

ShortWaveMagazine

# SWM



February 2005

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## make a

Doppler Radar For Home Use

## reviewed

Digital World Traveller

DRM Receiver From Coding Technologies



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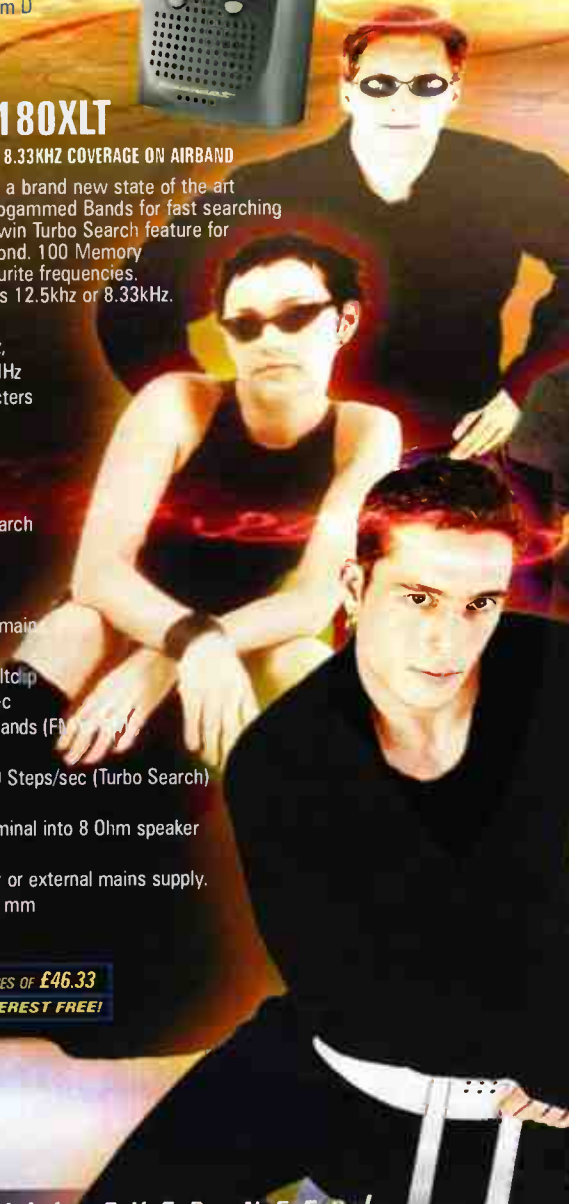
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## Broadcast

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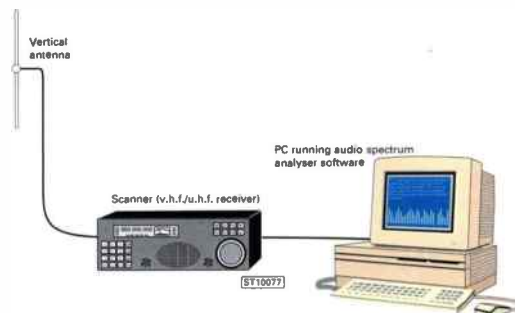
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If you want to meet others with a passion for radio, then look no further. Use our comprehensive and most up-to-date guide to local clubs.



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the on-line action!

## Coming Up Next Month

in March 2005 SWM

- Don't miss the FREE *Scanning Scene Extra* 32-page magazine
- Computers and Radios - they do mix! See how to make the most of the combo.
- Ramsey doppler direction finding antenna kit - built and tested.
- Keep on top of the world of monitoring with SWM
- and much more...

\*contents subject to change

## SWM Services

### Subscriptions

Subscriptions are available at £36 per annum to UK addresses, £44 Europe, £54 Rest of the World. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £61 (UK) £75 (Europe) and £92 Rest of the World.

### Components For SWM Projects

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

### Photocopies & Back Issues

We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for SWM are £5 inc P&P each and photocopies are £3.00 per article inc P&P.

Binders are also available (each binder takes one volume) for £6.50 plus £1.75 P&P for one binder, £2.75 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for SWM/PW is also available from the Editorial Offices for £2 inc P&P.

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# ED's



## comments

### Disasters

The world and its inhabitants continually experience disasters at a variety of levels. Some minor, others with massive impact and tragic loss. Late December saw an event that was to be responsible for the largest loss of human life in one day since WW1. The earthquake and resultant tidal wave (Tsunami) caused devastation to the area around Indonesia was a shocking reminder of how fragile our lives are. The world's citizens are seemingly all compelled to do what they can to help. It is the professionals in the area who will ultimately do most to assist those struck by this monumental natural event.

Radio communications play a vital role in the co-ordination and execution of emergency plans. There will doubtlessly be a deluge of radio based stories as the devastation unfolds. Certainly there is much activity from the region. One such snippet is as follows.

Two British radio amateurs are preparing to fly out to Sri Lanka in a bid to help in the aftermath of the disaster. **Malcolm Harwood M0XAT** and **John Baker G0MTQ** were due to fly from Manchester Airport and they should now have arrived.

Travelling at their own expense, the pair were carrying vitally needed amateur radio equipment to assist with relief effort in Sri Lanka. They also took some urgently-needed medical supplies.

The medical supplies have been donated by staff at the British Cattle Movement Service, where Malcolm's wife Lily works. Staff there have been very generous - to the point where their medical aid package is likely to have exceeded Malcolm's 50kg weight allowance by a further 100kg.

Malcolm was adamant that nothing would be left behind and was prepared to pay excess baggage charges himself. However, we understand that Qatar Airlines generously agreed to waive any excess baggage fees in this case.

John and Malcolm will be based in Colombo initially and will be assisting **Victor 457VK**, the President of the Radio Society of Sri Lanka and the rest of the RSSL team.

Operating from inside the prime minister's official house, Victor and his team are busy providing vital communications across the country. Sri Lanka's prime minister had no contact with the outside world until Victor and his team stepped in.

"Victor and the crew out there deserve some recognition for the work they are doing. I know that some of the team have been working non-stop" said Malcolm, who has been in constant contact with Victor since the disaster struck. "We will be out there for one week only, but we hope to put that time to good use".

With just 10 members, Malcolm's club - the Workington Amateur Radio & IT Club in Cumbria, may be a small club, but they certainly have a big heart. They don't have sufficient funds to sponsor the trip directly, but that hasn't deterred their members, who have supported the effort in a big way. They've been hard at work collecting transceivers for use in the relief effort in Sri Lanka.

**Brian Walker**, their co-ordinator who is known affectionately as 'the cadge', has obtained two radios. **Joe Loy M0DHV** has donated a Yaesu FT-747 GX plus a.t.u., with further equipment donations coming from **Steve Topping G0MTD**, **Mark McSherry 2E0MAX**, **Tom Baggle 2E0OMT** and **Lily Harwood**. Support has also come from outside of Cumbria with donations from the Isle of Man and Ireland.

In Sri Lanka, some 30,500 have died, and thousands more are missing. The number of homeless people is put at between 800,000 and one million. With the exception of Indonesia, more people have died in Sri Lanka as a result of the tsunami than anywhere else. Southern and eastern coastlines have been ravaged. Homes, crops and fishing boats have all been destroyed.

Here in the UK there has also been a flurry of communications activity from the rescue services due to gale force winds in Scotland and flooding in Carlisle. There is certainly no shortage of interesting signals.

### WRTH

Always a hot favourite, the *World Radio and TV Handbook* is an essential reference for the broadcast enthusiast. This month we give you the opportunity to save the normal £22.50 and win your own copy for free. Simply go to page 32 of this magazine, answer the two questions, complete your details and post to the SWM offices to be entered in the draw. All the details are given on that page - good luck.

### Scanning Scene Extra

It's bonus time again! Due to the popularity of this SWM add-on we're bringing you two Scanning Magazines this year. Look out for next month's issue of SWM as we'll be bringing you the first of this year's *Scanning Scene Extra* supplements. Some 32 pages of scanning based information and features essential for any keen 'scannist'.

### Change of Electrical Regulations

The turn of the new year saw the introduction of new regulations. Essentially they apply to anyone who undertakes electrical work in dwellings, even the householder in some cases.

Those undertaking the work will have to ensure that it complies with the requirements of Part P of the Building Regulations. Moreover, the majority of such work should be notified to Building Control prior to its commencement. Building Control will wish to inspect the work in order to confirm that it complies fully with the Building Regulations. Because Building Control officers do not have the resources or expertise to inspect and certify electrical installations, the Government has approved Competent Person Schemes. Firms assessed and registered by such schemes will be able to self-certify that their work complies with the Building Regulations. Once Part P is implemented it could be a criminal offence if the person or firm carrying out electrical installation work contravenes the Building Regulations. Local authorities will also have the power to require the removal or alteration of work that does not comply with the Building Regulations.

The National Inspection Council for Electrical Installation Contracting (NICEIC) website [www.niceic.org.uk/partp/partpindex.html](http://www.niceic.org.uk/partp/partpindex.html) describes the main requirements and scope of Part P. Further information can be obtained from NICEIC: Domestic Installer Scheme, Tel: **0800 013 0900**.

This change seems to bring an end to the DIY modifications to the household mains wiring often carried out by those of us who are competent and confident to perform such work in our own homes and outbuildings.

### New Series

Jack Weber begins a new series next month. The purpose of the nominally bimonthly series is to demonstrate that not only is the marriage of computers and radio one to be tolerated, it is possible for it to be a joyous union. Jack will be covering many aspects of the interoperability of the two technologies and just how useful computers can be in the pursuit of our hobby. The March issue of SWM sees Jack examine the use of audio spectrum analysers to extract useful information from received signals. I look forward to your feedback regarding the series - please don't be shy, let me know what you think.

Happy monitoring

AV4 73 Kevin

# QSL

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## topqsl

Dear Sir

I spotted some while ago that WINRADIO had a DRM plug-in demodulator, but couldn't find a UK supplier. I E-mailed WINRADIO in Australia for source and confirmation that the plug-in would be suitable for the G303i PRO model. They came back within minutes confirming suitability and giving an ordering web link to VT Merlin Communications. I downloaded the software from VT Merlin, paid £38 on-line and within a few hours I'd received the key and a credit card payment advice. I'd loaded the software and key and was up and running all well within 24 hours from first enquiry. This, I think, demonstrates quite well the power and speed of the web and Internet when you deal with well-organised and reputable companies.

Keying in the DRM published frequency instantly gives an indication on the graph of the signal shape and strength - no tweaking is ever required. If the signal is good (20 or above on my scale - 7 or up on the S-meter) and is square with sharp shoulders, the 'latching' only takes a few seconds. Then you hear stereo sound almost as good as v.h.f. f.m. Some stations also simulcast multimedia which can be viewed on a sub window, for example rolling world news.

Most good reception comes from Western Europe although I can fairly often pick up Kuwait (Arab music but at a lower resolution in mono). As yet, nothing from New Zealand or North America. The UK broadcasts are generally beamed away from the UK and for me are unobtainable. My location is in Surrey on top of a hill with a 5m mast atop carrying four antennas, the best of which by far is a 1.8m Colinear vertical stick (also very good for CB including the massive swearing unfortunately unlike the gentlemen and ladies of the amateur radio world).

It seems to me that DRM is suffering from the same problems that have beset h.f. a.m. - that of atmospheric. With DRM though there is no fading away like a.m., the audio just totally drops out or cannot be resolved (latched onto) in the first place. With the Winradio

G303i professional demodulator you can see the signal deteriorating on the graph. The shape remains, but the signal strength falls below the critical level. Using a pre-amp on the signal input sometimes works as DRM appears to be less affected by amplified noise mixed with the required signal unlike h.f. a.m.

I can see a whole new world for DXers opening up here as the distant DRM stations are chased down and captured when propagation is favourable. One of the fairly critical factors and one which will make a difference is the latitude and longitude of the listener's location as the beamed direction of the signal might mean that it will never be available. At the present time, I'm waiting for the final version of WINRADIO's Universal FSK Decoder which, according to them, is due sometime early 2005.

**Dennis Ellison**  
via E-mail

Dear Sir

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

Can anyone suggest where I can get plans and instructions to build/modify a battery powered receiver, or hardware and software to use with a laptop, so I can receive l.w., m.w., s.w., v.h.f., amateur bands, etc., with the minimum number of 'boxes' or suggest a source of very cheap second-hand units. I am also looking for a means of receiving DRM, but again, plans and ready-built units are expensive and hard to find. If you want to keep people interested in our hobby, we need more information and equipment at an affordable price - most scanners and DAB/f.m./m.w./l.w./s.w. receivers

are still far higher priced that their complexity justifies and self-build kits seem to be very limited in capability, or rely on advanced soldering and microelectronic gubbins.

