars**

Members of the **Weston-Super-Mare Radio Society** meet at the Woodspring, High Street, Worle, normally on the 1st and 3rd Monday of each month. Visitors and prospective members with an interest in amateur radio are always welcome. More information from **Graham Pinder G8WAR** on **(01934) 415700**.

The **Lagan Valley Amateur Radio Society** meet every 2nd Wednesday of the month at Harmony Hill Art Centre, Lisburn, Co. Antrim. There is no meeting during July and August. The Society also hold an annual rally, this year on the **11th March 2000** at the Lagan Valley Hospital Conference Centre, Lisburn, N. Ireland. Doors open 1200. Further details about the club's activities or about their rally can be obtained from **Reid MI0BOT** on **(01232) 258403** or E-mail **gi4gty@qsl.net** or look up their web site at **www.qsl.net/gi4gty**

Members of the **Hambleton Amateur Radio Society** now meet between 1930 and 2130 in the Mencap Centre, Northallerton. Further information from **John Hampson G0VXH** on **(01845) 537547**, E-mail: **jonham@beeathermail.net**

## New Website

A web site for radio in 18 languages! That's what you get when you log into the new **European Radio Network (ERN)** website. The site is accessible at **www.euromixonline.com** and allows Internet radio listeners full access to streamed audio from EuroMix - the first pan European multi-lingual radio station from ERN, which was launched at the end of December 1999 on Eutelsat *Hotbird 4* (analogue) and *Hotbird 3* (digital). The site has been designed and developed by **Adept Web** in Ramsgate and will be hosted by London based **World Radio Network**, ERN's parent company.

The website will also allow listeners to enter EuroMix competitions, access information about the four ERN stations, find links to contributing broadcasters and keep up-to-date on new developments across the network. The site will eventually feature full on-demand and streamed audio from the three EuroMax stations as they go live throughout 2000. The first EuroMax station broadcasting in German was launched back in January. EuroMax Francais and EuroMax English will be launched in the latter half of 2000.

The new website builds on the success of parent company WRN's Internet site. WRN was the first UK broadcaster to make its services available on Internet audio. Today it provides a live relay - using RealAudio and Microsoft's Media Player - of both the English language and German language services. In addition, it offers an audio-on-demand service, including programmes in more than a dozen languages. The WRN site receives over 40000 hits per day, 5000 of which are downloading audio, making it one of the most visited radio sites in the world.

Chantal Cook, ERN Project Manager said, "WRN is at the forefront of broadcasting technology and the new EuroMix web site will reflect not only this, but also the rich cultural diversity of Europe".

## Exhibition & Conference

The first ever Radio Solutions Exhibition and Conference on Continental Europe will take place on **13/14 March 2000** at the **Arabella Sheraton Hotel, Bogenhausen**. Radio Solutions has been running annually in the UK since 1992 and has grown rapidly, attracting visitors from around the world. In this millennium year, the Low Power Radio Association - organisers of this event - in association with Hy-Line Communication Products Vertriebs GmbH - believe the time is right to take the show to the German market.

Approximately 21 visitors have booked so far, from Germany, France, UK, Norway, Switzerland and Holland. They will be showing short range radio devices, components and associated services for licence-free use. Of special interest to the security industry, utilities and communications sector, low power (short range) radio technology for cable-free communication is becoming a critical factor in a multitude of industries.

Topics in the one day conference (March 14th) will include the regulatory environment in Europe as a whole (and Germany in particular), technical advances and some major application areas. There will also be an overview of the technical standards currently being drawn up by the LPRA for short range radio devices.

Information on Radio Solutions, Munich, can be obtained from the LPRA website at **www.lpra.org**

## Five Day Course

A practical five day course entitled **A Scientific Approach To Global Communications** - held on **24-28th April 2000** - is open to a wide range of age groups and is suitable for Radio Amateurs, listeners or anyone with an interest in radio. Candidates sitting the City & Guilds Radio Amateur Examination will find the subjects covered to be a useful revision opportunity.

Elements of the course include: The history of radio; What are radio waves and how do they travel?; Different types of transmissions - long wave to microwave; Modulation and signal analysis techniques; Receivers - ancient and modern; Satellites and radio astronomy and Computers and their use in the radio environment.

Participants will be able to transmit during the weekend, under the special amateur callsign of **GB2KRC**. Instruction in operating techniques and radio regulations will be included in the timetable.

Students will also have the opportunity to use a wide range of receivers and pick up High Resolution Picture Transmissions (HRPT) from weather satellites.

Klive Court is a Georgian house with modern extensions and facilities, situated in 25 acres of wooded grounds, near the North Somerset Coast. It is located 12 miles west of Bridgwater on the A39. The Centre is managed by the Education Department of Somerset County Council.

The five day course costs £189 per adult, with a reduced charge of £156 for students under the age of 18. This includes accommodation and full board at Klive Court.

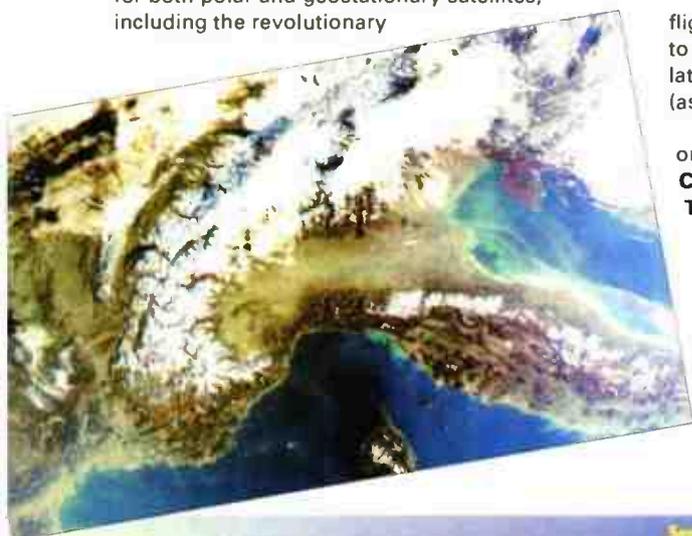
For further information or to obtain an application form, please contact the Course Director **Adrian Dening G4JBH** in the first instance on **(01288) 331113** (weekday evenings) or via E-mail at **106471.620@compuserve.com**

## Timestep's CHRPT

"Colour images from weather satellites in the winter? Not easy", **Dave Cawley** Managing Director of **Timestep** explains. Most amateurs receive NOAA APT, which is basically a two channel transmission, visible and infrared. To get colour, a clever mix of the two channels is used, but because the visible channel is so dark in winter, it is impossible to get good colour. Now with the advent of the Chinese CHRPT satellite (Colour High Resolution Picture Transmission) with 10 channels, four of these being dedicated visible channels, good colour can be obtained all the year round.

Dave goes on to explain, "the image here was taken on the 7 December at 0820, and yet the image is full of vibrant colour. Valleys are clearly visible in the mountains in Spain and the effect of rivers flowing into the sea can clearly be seen. So even in the middle of winter, colour images can be received, and this new system will plug into a u.s.b. port allowing even notebook computers to be used".

Timestep's CHRPT system is the company's newest product, and visitors to the London Amateur Radio and Computer Show at **Picketts Lock** on **11/12th March** will be able to see images on screen. Other equipment on offer will be Timestep LC and "i" serial interfaces with the latest 32-bit software, preamplifiers and antennas for both polar and geostationary satellites, including the revolutionary



230mm 'MicroPatch' square antenna for Meteosat. Visit Timestep on Stand K in the Red Hall!

You can also contact Timestep via their web site at **www.time-step.com** E-mail: **information@time-step.com** or telephone them on **(01440) 820040**, FAX: **(01440) 820281**.

## Radio Milestones

**Chinese Radio International, Polish Radio** and **ORF Vienna** have all recently been celebrating their longstanding short wave broadcasts in Esperanto.

Back at the end of December 1999, Chinese Radio International marked 35 years of daily Esperanto broadcasts. The station presently has a staff of ten professional Esperanto speakers and beams broadcasts to Europe, Latin America and both North East and South East Asia.

Polish Radio also celebrated their 40th anniversary of Esperanto broadcasts in the same year. They are presently using two frequencies and satellite transmissions.

ORF Radio Vienna started their regular broadcasts in the language in 1946 although they had already produced a regular course in Esperanto as long ago as 1924/5. Other major international stations which transmit programmes in Esperanto include **Vatican Radio, Radio Havana** and **RAI, Italy**.

For those who would like to hear the language, a full list of broadcasts and transmission times is available from: **Esperanto Association of Britain, 201 Felixstowe Road, Ipswich IP3 9BJ, Tel: (01473) 727221**, or more information can be found at **http://osiek.org/aera/frekvint.html**

## New Product

**Simon Collings**, Radio Communications Consultant, is now able to supply copies of Andre Brandao's new **AirNav Selcal** Decoding software on floppy disk. This allows those without Internet access or who are nervous of a credit card on the web, to order this excellent software. Full details of the product can be viewed on Simon's website at **http://wkweb4.cableinet.co.uk/simon.collings** The cost of **AirNav Selcal** Decoder on floppy disk is just £30 + £2.50 P&P (UK) or £5 airmail.

The original and highly acclaimed **AirNav v3.1** flight tracking and monitoring software continues to be available on CD-ROM - complete with the latest updates on floppy disk for only £53 + P&P (as above).

Find out more from Simon's website, as above, or contact Simon at **46 St Michaels Road, Cheltenham, Gloucestershire GL51 5RR, Tel/FAX: (01242) 514429**.

## Welsh Exhibition

The Barry Amateur Radio Rally has been renamed and is now to be known as **The Welsh Amateur Radio Exhibition**, Incorporating Computing & Internet. The next

Continued on page 10...

# rallies

### Attention Please!

Would you like to have your Rally publicised? If so, all you have to do is put together as much information as possible about the Rally, i.e. date, location, times, who to contact, etc. and send it to the Editorial Offices.

### 2000

**March 11/12:** The London Amateur Radio & Computer Show. There will be the usual mix of exhibitors at this two-day event, including computer software providers, special interest groups, a large Bring & Buy, local clubs, large and small Amateur Radio equipment dealers, electronic component vendors and lots more. In addition there will be free parking, family attractions (sport, cinema, swimming, golf, etc.), bar and restaurants, lectures, on-demand Morse tests, disabled facilities and a talk-in. Further information is available from **RadioSport** on **(01923) 893929**

**March 12:** The Wythall Radio Club are holding their 15th Annual Radio & Computer Rally at Wythall Park, Silver Street, Wythall, near Birmingham. Doors open 1000 till 1600 and admission is only £1.50. Plenty of traders in three halls and a large marquee with bar and refreshment facilities on site plus a big Bring & Buy stand. Talk-in on S22. There will also be a free park and ride for easy and comfortable parking. Contact **Chris G0EYO** on **0121-246 7267** evenings, weekends for details, FAX: **0121-246 7268** or E-mail **chris@g0eyo.freemove.co.uk**

**March 18:** The 7th West Wales Amateur Radio & Computer Rally will be held at Penparcau School, Aberystwyth. Doors open 1000 till 1530 and admission is just £1. Good parking facilities with easy access for disabled and traders for all stalls. Demonstrations of h.f., v.h.f., packet on the air. Amateur Radio and Computer Traders, Bring & Buy, clubs and special interest groups. Catering facilities also. Talk-in on S22. **Ray GW7AGG** on **(01686) 628778** or home QTH.

**March 19:** The Norbreck Amateur Radio, Electronics and Computing Exhibition, organised by the Northern Amateur Radio Societies Association (NARSA), is to be held at the Norbreck Castle Exhibition Centre, Blackpool. Don't miss the largest single day exhibition in the country. **Peter Denton G6CGF** on **0151-630 5790**

**March 19:** Bournemouth Radio Society's 13th annual sale is to be held at Kinson Community Centre, Felthams Park, Millhams Rd, Kinson, Bournemouth. Doors open 1030 and close at 1630.

Continued on page 10...

Send your news to Zoë Shortland at the Editorial Offices

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Large rotary tune, back-up memory, lock-out function.  
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Desk top stand for  
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Includes: psu: nicad batteries: cigar lead & plug:  
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## AOR AR5000 HIGH PERFORMANCE WIDE BAND ALL MODE RECEIVER

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The ARD-2 is fully portable with just a single lead  
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With built in LCD provides 2 lines of text with up  
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512 characters.



## ICOM IC-R75 QUALITY SHORTWAVE RECEIVER

(with coverage right up to 6m Ham  
Band).  
30kHz to 60MHz.  
USB. LSB. AM. FM. CW.  
featuring 101 alphanumeric memories: digital signal processing:  
automatic notch filter. 2 level pre-amp: clock. etc.



## AOR AR3000A WIDE RANGE RECEIVER

100kHz to 2036MHz.  
USB. LSB. CW. AM. FM. WFM  
RS232C interface.  
1000 alphanumeric memory channels  
large LCD display: analogue S-meter. etc. etc.



## ICOM PCR1000 COMPUTER CONTROLLED RECEIVER

10kHz to 1300MHz.  
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If shift function: noise blanker. CTCSS tone  
squelch. RF attenuator. unlimited memory  
channels. etc.



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50 memories: memory scanning: high and low impedance antenna  
sockets: programmable steps. etc. etc.



## BEARCAT UBC9000XLT VHF/UHF SCANNING RECEIVER

25 to 1300MHz (with gap).  
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socket. etc.



## ICOM IC-8500 PROFESSIONAL COMMUNICATIONS RECEIVER

0.1 to 2GHz.  
AM. FM. WFM. USB. LSB. CW.  
RS232C interface. 1000 alphanumeric memories: timer and sleep  
control: analogue S-meter: LCD display. etc. etc.



## COMMTEL COM 225 500 Channel Base Scanner 25-1300MHz CONTINUOUS (WITH NO GAPS). AM/FM/WFM.

Rotary tune: S-meter: memory back up:  
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Wide range multi-function receiver which includes unique 'text  
search'. also includes PC software.

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Half size antenna (40 through 10m) £12.00 + P&P.



Full size antenna (80 through 10m) £15.00 + P&P.



## SANGEAN ATS 818 A FAVOURITE PORTABLE SHORTWAVE RECEIVER

150kHz to 30MHz (AM. SSB).  
87.5 to 108MHz (FM).  
AM wide/narrow filter.  
54 memory channels. etc.



## SANGEAN ATS-909 QUALITY PORTABLE SHORTWAVE RECEIVER

153kHz to 30MHz (AM. SSB).  
87.5MHz to 108MHz (FM).  
Features (RDS) Radio Data System:  
307 memory channels: World  
clock. 3 timers: LCD display: Signal strength meter. etc.

... continued from page 7

exhibition takes place on **Sunday 26th March 2000**.

This year, the Exhibition will be featuring, centre stage, their 'Multimedia Shack' presentation with live demonstrations of computer aided station management, computer rig control, scale models of AMSAT Satellites, 'live' fast scan TV and many digital modes, including 'live' APRS presented by Kenwood UK. Using state-of-the-art equipment including multi video projection units this will be a show no serious amateur should miss!

The Welsh Amateur Radio Exhibition will be returning to the original venue, the newly refurbished Memorial Hall, Barry, South Glamorgan. With ample parking, this is an exciting venue with licensed bar and catering.

The Exhibition opens at 1000 for the disabled and 1030 for the general public. A special guest is planned to open the Exhibition at approximately 1130. Further information from **Brian Brown** on **(01222) 832253**.

## Mobile Sound

Popular music station, *Southern FM*, has recently had its Jeep Cherokee radio car equipped with Icom radio communications

who wanted their new vehicle to be equipped with communication equipment allowing it to broadcast on the road. One of the prerequisites of the brief was that non technical staff could operate the equipment from inside. On most occasions, the vehicle will only have one person such as a reporter or radio presenter in it, so simplicity had to be the keyword in the design of the system, from set-up to operation.

MRM satisfied the brief and engineered various components into a company operating unit that now sits neatly in the *Southern FM* radio car. Integral parts of the system include a Narti Broadcast link transmitter, a Sony off air receiver, an Icom IC-F1010 transceiver for car to studio communication, batteries and chargers. The vehicle also boasts a pneumatic extending mast, allowing the user to raise it with ease and transmit over a wider area.

An important part of the system is the IC-F1010 mobile radio transceiver, supplied by

## Anniversary Weekend

County Morse test teams will again be on the air during the 14th anniversary weekend of the **13/14th May 2000**. For ease of identification, all stations will use a special event GB0 prefix, followed by the county code suffix, e.g. the Isle of Wight will use the callsign GB0IOW and London GB0LDN. The Chief Morse Examiner will use GB0CW and the Deputy Chief Morse Examiner GB0MTS.

There will be a minimum of 27 stations active and a Morse Test 14th anniversary certificate will be available to any amateur who makes contact with at least 10 of the GB stations. The cost of the certificate is £2.50 (cheque or postal orders made out to the RSGB), \$5 or six IRCs. Applications with log extracts only should be sent to the **Chief Morse Examiner, David Waterworth G4HNF, 116 Reading Road, Woodley, Reading, Berks RG5 3AD**. QSL cards are not required to claim the award, which is also available to listeners.

Activity will be concentrated in the 80 and 40m

**Icom (UK) Ltd**. This allows the operator to talk back and listen to the studio while on air. Mike Rump, Chief Engineer of MRM Hire said, "the IC-F1010 was chosen for its flexibility, wide range of functions and ease of use".

Engineered together, the equipment allows the operator to broadcast efficiently and effectively providing a quality output. This is an important requirement for any professional broadcast radio station. The equipment has also been designed so that it has the option of being powered from the mains or from the car itself. This is especially important for

operations at outside events, such as exhibitions or county shows.

Gary Hornbuckle who is the *Southern FM* Chief Engineer said, "It works extremely well. I was especially impressed with its technical design. The Jeep and its equipment is used up to five times a week. It is employed extensively on the breakfast show and doubles up as a traffic buster car when the weather is poor and the plane cannot fly".

More information about Icom (UK) Ltd. at **Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742**.



equipment, so that the station can now perform outside broadcasts. The equipment, engineered by Brighton based company MRM Hire, means that the vehicle is now making an important contribution to the operation of the station.

MRM Hire originally received a very specific brief from *Southern FM*



bands, and in order to encourage newcomers to apply for the award, each team will spend some time calling slowly in the Novice c.w. section of the 80m band, above 3.560MHz. The event is not a contest and examiners will be happy to reply at any preferred calling speed. There are no restrictions on the type of Morse key used, all are welcome to call in and enjoy the friendship.

## Radio & TVDX News

Check out the u.h.f. airwaves for a new regional u.h.f. TV transmitter testing in North Holland - 'RTV Noord Holland' is transmitting on ch.E55-horizontal @ 200W e.r.p. The PM5544 test card is used with ident at top 'RTV NOORD HOLLAND' and lower 'NOZEMA K55'. The signal can be received easily in Rotterdam on an indoor antenna.

Programmes should now be on-air. Meanwhile in Eire there's a gradual and progressive close down of their Band 3 channels in favour of u.h.f. as the v.h.f. band is gradually emptied. Most of the Polish Band 1-2 TV bands have been emptied with news that all TV transmitters across chs. R1-5 inclusive have closed in favour of u.h.f., (this news from the Dutch BDXC).

Despite the RTP Portuguese national TV channels being bankrupt they will continue on-air being propped up by government funding. There have been moves to privatise the RTP-1 network which has suffered a reduction in viewing figures to under 30%, contrasting with the private commercial SIC channel that enjoys audiences of over 50% on a regular basis. The Lisbon government have refused to listen to the privatisation arguments.

The ITC have now

awarded the Norwich based Abacus Television an RSL-TV licence to offer a 24 hours daily, seven days a week of local, regional, and bought in programming. The transmitting channel has yet to be confirmed as a frequency has yet to be cleared by Europe - this could take up to 12 months.

At this time there are only five RSL-TV stations on-air in the UK though nearly another dozen have been approved to start transmissions. The ITC are currently delaying more RSL-TV licences pending further channel planning for the expansion of the national DTT channels.

The French Ministry of Culture and Communications are speeding up the introduction of DTT, aiming for a late 2001/early 2002 technical completion of the receiving box/decoder and transmission start. Concern is expressed in government circles that France is lagging behind much of Europe in digital technology.

Terrestrial Digital TV (DTT) continues to advance with the German Rhode and Schwarz receiving a 20million DM order for 60 high power transmitters to be installed across Spain. Currently about 50% of the Spanish population are in range of DTT expanding to 70% within the next year.

The government have announced plans

## Freepost Service

BARTG can now be contacted by Freepost for all membership correspondence. This Freepost address can **only** be used for **membership correspondence**. Because of the amount of forwarding and potential for delays, it cannot be used for any other BARTG correspondence.

So, if you would like to find out about membership, becoming a member, renewing a subscription, etc., then use the following address: **BARTG, FREEPOST NEA8763, Rotherham S66 7BR**. BARTG is also on the web, browse [www.bartg.demon.co.uk](http://www.bartg.demon.co.uk)

for a new band for wireless telecomms services based around the 3.4GHz band (previously used by Ionica PLC) for both business and home usage. Known as 'Fixed Wireless Access' this will offer "an alternative method of connection to provide services to homes and businesses using radio rather than fixed copper wire" - also minimising the inconvenience of road digging and high flying wires across countryside.

Though the frequency isn't advised, a firm called 'Black Box' have just marketed their 'SpeedLAN' 10Mbit/s wireless bridge providing a radio link up to 16km with a basic antenna or up to 40km for higher gain antennas. The system will provide for LAN (local area networking) links between split sites offering speech, data and with appropriate software provision for Ethernet/IPX routing.

More down to earth is news that Racal Translink and Motorola are working on a £350 million scheme to improve communications efficiency in the London Underground. The new network will

offer improved trackside comms for trains and operational staff in both voice and data (via Motorola TETRA) plus video imaging for advertising image boards such as currently on test at Holborn station.

It's likely that passengers/staff on the District, Piccadilly and Metropolitan lines may enjoy the new comms era by late Spring 2003 and the complete network some 15 months later. It has been suggested that the communications system will allow the use of 'standard' mobile 'phones and laptop computers (in the rush hour?!).

On Digital, the UK DTT provider will be launching Pay Per View offerings of film, sports and other exclusive shows late Spring 2000, encouraged by a subscription base now 560,000 accounts.

Send your news to  
Zoë  
Shortland  
at the  
Editorial  
Offices

## rallies

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

The Editorial Staff of *SWM* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers.

If you have any queries about a particular event, please contact the organisers direct.

Editor

Talk-in from G1BRS on 144MHz/S22. Amateur Radio and computer traders, clubs and specialised groups, excellent refreshments, admission £1. Details from **Oliver** or **Frank Goodger, 66 Selkirk Close, Merley, Wimborne, Dorset BH21 1TP** or Tel. (01202) 887721.

**April 9:** The West Manchester Radio Club are holding their Red Rose Rally at the Horwich Leisure Centre, Horwich, Bolton, Lancs, off Jnc6 M61. Doors open 1100 (1030 for disabled visitors). Admission by programme which costs £1.50, £1 for OAP on the door. There will be the usual stands, refreshments, Bring & Buy - any one item cost £2 to enter, no sales, no fees. **Don Aitchison G3BSA**, Rally Secretary, on (01942) 871620.

**April 16:** The 16th Yeovil QRP Convention is to be held at Digby Hall, Sherborne, Dorset. Doors open at 1000, talk-in on S22. There will be traders, construction challenge contest judging, three talks, QRP forum, in-hall catering, free parking, invalid facilities. Further details on (01935) 813054.

**April 16:** Swansea ARS will be holding their annual show in the Swansea Leisure Centre on the A4067 Swansea-Mumbles coast road. Doors open 1030-1700 and attractions include: trade stands, Bring & Buy, local interest groups and full catering & licensed bar. Admission is only £1, children just 50p. Further details from **Roger Williams GW4HSH**, Show Secretary, on (01792) 404422.

**April 16:** The Cambridgeshire Repeater Group are holding their annual rally at Bottisham Village College, Bottisham, which is about 10km east of Cambridge, access is via A14 and A1303. Features include a large hall, car boot sale, Bring & Buy and their renowned auction of radio and electronic equipment. Doors open 1030 and admission is £1.50. Refreshments available. Talk-in on S22. **Paul Dyke G0LUC** on (01462) 683574.

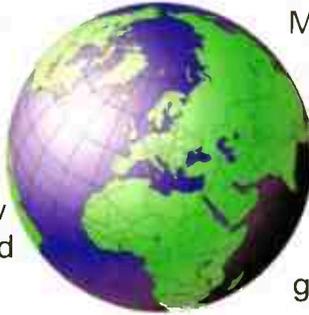
**April 30:** The Rainham Radio Rally is to be held at the Rainham School for Girls, Derwent Way, Rainham, Kent. Doors open 1000 (0930 for disabled visitors and items for Bring & Buy). Admission is £2, under 14s free. There will be a good mix of traders, selling new and used amateur radio equipment, electronic components, computers, etc. Many special interest groups will be represented also. Food and refreshments available. Talk-in on S22. Plenty of off road parking. More information on (01634) 365980 or E-mail: [martinm0ak@yahoo.com.uk](mailto:martinm0ak@yahoo.com.uk)

# World Wide Radio Guide

■ PAUL BEAM c/o SWM EDITORIAL OFFICES, BROADSTONE

■ E-MAIL: [wwrg@pwpublishing.ltd.uk](mailto:wwrg@pwpublishing.ltd.uk)

**H**ello again. This month as promised, I feature the balance of the short wave schedules up to midnight UTC. For those of you who don't know what I'm referring to, you should see the February issue of SWM.



Many thanks to all those of you that sent me positive feedback regarding last month's WWRG feature. I look forward to any comments relating to the material featured on these pages. Until next time happy listening and good broadcast DXing.

## SHORT WAVE

Time (UTC)	Station	Country	Day	Frequency (MHz)
1800-1827	R Prague	Czech Republic	-	5 930
1800-1827	R Prague	Czech Republic	-	7 315
1800-1830	V of Azerbaijan	Azerbaijan	-	9 165
1800-1830	V of Vietnam	Vietnam	-	7 145
1800-1830	V of Vietnam	Vietnam	-	7 440
1800-1830	V of Vietnam	Vietnam	-	9 730
1800-1859	R Polonia	Poland	-	6 000
1800-1859	R Polonia	Poland	-	7 285
1800-1900	BBC World Service	UK	-	3 955
1800-1900	BBC World Service	UK	-	6 195
1800-1900	BBC World Service	UK	-	9 410
1800-1900	BBC World Service	UK	-	12 095
1800-1900	R Taipei Int	China (Rep. Of Taiwan)	-	3 965
1800-1900	RAE	Argentina	Mon-Fri	15 345
1800-1900	Voice of America	USA	-	6 040
1800-1900	Voice of America	USA	-	9 760
1800-1900	V of Russia	Russia	-	5 940
1800-1900	V of Russia	Russia	-	5 965
1800-1900	V of Russia	Russia	-	9 340
1800-1900	V of Russia	Russia	-	9 480
1800-1900	V of Russia	Russia	-	9 890
1800-1900	WSHB	USA	Sun	15 665
1800-1900	WYFR Family R	USA	-	15 695
1800-1920	Radiobras	Brazil	-	15 265
1800-2000	IRRS-Shortwave	Italy	-	3 985
1800-2100	R Kuwait	Kuwait	-	11 990
1800-2100	R Kuwait	Kuwait	-	13 620
1830-1900	R Georgia	Georgia	-	11 910
1830-1900	R Sweden	Sweden	-	6 065
1830-1900	R Sweden	Sweden	-	7 345
1830-1900	R Vlaanderen Int	Belgium	-	5 910
1830-1900	R Vlaanderen Int	Belgium	-	9 925
1830-1900	R Vlaanderen Int	Belgium	-	13 600
1900-1910	V of Greece	Greece	-	7 475
1900-1910	V of Greece	Greece	-	9 375
1900-1930	V of Vietnam	Vietnam	-	7 145
1900-1930	V of Vietnam	Vietnam	-	9 730
1900-2000	BBC World Service	UK	-	3 955
1900-2000	BBC World Service	UK	-	6 195
1900-2000	BBC World Service	UK	-	9 410
1900-2000	Merlin Network 1	UK	Thu-Fri	6 010
1900-2000	R Korea Int	Korea(Rep.)	-	5 975
1900-2000	R Korea Int	Korea(Rep.)	-	7 275
1900-2000	R Pyongyang	Korea (DP.Rep.)	-	6 575
1900-2000	R Pyongyang	Korea (DP.Rep.)	-	9 335
1900-2000	R.Pyongyang	Korea (DP.Rep.)	-	11 710

Time (UTC)	Station	Country	Day	Frequency (MHz)
1900-2000	R Pyongyang	Korea (DP.Rep.)	-	13 760
1900-2000	R Pyongyang	Korea (DP.Rep.)	-	4 405
1900-2000	R Thailand	Thailand	-	9 655
1900-2000	R Thailand	Thailand	-	11 855
1900-2000	R Thailand	Thailand	-	11 905
1900-2000	SLBC	Sri Lanka	Sat	6 010
1900-2000	Voice of America	USA	-	9 760
1900-2000	V of Russia	Russia	-	5 920
1900-2000	V of Russia	Russia	-	5 940
1900-2000	V of Russia	Russia	-	5 965
1900-2000	V of Russia	Russia	-	7 205
1900-2000	V of Russia	Russia	-	7 340
1900-2000	V of Russia	Russia	-	9 480
1900-2000	V of Russia	Russia	-	9 890
1900-2000	WSHB	USA	Tue-Thu	15 665
1900-2000	WYFR Family R	USA	-	5 760
1900-2200	HCJB	Ecuador	-	17 660
1900-2200	HCJB	Ecuador	-	21 455
1930-2000	R Georgia	Georgia	-	11 760
1930-2000	R Slovakia Int	Slovakia	-	5 915
1930-2000	R Slovakia Int	Slovakia	-	6 055
1930-2000	R Slovakia Int	Slovakia	-	7 345
1930-2000	R Yugoslavia	Yugoslavia	-	6 100
1930-2000	V of Mongolia	Mongolia	-	11 790
1930-2000	V of Mongolia	Mongolia	-	12 085
1930-2030	R Tehran (IRIB)	Iran	-	7 190
1930-2030	R Tehran (IRIB)	Iran	-	9 022
1930-2030	R Tehran (IRIB)	Iran	-	11 765
1930-2030	V of Turkey	Turkey	-	9 630
1930-2030	V of Turkey	Turkey	-	9 895
193Fri-1955	RAI - Int	Italy	-	5 970
193Fri-1955	RAI - Int	Italy	-	7 285
193Fri-1955	RAI - Int	Italy	-	9 760
2000-2025	Israel Radio Int	Israel	-	7 510
2000-2025	Israel Radio Int	Israel	-	9 435
2000-2025	Israel Radio Int	Israel	-	11 605
2000-2025	Israel Radio Int	Israel	-	15 650
2000-2030	R Budapest	Hungary	-	6 025
2000-2030	R Budapest	Hungary	-	7 165
2000-2030	R Finland	Finland	-	6 135
2000-2030	Swiss Radio Int	Switzerland	-	6 165
2000-2030	Voice of America	USA	-	6 095
2000-2030	Voice of America	USA	-	9 760
2000-2030	V of Mediterranean	Malta	-	7 440
2000-2045	Deutsche Welle	Germany	-	9 725
2000-2045	R Iraq Int	Iraq	-	9 685
2000-2045	R Iraq Int	Iraq	-	11 785

## SHORT WAVE (continued)

Time (UTC)	Station	Country	Day	Frequency (MHz)	Time (UTC)	Station	Country	Day	Frequency (MHz)
2000-2100	BBC World Service	UK	-	3 955	2100-2200	R.Romania Int.	Romania	-	5 955
2000-2100	BBC World Service	UK	-	6 195	2100-2200	R.Romania Int.	Romania	-	7 195
2000-2100	BBC World Service	UK	-	9 410	2100-2200	R.Romania Int.	Romania	-	7 215
2000-2100	China Radio Int	China (People's Rep.)	-	5 965	2100-2200	R.Romania Int.	Romania	-	9 690
2000-2100	China Radio Int	China (People's Rep.)	-	9 535	2100-2200	Voice of America	USA	-	6 040
2000-2100	R Algiers Int	Algeria	-	11 715	2100-2200	Voice of America	USA	-	6 095
2000-2100	R Algiers Int	Algeria	-	15 160	2100-2200	Voice of America	USA	-	9 595
2000-2100	R Bulgaria	Bulgaria	-	5 845	2100-2200	Voice of America	USA	-	9 760
2000-2100	R Bulgaria	Bulgaria	-	7 535	2100-2200	V.of Russia	Russia	-	5 940
2000-2100	R Exterior de España	Spain	Mon-Fri	9 680	2100-2200	V.of Russia	Russia	-	5 965
2000-2100	V.of Indonesia	Indonesia	-	9 525	2100-2200	V.of Russia	Russia	-	7 300
2000-2100	V.of Indonesia	Indonesia	-	15 150	2100-2200	V.of Russia	Russia	-	7 340
2000-2100	V.of Russia	Russia	-	5 940	2100-2200	V.of Russia	Russia	-	9 890
2000-2100	V.of Russia	Russia	-	5 965	2100-2200	WSHB	USA	Sat-Sun	11 550
2000-2100	V.of Russia	Russia	-	7 340	2100-2300	WWCR-1	USA	-	9 475
2000-2100	V.of Russia	Russia	-	9 480	2100-2400	WEWN	USA	-	9 975
2000-2100	V.of Russia	Russia	-	9 890	2115-2145	V.of Armenia	Armenia	Mon-Sat	4 810
2000-2200	WYFR Family R	USA	-	5 760	2115-2145	V.of Armenia	Armenia	Mon-Sat	9 965
2000-2200	WYFR Family R	USA	-	7 355	2115-2245	R Cairo	Egypt (Arab Rep. Of)	-	9 990
2000-2200	WYFR Family R	USA	-	15 565	2130-2200	China Radio Int.	China (People's Rep.)	-	5 965
2000-2200	WYFR Family R	USA	-	21 525	2130-2200	China Radio Int.	China (People's Rep.)	-	9 535
2000-2315	IRRS-Shortwave	Italy	-	3 985	2130-2200	Merlin Network 1	UK	Fri	6 100
2005-2105	R Damascus	Syrian Arab Republic	-	12 085	2130-2200	R Belarus Int.	Belarus	Tue-Thu	7 105
2005-2105	R.Damascus	Syrian Arab Republic	-	13 610	2130-2200	R Belarus Int.	Belarus	Tue-Thu	7 210
2015-2100	V of Africa	Libya	-	15 235	2130-2200	R.Korea Int.	Korea(Rep.)	-	15 575
2015-2100	V of Africa	Libya	-	15 415	2130-2200	R.Tashkent	Uzbekistan	-	7 105
2015-2100	V of Africa	Libya	-	15 435	2130-2200	R Tashkent	Uzbekistan	-	9 540
2030-2045	R Thailand	Thailand	-	9 535	2200-1400	WWCR-3	USA	-	5 070
2030-2045	R Thailand	Thailand	-	9 655	2200-2230	R Budapest	Hungary	-	6 025
2030-2045	R Thailand	Thailand	-	11 905	2200-2230	R.Korea Int.	Korea(Rep.)	-	3 980
2030-2045	Voice of America	USA	-	6 095	2200-2230	R.Yugoslavia	Yugoslavia	-	6 100
2030-2045	Voice of America	USA	-	9 760	2200-2259	R Canada Int	Canada	-	5 995
2030-2100	R Belarus Int	Belarus	Tue-Thu	7 105	2200-2259	R.Canada Int.	Canada	-	7 235
2030-2100	R Belarus Int	Belarus	Tue-Thu	7 210	2200-2259	R.Canada Int.	Canada	-	9 805
2030-2100	R Sweden	Sweden	-	6 065	2200-2259	R.Canada Int.	Canada	-	13 690
2030-2100	R Tashkent	Uzbekistan	-	9 540	2200-2259	R.Canada Int.	Canada	-	15 325
2030-2100	R Tashkent	Uzbekistan	-	9 545	2200-2300	BBC World Service	UK	-	3 955
2030-2100	V of Vietnam	Vietnam	-	7 145	2200-2300	BBC World Service	UK	-	6 195
2030-2100	V of Vietnam	Vietnam	-	9 730	2200-2300	China Radio Int.	China (People's Rep.)	-	7 170
2030-2129	R Polonia	Poland	-	6 035	2200-2300	Merlin Network 1	UK	Fri	6 170
2030-2129	R Polonia	Poland	-	6 095	2200-2300	Merlin Network 1	UK	Fri	7 165
2030-2129	R Polonia	Poland	-	7 285	2200-2300	Merlin Network 1	UK	Fri	9 615
2030-2129	R Polonia	Poland	-	9 525	2200-2300	Overcomer Ministry	USA	Mon-Fri	5 995
2030-2130	R Havana Cuba	Cuba	-	13 660	2200-2300	R Bulgaria	Bulgaria	-	7 535
2030-2130	R Havana Cuba	Cuba	-	13 750	2200-2300	R.Bulgaria	Bulgaria	-	7 545
2045-2100	Voice of America	USA	-	6 095	2200-2300	R Exterior de España	Spain	Sat-Sun	9 680
2045-2100	Voice of America	USA	-	9 760	2200-2300	R Taipei Int.	China (Rep. Of Taiwan)	-	5 810
2045-2230	All India Radio	India	-	7 410	2200-2300	R Taipei Int.	China (Rep. Of Taiwan)	-	9 355
2045-2230	All India Radio	India	-	9 650	2200-2300	R Ukraine Int.	Ukraine	-	6 020
2045-2230	All India Radio	India	-	9 950	2200-2300	R Ukraine Int.	Ukraine	-	9 810
2045-2230	All India Radio	India	-	11 620	2200-2300	WSHB	USA	Thu-Sun	7 510
2050-2110	Vatican Radio 1	Vatican City State	-	4 005	2200-2300	WYFR Family R.	USA	-	7 355
2050-2110	Vatican Radio 1	Vatican City State	-	5 880	2200-2300	WYFR Family R.	USA	-	11 580
2050-2110	Vatican Radio 1	Vatican City State	-	7 250	2200-2300	WYFR Family R.	USA	-	15 565
2100-0400	WWCR-4	USA	-	7 435	2200-2300	WYFR Family R.	USA	-	21 525
2100-1000	WHRI-2	USA	-	5 745	2230-2255	R.Moldova Int.	Moldova	-	7 520
2100-2127	R.Prague	Czech Republic	-	5 930	2230-2300	R.Austria Int.	Austria	-	5 945
2100-2130	China Radio Int	China (People's Rep.)	-	5 965	2230-2300	R.Austria Int.	Austria	-	6 155
2100-2130	China Radio Int	China (People's Rep.)	-	7 150	2230-2300	R.Budapest	Hungary	-	3 975
2100-2130	China Radio Int	China (People's Rep.)	-	9 535	2230-2300	R.Sweden	Sweden	-	6 065
2100-2130	R Korea Int	Korea(Rep.)	-	6 480	2230-2300	R.Sweden	Sweden	-	7 325
2100-2130	R.Korea Int	Korea(Rep.)	-	15 575	2230-2300	R Tirana	Albania	-	7 130
2100-2159	R Canada Int	Canada	-	5 995	2230-2300	R.Tirana	Albania	-	9 540
2100-2159	R.Canada Int	Canada	-	7 235	2300-0500	WWCR-1	USA	-	3 215
2100-2159	R Canada Int	Canada	-	9 770	2300-2400	BBC World Service	UK	-	6 195
2100-2159	R Canada Int	Canada	-	9 805	2300-2400	Merlin Network 1	UK	Fri	3 985
2100-2159	R Canada Int	Canada	-	11 945	2300-2400	Merlin Network 1	UK	Fri	6 170
2100-2159	R Canada Int	Canada	-	13 650	2300-2400	Merlin Network 1	UK	Fri	6 180
2100-2159	R Canada Int	Canada	-	13 690	2300-2400	Merlin Network 1	UK	Fri	7 165
2100-2159	R Canada Int	Canada	-	15 325	2300-2400	R.Romania Int.	Romania	-	7 195
2100-2159	R.Canada Int	Canada	-	17 820	2300-2400	R.Romania Int.	Romania	-	9 690
2100-2200	BBC World Service	UK	-	3 955	2300-2400	V.of Turkey	Turkey	-	6 135
2100-2200	BBC World Service	UK	-	6 180	2300-2400	V.of Turkey	Turkey	-	9 655
2100-2200	BBC World Service	UK	-	6 195	2300-2400	WSHB	USA	Wed-Sun	7 510
2100-2200	R.Japan (Gen Service)	Japan	-	9 725	2315-2320	Kyrgyz Radio	Kyrgyzstan	-	4 050

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**LOG PERIODIC MLP32**

Freq. Range 100-1300MHz  
Length 1420mm Wide Band 16 Element directional beam which gives a maximum of 11-13Db Gain Forward and 15Db Gain Front to Back Ratio. Complete with mounting hardware. (The Ultimate Receiving Antenna - a must for the Dedicated Listener.)