It's time someone designed a modular scanner/general coverage receiver, using simpler components or cannibalised sub-assembled from house-hold radio/TV receivers, which a typical GCSE-level youngster could build, like the crystal sets, f.m. and 2m receivers I built as a 10 year old.

**David Gordon**  
Sompting  
W. Sussex

*David, there were numerous designs for simple receivers featured in books that we once stocked in the SWM Book Store. Unfortunately, these titles all are out-of-print. It seems that we should feature a suitable design in a forthcoming issue with components which are available today. Your suggestion for a project covering the build of a more advanced set would sadly not be financially viable as it would cost more to buy the components than a manufactured set. You'd be better off looking for a second-hand radio. There are some very reasonably priced receivers in this month's 'Trading Post' at the rear of the magazine. See page 75. -Ed.*

Dear Sir

In reply to the letter from Ron Green regarding WorldSpace, from the very start I was always led to believe that sales of these receivers, Yagi antennas and the like was partly intended to fund third world countries, mainly poor old Africa. The foot print service area is in fact an overspill into the UK, consult your handbook, you will see no bearing details, but our money is most welcome.

In fact, and I do not condone this as its a bit like buying a Baygen wind-up radio or their other products, the third world countries were to be the main benefactors. With this in mind, the start of the WorldSpace service gave the hype that there was a great many FTA channels, if you look back to the feature which was in this very magazine you will see at that time many stations listed, these have left the service, no more C&W-Jazz-

**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.**

Classical, etc., one wonders why...money or the lack of it coming in.

The only reason I have kept my receiver is the WRN relays, in particular Glen Houser's World of Radio on a Saturday morning, 0900 BST, once this goes the receiver will be sold, or perhaps converted. Some encrypted services open up from time-to-time, Radio Caroline is one, this is in the hope that you my little anorak friends will want to carry on listening to them, once the encryption is put back on, and it never works. All so called FTAs have to be paid for there is no such thing as a free lunch.

The reply from WorldSpace was typical, almost 'On your bike, mate' and as for their so-called newsletters, I have never received one, what a saving. I am quite surprised that the encryption has never been broken, there have been times I am led to understand when subscriptions have been overdue and the individual's receiver has stayed in the clear, pay attention WorldSpace.

In the meantime, advertising goes on for these receivers, with new models coming on the market from some cheap turn out country. I for one cannot see much difference in the old or new models, the technology is the same apart from the price, what mugs we were to believe the hype FTA music of your choice - 'Money - money - money - from a rich man's world', not from me WorldSpace.

I have waited many years for changes in output and have not seen much that is ravingly new in English, the automated in-house ONE seems to stay much as it is - and I am thinking of voyager in particular - once again as a temptation to buy the receivers, but a lot have vanished over the years, never to return, one does have to wonder just who is taking up the empty slots those that can afford the WorldSpace fees...be they religious stations or non-English, truly I do not believe the service is for us.

So, if you live in Africa you are well served, as for us in the UK, I for one intend to run my receiver into the ground and thereafter forget WorldSpace.

**M. Evans M3EMB**  
Bungay  
Suffolk

# communiqué

## Icom's New Addition!

**I**com (UK) Ltd. has made a new addition to their marketing department. **Annabel Clarke** joins the department as Marketing Assistant. Annabel's role will be to support Marketing Manager **Ian Lockyer**, in promoting the company's wide portfolio of communications technology products.

Annabel has spent the past two years working in the Customer Services department at the commercial refrigeration company, Blighline Ltd. In this position she was responsible for client liaison, database management and general administration. She is also a recent Business and Marketing graduate from Christchurch College, Canterbury. Contact Icom (UK) at **Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742** or visit [www.icomuk.co.uk](http://www.icomuk.co.uk)



## Temporary Website

**T**he **Trowbridge & District Amateur Radio Club (G2BQY)** are now maintaining a temporary website until a more permanent arrangement can be finalised. The URL is

<http://uk.geocities.com/tdarc@btinternet.com/index.html> The site should be regularly updated to show 'What's On', but for further information please contact the club secretary **Ian Carter G0GRI**, in writing to QTHR, E-mail to: [ian.g0gri@btinternet.com](mailto:ian.g0gri@btinternet.com) or telephone evenings and weekends **(01225) 864698**.

## RF Filter Evening

**T**he **Braintree Radio Society** recently held an r.f. filter evening where a talk was given by **Dave G0DEC** on the various types of filter and their uses, aided physically, with some home-made and commercial examples. Then, using a combination of network analysers and spectrum analysers a practical demonstration was given to members on how filters work and what the various skirt shapes should look like.

Members were then able to take the opportunity to try out their own filters on the equipment and make any adjustments as needed. This proved to be a very busy evening with the meeting overrunning by some considerable time. For details on the club visit [www.badars.org.uk](http://www.badars.org.uk)



## New Baluns

**N**evada are pleased to announce the release of three new 1:1 ratio 50Ω current baluns from Japanese manufacturer Comet. The baluns stop radiation from the outer of coaxial cables feeding matched antenna systems, such as dipoles and beams, and suitable for frequencies from 1.3-500MHz. They are constructed with an SO-239 socket on each end for easy connection to 50Ω coaxial cable. The baluns are available in three power ratings, TF-400 (400W), TF-1800 (1.8kW) and TF-4000 (4kW). Prices start from £59. Visit [www.nevada.co.uk](http://www.nevada.co.uk) or telephone **(02392) 313090** for more information.



## QRP Festival

**T**he **9th Red Rose QRP Festival** is to be held on **5 June 2005** from 1100 till 1600.

Located at Formby Hall, Alder Street (off High Street), Atherton, Manchester, this Festival is a friendly get together, to promote low power amateur radio operating and home construction.

There will be trade and individual stands, sales of new and surplus equipment and components, club stands, including RSGB and G-QRP, low cost Bring & Buy, Morse receiving tests with certificates, c.w. sign-in, Talk-in on S22, delicious refreshments at QRP prices, all in large spacious halls at ground level with huge free car park and disabled facilities.

Admission is £1.50 and more information can be obtained from **Les Jackson G4HZJ** on **(01942) 870634** or E-mail: [g4hzj@ntlworld.com](mailto:g4hzj@ntlworld.com)

## W&S Talk

**M**embers of the **Radio Society of Harrow** meet every Friday at 2000 at the Harrow Arts Centre, Uxbridge Road, Hatch End. On 25 February 2005, **Mark Francis G0GBY**, sales director of **Waters & Stanton PLC** will give a product talk, from 2000 sharp, in the Grimsdyke Room. More information from **Jim Ballard G0AOT** on **(01895) 476933** or E-mail: [g0aot@blueyonder.co.uk](mailto:g0aot@blueyonder.co.uk)

## New Secretary

**H**ere at the **SWM News Desk** we have recently been advised of a new secretary of the (now) old **Halkyn & DRC** - this being **Les Chesters MW0ELC**. Les advises us that the old club disbanded, due to problems at the club QTH and improved facilities were offered to club members at the **Mold Rugby Club**, in the town of **Mold, Flintshire**. Due to the relocation of the club, it was decided to rename the club **Mold & District Radio Club**. Members now have their own shack and full facilities for talks and lectures. Club night is Thursdays with Morse classes from 1930 every week and either an informal social or formal evening every other week. More information from Secretary **Len Chesters MW0ELC** on **(01244) 545369**, E-mail: [mw1blc@thersgb.net](mailto:mw1blc@thersgb.net) or from Hon. President **Eddie Hewins GW3GSJ** on **(01352) 780334**.



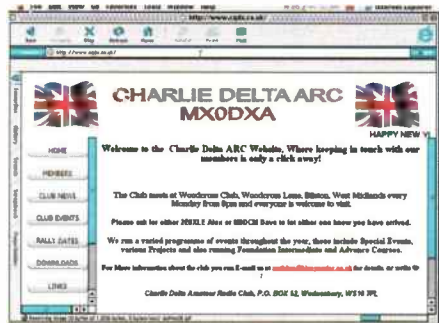
# rallies

## February Talk

**T**he Bangor & District Amateur Radio Society meet on the 1st Wednesday of every month in 'The Stables', Groomspoor at 2000. At 2000 on Wednesday 2 February 2005 the club are hosting a talk entitled 'Radio Old Timers' by **Dave G13OBO**. As always, visitors and new members are most welcome. More information from **Mike G14XSF** on **0284-277 2383** or club website **www.bdars.com**

## Weekend Course

**T**he Charlie Delta Amateur Radio Club will soon be starting another weekend Foundation Course and then towards the end of February will be running an Intermediate Course. Also, sometime in 2005, the club expect to run another Advance Course, but only if the demand is great enough. The club invite those with an interest in radio to go along and see what they have to offer. If anyone wishes to attend these courses or would just further information about the club, please contact **Dave M0DCM** on **(01902) 635244** or E-mail: **m0dcm@blueyonder.co.uk** or alternatively, visit **www.cqdx.co.uk**



## International Marconi Day

**T**his year the 18th International Marconi Day will take place on the 23 April 2005. Although not a contest, awards can be obtained and full details can be found at **www.gb4imd.co.uk**

For a station to be counted towards an award by applicants, that station must be registered by contacting the webmaster (**webmaster@gb4imd.co.uk**) prior to the event with full details of the station. In order to qualify as an 'Award Station' operations should take place from a site which either used Marconi equipment prior to his death in 1937 or from which Guglielmo Marconi carried out experiments during the same period.

## 2005

**February 6:** The South Essex Radio Society are holding their Canvey Island Radio Rally at the Paddocks Centre, at the end of A130. Doors open at 1030 and features include Amateur radio and computer, electronics, components exhibitors. There will be home prepared snacks, soft drinks, tea and coffee etc. This is the 20th rally of this venue! **Brian G7IIO** on **(01268) 756331** before 2100 for more information or visit **www.southessex.ars.btinternet.co.uk**

**February 13:** The Harwell Radio & Computing Rally will take place from 1030-1530 at the Didcot Leisure Centre, Didcot, Oxfordshire (come off at A34 past Milton Interchange midway between Oxford and Newbury). Talk-in on S22, Bring & Buy, junk stalls, trade stands, craft stalls, special interest groups, home-made refreshments, bar, full disabled facilities and good free parking. Admission is £1.50 (children under 12 free). Further information from **Ann** on **(01235) 816379** or E-mail: **ann.stevens@btinternet.com** or visit their website at **www.hamradio.harwell.com**

**February 20:** The Southgate Amateur Radio Club will be holding their Stevenage Radio & Electronics Show at the Stevenage Arts & Leisure Centre, Lytton Way, Stevenage. There is easy access by road and rail as well as plenty of parking. Doors open 1000 to 1600, admission £3, under 5s free. There are a variety of restaurants nearby, a 16 screen cinema, ten pin bowling and many national retailers. Visit **www.stevenageshow.dsl.pipez.com** for further details.

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

**March 20:** The Cambridge & District Amateur Radio Club have now confirmed the date for their rally, which is to be held at Britten Arena, Wood Green Animal Shelter, King's Bush Farm,

London Road, Godmanchester. Doors open at 1000 and entrance fee is just £2 (concession for OAP/disabled, children free). There will be free parking for up to 2000 cars, along with a bar and restaurant on-site. There will also be a Bring & Buy and a Talk-in on S22. More information from **John Bonner G0GKP** on **(01954) 200072**, E-mail: **j.bonner@ntlworld.com** or from **Ian Alexander G4AKD** on **(01954) 782974**, E-mail: **g4akd@thersgb.net**

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

**April 10:** The Yeovil ARC have booked the Digby Hall, Sherbourne for their 21st QRP Convention, the popular get together of QRPers from the South and West of England. Doors open at 1000 and car parking is free in the town centre car parks, which adjoin the hall. Follow the black and white Town Centre signs, off the A30 Yeovil to Salisbury Road. There will be two talks in the morning and another after visitors have enjoyed the excellent food available and browsed the many trade stands. Also, the Construction Challenge will be adjudicated and certificates will be presented to winners of the QRP Convention CW Funrun, which takes place prior to the Convention on the evenings 14-18 March, 1900-2100. Rules available from **G3IC0**. E-mail: **george@mudford.fstnet.co.uk**

**May 2:** The Dartmoor Radio Rally is to be held at Tavistock College, Tavistock, Devon. This is the same new location as last year, with plenty of space for traders to display their wares and for visitors to see them and talk to old friends. There is access for disabled visitors, but due to extensive building works, there can be no dedicated disabled parking. However, there is adequate car parking around the college site. There will be trade stands, a Bring & Buy and refreshments, etc. Doors open 1030 (1015 for disabled visitors), Talk-in on S22. Come and visit

beautiful Dartmoor, ideal for picnics, so why not bring the whole family along? **Ron G7LLG** on **(01822) 852586**.

**June 5:** The 9th Red Rose QRP Festival is to be held at the Forrby Hall, Alder Street (off High Street), Atherton, Manchester. This is a friendly get together, to promote low power amateur operating and home construction. There will be trade stands and individual stall, sale of new and surplus equipment and components, club stands, low cost Bring & Buy, Morse receiving tests with certificates, all in large spacious halls at ground level, with a huge, free car park and disabled facilities. Talk-in on S22 and admission is just £1.50. More details from **Les Jackson G4HZJ** on **(01942) 870634** or E-mail: **g4hzj@ntlworld.com**

**June 19:** The Annual Newbury & District Amateur Radio Society's Car Boot Sale takes place at the Ackland Memorial Hall, nr. Thatcham, Berkshire. Directions and a map can be found on the club's website, visit **www.ndars.org.uk**

**June 26:** The West of England Radio Rally is to be held in Frome, Somerset. Contact **Shaun G8VPG** on **(01225) 873098** or visit **www.westrally.org.uk** for more information.

**August 12:** The 12th Annual Junk Night of the Cockszie & Port Seton Amateur Radio Club will take place at the Cockszie & Port Seton Community Centre, South Seton Park, Port Seton. Entrance fee is just £1 and all proceeds will go to the British Heart Foundation. Tables are available on a first come, first served basis. There will be disabled access and a raffle at approximately 2100. Refreshments will also be available. Contact **Bob Glasgow GM4UYZ** on **(01875) 811723** or E-mail: **bob.gm4uyz@btinternet.com** for further information.

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

## New Amateur Satellite

**A**msat India has indicated that in early 2005, Feb-March, there will be a new LEO Amateur Satellite - **VUSAT**. Unlike the f.m. satellites which can only handle one QSO at a time, this one will have a Linear Crossband Transponder (435 to 145.9MHz) which will allow many s.s.b. and c.w. QSOs to take place simultaneously.

There are several AMSAT organisations contributing various components, more details can be found on AMSAT India's website **www.amsatindia.org** AMSAT-UK publishes a bi-monthly newsletter packed with the latest Amateur Satellite news. For more information contact **Jim Heck G3WGM** on **(01258) 453959**, E-mail: **g3wgm@amsat.org** or visit **www.uk.amsat.org**



# communiqué

## Waterlogged!

Specialists in developing products for the outdoor radio amateur, **SOTA Beams** have developed specially printed waterproof logsheets, known as WaterLog. These logsheets are designed to meet the needs of radio amateurs operating outdoors in less than perfect conditions. The WaterLog sheets are made from a waterproof paper, printed with a logging grid (10 contacts on each side) and presented on a metal aluminium alloy backboard, which is very light and strong. The type of paper used enabled pencil logging to be erased so the sheets can be used several times.

The WaterLog system measures 110 x 150mm, weighs just 95g and comes complete with five log sheets (enough for 100 contacts) and a pencil that's firmly attached. Priced at £6.50 plus £1 P&P, the WaterLog is available from SOTA Beams, **89 Victoria Road, Macclesfield, Cheshire SK10 3JA**. Alternatively visit [www.sotabeams.co.uk](http://www.sotabeams.co.uk) for more information.



## Pocket Sized Perfect Travel Companion

Weighing less than 130g and small enough to fit into your pocket, the Eton Mini 300PE world-band radio makes a perfect travel companion. Its oversized telescopic antenna provides great a.m./f.m. reception for camping, hiking, listening to sports or just relaxing in the backyard. Also pulling in seven short wave bands, you'll have access to both local and international news and music wherever go.

In addition to a built-in clock, alarm and sleep functions, with a large easy-to-read l.c.d. screen, the Mini 300PE comes with a *Short Wave Listening Guide*, a protective travel case and ear 'phones. At £24.95 the Mini 300 is available coloured red or pearl and is an indispensable companion. Tel: **023 92 313090** or visit: [www.etoncorp.co.uk](http://www.etoncorp.co.uk) for more information



## Successful Launch

Amateur Satellites *Ralphie* and *Sparkie* launched successfully on Tuesday 21 December at 1250, but as yet no contact has been made with the satellites. Their mission is to conduct a technical investigation to demonstrate packet radio for inter-satellite links using a frequency of 437.5MHz. Due to the low orbit it is anticipated that re-entry will occur within one to two weeks. There is no Amateur Transponder on board. For further information, visit

<https://spacegrant.colorado.edu/tiki-index.php?page=3CS>

## Winter Schedules

The B-04 (Winter 2004-2005) edition of Broadcasts in English is now available from the **British DX Club**. It was compiled by Dave Kenny and includes details of international broadcasts in English on short wave and medium wave for the Winter B04 schedule period. It is in time order throughout and covers all target areas. Transmitter sites are listed where known. A comprehensive guide to DX and media programmes is also included plus schedules for WorldSpace, World Radio Network (WRN) in English for Europe and Digital Radio Mondiale (DRM) transmissions.

Copies of this 32-page booklet are available for: UK: £2, Overseas: 5 international reply coupons, 5 Euros or \$5. UK cheques/postal orders should be made payable to the British DX Club. Payments in dollars or Euros are only accepted in cash. All orders, enquiries to: **British DX Club, 126 Bargery Road, Catford, London SE6 2LR** or visit [www.bdxclub.org.uk](http://www.bdxclub.org.uk)

## Microwave Enthusiasts

The **UK Microwave Group** - [www.microwavers.org](http://www.microwavers.org) - recently held its Microwave Round Table at the BT Labs in Martlesham, Suffolk. The event was attended by over 100 microwave enthusiasts from the UK, Europe and the USA. Over the days of the event, a full programme was scheduled with many interesting lectures on various aspects of microwave communications, as well as associated topics. An antenna testing range and full suite of microwave test equipment was also available to help test various aspects of home constructed and commercial modules that are in use today. If you are interested in microwave communications, the UK Microwave Group has a 'Yahoo-Group' online, visit <http://groups.yahoo.com/group/ukmicrowaves>



The group photo taken at the meeting. Credit to Ralph G4ALY.

## Essex Foundation Courses

Keen to get your M3 licence? Below is a list of clubs running courses in Essex to start you off in the right direction!

**Chelmsford Amateur Radio Society** run Foundation, Intermediate and Advanced courses. Contact: **Clive Ward M05IX** on (01245) 224577, Mobile: (07860) 418835, E-mail: [training2005@g0mwt.org.uk](mailto:training2005@g0mwt.org.uk) or visit [www.g0mwt.org.uk](http://www.g0mwt.org.uk) for more information

**Colchester Radio Amateurs** run Foundation and Intermediate courses. Contact: **Frank Howe G3FIJ** on (01206) 851189, E-mail: [james@mcginty.net](mailto:james@mcginty.net) or visit their website at [www.g3co.com.co.uk](http://www.g3co.com.co.uk)

**Havering & District Amateur Radio Club** are also running Intermediate courses. Contact: **Oliver Tillet G3TPJ** on (01708) 746677, E-mail: [g4hrc@haveringradioclub.co.uk](mailto:g4hrc@haveringradioclub.co.uk) or [www.haveringradioclub.co.uk](http://www.haveringradioclub.co.uk)

**Harlow & District Amateur Radio Society** run Foundation and Intermediate courses. Contact: **Len Brackstone G7UFF** on (01279) 864973, Mobile: (07931) 207184, E-mail: [g6ut@qsl.net](mailto:g6ut@qsl.net) or visit [www.qsl.net/g6ut](http://www.qsl.net/g6ut)

**Loughton & Epping Forest** run Foundation courses. Contact: **Marc Litchman G0TOC** on 0208-502 1645, Mobile: (07743) 456058, E-mail: [info@lefars.org.uk](mailto:info@lefars.org.uk) or [www.lefars.org.uk](http://www.lefars.org.uk)

## Sanyo Digital First

**S**anyo has launched its first digital radio, the DC-DAB01 Radio Micro hi-fi system. This latest DAB product to hit the market has been manufactured in a bid to expand the existing consumer demographic of the slightly older market and also appeal to younger generations, through superior sound and additional specifications.

Research carried out by the Digital Radio Development Bureau (DRDB) shows that most current consumers purchase digital radios to listen to BBC Radio 4, BBC Radio 2, Classic FM and BBC Radio Five Live, positioning them in the older age bracket. Sanyo has recognised this by producing a classic design, with elegant wooden-cased speakers and a chrome and black finish. However, Sanyo has also identified that the range of younger radio stations through digital is expanding and has therefore boosted the DAB01's superior sound with a digital amplifier and a 'Bass Xpander'.

The unit also features a front loading CD player and an audio input, which enables games consoles to be fed through the system. Sanyo aims to introduce a whole new series of digital radios in the coming months. Features of the DAB01 include:

- Total RM output 100W
- Bass Xpander
- Four modes - rock, pop, jazz and classic
- Front loading CD player
- Audio input
- Headphone socket
- DAB tuner
- FM digital tuner



The Sanyo SAB01 costs in the region of £160 and is available from all good electrical high street dealers. Sanyo can be reached at: **Sanyo House, Otterspool Way, Watford, Herts WD25 8JX**, Tel: (01923) 246363 or visit [www.sanyco.co.uk](http://www.sanyco.co.uk) for more information.

## Reading Rattle

**R**ichard Neale-Gardner M1EYA, the tapes manager of the RAIBC, has kindly offered to duplicate cassettes for the reading service called the 'Reading Rattle'. If anyone who is eligible because they have a visual handicap and who wishes to receive *PW*, *SWM*, *RadCom* read onto C-90 cassettes, please send a good quality Type 1 cassette to Richard at 72 Queensway, Brawell, Leicester LE9 8AP in an RNIB wallet, with your return address.

## Amateur Radio & The Tsunami Disaster

**A**mateur radio has played a key role in providing emergency communication in the area devastated by Boxing Day's earthquake and resultant tsunami. In the hours and days immediately after the tidal waves hit the coastal communities, the normal communication infrastructure was destroyed and radio amateurs immediately stepped in to fill the breach.

In the remote Andaman and Nicobar Islands, amateur radio has been banned by the Indian authorities on security grounds. But by the strangest of coincidences, a group of five Indian enthusiasts had received operating permission earlier in December, the first amateur radio licences issued for the islands since 1987. Within 30 minutes of the earthquake hitting Port Blair, the group, led by 46 year old Mrs Bharathi Prasad (callsign VU2RBI) had turned their short wave station into an emergency communications centre.

Using a combination of generators and car batteries to provide power, numerous messages were relayed from islanders to worried relatives on the mainland. The local authorities asked for the team's help to provide all forms of radio communications. Two members of the team and their equipment were sent to Car Nicobar island, in the centre of the worst-hit region, to provide whatever assistance they could. Far from being a security risk, amateur radio turned out to be a lifeline for the tens of thousands of displaced people on the islands.

The story was the same throughout the region, with radio amateurs in Sri Lanka, Thailand, India, Indonesia and elsewhere in the forefront of providing vital links in the devastated areas.

In Sri Lanka, three radio amateurs took a four wheel drive vehicle filled with amateur radio communications equipment and food and water for the displaced to the coastal town of Hambantota. They had to approach the town from the interior as the main road along the coast was badly battered, full of debris and impassable. They set up a short wave link to the Prime Minister's official residence in Colombo, which was manned by Victor Goonetilleke (callsign 4S7VK), the President of the Radio Society of Sri Lanka. He said, "It was wonderful even at such a tragic time, to link up the south of Sri Lanka with the Prime Minister who comes from the south and that is where is people are. When all the cellular 'phones and all other communications means failed, short wave stood bold and proud".

# LM&S

Long, Medium & Short Wave Bands

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

**C**atch of the month must go to **Peter Pollard**, who is almost certain he heard station VL8A in Alice Springs on 4.835MHz. An actual ident was never forthcoming. However, references to Sydney, the eastern states and Howard (the prime minister?) are pretty convincing. You may wish to go one better and attempt to haul the station in over their 120m band outlet on 2.310MHz. Alternatively, there's VL8T at Tennant Creek on 2.325MHz and VL8K at Katherine on 2.485MHz.