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- \* Cable-3 core
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FOR USE ON WITH RECEIVER 0 - 40 Mhz. ALL MODE NO ATU REQUIRED 2 "S" POINTS GREATER SIGNAL THAN OTHER BALUNS. MATCHES ANY LONG WIRE TO 50 OHMS

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- S0239 to BNC .....1.50 each
- PL259 to BNC .....2.00 each
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- MINI RF8 ..... 0.85 per mtr.
- RG58 STANDARD 0.35 per mtr.
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**MICRO MAG MTS42**

Freq. Range 25-2.1 GHZ  
Length 225 mm

£27.95

**WEATHER SATELLITE ANTENNA**

**TURNSTILE 137**

Freq. 137.5 MHz  
Length 1000mm

This Antenna is designed for external use to receive weather satellite signals.

Complete with mounting hardware.

£39.95

(Simple and easy to install a must for the enthusiast who has it all.)

£29.95

**SUPER SCANAIR BASE (Airband)**

(Stainless Steel) Freq. Range 117-140MHz  
Receive 117-140MHz  
Transmit 117-140MHz  
Length 825mm  
Connector-N TYPE

This is a transmitting & receiving antenna designed for the aircraft frequency range. (For the control tower & aircraft listener.)

**SUPER SCAN STICK**

Freq. Range 0-2000MHz  
Length 1000mm

It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. (Ideal for the New Beginner and the Experienced Listener alike)

£49.95

**SUPER SCAN STICK II**

Freq. Range 0-2000 MHz.  
Length 1500mm.

This is designed for external use. It will receive all frequencies. at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. (For the expert who wants that extra sensitivity)

£39.95

**MULTISCAN STICK**

Freq. Range Receive - 0-2000 MHz.

Transmit 144 - 146 MHz gain 2.5 DBd  
420 - 430 MHz gain 4.5 DBd  
Length 1000 mm.

Although marginally compromising sensitivity the multi scan stick has within its transmitting capabilities plus gain makes it an excellent antenna for the amateur and expert alike.

Comes complete with mounting hardware and brackets. (Ideal for the amateurs ham radio - user.)

£89.95

**IVX 2000**

Freq. Range Receive - 0-2000 MHz.

Transmit 50 - 52 MHz gain 2.00Dbd  
144 - 146 MHz gain 4.00 DBh  
420 - 430 MHz gain 6.00Dbd  
Length 2.5 m.

For external use, but at a pinch can be used in the loft. It has been finely tuned to make this Antenna the best there is. It has stainless steel radials and hardware. (THE BEST)

**MWA-H.F. WIRE ANTENNA**

Freq. Range 1.1-30MHz Adjustable Length up to 60 Metres  
Internal or external use. The long wire is known to be one of the best antennas for shortwave (HF) receiving. Comes complete with con box and dog bones, wire etc. (A must for the short wave listener.)

£29.95

**SWP 2000 FREQ. 25 - 2000 MHz. Length 515mm.**

Multiband good sensitivity for its small size. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. (Good for the car user who doesn't want an external antenna.)

£29.95

**SWP HF30**

Freq. Range 0.05-30MHz Length 770mm

Although small, surprisingly sensitive for the H.F. user. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. (Good for the car user who doesn't want an external antenna.)

£39.95

**TRI SCAN III**

Freq. Range 25-2000MHz  
Length 720mm

Desk Top Antenna for indoor use with triple vertical loaded coils. The tri-pod legs are helically wound so as to give it its own unique ground plane. Complete with 5mts of low loss coax and BNC plug. (Ideal for Desk Top Use.)

£34.95

**ROYAL DISCONE 2000**

(Stainless Steel) Freq. Range 25-2000MHz

Transmit 50-52MHz

144-146MHz

430-440MHz

900-986MHz

1240-1325MHz

Length 1540mm

Connector-N TYPE

The Ultimate Discone Design. 4.5DB GAIN OVER STANDARD DISCONE!

Highly sensitive, with an amazing range of transmitting frequencies, comes complete with mounting hardware & brackets (The Best There is).

£49.95

**HF DISCONE**

Freq. Range 0.05-2000MHz

Length 1840mm

Internal or External use (A Tri-Plane Antenna). Same as the Super Discone but with enhanced HF capabilities, comes complete with mounting hardware and brackets. (Ideal for the Short Wave H.F. Listener.)

£49.95

**SUPER DISCONE**

Freq. Range 25-2000MHz

Length 1380mm

Internal or External use (A Tri-Plane Antenna). The angle of the ground planes are specially designed to give maximum receiving performance within the discone design. The Super Discone gives up to 3Db Gain over a standard conventional discone. Comes complete with mounting hardware and brackets. (Ideal for the Experienced Enthusiast.)

£39.95

**DISCONE**

Freq. Range 70-700MHz

Length 920mm

Internal or External use. (Classic Antenna Design. Comes complete with mounting hardware and brackets. (Ideal for the Beginner.)

£29.95

**G. SCAN II**

Freq. Range 25-2000 MHz.Length 620 mm.

Magnetic mount Mobile Scanner Antenna. 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug. (Good for when you are driving about)

£19.95

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# Bandscan Australia



Radio Australia (RA) is still in the news here over the Timor issue. The government is refusing to allow RA access to its old transmitter facility on the Cox Peninsula in the Northern Territory or even to guarantee it time on that transmitter when the site is sold. Possible purchasers include Radio Free Asia and Merlin, the former division of the BBC. However, that sale might be some way off too since Northern Territory Aboriginal peoples have staked a land claim on the site.



In the absence of the Cox Peninsula facilities, RA is leasing time on transmitters in Singapore and Taiwan for programming once transmitted from the Shepparton site and using Shepparton to try to meet its Timor programming objectives. The difficulty here is that to increase Timor targeted programming, more content needs to be moved to Singapore from Shepparton and this needs lengthy negotiations with the Singapore government.

Meanwhile, UNAMET, the UN peacekeepers in Timor, have had to rely on the Portuguese national broadcaster RTP1 for transmissions into Timor and the BBC and the International Red Cross have begun transmissions to Timor from Geneva in Switzerland.

## Channel Seven

The Seven television network has entered into a joint venture with Granada Media to outsource most of the network's local drama and entertainment content. This move shifts somewhere in the vicinity of \$60 million (£24 million) to the joint venture and creates Australia's biggest television production house. The Seven Network in the process gains the undoubted skills of Granada in production and in digital transmission. It also gains an international market for its productions which include the soapie *Home and Away*.

In unrelated moves Seven's Internet arm i7 has bought into the Internet radio venture Digital One and has set up a joint Internet venture with US broadcaster NBC's Internet arm NBCi. The resulting Internet site will be up and running in April this year using NBC's snap.com URL.

The Australian Internet broadcaster Digital One is planning to have ten Internet radio stations operating by the end of the year and can be found at <http://www.digitalone.com.au/> The Seven Network is at <http://www.seven.com.au/>

## Reception Reports

**Martyn Gardiner** from Portsmouth has been a bit pressed for listening time again but has still found time to send in a few RA contacts. Martin has pulled in RA news at 2000UTC on 9.500MHz with good reception using a Roberts transistor portable with its own half metre telescopic antenna. When holidaying in Gloucester using his Lowe HF-150, he was pulling in RA in the mornings on 17.750 and 21.820MHz. This latter was using a short indoor antenna made up of about 3m of wire with the receiver's inbuilt whip amplifier. Martin says he heard the Sydney New Year's Eve fireworks live on RA.

## Digital Television

Some commentators are noting that television production may become more concentrated in the eastern capitals Sydney and Melbourne because of the cost of setting up new digital television production and transmission facilities. The move has already started with Channel 10 in Perth, Western Australia, apparently producing its weekday news broadcasts in Sydney and the network's Adelaide news being produced in Melbourne.

## Mobile Telephones

Most of the analogue mobile telephone network closed down on schedule at midnight on 31 December 1999. This closure means that all major capital cities and many major regional areas have no analogue network. The few remaining parts of the network will be progressively closed during 2000. The analogue system has been replaced with a Code Division Multiple Access (CDMA) system. CDMA handsets will also work on remaining analogue parts of the network.

Reactions have been mixed as users find differences in coverage between the old analogue system and the CDMA system. And there has been the usual spate of political bickering about which administration promised what coverage to which users.

## Talkback Radio Saga

The talkback radio story mentioned in the last two of these columns has yet to run its course. The enquiry set up by the Australian Broadcasting Authority has taken public evidence from the main players and has now gone behind closed doors for more evidence taking and deliberations.

In similar vein, Melbourne AM radio station 3AW has had its own scandal with the sacking of a late night program host for allegedly soliciting free holidays, services and products in return for on-air mentions and interviews. In addition, it has been admitted that a \$A4,000 (£1,600) prize went to the brother-in-law of a station producer.

## Police Radio

There are real concerns that the New South Wales police service will need to rely on their old analogue radio network for the 2000 Olympic Games coming to Sydney in September this year. The service is in a cleft stick on this issue. They need a more secure digital network to avoid recurrences of recent situations when pirate broadcasters were able to get into and broadcast on the police network.

However, there have been delays and technical problems with the digital compatible communication consoles bought in 1998 from Motorola for the Sydney police communications centre. And, disciplinary action has been taken against 15 police officers involved in an alleged ordering process manipulation in favour of Motorola.

The latest recommendation is that the police service stand back from the commitment of \$27 million (£10.8 million) for the new network and look at emerging technologies instead. Given the short time until the Olympics, it is almost certain that the old analogue network will be carrying the load of police communication at that event.

## Internet

The ABC and Radio Australia are on <http://www.abc.net.au/> and <http://www.abc.net.au/ra/> respectively. Radio New Zealand is at <http://www.rnzi.com/>

Australia's Radio and Space Services IPS (Ionospheric Prediction Services) is at <http://www.ips.gov.au/> and this includes a vast array of information useful to short wave listeners. Australia's Bureau of Meteorology has at [http://www.bom.gov.au/other/rad\\_sch/vlm\\_sched.shtml](http://www.bom.gov.au/other/rad_sch/vlm_sched.shtml) the schedule for VLM operating on 7.470MHz out of Casey in the Antarctica.

I mentioned the URL for the Seven Network above. Other commercial television networks are the Nine Network at <http://www.ninensn.com.au/> and the Ten network at <http://www.ten.com.au/> The Special Broadcasting Service (SBS) is at <http://www.sbs.com.au>

Other Internet radio services are OzWorld at <http://www.ozworld.com.au/> Edge FM on <http://www.edgefm.com.au/> and Austereo at <http://www.radio.village.com.au/>

## And Finally

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@pcug.org.au](mailto:greg@pcug.org.au)



# LM&S

At midnight on March 25 all clocks in the UK will be put forward by one hour to display British Summer Time (BST), which is one hour ahead of Greenwich Mean Time (GMT) and Universal Time Co-ordinated (UTC). However, the international broadcasters will continue to refer to UTC in their s.w. schedules and during their broadcasts.

To avoid confusion it is advisable to place a small clock by your receiver and set it to UTC (=GMT). Do not alter it when the change over to BST takes place. The times quoted in LM&S will continue to be in UTC, so if you intend to send reports to me for inclusion therein please ensure that the times are in UTC, not BST.

Quite a few of the International Broadcasters are likely to alter their short wave broadcast schedules on March 26 to take account of seasonal changes in propagation. After that date some of the s.w. data herein may be no longer applicable.

## Long Wave Reports

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

Whilst searching the band soon after midnight **Simon Hockenhuil** (E.Bristol) picked up a broadcast from Ríkisutvarpid (RUV) in Reykjavik via their 300kW outlet at Gufuskalar, W.Iceland, on **189kHz**. The transmission rated SINPO 25443 at 0045UTC. He then tuned to **207kHz** to check if their outlet at Eidar, E.Iceland, was audible and was pleased to log it as 22422 at 0050.

Their broadcasts via Gufuskalar were also received by **Ernie Strong** in Ramsey, Cambs. He obtained best reception by setting his receiver to the ECSS u.s.b. mode and logged their transmission as 22232.

## Medium Wave Reports

There were two reports of broadcasts from m.w. stations in Canada and E.USA reaching the UK via transatlantic paths during December. During the early morning of the 25th **Harry Richards** picked up a clear ident from WTOP in Washington, DC on **1500kHz** at 0700UTC, which rated SINPO 23232.

Up in Shetland, the later arrival of dawn enabled **John Slater** (Scalloway) to log at around 0830UTC VOXM St.John's, NF on **590** (26th & 27th); CJYQ St.John's, NF on **930** (25th-27th); also WBBR in New York, NY on **1130** (25th-29th) - all rated SIO 222. He also heard on the 27th WEEI in Boston, MA on **850**, which rated SIO333 at 0830.

The sky waves from quite a few of the many m.w. stations in the Middle East,

N.Africa, Europe and Scandinavia reached the UK after dark - see chart. The extensive log compiled by **George Millmore** (Wootton, IoW) includes Les Trembles, Algeria, on **549kHz**, which he rated SIO 434 at night. On December 6th he was surprised to find their broadcast in Arabic still audible at 0850UTC - it rated SIO 222.

During daylight the ground waves from some local radio stations reached remarkably distant places! Whilst visiting N.Lincolnshire during the New year weekend **Brian Keyte** (Gt.Bookham) found that Classic Gold serving W.Yorkshire on **1278** and **1530kHz** had changed it's ident (for the Millennium) to 'Big AM' on both frequencies.

## Short Wave Reports

When the broadcast schedules from March are introduced it will be interesting to see if better use will be made of the **25MHz (11m)** band. At present only three broadcasters are taking advantage of the conditions prevailing therein, namely **Deutsche Welle (DW)**, **Radio France International (RFI)** and **Radio For Peace International (RFPI)**, Costa Rica. There were no reports to indicate how well their broadcasts are being received in the intended areas but they were mentioned in the reports from some listeners in the UK:-

DW on **25.740** (Ger to S & SE.Asia? 0800?-1400?) was 55444 at 0930 in Scalloway, Shetland; 25443 at 1020 by **Fred Pallant** in Storrington; 25522 at 1050 in E.Bristol; 35433 at 1055 by **Fred Wilmshurst** in Northampton; 32322 at 1100 by **Bill Griffith** in W.London; 25122 at 1225 by **Eddie McKeown** in Newry; 55534 at 1313 by **Richard Reynolds** in Guildford.

RFI on **25.820** (Fr to E/C.Africa 0900-1300) was 25443 at 1032 in Storrington; 35233 at 1040 in Newry; 25522 at 1045 in E.Bristol; 35433 at 1055 in Northampton; 34443 at 1105 by **Robert Connolly** in Kilkeel; 54444 at 1200 in W.London.

RFPI on **25.930** (Eng [u.s.b.] 1200-?) was 25232 at 1345 in Scalloway; 13232 at 1450 in Storrington.

Quite a few broadcasters are making good use of the **21MHz (13m)** band. During the morning they include R.Pakistan **21.460** (Ur to Eur 0800?-1100, Eng 1100-1105), rated 54445 at 0900 by **Bernard Curtis** in Stalbridge & 45554 at 1105 by **David Edwardson** in Wallsend; R.Austria Int, Moosbrunn **21.765** (Eng to Australia 0930-1000) 54444 at 0930 by **Sheila Hughes** in Morden; R.Australia via Shepparton **21.820** (Eng to Asia 0900-1400) 44444 at 1055 in W.London & 43333 at 1325 by **David Hall** in Morpeth; Vatican R, Italy **21.850** (It, Fr, Eng to Eur?, Asia?) 44444 at 1055 by **Thomas Williams** in Truro; UAER, Abu Dhabi **21.735** (Ar to Eur? 0800?-1600?) 34443 at 1100 in Kilkeel; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.]) 25333 at 1105 in Northampton; DW via ? **21.780** (Eng to Africa 1100-1157) SIO 333 at 1105 by **Philip Rambaut** in Macclesfield; R.Prague, Czech Rep **21.745** (Eng to ? 1130-1200) 45534 at 1130 in E.Bristol.

After mid-day, R.Ukraine Int **21.510** (Eng to Australia 1200-1300) was rated 44443 at 1205 by **Rhoderick Illman** in Oxted; Channel Africa via Meyerton, S.Africa **21.530** (Eng to Africa 1300-1455? Sat/Sun) 44344 at 1300 in Newry; BBC via Cyprus **21.470** (Eng to E.Africa 1300?-1700) 45544 at 1400 by **Stan Evans** in Herstoncoex; VOA via Sri Lanka **21.840** (Eng to Africa? 1400-1500?) 35543 at 1430 by **John Parry** in Larnaca, Cyprus; BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) SIO 433 at 1500 by **Tom Smyth** in Co.Fermanagh; Voz Christiana, Chile **21.500** (Sp to N.America 1100-2100?) 22232 at 1500 by **Robert Hughes** in Liverpool; UAER, Dubai **21.605** (Eng to Eur 1600-1640) 32233

## Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	E
153	Donebach DLF	Germany	500	B*,C,D,E,G,H
153	Bod	Romania	1200	G*
162	Allouis	France	2000	B,C,D,E,F*,H
171	B'shakovo etc	Russia	1200	B*,C,D,E,G*,H
171	Lvov	Ukraine	500	B*,G
177	Dramenburg	Germany	500	C,D,E,H*
183	Saarlouis	Germany	2000	B,C,D,E,F*,G*,H
189	Gufuskalar	W.Iceland	150	A*,G*
189	Tbilisi	Georgia	500	G*
198	Drortwich BBC	UK	500	B,C,D,F*,G*,H
207	Munich DLF	Germany	500	A,C,D,E,F*,G*,H
207	Eidar	E.Iceland	100	A*
207	Azilal	Morocco	800	E,G*
216	Roumoules RMC	S.France	1400	B*,C,D,E,F*,G*,H
216	Ganca	Azerbaijan	500	C*,G*
225	Polskie R-1	Poland	?	A,C,E,G*,H*
234	Beidweiler	Luxembourg	2000	B*,C,D,E,F*,G,H
243	Kalundborg	Denmark	300	A,B,C,D,E,G,H
252	Tipaza	Algeria	1500	E
252	Atlantic 252	Eire	500	C,D,E,F*,G*,H,I
261	Burgi(R.Ropa)	Germany	85	A,C*,D,E,F*,G*,H*
261	Taldom Moscow	Russia	2500	G*
270	Topolna	Czech Rep	1500	A,C,D,E,G*,H
279	Sasnovy	Belarus	500	B*,C,D,E,G*,H

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

### Listeners -

- (A) Simon Hockenhuil, E Bristol
- (B) Sheila Hughes, Morden
- (C) Eddie McKeown, Newry
- (D) George Millmore, Wootton, IoW
- (E) Fred Pallant, Storrington
- (F) Tom Smyth, Co Fermanagh
- (G) Ernie Strong, Ramsey, Cambs
- (H) Fred Wilmshurst, Northampton
- (I) Tom Winzor, Plymouth



at 1605 by **Robert Beason** in Nottingham.

In the **18MHz (15m)** band R.Denmark via R.Norway **18.950** (Da to N.America 1230-1300) was 55544 at 1227 in Northampton; R.Sweden, Stockholm **18.960** (Eng to N.America 1230-1300) was rated 54444 at 1247 by **Tom Winzor** in Plymouth & 55544 at 1250 in Herstmonceux.

R.New Zealand's broadcast to Pacific areas in the **17MHz (16m)** band has been reaching the UK well during the day. Until December 16 it was on **17.675** (Eng 1750-1005) and rated 35534 at 0745 in Guildford & 35553 at 0900 in Wallsend. It was then moved to **17.690** and rated 43333 at 0555 in Morpeth. Also noted during the morning were R.Australia via Shepparton **17.750** (Eng to Asia 0000-0500, 0600-0830, 0830-1100), rated 22222 at 1000 in Truro; BBC via Masirah, Oman **17.790** (Eng to Asia 0915-1100) 34343 at 1009 in Oxted; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1600) 34443 at 1120 in Kilkeel.

During the afternoon R.Bulgaria, Sofia **17.500** (Eng to Eur 1200-1300) was 54554 at 1240 in Herstmonceux; R.France Int via ? **17.620** (Eng to E.Africa, M.East 1400-1500) SIO 555 at 1400 in Co.Fermanagh; R.Canada Int via Sackville **17.710** (Eng to USA, Mexico, Caribbean 1200-1500 [Sun 1300-1700]) 45343 at 1407 in Northampton; BBC via Ascension Is **17.830** (Eng to Africa ?-2100) 45344 at 1528 by **Tony Hall** in Freshwater Bay, IoW; VOA via Morocco **17.895** (Eng to Africa 1600-1900) 54445 at 1635 in Stalbridge; R.France Int via Gabon? **17.560** (Eng to E.Africa, M.East 1400?-1600?) 34543 at 1653 in Larnaca, Cyprus; Channel Africa via Meyerton **17.870** (Eng to W.Africa 1700-1730) 44444 at 1700 in Morden.

Later WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1600-2300) was 32222 at 1758 in Nottingham; R.Nederlands via Bonaire, Ned Antilles **17.605** (Eng to Africa 1830-2025) 33343 at 1850 in Liverpool; HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200) 44444 at 1900 in Plymouth; RCI via Sackville **17.820** (Fr, Eng to Eur, Africa 2000-2200) 24333 at 2123 in Storrington.

Despite the increased use of the **21** and **17MHz** bands there is still much to interest the listener in the **15MHz (19m)** band. Before noon R.Kuwait **15.110** (Eng, Ar to SE.Asia 0500-0930?) was 55544 at 0656 in Guildford; KTWB Guam **15.330** (Eng to Pacific 0830-0930) 34333 at 0831 by **Vera Brindley** in Woodhall Spa; VOA via Thailand? **15.150** (Eng to Asia? 0900?-?) 43334 at 0925 in Stalbridge; UAER, Dubai **15.395** (Eng to Eur 1030-1050) 54444 at 1040 in Herstmonceux; HCJB Quito, Ecuador **15.115** (Eng to Eur? 1100-1600?) 34443 at 1125 in Kilkeel.

During the afternoon R.Ukraine Int **15.520** (Eng to Australia 1200-1300) was 42332 at 1210 in Morden; RFI via Allouis? **15.155** (Eng to Eur, Africa 1200-1257) 44444 at 1200 by **Gerald Guest** in Dudley & 45544 at 1215 in E.Bristol; Swiss R.Int via Sottens **15.185** (Eng, Ger, Fr to Asia 1400-1600) 32111 at 1400 in Truro; BBC via Masirah Is, Oman **15.310** (Eng to S.Asia 1400-1700) 34553 at 1445 in Larnaca, Cyprus; VOA via Morocco? **15.205** (Eng to Eur, N.Africa, M.East 1500-1700) SIO 534 at 1500 in Co.Fermanagh; Israel R, Jerusalem **15.650** (Eng to Eur? 1500-1530) 54444 at 1500 in Plymouth; Voice of Hope via Julich, Germany **15.715** (Eng to S.Asia? 1330-1630) SIO 444 at 1545 in Macclesfield; WWCN Nashville, USA **15.685** (Eng to N.America, Eur 1300-2200?) 44433 at 1550 in Freshwater Bay, IoW; Africa No.1, Gabon **15.475** (Fr to W.Africa 1600-1900) 33443 at 1600 in Storrington; R.Algiers Int via Bouchaoui **15.160** (Eng to Eur, M.East, N.Africa 1600-1700) 34433 at 1616 in Newry.

Later, VOA via Greenville, USA **15.580** (Eng to Africa 1800-2200) was 45343 at 1836 in Northampton; WEWN via Vandiver, USA **15.745** (Eng to Eur 1100-2200?) 33443 at 1930 in Liverpool; RCI via Sackville **15.325** (Fr, Eng to Eur, Africa 2000-2300) 21121 at 2123 in Nottingham.

In the **13MHz (22m)** band Swiss R.Int via Sottens **13.685** (Eng, It, Ger, Fr to Australasia 0830-1030) was rated SIO 444 at 0842 by **Francis Hearne** in N.Bristol; R.Austria

Int via Moosbrunn **13.730** (Ger? to Eur) 44444 at 0945 in Truro; Croatian R, Zargreb **13.830** (Cr to N.America 1230?-?) 35333 at 1130 in E.Bristol; R.Austria Int via Moosbrunn **13.730** (Eng to Eur 1330?-1400) SIO 555 at 1330 in Co.Fermanagh; RCI via Sackville, Canada **13.650** (Eng to USA, Mexico, Caribbean 1200-1500) 33323 at 1350 in Stalbridge; R.Sweden **13.800** (Eng to Pacific, Asia 1430-1500) 54444 at 1443 in Plymouth; AWR via Guam **13.720** (Eng to S.Asia?) 45443 at 1458 in Larnaca, Cyprus; Vatican R, Italy **13.765** (Various to Africa 1500?-1612?) 44444 at 1553 in Woodhall Spa; R.Norway Int **13.800** (Norw to E.Eur, E.Africa 1600-1629) 55555 at 1605 in Liverpool; RUV Reykjavik, Iceland **13.860** (Ic 1510-?) 44444 at 1605 in Scalloway; UAER, Dubai **13.675** (Eng to Eur 1600-1640) 55444 at 1608 in Northampton; VOA via Sao Tome **13.600** (Eng to C/E.Africa 1600-1700) SIO 333 at 1615 in Macclesfield; WHRI via Noblesville, USA **13.760** (Eng to E.USA, Eur 1800-2000) 22222 at 1919 in Nottingham; RCI via Sackville, Canada **13.650** (Fr, Eng to Eur, Africa 2000-2200) 55444 at 2108 in Freshwater Bay, IoW; WJCR Millerstown, KY **13.595** (Eng 12hr, Chin 12hr) 33333 at 0130 in Kilkeel.

Broadcasts from many areas reach the UK in the **11MHz (25m)** band. During the morning R.Nederlands via Irkutsk **12.065** (Eng to Asia, F.East 0930-1125) was 33323 at

Continued on page 18.

### Local Radio Chart

Freq (kHz)	Station	ILR BBC	o.m.r.p (kW)	Listener	Freq (kHz)	Station	ILR BBC	o.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	E,F,H,I	1170	1170AM,High Wycombe	I	0.25	E,I
585	R.Solway	B	2.00	A	1242	Capital G,Maldstone	I	0.32	C,E,F
603	Capital G,Litt'brne	I	0.10	A,E,F,H,I	1251	C.G Amber Bury StEd	I	0.76	E,H,I
630	R.Bedfordshire(3CR)	B	0.20	C,E,F,H,I	1260	Brunel CG, Bristol	I	1.60	E,F
630	R.Cornwall	B	2.00	A,F	1260	SabrasSnd,Leicester	I	0.29	H,I
657	R.Chwyd	B	2.00	A,F,G,H	1260	R.York	B	0.50	A
657	R.Cornwall	B	0.50	A,F,J	1296	Radio XL,Birmingham	I	5.00	A,E,F,H,I
666	CI.Gold 666, Exeter	I	0.34	E,F,H,I	1305	Premier via ?	I	0.50	E,F,H,I
666	R.York	B	0.80	A,H	1323	Capital G,Southwick	I	0.50	E,F,I
729	BBC Essex	B	0.20	C,E,F,G,H,I	1323	SomersetSnd,Bristol	B	0.63	G*,H
738	Hereford/Worcester	B	0.037	A,E,F,H,I	1332	Premier, Battersea	I	1.00	E,F
756	R.Cumbria	B	1.00	A,E,H*	1332	CI.Gold 1332,Pt'bo	I	0.80	E,H,I
756	The Magic 756,Powys	I	0.63	E,F,H,I	1332	Wiltshire Sound	B	0.30	F
765	BBC Essex	B	0.50	C,E,F,H,I	1359	Breeze, Chelmsford	I	0.28	E
774	R.Kent	B	0.70	E,F,H,I	1359	BBC Essex	I	0.27	E,H,I
774	R.Leeds	B	0.50	E	1359	R.Solent	B	0.85	F,H
774	CI.Gold 774, Glos	I	0.14	E,F	1368	R.Lincolnshire	B	2.00	E
792	CI.Gold 792,Bedford	I	0.27	E,F,H,I	1368	Southern Counties R	B	0.50	C*,E,F
792	R.Foyle	B	1.00	A	1368	Wiltshire Sound	B	0.10	F
801	R.Devon & Dorset	B	2.00	A,B,E,F,H	1377	Asian Sd, Rochdale	I	0.10	A,E*
828	CI.Gold 828, Luton	I	0.20	E,H,I	1413	R.Gloucestera via ?	B	?	H,I
828	Magic 828, Leeds	I	0.12	A	1413	Premier via ?	I	0.50	E,H,I
828	2CR CG, Boumemouth	I	0.27	F	1413	Fresh AM, Skipton	I	0.10	A
837	R.Cumbria/Furness	B	1.50	A	1431	Breeze, Southend	I	0.35	C*,E,F
837	Asian Netwk Leics	B	0.45	E,F,H,I	1431	CI.Gold, Reading	I	0.14	E,F,I
855	R.Devon & Dorset	B	1.00	F,J	1449	R.Peterboro/Cambs	B	0.15	H,I
855	R.Lancashire	B	1.50	H	1458	R.Cumbria	B	0.50	A
855	R.Norfolk, Postwick	B	1.50	E,H	1458	R.Devon & Dorset	B	2.00	A,F
855	Sunshine 855,Ludlow	I	0.15	E,I	1458	R.Newcastle	B	2.00	G*
873	R.Norfolk, W.Lynn	B	0.30	E,F,H,I	1458	Sunrise, London	I	50.00	E,F,H,I
936	Brunel CG, W.Wilts	I	0.18	E,F,H,I	1458	Asian Netwk Langley	B	5.00	H
936	Fresh AM, Hawes	I	1.00	A,E	1476	CountySnd,Guildford	I	0.50	B*,E,F
945	CI.Gold GEM, Derby	I	0.20	E,G,H,I	1485	CI.Gold, Newbury	I	1.00	C*,E,I
945	Capital G, Bexhill	I	0.75	C*,E,F,H	1485	R.Humberside (Hull)	B	1.00	H
954	CI.Gold 954,Torquay	I	0.32	E,F,H	1485	R.Merseyside	B	1.20	A,F
954	CI.Gold 954, H'ford	I	0.16	E,I	1485	Southern Counties R	B	1.00	C*,E,F
963	Liberty R, Hackney	I	1.00	C*,E,F,H,I	1503	R.Stoke-on-Trent	B	1.00	AC*,D*,E*,F*,H*,I
972	Liberty R, Southall	I	1.00	B,C*,E,F,H,I	1521	Breeze, Raigate	I	0.64	B*,E,F,G,H*,I
990	R.Aberdeen	B	1.00	E	1530	R.Exsex, Southend	B	0.15	E,F,H,I
990	R.Devon, E.Devon	B	1.00	A,E,F	1530	CI.Gold via ?	I	?	G
990	Magic AM,Doncaster	I	0.25	H	1530	CI.Gold W.Yorks	I	0.74	A,E
990	CI.G, Wolverhampton	I	0.09	E,H,I	1530	CI.Gold Worcester	I	0.52	E,F,I
999	C.Gold GEM Nott'ham	I	0.25	E,H,I	1548	R.Bristol	B	5.00	F
999	Magic 9-99 P'stn	I	0.80	A	1548	Capital G, London	I	97.50	A,E,F,G,H
999	R.Solent	B	1.00	E,F	1548	Magic 1548,Liverpool	I	4.40	E*
1017	CI.G, Shrewsbury	I	0.70	E,H	1557	R.Lancashire	B	0.25	A
1026	R.Cambridgeshire	B	0.50	E,H,I	1557	CI.Gold 1557,N.hant	I	0.76	E,H,I
1026	Downtown R, Belfast	I	1.70	A,E,G	1557	Capital G, Sol'ton	I	0.50	E,F
1026	R.Jersey	B	1.00	B,E,F	1584	London Turkish R	I	0.20	E,F
1035	RTL Country 1035	I	1.00	E,F*,H,I	1584	R.Northingham	B	1.00	C*,E*
1035	R.Sheffield	B	1.00	H	1584	R.Shropshire	B	0.50	E*
1035	N.Sound 2, Aberdeen	I	0.78	A	1584	Tay, Perth	I	0.21	E*
1116	R.Derby	B	1.20	A,E,H,I	1602	R.Kent	B	0.25	E,F
1116	R.Guernsey	B	0.50	E,F					
1152	CI.G Amber, Norwich	I	0.83	H					
1152	LBC 1152 AM	I	23.50	E,F,H,I					
1152	Pic'ly 1152,Manch'r	I	1.50	A					
1152	PlymSnd AM,Plymouth	I	0.32	J					
1152	CI G, Birmingham	I	3.00	I					
1161	R.Bedfordshire(3CR)	B	0.10	E,H,I					
1161	Brunel CI.G,Swindon	I	0.16	E,F					
1161	Magic AM,Humbersidel	I	0.35	A					
1161	Southern Counties R	B	1.00	C*,E,F					
1161	Tay AM, Dundee	I	1.40	C*					
1170	CI.G Amber, Ipswich	I	0.28	E,H					
1170	Magic 1170,Stockton	I	0.32	A,H					
1170	Capital G,Portsm'th	I	0.50	E,F					

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

Listeners.-

- (A) Robert Connolly, Kilkeel.
- (B) Simon Hockenhill, E.Bristol.
- (C) Sheila Hughes, Morden.
- (D) Rhoderick Illman, Oxted.
- (E) Brian Keyte, Bookham
- (F) George Millmore, Wootton, IoW.
- (G) Tom Smyth, Co.Fermanagh
- (H) Emie Strong, Ramsey, Cambs.
- (I) Fred Wilmshurst, Northampton.
- (J) Tom Winzor, Plymouth.

0930 in Stalbridge; V of Mediterranean, Malta via Russia?  
**11.770** (Eng) 22222 at 0935 in Truro; Adventist World R via  
 KSDA Agat Guam **11.660** (Eng to Asia 1000-1030) 22222 at  
 1000 in W.London & 44444 at 1020 in Scalloway.