VT Merlin signed a broadcast contract with China Radio International (CRI) to provide the facilities to deliver English and Chinese programming into southern Africa, English and Portuguese into South America and Spanish programming into Mexico and Central America. CRI's language programming will be delivered via satellite to the transmitter sites.

Mr Xia Jixuan, CRI's deputy director-general, commented: "This (one year) contract with VTC will ensure stronger, clearer signals and a better service for CRI's listeners".

Meanwhile, a Thales (pronounced "tal-less") press release announced that a new

world record had been reached for digital a.m. broadcasting, in Macedonia. The national public broadcasting operator, in collaboration with Thales and Deutsche Welle, succeeded in transmitting 720kW of Digital Radio Mondiale (DRM) mode from the medium wave station at Ovce Pole; the highest DRM power ever broadcast by a single transmitter, achieving "exceptional coverage and quality of reception".

Tests were carried out on 810kHz using the Thales 1200kW solid-state medium wave analogue transmitter, installed at the Ovce Pole site in June 2002.

Measurements of signal quality and coverage area were performed by Deutsche Welle's mobile facilities and various fixed control and measurement centres throughout Europe. Tests were carried out overnight and during daylight hours to monitor

## Tropical Band Table

MHz	UTC	Service	Country	Listener
3.210	0725	WWCR, Nashville	USA	E I
3.255	0320	BBC World Service	G/AFS	F
3.910	1835	Unid religious programming	?	H
3.915	1806	BBC World Service	G/SNG	A F
3.930	0340	KBS Hwasong	KOR	F
3.950	1555	Xinjiang	CHN	A I
3.955	1910	Radio Taiwan	TWN/G	I
3.955	2108	Radio Korea Int.	KOR/G	I
3.965	2057	Radio France Int'l	F	G I
3.965	2202	Radio Taiwan	TWN/F	C
3.975	2155	Radio Budapest	HNG	C I
3.980	1900	Voice of America	USA/D	E I
3.985	0306	Voice Islamic Rep of Iran	IRN	I
4.005	2207	Vatican Radio	VVA	C F I
4.635	2230	Radio Tajikistan	TJK	F
4.760	0134	All India Radio, Port Blair	IND	I
4.770	2225	FRCN Kaduna	NIG	F
4.800	1432	All India Radio, Hyderabad	IND	A
4.800	2215	CPBS 2 Beijing	CHN	D
4.800	2230	CNR1 Shijiazhuang	CHN	F
4.810	1430	Voice of Armenia	ARM	A
4.820	2142	Xizang Lhasa	CHN	C F
4.835	1840	VL8A Alice Springs	AUS	H
4.835	2250	RTM Bamoko	MIL	F
4.835	1900	VL8 Alice Springs	AUS	H
4.840	1345	All India Radio, Mumbai	IND	A
4.845	2144	ORTM Nouakchott	MTN	C D E H I J
4.860	1425	All India Radio, Delhi	IND	A D I
4.880	1455	All India Radio, Lucknow	IND	A
4.890	0400	Radio France Int'l	F/GAB	F I
4.895	1457	All India Radio, Kurseong	IND	A
4.905	2205	Xizang Lhasa	CHN	D F I
4.910	1820	ZNBC Radio 1	ZMB	A F I
4.915	0545	GBC 1 Accra	GHA	F I
4.920	2207	Xizang Lhasa	CHN	D
4.940	1446	AIR Guyahati	IND	A
4.940	1905	Voice of America	USA/STP	A D E
4.960	0410	Voice of America	USA/STP	F I
4.980	0122	PBS Xinjiang	CHN	I
5.015	2100	Turkmen Radio	TKM	I
5.025	2130	Radio Tashkent	UZB	B H I
5.025	2150	Radio Rebelde	CUB	C F
5.030	2210	Radio Burkina	BFA	D I
5.050	0103	WWRB, Manchester	USA	I
5.060	0012	Xinjiang Urumqi	CHN	I
5.070	0605	WWCR, Nashville	USA	F I
5.085	0301	WWRB, Manchester	USA	I

DXers:-

- A John Parry, Cyprus
- B Sheila Hughes, Morden
- C Rhoderick Illman, Oxted
- D Geraint Gill, Llanfairfechan
- E Bernard Curtis, Stalbridge
- F Vic Prier, Seaton
- G Fred Wilmschurst, Northampton
- H Peter Pollard, Rugby
- I Michael Casey, Manchester
- J Simon Hockenhill, Bristol

the effects of ground and sky wave propagation. Programme content was that from Macedonian Radio.

The DW measurement van confirmed a coverage area during daylight of up to 300km, whereas by night the DW centres recorded reception over larger areas of Western Europe. It would seem another success for DRM.

Whilst on the subject of DRM, the RTL outlet on 1440kHz medium wave has been testing the new technology at various times of day and night since mid-November. I'd be

Listeners:-

- A Sheila Hughes, Morden
- B Thomas Williams, Truro
- C Eddie McKeown, Newry
- D Charles Hendry, Amersham
- E Simon Hockenhill, Bristol

## Long Wave Table

Long Wave Table

kHz	Service	TX Location	Country	Power (kW)	Listener
153	Deutschlandfunk	Donebach	D	500/250	A* B* C E
162	France Inter	Allouis	F	2000/1000	B* C
171	Medi 1	Nador	MRC	2000	C
171	Radio Chechnya Svobodnaya	Tibilsskaya	RUS	1200	D*
171	Radio Rossi	Bolsakovo	RUS	600	D* E
177	Deutschlandradio Berlin	Zehlendorf	D	500	A* C E
183	Europe 1	Saarouis	D	2000	B* C
189	Rikisutvarpid	Gufuskalar	ISL	150	C*
198	BBC Radio 4	Droitwich	G	500	A* C
198	Mayak	Many	RUS	150	D*
207	Deutschlandfunk	Aholmring	D	500	A* B* C E
207	Rikisutvarpid	Eidar	ISL	100	C*
216	Radio Monte Carlo	Roumoules	F	1400	B* C E
225	Polish Radio 1	Solec Kujawski	POL	1000	C E
234	RTL	Beidweiler	LUX	2000	B* C
243	Denmark Radio 1	Kalundborg	DNK	300	A* B* C E
252	RTE Radio 1	Clarkstown	IRL	500/150	A* B* C E
252	Algiers Radio 3	Tipaza	ALG	1500/750	A*
261	Radio Rossi	Taldom	RUS	2500	D*
270	Czech Radio 1	Uherske-Hradiste	CZE	850	A* C E
279	Belarussian Radio 1	Sasnovy	BLR	500	C* E*

\* = dark

interested to hear your observations on this or any of the other DRM outlets on medium wave and how they're affecting your listening habits, if at all.

Ouagadougou's Radio Burkina aired an announcement in early December by their director-general, expressing his pleasure in informing listeners of Burkina Radio and Rural Radio that the 100kW short wave radio transmitter, which broke down some months previously, was now back on air. Listeners were advised that they could therefore once more receive the station's broadcasts on 4.230MHz from 0800 to 1700 and on 5.030MHz from 1700 to 0800.

German commercial broadcaster Truck Radio launched 6 December on 855kHz in Nordkirchen and 702kHz in Juelich. Both outlets use just 5kW and estimated coverage is about 50km. Despite this you may be able to log these from UK shores during transition or darkness hours.

Truck Radio's diet of Country hits, Classic Rock and Southern Rock, a 24-hour-a-day service for professional truckers and drivers, is due to be rolled out nationwide during the year.

Kol Israel's short wave service has been given yet another stay of execution. The latest word is that it's business as usual at the station at least until the end of March. It had been thought that the short wave outlets would close at the end of 2004.

Ofcom is seeking views on the allocation of 10 medium wave frequencies, each of which could be re-used in more than one area, for new community radio or local/regional commercial services. The ten channels in question are 1116, 1368, 1377, 1431, 1485, 1521, 1530, 1566, 1584 and 1602kHz.

## Listener News

Hello and welcome to **Graham White** who writes in for the first time. Graham's initial logs were collated using a hand-held IC-R2 scanner attached to a home-made dipole. A DX-394 receiver was being promised for Christmas and he hopes to become a regular contributor to the column. Looking forward to hearing from you again soon, Graham.

Thanks also to **Freddy McGavin** from Dublin for submitting his first logs to 'LM&S', certainly since I've been at the helm. Freddy's Roberts RC828 portable has recently been replaced with a Drake R8E and he hopes to couple this to an RF Systems DX-1 Pro active antenna sometime this year. He's expecting a vast improvement on his station's receive capabilities.

Freddy was delighted to be one of our winners of the *SWM Scanning Scene Extra* September issue competition. Well done! Hope you enjoy the *ScanCat* software.

Clandestine Radio Watch, the website of **Martin Schöch**, has released its annual report detailing clandestine radio trends during 2004. Over the year, the activity of short wave clandestine stations actually decreased by almost 30% to 1229 Weekly Broadcasting Hours (WBHs), the lowest level since 1999.

Asian-based activity decreased by 35% with respect to 2003. However, clandestine activity to targets on the American, African and

## Local Radio Table

kHz	Service	Svc area/TX site	kW	SWL
558	Spectrum	Crystal Palace	1	B D
603	Capital Gold	Littlebourne	0.1	BD
630	BBC 3CR	Luton	0.2	B D
657	BBC Radio Cornwall	Bodmin	2	D
666	Classic Gold	Exeter	0.34	D
729	BBC Essex	Manningtree	0.2	B
738	BBC Hereford & Worcester	Worcester	0.037	A* D
765	BBC Essex	Chelmsford	0.5	B D
774	BBC Radio Kent	Littlebourne	0.7	B
792	Classic Gold	Bedford	0.275	B
801	BBC Radio Devon	Barnstaple	2	B D
828	Classic Gold	Bournemouth	0.27	D
828	Classic Gold	Luton	0.2	B D
828	BBC Asian Network	Wolverhampton	0.2	D
837	BBC Asian Network	Leicester	0.5	B D
855	BBC Radio Norfolk	Norwich	1.5	B
855	BBC Radio Devon	Plymouth	1	C* D
855	Sunshine 855	Ludlow	0.15	D
873	BBC Radio Norfolk	West Lynn	0.3	B*
945	Capital Gold	Bexhill	0.7	B
954	Classic Gold	Torbay	0.4	D
954	Classic Gold	Hereford	0.16	D
963	Asian Club	Hackney	0.95	B D
972	Asian Club	Southall	1	B D
990	BBC Radio Devon	Exeter	1	D
990	Classic Gold	Wolverhampton	0.09	D
999	BBC Radio Solent	Fareham	1	A B D
999	Valleys Radio	Ebbw Vale	0.3	D
1017	Classic Gold	Shropshire	0.63	D
1026	BBC Radio Jersey	Trinity	1	D
1026	BBC Radio Cambridgeshire	Cambridge	0.5	A* B D
1035	Easy Radio London	Crystal Palace	1	B
1116	Valleys Radio	Ebbw Vale	1	D
1116	BBC Radio Guernsey	Rohais	0.5	D
1152	LBC	London	23.5	B
1152	Capital Gold	Birmingham	3	D
1161	BBC Southern Counties Radio	Bexhill	1	B
1170	Swansea Sound	Swansea	0.58	D
1170	Capital Gold	Portsmouth	0.12	B D
1242	Capital Gold	Maidstone	0.32	B
1251	Classic Gold Amber	Bury St Edmunds	0.76	D*
1260	Classic Gold	Bristol	1.6	C*
1296	Radio XL	Birmingham	10	D
1305	Premier	London	0.5	B
1323	Capital Gold	Brighton	0.5	B
1332	Premier	Central London	1	B
1359	Classic Gold Breeze	Chelmsford	0.28	B
1368	BBC Southern Counties Radio	Duxhurst	0.5	B
1413	Premier	East/West London	0.5	C*
1431	Classic Gold Breeze	Southend	0.35	B D*
1431	Classic Gold	Reading	0.14	C* D
1458	Sunrise	London	125	B D
1458	BBC Asian Network	Birmingham	5	D
1458	BBC Radio Devon	Torbay	2	D
1485	BBC Southern Counties Radio	Brighton	1	B
1485	Classic Gold	Newbury	1	D
1503	Sound Radio	London	2	A*
1503	BBC Radio Stoke	Staffordshire	1	A* D*
1521	Classic Gold	Reigate	0.64	B D
1521	Forest of Dean Community Radio	Coleford	0.1	D
1530	Capital Gold	Worcester	0.52	D
1530	BBC Radio Essex	Southend	0.15	B
1548	Capital Gold	London	97.5	B
1557	Classic Gold	Northampton	0.76	C*
1566	County Sound	Guildford	0.8	A* B
1566	BBC Somerset Sound	Taunton	0.6	D
1584	Turkish Radio	London	0.2	B
1602	BBC Radio Kent	Rustall	0.25	B

\* = dark

Listeners:  
 A Sheila Hughes, Morden  
 B Rhoderick Illman, Oxted  
 C Henry Brice, Cornwall  
 D Simon Hockenhill, Bristol

Oceanian continents has remained more or less unchanged.

The three most active target areas worldwide are still Iraq, North Korea and Afghanistan.

If you are at all interested in the world of clandestine radio I suggest you take a look at Martin's excellent web site to discover more about this fascinating aspect of broadcasting - [www.schoechi.de/crw.html](http://www.schoechi.de/crw.html) - where you can sign up for free E-mail delivery of the twice-

monthly newsletter.

Finally, don't get too excited if you hear Asian music on 1035kHz. It's probably just Kismat Asian Talk Radio (KATR) out of London. Ofcom recently granted Easy Radio London a format change with almost immediate effect.

That's it for this time. Keep those letters and E-mails coming. Thanks to all those who contributed to this month's column. See you next time.

# Medium Wave Table

kHz	Service	Location	Country	kW	Listener
531	RTA 1	Ain-EI-Beida	ALG	600/300	D
531	Utvarp Foroya	Akraberg	FRO	200/100	G
531	RNE 5	Many	E	10-25	D
531	Swiss Radio (German)	Beromunster	SUI	600	D G
540	Radio Twæe	Wavre	BEL	150	D* G
549	UCB Europe	Dundalk	IRL	70	D G
558	RNE 5	Many	E	5-50	D*
558	YLE Radio	Helsinki	FIN	50	D*
567	RTE 1	Tullamore	IRL	500	E* G
576	Sudwestrundfunk (SWR)	Muhlacker	D	100	D G*
585	RNE 1	Madrid	E	600	D* G
585	FIP	Paris	F	8	G
585	BBC Radio Scotland	Dumfries	G	2	D
594	HR Skyline	Frankfurt	D	250	D G*
594	RTM A	Oujda	MRC	100	D*
603	France Info	Lyon	F	300	D G*
603	BBC Radio 4	Newcastle u Tyne	G	2	D
612	RTM A	Sebâa-Aitoun	MRC	300	D*
612	RNE 1	Vitoria	E	10	G*
621	RTBF 1	Wavre	BEL	300	D G*
630	Tunis Radio	Djêdeïda	TUN	600	D G*
630	NRK Europakanalen	Vigra	NOR	100	D
639	RNE 1	Many	E	10-300	D G*
639	Czech Radio 2	Prague	TCH	1500	D G*
648	BBC World Service	Orfordness	G	500	D* G
648	RNE 1	Badajoz	E	10	D*
657	RAI Uno	Many	I	25-120	G*
657	RNE 5	Madrid	E	50	D* G*
657	BBC Radio Wales	Wrexham	G	2	D G
666	Radio Vilnius	Sitkunei	LTU	500	D*
666	Sudwestrundfunk (SWR)	Rohrdorf	D	150	D* G*
675	Arrow Classic Rock	Lopik	HOL	120	D E* G
684	RNE 1	Seville	E	600	D* G*
693	BBC Radio 5 Live	Many	G	1-150	B
693	RNE 1	Many	E	10-20	D*
702	NDR 4	Flensburg	D	5	D* G*
711	Radio Bleu	Rennes	F	300	D G
720	BBC Radio 4	Lisnagarvey	G	10	B G*
720	BBC Radio 4	London	G	0.75	G
729	RNE 1	Many	E	10-100	D*
729	RTE Radio 1	Cork	IRL	10	D G
738	RNE 1	Barcelona	E	500	A* D* G*
738	Radio France Int.	Paris	F	5	D*
747	Radio 747	Flgvoland	HOL	400	D G
756	Deutschlandfunk (DLF)	Braunschweig	D	200	A* D G
765	Option Musique	Sottens	SUI	600	D G*
774	RNE 1	Many	E	20-100	D*
774	BBC Radio 4	Enniskillen	G	1	D
774	BBC Radio 4	Plymouth	G	1	E*
783	MDR Info	Leipzig	D	100	D*
783	Radio Mirimar	Barcelona	E	50	D*
792	France Info	Limoges	F	300	D G
801	RNE 1	Many	E	10-20	D*
801	Bayern	Munich	D	100	D*
810	Mayak	Dubovka	RUS	500	F*
810	Radio Scotland	Westerglen	G	100	A* D G
819	ERTU1	Batrà	EGY	1000	D* G*
819	RAI Uno	Trieste	I	20	A*
819	Sud Radio	Toulouse	F	20	A* D*
828	NDR	Hanover	D	20/5	D
837	France Info	Nancy	F	200	D G
846	R Radonezh	Moscow/Noginsk	RUS	150	F*
846	RAI Due	Rome	I	60	D
855	RNE 1	Murcia	E	300	D* G*
864	La City Radio	Paris	F	300	A* D G
873	American Forces Network	Frankfurt	D	150	D* E* G
873	BBC Radio Ulster	Enniskillen	G	1	D
882	COPE	Many	E	2-5	D*
882	BBC Radio Wales	Washford	G	100	B D
891	Radio 538	Hulsberg	HOL	20	D*
900	RAI Uno	Milan	I	600	D G*
909	BBC Radio 5 Live	Many	G	0.25-200	B E*
918	Radio Slgovnia	Domzale	SVN	600/100	D* G*
927	Radio Een/927 Live	Wolvertem	BEL	300	D G
936	Bremen 1	Bremen	D	50/10	D*
945	France Blue	Toulouse	F	300	D* G
954	Czech Radio 2	Brno	CZE	200	G*
954	Onda Cera Radio	Madrid	E	20	D*
963	YLE Radio	Pori	FIN	600	D* G*
972	Nord Deutscher Rundfunk (NDR) Hamburg	Hamburg	D	100	D G
990	Deutschlandfunk (DLF)	Berlin	D	100	D* G*
999	COPE	Madrid	E	50	D*
1008	SER	Many	E	5-10	D*
1008	Radio 10 Gold	Flgvoland	HOL	400	D G
1017	Sudwestrundfunk (SWR)	Wolfsheim	D	100	D* G
1026	SER	Many	E	5-10	A*
1035	Radio Nacional	Porto Alto	POR	100	D*

kHz	Service	Location	Country	kW	Listener
1044	MDR Info	Dresden	D	20	D* G*
1044	Radio San Sebastian	San Sebastian	E	10	D* G*
1053	Talksport	Droitwich	G	500	B D
1062	Denmark Radio P3	Kalunborg	DNK	250	D G*
1071	Euskadi Irratia	Bilbao	E	50	G*
1071	Talksport	Clipstone	G	1	D
1080	SER	Many	E	5-10	D*
1089	Talksport	Brookmans Park	G	400	B D
1089	RNE5	Almaria	E	10-25	D*
1098	Radio Slovensko	Nitra	SVK	50	D* G*
1107	American Forces Network	Bavaria	USA/D	10	D* G*
1107	Talksport	Many	G	2	B D
1116	Radio Pontevedra	Pontevedra	E	5	D*
1125	Radio 21	Houdeng	BEL	10	D G*
1125	BBC Radio Wales	Llandrindod Wells	G	1	G
1134	Croatian Radio HR1	Zadar	HRV	600	D* G*
1143	American Forces Network	Many	USA/D	0.3-10	D G*
1152	RNE 5	Many	E	10-20	G*
1179	Swedish Radio 1	Solvesborg	S	600/300	D G*
1188	VQA/RFE	Marcali	USA/HNG	500	D
1197	VQA/RFE	Munich	USA/D	300/150	D*
1197	Virgin Radio	Many	G	0.2-2	B D E*
1206	France Info	Bordeaux	F	300	D G*
1215	Virgin Radio	Many	G	0.32-200	B D
1224	Radio Popular	San Sebastian	E	10	D*
1233	Virgin Radio	Many	G	0.1-0.5	B E*
1233	ČRoF	Prague	CZE	40	D*
1242	Virgin Radio	Many	G	0.5-2	D* E* G
1242	France Info	Marseille	F	150	D G*
1251	Radio 747	Hulsberg	HOL	10	D*
1260	Virgin Radio	Lydd	G	1	B E*
1269	Deutschlandfunk (DLF)	Neumunster	D	300	D G*
1278	France Bleu	Strasbourg	F	300	D G*
1278	RTE Radio 2	Dublin/Cork	IRL	10	D*
1296	BBC World Service	Orfordness	G	500	D* G*
1305	RNE 5	Many	E	10-25	D*
1314	NRK Europakanalen	Kvitsoy	NOR	1200	D G
1323	Voice of Russia	Wachenbrunn	RUS/D	800/150	D G*
1332	RAI Uno	Rome	I	300	D*
1341	BBC Radio Ulster	Lisnagarvey	G	100	A* E* G
1350	Radio Orient	Nancy	LBN/F	300	D* G*
1359	RNE 3	Madrid	E	600	D* G*
1368	Manx Radio	Douglas, IOM	G	20	D
1377	France Info	Lille	F	300	D G
1386	Russkoye Mezhunarodnoye R.	Bolshakovo	RUS	1200	F G
1386	Voice of Russia	Sitkunei	RUS/LTU	750	D* F*
1386	China Radio Int'l	Sitkunei	CHN/LTU	750	F* G*
1395	Trans World Radio	Flake	MCO/ALB	500	D*
1395	Voice of America	Flake	USA/ALB	500	F*
1404	France Info	Brest	F	20	D G*
1413	RNE 5	Many	E	5-10	D*
1422	Deutschlandfunk (DLF)	Heusweiler	D	1200/600	D G
1440	RTL	Marnach	CHN/LUX	1200/300	D
1440	Saudi Radio	Dammam	ARS	1600	F*
1440	Radio France Int.	Moscow/St Petersburg/RUS	10	F*	
1449	Libyan Radio	Misurata	LBY	20	D*
1467	Trans World Radio	Romoyles	MCD/F	1000	D*
1467	China Radio Int.	Grogoripol	CHN/MDA	150	F*
1476	Radio 1476	Vienna	AUT	60	D* G*
1494	Voice of Russia	Krasnyy Bor	RUS	600	D*
1494	France Info	Clermont-Ferrand	F	20	D* G*
1503	Radio Sarasyre	Bushehr	IRN	500	D*
1510	WWZN	Boston, MA	USA	50	C
1512	Radio Vlaanderen/Radio Een	Wolvertem	BEL	300/25	A* D
1512	BSKSA	Jeddah	ARS	1000	F*
1521	Saudi Radio	Duba	ARS	2000	D* F*
1521	China Radio Int.	Urumqi	CHN	500	F*
1530	Vatican Radio	Vatican City	CVA	150/450	D*
1530	Voice of America	Sao Tome	USA/STP	600	F*
1539	Evangeliums Rundfunk	Mainfingen	D	700/120	D G*
1557	France Info	Nice	F	300	G*
1557	China Radio Int.	Sitkunei	CHN/LTU	150	F*
1575	RAI Uno	Genova	I	50	D* G*
1575	SER	Many	E	5	D* F*
1593	Voice of America	Kuyait	USA/KWT	150	D* F*
1593	Radio Cluj	Sibiu	ROU	7	F*
1602	Radio Vitoria	Vitoria	E	25	D
1611	Vatican Radio	Vatican City	CVA	100	D*

\* = dark

Listeners:-

- A Sheila Hughes, Morden
- B Rhoderick Illman, Oxted
- C Harry Richards, Barton-on-Humber
- D Eddie McKeown, Newry
- E Henry Brice, Cornwall
- F Charles Hendry, Amersham
- G Simon Hockenhill, Bristol