After mid-day, the BBC via Biblis **11.680** (Eng to E.Eur  
 1230-1300) was SIO 433 at 1245 in Macclesfield; R.Canada  
 Int via Skelton, UK **11.980** [was 11.740] (Eng to Eur 1430-  
 1500) 34222 at 1445 in Newry; V of Russia **12.070** (Eng  
 [WS]) SIO 222 at 1500 in Co.Fermanagh; BBC via Skelton &  
 Woofferton, UK **12.095** (Eng to Eur, N/W.Africa 0700-1900)  
 55555 at 1515 in Plymouth; R.Jordan via Al Karanah  
**11.690** (Eng to W.Eur, E.USA 1100-1730) 54544 at 1520 in  
 Herstmonceux; R.Nederlands via Tashkent **12.070** (Eng to  
 S.Asia 1430-1625?) 35343 at 1520 in Northampton;  
 R.Pakistan, Islamabad **11.570** (Eng to M.East 1600-1615)  
 21212 at 1601 in Nottingham; R.Australia via Shepparton  
**11.660** (Various to Asia 1430-1700) 33533 at 1610 in  
 E.Bristol; R.Algiers Int via Bouchaoui **11.715** (Eng to Eur,  
 M.East, Africa 1600-1700) 44444 at 1655 in Morpeth;  
 R.Kuwait via Kbd **11.990** (Eng to Eur, N.America 1800-  
 2100) 54444 at 1802 in Freshwater Bay, IoW; R.Nederlands  
 via Madagascar **11.655** (Eng to Africa 1730-2025) 44333 at  
 1905 in Morden; V of Tanzania, Dole **11.735** (Swah to  
 E.Africa 1500-2000) 32232 at 1915 in Liverpool.

Noted in the **9MHz (31m)** band during the morning

were KNLS Alaska **9.615** (Eng to F.East 0800-0900) 34333 at  
 0823 in Woodhall Spa; HCJB Quito, Ecuador **9.780** (Eng to  
 W.America 0500?-0900?) 54444 at 0826 in Plymouth; Swiss  
 R.Int via Montsinery, Fr.Guiana **9.885** (Eng, It, Ger, Fr to  
 Australia 0830-1030) 45343 at 0830 in Newry; R.Australia via  
 Shepparton **9.710** (Eng to Pacific areas 0800-0900) 33333 at  
 0845 in Herstmonceux; R.Vilnius, Lithuania **9.710** (Eng to Eur  
 0930-1000) SIO 333 at 0930 in Co.Fermanagh; VOA via  
 Greenville, USA **9.590** (Eng to C.America 1000-1100) SIO 333  
 at 1045 in Macclesfield; R.Nederlands via Wertachtal **9.855**  
 (Eng to Eur 1130-1325) 54444 at 1128 in Oxted.

After mid-day, R.Vlaanderen Int, Belgium **9.925** (Eng to  
 Eur 1230-1300) was 44444 at 1230 in Morden; R.Australia via  
 Shepparton **9.500** (Eng to Asia 1430-2130) 44544 at 1547 in  
 Wallsend & 45544 at 1910 in Northampton; AIR via Delhi  
**9.950** (Eng to Eur 1745-1945) 44333 at 1900 in Liverpool;  
 R.Nederlands via Flevo **9.895** (Eng to Africa 1830-2025)  
 22222 at 1913 in Nottingham; VOIRI Tehran, Iran **9.022** (Ger,  
 Fr, Eng to Eur 1730-2030) 35444 at 1955 in Storrington; DW  
 via ? **9.725** (Eng to ?) 44544 at 2005 in E.Bristol;  
 R.Nederlands via Flevo **9.895** (Eng to Africa 1830-2025)  
 44344 at 2020 in Freshwater Bay, IoW; R.Thailand via Udon  
 Thani **9.535** (Eng to Eur 2030-2045) 22222 at 2040 in Truro; V  
 of Armenia via Kamo **9.965** (Eng to Eur 2055-2120) 44344 at  
 2115 in Dudley; RCI via Sackville **9.770** (Fr, Eng to Eur, Africa



Continued  
 on page 22.

## Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
846	Rome	Italy	1200	B*,E*,G*,J*	1206	Bordeaux	France	100	B
855	RNE1 via ?	Spain	?	E*,G*,J*	1215	Virgin via ?	UK	?	E,F,G,I,J
864	Santah	Egypt	500	G*	1224	Lelystad	Holland	50	G
864	Paris	France	300	B,E,G,I	1224	COPE via ?	Spain	?	G*
864	Socuellamos(RNE1)	Spain	2	E*,G*	1233	Virgin via ?	UK	?	F,G,I
873	Frankfurt(AFN)	Germany	150	D,E*,H*,J*	1242	Virgin via ?	UK	?	FG
873	Zaragoza(SERI)	Spain	20	E*	1251	Marcali	Hungary	500	G*
873	Ennskilten(RUI)	UK	1	F	1260	SER via ?	Spain	?	E*
882	COPE via ?	Spain	?	E*	1269	Nuremster(DLF)	Germany	600	E*,G*,J*
882	Washford(BBCWales)	UK	100	D,E,G,I	1269	COPE via ?	Spain	?	E*
891	Algiers	Algeria	600/300	G*	1278	Strasbourg	France	300	B
891	Hulberg	Netherlands	20	G*	1278	Dublin/Cork(RTE2)	Eire	10	D,E*,F*,G*,J*
891	Antalya	Turkey	600	G*	1287	RPE via ?	Czech Rep.	10	B,E*,G*,J*
900	Brno(CRo2)	Czech Rep	25	E*	1287	Lenda(SERI)	Spain	10	E*,G
900	Milan	Italy	600	B,E*,G*	1296	Valencia(COPE)	Spain	10	G*
900	COPE via ?	Spain	?	F	1296	Orfordness(BBC)	UK	500	F*
909	Lisnagarvey(BBC5)	N.Ireland	10	G*	1305	RNE5 via ?	Spain	?	E*,G
909	B'mans Pk(BBC5)	UK	140	E,G,I	1314	Kitvsoy	Norway	1200	B,E,G,I
918	Domezale	Slovenia	600/100	E*,G*	1323	W'brunn (V.Russia)	Germany	1000/150	B,I
918	Madrid(R.Int)	Spain	20	E*,G*	1332	Rome	Italy	300	E*,J*
927	Wolvertem	Belgium	300	E,G,I	1341	Lisnagarvey(BBC)	N.Ireland	100	D,E*,F,G,I
936	Bremen	Germany	100	E*	1341	Tarrasa(SERI)	Spain	2	E*,G*
936	Venezia	Italy	20	E*	1350	Cesvaine/Kuldiga	Latvia	50	E*
936	RNE5 via ?	Spain	?	G*	1359	Madrid(RNE-F5)	Spain	600	E*
945	Toulouse	France	300	B*,G*	1368	Foxdale(Marx R)	Is of Man	20	D*,E*,F
954	Brno (CRo2)	Czech Rep.	200	E*,G*	1377	Lille	France	300	B,E*,G
954	Madrid(CI)	Spain	20	E*,G*	1386	Bolshakovo	Russia	2500	B,E*,G*,J*
963	Pori	Finland	600	B,E*	1395	Lopic	Netherlands	120/40	E,G,I
963	Tir Chonail	Eire	10	F*	1404	Brest	France	20	E*,J*
972	Hamburg(NDR)	Germany	300	B,E*,G	1422	Hausweiler(DLF)	Germany	1200/600	E*,G*,J*
972	RNE1 via ?	Spain	?	E*	1440	Marnach(RTL)	Luxembourg	1200	B,C*,E,G
981	Alger	Algeria	600/300	E*,G*	1440	Damman	Saudi Arabia	1600	I*
990	Berlin	Germany	300	B,E*,G*,J*	1449	Redmoss(BBC)	UK	2	B,D,E*
990	R.Bilbao(SLICE)	Spain	10	E*,G*	1458	Flake	Albania	500	G*
990	Tywyn(BBC)	UK	1	D	1467	Monte Carlo(TWR)	Monaco	1000/400	E*,G*
999	Madrid(COPE)	Spain	50	G*,J*	1476	Wien-Bismarberg	Austria	600	G*
1008	SER via ?	Canaries/Spain?	?	E*	1485	SER via ?	Spain	?	I*
1008	Flevo(Hilv-5)	Holland	400	G*,H*,J*	1494	Clermont-Ferrand	France	20	G
1017	Rheinsender(SWF)	Germany	600	E*,E*,F*,G*,J*	1494	St.Petersburg	Russia	1200	E*,G*
1017	RNE5 via ?	Spain	?	B*	1512	Wolvertem	Belgium	300	E*,G,I
1026	SER via ?	Spain	?	E*	1521	Duba	Saudi Arabia	2000	E*,G*
1035	Milan	Italy	50	G*	1530	Vatican R	Italy	150/450	C*,D*,E*,G*,J*
1044	Sebae-Aioum	Morocco	300	G*	1539	Mainflingen(ERF)	Germany	350(700)	E*,G*,J*
1044	S.Sebastian(SER)	Spain	10	E*,G*	1539	Valiadolid(SER)	Spain	5	E*
1053	Talk R.UK via ?	UK	?	E,F,G,I,J*	1575	Genova	Italy	50	E*,G*
1062	Kalundborg	Denmark	250	B,E*,G*,J*	1575	SER via ?	Spain	5	E*
1071	Cairo	Egypt	100	G*	1584	SER via ?	Spain	2	E*,G*
1071	Riga	Latvia	50	E*	1593	Holzkirchen(VOA)	Germany	150	E*,G*,J*
1071	Bilbao(EI)	Spain	5	E*,G*,J*	1602	SER via ?	Spain	?	E*,J*
1071	Talk Radio UK via ?	UK	?	G	1602	Vitoria(EI)	Spain	10	E*,G*,J*
1080	SER via ?	Spain	?	E*,G*	1611	Vatican R	Italy	15	D*,E*
1089	Talk Radio UK via ?	UK	?	E,F,G,I					
1098	Nitra(Jarok)	Slovakia	1500	B,E*,G*					
1107	Talk R.UK via ?	UK	?	E,G					
1116	Bari	Italy	150	G*					
1125	La Louviere	Belgium	20	E*,G*					
1125	Deanovec	Croatia	100	B					
1125	RNE5 via ?	Spain	?	E*,G*					
1125	Llandrindod Wells	UK	1	D,F					
1134	Zadar(Croatian R)	Croatia	600/1200	B,E*,G*,J*					
1134	COPE via ?	Spain	2	E*					
1143	Stuttgart(AFN)	Germany	10	E*					
1143	COPE via ?	Spain	2	E*,G*					
1161	Ain-Salah	Algeria	5	E*					
1179	SER via ?	Spain	?	E*					
1179	Solweby(SER)	Sweden	600	A*,B,E*,G*,J*					
1188	Kuame	Belgium	5	E*,G*,J*					
1188	Reichenbach(MDR)	Germany	5	G*					
1188	Szolnok	Hungary	135	B,E*					
1197	Munich(VOA)	Germany	300	B					
1197	Virgin via ?	UK	?	E,F,G,I					

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

### Listeners:-

- (A) Robert Beason, Nottingham
- (B) Simon Hockenhill, E.Bristol
- (C) Rhodencey Illman, Oxted.
- (D) Brian Keyte, Gt.Bookham.
- (E) George Millmore, Wootton IoW.
- (F) Tom Smyth, Co.Fermanagh
- (G) Emie Strong, Ramsey, Cambs.
- (H) Thomas Williams, Truro.
- (I) Fred Wimshurst, Northampton.
- (J) Tom Winzor, Plymouth.

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NEXT DAY DELIVERY TO MOST AREAS, £10.00.

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### Q-TEK APOLLO 2000MKII

A brilliant new compact indoor antenna that covers 0-1650MHz and is just 20" tall (collapsed). Supplied with coax and BNC plug fitted.

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A high performance wideband discone offering superb performance from 25-2000MHz. Transmit range:- 6m, 2m, 70cm, 32cm & 23cm (power handling 200W). Fitted with low loss 'N' type connector. Supplied with mounting brackets.

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### AIR-44 (Airband base)

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

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PROFESSIONAL QUALITY

AIR-35 (As above) 1m long. Gain 3/6dB. **£44.95** P&P £5



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A miniature wideband antenna. Receives 30 - 1200MHz. BNC fitting only 1.5" long. It's superb (for its size). RRP £29.95.

SAVE £10

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### REGULAR-GAINER RH-770

BNC 21cm flexible whip that is ideal as replacement

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### SUPER-GAINER RH-9000

BNC 40cm flexible model for the ultimate in gain.

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Portable SW reel antenna. Connects to a 3.5mm jack or clips onto your telescopic antenna. **£14.95**.

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### NEW Q-TEK CYCLOPSE

Your eye-in-the-sky. The ultimate short wave receiving antenna. Doesn't your short wave receiver deserve

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INTRO PRICE **£59.95** P&P £8.50 (Coax has PL-259 fitted)



### THE VERTICAL CYCLOPSE

This new short wave listeners antenna was initially made specifically for one of our commercial but we felt the general public would find it of great interest. Agt only just over 7 feet high this vertical short wave receiving antenna will give amazing results from 0.2-30MHz and thanks to its commercial construction you simply erect it and away you go. Length 7'6". Coax supplied: 20m with PL-259 fitted. SSP £129.00.

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### GLOBAL AT-2000

Deluxe SW ATU 0-30MHz. SO239 fittings.

ONLY **£85.00** P&P £4 (Probably the best ATU around)



### VECTRONICS AT100

Active SW antenna Covers 0.3-30MHz with adjustable sensitivity. Simply connect to a

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Enamelled.....	£12.95 P&P £5
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Flexweave (H/ duty).....	£30.00 P&P £5
Flexweave H/ duty (20 mtrs).....	£15.95 P&P £5
Flexweave (PVC coated 20 mtrs).....	£18.95 P&P £5
Flexweave (PVC coated 50 mtrs).....	£40.00 P&P £5



### Q-TEK HF-30

An amazing new design concept in compact HF antennas. Thanks to its six-stage multi-resonant coil system stacked vertically utilising a magnetic balun at the base you can obtain better results than ever experienced from a compact-vertical HF antenna. (SO-239 fitting:- 4' high - clamps to any mast up to 2" dia). 0-30MHz.

Send SAE for review

ONLY **£84.95** (DEL £10.00) SUPERB HF SHORTWAVE ANTENNA

### NEW SP-1 SPYWIRE

Ideal for any receiver. Receives all short wave bands. All mode, no ATU required. Built in balun.

SO239 connection. **£29.95** + £3 P&P



LW-2 High quality long wire antenna kit....£39.95 P&P £5

### INTERFERENCE STOP IT!

Rectangular snap-fixing ferrite cores suitable for :- Radio coax/TV/mains/telephone/PC & data cables.

Plastic teeth prevent it from sliding on cable. Simply snap close onto cable and job is done!

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### POLICE STYLE HOLSTER "HHC-2"

Matches all hand-helds can be worn on the belt or attached to the quick release body holster.

**£22.95** P&P £1



### QS-300

A fully adjustable desk top stand for use with all hand-helds. Fitted coaxial fly (FAI) with BNC & SO239 connectors.

ONLY **£14.95** P&P £2



### EP-300

Deluxe over the ear earpiece.

ONLY **£9.95** P&P £1

## ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ BARGAIN BASEMENT ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

### ROYAL DISCONE

(Stainless steel) Frequency range: receives 25-2000MHz, transmit 6/2/70/23cm, connector N type. High sensitivity with an amazing range of transmitting frequencies. Comes complete with mounting hardware & brackets. SSP £49.95.

SPECIAL OFFER **£29.95**

P&P £8.50



### HALF PRICE PRE-AMPS

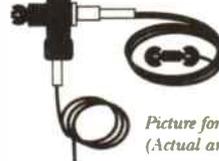
Boost reception of your scanner with this pre-amp. 100-1000MHz. RRP £39.95.

SPECIAL OFFER **£19.95**

P&P £1.00

### HF WIRE ANTENNAS

(0-30MHz) Internal or external use comes complete with con box and dog bone wire, etc. (A must for SW listeners). Was £39.99.



NOW **£24.95** P&P £6.50

Picture for reference only. (Actual antenna may vary)

# HAYDON

## COMMUNICATIONS



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The AR-5000 advances the frontiers of performance providing excellent strong signal handling, high sensitivity and wide band coverage. Covers 10kHz-2600MHz.

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WITH SPECTRUM MASTER SOFTWARE WORTH £130.00



### FAIRHAVEN RD-500VX+

0-1750MHz, all mode, fully featured. We have had this unit independently tested & compared to other radios priced at around £1500 and in our opinion this is the best there is. Incl's optional PC control kit. Buy yours before the price increases. New RRP ~~£899.00~~

OUR PRICE **£799.00**

Optional remote keyboard £15.00 P&P £4.00



### YAESU FRG-100

Brilliant short wave receiver. Outperforms any other receiver in its price bracket.

SALE PRICE **£369.00**



### REALISTIC DX-394

★ Superb performance SW receiver ★ 0.2-30MHz (all mode) ★ Selectable tuning steps (down to 100Hz) ★ 240 or 12V ★ Digital S-meter ★ Attenuator ★ Key pad entry ★ 160 memories ★ Clock/timer ★ Noise blanker ★ Limit scan ★ Tape output Was ~~£199.00~~

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### BEARCAT BC-9000XLT

We have just secured a small quantity of this amazingly high performance desk-top scanner.

The unit covers from 25-1300MHz and has nearly every facility available including 500 memories, alpha-numeric display, switchable modes and even a scan rate of 100 channels per second. WHATS EVEN BETTER IS THE PRICE. Was ~~£299.00~~.

WHILE STOCKS LAST NOW ONLY **£219.00**



### ICOM PCR-1000

Amazing front end performance

Bring another world to your computer. It covers a wide frequency range from 0.01-1300MHz (all mode). Incl's SSB. RRP ~~£349.00~~.

OUR PRICE **£249.00**

Icom IC-R75 UT-106

SW receiver for the true enthusiast.....£609.00  
DSP filter for PCR-1000, R-75 & IC-706 .....£69.95



### SANGEAN ATS-909

Synthesized world receiver with RDS and 306 memories. Covers SW/MW/LW & FM stereo.

ONLY **£129.95**



### SONY SW-100E

Award winning miniature portable SW receiver. Its performance is brilliant for its size. The best short wave receiver for under £250. 0.15-30MHz all mode (incl's SSB & FM stereo). RRP ~~£220.00~~.

SALE PRICE **£129.95**

Sony SW-55 Superb quality short wave receiver.....£239.00

HD-010 deluxe stereo/mono headphone

for SW portables .....£7.99 P&P £2.00



### MVT-7100EU

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

SPECIAL OFFER **£195.00**

MVT-9000MkII Flagship h/h scanner .....£319.95

Soft case for 7100EU/9000 - specify .....£19.99

HD-010 deluxe stereo/mono headphone

for hand-held scanners .....£7.99 P&P £2.00

### ICOM IC-R2

Miniature wideband hand-held scanner covers 0.5-1300MHz (AM, FM/WFM). Search banks memories and many more features.

**We've sold 100s** **£129.00**



### AOR AR200

The latest all mode innovation in handies. There's too many features to list (.2-2GHz, all mode). (Incl's SSB). Supplied with nicads/charger ready to go.

SALE PRICE **£339.00**

Soft case for AR200/8000.....£19.99

AR8000 wideband hand-held receiver .....£279.95



### AR108

Palm sized dedicated airband scanning receiver. Covers airband 108-136.975MHz VHF 136-180MHz with 99 memories.

ONLY **£59.95**

Optional batteries + charger £13.99.

## SHOWROOM & MAIL ORDER:

Unit 1, Thurrock Commercial Park, Purfleet  
Industrial Estate, London Rd, Nr. Aveley,  
Essex RM15 4YD  
TEL: 01708 852524 FAX: 01708 863441  
Open Mon - Fri 9am - 4.30pm. Sat 9am - 1.00pm

## W. MIDLANDS SHOWROOM

Unit 1, Canal View Ind. Est.,  
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Open Mon-Fri 9.30-5pm. Sat 9.30-2pm  
NO MAIL ORDER TO MIDLANDS BRANCH

## NEW CLOCKS/WEATHER STATIONS FOR THE 21st CENTURY FROM OREGON SCIENTIFIC



**RM-913** RADIO CONTROLLED CLOCK. ● 12 24hr function ● Auto clock from "Rugby" RF signal ● Alarm function ● Backlight & more ● Incl's batteries  
**£11.99** P&P £2



**BA-312E** WEATHER CLOCK.  
● 5 weather forecast ● Temp (Min max)  
● "Higlo" illumination ● Alarm calendar  
● Much more ● Incl's batteries  
**£27.99** P&P £2



**BA-888** ELECTRONIC BAROMETER CLOCK.  
● Temp weather forecast pressure barometric trend ● 24hr bargraph  
● 12 24hr clock & alarm ● Humidity  
● Table wall mount  
**£69.95** P&P £4



**RM-338** EXECUTIVE CLOCK.  
● Jumbo LCD ● 12 24hr clock  
● 100yr calendar ● Temp (°C °F)  
● Wall or desk mount ● Backlight ● Incl's batteries  
**£24.99** P&P £2



**BAR-888U** WEATHER RADIO CONTROLLED CLOCK.  
● Supplied with one remote (wireless) sensor ● Weather forecast ● Barometer  
● 24 hr "radio" clock ● Thermometer  
**£69.95** P&P £4



**JM-838** JUMBO WALL/DESK CLOCK. ● Wide screen 2" digit time display ● Barometer ● Calendar ● Temp ● Auto RF synch clock from Rugby  
**£59.95** P&P £4



### GARMIN GPS-III PLUS

Upgradable GPS system supplied with data lead and free on-board maps. Shows cities, airports and much, much more.

SALE PRICE **£315.00**

New Garmin Street Pilot GPS	£419.00
New Garmin Street Pilot Colour	£549.00
Soft case for GPS-III Plus	£20.00
GPS-III UK version with moving map	£249.95
UK Map Source CDROM	£69.95
Cigar power lead	£20.00
Active magmount antenna	£39.95



### NEW GPS-12 NAVIGATOR

(now with 24 hour battery life) 12 channel receiver. Includes: UTM, ordnance survey, waterproof to IPX-7 standard.

SALE PRICE **£129.95**



### OPTO TECHTOVZ

Micro frequency counter. 10MHz-1.2GHz. RRP £89.99.

ONLY **£49.99**



### WATSON HUNTER

Frequency counter 10MHz-3GHz.

ONLY **£59.95**  
+ free case worth £15.00



### OPTO MINI SCOUT

10MHz-1.4GHz frequency counter with bargraph and "reaction tune" capability. (Incls. nicads & charger).

SPECIAL OFFER **£139.95**



### OPTO SCOUT 40

10MHz-1.4GHz frequency counter with 400 memories and "reaction tune" capability. (Incls. nicads & charger).

SPECIAL OFFER **£319.95**

## PMR-446 TAKES UK BY STORM

Haven't you ever wanted to play radio? Now you can! - No license required - Yes, anyone can buy and use this two way radio system with absolutely no running cost! Are you going on holiday and need some for the family - need communications for your work or leisure - then look no further. PMR-446 solves the problem. We've even seen families using them at fun parks to stay in touch and, don't forget, you can use them as much as you like - it will not cost you a penny.



### MOTOROLA TA-200

- ★ Typically up to 3Km range dependent upon terrain
- ★ Large, easy to read LCD screen with user-friendly icons
- ★ You choose who to talk to and select from 300 channel settings
- ★ Rugged and stylish design - choose from yellow or blue
- ★ One button operation - easy for adults and children to use, simply push to talk.

ONLY **£69.95** or 2 for £129.00



### NISSEI EP-300 TM

Over the ear earpiece with lapel mic & PTT  
Fits Motorola TA-200.

ONLY **£24.95**



### MOTOROLA TA-288

Licence free PMR-446 radio with nicad and charger. ● No need for a walkie-talkie licence and there are no airtime charges. Just pick up your new Motorola Talkabout TA288 walkie-talkie and start using it. ● Your Motorola Talkabout TA288 is supplied with a rechargeable NiMH battery for up to 1 hour of continuous talktime or 13 hours of standby time. ● With up to a 3km range out of sight does not mean out of touch. This dependable little walkie-talkie will help keep your group together.

ONLY **£109.95** or 2 for £199.00



### MOTOROLA HANDIE PRO

- ★ Up to a mile in range (depending on terrain)
- ★ 38 channels
- ★ Rapid one-hour drop in charger
- ★ Internal vox with user sensitivity
- ★ Large, easy to read LCD screen

ONLY **£179.95**  
or 2 for £329.95



NEW  
7th EDITION  
UK  
SCANNING  
DIRECTORY

ONLY  
**£19.50**

P&P £3.50

## Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
3.200	TWR Manzini	Swaziland	0308	G	4.890	R Port Moresby	New Guinea	2009	H,J
3.240	TWR Shona	Swaziland	0310	G	4.895	AIR Kurseong	India	1435	J
3.255	BBC via Meyerton	S Africa	2004	G,H	4.895	Pakistan BC	Pakistan	1650	H
3.270	Nambian BC, Windhoek	Namibia	0359	B,G	4.900	SLBC Colombo	Sri Lanka	0022	B,G
3.290	Nambian BC, Windhoek	Namibia	1939	B,H	4.915	R Anhanguera	Brazil	0317	G
3.300	R.Cultural	Guatemala	0010	B	4.915	GBC-1, Accra	Ghana	2239	B,C,G,H,I,M
3.315	AIR Bhopal	India	1704	C,H,J	4.915	KBC Cent Sce Nairobi	Kenya	1756	H
3.320	SABC (RSG) Meyerton	S Africa	2004	B,H	4.920	R Quito, Quito	Ecuador	0800	C,G,J
3.335	CBS Taipei	Taiwan	2026	H,M	4.920	AIR Chennai	India	1702	B,C,H,I,J
3.365	GBC R-2	Ghana	2100	G,H	4.927	RR1 Jambi	Indonesia	1540	J
3.365	AIR Delhi	India	1800	C,D,H	4.930	R Internacional	Honduras	0035	B
3.915	BBC via Kranji	Singapore	2152	B,C,G,L	4.940	AIR Guwahati	India	0027	B,G,H
3.955	BBC via Skelton	England	2100	B,G,K,L,M	4.945	R Illimani, La Paz	Bolivia	0050	B
3.965	R Taipei via Skelton	England	1850	A,F	4.945	R Difusora	Brazil	0729	I
3.965	RFI Paris	France	2127	G,M	4.950	AIR Srinagar	India	1627	G,H,I,J
3.975	R Budapest	Hungary	2230	F,G,K,M	4.950	VOA via Sao Tome	Sao Tome	2034	D,F,G,H,M
3.976	RR1 Pontianak	Indonesia	1448	J	4.955	R.Nac de Colombia	Colombia	0410	B,G,I
3.980	R Korea via Skelton	England	2200	F,G,K,L,M	4.960	R Federacion, Sucua	Ecuador	0135	B
3.985	Nexus, Milan	Italy	1835	F,G,M	4.960	VOA via Sao Tome	Sao Tome	0258	G
3.995	DW via Julich	Germany	0404	G	4.965	SWABC Windhoek	S W Africa	1656	I
3.995	DW via Meyerton	S Africa	2150	B,L,M	4.975	R Pacifico, Lima	Peru	0737	I
4.003	RR1 Padang	Indonesia	1450	J	4.975	R Uganda, Kampala	Uganda	2036	F,G,H,I
4.005	Vatican R.	Italy	0404	G	4.980	PBS Xinjiang, Urumqi	China	1642	B,D,H,J
4.035	Xizang PBS, Lhasa	Tibet	1520	J	4.980	Ecos del Torbes	Venezuela	0235	B,C,E,G,I,J,M
4.760	AIR Fort Blair	India	0015	B	4.985	R Brazil Central	Brazil	2204	I
4.765	R.Rural, Santarem	Brazil	0020	B	5.005	R.Nepal, Kathmandu	Nepal	1631	G,H
4.770	FRCN Kaduna	Nigeria	1946	D,E,G,H,I,J	5.010	R Garoua	Cameroon	1659	I
4.775	AIR Imphal	India	1700	H,J	5.010	AIR Thru'puram	India	0030	B,G
4.775	TWR Manzini	Swaziland	0406	G	5.025	ABC Katherine	Australia	2137	H
4.783	RTM Bamako	Mali	2104	G,H,I	5.025	R Rebelde, Habana	Cuba	0322	B,G,I,J
4.790	AIR Itanagar	India	1530	B,J	5.025	R Uganda, Kampala	Uganda	1952	H
4.790	Azad Kashmir R.	Pakistan	1643	G,I	5.035	R Aparecida	Brazil	0712	I
4.800	AIR Hyderabad	India	1701	H,I	5.035	R Educacao Rural	Brazil	0110	B
4.800	LNBS Maseru	Lesotho	0314	G	5.035	R Bangu	C Africa	0438	G
4.805	R.Nac Amazonas	Brazil	0015	B	5.045	R Cultura do Para	Brazil	0637	I
4.815	R Difusora, Londrina	Brazil	0020	B	5.047	R Togo, Lome	Togo	2220	E,F,H,I
4.815	R Diff TV Burkina	Quagadougou	2126	E,G,H,I	5.050	Haixia 1, V of Strait	China	2122	F,H
4.820	R Botswana, Gaborone	Botswana	1938	G,H	5.050	R Tanzania	Tanzania	2034	G,H
4.820	La Voz Evangelica	Honduras	0315	G	5.055	RFO Cayenne(Matoury)	French Guiana	0323	B,G
4.822	R Mauritanie	Mauritius	2236	I	5.060	PBS Xinjiang, Urumqi	China	1600	B,D,J,M
4.825	R Cancao Nova	Brazil	0510	E,I	5.075	Caracol Bogota	Colombia	0115	B
4.828	ZBC R-4	Zimbabwe	1932	H	5.100	R Liberia, Totota	Liberia	0055	B
4.830	R Tachira	Venezuela	0230	B,E,I	5.131	R Vis 2000 B'bamarca	Peru	0105	B
4.835	R Tezulutlan, Coban	Guatemala	0110	B					
4.835	RTM Bamako	Mali	2105	E,F,G,H,I,M					
4.840	AIR Bombay	India	1648	B,G,H,I					
4.845	R Fides, La Paz	Bolivia	0035	B					
4.845	ORTM Nouakchott	Mauritania	2238	D,F,G,I,M					
4.850	R Yaounde	Cameroon	2239	B,G,M					
4.850	AIR Kohima	India	1400	G,J					
4.860	AIR Delhi	India	1646	H,I,J					
4.865	R Alvorada, Londrina	Brazil	0730	I					
4.875	R Roraima, Boa Vista	Brazil	0512	E					
4.879	R Bangladesh	Bangladesh	1540	J					
4.885	R Clube do Para	Brazil	0625	B,E,I					
4.885	KBC East Sce Nairobi	Kenya	1754	E,H					
4.890	RFI Paris	via Gabon	0358	G					

DXer	Station
(A)	Robert Beason, Nottingham
(B)	Robert Connolly, Killeel
(C)	David Edwardson, Wallsend
(D)	Bill Griffith, W.London
(E)	David Hall, Morpeth
(F)	Sheila Hughes, Morden
(G)	Eddie McKeown, Newry
(H)	Fred Pallant, Storrington
(I)	Richard Reynolds, Guildford
(J)	John Slater, Scalloway
(K)	Tom Smyth, Co.Fermanagh
(L)	Thomas Williams, Truro
(M)	Fred Wilmschurst, Northampton

2000-2200) SIO 333 at 2122 in N.Bristol; R.Cairo, Egypt 9.990 (Eng to Eur 2115-2245) 33333 at 2230 in W.London; Swiss R.Int via Montsineri, Fr.Guiana 9.905 (Ger, Eng, Sp, Fr, It to C/N.America 0000-0500) 44444 at 0120 in Killeel.

The 7MHz (41m) band carries quite a few broadcasts for listeners in Europe. Some originate from R.Japan via Woofferton, UK 7.230 (Jap, Eng 0500-0700), rated 54433 at 0650 in Herstmonceux; Christian Science via WSHB Cyprus Creek, USA 7.535 (Eng 0400?-1000?) 54445 at 0730 in Stalbridge; R.Minsk, Belarus 7.210 (Russ) 33333 at 0850 in Oxted; Voice of Greece, Athens 7.450 (Eng, Gr 1800-1830) 44444 at 1806 in Woodhall Spa; All India Radio (AIR) via Bangalore 7.410 (Hi, Eng 1745-2230) 54454 at 1855 in Liverpool; R.Bulgaria, Sofia 7.535 (Fr 1800-1900, Eng 2000-?) SIO 555 at 1830 in Macclesfield & 54444 at 2007 in Plymouth; R.Slovakia Int 7.345 (Eng 1930-1957) SIO 333 at 1932 in N.Bristol; V of the Mediterranean, Malta via Russia 7.440 (Eng 2000-2100) heard at 2000 in Dudley; R.Budapest, Hungary 7.165 (Eng 2000-2030) 54544 at 2010 in E.Bristol; R.Polonia (Polish R), Warsaw 7.285 (Eng 2030-2130) 21222 at 2053 in Nottingham; V of Russia, Moscow 7.300 (Eng) 55444 at 2112 in Freshwater Bay, IoW; R.Romania Int, Bucharest 7.215 (Eng 2100-2156) 33222 at 2130 in Morden; China R.Int via Russia 7.170 (Eng 2200-2257) 55544 at 2220 in Northampton; R.Tirana, Albania 7.130 (Alb 2200-2230, Eng 2230-2300) 44444 in Morpeth.

Also received in the UK were some intended for other areas: WHRI via Maine, USA 7.580 (Eng to N.America) rated 44444 at 2320 by Martin Cowin in Kirkby Stephen; KTBN via Salt Lake City, USA 7.510 (Eng to N.America 0000-1600) 33333 at 0055 in Killeel; V of Nigeria, Ikorodu

7.255 (Eng to W.Africa) 44343 at 0515 in Newry.

Some of the many broadcasts to Europe in the 6MHz (49m) band originate from R.Netherlands via Julich, Germany 6.045 (Eng 1130-1325), rated 54444 at 1322 in Plymouth; R.Austria Int, via Moosbrunn 6.155 (Eng 1730-1800) 44444 at 1750 in Woodhall Spa; Deutsche Welle (DW) via Julich? 6.140 (Eng Service) SIO 444 at 1800 in Co.Fermanagh; R.Prague, Czech Rep. 5.930 (Eng 1800-1827) 44444 at 1815 in Stalbridge; RAI Rome 5.970 (Eng 1935-1955) 44444 at 1938 in Newry; R.Slovakia Int 6.055 (Eng 1930-2000) 53544 at 1950 in E.Bristol; R.Finland via Pori 6.135 (Eng 2000-2030) SIO 444 at 2002 in N.Bristol; Swiss R.Int via Julich, Germany 6.165 (Ger, It, Fr, Eng 1830-2030) 33333 at 2018 in Nottingham; R.Budapest, Hungary 6.025 (Hung 2100-2130) 44333 at 2100 by Richard Howard in NW.Northampton; R.Budapest, Hungary 6.025 (Eng 2200-2230) 53344 at 2158 in Kirkby Stephen; R.Canada Int via Skelton, UK 5.995 (Fr, Eng 2000-2300) 55555 at 2200 in Dudley; R.Taipei Int via WYFR 5.810 (Eng 2200-2300) 45444 at 2205 in Northampton; R.Ukraine Int, Kiev 6.020 (Eng 2200-2300) 32222 at 2220 in Morden; R.Sweden via Horby 6.065 (Eng 2230-2300) 54544 at 2250 in Herstmonceux.

Also mentioned in the reports were R.Diff Nationale, Chad 6.165 (Fr), rated 54434 at 2209 in Guildford; BBC via Antigua, W.Indies 5.975 (Eng to C/N.America 2100-0800) 44444 at 0050 in Killeel; WEWN Birmingham, USA 5.825 (Eng to N.America 2200-0900?) 55555 at 0420 in Morpeth; WHRI South Bend, USA 5.745 (Eng to N.America 2100?-1000) 44334 at 0903 in Oxted; Caribbean Beacon, Anguilla 6.090 (Eng to N.America?) 33343 at 0915 in Scalloway.



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

### Signal Strength

5	excellent
4	good
3	fair
2	poor
1	barely audible

### Interference

5	nil
4	slight
3	moderate
2	severe
1	extreme

### Noise

5	nil
4	slight
3	moderate
2	severe
1	extreme

### Propagation

5	nil
4	slight
3	moderate
2	severe
1	extreme

### Overall Merit

5	excellent
4	good
3	fair
2	poor
1	unusable

# Old Lessons, often repeated for the beginner

In my experience there's nothing quite like the feel of a 'proper' receiver, and once again I'm privileged to have been given the opportunity to comment on a classic of the genre. I am sitting here right now savouring the delights of (and some reservations about) a Collins HF-2050, a receiver few of us will ever own, but some have appeared on the second-hand market so there is always the possibility of stumbling across one. I thought I might do exactly that when I drove from North Devon to Bradford and back last week on a visit to John's Radio (No, the John isn't me) to inspect and purchase some items of test gear. The warehouse was a true Aladdin's cave of equipment, and in the short time I was there I did see a selection of Racal RA1792 receivers and sundry other interesting boxes but no Collins - but that doesn't mean one wasn't lurking in one of the numerous dark corners.