# Short Wave Table

MHz	UTC	Service	Country	Lang	SINPO	SWL	MHz	UTC	Service	Country	Lang	SINPO	SWL
5.800	0430	Radio Bulgaria	BUL	Spa	34023	VP	6.210	1320	Laser Radio	G	Eng	34333	FM
5.865	0445	Voice of Greece	GRG	Gre	22222	YP	6.220	1330	Laser Radio	G	Eng	34343	FM
5.900	0500	Radio Bulgaria	BUL	Spa	45344	VP	6.225	1350	Deutsche Welle	D/KAZ	Eng	35555	JP
5.955	0530	Radio Tirane	ALB	Ita?	42232	VP	9.525	1300	Radio Polonia	POL	Eng	44444	SHH
5.975	0502	Radio Japan	JVG	Eng	45444	FM	9.525	1345	Radio Polonia	POL	Eng	44444	FM
6.000	0111	Radio Havana, Cuba	CUB	Eng	34443	FM	9.560	1319	Radio Australia	AUS	Eng	25122	EM
6.005	0110	China Radio Int.	CHN/CAN	Eng	24443	MC	9.715	1330	Radio Tashkent Int.	UZB	Eng	34333	SHH
6.020	0409	Voice of Turkey	TUR	Eng	44444	MC	9.780	1355	Voice of America	USA/PHL	Eng	45454	JP
6.030	0119	Radio Japan	JVG	Eng	33442	MC	9.870	1300	Radio New Zealand Int.	NZL	Eng	34434	GG
6.055	0025	Radio Exterior de Espana	E	Eng	44444	SH	9.980	1325	AFRTS	USA/SL	Eng	44444	FM
6.090	0231	Dr. Gene Scott's Uni Network	USA	Eng	25322	MC	11.530	1300	Radio Mesopotamia	IRQ/G	Kur	44444	RH
6.115	0245	Radio Tirane	ALB	Eng	45343	MC	11.550	1330	Swedish Radio Int.	S	Eng	55343	EM
6.140	0100	Radio Romania Int.	ROU	Eng	53444	BC	11.570	1330	China Radio Int.	CHN	Urd	33343	RH
6.145	0050	Radio Japan	J	Eng	34433	FM	11.850	1333	Radio Polonia	POL	Eng	34343	MC
6.165	0100	Radio Netherlands	HOL	Eng	41222	FM	13.610	1320	China Radio Int.	CHN/CAN	Eng	55555	VP
6.175	0227	Adventist World Radio	USA/AUT	Eng	43543	MC	13.630	1346	UAE Radio, Dubai	UAE	Ara	45334	HB
6.175	0233	Voice of Vietnam	VTN/CAN	Eng	33542	MC	13.635	1328	Voice Int.	USA	Eng	33222	HB
6.200	0108	Radio Prague	CZE	Eng	55555	MC	13.685	1327	Voice Int.	AUS	Eng	32332	HB
7.160	0306	BBC World Service	G/ASC	Eng	33432	MC	15.105	1306	Radio Romania Int.	ROU	Eng	35533	EM
7.160	0338	Radio Tirane	ALB	Eng	33432	MC	15.155	1331	Voice of Turkey	TUR	Eng	45444	EM
7.160	0522	BBC World Service	G/ASC	Eng	35332	MC	15.195	1332	Voice of Turkey	TUR	Eng	24232	EM
7.190	0334	Voice of Russia	RUS/AUKR	Eng	55555	MC	15.240	1358	Swedish Radio Int.	S	Eng	44444	TW
7.195	0314	Voice of Russia	RUS	Eng	55455	GW	15.825	1304	WWCR Nashville	USA	Eng	35233	EM
7.200	0120	Voice of America	USA	Eng	55555	FM	17.630	1305	Africa, No 1	GAB	Fre	34322	RH
7.305	0259	Radio Bulgaria	BUL	Eng	44545	FM	17.745	1333	Radio Romania Int.	ROU	Eng	55555	PW
7.325	0053	OFF Radio Austria Int.	AUT	Eng	55445	GW	17.820	1347	China Radio Int.	CHN	Eng	24343	PW
7.440	0130	Radio Ukraine Int.	UKR	Eng	45544	FM	21.455	1300	HCBJ	EOA	Eng	34343	FM
7.580	0241	WHRA Greenbush	USA	Eng	45455	MC	21.820	1300	Deutsche Welle	D	Ara	44444	TW
9.690	0304	China Radio Int.	CHN/E	Eng	13432	MC							
9.845	0033	Radio Netherlands	HOL	Eng	34232	EM							
11.710	0216	RAE Buenos Aires	ARG	Eng	25432	MC							
11.765	0519	BBC World Service	G/AFS	Eng	25443	MC							
11.780	0157	Radio Nal de Amazonia	B	Por	35433	MC							
11.820	0408	Radio New Zealand Int.	NZL	Eng	15432	MC							
11.875	0515	Channel Africa	AFZ	Eng	35433	MC							
<b>0600-0700</b>													
5.825	0542	WEWV Vandiver	USA	Eng	24443	MC	5.765	1428	AFRTS	USA/GUM	Eng	24552	JP
5.885	0614	Vatican Radio	VAT	Eng	45444	HB	6.395	1450	Jolly Roger Radio (pirate)	JRL	Eng	33333	FM
6.005	0522	BBC World Service	G	Eng	45444	HB	7.125	1455	Voice of America	USA/THA	Eng	32232	BC
6.105	0524	Voice of America	USA	Eng	25333	HB	9.345	1437	Radio Netherlands	HOL	Eng	44243	EM
6.140	0626	Deutsche Welle	D	Eng	25232	HB	9.475	1455	Radio Australia	AUS	Eng	55444	BC
6.195	0627	BBC World Service	G	Eng	35333	HB	9.700	1405	China Radio Int.	CHN	Eng	45434	GeG
7.160	0532	BBC World Service	G	Eng	55555	HB	9.795	1400	China Radio Int.	CHN	Eng	44444	GG
7.225	0533	Deutsche Welle	D	Eng	44344	HB	9.935	1455	Voice of Greece	GRG	Eng	33444	RH
7.250	0513	Vatican Radio	VAT	Eng	35444	MC	9.970	1455	RTBF	BEI	Fre	34444	RH
7.355	0535	Family Radio	USA	Eng	45444	HB	9.980	1424	AFRTS	USA/SL	Eng	25443	MC
7.580	0545	WHRA Greenbush	USA	Eng	45333	HB	10.330	1430	All India Radio	IND	Hin	44333	RH
15.720	0605	Radio New Zealand Int.	NZL	Eng	35453	JP	11.550	1435	Swedish Radio Int.	S	Eng	44454	RH
<b>0700-0800</b>													
7.355	0705	WYFR Okeschobee	USA	Eng	43334	BC	11.585	1440	All India Radio	IND	Hin	44444	RH
7.535	0715	WSHB Cypress Creek	USA	Eng	44333	BC	11.680	1435	Radio Australia	AUS	Eng	34333	TW
13.715	0700	Radio Slovakia Int.	SVK	Eng	44444	SHH	12.080	1440	Radio Netherlands	HOL	Eng	44333	SHH
15.350	0703	China Radio Int.	CHN	Eng	24443	MC	13.610	1415	China Radio Int.	CHN	Eng	55445	BC
15.400	0710	BBC World Service	G/ASC	Eng	44544	MC	13.685	1410	Voice Int.	AUS	Eng	54334	BC
15.460	0712	Radio Slovakia Int.	SVK	Eng	55455	MC	15.120	1440	Voice of Nigeria	NG	Eng	25722	EM
15.465	0714	BBC World Service	G	Eng	25432	MC	15.505	1455	Radio Kuwait	KWT	Ara	33343	RH
15.565	0717	BBC World Service	G/CYP	Eng	35433	MC	15.520	1455	Family Radio	USA/UAE	Urd	32333	RH
15.575	0718	BBC World Service	G/CYP	Eng	15342	MC	15.545	1455	Voice Islamic Rep of Iran	IRN	Ara	44454	RH
17.640	0719	BBC World Service	G	Eng	35433	MC	15.565	1450	BBC World Service	G	Eng	43333	RH
17.830	0721	BBC World Service	G	Eng	24443	MC	15.585	1445	Radio Exterior de Espana	E	Spa	55555	RH
21.690	0725	BBC World Service	G/SNG	Eng	15432	MC	15.595	1436	Radio Netherlands	HOL	Eng	24112	EM
21.790	0728	Voice of Russia	RUS	Eng	15433	MC	15.605	1445	Deutsche Welle	D/RUS	Tur?	54444	RH
<b>0800-0900</b>													
5.815	0807	World Music Radio	DNK	Mix	45443	MC	15.630	1440	Voice of Greece	GRG	Eng	43333	RH
5.825	0805	WEWV Vandiver	USA	Eng	45444	MC	15.700	1440	Radio Bulgaria	BUL	Slr	55555	RH
5.965	0805	Radio Vlaanderen Int.	BEL/D	Eng	45544	FM	15.760	1435	Kol Israel	ISR	Heb	43343	RH
5.985	0800	Radio Vlaanderen Int.	BEL	Eng	55555	EM	15.785	1435	Galei Zahal	ISR	Heb	33333	RH
6.005	0815	Deutschlandradio Berlin	D	Ger	44444	VP	15.825	1410	WWCR Nashville	USA	Eng	44344	GW
7.345	0810	Radio Prague	CZE	Eng	45544	FM	15.825	1430	WWCR Nashville	USA	Eng	44454	RH
9.410	0820	BBC World Service	G/CYP	Eng	55534	VP	17.510	1445	WHRA Greenbush	USA	Eng	55445	BC
9.590	0811	Radio Australia	AUS	Eng	22211	EM	17.620	1415	Radio France Int.	F	Eng	54444	FM
9.710	0802	Radio Australia	AUS	Eng	24122	EM	17.700	1455	Channel Africa	AFS	Eng	46333	BC
9.880	0803	Radio Prague	CZE	Eng	55555	MC	21.455	1445	HCBJ	EOA	Spa	55445	BC
9.885	0804	Radio New Zealand Int.	NZL	Eng	22322	EM	21.680	1444	BBC World Service	G/CYP	Eng	25422	SH
11.755	0845	YLE Radio Finland	FIN	Fin	55545	EM							
11.840	0816	KTHW	GUM	Eng	32232	EM							
11.865	0800	Trans World Radio	USA/ALB	Eng	35555	PW							
12.085	0820	BBC World Service	G/CYP	Eng	33443	VP							
13.720	0850	Radio Exterior de Espana	E	Spa	55555	VP							
15.084	0815	Voice Islamic Rep of Iran	IRN	Eng	25432	VP							
15.350	0850	Voice of Turkey	TUR	Eng	55545	VP							
15.400	0820	BBC World Service	G	Eng	45434	VP							
15.565	0820	BBC World Service	G	Eng	34433	VP							
15.630	0850	Voice of Greece	GRG	Eng	44434	VP							
17.490	0821	China Radio Int.	CHN	Eng	33333	FM							
17.700	0820	Amateur Radio Mirror Int.	AFS	Eng	25233	EM							
21.470	0835	BBC World Service	G/SEY	Eng	22222	VP							
21.530	0840	Voice of Greece	GRG	Eng	55555	VP							
21.570	0850	Radio Exterior de Espana	E	Spa	23432	VP							
21.580	0830	Radio France Int.	F	Fre	33343	VP							
21.605	0855	UAE Radio, Dubai	UAE	Ara	52333	VP							
21.680	0855	BBC World Service	G/CYP	Eng	32222	VP							
<b>0900-1000</b>													
5.825	0930	WEWV Vandiver	USA	Eng	34333	SHH	9.975	1645	Voice of Korea	KRE	Eng	33332	FM
5.880	0915	WHRI Hialeahville	USA	Eng	43334	BC	11.975	1632	Deutsche Welle	D/KRG	Eng	24332	JP
6.140	0800	Deutsche Welle	D	Eng	54444	SHH	11.980	1620	Radio Kuwait	KWT	Ara	44344	RH
9.290	0800	Free Radio Service Holland	HOL	Eng	45243	EM	12.005	1624	Tunisian Radio	TUN	Ara	44444	RH
9.420	0831	Voice of Greece	GRG	Eng	34222	EM	12.035	1629	Deutsche Welle	D/POR	Fre	44434	RH
9.710	0930	Radio Vilnius	LTU	Eng	44444	GG	12.045	1637	Radio Japan	J	Eng	23433	RH
9.870	0915	Trans World Radio	MCO	Eng	55445	BC	12.050	1641	Radio Cairo	EG			

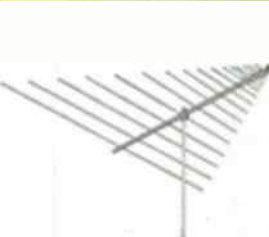
### Scanner Base Verticals

-  **SUPERSCAN STICK I (WIDEBAND)** £29.95  
 \*FREQ: 0-2000 MHZ \*LENGTH: 100cm \*SOCKET: SO239 £6.00p+p  
 \*RADIALS: 3X17cm
- SUPERSCAN STICK II (WIDEBAND)** £39.95  
 \*FREQ: 0-2000 MHZ \*GAIN: 3.00dB OVER SSSI £6.00p+p  
 \*LENGTH: 150cm \*SOCKET: SO239 \*RADIALS: 3X50cm
- These two superb fibreglass external wideband antennas have capacitor loaded trapped coils to give maximum sensitivity to even the weakest of signals. No wonder they are best selling verticals !!!
- AR-50 (AIR BAND)** £39.95  
 \*FREQ: CIVIL & MILITARY AIR \*GAIN: 3.0, 6.0dB £6.00p+p  
 \*LENGTH: 100cm \*SOCKET: SO239 \*RADIALS: 3X17cm
- AR-60 (AIR BAND)** £49.95  
 \*FREQ: CIVIL & MILITARY AIR \*GAIN: 4.5, 7.0dB £6.00p+p  
 \*LENGTH: 150cm \*SOCKET: SO239 \*RADIALS: 3X50cm
- These dedicated fibreglass external antennas are pre-tuned for both air band frequencies. Get the gain and don't miss take off!
- X1-HF VERTICAL (DEDICATED HF)** £49.95  
 \*FREQ: 1-50 MHZ \*LENGTH: 200cm \*SOCKET: SO239 £6.00p+p  
 \*RADIALS: NONE
- This HF vertical antenna incorporates helical traps and is an ideal alternative to a long wire.