In many ways the HF-2050 (also known as the R-5099 or R-5104) is similar to the RA1792 and other receivers from a professional background, particularly in its size, general appearance, style of display and keypad feel. It's almost as though there has been a common design dictated by commercial customers, possibly government agencies. Another common feature to all these receivers is the relative simplicity of the front panel which gives matching simplicity of operation. Every control has an obvious function, and the attendant ease of operation usually makes driving this type of equipment very relaxing, (but read on). If at all possible, every serious listener should have a receiver of this breeding. They may not have the range of sometimes questionable 'features' seen in the latest offerings in the hobby market, but pro' receivers will usually get on frequency faster, stay on frequency longer and produce high quality audio from difficult signals.

Audio quality came to mind early on in my use of the HF-2050 because this receiver uses d.s.p. techniques to provide i.f. filtering and demodulation and I was keen to hear if the resultant audio was any better than that from some recent receivers I have tried and in which I was disappointed. The r.f. architecture of the HF-2050 follows the usual path taken by these receivers, with the r.f. input signals being sorted out into three basic bands by high pass and low pass filtering with a distinct split at 2MHz between m.f. and h.f. sections, whilst the i.f. range from 500kHz down to 14kHz is treated to a

conversion process using a 12MHz local oscillator to give a main receiver tuning range of 12.014 to 12.499MHz when the display shows 14kHz to 499kHz. As with most professional receivers, the HF-2050 has a comprehensive front-end protection system starting out with a small neon tube wired across the antenna input socket. I first saw this technique used in the BC-348 receiver produced (not by me) during WW2 so it's not new, but it is extremely effective against static voltage build up on wire antennas, and recommended as basic



protection even today. Does anyone remember the small wire ended neon which was fitted across the audio output transformer primary in the Command receivers? I never knew whether that was to protect the transformer or the operator's ears. Briefly continuing on this digression, didn't the American manufacturers produce some superb engineering in that 1940-45 period? Made our own R-1155 look like a throwback to the dark ages.

## However - On With The Story

Much to my surprise the circuit of the HF-2050 shows an a.g.c. feed to the first mixer, and following this through reveals that there is a d.c. drive to a back-to-back diode network on the primary of the mixer input transformer, and this d.c. is also taken to another diode attenuator at the input of the 3MHz second i.f. stage immediately prior to the i.f. noise blanker. Why am I surprised? Because it's not been considered good practice to have any non linear devices in the signal path between the antenna and the first mixer since there is evidence that intermodulation can take place in such devices when input signals are high, say in the medium wave band, with unwanted degradation of receiver performance. Perhaps this is why the frequencies below 2MHz are hacked off by filtering before they reach the diodes? Only the original designer can tell



This month John returns with another classic commercial receiver under the 'microscope'. Read on to discover JW's findings on the Rockwell Collins HF-2050 professional receiver.

**Continued on page 26...**

# Specialist communic

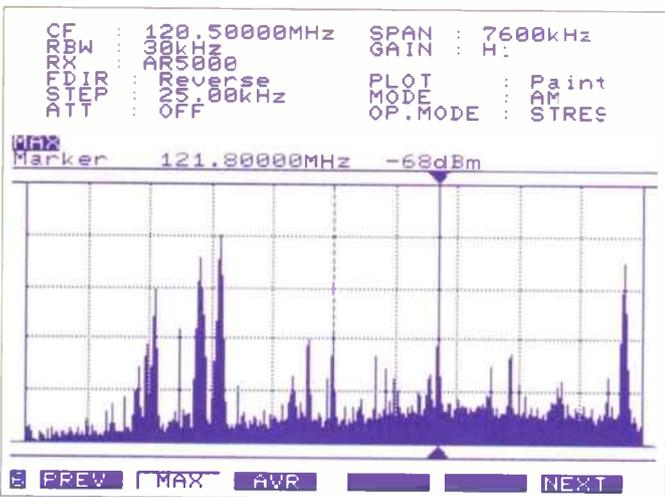


AOR receivers and major items are capable of full computer control

## Setting new standards, SDU5500 Spectrum Display Unit

The SDU5500 is an 'all new' Spectrum Display Unit and a worthy successor to the SDU5000 (which offered practical and cost effective monitoring). Coupled to the AR5000 receiver, it provides a spectrum display of 10 MHz bandwidth anywhere between 10 kHz and 2600 MHz. Already pressed into commercial usage by the government, the professionalism of the unit has truly been grasped. The SDU5500 has a high resolution monochrome (white/blue) LCD with improved status read-out on the top-half of the display with a spin wheel tuner controlling the marker position, similar to a dedicated high-priced spectrum analyser.

Receiver	
AR5000	IC-R8500
AR3000A	IC-R9000
IC-R7100	Other



★★★★ AR5000+3 awarded four stars by both the authoritative *Passport To World Band Radio* and *World Radio & TV Handbook*

### AR5000

True base receivers are few and far between, some have simply evolved from the hand held equivalents with little tangible improvement in performance or facilities over their smaller counterparts - *the AR5000 is not like this!*

High performance, top quality build and true wide coverage all mode receive. The "+3" version offers even more with synchronous AM, AFC and Noise Blanker. Popular with government agencies throughout the world. **£1545**

### AR5000c

When making critical measurements, the frequency coherence is very important whether a single or multiple unit is employed. This involves the use of a single reference for all oscillators employed throughout the receiver. The AR5000C now provides this commercially required capability. The "C" version may be provided to order in either the standard AR5000 format or with two of the +3 additions of AFC and NB. If you are a commercial operator with this application in mind, please request the separate specification leaflet for the AR5000C. **£1989**

### AR5000+3 - Sync AM, AFC, NB

The "+3" version offers even more with synchronous AM (upper side band, lower side band and double side band with excellent lock range), AFC (Automatic Frequency Control for accurately tracking moving transmissions or unusual band plans) and Noise Blanker. **£1749**

### Passport to World Band Radio '99.

*"Front-end selectivity, image rejection, IF rejection, weak-signal sensitivity, AGC threshold and frequency stability all superior".*

*"Unlike virtually every other receiver we have tested over the past 21 years, the frequency readout is unfailingly accurate to the nearest Hertz. This should make the AR5000+3 of exceptional interest to broadcast engineers".*

### World Radio TV Handbook '99.

*Speaking of the AR5000+3 in conclusion... "Compared with the ICOM ICR-8500 it offers considerably more features, better strong-signal handling, wider coverage and decidedly superior filters".*

### AR5000+3

- ✓ Wide frequency coverage 10 kHz - 2600 MHz
- ✓ All mode reception: USB, LSB, CW, AM, Synchronous AM, NFM, WFM with automode tuning (any mode and bandwidth on any frequency is possible)
- ✓ Automatic Frequency Control
- ✓ Noise blanker
- ✓ High stability TCXO reference, 1 Hz NCO tuning
- ✓ 1,000 memories, 10 memory banks, 20 search banks, 5 VFOs (all twice!), alpha tag, EEPROM chip storage
- ✓ Multiple IF bandwidth 3 kHz, 6 kHz, 15 kHz, 30 kHz, 110 kHz, 220 kHz with an option position for 500 Hz CW. (30 kHz is ideal for WEFAX).
- ✓ High sensitivity and excellent strong signal handling assisted by a preselected front end from 500 kHz - 1 GHz
- ✓ Extensive RS232 control list
- ✓ SDU ready with IF output for spectrum display unit

The SDU5500 supports a number of AOR and ICOM receivers, see above. In addition, the SDU5500 may be used with other receivers which offer a 10.7 MHz I.F. output with suitably wide bandwidth, please refer to the colour leaflet for details. Various enhancements have been implemented over the earlier SDU to provide even greater functionality and professionalism. **Free internet download software** for the PC Windows operating system is available from our UK web site <http://www.aoruk.com/firm5500.htm> **£869**

*Commercial and government organisations are selecting the AR5000 and SDU5500 every month. The combination is so successful that in many cases it is being singled out for implementation or consideration as their 'standard kit'!*



As reviewed in the December '99 edition of *Short Wave Magazine*

# ation radio receivers

ontrol, many have software available as a free internet download



**ACARS : imagine sitting at an airfield with the ARD-2 in one hand and a hand-held receiver in the other (such as the AR8200) with just a single connecting cable between them... its that simple, NAVTEX reception is possible too.**

ACARS is the transmission of data over a conventional airband communication frequency, if you have a good VHF AM airband receiver, already half the requirement is in your possession. ACARS reception at an airfield is now possible without the fuss of carrying around a computer, especially as the ARD-2 may be powered from internal batteries. Simply connect the audio output from a suitable airband receiver (such as the AR8200) to the audio input of the ARD-2, switch on the ARD-2 and adjust the audio level and tune to one of the ACARS frequencies... data bursts will be displayed on the ARD-2.

Of course for a more detailed view, a computer may be connected, free PC Windows software is available from our UK web site <http://www.aoruk.com> To add to the excitement, London has a new frequency of 136.900MHz (from about December 1999), the usual frequency being 131.725MHz in Europe (131.550MHz in North America and the Pacific, 131.450MHz in Japan).

Reception of marine NAVTEX is also provided by connecting the ARD-2 to a suitable short wave receiver with SSB capabilities (such as the AR7030).

The built-in LCD provides two lines of text with up to 32 characters of text per line and a scroll back buffer of 512 characters. A built-in speaker with volume control allows you to monitor activity and assess what is going on, this is particularly useful for fine tuning of NAVTEX and enables you to shut the sound off completely when not required. A LEVEL control provides threshold adjustment to achieve the best capture of weaker signals for improved differentiation between noise and data.

Sockets are provided on the front and rear panels for external speaker and earphone connection etc.

A 9-pin **RS232** socket is also provided to enable **connection to a computer** for improved comfort when viewing for extended periods of time (free PC Windows software is available from our UK web site <http://www.aoruk.com>), the RS232 connecting lead is supplied with the ARD-2.

**Don't get left behind... take a close look at the ARD-2 today and enjoy the digital revolution. ARD-2 £349**



The **AR8200** has been the first hand portable wide band all mode production receiver to arrive on the market place with the new airband channel step of 8.33kHz correctly implemented. With the new channel step already in use in Europe (and the UK to follow in the near future), it is surprising how few radio receivers provide this capability.

**To quote from the January'2000 SWM 'Airband column' page 65 - on the subject of 8.33kHz channel spacing... "The only scanner I know of that is currently on sale and is designed for 8.33kHz steps (inclusive of a narrow a.m. receiving mode) is the AR8200 from AOR."**

The facilities offered by the AR8200 are stunning... take the 'step-adjust' feature for example. If you have a frequency of say 151.010 MHz and wish to step in 15kHz increments, most receivers would simply assume 151.000MHz then step 151.015, 151.030 etc. However, the AR8200 may be programmed to step in the desired manner of 151.010, 151.025, 151.040, 151.055MHz etc. Other real life examples would be the 27.60125MHz

CB frequency incremented in 10 kHz steps, no problem also the 900MHz band which implements 25 kHz steps but a 12.5 kHz offset. Add to this the foresight of 8.33kHz airband steps and you have a very flexible unit!

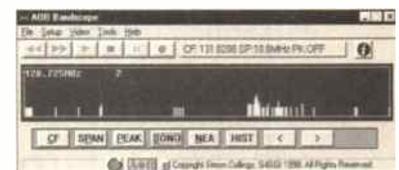
**Full computer control** is provided by the AR8200 receiver (via the optional CC8200 interface or equivalent), not just clone of data. You can set frequencies, edit memory channels, add text comments, customise search banks, edit the auto-bandplan data etc. The '8200 toolkit' software is available as a **free download from the AOR web site** and is provided with the optional CC8200 computer control interface.

Uniquely, **SLOT CARDS** are available to further extend the capabilities of the AR8200, these include the **EM8200** for external backup of 4,000 memories, **CT8200** for CTCSS squelch & search, **TE8200** to remove annoying single tones which may otherwise prevent efficient searching of certain bands, **RU8200** record/playback, **VI8200** analogue voice inverter. Other options include the CC8200 computer control interface lead, SC8200P soft case and more!

**AR8200 £399**



**Shown here with optional slot cards**



Many other products available:  
AR7030, AR7030 PLUS, AR3000A,  
AR3000A PLUS, AR8000, software...  
**Detailed leaflets available upon request.**

**AOR (UK) LTD** 4E East Mill, Bridgefoot,  
Belper, Derbyshire, DE56 2UA England  
**AOR** Tel: 01773 880788 Fax: 01773 880780  
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"Clearly, the fact that it takes so much circuit space to achieve the d.s.p. functions in the HF-2050 means that it may not be reasonable to compare its performance with that of the single chip processors in more modern equipment such as the NRD-545"

us, and I don't have access to that level of information.

Back two steps to the first mixer which uses four MRF517 bipolar devices in a quad configuration driven at high level from a local oscillator tuning 99.5 to 129MHz which, with a first i.f. of 99MHz, gives the r.f. tuning range of 500kHz to 30MHz. A crystal filter at 99MHz provides a basic bandwidth of 12kHz before signals pass to the second mixer which again uses four bipolars in a quad driven by a local oscillator of 96MHz giving a second i.f. of 3MHz. I checked the characteristics of the MRF517 and note that it is specified for Class A r.f. linear amplifier use, with an extremely good third order intermodulation performance. A perfect choice for the application in the HF-2050.

Further basic selectivity is provided by a 16kHz wide crystal filter at 3MHz before the i.f. is fed to a noise blanker which uses a balanced pair of f.e.t.s to punch a hole in the i.f. signal, the noise spikes being processed separately in a sub-i.f. having its own a.g.c. system. Noise blanker threshold adjustment is extended to a front panel control, which is a nice facility for the operator to have when manually using the receiver, always remembering that many of these units would have been installed in racks and remote controlled from some other location.

From this point onwards the 3MHz signal is converted into a digital data stream by a fast analogue to digital converter and all filtering and demodulation is carried out using algorithms contained in firmware. The circuit for all of this takes up no less than eleven sheets in the service manual, and I freely admit that understanding and explaining this in simple terms is quite beyond the bounds of my competence. Clearly, the fact that it takes so much circuit space to achieve the d.s.p. functions in the HF-2050 means that it may not be reasonable to compare its performance with that of the single chip processors in more modern equipment such as the NRD-545, but there is also at least a ten year gap between these designs which may explain the relative complexity of the earlier HF-2050. In any case I am not evaluating the receivers side by side as a potential commercial or military customer; I am standing in for the serious hobby user who just wants me to

find out how well these top receivers satisfy the listeners' needs. (Is that what modern managers call a 'Mission Statement'?). To boldly go where no listener has gone before; complete with American split infinitive.

So get on with it; how did it perform? Stare at acres of grey panel and connect the (115V only) mains supply. Oh dear, no backlighting on the display so change to reading glasses and peer through the gloom. Actually there are two displays, one carrying channel number, b.f.o. frequency - which reads the offset of the b.f.o. from carrier frequency, and frequency - which obviously is the frequency to which the receiver is tuned. The second display carries a series of columns labelled 'Status', 'Tune', 'Mode', 'AGC', 'Bandwidth', 'Audio' and 'CNTL'. Above these columns is the signal level meter which is a horizontal bar graph calibrated in dB above 1µV, and an audio output level bar graph calibrated in dBm from -15 to +15. Remember what I told you before that the audio dBm is relative to 1mW in 600Ω (775mV), whereas the dBm used in r.f. measurements is 1mW in 50Ω (224mV).

These columns: well they are actually a bit of a confidence trick, because the different legends in the column are painted on the plastic front sheet and the display itself simply moves an arrow cursor up and down behind the panel. Even that is untrue, because the arrow only moves down from top to bottom and back to the top again so we have here a case of the irritating one way scrolling so disliked by Larry Magne (and me) - *me too -Ed*. Why do we feel this way? Let me explain. If you are listening to an a.m. station using a bandwidth of 3.2kHz and want to change this to the 6kHz bandwidth, you have to press the 'B/W' switch to step through 3.2kHz, 1kHz, 0.3kHz and finally to 6kHz. If, as is often the case after a stiff gin and tonic, your trembling fingers twitch on the button, the damned cursor gaily skips over the 6kHz and you have to go through the entire sequence again to get back to 6kHz. The direction of step is one way only, so round and round you go like an experimental rat in a maze until you hit the right target. British readers will understand why my wife compares me to Victor Meldrew, the TV character in *One Foot In The Grave*. And all the functions on this second display behave in exactly the same way, so there is no escape for you.

Right; let's get on to frequency. I want to listen to my favourite aircraft channel on 5.616MHz, so I have to either tune to it using the tuning knob, or key it in using the prominent keypad - except for the fact that I can't get the keypad to respond.

Here's the sequence. Press 'FREQ' key, then 5.6.1.6., then 'ENTER'. Fine, now we are on frequency but find that all panel controls are locked out. Press 'NORM' key to restore controls and use scrolling on 'DIAL' key to go to 'FREQ' (twice around the rat's maze). Press

'MODE' key and scroll through available modes to get to upper sideband. Find that the channel is noisy and want a narrower bandwidth. Press 'B/W' key and discover that 'USB', 'LSB' and 'ISB' have only a fixed 2.8kHz bandwidth available. Use native ingenuity to discover that selecting the 'CW' mode

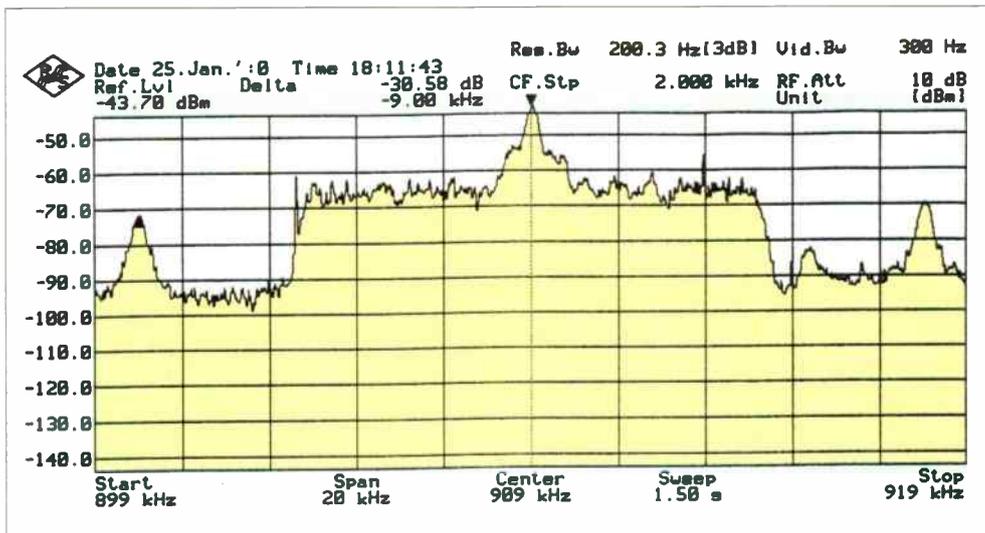


allows use of the 6kHz and 3.2kHz filters, but if you scroll back to 'USB' and then decide that 'CW' is better you find that on returning to 'CW' you are back with the default filter of 1kHz and have to use the **££&\*** scrolling again. The kindest thing I can say is that it's clumsy to use, but I do appreciate that this receiver was probably meant to sit happily in a rack listening to a single frequency for years on end, so I'm not being fair in my irritation.

The fact that the HF-2050 is not intended for 'tuning around' is made clear when you try to do just that. The main tuning knob is smaller than usual and quite stiff in its action. Despite a 'dimple' in the knob for a probing finger to investigate, it is simply not possible to tune this way and you have to use a hefty full-blooded wrist action to get the knob turning. The tuning rate is selected by - guess what? - scrolling down the 'Tune' column, and the available frequency steps are 10Hz which is fine for slow tuning around a c.w. signal; 100Hz which is equally satisfactory, but then leaps to 10kHz steps which is too fast for tuning even a.m. stations. The intermediate 1kHz step seems to have been forgotten. Strange feature! Did I really see a Collins name plate on this receiver?

What about the other columns in the array. The 'Mode' switch selects a.m., c.w., u.s.b., l.s.b. and i.s.b., although the i.s.b. option was not fitted to the receiver I tested; the B/W switch selects i.f. (d.s.p.) bandwidths of 6, 3.2, 1kHz and 300Hz, but as I have already said, these are only available for a.m. and c.w. modes; the 'dial' switch selects what parameter the tuning knob controls, which can be 'FREQ' for tuning the receiver, 'BFO' for tuning the b.f.o. offset, 'CHAN' for trawling through the stored memory channels, or 'LOCK' which locks out the front panel controls. 'AGC' selects fast, slow and off, with the time constants being well chosen and working well on all signals except very strong a.m. broadcasts where the 'slow' a.g.c. setting results in quite severe audio distortion. The 'Tune' switch selects the tuning rate of the main knob depending on what function the 'DIAL' switch has selected, and the other switches are too obvious to remark on. Underneath this array of push buttons lurks the concentric r.f. gain and Noise Blanker control, and I was pleased to see that the r.f. gain is very properly designed as a pedestal on the a.g.c. line which means you can listen to strong s.s.b. utility channels in glorious silence by backing off the gain. The noise blanker works very well, and the rotary blanking threshold is smooth and easy to use. A further dual concentric control carries the a.f. volume and the squelch control. The squelch is audio derived and has a tendency to open on short noise spikes which might not happen if the level were a.g.c. derived - but it's a small concern because listening to typical Shanwick ATC frequencies with the squelch control advanced is very pleasant.

I mentioned 'Channel' which should tell you that the HF-2050 has memory facilities, to wit 30 channels each storing frequency, mode, bandwidth, a.g.c. and b.f.o. settings - very comprehensive. Entering information into each channel is a bit fiddly, but having completed the task the resultant access is swift and sure, and if you use the 'FAST' tune setting you can whizz through the stored channels really quickly. Eagle eyes spotting that some of the numeric keys on the keypad are also designated 'SCAN',



'DWELL' and 'GROUP' will assume, as I did, that it is possible to scan the memory channels with a preset dwell time on each channel. Bad news I'm afraid. The handbook told me that these functions are not used, so memory contents are only available by keying in a memory channel number or scrolling through using the main tuning knob. Actually, unless each channel has a unique squelch setting of its own, h.f. scanning can be a real pain. (Note that the AOR AR7030 does indeed have this facility which makes h.f. scanning a real pleasure).

Before carrying on to actual results with an antenna connected, let me summarise my usual series of performance measurements so that you can place the HF-2050 in your own particular ranking. The sensitivity at first seemed inferior to other receivers I have tested, but checking the handbook specification showed that the quoted sensitivity between 500kHz and 30MHz was 0.8µV for 10dB S/N ratio, which meant that the receiver I tested was better than specification. To keep everything in the same units, 0.8µV in 50Ω is -109dBm.

Frequency (MHz)	Mode	Bandwidth (kHz)	Sensitivity (dBm)
14.2	u.s.b.	2.8	-112
14.2	l.s.b.	2.8	-112
14.2	a.m.	3.2	-108
14.2	a.m.	6.0	-104
14.2	c.w.	1.0	-115.5
14.2	c.w.	0.30	-123
6.5	a.m.	3.2	-108
0.90	a.m.	3.2	-108

All very satisfactory and as expected.

Dynamic range measured in u.s.b. at 14.058 and 14.038MHz was 97.5dB; 3rd order intercept point was +28dBm, and 2nd order intercept point measured using signals at 6.5 and 7MHz, resolving the product at 13.5MHz was +50dBm, which could have been rather better although the handbook quoted only +40dBm. The synthesiser was nice and clean with a result of -126dBc/Hz at 10kHz wanted/unwanted spacing, and this cleanliness was very evident when tuning close to a strong signal, something which I will mention again later.

Now let's get down to the performance when connected to a real antenna. I was very keen to sample the audio from this receiver because of its use of d.s.p., and I have to say I was very impressed

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# A Buyer's Market

By Jerry Glenwright

There's never been a better time to buy a computer - even the second-hand scene is awash with staggeringly cheap computers of all descriptions. To start off this 'ShackWare Special', Jerry Glenwright guides us through the computer maze.

**R**emarkably, I'm now into my fifth year writing 'ShackWare'. I penned the first in December 1995, and as each year has passed, it's become increasingly clear that computers continue to play an ever larger part in this great hobby of ours. Where once you might think about using say, a Spectrum for decoding amateur or weather station RTTY, or a BBC or Atari ST to resolve WEFAX, nowadays it's almost impossible to avoid a computer, even if you're not using one in the shack, the chances are that the station you're listening to is.

Fortunately, there's never been a better time to buy a computer (how many times have you heard that one before!), and it really is a buyer's market. The second-hand scene is awash with staggeringly cheap computers



Somewhere out there's an APT decode program to support these two Orics - all we've got to do now is find it!

of all descriptions, and not just the antique 8-bit machines that are my particular favourites either! Powerful 16-bit computers such as Atari STs, Amigas, Archimedes and the like can be had at under £20 if you shop around and old

386 and 486 PCs are available everywhere at anything from £5 to £100 depending upon spec.

We'll look a little closer at the 16-bit offerings elsewhere in the 'ShackWare Special', but for now, let's turn to that most ubiquitous of computers, the PC.

I make no apologies for covering much the same ground as I did last year, for a year is a very long time indeed in the world of the PC and what was cutting edge when the last special was published is now being pushed out at bargain-basement prices.

## What's A PC?

First though, and for the benefit of those new to computers (the more experienced should feel free to skip ahead), let's have a look at precisely what a 'PC' is and what it can do for us in the shack.

PC itself means personal computer and is the name given by IBM to its fledgling entry into the burgeoning microcomputer market in the early 1980s. Back then,

IBM simply did not (and could not) believe that these little desktop computers could ever seriously challenge the market and placed all its money on the minicomputers and mainframes, though with just enough hedging to fashion and launch a microcomputer too.

The company bought a quick and dirty operating system off the shelf from the then little-known Seattle software house, Microsoft. This was the MS-DOS operating system (known in its PC guise as PC-DOS) which Microsoft in turn had bought off the shelf from an even smaller company. Microsoft established itself by producing a version of BASIC for the Altair - the world's first ever microcomputer - and had subsequently ported the language to other platforms (read: 'produced versions for other computers' for those who don't speak computerese!).

So IBM launched its PC and the machine quickly became a favourite with corporate buyers who liked its open architecture (you could, literally, open up the machine and plug in expansion devices) and the fact that it was supported by the world's biggest manufacturer of computer systems. As the saying used to go, 'no-one ever got fired for buying IBM'. Middle-managers lapped it up!

An enormous installed corporate user base led to the machine being taken up by all the software houses, the wares of which were never complete unless a version was available for the PC (the same situation exists today and no Sony PlayStation game is without its PC cousin).

The availability of enormous quantities of quality software, both serious stuff and games, led to more and more home users buying PCs. Though initially, this was just a droplet in the PC sales ocean, prices being what they were.

In fact, it wasn't until our very own electronics bandwagon box-shifter Amstrad looked long and hard at the PC market and decided that what it was crying out for was an affordable compatible that the market really got going.

PC compatibles - computers which behave in the same way as PCs and which can use PC software - had been produced almost as soon as the computer was launched by IBM. The PC's operating system, PC-DOS, was available in its generic MS-DOS form from Microsoft to anyone with a little under a hundred quid to spare and the PC's BIOS - the nitty-gritty software buried deep within the computer and which controls it at its most basic level - had been independently reproduced by a number of clever far-eastern programmers.

The hardware, such as floppy drives and the like, was all simple industry-standard off-the-shelf kit. In keeping

# ShackWare SPECIAL ShackWare SPECIAL ShackWare SPECIAL

with the computer, they set out to emulate, however PC compatibles were costly when compared with popular home computers such as Spectrums, Orics, Commodore 64s and the like.

Amstrad saw a niche and filled it. The company's PC1512 was a 512K (at that time, the standard base RAM quotient for a PC) computer with a CGA colour screen, twin 5.25in floppy drives, three free expansion slots and even (with incredible foresight) a bundled mouse and a copy of the GEM windowing environment.

At considerably less than half the price of most of its competitors, the machine sold like hot cakes. An upgraded version, the PC1640 (with 640K RAM, the PC's maximum base RAM), with optional 20Mb hard drive continued the startling success.

True, the Amstrad computers were plastics (and 'plasticity') affairs with a build quality that made them feel a bit like toys, but at the price, there was nothing to match them. And as for build quality, I know a number which are still going strong today!

Amstrad opened the floodgates and within a couple of years, the market was swamped with cheap PC-lookalikes and the only serious choice for a truly versatile computer whether in the home or office, was the PC.

Spearheaded by the PC, microcomputers became so successful in fact, that the minicomputer market withered and died and for all but a few highly-specialised tasks, mainframes quickly followed them. The distinction between mainframes, minis and micros blurred almost completely and micros created as 'workstations' (powerful desktop computers with networking capabilities and grown-up operating systems such as Unix) have truly breathtaking performance, power only dreamed of by the mini manufacturers of a decade or so ago.

## Today's Market

And so to today. The market is so saturated with PCs that two very advantageous phenomena occur: development is exceptionally rapid in order that those who already own PCs can be persuaded to abandon them in favour of more powerful offerings, and prices are staggeringly low. Cheap prices and blistering performance equate to a shack-based PC that will serve you in any task you care to ask of it and which won't make your bank manager's eyes water when he sees what you've spent to acquire it!

And there's a third advantage: those who do upgrade their PCs sell off or trade in the old ones at crazy prices which means that you can buy a computer that even two years ago would have been absolutely at the leading edge for just a few hundred pounds, or a shack workhorse from say three or four years ago with all the power required for almost any task for just a few tens of pounds. The micro revolution has truly arrived.

So why introduce a computer into the shack? After all, all that's really needed is a receiver that will tune the bands and a pair of ears. Well, yes, but we s.w.l.s and amateurs are nothing if not a curious lot and it's that curiosity that a computer can satisfy perhaps more than any other piece of equipment.

## Data Transmissions

Foremost, a computer provides a foothold in the fascinating world of data transmissions - the strange clicks, buzzes and squawks which are all but meaningless to the human ear but which can be translated easily by even the most basic computer into pictures and text from weather stations, aircraft, the military, amateurs and more. FAX and slow scan television pictures, c.w., RTTY, ACARS and such are all within easy reach of a computer and an easy-build home-brew interface to connect it to your set.

## The Internet

And then there's the Internet - a vast global network of computer networks which offers information and the potential for contact with a quantity and in a way that was the stuff of science fiction just a few years ago. While many s.w.l.s continue to resist its lure, others regularly log on and use it like the tool it is, a simple but powerful addition to their arsenal of listening aids - I'd no more be without my 'net connection than my Global a.t.u.!

Increasingly, receivers are being made with computer interfaces, which enable control and features such as scanning and memory organisation to be automated or made easier and yet paradoxically, far more powerful. And that's the way to look at it.

Computers are tools, adaptable, versatile and sometimes incredibly powerful tools, which



Computers in the shack can be a good idea, but it'll be a few years yet before this little chap can push the buttons for you...



exponentially expand the possibilities for listening, and while they introduce their own peculiar problems (principally, noise) they are, nevertheless, extremely important in the shack. You can certainly manage perfectly well without one, but your enjoyment will be increased many-fold with one.

## Where To Buy

If you're yet to buy and you're looking for a new machine, there's really only one choice: a PC. While Apple's iMacs look glorious in their sorbet-coloured cases and are excellent machines in every respect, it's still the ubiquitous PC which is cheap, powerful, has a small planet's worth of expansion devices and a universe of software support including the shareware radio-oriented stuff which is so important to us.

Unfortunately, there's such a choice that buying a PC can be a bewildering experience for the uninitiated, especially if you go along to one of those electrical warehouses that sell everything from toasters to televisions and which used to be in the high-street but which now blight the landscape with their giant



The grandfather of all UK micros, the UK101. Available only in kit form, this one was built in the very early 1980s by my brother-in-law James Neal, then housed in that lovely home-made wooden case complete with proper keyboard and clock and baud rate switches! Nice one, Jim...





## ...continued from page 27

indeed. Listening to commercial utility s.s.b. channels such as the transatlantic ATC from Shanwick, Gander and New York produced crisp and clear audio with little or no adjacent channel rubbish, and weak amateur signals on 20m sounded equally good. This was Collins audio at its best, and whatever algorithms were being used in the d.s.p. performed superbly.

Now to the acid test which was to find out if the 'monkey chatter' which plagued the NRD-545 on medium wave a.m. was also present on the HF-2050. I tuned to my test signal which as you know is Radio Five Live on 909kHz and listened: beautiful audio. I



then tuned slowly across the signal and down the sides of the i.f. passband. Once again, no 'Urgly-gurglies' in the passband and no chatter outside. This is d.s.p. working as I hadn't heard it before. Whereas in the NRD-545 I couldn't hear anything but jungle noises for up to 15kHz off frequency, the HF-2050 left 909kHz behind and tuned gracefully to Radio Milan on 900kHz without any

sign of 'chatter'. Just to see what the band was like, I ran a scan with my spectrum analyser and you will see from the results shown in Fig. 1. that the BBC were using their Optimod processing to the limits of decency, with a solid wall to wall signal occupying - dare I say it - much more than their  $\pm 4.5\text{kHz}$  allowance!

The Radio Milan signal at 900kHz is clearly visible some 30dB down on the BBC, and also visible is the signal 9kHz higher than 909 at 918kHz. I tuned to this with the HF-2050 and found that I could not resolve it. Just to prove a point, and because I have succumbed to having an AR7030 around at all times, I went to 918kHz with the '7030 and found that the signal was easily readable, although the HF-2050 still couldn't make anything of it. No wonder AOR always get top ratings in *Passport To World Band Radio*.

Now for all you receiver fans out there, I'd like to suggest that this medium wave test is a simple but powerful way to check how good your receiver really is, because in order to resolve a weak continental station 9kHz away from a strong BBC or Local Radio transmission it has to have good

selectivity and stop band rejection, good intermodulation performance and clean local oscillator characteristics (that's the point of the reciprocal mixing measurements), which incidentally would show that a dowager AR88 would probably have a much cleaner local oscillator than some of the latest synthesised receivers. Must do a test myself some time using an AR88 or HRO. Why don't you sit down this evening and put your own receiver to the test?

Down among the dead men between 14 and 500kHz the HF-2050 performed beautifully, with Rugby on 60kHz banging in a huge signal, and other interesting noises being logged at frequencies that most Hi-Fi enthusiasts claim they can hear from a loudspeaker without needing a receiver. Those I.f. listeners will just love this receiver, in fact so would most listening enthusiasts whatever their interests, despite my slight irritation over the clumsiness of some of the operations.

## Overall Conclusions

The HF-2050 is a desirable receiver which lands professional performance on the listener's table. I haven't mentioned the superb stability (10Hz per MHz over the temperature range 0° to 50°C) nor the front-end protection system which will handle +47dBm (that's over 40W of r.f.), but this gives you some further idea of the engineering quality. The r.f. and audio performance were outstanding, and the d.s.p. worked so well that I am (almost) converted from my disappointment at other receivers in this area. For my own listening which is largely on known frequencies, the HF-2050 would be ideal, but for a user who wants to 'tune around' I would say look elsewhere. Having had the chance to review one or two of these ex-professional receivers, if anyone were to ask me to choose my favourite I would have to say without hesitation that the RA1792 knocks spots off everything else I have tried, but who knows; I have another goody on the bench right now so things may change. See next month. In the meantime if anyone offers you an HF-2050, take it.

## And So To Other Things

I was given an elderly Murphy broadcast receiver by my local recycling centre (a New Labour name for the rubbish tip) and since this is one of the nicer radios of the fifties period, being built on a large standing baffle for the speaker (you have all seen them), I decided to have a go at restoration. I always try to have a circuit diagram to hand on these ventures but didn't have one for this particular model so trawled the Internet and discovered a very useful and informative site at [www.radio.mcmail.com](http://www.radio.mcmail.com). The site is run as the "Vintage Radio Emporium" as a totally hobby pastime, but there was a query service so I asked for a copy of the Murphy circuit. Within an hour I had a reply and for a very small payment I received the diagram by post within a couple of days. Nice chap to deal with, and strongly recommended. Thank you David, and thanks to those who have written asking me to continue with the classic reviews in *Short Wave Magazine*. My access to these wonderful receivers is all due to the Editor who manages to persuade the owners to lay my hands on them on your behalf. For me it's nothing but enjoyment, and I do appreciate the generosity of those who supply the review equipment.

Happy Listening.

**SWM**

Short Wave Magazine, March 2000



most likely to find is the STe in 512K and 1040K formats. These feature a built-in power supply, floppy drive, and half or one meg of RAM respectively. Build quality was good throughout the production run so there's no particular reason to choose one machine over another, though examine a prospective purchase carefully. Main problem is the built-in power supply which used to cost an arm and a leg to replace, but which can now simply be swapped out for another boot/jumble sale purchase!

The Amiga is arguably a better-specified computer with its powerful custom graphics and sound chips, but suffers from a dearth of decent radio-oriented software (unless you know different!). There is stuff available but you'll have to look long and hard to find it. Similarly, the Archimedes can be used productively in the shack but with nothing like the ease of the ST.

### Cheap & Cheerful

On the 8-bit front, choose either a Spectrum or a BBC B. Both are remarkably cheap - Spectrums especially so - and both enjoyed some of the best radio-oriented software available bar none. Technical Software's products such as RX4 and RX8 are among the best radio software yet written, given the inherent limitations of the hardware platforms they were aimed at. All of Technical Software's products will give you an excellent insight into data decoding and enable you to learn the ropes before shelling out on an all-singing PC and a copy of *JVComm*.

Spectrums went through several distinct development phases and the machines look very different from each other. Early Spectrums are about the size of a half-pound box of chocolates though only an inch or so thick. They have a distinctive rainbow flash screen-printed across one corner and rubber calculator-like keys - the infamous 'dead flesh' keyboard. Sinclair facelifted the Spectrum two or three years into its production run with a snazzy QL-like black plastics box with a 'real' keyboard (in fact, there was a rubber membrane beneath the keys). These are the 'Plus' machines.

Despite the appellation 'genius', Sinclair went spectacularly bust in the later half of the 1980s and was bought lock, stock and barrel (including all rights to the name Sinclair) by Alan Sugar and Amstrad. The Spectrum was then facelifted again and ended up looking rather like Amstrad's own CPC range.

Of these Spectrums, the best is undoubtedly the Plus 2. A 'real' keyboard, 128K RAM and a built in cassette drive for reliable loading (often a problem with Spectrums) puts it well ahead of other Spectrum variants, and you don't pay a premium for the poorly-supported disk drive - Spectrums are the classic cassette-only computers.

You'll pay anything from a couple of quid upwards for a Spectrum. Some will be offered with carrier bags of games software, joysticks and with an accompanying hike in price. Ignore these - unless you like playing games.

Boot sales are the best hunting grounds and provide the best bargains. Look under the pasting tables for the inevitable sorry-looking cardboard box full of cassette software and a spectrum nestling within.

Local free ad newspapers feature adverts for Spectrums at insane prices: £20 or £30 or even more. The owners imagine that including the description 'perfect introduction for children' will cause computer-illiterate parents to buy a 'cheap' machine for their kids. Ignore.

### Broadcast Special

From the slightly ridiculous but cheap and usable to the sublime: the BBC microcomputer. Commissioned by the BBC, Acorn produced possibly the best microcomputer ever - albeit one with a chronically small RAM quotient. The BBC wanted a micro to badge and offer to the public in support of its computer-literacy programs in the early 1980s and Acorn won the contract to build it.

From the start, the BBC micro was bought in droves by

educational establishments and became the *de facto* school standard (a position only very recently usurped by PCs and compatibles).

The BBC has a fantastic array of proper I/O ports, excellent high resolution graphics capabilities, a disk-based operating system (always spelt 'disc' in Beeb computing circles), superlative built-in BASIC with in-line assembler and some truly excellent serious third-party software. It also had a price tag that put it well out of reach of most of us who lusted after one at the time.

Now however, schools are abandoning their old kit in favour of the world's favourite PC, the PC (if you see what I mean), which means that Beebs can be had for a few quid at boot fairs and electronics surplus supply stores around the UK. My own nearest, GW Radio in Worthing, often has Beeb bits and bobs very cheaply, including machines. I bought a Cumana twin 5.25in drive mech complete with power supply for just £3 from GW just before Christmas, and no doubt you can find similar bargains at second-hand shops near you.

And buy a Beeb, and you can tap into Technical Software's fantastic range of data decode programs...

### Also Rans

Buy any of the following machines and, though you'll carry home a very nice plaything that you can safely experiment with and for which you may even track down some useful software (via the helpful readers of the 'ShackWare' column!), you probably won't get much real use from such a computer.

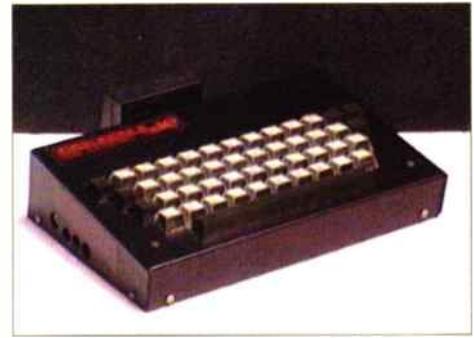
The Amstrad CPCs (CPC464 and CPC664) are probably the best of the also rans. The disk-based model is the one to seek out and gives you access to a wealth of quality CP/M software (of which you can buy vast PD libraries on CD-ROM very cheaply). The CPC664 has 128K RAM, reasonable BASIC and comes with either a green-screen or colour monitor.

Incidentally, Amstrad should, perhaps, have a whole feature all to itself, such was the company's prodigious computer output during the 1980s. Beginning with the Z80-based CPCs in the mid-1980s, Amstrad's policy was always one of creating computers that were a complete system - keyboard, screen, built-in cassette or disk drive and so on. Amstrad was responsible for the CP/M-based PCW range which was going strong until very recently (*SWM* published an excellent two-part feature showing how to control an HF-225 receiver with a PCW).

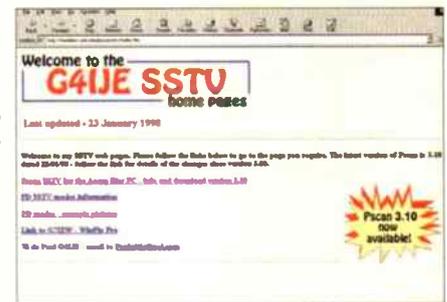
Amstrad produced the first affordable PC compatibles, the first affordable PC laptop (the PPC) which had a built-in 2400 baud modem the fastest available then, and many others. Some were turkeys, some were excellent. All are cheap.

### And Finally

Finally, from time to time you'll come across computers such as the Dragon (unusual 6809 processor), ZX81 (a really very good Sinclair machine), Commodore PET, 64, Plus 4 and Vic 20 (good machines but let down by horrible BASIC and snail-like disk drives), Orics (ignore), Acorn Electron (pitched as affordable-but-cut-down BBC Bs - ignore), Computers Lynx (utterly forgotten), Jupiter Ace (offered Forth instead of BASIC and failed miserably), Sord M5 (forgettable and forgotten) et al. They're interesting, fun toys and hugely useful...when you've got a table with a wobbly leg or a door that won't stay open!



**You'd be surprised at just what can be done with the remarkable ZX81. Here, it's pictured with an add-on third-party keyboard and metal case (inhibits computer hash).**



**Another downloadable shareware decoder, this time in support of the Acorn RISC computers.**







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# ShackWare – The Column

■ JERRY GLENWRIGHT, 23 DOWNLAND AVENUE, SOUTHWICK, WEST SUSSEX BN42 4RF ■ E-MAIL: shackware@pwpublishing.ltd.uk

**R**egular readers will know that I've long recommended Dave Miller's excellent FAX and RTTY decoder *FaxCode* to those who use Atari ST computers. However, given my one page bi-monthly, I've been unable to get my teeth into this program and actually review it for you. Well, this time around it's the 'ShackWare Special', so I've decided to devote the whole of 'ShackWare', the column, to a closer look at Dave's superlative program. Don't worry though, your letters and tips will return as normal in the next instalment.

## Alternative PC

PCs and PC shareware dominate the s.w.l.'s data decoding arsenal, and probably rightly so. PCs are cheap, there's a large installed user base and plenty of authors supporting the machine with some of the best radio-oriented software it's possible to acquire. Older software such as *JVFAX* and *Hamcomm* both offer quality decoding from within easy-to-use shareware programs and, perhaps even better, both use the same simple interface to connect your radio to your computer.

This interface is variously known as the 'Hamcomm' or 'comparator' interface. It uses simple components such as four signal diodes and an op-amp which many s.w.l.s can probably find in their junk boxes, and can be constructed in an hour or so on the kitchen table.

More recent programs such as *WxSat* and *JVComm* make use of the PC's sound card (almost all PCs have what's known as a SoundBlaster-compatible plug-in expansion card that enables the PC to produce high-quality sounds) to handle the interfacing and some of the decoding, taking the strain off the software and allowing for even more sophisticated decoding.

So all's well in the world of the data modes...if you have a PC. Unfortunately, not everyone does and not everyone wants one either! Some have only a passing interest in computing - it's simply an adjunct to their listening activities - others have computers such as Apple Macs which they use for work, and still others have 16-bit machines left over from the home computer heydays of the 1980s which they'd like to put to good use.

As I continually discover via correspondents to 'ShackWare', there is at least one good decode program for almost every computer, but about the best of the bunch for FAX and RTTY decode is Dave Miller's excellent, *FaxCode ST*. Written by Dave around 1997, *FaxCode* does for the Atari ST what *JVFAX* does for the PC: provides a competent entry into the world of decoding FAX and teletype transmissions via a simple interface.

In fact, that interface is virtually the same as the comparator interface used with PCs and it can be built for a pound or two very easily.

For this review, I used my PC comparator interface. The only modification is to connect pin 6 (the CTS line) to pin 5 (the ST's DSR line). Actually, there's one other slight modification: the ST has a 25-pin male D-connector as a serial port. Almost everything else uses a 25-pin female D-connector. The solution is to use one of the widely available gender-changers. I simply soldered a 25-pin socket in parallel with the 25-pin plug on my home-brew comparator interface.

## Up & Running

*FaxCode ST* is shipped on just one 720K floppy disk. The shareware program comes with a circuit diagram and details of how to register. To begin using *FaxCode*, attach the interface to the ST's serial port and a line-out or earphone outlet from your receiver to the interface. Insert the disk and double-click *FaxCode*. You'll see a 'nag' screen (which is removed in the registered version) and then a dialogue prompting you to choose between FAX and RTTY decoding. Click one of these and you're transported to the program proper.

*FaxCode*'s FAX screen features a simple menu of options across the top line while reserving the rest of the screen for received pictures. There's also a pop-up help screen offering a reminder of all the key commands available.

I connected the interface, double-clicked the software, selected FAX when prompted and tuned the receiver to Bracknell on 4.608MHz. A FAX transmission was in progress and immediately, a decoded FAX began to scroll down the screen.

The picture was incredibly noisy, but that's because I was using my pocket Sony SW100 sited close to the ST rather than the Lowe HF-225 I'd usually use to test software. I couldn't find a cable which would reach from the receiver at one side of my shack (where the antenna feeds come in through the window) to the ST at the other!

*FaxCode* however, performed faultlessly. Even with a noisy signal it was able to auto-detect start and stop tones and synch the incoming FAX almost every time. The uppermost screen line sports a real-time mini 'scope' which helps significantly with tuning.

Dave has elected to use a windowing system to get around the problem of the ST's displayed screen width being smaller than a typical FAX. The left and right arrow keys switch between left and right virtual screens respectively, so you can switch to and fro at the touch of a key. In practice, this is a neat solution which is quick and allows the received FAX to be viewed at a reasonable size on screen.

There's a manual 'FAX' mode as well as an APT mode which enables you to set the program decoding at any point without having to wait for a start tone and synchronizing signal. You can then use a dedicated function key to align the picture.

And when you've received a FAX, you can print directly from within *FaxCode* or save it to disk in one of two popular formats for later viewing, printing or manipulation. I didn't try printing so I can't vouch for how well this option performs, but I did save several FAXes to disk and port them between the ST and my PC without a hitch. For those with an ST but no printer, this option would enable you to take disks of FAXes to work and print them from a friendly PC!

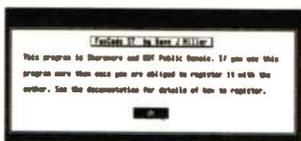
*FaxCode* will work with a basic 512K ST, but is happiest with a machine with 1Mb or more. I've upgraded my ST's RAM to a meg and the program reported 12 'pages' of free RAM - which seemed to be more than enough to receive several FAXes with room to spare (I left the program running in manual mode).

The usual FAX options such as drum speeds from 60rpm to 240rpm, IOCs of 288 and 576 are all available at the touch of a key.

## Typing Test

Next, I quit the FAX decoder and selected RTTY. Once again, *FaxCode* provides a selection of options on the uppermost screen line (including another useful scope tuning aid) and devotes the rest of the screen to displaying decoded text.

Though RTTY is transmitted using a variety of 'shifts' between its two tones, *FaxCode* detects the shift automatically



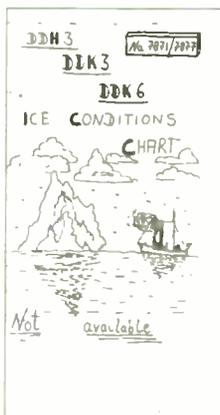
**A registration fee of just six quid will banish this 'nag' screen forever!**



**The program presents you with a choice of viewing...**



**Though FaxCode dispenses with GEM for reasons of speed, on-line help is available at the touch of a key.**



**FaxCode's abilities are very good indeed, and a perfect introduction to the business of decoding.**

like its counterparts on the PC - able to the task in hand.

### Conclusion

I recommend *FaxCode* unreservedly. The program does everything you'd want from a good FAX and RTTY decoder and yet it's very cheap. It's easy to use too, and makes use of the well-known comparator interface (slightly modified) which you can make or buy from one of the advertisers in

so with a new station, there's no messing around trying to determine the shift being used - a useful feature for novices.

I used *FaxCode*'s tuning aid to tune my SW100 to Deutscher Wetterdienst's RTTY service on 4.583MHz and sat back to watch the familiar data scrolling up the screen.

From within the RTTY decoder you can dump the incoming data to a printer or direct to disk, though with no suitable printer to hand, I didn't try the option. Standard features include speeds from 45.5 to 100, as well as normal and reverse reception and the useful unshift on space.

In use, *FaxCode* felt very stable. Dave Miller has done a good job with the program and the result is software which feels -

*SWM* and adapt yourself.

Given that you can probably find an ST at under £10 and that the machine will be very useful in other ways around the shack, there's plenty of good database, word processor and other serious software for the ST as well as masses of games. An ST and a copy of *FaxCode* gives you a (less than) £20 entry into the world of data decoding and at that price, everyone can have a go.

### Where To Get It

*FaxCode* ST is available from a variety of sources. Those with an Internet account can download the program from the public ST software archive at [ftp.funet.fi/pub/ham/fax\\_sstv](http://ftp.funet.fi/pub/ham/fax_sstv). The FaST club also offers the program as part of its shareware and PD library collection.

Alternatively (and as always) you can get the unregistered program from me by sending a suitably formatted disk and an s.a.e. There's no charge other than the shareware fee of £6 (£7 outside the EC) you'll pay to Dave. After registering, you'll receive future updates and a version without a 'nag' screen.

Projected improvements include support for SITOR A/B, a full-screen spectrum display and an option to set the ST's clock from a standard time station. No doubt all these things will appear if enough six quid cheques and POs roll in.

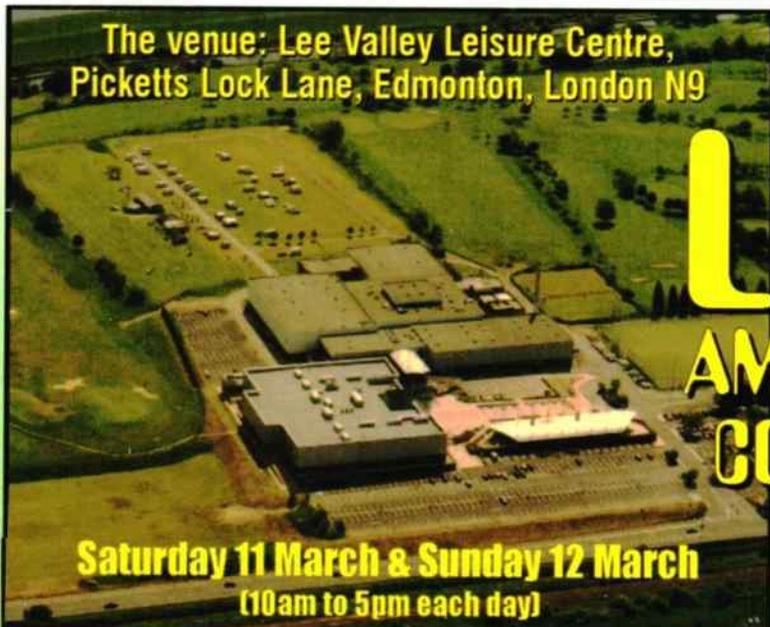
**Footnote:** Dave, if you're out there and reading this, get in touch. Your ZetNet E-mail address has expired.



**Another of the sample pictures shipped with FaxCode, so that you can see just what the program is capable of.**



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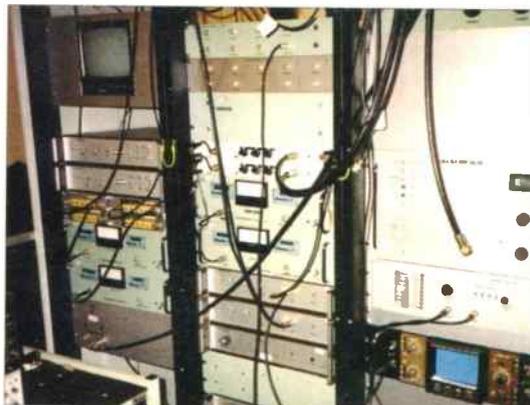
freemart

Last month we delved into the history of Jodrell Bank.

This month Dr. Alastair G. Gunn guides us through state-of-the-art technology.

# The Technology

**R**adio astronomy is a specialised subject. Like much of modern science, it relies crucially on state-of-the-art technology; it is just as much about instrumentation as about pure science. It is a field of research in which the demands of scientists drive the advances in technology and the progress in technology opens up new and exciting methods in science. But however high-tech the radio astronomer's equipment, the aims are the same: to deduce, from the radiation received from the sky, something about the universe around us.



**A rack containing intermediate amplifiers and filtering for the Mk2 radio telescope as well as frequency distribution to Jodrell Bank's remote telescopes from the Atomic Standard Frequency.**

waves from a low frequency limit of roughly 15MHz to a high frequency cutoff of about 600GHz, although higher frequencies suffer from absorption by water, oxygen and carbon dioxide molecules. The low frequency limit varies with the degree of solar activity.

This range of usable frequencies, which includes the h.f., v.h.f. and u.h.f. bands, is appropriately called the 'radio window'.

Radio astronomers observe the sky at many different frequencies, but most commonly at L-band (about 20cm wavelength), S-band (10cm), C-band (6cm), X-band (3cm), Ku-band (2cm) and K-band (1cm).

## Interference Level

Nowadays it is becoming more and more common for the astronomer's observing frequency to be dictated, not by the object being studied, but by the level of interference from terrestrial signals. Large amounts of radiation are emitted by mobile 'phones, satellite communications and navigation, TV and radio broadcasting, radar systems and even microwave ovens, remotely controlled car locks and automatic garage doors, and these are ever increasing.

By comparison, the radio signals from space are extremely weak. So weak, in fact, that the total amount of energy from astronomical sources received by Jodrell Bank's 76m Lovell telescope, since it was built in the 1950s, would be barely enough light a torch bulb for a millisecond. The cosmic signals of interest are about one billion times than the strongest form of man-made interference

Radio astronomers have learnt to coexist in this



**A signal bandwidth selector unit for the Very Long Baseline Interferometry (VLBI) system at Jodrell Bank.**

For thousands of years mankind's observations of the universe were restricted to visible light. Only in the last two hundred years have we been analysing other forms of electromagnetic radiation from the heavens.

In 1931 Karl Jansky, using a directional

antenna, found radio waves of 14.6m wavelength coming from the sky. At the time, Jansky's work got little attention from astronomers and many regarded radio techniques with some suspicion.

But during the mid-1930s, Grote Reber, a radio engineer and amateur astronomer, inspired by Jansky's discovery, spent six years mapping the intensity of cosmic radio waves at 160 and 480MHz. He found that the most intense signals were coming from the centre of our own galaxy, the Milky Way, but that other bright spots did not correspond to any known astronomical object.

## Radio Window

Eventually astronomer's interest did turn towards radio signals. It was found that many kinds of astronomical objects emit radio waves, and by several different mechanisms. Today, radio astronomy involves advanced equipment, has developed some of science's most ingenious methods and achieves the clearest view of the universe around us.

The Earth's atmosphere is transparent to radio



**A receiver cryostat under construction. This is one of fourteen 33GHz receivers which will form part of the Very Small Array (VSA) on Tenerife to study the radiation originating in the Big Bang.**

Short Wave Magazine, March 2000

# History of Jodrell Bank

jungle of radio emission. Some of the more important observing bands are protected by national or international regulations, but often radio astronomy receivers must be designed specifically to withstand the worst effects of some of these powerful unwanted signals, some of which are at frequencies very close to the protected bands.

## Several Components

A system designed for use in radio astronomy consists of several components: a radio telescope, a receiver system and a system to record or analyse the signals. These separate components are often designed for specific research tasks or for specific observing frequencies.

Each observing system requires a radio telescope. Such a telescope operates on the same principle as the optical telescope. The instrument consists of a paraboloidal reflecting surface which gathers incoming radiation and focuses it to a single point.

A large, well-designed dish is essential in radio astronomy. Large collecting areas are required to gather as much as possible of the weak radiation which reaches the Earth. The accuracy of the surface is also crucial. If the surface of the dish is warped on a scale similar to the wavelength of the received signals, then the waves lose coherence before they arrive at the receiver. That is, the waves become jumbled up and the signal loses its wavelike character.

Radio astronomy dishes are therefore designed with great rigidity so that they retain their shape in whichever direction they are pointed. The surface accuracy of the dish thus determines the highest frequency at which it can operate.

## Unwanted Signals

A crucial aspect of radio telescope design is the response to unwanted signals. The dish should receive radio waves from a very narrow range of directions surrounding the axis of the dish. It therefore picks up signals mainly from the object at which it is pointed, and not from its surroundings. This low response to outside signals also helps, to some extent, in the battle against man-made interference.

Radio waves reaching the focus of a radio telescope are often directed efficiently to the receiver using a narrowing metal tube called a feed horn. Just as in any other kind of radio receiver, the radio waves are then transformed into electrical signals on a transmission line.

The receiver amplifies the input signal and contains filters that define the pass-band; the range of frequencies which are allowed through the system. In a radio astronomy receiver the signals are picked up by a small gold-plated copper probe placed at the end of the feed horn. In some

u.h.f. receivers a dipole arrangement is sometimes used.

## Important Feature

An important feature of most radio astronomy receivers is their ability to distinguish the polarisation components of the received signals. This is often a key requirement of the astronomer because the polarisation of the incoming radiation holds important clues to the physical characteristics of the radio source.

Radio astronomers are constantly striving for better receiver sensitivity. However, it is not sufficient just to make the receiver super-sensitive, because of the presence of strong interference signals. It is a big challenge to design receivers which can observe the weak radio astronomy sources in the presence of these large man-made signals. The toleration of interference is the main difference between radio astronomy receivers and most commercial systems.

## Receiver Sensitivity

Receiver sensitivity is largely determined by the low noise amplifier (LNA), which substantially amplifies the weak astronomy signals, whilst introducing the minimum possible electrical noise from its own circuits. State-of-the-art transistors are used, the current favourite being the indium phosphide high electron mobility transistors (InP HEMT), some of which have been designed and manufactured specifically for radio astronomy applications.

Great care in the design and manufacturing process is needed to exploit the potential of these devices. The LNA design is optimised for the particular observing waveband so that radio astronomers have a suite of receivers that can be fitted to telescopes depending on their current requirements. To make switching frequencies easier, this suite of receivers is often mounted on an automatic carousel which rotates a chosen receiver system into the focal volume of the telescope.

As well as being very sensitive, radio astronomy receivers have to be linear in their response to signals so as not to distort them. Poor linearity results in the generation of intermodulation products between man-made signals which destroys the ability to detect the weak astronomical signal. The best possible linearity is achieved by carefully distributing gain throughout the receiver system, by using high quality band-pass filters to limit the bandwidth to the



**Testing of a 5GHz receiver used in the MERLIN array of telescopes. The cryostat is cooled with a helium gas refrigeration system to about 15° above absolute zero.**

**A cryostat system under construction. The helium gas is expanded into the displacer unit at the bottom to provide efficient cooling of the amplifiers. The thin wires carrying power to the amplifiers are coiled within the cryostat to remove the heat due to conduction.**



*Continued on page 45...*

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Gain 5dB +/-0.2dBs  
Intercept Point +45dBm IP 3rd order (10MHz/12V)  
DC power supply 11.5-13 volt DC at 70mA typ. (230V mains adaptor for 12V DC is supplied with the antenna)  
Mast diameter 30-50mm can be fitted  
Dimensions ARA40 115cm total length with glassfibre whip. Antenna tube 40mm x 140mm  
ARA40 TEL 125cm total length with telescopic whip extended. 45cm minimum length. Antenna tube 40mm x 140mm  
Ideal for portable radio

£139

### ARA 60

#### Technical performance

Frequency range 40kHz-60MHz (full performance) 60-120MHz  
2-3dB less gain  
Output impedance 50-75 ohm coaxial  
Connector to Rx PL type delivered as standard. Other standards can be fitted on request  
Gain 10dB +/-0.2dBs  
Intercept Point +50dBm IP 3rd order (10MHz/12V)  
DC power supply 11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)  
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### ARA 2000

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Frequency range 50-2000MHz  
Output impedance 50-75 ohms coaxial  
Gain 19dB -1000MHz  
18dB -1400MHz  
16dB -2000MHz  
Noise figure 1.5-2dB -1000MHz  
1.8-2.5dB -1500MHz  
2.5-4dB -2000MHz  
3rd order IP +35dB typical  
Output impedance 50-75 ohms coaxial  
Connector standards N type connector at the antenna. BNC male connector to the receiver  
Power supply 12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna  
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Diameter 90mm  
Weight 2kg  
Accessories Mains wall plug adaptor (230V A/12V DC). Interface unit (remote supply unit) 1.2m coaxial cable and mast mounting clamps

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# The Technology of Jodrell Bank

Continued from page 41...

absolute minimum necessary for the observations, and by use of highly linear electronic components at key points in the receiver.

## Low Temperature

In order to get the very best sensitivity from receivers, radio astronomers often cool them to about  $-260^{\circ}\text{C}$  (15K) using closed-cycle helium refrigerators. This very low temperature minimises the natural motion of electrons in the receiver which introduces a background noise level into the circuits. A secondary benefit is that cooling the metal components increases their conductivity and thereby increases the receiver sensitivity.

At Jodrell Bank, the radio receivers provide signals to various types of observing systems dictated by the scientific goals of the observations. Usually some additional filtering and amplification are performed.

The very high frequencies used in radio astronomy are difficult to manipulate in an analogue system, so often an accurate reference frequency is mixed with the detected signal. This has the effect of reducing the frequency of the radio waves by a known amount and so enables more convenient digitisation and analysis. Such analysis may involve looking at the time variation of the signal, the spectral or polarisation characteristics of the radio emissions or production of a radio image of the object of interest.

An important quest of the astronomer is to achieve greater and greater resolution in their view of the universe. Resolution is a measure of the amount of detail that can be seen; increasing resolution is like zooming in on smaller and smaller features in the sky.

For a radio telescope, the resolution depends on two things: the diameter of the dish and the frequency of the signals it is receiving. The bigger the telescope and the higher the frequency the better the resolution.

## Better Resolution

Optical telescopes are generally smaller than radio telescopes but achieve much better resolution because light is at a much higher frequency than radio waves. To achieve a similar resolution, a radio telescope would have to be many hundreds of miles wide. However, not to be outdone, radio astronomers have devised sophisticated methods of improving and even surpassing the highest resolutions obtained using optical methods.

Imagine the surface of a radio telescope split up into separate imaginary segments. Each segment reflects radio waves to the focus where they become superimposed. In effect, the signal received is the combined signal from each of these segments.

If we have only two segments we could simulate the effect of a larger dish by moving one segment to different positions around the other and adding together all the combinations of signals. This is the basis of the technique known as interferometry.

Short Wave Magazine, March 2000

## Separate Dishes

Instead of using separate segments of the same dish, an interferometer uses separate dishes. By moving these dishes around and adding together all the signals astronomers can synthesise the signal that would be achieved with a single very large dish. Instead of moving each dish, the rotation of the Earth can be used to change their orientation with respect to the astronomical object.

The signals from each dish are multiplied and accumulated in a process called *correlation*. If we sampled the signal with dishes in every possible position we would produce the image that would be obtained with a completely filled-in dish. The result, however, is never that good because there are always gaps in the synthesised dish.

However, the resolution, like other telescopes, is dependent on the size of the synthesised dish. This size is equal to the largest separation, or baseline, of all the individual dishes.

## Microwave Links

In the UK the MERLIN instrument, operated by the University of Manchester at Jodrell Bank, consists of six telescopes dotted around the country giving a maximum baseline of 217km. MERLIN signals are transmitted via microwave links to a special computer at Jodrell Bank which correlates the signals.

In this kind of telescope, astronomers have to ensure that the signals from each telescope remain coherent. This means combining the signals arriving at precisely the same time at each telescope. In order to do this we need to know exactly how long the cables or transmission links are.

This is easy to measure with short baselines but for baselines more than a few hundred kilometers it becomes extremely difficult. In this case, instead of correlating the individual signals as they arrive at the telescope, astronomers record them on magnetic tape along with the precise time.

If the clocks at each antenna agree exactly, then we can combine the signals at a later date by lining up all the times of arrival. Most observatories use atomic clocks such as a hydrogen maser clock which gives the time to within several millionths of a second. This technique is known as Very Long Baseline Interferometry (VLBI).

The VLBI technique achieves the most detailed view of the sky available to astronomers. The best resolution yet obtained with VLBI is equivalent to being able to see a football at the distance of the Moon. This resolution is 100 times better than the Hubble Space Telescope at optical wavelengths.

## Advanced Technology

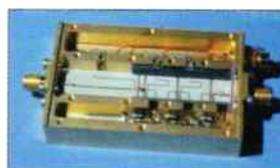
The VLBI method is just one of the many intricate techniques used to study the universe by astronomers. Today's radio astronomers have a vast array of advanced technology to aid them in their quest to understand the workings of the universe. The sophisticated design of radio receivers, the sheer ingenuity of technicians and the rapid advances in computing and engineering have all played a part in making radio astronomy an extremely vibrant and productive science.

At Jodrell Bank, developments are taking place all the time; new receivers technologies are being created and sensitivity and resolution are constantly being improved. With the dawn of the new millennium radio astronomy is set to remain an exciting and innovative field.

SWM



**A correlator board from the MERLIN data acquisition system. The special purpose processors at the upper right are used to measure the correlation between signals from a single pair of telescopes in the array. A total of 21 such boards are needed for the array of seven telescopes.**



**Close up of a low noise amplifier unit whose detailed design allows superior sensitivity in radio astronomy receivers.**

You can visit the Jodrell Bank site which is located off the A535 (take J18 M6). Opening times are: 1100 - 1630, Tuesday to Sunday until 18 March. Then opening times are daily, 1030 - 1730. Admission charges currently are: Adult £4.60, Child £2.30 and concession £3.30. Children under 5 years enter free, but are not allowed access to the planetarium. A family ticket at £13.50 allows two adults and three children free access. You can contact the visitor centre by Tel: (01477) 571339.

The Jodrell Bank Web site is [www.jb.man.ac.uk](http://www.jb.man.ac.uk)

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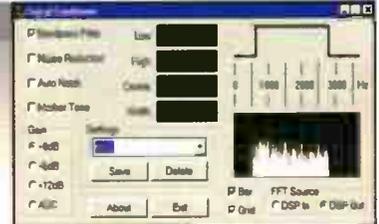
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### Model Name/Number

#### Construction of internals

#### Construction of externals

#### Frequency range

#### Modes

#### Tuning step size

#### IF bandwidths

#### Receiver type

#### Scanning speed

#### Audio output on card

#### Max on one motherboard

#### Dynamic range

#### IF shift (passband tuning)

#### DSP in hardware

#### IRQ required

#### Spectrum Scope

#### Visitune

#### Published software API

#### Internal ISA cards

#### External units

### WR 1000

### WR-1500

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100 Hz (5 Hz BFO)

6 kHz (AM/SSB),

17 kHz (FM-N), 230 kHz (W)

PLL-based triple-conv. superhet

10 ch/sec (AM), 50 ch/sec (FM)

200mW

8 cards

65 dB

no

no - use optional DS software

no

yes

yes

yes

£299 inc vat

£359 inc vat

0.15-1500 MHz

AM,LSB,USB,CW,FM-N,FM-W

100 Hz (1 Hz for SSB and CW)

2.5 kHz(SSB/CW), 9 kHz (AM)

17 kHz (FM-N), 230 kHz (W)

200mW

8 cards

65 dB

±2 kHz

use optional DS software

no

yes

yes

yes

£369 inc vat

£429 inc vat

0.15-1500 MHz

AM,LSB,USB,CW,FM-N,FM-W

100 Hz (1 Hz for SSB and CW)

2.5 kHz(SSB/CW), 9 kHz (AM)

17 kHz (FM-N), 230 kHz (W)

200mW

3-8 cards (pse ask)

85dB

±2 kHz

YES (ISA card ONLY)

yes (for ISA card)

yes

yes

yes (also DSP)

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# SSB Utilities

Welcome to a new year, a new decade, a new century and a new millennium. I hope that everybody had a good Christmas and New Year period, and that you have now recovered.

I am happy to report that everything in my shack passed the Y2K period with flying colours, and even though I was on-call during the millennium weekend, everything went smoothly, and I was able to spend many hours listening to the radio while other parts of the globe reported on their Y2K problems and plans.

I did a lot of listening over this period, but I did not hear too much worthy of being described as special. There were plenty of stations mentioning Y2K tests and plenty of radio and TV stations with special millennium programmes.

## Testing, Testing

Over in the USA, the MARS (Military Affiliated Radio System) operators were running tests in the days leading up to 31st December, and I can report that I heard some of these on 26th December. Station AAT4RO/T in North Carolina was operating on 13.993MHz as the Net Control Station for the MARS Y2K Exercise, and spent much of the time calling and communicating with other MARS stations in the eastern states of the USA.

On Saturday 1st January the RAF flew at least one of each type of aircraft that they operate, and I know that a number of scanner listeners were quite surprised to hear fast jets operating up and down the country. However, the test flights also included larger aircraft as well, as I personally heard some of the VIP fleet, and also Hercules transport aircraft.

The whole idea of the test flights were to show that the aircraft had not been adversely affected by the Y2K bug, and that they were still able to operate. Did anyone hear any of these flights working Architect on 1st January?

By now, most people will realise just how much of a damp squib the whole Y2K panic really was, however, I still remain skeptical. Working in the IT industry has taught me that nothing is ever completely fixed.

## CCF

In the December issue I reported that the Combined Cadet Force (CCF) would be holding their annual Winter Wine communications contest at the start of December 1999. This was held, as planned, over the weekend of 4th/5th December, with many stations up and down the country passing messages to each other, and taking turns to be the Net Control Station.

In the same issue, I also reported that the results of the contest would be announced at 1200 on Christmas Day on 5.328MHz. At the appointed time, there were several calls by a single CCF station, and even a brief contact with an ATC station, however there was some interference from strong signals on a nearby frequency.

I sat and listened, waiting for the results to be announced, and after a while I decided to check the other CCF frequencies, only to find that they were just finishing the results rundown on 5.343MHz! So, I missed all the results this year.

It seems that due to the interference and lack of contact on their primary frequency, they changed to another nearby frequency. If anyone was listening to the frequency which I mentioned, I hope that you eventually decided to search for them and found them on the other frequency.

## Easter Bonnett

One snippet of news which I did manage to find out about is that they will be holding another similar contest during early March 2000 - to be known as Easter Bonnett. Although I do not have confirmed dates for this, I would expect it to be either 4th/5th March (most likely) or 11th/12th March.

There is a list of CCF frequencies in this column in the December 1999 issue, however following some research on the Internet, I can now present an updated list. The CCF have 12 h.f. frequencies allocated to them, as follows: 2.273, 2.413, 2.768, 3.850, 4.363, 4.443, 4.918, 4.921, 4.953, 5.328, 5.343, 6.913 and 7.708MHz.

These frequencies are never mentioned on air. The CCF operators always refer to other frequencies using code-letters, and these are changed on a regular basis.

From various web pages on the Internet, it seems that these are not all used for voice communications, as they have a network of computer terminals and packet modems. One of the frequencies is supposed to have a Packet mailbox - has anyone heard anything? The stations are most active during the day, but there is sometimes some activity during the evenings and Saturday afternoons.

## AirNav

Back in January 1999 *SWM* carried a review of the *AirNav* aircraft tracking program. I am happy to say that development of the program has continued over the past 12 months, and I am in the midst of using the program while I write a review of the new program.

For those of you who are not familiar with the *AirNav* program, this is a program which runs on a PC and allows you to visually track the flight of aircraft as you enter their position reports. When you hear the aircraft reporting their position to the ATC centres, you can transcribe the report into the program, and it will draw a small aeroplane symbol on a map, and even draw a line to indicate the route of the flight. As more and more aircraft details are entered into the program, you can see their relative positions, and also all their positions to your own location.

However, the main reason for mentioning this program is the recent release of an add-on program which will decode SELCAL codes via the sound-card in your PC. By feeding the audio from your h.f. receiver into the sound-card, the add-on program will interpret the SELCAL tones and search for the code in the *AirNav* database.

If the SELCAL code is in the database, it will display the details of the aircraft registration, aircraft type and operator - which all help in confirming the flight details. I am still experimenting with the new program, so I cannot really comment upon its use at the moment, however it works very well with strong clear signals.

I have yet to test it with weak signals, or those suffering from interference. I will try to give more information over the next few months as I complete my review of the latest *AirNav* program.



A couple of screen grabs from the AirNav web site, see web address below.