### Discone Base Antennas

-  **STANDARD DISCONE (WIDEBAND)** £29.95  
 \*FREQ: 25-1300 MHZ \*LENGTH: 100cm \*SOCKET: SO239 £6.00p+p  
 \*RADIALS: 16
-  **SUPER DISCONE (WIDEBAND)** £39.95  
 \*FREQ: 25-2000 MHZ \*GAIN: 3.00dB OVER STANDARD £6.00p+p  
 \*LENGTH: 140cm \*SOCKET: SO239 \*RADIALS: 16
-  **HF DISCONE (WIDEBAND/HF SENSITIVE)** £49.95  
 \*FREQ: 0.05-2000 MHZ \*LENGTH: 185cm \*SOCKET: SO239 £6.00p+p  
 \*RADIALS: 16
-  **ROYAL DISCONE 2000 (WIDEBAND/STAINLESS)** £49.95  
 \*FREQ RX 25-2000 MHZ \*FREQ TX: 50-52 144-146 430-440 £6.00p+p  
 900-986 1240-1325 MHZ \*LENGTH: 155cm \*GAIN: 4.5dB OVER STANDARD \*SOCKET: N-TYPE \*RADIALS: 16
- The discone has been around for over 40 years and is generally recognized as the original and probably the best all round scanner antenna. Choose the best one for your station or call us for advice.

### Beam Antennas

-  **MLP-32 (LOG PERIODIC)** £39.95  
 \*FREQ: 100-1300 MHZ TX & RX £6.00p+p  
 \*GAIN: 11-13dB \*LENGTH: 140cm  
 \*SOCKET: N-TYPE
- MLP-62 (LOG PERIODIC)** £169.95  
 \*FREQ: 50-1300 MHZ TX & RX £6.00p+p  
 \*GAIN: 10-12dB \*LENGTH: 300cm  
 \*SOCKET: N-TYPE
- These two beam antennas are sold mainly to our military & commercial customers. With an SWR 2:1 or better over the whole frequency, for performance it just doesn't get better.
- AR300XL** £49.95  
 Rotator for both antennas £6.00p+p

### Getting Rigged Up

We have a massive stock of all mounting hardware products, brackets, poles, cables & connectors etc. Phone, email, or check the Web for details !! Remember we can make up any cable leads. Fitted with connectors of your choice at your request !!





**ROYAL DOUBLE DISCONE 2000** NORMAL PRICE £59.95  
 \*FREQ RX: 25-2000 MHZ  
 \*FREQ TX: 130-175/410-475 MHZ  
 \*GAIN: 5.5dB  
 \*LENGTH: 150CM  
 \*SOCKET: N-TYPE

**SALE PRICE £49.95**

This antenna has a superior wideband coverage for receive with a low SWR match right across the VHF and UHF spectrum




### Going Mobile

-  **G-SCAN II MOBILE (WIDEBAND)** £24.95  
 \*TYPE: TWIN COIL \*FREQ: 25-2000 MHZ £6.00p+p  
 \*LENGTH: 65cm \*BASE: MAGNETIC \*CABLE: 4m WITH BNC
-  **SKYSCAN MOBILE (WIDEBAND)** £19.95  
 \*TYPE: 4 TUNED WHIPS \*FREQ: 25-2000 MHZ £6.00p+p  
 \*LENGTH: 65cm \*BASE: MAGNETIC \*CABLE: 4m WITH BNC
- Don't lose those signals while on the move, get high performance reception where ever whenever.


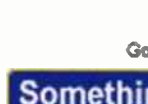
### Portable Antennas

-  **TRI-SCAN III DESKTOP (INTERNAL/WIDEBAND)** £39.95  
 \*TYPE: TWIN COIL \*FREQ: 25-2000 MHZ \*LENGTH: 90cm \*CABLE: 4m WITH BNC £6.00p+p
-  **SWP-2000 (GLASS MOUNT/WIDEBAND)** £29.95  
 \*TYPE: SUCTION MOUNT \*FREQ: 25-2000 MHZ £6.00p+p  
 \*LENGTH: 55cm \*CABLE: 4m WITH BNC
-  **SWP-HF30 (GLASS MOUNT/DEDICATED HF)** £39.95  
 \*TYPE: SUCTION MOUNT \*FREQ: HF 0.05-30 MHZ £6.00p+p  
 \*LENGTH: 80cm \*CABLE: 4m WITH BNC
-  **MAX-6 ACTIVE (INTERNAL/EXTERNAL/WIDEBAND)** £49.95  
 \*TYPE: ACTIVE PRE-AMP \*FREQ: 25-1800 MHZ \*GAIN: 14dB \*LENGTH: 140cm \*CABLE: 4m WITH BNC £6.00p+p
- Get the most from your scanner buy using one of our portable antennas and enjoy great performance without the need to erect an external one.

### Shortwave Wire Antennas

-  **MWA-HF MKII (EXTERNAL DELUXE HF ANTENNA)** £49.95  
 \*TYPE: WIRE BALUN MATCH \*FREQ: 0-40 MHz \*LENGTH: 25M \*CABLE: 10m WITH PL250 £6.00p+p
-  **MD37-SKYWIRE (EXTERNAL STANDARD HF ANTENNA)** £39.95  
 \*TYPE: WIRE BALUN MATCH \*FREQ: 0-40 MHz \*LENGTH: 25M \*CABLE: 10m WITH PL250 £6.00p+p
-  **LONG WIRE BALUN (ON ITS OWN)** £19.95  
 Get the best from your HF receiver and get a long wire. Our own ferrite baluns give up to 2 "S" points greater signal than other similar baluns, with a smooth match over 40mhz. £2.00p+p

### Handheld Antennas

-  **MRW-100 (SUPER GAINER BNC)** £19.95  
 \*FREQ: 25-1800 MHZ \*LENGTH: 40cm \*FITTING: BNC £2.00p+p
-  **MRW-210 (SUPER GAINER SMA)** £22.95  
 \*FREQ: 25-1800MHZ \*LENGTH: 40cm \*FITTING: SMA £2.00p+p

Going out? Don't miss out! Get a Super Gainer!!

### Something Extra

-  **TURNSTILE 137 (DEDICATED WEATHER SATELLITE)** £39.95  
 \*FREQ: 137.5 MHZ \*LENGTH: 100cm \*SOCKET: SO239 £6.00p+p  
 \*RADIALS: 4
-  **MRP-2000 (ACTIVE WIDEBAND PRE-AMPLIFIER)** £49.95  
 \*FREQ: 25-2000 MHZ \*GAIN: 14.0dB \*POWER: 9-15v £6.00p+p  
 \*CABLE: 1m BNC-BNC
-  **MRP-137 (ACTIVE WEATHER SAT PRE-AMPLIFIER)** £44.95  
 \*FREQ: 137.5 MHZ \*GAIN: 25.0dB \*POWER: 9-15v £6.00p+p  
 \*CABLE: 1m BNC-BNC

[WWW.SCANNERANTENNAS.COM](http://WWW.SCANNERANTENNAS.COM)