Combined Cadet Force - <http://www.geocities.com/CapeCanaveral/hall/8701/ham>  
*AirNav* SELCAL decoder - <http://www.airnavsystems.com>

Web  
Watch

# Propagation Forecasts

## How to use the Propagation Charts

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

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

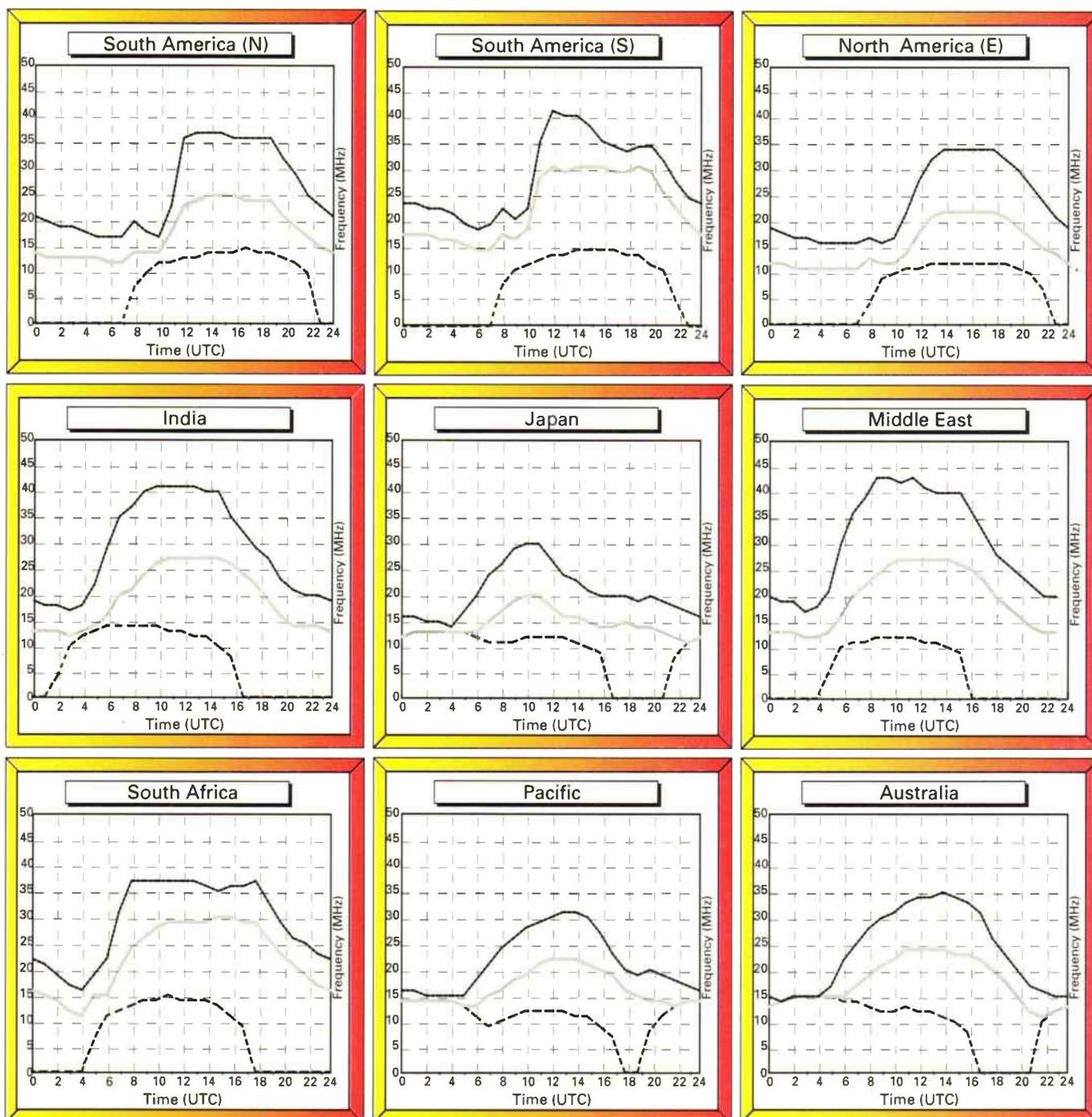
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50%

probability of success for the path and time.

To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots against frequency.

Good luck and happy listening.

March 2000  
Circuits to London

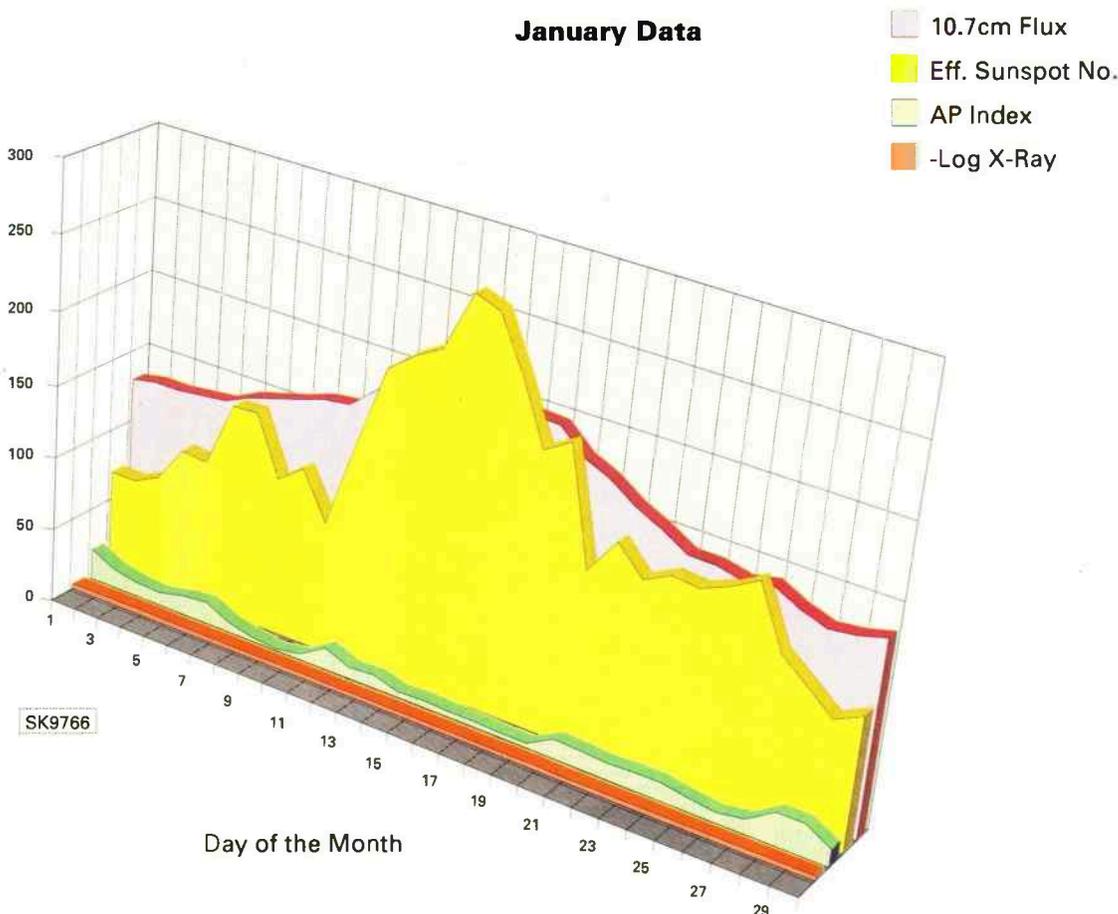


# Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, January 2000.



## January Data



## guide to the chart

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

The K and AP indices are measures of geomagnetic activity.

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

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

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

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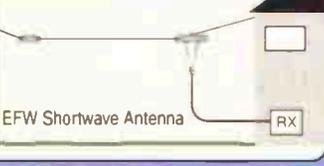
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# Amateur Bands

I'm starting this on the first day of the new century hoping to 'clear my decks' and get some outstanding jobs finished before Herself returns from Ukraine. One of December's gales - or was it the work of Christmas revellers passing by? - managed to displace the garden-end fence. Unnoticeable from indoors, but very obvious from the road. So, down with the end-fed, then some head-scratching before remembering a hydraulic car-jack. Find it, use it, then apply the leaden-shod boot in two places before re-fixing securely and restringing the antenna. Everything *precisely* as before, but the tuning had changed! Yesterday, progressing a screened loop for Top Band reception, rather to improve signal to noise ratio than improve DX reception. When this column is done, back into the workshop and the FRG-7 restoration.

## Silent Keys

CQ Magazine seem to be 'taking it on the chin' lately. First, Al Dorhoffer K2EEK. Then Jim Dionne K1MEM at age 51 after a lifelong fight with kidney disease. Jim had run the WAZ programme for fifteen years. Then in early November, Chod Harris WB2CHO/VP2ML had a severe heart attack, complications ensued from which he died on December 8. He also was a young man, only fifty. Hardy Mueller DL2HZM died in late November while operating as PY0FZM on Fernando do Noronha.

## Coming Up

VK0LD on Macquarie Island seems to be setting a good example. When the bad manners of the pile-up get to him, he either changes frequency or goes QRT. As he rightly says 'You need me more than I need you'. The QSLing will be done *after* November 2000. (Later: we hear he has given up the unequal battle and won't re-appear).

**Bernhard DL2GAC** will be swanning around the Pacific for three months starting at the end of January - the first stop to be Temotu H40.

HR1RMG's trip to Swan Is. has been postponed, but it just might appear soon after this reaches you. For Nepal, look for 9N7RB, mainly 14-21-28MHz sideband. All cards to W8NRB at the W8 Bureau.

We note K2ZR as active from Florida Keys until mid-April, with the possibility of Dry Tortugas activity for a weekend, too. In the same area, PA3GIO will be active from mid-March first from Southwest Cay and then Little Water Cay. OK2ZW is 9G5ZW for three years and OK1MU is signing OD5/OK1MU and asks for his cards via OKDXF.

The first issue of the *59(9) DX Report* for the new millennium points out that an expedition to Agalega 3B6 in October is 'on the cards', but the budget looks like \$160,000 US - amazing isn't it that three decades ago a DXpedition to Agalega could be mounted without significant assistance!

Macao, XX9 went back to BY on December 19. As a DXCC entity it looks to be going to disappear from the lists, unless the BYs allocate a new block of prefixes - XX belongs of course to Portugal.

An FK8 Chesterfield Is operation is being mounted from New Caledonia in mid to late March - this one may turn out to be a DXCC New One.

Finally, TZ6VV and TZ6YL will be permanently QRT from Segou on April 1 as they can no longer work in Mali due to health problems. However, Larry and Trish will make as many QSOs as possible before the antennas come down. For QSLs, send them to **KBOVV** (Larry's home call), **3850 Willomet Avenue, Fort Worth, Texas, 76133**.

## LA

In the December 1999 issue of their magazine, *Just Listening* was part of the pile in Box 4. I always look forward to this as a check on what I receive from contributors, quite apart from the pleasure I get from reading it. The **International Listeners Association** can be reached at **1 Jersey Street, Hafod, Swansea SA1 2HF** for further details.

## Letters

Let's start with **Godfrey (Airband) Manning G4GLM**, on the question of Aeronautical Mobile operation. Godfrey says most /AM operation is by pilots using the aircraft's own gear, otherwise finding power and an antenna would be a problem. Aircraft sets are, he says, 'designed to operate without interfering with other systems such as fly-by-wire' so Godfrey doubts if this is the reason for us observing fewer /AM stations nowadays. I wonder if anyone else has an input to this question?

Having read **Philip Davies** of Market Drayton in *Just Listening*, the very next letter I open is from - Philip Davies of Market Drayton! Living alone, Philip needs a 36-hour day for all the things he has to do - but he still clocked up 1500 new prefixes in '99 and three all-time new countries by way of Campbell Island ZL9CI, Nauru C21NI and West Kiribati T30R. Philip raised a point on the subject of earthing, which alas is too deep to answer here, so I will drop him a line direct.

Now we go to the c.w. mode with **Ted Trowell** in the Isle of Sheppey. Ted found conditions decidedly variable. On Top Band Ted noted 5C8M (Morocco), CN8WW, 5B4/UT7QF and EA6CC. On Eighty, CN8WW again, while on 7MHz we see JA3ZOH and TA2BK.

Next, 10MHz where around evening-meal time we see OY2H and EA6NB and 14MHz where the morning long path yielded ZL3REX and mid-afternoon VE7BKL and N7WO. Up again for 21MHz connections with VP5K4LQ, 9H1EL, JY9NX, OA4/DL1NL, VE6JY and after dinner C6AJX and CE3F.

The pickings from 24MHz included KP4S, ET3VSC, KP2J, all mid-morning, plus VQ9VK, W7OMT and VE7SR. Finally, 28MHz for FG5FR, PJ2MI, ZD8A, ZF6CW, AA1AC/VP9, PY5BLG, CN8WW, 5B4AGO, ZS6VR, V26X, J2A, 5A1A, ZS6EZ, P43JB, LU4AAV, PU2PGR, XE1GSQ, HK0ER, CX4GL, YV1NX, HC1MD, VP5/KB4IRS, VE6JY, P40V, N6BT, 8P9JO, VP5/K4LQ, CO8LY, VE5SF and FG5FR.

**Paul and Peter Goodhall** in Oxford took a ride to Rednal just pre-Christmas, where Peter was able to get his Christmas present by way of a DX-394 receiver. Peter's first 3.5MHz DX on his own receiver was a ZL, so he's coping OK! On the c.w. front, XU7AAV was logged working DJ2PJV, 3A/VA3EU working K6CT, VU2GTE and OM5XX. The 'biggie' though was catching VK0LD in QSO with PA7CN - and they nailed him again on sideband four days later, both on 14MHz. Otherwise, the s.s.b. crop, though large, was relatively run-of-the-mill, reflecting the comments of most other correspondents.

Now we turn to **Colin Dean** in Barnsley. His offering included, on 7MHz, AP2N, BV2RS, CO6KT, CT3GU, C31JI, EX8MK, HL3ERJ, JT1CD, R1ANZ, TA3D, UN0N, YB0AN, 4L2M, 5C8M, 9K2AI and 9K2GS, plus 14MHz loggings of FOSJV and 3W6KM. Up on 21MHz, Colin booked in ET3AA, EK6TA, OH0JTU, VK2, VK5, VK6, VU2DK, YB0ECT, ZD7WRG, 3A/VA3EU, 5N9CEN, 6W1HM, 6Y5DA and 9M6RIT before going to 28MHz for AP2JZB, A41LZ, CO0DX, CP6XE, ET3AA, FM5DN, FR5DX, KP2BH, KP2D, NP2JV, OD5NH, PZ5RA, P43P, TA2FE, TF3AO, T14CC, VK3PFJ, VK3TZ, KN4UG/VP5, YS1/KA0UBH, VU2XO, V44NK, WP4NLY, ZD7VC, ZF2RT, ZP6CC, Z21KF, 3DA0WPX, 3E1DX, 3V8BB, 4L5D, 5A1A, 6W6/K3IPK, KN5H/6Y5, 8P6FH, 8P9EM, 8R1Z, 9J2FR, 9K2HS and 9K2QA.

Finally, if any of you ever listen to our local net, (Sundays, 1100 local, 3.795± QRM) and noted Yours Truly 'disappearing' at odd moments, my apologies. The fault is an intermittent one and having spoken to it a little harshly maybe, the fault has gone into its shell and refuses to come out again! I guess the answer is to threaten it with the dear old TS-520S. Alternatively, I'll have to fillet the p.s.u. to find where and why voltage stabilisation disappears.

## Finished!

That's it for another time. Input - letters, comments, lists and all, to **Box 4, Newtown, Powys SY16 1ZZ** to arrive as always by the first day of the month. Please try not to be late, but if you are, then your letter falls back to the next column - we never waste input!

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■ KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS

# DX Television

December was fairly tame by comparison with the previous month when F2-layer propagation ruled! This reduction in activity was to be expected, however. Previous F2 periods have shown October, November and February to be the more active months for F2 activity, with a drop-off in December and January.

## Reception Reports

Sporadic-E signals from Germany emerged on December 18th. These were captured by **Simon Hockenhull** (Bristol) on Channel E2 showing skiing shortly after 1110UTC with levels reaching P3. Channel E3 became active by 1120, but the weak signals could not be identified. On the 6th, **Peter Barber** (Coventry) noted a short-lived opening from Italy on Channel IA.

Both **Stephen Michie** (Bristol) and Peter have witnessed lots of Meteor- Shower (MS) DX in Band I. Most 'pings' were of programme material and could not be identified.

Tropospheric reception failed to produce anything worth mentioning. Over in Finland, conditions were marginally better with ORT-1 (Russia) on Channel R1 received from St. Petersburg by **Pertti Salonen** in Vaajakoski. Signals appeared on the 13th, 22nd, 23rd and 24th.

## DXTV Log For December 1999

The following reports have been supplied by Simon Hockenhull, Stephen Michie and Peter Barber. All times are shown in GMT/UTC.

Day	Log
1	0703 E3 DR-TV (Denmark) PM5534 test card via Meteor-Shower. 0724 E3 SVT-1 (Sweden) with 'SVT-1' 'SVERIGE' PM5534 test card.
3	0742 E3 DR-TV PM5534 via MS. 1100 Foreign p.m.r. heard between 34 and 35MHz via F2-layer propagation.
5	0747 E3 DR-TV PM5534 test card via MS.
6	1141 IA TVA or RAIUNO (Italy) programme.
12	0720 E3 Unidentified cartoons via MS (also at 0755).
15	0732 E3 Unidentified Breakfast TV news via MS. 0759 E3 NRK-1 (Norway) with 'Hemnes' PM5534 test card via MS.
18	1110 E2 ARD-1 (Germany) with skiing programme via SpE. 1120 E3 Unidentified signals.
20	UK tropospheric f.m. reception.

## What's Happened To SSTV?

Our epic article in the January issue of *SWM* has prompted **Cliff Dowding** (Birmingham) to ask if it would be possible to include examples of SSTV (Slow-Scan TV) pictures in this column. Cliff also wonders if anyone is still interested in the hobby!

Well, traditionally, TV DXing has been the tag assigned to the reception of broadcast TV stations rather than signals transmitted by licensed amateur enthusiasts. Most of the readers of this column are only active in the field of



**Fig. 4: An eye-catching identification logo transmitted via SSTV by SP7IIT. The examples of SSTV reception featured this month were supplied by Cliff Dowding in Birmingham.**

broadcast TV reception and so we tend to include this type of log. We also receive details of DX successes on the f.m. band (when conditions allow), but again it is 'broadcast' radio stations which are the main interest. However, that is not to say that we do not welcome reports of reception from enthusiasts who are interested in the amateur bands.

Broadcast-band DXing is often perceived by reporters in the media as an 'anorak' hobby. This is mainly because the reporters haven't got a clue what they are writing about! But one thing is for sure - there are a lot of DX enthusiasts out there!

Propagation is common ground which we all share, so there is no real reason why we cannot air amateur reception experiences, provided it falls into the DX category and not something that can be received on demand or at the drop of a hat.

Cliff assures readers that SSTV pictures can be received from around the World without the need for a large antenna system. Cliff is using an Icom R8500 receiver fed from a Datong active antenna mounted at 10m above the ground. Some of the results are shown this month.

So, to all SSTV enthusiasts out there, let us have details about how to get started, the equipment required, frequencies used, when the bands are active, typical reception distances, which catches are common and which ones are rare, etc. Also, why not send photographs of your DX SSTV reception, either as colour prints or as 'jpg' files on a PC disk?

**Ian Moody** (Sutton, Surrey) plans to take up DXing on the 23 and 24cm amateur bands as a supplement to broadcast-band v.h.f./u.h.f. DXing. When 70cm was popular for amateur TV transmissions some years ago, many DXers would have a look for foreign signals during lifts. This, of course, depends on whether the tuner would venture far enough below Channel 21.

## WRTH 2000

**Tim Bucknall** (Congleton) is among several TV DXers who have voiced their disappointment concerning the TV section in the latest *World Radio & TV Handbook*. We haven't seen a copy, but it sounds as though its usefulness has rapidly diminished.

Peter Barber comments that his old 1990 edition contains more information on TV than the latest 'skimmed' version. The main problem is creating something which is not out-of-date as soon as it's published. With TV services coming and going or changing hands constantly, is it not surprising that this situation has arisen.

Continued on page 56.



**Fig. 5: Graphics used by the Swiss French-language TV service, TSR, to introduce commercials.**



**Fig. 1: Reception of SSTV from HAAEN in Budapest, Hungary.**



**Fig. 2: HG5P received from Hungary via SSTV.**



**Fig. 3: SP3HYP noted in the UK via SSTV.**



**Fig. 6: This month's saunter in our regular 'Down Memory Lane' spot. This logo from Harlech TV was used with the introduction of colour in Wales/Cymru.**

■ GODFREY MANNING G4GLM, C/O THE GODFREY MANNING AIRCRAFT MUSEUM, 63 THE DRIVE, EDGWARE, MIDDLESEX HA8 8PS

# Airband

I will never forget the look of amazement on Chris' face the first time I took her to see a Vulcan fly. That was at an airshow at Abingdon. We later saw it at Halton. As both bases now have reduced rôles and neither hosts an airshow, it tells you how long ago that was!

The example in question was XH558, a Mk. 2 Avro 698 Vulcan that had been adapted for various rôles in its lifetime, including tanker and bomber. We were rather overcome when we watched it fly for what might have been the last time. It is now on the ground at the excellent Museum at Bruntingthorpe.

I'm pleased to say that the quest to preserve our aviation heritage still lives on in some quarters and that Bruntingthorpe is a wonderful example. In terms of funding, I don't know how they do it! Recently, an old B.747 airframe was tested for resistance to terrorist bombs. They literally blew it up, but one of the explosive devices was inside a hardened cargo pallet which successfully minimised the damage. The researchers contributed to Bruntingthorpe's funds in return for the use of the airfield - *so you do know then - Ed.*

You'll find the site a few kilometres south of Leicester. It's open every Sunday from 1000 until 1600 with admission around £3 for adults seeming quite reasonable. For more details, telephone them on **0116-247 8040**.

As far as the Vulcan goes, they tell me that Marshall's of Cambridge are stripping the airframe down as a proper commercial venture. This will enable a detailed inspection to take place, following which the extent of any remedial work will become apparent. Commercial (or indeed any!) sponsorship/contributions are sought to finance the rebuild.

If you can help, please make direct contact on the above 'phone number. As the work is being done to full airworthiness standards, the Vulcan is currently sealed away from the public in a hangar. If all goes well, the most optimistic estimate is that it might fly before the end of the year. Let's hope so and pass on our good wishes that this becomes a reality!

## Museum Piece

If in Norfolk, the Radar Museum at RAF Neatishead might be worth a visit, suggests **Peter Wade** (Sevenoaks). It's open from 1000 until 1500 on the second Saturday of each month and, from Easter to September, on Tuesdays. The entrance is recognised by the gate guardian, a Phantom displayed on a pole. You are not breaking any laws taking photos from public land, Peter, but once admitted inside a sensitive site, permission should be sought as an obvious courtesy prior to attempting photography.

I was surprised to find a radar museum here as the Royal Radar Establishment, Malvern, would have seemed a more auspicious place. It was there that CORAL-66, a computer language for programs that process radar signals, was developed. Now superseded by the likes of C, it struck the balance between appearing as an easily-written high-level language and yet permitting access at machine level, almost like assembler language. I wonder if I'll receive 'happy memory' letters from readers on this subject, or indeed if anyone will even know what I'm talking about?!

## Frequency & Operational News

The current list of Manchester Area Control Centre frequencies is kindly sent with the *AIP* amendments by **Martin Sutton** (CAA). They are 124.2, 125.1, 125.95, 126.65, 128.05 (this is new), 133.05 and 133.4MHz. Note that 134.925 is hence deleted. The centre also provides Pennine Radar to the Northern Off-Route Coordination Area on 128.675MHz.

The Manchester centre remains a sub-unit of LATCC, although I don't know of its intended fate should the new en-route centre at Swanwick, Fareham, commence service. I seem to remember (long ago!) that there was a third FIR, Preston, served by the Manchester centre. Nowadays, pilots don't need to know when handed off from LATCC to a Manchester controller as it's all part of London Airways.

On the airways, a new reporting point is ANNIK in the North Sea east of Newcastle where UY802 and UY804 cross.

Aerodrome information as published in *GASIL* 4 of 1999 from the CAA, the last of that year. Cambridge moves its Radar from 130.75 to 124.975; Elmsett Radio moves from 130.425 to 130.9; Fair Isle gets an Air/Ground Radio station for the first time on 118.025; Manston Tower moves from 119.275 and now shares with PAR 119.925; Plymouth Tower moves from 122.6 to 118.15 and Teesside ATIS moves from 121.825 to 136.2MHz.

Some gliding/parascending sites have changed. Those at Bigginmore, Brands Hatch, Downham Market, Galewood, Hanningfield, Hucklow Moor, Parwich Meadow, Tadlies, Tenby Beaches, Tideslow Farm, Tilstock and Woldingham have all been withdrawn. Not enough to balance the books is one new site in Northumberland at Milfield.

Do readers visit or take advantage of their local gliding sites and aerodromes? I'd be interested to know what goes on in **your** locality. Make it your (belated) New Year's Resolution to write in and let me know!

## ATIS

Above, I mentioned the new frequency for the ATIS at Teesside. What is an ATIS and what possible use is it? Prior to takeoff or approach, the pilot needs some idea as to what weather can be expected. If visibility is too restricted (by fog or low cloud), or if the crosswind is too strong, then takeoff or landing might be unsafe and must be avoided. Takeoff can be delayed pending an improvement in the weather, but this isn't so easy in the case of landing. If fuel runs low, the flight must divert to the nearest suitable aerodrome with acceptable weather.

There are long-range sources of weather information. Flight Briefing Units have access to weather reports on the aeronautical communications networks (no longer served by clattering teleprinters, we've reached the computer and FAX age!). In the air, regular recorded reports for major airports can be heard on the various VOLMET services.



## Abbreviations

AIP	Aeronautical Information Publication
ATIS	Automatic Terminal Information Service
B	Boeing
BST	British Summer Time
CAA	Civil Aviation Authority
FIR	Flight Information Region
GASIL	General Aviation Safety Information Leaflet
LATCC	London Area & Terminal Control Centre
MHz	megahertz
PAR	Precision Approach Radar
UTC	Universal Time Co-ordinated
VOLMET	VOLume METeorological report

**Continued on page 56.**

**Hunter GA11.**

*Christine Mlynek.*



## Airband

...continued from page 55

Closer to the particular airport, pilots need the most up-to-date information possible and controllers were becoming overloaded by reading the same reports to each successive flight that called in. A recording, based at the airport, transmitting continuously on its own discrete frequency, was the answer. This is the Automatic Terminal Information Service or ATIS (DATIS, Digital ATIS, if recorded by computer, perhaps as pre-set phrases automatically annunciated in the correct sequence).

What does it tell you? "This is Teeside information delta, the one three one five hours weather" tells you to which aerodrome's service you are listening and the time (24 hour clock, UTC, which is one hour earlier than clock time when we're on BST). The letter tells you which bulletin is current, D (delta) in this case. When they next update it, the new recording will be E (echo), the next letter in the alphabet.

Wind next. The magnetic heading from which it comes is stated in degrees, followed by the average speed in knots (nautical miles per hour). Any variability or gusting is also elaborated.

Visibility is in metres (kilometres, hopefully) and any significant weather gets a mention. An example would be "Two thousand metres in rain."

Cloudbase is measured in feet above ground. It can either be in eighths of cover (oktas) or summarised as: few (up to 2 oktas), scattered (2-4 oktas), broken (5-7 oktas) or overcast (8 oktas, full house!). If neither cloud nor visibility will affect operations, the report is abbreviated to CAVOK (you would hear 'Cav-Oh-Kay') meaning that Cloud And Visibility are, well, OK!

Temperature and dew point are in Celsius. If dew point is close to, or equals, temperature, then the air is humid and piston engine carburettors can ice up unless the carburettor heater is switched on. This can happen in surprisingly warm conditions. All airframes can accumulate ice, too, if it is cold enough.

Barometric pressure needs to be set on the altimeter subscale and visitors to my Museum can try this for themselves. The QNH setting makes the altimeter read altitude above sea level. The telephone number to arrange a Museum visit is **0208-958 5113** and there isn't a Q-code for that.

The other useful information, apart from the weather, is active runway. Knowing which runway is in service enables the traffic flow around the aerodrome to be understood. Any other operational information might also be included, such as navigation aid serviceability or windshear reports.

All in all, useful for understanding the activity at an aerodrome, for deciding if the wind is gusting enough to make you want to lower your antenna mast, and to compare your own weather readings with those of the professionals.

All letters received up to January 12 have been answered (Christmas Quiz excepted). The next three deadlines (for topical information) are March 6, April 10 and May 8. Replies always appear in this column and it is regretted that no direct correspondence is possible.



Yak-11.

Christine Mlynec.

## DX Television

...continued from page 54

A similar thing happened with the *List of VHF/UHF Television Stations* published by the European Broadcasting Union many years ago. Thicker than a telephone directory, it listed all known European TV transmitters and relays, plus those located in Russia, roughly as far as Moscow. Then, all of a sudden, Russian and Eastern-bloc countries were simply listed as 'no recent information'. The publication is no longer produced - a pity really since it contained virtually every transmitter's technical details which one could wish for, such as e.r.p.s, site height, transmitter height, offsets, geographical co-ordinates, etc.

### New Baby Alarms

There's more bad news about potential interference problems in Band I lurking on the horizon! **Roger Bunney** (Romsey) has discovered several local baby alarms operating around Channel E2. One was measured at 48.27MHz, another just below and a third at 48.8MHz. The units are thought to have come from China and are being sold by a well-known supermarket chain.

### Tuner Sought

Ian Moody is seeking a v.h.f./u.h.f. tuner type ET548 to replace a Philips UV411 in his home-brew desk-top TV tuner unit. The ET548 is an 'oldie' but 'goodie' unit using a BF960 or 3SK82-83Y front-end. The tuner was used in the GEC C2285 and Hitachi CPT1624 TV models dating back to around 1984. Does anyone happen to have one of these tuners lying around in their junk box? If so, please let us know.

### FM DXing

There isn't much to report this month, apart from a tropospheric opening on the 20th reported by Stephen Michie (Bristol). Signals were identified from various UK transmitters including Mendlesham, Croydon, Sandy Heath and Rowridge.

### USA MS Ping

Further information has come to light regarding the possible reception in the UK of a ChA6 audio carrier via Meteor-Shower at 1115 on November 29th by **Mark Hatton**. The traffic report heard was interrupted by a second 'ping' and it was this which WECT confirmed as their 'anchor' woman. The traffic report, which included the time reference of 5:26, was actually a five-year-old report originally aired by KBSN California. So why was this signal being aired and who was transmitting it? Mark suggests that there may have been tropospheric ducting out into the mid-Atlantic, the signals then being assisted into the UK via Meteor-Shower activity.

### Service Information

**Gösta van der Linden** (Netherlands) advises that the new Dutch regional station 'RTV Noord Holland' commenced on December 7th. The 200W e.r.p. transmitter is located at Wormer (north of Amsterdam) and uses Channel E55 with horizontal polarisation. The PM5544 test card carries the identification 'RTV NOORD HOLLAND' at the top and 'NOZEMA K55' in the lower black rectangle. This should be an easy station to DX in the UK.

In the Thüringen area of Germany, the Sonnenberg ChE12 ARD-1 outlet has closed to make way for DAB services. Transmissions are now on E44. In the Sachsen area, Zwickau TV will come on-air using E24. In Berlin-Brandenburg, digital broadcasts are being radiated from the following transmitters:-

Alexanderplatz:	ChE37 1kW; E43 1kW; E51 3kW; E53 1kW; E59 10kW
Schäferberg:	ChE46 5kW; E51 5kW; E59 5kW
Rüdersdorf:	ChE59 5kW
Scholzplatz (SFB):	ChE37 1kW
Zeuthen:	ChE51 1kW

Using a data rate of 4.5MBs<sup>-1</sup>, these stations will support 19 TV programmes and two radio channels.

### Keep On Writing!

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

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### PCR 1000



The explosive growth of the internet in the last few years has brought a wealth of information to PC users everywhere. However, long before this the airwaves have been filled with communications of all kinds - broadcast radio and TV, ham station, marine and aviation to name a few. The PCR-1000 lets you listen in to this exciting world from your own computer. *The RRP has now gone up to £349, however we do have a number of units still available at*  
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IC-R7100	£899
KPC-3	£90
ICS FAX-1	£TEL
Bearcat UBC-860XLT	£99
Realistic PRO-2006	£99
AOR AR3000	£375
Icom IC-R7000	£550
2 x KAM plus	£225
KPC-3	£90
Icom IC-R71E	£TEL
Tokyo HX-240	£150

#### ACCESSORIES

UK Scanning Directory	£18.50
Watson QS-200 mobile unit	£4.95
Watson QS-400 adjustable holder	£9.95
Carrying cases for scanners from	£17.00
Ferrells Confidential Freq List	£19.99
Scanmaster Base Antenna	£39.95
Scanmaster Discone Antenna	£49.95
Watson W-901 regular gainer ant.	£12.95
Universal 3 in 1 swan neck holder - screw in/stick in/put on glass	£17.50

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Housed in DB-25 the RS-8200 allows computer control of the AR8200 and supports both software and hardware squelch detect. **£39.99.**

### RS-2700/8000

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### JAV-232

Not only compatible with the AR8200 but many other receivers also including the AR8000, AR2700, Alinco DJ-X10, Icom IC-R10 and IC-R2 to name a few. When used with the AR8000 or AR8200 the JAV-232 also provides a squelch activated tape recording circuit and audio. The AR8200 connections also provide a FM Discriminator output for DATA decoding. The JAV-232 costs **£69.99** but for connection to the AR8200 an optional OS-8200/DIN lead is required at **£15.00.**

*Other interfaces for the Icom IC-R2, IC-R10 Trident TRX-100XLT and Alinco DJ-X10 also available.*

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# Info in Orbit

## Dawn on 1 January, 2000

I spent the last few hours of 1999 with Marion (XYL), daughter Cathy and grandson Joseph, while back at home I entrusted the computers to collect pictures from METEOSAT and the polar orbiters - all under automatic control.



**Fig. 1: NOAA-15 infra-red image from 1 January 2000 - 0856UTC (shortly after sunrise).**



**Fig. 2: NOAA-12 - Millennium-crossing image from Robert Read in New Zealand.**



**Fig. 3: NOAA-12 Pass over Britain 31 December 1999 at 1904UTC.**

On return during the early hours of Saturday 1 January, I was pleased to find that everything had worked perfectly! The only 'fly in the ointment' was the decision by EUMETSAT to continue encrypting images - even during the move into the new year. I collected the first PDUS image of the year/decade/century - but it was encrypted.

In this edition, the dawn of the new century is recorded by a collection of satellite pictures spread around the longitudes of planet earth. The term 'millennium' has been used to describe entry into the year 2000.

As an astronomer having some familiarity with the history of calendars, I am reluctant to accept the year 2000 as the start of the 'new millennium' because, as pointed out by the United States Naval Observatory and Royal Greenwich Observatory, the counting of the years commenced with 1AD (amongst other matters), and this results in the new millennium actually starting on 1 January 2001. However, I won't try to hold back the tide!

The sun rose over Britain (specifically Plymouth) around 0815UTC on 1 January, 2000 and we enjoyed a sunny, slightly misty sunrise. The crescent moon shone in the south, and Venus was visible as the bright morning 'star'.

The first day of the new century was worth enjoying. NOAA-15 was the first WXSAT to provide a.p.t. images of Britain after sunrise, and it captured the scene to perfection, see Fig. 1.

## Around The World

Earth is divided into 24 time zones spread across 360° circumference, in which each zone experiences its own solar noon, when the sun reaches its highest elevation around local 12am. By international agreement, the date changes (from one date to the next) at the International Date Line.

'Midnight' moves around the world, defined by the sun's position, so the first location on earth to reach the new year/century (whatever) was along this line. To mark the occasion, NOAA (the US government agency responsible for operating America's WXSATs) switched NOAA-12 on, transmitting on 137.62MHz (to avoid a v.h.f. clash with NOAA-15), for few hours during this period.

The orbit chosen was 44,825 (or so) at approximately 1430UTC (though some reports say it came on one orbit earlier), and the spacecraft was turned off during orbit 44,829 at approximately 2055UTC.

Wayne G. Winston, a NOAA/NESDIS meteorologist, explained that these orbits permitted a.p.t. coverage "while the satellite is southbound over the Pacific Ocean and crossing over the International Date Line from an area where the local date is December 31, 1999, into the area where the local date is

January 1, 2000. Because of the orbital parameters of the active NOAA satellites, this will permit the first available NOAA a.p.t. images in the year 2000, just west of the Date Line - primarily New Zealand and Australia".



**Fig. 4: GOES-10 (west) sees the last day of the century over the Pacific ocean.**

Robert Read of Christchurch, New Zealand, captured Fig. 2 - a unique image from NOAA-12. He has incorporated the international dateline as a red line within the image, at 0538 local time on Saturday 1 January, 2000. NOAA-12's subsequent passes over Britain included that shown in Fig. 3.

The first countries to enter the new century were those to the west of the International Date Line, including Japan, Australia and China. Further 'east' of the Dateline, the Pacific ocean and America were still in the previous century.

Figure 4 is from GOES-10 (west), received at 2253UTC on 31 December, showing the eastern Pacific region in sunlight on the last day of 1999. The new century had already started further west. The far eastern coast of Australia is just seen in the bottom left part of Fig. 4, as the sun rises there - on 1 January 2000!

The images transmitted by METEOSAT-7 on 31 December at 2246 and 2248UTC originated from GMS-5, positioned over longitude 140°, showing an infra-red and then visible-light image of the region - see Fig. 5. Australia was experiencing sunrise - see bottom left of the image.

As the Dateline moved further west, sunrise followed. The mid-day GMS-5 image is transmitted at 0448UTC from METEOSAT-7, having been received a little earlier.

The Chinese geostationary WXSAT FENGYUN-2 was the next to record sunrise, followed by INDOEX (METEOSAT-5) located over the Indian ocean. Figure 7 - from INDOEX - was transmitted via METEOSAT-7.

The first home-produced, unencrypted images from METEOSAT-7 for this day, were transmitted at 0558 and 0602UTC. With the winter solstice having been only a few days earlier (on 22 December 1999), the region of the south pole can be seen in sunshine, see Fig. 8.

The earth rotates and the sun rises in lands further west. America experienced the New Year a few hours later than Britain. GOES-8 provides visible-light scans every hour, and METEOSAT-7 transmits an infra-red and then visible-light image from GOES-8 once every three hours, see Fig. 9.

By any standards, 1 January, 2000 was a memorable day.

## Current WXSATs

The unexpected decision to temporarily switch NOAA-12's a.p.t. service for a few hours during the year-end was a bonus for everyone. What a pity that METEOSAT's PDUS service continued to be encrypted throughout. OKEAN-O has apparently suffered permanent failure. No details appear available yet. METEOR 3-5 and RESURS 01-N4 continue transmitting when in sunlight.

NOAA-12's a.p.t. service is expected to resume from 1 September. On NOAA-15, the three high-gain antennas connected to three of the four NOAA-15 transmitters (STX-1, STX-2 and STX-3), have experienced increasing performance degradation, and radio frequency interference is being received by the AMSUB instrument.

The STX-1 high-gain h.r.p.t. antenna (1698.0MHz)



**Fig. 5: GMS-5 visible-light image (re-transmission from METEOSAT-7) showing first light of the century.**

degraded to a level where small dish (1m) users experienced a significant number of h.r.p.t. dropouts, usually rendering the data unusable. On 28 September 1999, NESDIS moved the h.r.p.t. service from STX-1 to the STX-2 OMNI antenna (1702.5MHz). This transmitter/antenna combination was tested with small dish receiving stations and found to provide satisfactory reception under most conditions. STX-2 transmissions are right-hand circularly polarized, and compatible with existing h.r.p.t. antenna systems.

I heard one short transmission from *SICH-1* (137.40MHz) but nothing from *OKEAN-4* (also known as 1-7).

## North To Alaska

Whilst working in Alaska, **Dick Mobley** has had an opportunity to obtain high resolution WXSAT images of the region. **Figure 10** is a composite of three such infra-red images. The region of Homer Spit, a thin stretch of road about three and a half kilometres in length, was Dick's target. He reports that they have been having some minor earthquakes around the area, and that in the past, volcanic activity has not been far behind.

## RIG Competition

The Internet's Remote Imaging Group mailing list for WXSAT enthusiasts (rig-I) recently held another competition, this time a dual-entry. An image of the infra-red transmission from the *NOAA 14* pass at 1533UTC on Saturday 11 December was requested, together with "the best image you ever got". To the pleasant surprise of the mailing list readers, an extra offer was received from Wayne Winston of NOAA (referred to above) to say that the winner would also receive a ('mystery prize') package from NOAA that would include a selection of trinkets, publications and other goodies.

All entries for the competition were displayed on Paul Hayes' web site

[http://web.ukonline.co.uk/phqfh/comp\\_2000.htm](http://web.ukonline.co.uk/phqfh/comp_2000.htm) - so new entrants had the opportunity to have a look at the standards being achieved by WXSAT systems across Britain and abroad!

I chose to remain on the sidelines for the NOAA competition due to a recurring problem apparently with the down-lead from my roof-mounted antenna. It is going to be taken down for examination shortly, but in its absence I have no alternative working antenna. My original (Jaybeam) antenna is minus one phasing harness and the supplier no longer produces them. My third antenna has a broken connector.

**Paul Hayes** and **Peter Tanner** were joint winners for the 11 December competition. The 'best ever' competition was jointly won by **Les Hamilton**, **George**

**Newport** and **Peter Tanner**. Finally, an 'overall' winner - see **Fig. 11** - was identified after taking into consideration previous competition results: **Les Hamilton** achieved 93 points, followed by **Alan Jarvis** with 92 points.

Les, Alan and I spent several hours chatting during breaks at the RIG convention a couple of years back. The competition itself was jointly organised by **Dave Cawley** and **Paul Hayes**, Paul doing the hard work of providing web hosting and also donating a QFH antenna for the winner.

**Julian Moss** started 'rig-I', and the prize of a *Short Wave Magazine* subscription was donated by **Timestep**. Let us also give thanks to NOAA for freely giving their satellites to the world and adding a bumper prize.

## Best Archive Image

The next competition - 'your best archive image' - is an exceptional challenge for me. I have original audio tapes carrying recorded WXSAT and other passes, dating back to my first experiments in WXSAT signal decoding. Each pass was very carefully logged - starting from the mid-eighties - but....can I find those lists? I have very old passes from *METEOR 1-30*, various *COSMOS* precursors to *OKEAN*, and early *OKEAN*s, as well as very old NOAA tapes. My problem now is to produce pictures from these tapes (some are easy) and identify their date (hard)!

Looking back through the collection prompts me to consider starting a new feature for 'Info', along the lines of 'from the WXSAT archive'!

## Equipment Review

Under test at home I have the RIG/Timestep *METEOSAT* down-converter, and off-set dish with active feed, a system that should cut the cost of installing *WEFAX* reception hardware to under £200! I expect to submit a review for publication as soon as tests are complete.

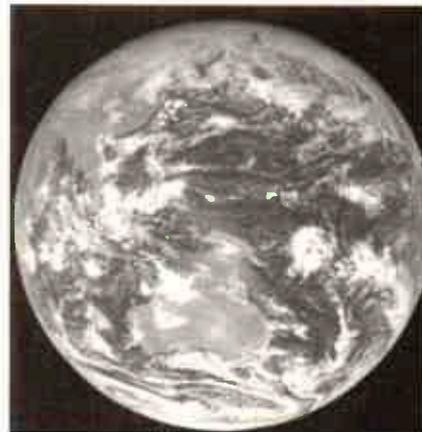
## International Space Station

The ISS represents a partnership of sixteen nations. It is an engineering, scientific and technological project entering a new era of human space exploration, thus says NASA in its introduction. The space station will include six laboratories and provide more space for research than any spacecraft ever built.

During a period of five or more years, some 40 space flights and at least three space vehicles - the Space Shuttle, the Russian Soyuz rocket and the Russian Proton rocket - will deliver the various components to Earth orbit. Component assembly will require a combination of human space-walks and robot technologies.

The ISS's first two components are in good shape with only minor issues facing the flight control teams in Houston and Moscow - none of which affect the operation of the complex. A *ZARYA* software patch was uplinked from Russia's Mission Control Centre, this allows additional electrical power system parameters to be sent to the ground via *UNITY*'s early communications system. This data now can be viewed more frequently using NASA's Tracking and Data Relay Satellite System.

Separate launch: the *Zvezda* Module (technically called the Service Module) is the primary Russian station contribution forming the early station's living quarters. It provides life support system functions to all early elements. It is the primary docking port for Progress-type cargo re-supply vehicles, and provides propulsive attitude control and re-boost capability for early station activities. *Zvezda* - the Russian word for Star - will serve as the early living quarters for crews housed on the station when the Shuttle is not present. News just in (mid-January) indicates that launch has been postponed until mid-August.



**Fig. 6: GMS-5 mid-day local time, visible-light image 1 January 2000.**



**Fig. 7: INDOEX image from METEOSAT-7 at 0524UTC on 1 January 2000.**



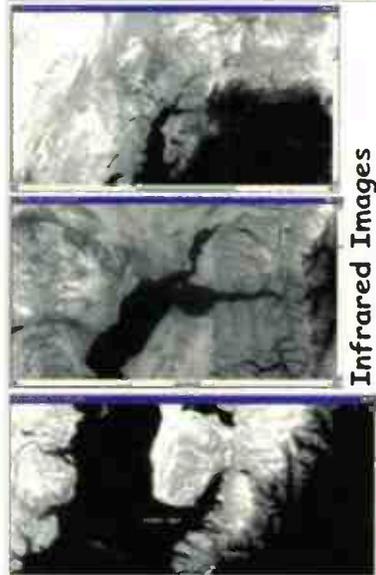
**Fig. 8: METEOSAT-7 visible-light image at 0602UTC 1 January 2000.**



**Fig. 9: GOES-8 (east) visible-light image 1558UTC 1 January 2000.**

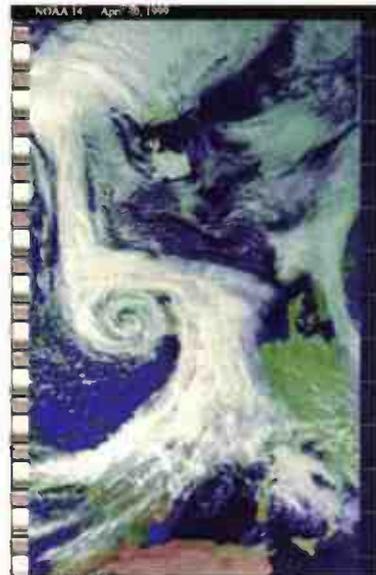
Shuttle launch: STS-101 *Atlantis* - 3rd ISS Flight (2A.2) Launch no earlier than 16 March 1245UTC, to 173 nautical miles altitude with inclination 51.6°. Payload Spacehab Double Module.

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me at the address at the head of the column, as the *Shuttle Pack*. Please include £1.50 and stamped s.a.e. for the A4 booklet.



Infrared Images

**Fig. 10: Alaska - h.r.p.t. NOAA-15 image 9 November 1999 at 1841UTC from Dick Mobley.**



**Fig. 11: Les Hamilton's 'best ever' image.**

**Stop Press**

The death has been announced of Geoff Perry MBE, founder of the Kettering Group and co discoverer of Plesetsk launchsite in 1966. He was 72, and was taken ill suddenly on Tuesday afternoon 18 January, whilst out with his wife Jean, and a visiting Group member, Jos Heyman from Perth, Australia. Despite rapid evacuation to

Stratton Hospital, Geoff was pronounced dead some 30 minutes later, following a heart attack which struck without warning. This information was received from Max White. An appreciation of Geoff will be included in the next edition of 'Info'.

**Kepler Elements - WXSATS, MR and Shuttle**

- 1 If you want a computer disk file containing recent elements for the WXSATS, AMSATS and others of general interest, together with a large file holding elements for thousands of satellites please enclose 50p with a PC-formatted disk and stamped envelope. A print-out is included that identifies NASA catalogue numbers for the WXSATS. The disk file is ideal for automatic updating of tracking software.
- 2 I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions. Transmission frequencies are given for the operating satellites. This data originates from NASA.

**Frequencies**

NOAA-14 transmits a.p.t. on 137.62MHz.  
 NOAA-15 transmits a.p.t. on 137.50MHz.  
 NOAAs (11 and sometimes 9) transmit beacon data on 137.77 or 136.77MHz.  
 METEOR 3-5 transmits on 137.30MHz when in sunlight.  
 OKEAN-4 and SICH-1 use 137.40MHz for brief transmissions.  
 RESURS 01#4 transmits a.p.t. on 137.85MHz.  
 METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.  
 GOES-8 (western horizon where receivable) uses 1691MHz for WEFAX.

**Fig. 12: Forthcoming Shuttle Missions.**

**Upcoming Space Shuttle Missions**

Updated Jan 4, 2000 (replaces Dec 26) Compiled by Bruce Buckingham KSC PA

STS Mission No. (nth Shuttle Flight)	STS-99 (97)	STS-101 (98)	STS-92 (99)	STS-97 (100)
Orbiter	<i>Endeavour</i> DV-105	<i>Atlantis</i> DV-104	<i>Discovery</i> DV-103	<i>Endeavour</i> DV-105
(nth flight of orbiter)	(14)	(21)	(28)	(15)
Primary Mission	Shuttle Radar Topography Mission	3rd ISS Flight (2A.2) SPACEHAB (DM) ICC	4th ISS flight (3A) - Z-1 truss, PMA 3	5th ISS flight (4A) P6 module P6
**Target Launch Date/Time (Pad)	*Jan 31 at 12.47pm (NET) (39A)	March 16 at 7.45am (NET) (39B)	June 14 at 8.42pm (NET) (39A)	July 20. 6.49am (NET) (39B)
Launch Window	2 hours, 2 minutes	5-10 minutes	10 minutes	10 minutes
KSC Landing Date/Time	*Feb. 11 at 4.52pm	March 27 at 2.40am	June 24 at 5.10pm	July 29 at 3.34am
Mission Duration	11 days 4 hours 8 min	10 days 19 hours	10 days	9 days
Inclination/Altitude	57° 126 nautical miles	51.6° 173 nautical miles	51.6° 173 nautical miles	51.6° 173 nautical miles
Crew (Shuttle flight number) (Size)	Cdr. Kevin Kregel (4) Pit. Dom Gorle (2) MS. Janet Kavandi (2) MS. Janice Voss (5) MS. Mamoru Mohri (NASDA) (2) MS. Gerhard Thiele (ESA) (1) (six)	Cdr. James Halsell (5) Pit. Scott Horowitz (3) MS. Mary Ellen Weber (2) MS. Edward Tsang Lu (2) MS. Jeffrey Williams (1) MS. Yuri Malenchenko (RSA) (1) MS. Boris Morukov (RSA) (1) (seven)	Cdr. Brian Duffy (4) Pit. Pam Melroy (1) MS. Koichi Wakata (NASDA) (2) MS. Leroy Chiao (3) MS. Jeff Wisott (4) MS. Michael Lopez Alegria (2) MS. Bill Arthur (3) (seven)	Cdr. Brent Jell (3) Pit. Mike Bloomfield (2) MS. Joe Tanner (3) MS. Carlos Noriega (2) MS. Marc Garneau (CSA) (3) (five)

\*\* Target launch and landing dates are based on KSC assessments. Official launch dates are set at the Flight Readiness Review.  
 \* Change from earlier update.

All times are Eastern

U/R Under Review  
 TBD To Be Determined  
 NET No Earlier Than

Crew  
 Cdr Commander  
 Pit Pilot  
 MS Mission Specialist  
 PC Payload Commander  
 PS Payload Specialist  
 ISS International Space Station

CSA Canadian Space Agency  
 ASI Italian Space Agency  
 RSA Russian Space Agency  
 CNES French Space Agency  
 NASDA National Space Development Agency of Japan  
 ESA European Space Agency

# Timestep



PROsat for Windows is used by most leading weather satellite enthusiasts. They have grown up using Timestep products and now rely on the superior image quality and ease of use provided by PROsat for Windows. Features such as real time reception, auto-scheduling, temperature readout, totally automatic reception of all NOAA's and Soviet satellites and automatic animation have made PROsat the preferred package. Satellite profiles allow individual adjustment of synchronisation and input levels, giving unrivalled automatic or manual reception of even "difficult" satellites. Geostationary satellites are well covered and include METEOSAT, GOES, GOMS, GMS and even INSAT. All images can be in colour and because this is a full 32 bit Windows application it will work perfectly on Windows 95-98-NT4.

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# MilAir

## RIAT 2000 - Cottesmore

Confirming the suppositions I made in last month's column, on Monday 24th January an official announcement was made that this year's International Air Tattoo will be staged at RAF Cottesmore. I am grateful to those of you who responded to my comments on this subject last month and it is obvious that some of you share my reservations regarding the limited access into the airfield. Nevertheless, as always I am sure it will be an excellent show.

## London Military

My thanks go to those of you who kindly responded to my request for updated lists of London Military frequencies, in particular, **Dave, Phil & Paul, Lee, Mike** from Cumbria, **Photavia, Ron A, Ron K** and all the **Anons**. I am consequently utilising a fair chunk of space this month to present a 'London Military Special', listing what I hope is a complete current frequency listing. What follows is an 'edited' compilation of the London frequencies and as far as I establish they have all been noted in use in the past 12 months. (The Autumn 1999 changes having been taken into account).

For reference: ICF = Initial Contact Frequency, STC = Special Tasks Cell. It is worth noting that the listener can be caught out by Special Task Cell frequencies. Some of these frequencies like my local one, 244.375, can be heard fairly regularly, whereas others may not be noted for 18 months.

It is very easy to think that they have been withdrawn when all of a sudden they chirp into life. The longest I have gone without hearing a specific STC frequency is 25 months, others have been even longer!

## London Military North/West/South

127.45	ICF/Northwest Sector	264.825	North/West ATC Primary
128.25	South/West Standby	268.975	South/STC
128.7	North/West ATC Primary	270.0	Central/Standby
133.3	South/West ATC Primary	275.35	Central/ICF
133.9	South/West ATC Primary	275.475	South/West ICF
135.15	South/West ICF	277.125	South/West Standby
233.8	Clacton	278.025	South/West
244.375	Berry Head STC	278.075	New Sep 99 S/W ATC Primary
245.1	Practice Emergency Test Frequency	279.175	South/West STC
		279.225	South/Southwest STC
245.175	New Oct 99/SW Primary	279.475	North/Standby
245.25	North STC	281.225	North/STC
247.275	New Nov 99	283.525	South/West ATC Primary
249.675	South/West STC	284.875	North STC
251.225	Seaford/Hurn	285.175	South/West
254.225	South/West ATC Primary	290.575	South/STC
254.275	North/West/ICF	291.075	London Upper
257.225	South/West ATC Primary	292.525	North/West ATC Primary
257.275	New Nov 99	299.8	Dover/Lydd
261.025	South/STC	340.25	North/Warton STC
262.975	South/West ATC Primary		

## London Military East

131.225	Standby	277.775	STC Discrete
133.325		279.3	ATC Primary
135.075	Northern Area Primary	280.575	STC
135.275	Eastern UK ICF	284.3	Discrete
135.625	ATC Primary	290.6	Discrete
135.925		290.7	WASH/ACMI Transit
232.025	ATC Primary	291.775	WASH/ACMI Transit
248.775	STC/ACMI	292.6	Discrete
254.825	ATC Primary	293.475	ATC Primary
263.075	ATC Primary	299.975	Eastern UK ICF
275.675	ATC Primary	313.0	ATC Standby & Discrete
278.775	WASH/ACMI Transit		

I have seen a recent report that 292.1 is also in use as London Military, but despite extensive listening, I have not yet heard it in use and I suspect that this is an error. The following frequencies were all reported as in use by London between 1995 - 1998, but are all now thought to have been withdrawn or reported in error. According to all the information I have, none of them have been reported in the past two to three years: 245.325, 250.275, 254.9, 261.0, 282.125, 283.675, 290.3, 291.175. As ever, if you can add to or amend any of this information, please let me know. If you don't tell me, I can't put it in *SWM*!

## C-130 Record

An interesting snippet was sent to me by **Brian L.** which I think may come from RAF News or one of the other official publications. A brand new Hercules C.4, (C-130J in RAF terms), set two new aviation world records during its delivery flight from the Lockheed plant at Dobbins Air Force Base, Atlanta, on route to RAF Lyneham.

The records were related to the turboprop classes Unlimited and Class C1M, which appertain to average speed over a recognised course. The non stop Trans-Atlantic flight was made without in-flight refuelling and covered a total distance of 4127.73 statute miles or 6641.52 kilometres. (You can't get more precise than that).

Leaving Dobbins at 8.29pm, (local), on 7th December the overall flight time was nine hours 58 minutes at an average speed of 405mph, (652km/h). I think most readers will agree that it is a fairly impressive record for a turboprop aircraft.

Much has been written about the C-130J over the past few years so it is good to see it prove itself. The final comment should go to the Lyneham station commander, Group Captain Geoff Bullen, who was also the co-pilot.

After completing the flight he stated, "Having spent the last two and a half years listening to what the C-130J can't do, I have just spent 10 hours experiencing what it can do, and it was extremely impressive".

## Band Allocation

I have had an E-mail from **Jamie** in Newcastle, who asks if I can identify what other frequency allocations are contained within the Military u.h.f. airband, 225 - 400MHz. According to documents issued by the Radio Communications Agency here are the **primary** items that appear within that NATO band.

MHz	Comment
225.0-230.0	Available for civil use in the NATO band, 225- 400MHz.
232.0-236.0	Radio Astronomy at Darnhall, Defford, Jodrell Bank, Knockin, Pickmere and Wardle.
243.0	EPIRBs (Personal emergency locator beacons, often used at sea) - also the u.h.f. distress frequency.
312.0-315.0	Mobile Satellite Services operate on a <b>secondary</b> basis.
326.5-328.5	Radio Astronomy at Jodrell Bank.
328.6-335.4	Aeronautical Radio-Navigation Beacons (n.d.b.s, etc.).
335.4-399.9	Airfield Instrument Landing Systems (ILS) Glide paths.
380.0-383.0	Home Office and/or Scottish Office Emergency Services (as required).
390.0-393.0	Home Office and/or Scottish Office Emergency Services (as required).
387.0-390.0	Mobile Satellite Services, Space to Earth, operate on a <b>secondary</b> basis.

I hope this gives you a guide. As you can see, some are only used as a secondary band and others will only produce data or ident transmissions, so don't expect to hear too much in the way of voice communications.



A NASA operated SR-71 flew for the first time in eight months during June 1999, subsequently flying several more missions by October. (Two aircraft are being kept in an airworthy condition). Consequently, I thought our photo this month would depict one of the NASA operated Blackbirds seen on the ramp at Edwards in 1995.

■ ROGER BUNNEY, 35 GRAYLING MEAD, FISHLAKE, ROMSEY, HANTS SO51 7RU

# Satellite TV News



**Chechnya burns - a reporter updates viewers via a 36°E news package.**



**Clouds over the Earth as the Challenger flies over, seen via the NASA-TV live coverage over NSS-K digital on Christmas Day.**



**An unknown caption ex USA via NSS-K digital.**



**The Hubble telescope is drawn into Challenger's cargo hold for on-board repairs, the white structure, right, is part of the Challenger structure - via NASA TV.**

The dramatic event of the past few weeks was of course our entry into the new Millennium, and as our old friend **Roy Carman** (Dorking) commented, there was a 'deluge' of news and OB feeds for the satellite enthusiast!

Unfortunately, yours truly was swamped not so much with countless exotic OB receptions from remote Pacific islands, but with one of the several strains of 'flu circulating around the area - in fact - I've had 'flu version 1.1 before Christmas and then end December with version 1.2, the later an upgraded 'flu that knocks you down. When you're just

about standing seven days later, it re-introduces intense headaches to knock you down once more! Three weeks on and the 'flu bug rumbles on...

My own Millennium sightings were very restricted, opting for the easy analogue loggings through glazed dizziness! There were many signals about though - one that just refused to appear was the BBC Shetlands feed into network.

There was quite a build up to our Millennium experience with overseas networks reporting on 'the Dome' and the London preparations. December 27, 1900 and the RTP Lisbon reporter was found with both reports and 'happy new year' links around the Thames, this on a Brightstar VCR payout into Lisbon MCR via NSS-K, 21.5°W - 11.550GHz-H (SR 5632; FEC 3/4) via a Reuters digital lease.

The French Telecom birds were very active and featured numerous analogue feeds, 2C @ 3°E carried for example an NTSC feed into an American network @ 2145 (12.643GHz-V) and nearby @ 12.600GHz-V an entrancing offering ex Egyptian Radio and Television with a choir suitably located offering a sing-in of hymns, etc.

A couple of hours earlier on *Telecom 2D* @ 5°W the French president was addressing the nation, the OB feed @ 11.513GHz-H which re-appeared slightly delayed on the main TF-1 national feed also *Telecom 2D* @ 11.689GHz-H!

*Eutelsat I F3* @ 36°E carried several digital feeds, though the SISLink operators seemed to opt into encryption (certainly loss of locked picture) when the actual transmission occurred and once completed switching off completely! There has been expressed the thought that SISLink are using MPEG-PowerVu transmission, something that isn't available in any UK receiver - shades of the EBU's MPEG 4:2:2 that we also cannot crack.

Checking out Roy Carman's log shows a massive pile-up and a few satellite owners really made a financial killing over the new year period. NSS-K, 21.5°W offered a mass of OB feeds from around the World, even APTN appeared in analogue mid afternoon, a rare sighting these days.

The Chinese welcomed year 2000 which was fed into Europe at 11.577GHz-H (5632+3/4 - actually a programme feed for Beijing's CCTV-4 channel) with 11.559GHz-H digital offering a Chinese show out of Hong Kong. This feed cut to offerings of celebrations from other parts of the Pacific Rim.

One dramatic Millennium Eve event was the retirement of President Yeltsin, well covered as a dramatic news 'exit' over much of the day. ZEE-TV (UK) took an Indian TV insert at 11.582GHz-H (unusual SR 5640+3/4), this initially was a religious service developing into a magnificent song and dance spectacular.

Certain of the trans-UK feeds were obviously carried via *Intelsat 801* @ 31.5°W, odd to relate that an OB feed from the London Dome was carried as a satellite feed into the White City (10.960GHz-V 5632+3/4) - what, no fibre cables laid! Italy of course retained her presence on *Intelsat 705* @ 18°W, but

from about 2100 NSS-K provided a kaleidoscopic entertainment from around the World, the grandeur of Moscow's Red Square at their midnight, the Eiffel Tower, Berlin and the USA.

Around the same time, *Eutelsat W2* @ 16°E also burst

into activity with largely European OB circuits, London, Italy, Amsterdam - even at 11.015GHz-H digital on Tower Bridge there were folk waving placards 'The end of the World is nigh' and 'This is your last chance to sin!' (no chance for me with the 'flu unfortunately!)

In all, Millennium night for the satellite diehards was all action and entertainment as they crouched over their monitor, dish positioner and bottles. Let's wish a good belated new year to all our readers.

Life continued despite the Millennium. Other religious occasions around this period were of course Ramadan, heavily covered on the numerous Arabic channels and the Russian Orthodox Christmas celebration. The Russian TV channel PTP carried several church services on January 6th. PTP is available in the UK at strong signal levels in C-Band - *Gorizont 31* @ 40.5°E, 3.675GHz, RHC and it's worth checking on the 11° and 14°W slots as well for Russian sourced programming.

The 'flu epidemic of course has been headline news during January and one NHS hospital outside broadcast circuit was carried into UK breakfast TV via UKI-149 on the 10th - the usual 11.530GHz-H analogue. Breakfast TV has also been taking SNG OB digital offerings via UKI-415 (11.566GHz-H, 5632+3/4), 415 may be the follow-on from 149 should this analogue truck be closed down.

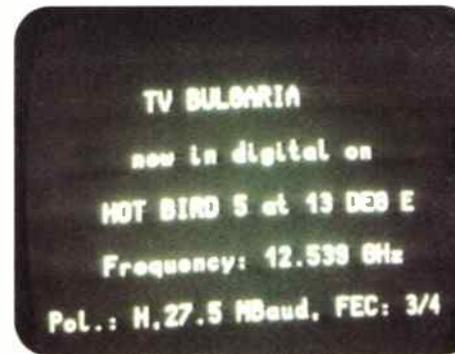
Both UKI-149 and 415 were carried over NSS-K @ 21.5°W. The other main event over the Christmas period was the *Challenger/Shuttle* flight when the Hubble space telescope was repaired. NASA-TV provided dramatic live footage of the orbital action, the capture of *Hubble* into *Challenger's* cargo hold for repairs and then relaunched. The NSS-K, 11.566GHz Reuters lease carried extensive Shuttle mission/updates at regular times daily.

After prolonged negotiation over orbital slot parking (see news section) *Telstar-12* - previously known as *Orion-2* - happily settled down to a 'Welcome to Telstar 12' analogue NTSC caption at 11.542GHz-V and awaits a queue of customers. Nearby at 14.8°W *Eutelsat I-F5* had been downlinking an Italian promotional channel 'Digitally' at 12.516GHz-V analogue (I thought this was actually on Telstar!).

'Digitally' is uplinked ex Fucino earth station, Italy, and is received in Ontario for American cable distribution. Eutelsat are now feeding 'Digitally' via their Atlantic Gate 12.5°W slot and *I-F5* has been moved back to 12.5°W, though the inclined orbit it suffers makes for an unpopular commercial craft to hire.

An active spot to check for sports feeds into the UK is *Intelsat 801* @ 31.5°W, both BT Paris and Sky Sports have been seen using 10.964 and 10.995GHz-V respectively with the familiar SR 5632+3/4 parameters. Another varied slot for all manner of domestic OB programming is *Kopernikus-2* @ 28.5°E. With the close proximity of *Astra 2A* @ 28.2°E, the tendency seems to be use of lower Ku-band 11.2-11.70GHz.

In recent weeks, remote links included shopping malls, flooding, happy German singers, motorway crashes and sporting events. NDR are particularly active and most



**A caption seen via Hot Bird capacity @ 13°E.**

evenings around 1700 will see at least one link on air, though often three are present.

More of the BBC regional SNG trucks appear to have gone digital as there seems minimal analogue 1800 activity on 5°W and 3°E into BBC regional news programmes. I gather that BBC-TV South uplink onto *Telecom 2C* which is received at BBC White City and then fed via terrestrial microwave back to Southampton.

Roy Carman noted a *Telecom 2C* digital feed on December 14th concerning the French navy and their aircraft flying surveillance missions, the story being the oil tanker sinking off their NW coast and the resultant oil pollution. Odd parameters of SR 6289 and FEC 7/8.

The same day SISLink ran up their UKI-38 unit to Liverpool to cover Paul McCartney's visit to the Cavern night club. The crowd were loudly enthusiastic making the reporter difficult to hear - via *Telecom 2D* @ 5°W, 11.508GHz-H (5632+3/4).

One good 'DX' catch by Roy was *Eutelsat 2-F1* @ 48°E using the unconventional digital parameters SR 2222 with FEC 0.5 @ 11.042GHz-H. Despite the downlink registering as good as +50% on his receiver, the downlink signal kept dropping out - this is a first for Roy and an orbital slot that is never reported! Checking out the German 'Telesatellite' definitive listing shows that nothing is currently active as a permanent downlink from this slot.

For several days over the Christmas period 'Chaosfilms' appeared on *NSS-K* @ 21.5°W - the 22nd an NTSC analogue feed @ 11.590GHz-V with a seasonal Lapland offering, the 27th another 'Chaosfilms' epic on *NSS-K* - 11.588GHz-V - this time featuring an indoor party (live) together with shots of the Eiffel Tower. Though at 1800 this is obviously a VTR insert and during the playout very heavy rain (in France) took out the uplink in rain fade, even with threshold extension at maximum (3.5dB) the signal went into noise and slowly returned to normal. Here in the UK at this time the weather was dry.

Another change in the digital parameter experience was seen on *Eutelsat W2* @ 16°E, the Italian Lario Earth Station was received @ 10.993GHz-H with an SR 6406, FEC 3/4 transmitting a variety programme. The same day on *W2* @ 12.558GHz-H, 12.565GHz-V the return of ski jumping from Innsbruck, Austria, again we find an SR 11281, FEC 3/4.

It's possible that SNG operators, as an attempt to minimise third parties observing their digital signals, may opt into 'non standard' parameter rates - they've only to advise their receiving site of the specifics and everyone else will be left in the dark - unless an aware enthusiast opts for a receiver that can operate in an 'auto' mode, seeking and locking up any non standard transmission and revealing the SR/FEC and PIDS.

To perhaps expand on this observation, I have before me a final page of Roy Carman's log comprising eight loggings between the 1st-3rd January. All are Ku/Telecom band receptions. Only 1 is a 'standard' (or commonly used) parameter - that is SR 5632+3/4. Others are in SR and FEC respectively - 5031+2/3; 2171+7/8; 6406+3/4; 30000+3/4; the 2 x 11281+3/4 and 3254+1/2.

Just a quick note to say that we're pleased to hear from readers' and their satellite receptions. When writing, details of equipment in use will be equally welcome, however basic or complex, current day or going back to *Sputnik* in the late 50s.

## Orbital News

The Eutelsat press release of December 13th advised that agreement had been reached for the use of the 15°W slot by Loral Skynet (operator of *Telstar-12*) and for Eutelsat's operations at their 'Atlantic Gate' slot @ 12.5°W. Loral are now playing for trade at 15°W whilst Eutelsat have withdrawn their vintage *I-F5* satellite from 14.8°W.

*Telstar-12* operates with 36 Ku-band high powered transponders under a temporary FCC licence pending permanent approval of that slot. Meanwhile, Eutelsat are using their *II-F2* bird at 12.5°W slot pending the launch of their '*Atlantic Bird-1*' satellite, Summer 2001, which will add a further 20 Ku-band transponders into that slot.

Until the new '*Atlantic Bird-1*' is launched, Eutelsat will operate their trans-Atlantic link with *I-F5* and *II-F2*. The former craft is elderly and has exhausted most of her station keeping

fuel and is consequently suffering inclined orbit movement.

Eutelsat have launched a 'sampler' digital multiplex on their 7°E *W3* satellite, this bouquet includes Euronews; Fashion TV; RAI UNO; RTP International; the French TV5 and German ZDF TV channels plus a couple of French RFI radio channels. Check out 11.387GHz-H @ SR 27500; FEC 3/4. The VPIDS and APIDS vary between each programme (e.g. RTP VPID 4355, APID

4536 whilst Fashion TV has VPID 123, APID 133!).

Intelsat anticipated that their fleet would suffer no Y2K problems as satellites operate by referencing the sun and typically do not contemplate time and dates. All their six earth based tracking stations had been well checked for

problems service outage and in practice no problems were experienced anywhere in the Intelsat organisation over the new Millennium transfer.

The Indian production group TV-18 have formed a partnership with CNBC to create 'CNBC-Asia', a 24-hour news and business channel launching later this year. And another SE Asian news channel is planned to open during 2001, a consortium of Malaysian (TV3), Indonesian and Singapore media interests plans a Jakarta based satellite TV channel in the English language - proposed name is 'Global TV'. The Spanish commercial TV channel 'Antena 3' is also planning a 24-hour news channel, opening date unknown.

After several years of commercial rivalry, Sweden's TV4 commercial TV satellite channel has joined in an operating partnership with rival Canal Plus Nordic. Their two TV groups will share sporting events and co-operate in programme production and developing new specialised channels. Both groups are also investing large sums in local film production.

Recently an *NSS-K* 11.625GHz-V digital lease has been seen using MPEG 4:2:2 compression on a Washington-Europe feed, similar to the EBU compression standard. Unfortunately, 4:2:2 cannot be resolved on any standard MPEG-2 (DVB) receiver, with the PowerVu standard also in use the locking up certain of these transmissions will be impossible!

Eurosport are considering their own 24-hour sports news channel and have in recent times been discussing the project with ESPN, TF-1 and Canal+ for this European coverage programme. No dates have been given for the opening of the proposed channel.

Stefan Hagedorn's 'Transponder News' advised that the Iraqi Space Channel is now available in digital via 36°E capacity @ 11.013GHz-V (SR 4338; FEC 3/4, VPID 4130; APID 4131). The signal proved too weak - showing about 20% deflection on the signal level scale - to lock up on my 1.2m dish.

Finally, there are rumours that BSKYB may close down their analogue transmissions from the *Astra 1* - 19.2°E slot - by end year 2000. The combined analogue/digital subscriber number reached nearly four million at the end of 1999 and anticipated five million end 2000. The numbers of analogue to digital shifts plus new digital subscribers has encouraged thoughts to the analogue close-down originally planned for end 2002.



(Left & Above) These are seen on a *Telecom 2B/D* digital bouquet @ 5°W.



Our old friend UKI-149 analogue often seen early mornings at 21.5°W may soon be off the air.



The Italian 'DIGITALY' 24 hour promo channel via the 'Atlantic Gate' Eutelsat capacity.



This shows the C-Band TV du Mauritanie' output night of December 21st with mistracking video type bars over all programming via their 3.919GHz-RHC on *Arabsat 2B* @ 30.5°E.



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# Scanning

**H**ello again. Well, the nights are drawing out and if you live in the wilds of the UK, there should not be too many times when you have to listen to the local authority roads department frequencies in low band f.m. to see which roads have been gritted and whether the snow ploughs are out. All the frequencies which you may need for that particular useful item of eavesdropping are listed in the *UK Scanning Directory* which is, of course, available from the *SWM Book Store*. This book I find to be a necessary tool in locating just what I want to hear and also, on occasions, identifying what I have just received.

Apart from a scanner and an outdoor antenna, the *UK Scanning Directory* is really the next most important bit of kit that you will need. If your scanning needs are local, then you can probably dispense with the outdoor antenna but, trust me, you will eventually need one.

Now I don't want to intrude on anyone else's column space, but there is another item of equipment that I have found to be really useful. I have a computer - just an old 486 running *Windows 95*. From the Internet I downloaded the most excellent program for recording received audio. The program is *Scanner Recorder* and is freely available at <http://www.davee.com/scanrec.html>

All you need, apart from the program, is a shielded leaded terminated in a plug at either end. One plug to fit your scanner's external speaker or line out socket and one to plug into the computer's soundcard. *Scanner Recorder* can then be set up to record all the audio that emanates from the set.

The advantage with this program over taping is threefold. Firstly, there is no audio loss at the beginning of transmission as switching is super fast, secondly there is an adjustable audio squelch that controls switching and thirdly the audio is compressed to a wav. file enabling swift playback and erasure. You can wander off and leave it running, or as I do, leave it on overnight and review events the following day.

Audio can be edited using the Windows sound recorder and also E-mailed. Sorry to go on about computers...

## Been Listening?

Last month I mentioned lower frequency DX reception. Have you been listening? I have. Although the 30 to 50MHz section has not been consistently sparkling, it has been some fun. I have heard US Fire Departments and on 41MHz an American Police force doing masses of vehicle and person checks.

There have also been loads of other less exotic stuff including a plumbing company in the New York area which was having a ghastly experience with a blocked drain in Yonkers. I still live in hope of hearing the California Highway Patrol on 42MHz...fat chance of that!

## Military MOULD

No doubt when you have been listening into the 70cm amateur band you have heard several rather strange and usually boring transmissions which consist of about a second of blank carrier followed by a small data burst and then shut off again. The whole procedure being repeated every 30 seconds or so.

If you search around you may find a few of these signals depending on whereabouts you live. They appear in other parts of 400MHz as well, not just the amateur band. Also, should your scanner get lost while in a search mode in the 70MHz area, you may well find identical transmissions to those in 400MHz.

You also may notice that some of these signals are transmitted simultaneously on both bands. You are listening to MOULD. This is a military system which was built many years ago and is a national scheme.

Some UK bases abroad also have the same system. This

is a voice system which very rarely fires up with test transmissions and even rarer still, actual exercise traffic. Some years ago it was using Pye equipment, but now with Pye becoming Philips and now Simoco, things may have changed.

As the u.h.f. part of the system is partly within the amateur band, the casual listener may be forgiven for inadvertently monitoring it but, however, should you hear voice traffic on MOULD, then you will realise that the voice procedure is military in origin and the repeaters are linked giving useful coverage.

Can anyone give me any more information regarding this system? I don't even know what MOULD stands for - if anything. Having heard the transmissions for many years, my curiosity has been well and truly aroused. Please, if you do know anything then get in touch. As usual, anonymity is guaranteed if required. But I am intrigued.

## What's Yours?

What sort of equipment do you use for monitoring? It may be the most simple of set ups - maybe a hand-held on the shelf with the local frequencies of interest whirling around on the display or you may have the latest 'Yokohama Castanet 4000' or whatever with all accessories and a selection of antennas to switch in.

The basic tenet is, however, "If it's not running then you won't hear a thing". The finest kit will not be much use if it's not switched on or you don't know how to drive it properly. The fine thing about this hobby is that it's not exclusive. You can certainly do other things while listening for traffic.

For example, I can be working at the word processor or patching something on the bench for a few hours and then suddenly realise that the scanner is not turned on and I could well have been listening to something useful. Even the local inshore weather forecast is useful information when you live in the middle of nowhere and the mainstream TV and radio weather forecasts either tell you fibs or miss your area out altogether.

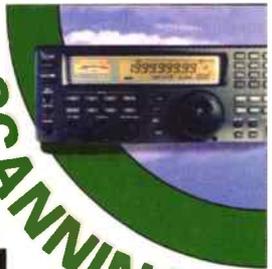
While I am typing this I have a Commtel base scanner running and a Standard C5900 v.h.f./u.h.f. amateur scanner/transceiver trundling away as well. There is a Yaesu FT-920 h.f. radio listening to a utility frequency and another u.h.f. amateur radio tuned to one of our local amateur nattering frequencies. Local in this case means over a 80km sea path.

The AR1000 is not running at the moment. I use it in conjunction with a museum piece 286 computer to monitor pager traffic, but the computer plays hell with the BBC2 TV reception. So, while you are working alone you can still be gathering information which is pretty much what this part of the radio hobby is about.

Of course, I don't recommend that you run a scanner while working in the local supermarket or other place to where the public have access as that would certainly be deemed to be a trifle unshrewd, but you get my drift. By the way, the Commtel base scanner is just hooked up to a home-made whip antenna about a metre long mounted on the bracket that the outside light is on.

The C5900 has a triple band Watson W2000 antenna which is ideal for 50, 144 and 433MHz amateur bands and also great for general scanning. This antenna is mounted on a chimney stack and is now at an angle of about 10° from vertical following gale force winds.

This 'white stick' has taken an awful beating from the terribly high winds that we endure here and has been in situ for the last three years now and continues to perform as new. I can recommend it without hesitation. Having tempted fate in this way, I expect the darn thing will be in pieces in the garden in the morning having been sat on by a sparrow - oh well!



SCANNING

## 'Outta' Space

I have almost run out of space now. I really could go on for ages, but then there is always another month. If you have any information, queries, questions or tips then please get in touch either by E-mail or any other means. I am subscribed to the *SWM* list server that Kevin gave details of in his 'Ed's Comments' in the January *SWM*, so anything of general interest can be transmitted there. I can reply either via the column or individually, whichever suits you, but I am always after information as well. There is always something new to learn.

Finally be a 'shrewdie'. We all know that scanning runs a fine edge of legality. Please keep listening.

# Book Profiles

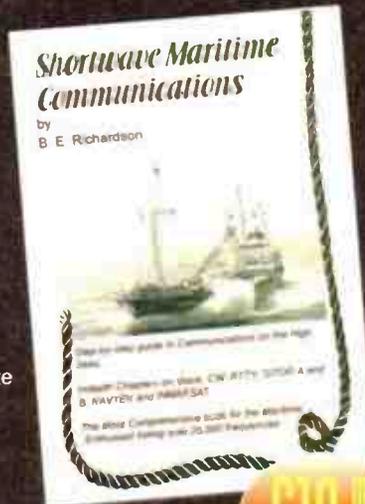
See below for our comprehensive book listing or visit [www.pwpublishing.ltd.uk/books/](http://www.pwpublishing.ltd.uk/books/) for lots more information on radio-related books. Internet users can order on-line.

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This awesome radio covers 5kHz-30MHz in bandwidths of AM, Slideback, FM, CW and SSB demodulation modes. Contains lots of features and you can bet this is a super-rare find in the used market.

**£2600**



**Eddystone 1830/1**

The Eddystone 1830/1 is an HF/MF communication receiver covering a frequency range of 120kHz-31MHz in 9 bands AM, USB, LSB and CW. Four IF bandwidths: 0.100, 1.3, 3.0 & 6.0kHz. Main IF output is 100kHz. Other features: AF & RF gain controls, preselector RF peaking control, BFO pitch control & silky smooth slide rule tuning dial.

**£1295**



**Harris RF-590**

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**£2250**



**Watkins & Johnson REC-977A**

The Watkins & Johnson model 977-4 VHF/UHF receiver covers the frequency range 30-300MHz in 2 bands (30-90MHz & 90-300MHz). Reception is in the CW, AM, FM or PULSE mode and IF bandwidth included are 40kHz, 300kHz & 3MHz. The unit also features a COR-SQUELCH circuit and a centre frequency tune & signal strength meters.

**£499**



**Racal RA329 (RA-217D)**

Military HF radio receiver incorporates the RA-217D receiver. Reception from 3kHz-30MHz. SSB, DSB, MCW, CW, FSK, PhM & FM. IF bandwidths include 200Hz, 1kHz, 3kHz & 13kHz. AGC control allows for manual, short, medium or long time 200-250VAC, 45-400Hz or from 9-30 VDC floating input.

**£975**



**Watkins & Johnson 8716**

The Watkins & Johnson WJ-8716 has only just arrived in to stock. It is a 0.1-30MHz commercial receiver. It covers all modes. It is fully fitted out with filters but we do not know which one's yet. This receiver has only just arrived.

**£1999**



**Watkins & Johnson 8730A**

The Watkins & Johnson WJ-8730A receiver covers the VHF low band frequency range from 20-90MHz and the UHF band frequency range from 490-1000MHz. IF bandwidth included are 50, 200 & 500kHz. Reception is in the CW, AM, FM & PULSE modes. Other features include a COR-SQUELCH circuit, AFC, DAFC (digital frequency control) and a panoramic display.

**£2250**



**Harris CEI-357**

This VLF receiver manufactured by Communication Electronics Inc. now Watkins Johnson, covers the frequency range of 1kHz-800kHz. IF bandwidth include 150Hz, 1kHz, 3kHz & 6kHz. Built-in 0, 20, 40 and 60dB input attenuator, digital frequency readout with DAFC (digital frequency control) and BFO modes of ZERO, VARIABLE, 5.5kHz USB & LSB.

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Each topic covered is clearly

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## The Complete Shortwave Listener's Handbook

Short wave radio may be the most fun you can have sitting down, and this A-Z guide for everyone from absolute

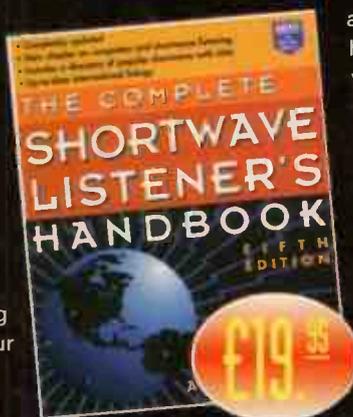
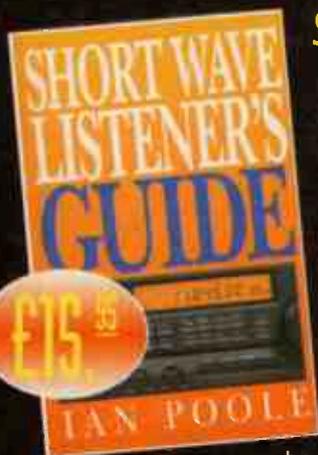
beginners to advanced hobbyists is your all in one partner in listening. It gives you complete, up-to-date information on equipment, world-wide stations, clubs,

satellites, computers and much more. All you need is enthusiasm.

Chapters cover: Help with choosing and using equipment - from the simplest to the most sophisticated; Guidance on finding hot, newsworthy stations, espionage broadcasts and pirate and illegal frequencies; Up-to-date listings of stations and frequencies for all inhabited portions of the globe; Insiders guide to web sites with shareware for translating audio Morse to text, receiver control demo programs and much more; Simple, cheap ways to improve reception; Convenient lists of station and equipment dealer address and loads more. All for **£19.95.**

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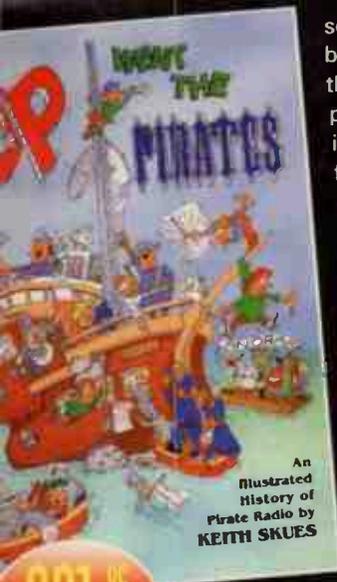
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## The ARRL UHF/Microwave Experimenter's Manual

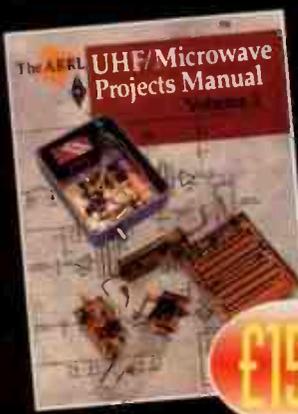
The ARRL UHF/Microwave Experimenter's Manual is written for the growing numbers of radio amateurs who are discovering that there is life on the frequencies above the 70cm band. Technicians and engineers will find this book particularly useful as the basis for understanding microwave technology.

Those individuals with some experience in u.h.f. and microwave work will certainly recognise familiar names along the many experts who contributed to each of the twelve chapters: A brief history; Safety;

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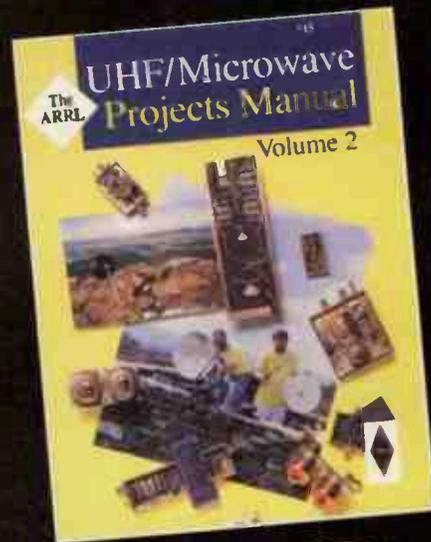
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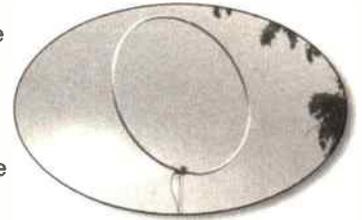
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**Yupiteru MVT-7100EU**  
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73 from Dave G4KQH, Technical Manager.

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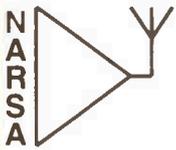
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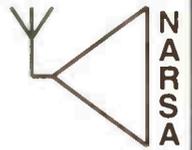
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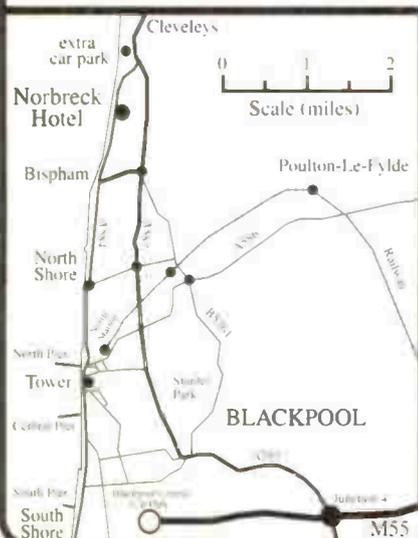
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# Decode

Something for everyone this month with a continuation of my beginners section and some details on a brand new data mode for the more adventurous listener.

## Keyboard-to-Screen!

For this month's beginners section I thought it would be useful to take a close look at how pressing a key on your computer gets transformed into a radio signal and then ends-up on someone else's computer screen. This may sound awfully complicated, but I'll try and show what a simple process it really is.

To keep this bang up-to-date I'll assume a computer is being used both by the sending and receiving stations. So let's get started with the very first key press. Underneath each key on your computer is some sort of detector that can tell that a particular key has been pressed.

There have been a wide variety of sensors used over the years ranging from a simple on/off switch through to a variety of sophisticated movement sensors. It doesn't really matter what type of sensor is used, just the point that pressing a key causes an electrical sensor to operate.

You will have noted that using a modern keyboard is not as simple as just pressing one key at time as there are several occasions where pressing two keys together changes the meaning. The classic example of this is the SHIFT key which switches between lower case and capital letters.

Another example is the Shift Lock key. In this case, the computer has to remember that all letters turn to capitals once the shift lock key has been pressed. Because this requirement is the same for just about every computer, special integrated circuits have been developed that automatically handle the processing of these keys.

If you've been involved at all with computers you will have learnt that they can only really deal with numbers and binary ones at that. So what on earth does a computer do when it has to handle letters and punctuation? The answer is all characters are converted to numbers.

In order for this to work successfully, there needs to be some sort of standard to make sure the conversion between numbers and letters is the same on all computers, otherwise we'd all be seeing gibberish on our screens. So if, for example, the letter A was to be represented by the number 65 this would have to be true on all computers so that every time they encountered this number they would treat it as the letter A.

Not surprisingly, there are a number of standards around, but the one that predominates in computing is known as ASCII, which is the American Standard Code for Information Interchange. A bit of a mouthful, so it's usually referred to as ASCII and pronounced 'As Key'.

The conversion between a letter and a number can be visualised rather like using a simple look-up table. **Figure 1** shows an example of a basic ASCII look-up table.

Now we have one more problem to cope with before the groups of numbers can be dealt with by the computer and that is the conversion to binary numbers. You see the use of numbers like 65 for A is really only shown in this way for our convenience as we are used to dealing with the decimal numbering system.

You may recall that computers can only really handle binary numbers which comprise just 1s and 0s. The reason for this is tied-up with the fact that signals inside the computer can only take on two possible conditions On or Off and they operate by generally using the 'On' state to represent a binary 1 and the 'Off' state to represent 0.

To show you what this looks like, **Fig. 2** shows the same look-up table but using binary numbers.

To summarise this first section, you should now understand that pressing the A key on your computer causes a special integrated circuit to generate the binary number 1000001 (65) for the computer to process. You need to be comfortable with this principle before we move on to the next section.

## Alphabet Spaghetti

Everything we discussed so far works fine when dealing purely with the standard computer, but we want to use our computers for radio communications. The trick here is that we want to use the computer to emulate existing radio communications systems.

One of the main differences between the radio based systems used by utilities and what happens inside our computers is the alphabet look-up tables that are used. As an example, good old RTTY uses what's become known as the International Telegraph Alphabet No 2 or ITA2 instead of ASCII.

Now this is very different to the ASCII code I've covered so far. For a start, the alphabet is limited to use just five binary digits as opposed to seven used for ASCII. As a result, the relation of letters to converted numbers is totally different as is the use of the shift function.

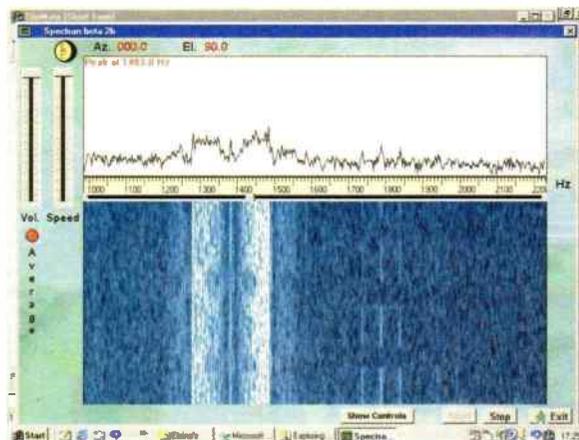
To give you an example, **Fig. 3** shows the first five letters of the alphabet using the ITA2 look-up system.

As you can see from **Fig. 3**, the resultant conversion is very different. Fortunately, you don't have to worry about this conversion problem because that's the job of your decoding software. This software already knows the ASCII code that your computer uses and so can use its own built-in look-up table to change between ASCII and ITA2 and vice versa.

There are loads of different alphabets around on the h.f. bands and most of the main digital modes have their own special alphabet table. I'll give a fuller description of the various alphabets in a later column, but for now you just need to understand the principle of different alphabet tables for different modes.

## Get Out!

So far you should have a pretty good understanding that a computer transforms key presses into binary numbers and that these can be converted again to look like one of the



**Analysis of an FEC signal using Spectran.**

**Fig. 1: Basic ASCII Look-up Table, Decimal Values.**

Key	Value
A	65
B	66
C	67
D	68
E	69

**Fig. 2: ASCII Look-up Table using Binary Numbers.**

Key	Value
A	1000001
B	1000010
C	1000011
D	1000100
E	1000101

**Fig. 3: ITA2 RTTY Look-up Table.**

Key	Value
A	11000
B	10011
C	01110
D	10010
E	10000

data modes such as RTTY. The next problem is how to get this information out of the computer and convert it into a radio signal.

If we start with the radio system, a listen around the popular utility frequencies will show that many data signals are similar in that they seem to generate a type of warbling sound. If you were to analyse these sounds with a spectrum analyser (described elsewhere) you would find that they often comprise a signal that switches between two, closely spaced, frequencies.

A common standard for RTTY is a spacing of 400Hz. Now this use of two conditions to represent a data signal is just like the logic 1 and 0 that's used inside computers to handle binary numbers. It really is as simple as that - the radio signal has two possible states and the higher of the two frequencies is normally used to represent a binary 0 whilst the other, lower frequency is used for a binary 1.

Okay, so that's the radio system, but how do you get the numbers from the computer to the radio. These days, the most common way of doing this is to send each letter one bit at a time by sending the information through some software that uses the computer's soundcard to generate two tones that are spaced 400Hz apart.

One of the most common standards for this is to use approximately 1225Hz for a binary 1 and 1625Hz for a 0. So, there we go, we've managed to generate a basic digital signal from the computer, but how do we receive it?

Well, we just have to reverse the process. If you set your receiver to s.s.b., the two tones of the transmitted signal emerge as two audio tones. These tones can then be applied to the soundcard where they get converted by your decoding software into their respective binary 1s and 0s. This is then changed into the appropriate ASCII code where the computer's display system can show the received text on the screen or send it to the printer.

That just about concludes this simple introduction to the process of sending and receiving data signals. There's clearly much more to be learnt, but this gives you the basic foundation you need in order to move on to the more advanced systems.

## MT63 Data System

Recent years have seen continued development of low speed, but highly reliable data systems. Whilst these have been devised primarily for the amateur market, their success has often resulted in these modes being taken-up by commercial operators.

The system I want to cover this month is MT63 which has been developed by Polish amateur Pawel Jalocho SP9VRC. The main requirement of the mode was to provide a very reliable link for typed text. Whereas many systems tend towards complex error detection and correction systems MT63 uses a rather different approach.

The MT63 signal uses a total of 64 different modulated tones and each character is spread over many tones and also spread over several seconds. The idea being that the receiver can always work out the character even in the presence of quite severe interference.

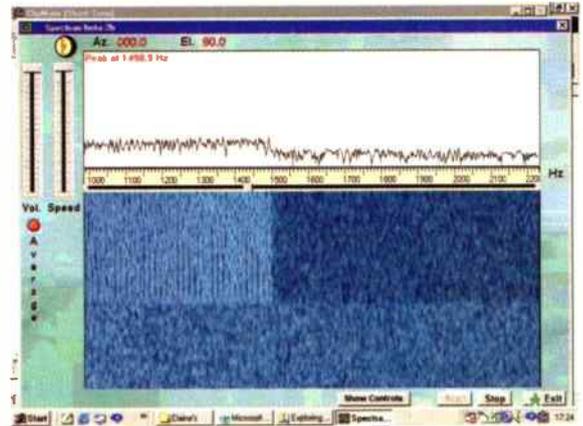
Although the data rate on the 64 modulated tones is quite slow, overall transmission speeds of 100w.p.m. are common-place - certainly faster than I can type! This overall process of error detection and correction is broadly similar to the FEC modes associated with the well established SITOR transmissions. This is where each character is sent more than once in the hope that at least one will arrive in good condition!

As well as being a technically interesting mode, there is lots of amateur interest resulting in a good supply of free software, so it's really easy to get started and see what the mode is like to use. If you already have a PC with a

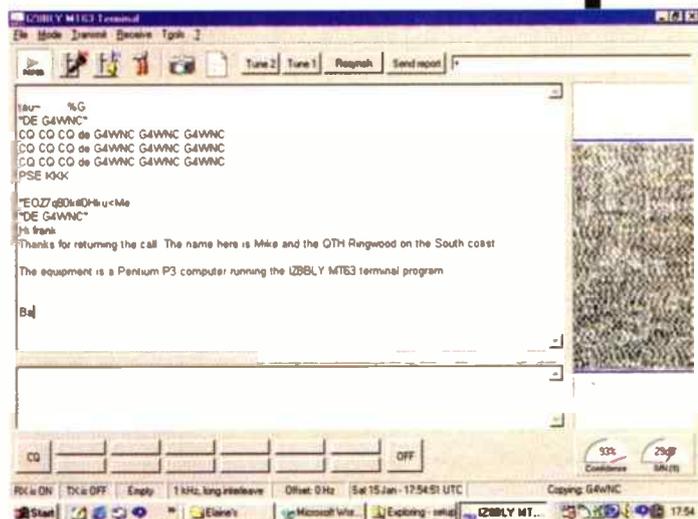
soundcard, the easiest way to get started is to download the *MT63 Windows Terminal* program by Nino Porcino IZ8BLY from: <http://ninopo.freeweb.org/>

I've shown a screen shot or two in the column so you can see its a very comprehensive transmit/receive program that uses the soundcard for encoding and decoding. Now the next thing you need is to be able to find and recognise a MT63 transmission. If you want to listen to a recording of MT63 take a look at the official MT63 Web page at: <http://www.qsl.net/zl1bpu/MT63/MT63.html>

At the time of writing, the main frequency being used by amateurs is 14.347MHz.



**Analysis of MT63 Signal showing the multiple tones.**



**MT63 Terminal Program for Windows.**

## Spectrum Analyser

This is a bumper month for new software and I've just discovered another interesting spectrum analyser. The latest model is *Spectran* which has been designed for Windows '95 PCs by amateurs I2PHD, IK2CZL. As you can see from the screen shots, the display boasts simultaneous spectrum analysis and oscilloscope displays which can be very useful when trying to analyse data signals.

I was particularly impressed with the very clear display and the ability to use extremely fine frequency resolutions. This flexibility means that you could use *Spectran* to really get into some of the very narrow-band modes. Like most of the more recent spectrum analysers, this one operates in real time so you can use it as a very sophisticated tuning aid as well as an analysis tool. To pick-up a copy visit:

<http://members.xoom.com/spectran/>

## Web Watch

To pick-up a copy of *Spectran* visit: <http://members.xoom.com/spectran/>  
Download the *MT63 Windows Terminal* program by Nino Porcino IZ8BLY from: <http://ninopo.freeweb.org/>

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# Maritime Beacons

Enhanced propagation conditions were present during some nights in October, November and December and the listeners who were fortunate enough to encounter them logged beacons which they had not previously heard.

Towards the end of November, **Peter Rycraft** (Wickham Market, Suffolk) heard for the first time the beacons at Nos Emine Lt, Bulgaria (EI) on **291.5** and Roscoff Lt, France (BC) on **304.5**. He says "I was most surprised to find a beacon from Bulgaria until I looked in an Atlas and discovered that there was some coastline bordering the Black Sea". His extensive log also included three beacons which are rare for him - Mahon Menorca, Balearic Is (MH) **292.0**; Pt de Creach Lt, France (CA) **301.0**; Le Grand Jardin Lt, France (GJ) **306.5**.

At 2235 on November 27 **Ross Workman** (Shoreham-by-Sea) picked up for the first time the ident (L) from Torre de Hercules, N.Spain on **301.5**.

At his vantage point on the Is of Man Albert Moore (Douglas) logged the beacons at Cala Figuera, Majorca (FI) on **286.5**; Mahon Menorca (MH) **292.0** and several along the south coast of Spain - see chart.

Over in N.Ireland, **Robert Connolly** (Kilkeel) found the conditions favourable during the early hours of December 12. Between 0040 and 0200 he logged forty-five beacons, the majority being from Spain and the Mediterranean area. A new one for him was Cabou Salou, S.Spain (UD) on **288.5**. In Belfast **Victor Robb** added the beacon at Senigallia Lt, Italy (SA) on **311.5** to his growing all time list.

Several DXers reported hearing a beacon (MY) on **303.0**. At first this seemed to be an error in frequency measurement because the beacon at Cabo Mayor, Spain (MY) operates just **1.5kHz** higher on **304.5**. However, **Peter Pollard** (Rugby) included MY on **303.0** and **304.5** in his report. Some time ago the beacon at Myggenaes, Faeroes (MY) was on **303.0** but recently it has been logged on **337.0**. Any information about this topic would be very welcome here.

A number of other interesting items were mentioned in the reports for this quarter. **Fred Wilmschurst** (Northampton) found reception difficult around **312.0**, whereas he had logged a number of beacons there previously. The cause was interference from a plain carrier, so he may be able to 'null-it-out' by using a directional loop instead of a random wire antenna.

**Brian Heath** (Stapleton) clearly heard the callsign MAA on **297.5** at 0443 on October 10 and again at 0537 on December 7. A keying fault at Mantyluoto, Finland (MA) on **297.5** seems most likely. **Brian Keyte** (Gt.Bookham) found the beacon at Prins Christian Sund, S.Greenland (OZN) **372.0** very hard to detect this time.

A very welcome first report arrived here from **Brian Williams** in Penarth, S.Wales. He searched the band between **277.0** and **433.3kHz** with an Icom IC-756 plus home built pre-selector and a 30m

wire. He logged a number of beacons but some proved to be aero, which are outside the scope of these articles.

In addition to listing the maritime radiobeacons, **Robert Connolly's** popular guide details many of the aero beacons and thereby provides DXers with a simple cross-check. The latest (fifth edition) of his inexpensive 54 page spiral bound guide is still available - for more information please write to him via me initially and enclose an s.a.e.

## Long Wave Maritime Radiobeacon Chart

Freq (kHz)	C/S	Station Name	Location	DXer
215.0	EM	Egedsminde	Greenland	A*
284.5	MA	Cabo Machichaco	NE.Spain	A,B*,C,D,E*,F*,G,H*,I*,K,L*,M*
284.5	PR	Porkkala	Finland	C*,L*
285.0	NP	Nieuport W.Pier	Belgium	H*
286.5	FI	Cala Figuera	Majorca	A*,C*,D,G*,H*,L*,M*
286.5	FT	Cap Ferret Lt	SW.France	A,C,D,F*,G,H*,L*,M*
286.5	PZ	Cozzo Spadaro	Sicily	A*
287.3	IB	I.Berlenga	Portugal	H*
287.5	CV	Cabo Carvoeiro Lt	Portugal	A*
287.5	MD	Cabo Mondego	Portugal	A*,H*
287.5	SE	Sete Mt St Clair	S.France	A*
288.0	HH	Hoek van Holland	Holland	A*,C*,H*
288.5	CT	Pt de Cambrit Lt	France	H*
288.5	FI	Cabo Finisterre Lt	N.W.Spain	A*,B*,C*,D,F*,H*,M*
288.5	UD	Cabo Salou	S.Spain	A*,H*
288.5	YM	Ijmuiden Lt	Holland	B,C,H*,J
289.5	NP	Punta Carena	Italy	C*
289.5	SN	Ile de Sein NW Lt	France	B,C,E*,F*,G*,H*,L*
290.0	AV	Aveiro	Portugal	H*
290.0	MR	Mortador	Portugal	A*
290.5	VI	Cabo Villano Lt	N.Spain	A,B*,C,D,E*,F*,G,H*,J,K,L*,M*,X*
291.0	SM	Pt. St.Matthew	France	H*
291.0	SN	Cabo San Sebastian	S.Spain	A*,D*
291.5	EI	Nos Emine Lt	Bulgaria	H*
291.9	LT	La Isleta	Canaries	A*
291.9	NA	Punta Lantaila	Canaries	A*
292.0	MH	Mahon, Minorca	Balearic Is	A*,D*,F*,G*,H*,L*
293.5	RO	Cabo Silleiro Lt	N.Spain	A*,D,H*
294.0	PH	Cap d'Alprech	France	A,B,C,D,E*,F*,G,H*,J,L*,M,X
294.6	NO	Cabo de la Nao	Spain	A*
295.5	CB	La Corbiere Lt	Jersey C.I.	A,B,C,E*,H*
295.5	CR	Cap Couronne	France	H*
295.5	RE	La Rochelle	France	A,H*
296.0	GR	Goeree Lt	Holland	D,C,H*,L,X
296.0	KN	Skrova Lt	Norway	C*,F*,G*,L*
297.0	B	Cabo Trafalgar	SW.Spain	C*
297.0	FG	Pt de Barfleur Lt	France	F*,H*
297.5	MA	Mantyluoto	Finland	A*,B*,D*
297.5	PS	Cabo Penas Lt	N.Spain	A,H*
298.0	GX	Ile de Groix	France	H*
298.0	TA	Cabo Gata	S.Spain	A*,H*
299.0	AD	Ameland Lt	Holland	A*,H*
299.0	BN	Les Baleines	W.France	E*,H*
299.0	O	Tarifa	S.Spain	A*
299.5	VS	Vieste Lt	Italy	A*
300.0	TI	Cap d'Antifer Lt	N.France	E*,H*
301.0	CA	Pt de Creach	France	A,B*,C,D,E*,F*,G,H*,J*,L,M
301.0	ER	Eierland Lt	Holland	A,H*
301.0	HA	Pt del Hank	Morocco	A*
301.5	L	Torre de Hercules	N.Spain	A*,B,C,D,G*,H*,L*,M*
302.0	RB	Cherbourg Ft W Lt	France	A*,F*,H*
303.0	O	Rota	SW.Spain	A*,C*,D*,G*,M*
303.0	MY	Refer to text	?	F*,G,K,M*
303.0	YE	Ile d'Yeu Main Lt	W.France	H*
303.4	VC	Cape St.Vincent	Portugal	H*
303.5	OR	Punta de Lobregat	S.Spain	A*,C*,D*
303.5	VL	Vieland Lt	Holland	A*,H*
304.0	BR	Cap Bear	France	A*,H*
304.5	BC	Roscoff Blosson Lt	France	H*
304.5	MY	Cabo Mayor Lt	N.Spain	A,B*,C,D,E*,F*,L*
305.7	DA	Dalatangi Lt	Iceland	A*,C*,G*
306.5	GJ	Le Grand Jardin Lt	France	H*

Freq (kHz)	C/S	Station Name	Location	DXer
306.5	H	Hel Lt	Poland	A*,C*,D*,G*
306.5	KL	Kolkasrags	Latvia	A*
307.5	RS	Ristna	Estonia	A*,B*,C,D*,G*,L*,M*
308.0	AK	Table D'Oukacha	Morocco	A*
308.0	RD	Roches Douvres Lt	France	H*
308.5	NZ	St Nazaire	France	A*,C,G*,H*
309.5	BA	Punta Estaca Bares	N.Spain	A,B,C,D,F*,G,H*,J*,L*,M*
309.5	WE	Wangerooe Lt	N.Germany	C
310.0	ER	Pt de Ver Lt	N.France	A*,B,C,E*,H*,L,M
310.5	AS	Castellon	Spain	A*
310.5	BR	El Burullus	Egypt	A*
310.5	DA	Damietta Mouth	Egypt	A*,B
310.5	GV	Genova	Italy	A*
311.5	SA	Senigallia	Italy	A*,C*,G*
312.0	OE	Oostende	Belgium	F*,G,H*,J*
312.0	SP	Cap Spartal	Morocco	A*,C*
312.5	AK	Alkmenrags	Latvia	A*
312.5	BK	Baltijsk	Russia	A*,C*
312.5	BT	Mys Taran Lt	Russia	A*,C*
312.5	CS	Calais Main Lt	France	A,B,C,H*,J,M,X
312.5	DB	Doodsisky	Ukraine	A*
312.5	KA	Klaipeda Rear Lt	Lithuania	A*
312.5	LB	Liepaja	Latvia	A*
312.5	VS	Cabo Estay Lt	N.Spain	F*,H*
312.5	WW	Ventspils	Latvia	A*
312.6	KB	Krautsand	Germany	A*
313.0	PA	Cabo de Palos Lt	S.Spain	A*,D*,F*,H*,M*
314.0	PQ	Porquerolles	S.France	H*
314.0	VG	Ile Vierge Lt	France	A,B,C,D,E*,F*,G,H*,J*,K,L,M
314.0	WU	Wustrow Lt	NE.Germany	A*
314.5	SK	Strandhofn	Iceland	A*
314.5	TL	Punta D.Penna	Italy	A*
315.5	ND	Nida	Lithuania	A*
337.0	MY	Myggenaes	Faeroe Is	A*,C,F*,G,H*,L*,M*
367.0	JV	Jakobshavn	Greenland	A*
372.0	OZN	Prins Chris's Sund	Greenland	A*,C*,G*,H*,L*
381.0	AB	Akraberg	Faeroe Is	A*,C,D,F*,G,H*,L*,M*
404.0	NL	Nolso	Faeroe Is	A*,B*,C,F*,G,H*,L*,M*
404.0	NS	Narssaq	Greenland	A*

### Note:

Entries marked \* were logged during darkness.

All other entries were logged during daylight or at dawn/dusk.

### DXers:

- (A) Robert Connolly, Kilkeel.
- (B) Brian Heath, Stapleton.
- (C) Brian Keyte, Gt.Bookham.
- (D) Albert Moore, Douglas, IoM.
- (E) Fred Pallant, Storrington.
- (F) Peter Pollard, Rugby.
- (G) Victor Robb, Belfast.
- (H) Peter Rycraft, Wickham Market.
- (I) Tom Smyth, Co.Fermanagh.
- (J) Philip Townsend, E.London.
- (K) Brian Williams, Penarth.
- (L) Fred Wilmschurst, Northampton.
- (M) Ross Workman, Shoreham-by-Sea.
- (X) Eric Tubman, Whitstable.



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**PUBLISHED** on the fourth Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Printed in England by Southernprint (Web Offset), Factory Road, Upton Industrial Estate, Poole, Dorset BH16 5SN. Tel: (01202) 622226. Distributed by Seymour, 96 Newman Street, London W1P 3LD. Tel: 0171-396 8000. Fax: 0171-396 8002. Web: <http://www.seymour.co.uk>. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd.; South Africa - Central News Agency Ltd. Subscriptions INLAND £33, EUROPE £40, REST OF WORLD (Airmail) £44, REST OF WORLD (Airmail) £50 payable to SHORT WAVE MAGAZINE, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. SHORT WAVE MAGAZINE is sold subject to the following conditions, namely that it shall not without the written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

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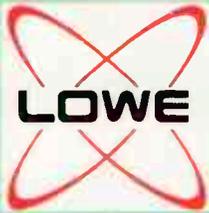
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