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MHz	UTC	Service	Country	Lang	SINPO	SWL	MHz	UTC	Service	Country	Lang	SINPO	SWL	MHz	UTC	Service	Country	Lang	SINPO	SWL															
17.900	1636	Voice of America	USA	Eng	4444	GW	13.620	1905	All India Radio	IND	Hin	43343	RH	6.170	2231	China Radio Int.	CHN	Eng	33333	FH															
21.630	1636	Radio Japan	J/ASC	Jap	24332	RI	13.640	1916	Voice of America	USA	Eng	35323	GB	7.345	2240	Radio Prague	CZE	Eng	55545	GeG															
<b>1700-1800</b>																																			
5.815	1725	World Music Radio	DNK	Eng	34433	FM	13.650	1900	Radio Canada Int.	CAN	Fre	43343	RH	7.500	2205	Radio Bulgaria	BUL	Eng	35544	FW															
5.855	1722	Trans World Radio	MCO/ARM	Eng	34132	EM	13.695	1900	Family Radio	USA	Eng	34434	RH	7.935	2200	Chinese National Radio 1	CHN	Chi	33343	VP															
5.915	1732	Radio Slovakia Int.	SVK	Eng	44444	HB	13.780	1918	Deutsche Welle	D	Eng	44444	HB	9.355	2240	Radio Taiwan Int.	TWN/USA	Eng	35555	FW															
5.930	1717	Radio Prague	CZE	Eng	55455	EM	15.400	1925	BBC World Service	G/ASC	Eng	35544	FW	9.575	2230	Medi 1	MRC	Fre	35544	FW															
6.055	1738	Radio Slovakia Int.	SVK	Eng	44444	HB	15.565	1915	WYFR Onechobee	USA	Eng	44334	BC	9.580	2215	Africa. No 1	F/GAB	Eng	44434	FW															
6.195	1740	BBC World Service	G	Eng	44333	HB	15.825	1906	WWCR Nashville	USA	Eng	45434	HR	9.950	2205	Radio Cairo	EGY	Eng	45555	FW															
7.120	1730	United Nations Radio	USA/AFS	Eng	24112	EM	<b>2000-2100</b>																												
7.230	1744	BBC World Service	G	Eng	33333	HB	5.775	2026	IRRS	I	Eng	32443	GB	11.690	2200	Deutsche Welle	D/CAN	Ger	15432	MC															
9.410	1751	BBC World Service	G	Eng	35333	HB	5.885	2050	Vatican Radio	VCA	Eng	22211	EM	11.730	2212	Radio Vlaanderen Int.	BEL/ATN	Eng	25544	FW															
9.475	1754	Radio Australia	AUS	Eng	34242	HB	5.915	2042	Radio Slovakia Int.	SVK	Eng	44444	FM	11.790	2202	Radio Hal de Amazonia	B	Por	14432	MC															
9.690	1705	Voice of Nigeria	NIG	Eng	44434	FM	5.950	2029	China Radio Int.	CHN	Eng	44434	SH	13.620	2234	Radio Australia	AUS	Eng	33333	FH															
9.855	1715	Radio Cairo	EGY	Eng	34433	FM	6.025	2000	Radio Budapest	HNG	Eng	43443	GG	<b>2300-0000</b>																					
9.980	1745	AFRTS	USA	Eng	34433	VP	6.035	2017	Voice of America	USA/STP	Eng	45544	FW	5.920	2331	WBOH Newport	USA	Eng	35434	MC															
11.625	1734	Vatican Radio	VCA	Eng	25122	EM	6.040	2030	RAI Int.	I	Eng	55545	GeG	5.925	2305	Radio Prague	CZE	Eng	33333	TW															
11.720	1773	Scandinavian Weekend Radio	FIN	Eng	15432	MC	6.055	2012	Voice of Turkey	TUR	Eng	45544	SH	5.930	2340	Radio Prague	CZE	Eng	55555	FM															
12.160	1702	WWCR Nashville	USA	Eng	34333	RI	6.065	2040	Swedish Radio Int.	S	Eng	54344	VP	5.975	2318	BBC World Service	G	Eng	44433	TYW															
13.580	1707	Swedish Radio Int.	S	Swe	34333	RI	6.110	2025	Voice Islamic Rep of Iran	IRN	Eng	43444	VP	5.985	2302	Radio Free Europe/Radio Liberty USA/GRC	USA/GRC	Rus	33453	MC															
13.690	1710	BBC World Service	G	Ara	34322	RI	6.145	2056	Voice of Russia	RUS	Eng	35544	MC	6.040	2308	China Radio Int.	CHN/CAN	Eng	35433	MC															
13.697	1714	Family Radio?	USA	Eng	33322	RI	6.195	2031	BBC World Service	G	Eng	44444	HB	6.050	2358	Radio Exterior de Espana	E	Eng	33444	GW															
13.765	1733	Vatican Radio	VCA	Eng	25132	EM	6.225	2012	Voice of Russia	RUS	Eng	34333	TW	6.110	2330	BBC World Service	G	Ara	45434	GeG															
15.255	1722	Charmel Africa	AFS	Eng	24232	EM	6.280	2015	Kol Israel	ISR	Eng	45544	GeG	6.135	2322	Radio Romania Int.	ROU	Eng	44444	FH															
15.370	1733	Vatican Radio	VCA	Eng	25132	EM	7.105	2030	Radio Minsk	BLR	Eng	44344	EM	6.195	2321	BBC World Service	G	Eng	35433	MC															
15.615	1710	Lobyan Jamhiraya Radio	LBY/F	Ara	34343	EM	7.120	2033	Radio Netherlands	HOL/MDG	Eng	14342	MC	7.105	2315	Radio Romania Int.	RRI	Eng	44132	EM															
15.660	1719	Lobyan Jamhiraya Radio	LBY/F	Ara	34343	EM	7.185	2031	China Light Int.	UZB	Eng	24332	MC	7.275	2340	Radio Yikins	LTU	Eng	44243	EM															
17.810	1732	United Nations Radio	USA/ASC	Eng	25122	EM	7.190	2020	China Radio Int.	CHN	Eng	43434	HB	9.525	2305	WHRI Hobbesville	USA	Eng	33333	FM															
18.900	1725	WYFR Onechobee	USA	Eng	44333	BC	7.250	2055	Vatican Radio	VCA	Eng	43333	SH	9.610	2322	Radio Romania Int.	ROU	Eng	33333	FH															
<b>1800-1900</b>																																			
5.850	1840	Radio Canada Int.	CAN	Eng	33333	SHH	7.255	2010	China Radio Int.	CHN	Eng	45544	VP	9.625	2330	Radio Canada Int.	CAN	Eng	44433	FM															
5.910	1832	Radio Vlaanderen Int.	BEL	Eng	45343	EM	7.280	2037	Radio Minsk	BLR	Eng	44344	EM	9.975	2340	WEWN Birmingham AL	USA	Eng	34443	FM															
5.955	1807	Voice of Vietnam	VTN	Eng	42343	FM	7.280	2037	Voice of Vietnam	VTN	Eng	32233	FM	11.620	2338	All India Radio	IND	Eng	15432	MC															
5.955	1826	Radio Romania Int.	ROU	Eng	24222	EM	7.320	2024	Voice of Russia	RUS	Eng	43434	HB	<b>Dixers:-</b>																					
6.085	1838	Swedish Radio Int.	S	Eng	55555	EM	7.330	2027	Voice of Russia	RUS	Eng	43434	HB	Bernard Curtis	BC		Henry Richards	HR																	
6.185	1841	BBC World Service	G	Eng	43232	EM	7.330	2032	Voice of Russia	RUS	Eng	55545	VP	Charles Hendry	CH		Harry Brice	HB																	
7.130	1835	Radio Romania Int.	ROU	Eng	55534	VP	7.340	2030	Radio Minsk	BLR	Eng	44444	HB	Eddie McKeown	EM		John Parry	JP																	
7.240	1859	WYFR Onechobee	USA	Eng	24332	EM	7.345	2045	Radio Slovakia Int.	SVK	Fre	43443	FM	Francis Heame	FH		Michael Casey	MC																	
7.290	1830	Voice of Russia	RUS	Eng	44444	SHH	7.360	2045	Family Radio	USA	Eng	45444	VP	Fred Wilmshurst	FW		Peter Pollard	PP																	
7.410	1830	All India Radio	IND	Eng	43343	VP	7.365	2017	Vatican Radio	VCA	Eng	34233	EM	Freddie McGavin	FM		Rhoderick Illman	RI																	
7.490	1823	Radio Vlaanderen Int.	BEL	Eng	44444	EM	7.410	2048	All India Radio	IND	Eng	44344	HB	Geraint Gill	GG		Robert Hughes	RH																	
9.410	1829	BBC World Service	G	Eng	43232	EM	7.420	2053	Swedish Radio Int.	S	Eng	43344	HB	Gerald Guest	GG		Sheila Hughes	SH																	
9.445	1830	All India Radio	IND	Eng	55545	VP	7.475	2020	Voice of Greece	GRC	Eng	55534	VP	Graham White	GW		Simon Hockenhill	SH																	
9.630	1851	BBC World Service	G	Eng	34232	FM	7.490	2045	Radio Vlaanderen Int.	BEL/RUS	Eng	45555	FW	<b>Equipment Used:</b>																					
9.780	1813	Republic of Yemen Radio, Sana'a	YEM	Eng	34333	FM	7.490	2020	WTJC	USA	Eng	22222	TYW	Bernard Curtis	BC		Charles Hendry	CH																	
9.885	1807	Radio Netherlands	HOL	Eng	44433	FM	9.370	2020	WTJC	USA	Eng	22222	TYW	Charles Hendry	CH		Eddie McKeown	EM																	
9.950	1830	All India Radio	IND	Eng	45534	VP	9.410	2040	BBC World Service	G/CYP	Eng	45555	FW	Eddie McKeown	EM		Francis Heame	FH																	
11.555	1820	Kol Israel	ISR	Spa	44534	VP	9.500	2014	Radio Australia	AUS	Eng	42442	HB	Francis Heame	FH		Fred Wilmshurst	FW																	
11.655	1830	Radio Netherlands	HOL/MDG	Eng	35423	VP	9.585	2006	Radio Exterior de Espana	E	Eng	44454	MC	Freddie McGavin	FM		Geraint Gill	GG																	
11.720	1839	Scandinavian Weekend Radio	FIN	Eng	35443	MC	9.600	2025	China Radio Int.	CHN	Eng	44444	FM	Gerald Guest	GG		Graham White	GW																	
11.925	1850	Adventist World Radio	USA	Eng	34433	FM	9.630	2050	BBC World Service	G/??	Eng	33333	FM	Geraint Gill	GG		Graham White	GW																	
11.980	1828	Radio New Zealand Int.	NZL	Eng	45554	VP	9.680	2038	Radio Exterior de Espana	E	Eng	45555	FW	Harry Richards	HR		Henry Brice	HB																	
13.710	1850	Voice of America	G/THA	?	32232	PH	9.840	2020	WHRI Hobbesville	USA	Eng	33433	MC	John Parry	JP		Michael Casey	MC																	
13.755	1850	BBC World Service	G/THA	?	32232	PH	9.885	2026	Radio New Zealand Int.	NZL	Eng	44444	TYW	Michael Casey	MC		Peter Pollard	PP																	
13.820	1850	Radio Marti	USA	Spa	23333	PH	9.895	2000	Radio Netherlands	HOL	Eng	55545	VP	Peter Pollard	PP		Rhoderick Illman	RI																	
13.845	1845	WWCR Nashville	USA	Eng	33343	FM	9.905	2050	All India Radio	IND	Eng	22222	TYW	Rhoderick Illman	RI		Robert Hughes	RH																	
15.140	1830	Radio Canada Int.	CAN	Eng	43333	FM	9.950	2048	All India Radio	IND	Eng	22222	TYW	Robert Hughes	RH		Sheila Hughes	SH																	
15.240	1825	Voice of America	USA	Eng	43334	BC	11.655	2047	Radio Netherlands	HOL/MDG	Eng	35333	MC	Simon Hockenhill	SH		Thomas Williams	TW																	
15.825	1850	WWCR Nashville	USA	Eng	35433	HB	11.760	2050	Radio Havana, Cuba	CUB	Eng	34333	FM	Thomas Williams	TW		Vic Prier	VP																	
<b>1900-2000</b>																																			
5.895	1920	Radio Rossi	RUS	Rus	55545	GeG	12.095	2037	BBC World Service	G/ASC	Eng	25444	FW	<b>Signal Strength</b>																					
5.915	1932	Radio Slovakia Int.	SVK	Eng	44444	HB	13.615	2016	WEWN Vandiver	USA	Eng	35323	HB	5	excellent																				
5.945	1944	ORF Radio Austria Int.	AUT	Ger	54444	HB	15.295	2028	Adventist World Radio	USA	Eng	24232	EM	4	good																				
5.955	1900	Voice of Vietnam	VTN/AUT	Ita	43334	BC	<b>Interference</b>																												
5.975	1930	BBC World Service	G/ATG	Eng	34433	SH	3.955	2104	Radio Korea Int.	KOR	Eng	45455	GVW	5	nil																				
6.010	1900	Sri Lanka Broadcasting Corp.	CLN	Eng	22222	EM	5.775	2105	IRRS	I	Eng	44444	SHH	4	slight																				
6.035	1950	RAI Int.	I	Eng	33442	MC	5.800	2134	Radio Bulgaria	BUL	Eng	55555	EM	3	fair																				
6.035	1956	Voice of America	USA/STP	Eng	33442	MC	5.850	2100	Radio Canada Int.	CAN	Eng	44334	GG	2	poor																				
6.055	1940	Voice of Turkey	TUR	Eng	55555	EM	5.930	2154	Radio Prague	CZE	Eng	35544	FW	1	barely audible																				
6.100	1926	China Radio Int.	CHN	Eng	13442	MC	5.975	2122	BBC World Service	G/ATG	Eng	23342	MC	<b>Propagation Disturbance</b>																					
6.115	1945	Radio Tirana	ALB	Eng	424																														

# Off<sup>the</sup> Record

- Oscar do SWM Editorial offices
- E-mail [off.the.record@pwpublishing.ltd.uk](mailto:off.the.record@pwpublishing.ltd.uk)

Who would you say is your current favourite radio presenter and why? Mine would have to be the excellent Tommy Boyd. Listening to his speech based programmes I learn a little, laugh a little and it is as if I am in the company of an intelligent and interesting human being.

Programmes consisting of a string of gramophone records may have made for good radio some years ago, but that is not the case now. I was listening to a discussion programme the other day and the subject came up regarding the essence of what true democracy really is, and Mr Boyd's thoughts echoed my own. It is not so much about the right to place a cross on a ballot paper, or even to be able to replace one elected individual with another every few years. You only truly have democracy when there is freedom of expression and when people's voices do not get stifled in the system somehow, and perhaps more importantly there must be the will and also a mechanism to allow good ideas to come forward and be brought into fruition without obstruction, thus any member of the public may be able to enhance the quality of our lives at any time.

This principle can apply to radio or to anything else. Where a grievance is valid it should be dealt with. The plans and ideas which have the most merit are the ones which should be given the highest priority. Vested interest and 'Masonic' who-you-know connections should not be a factor. Radio listeners should be able to tune in to the best possible radio services that our radio professionals and providers can deliver, and that is not happening. The regulatory system appears to me to lack wisdom or understanding of the medium. At present it is neither democratic nor right.

## The Big Conversation

Continuing the political connection just for a moment, I recall quite some months ago now the government launched a kind of suggestions box web site called The Big Conversation, which was supposedly a means by which any member of the public could communicate comments, ideas and reactions to the government, with the implication being that they were really keen to hear from us all. Tony Blair gave a televised speech for the launch of this service. The reason why it stuck in my mind and why I am mentioning it here

is that out of all the many very serious topics and issues which might concern the government, I remember that he spent some moments saying that they would welcome our thoughts on the subject of digital broadcasting.

I find it a little disconcerting that they seem to be so concerned to be involved in the push towards digital, especially since it carries with it the notion that this means the demise of analogue at the earliest possible opportunity. If they hope to clear band space and sell it off to mobile 'phone networks or other bidders then I would remind everyone that electro-magnetic radiation propagation is a naturally occurring phenomenon, and the spectrum is not theirs to sell.

Commercial companies and the public should resist any such moves on principle (said he naively). I am not convinced that the expanding number of available broadcast channels that digital brings is turning out to be the utopia we believed it might be in the days before we actually got it. The technical quality argument does not persuade me either. It is fine when signals are good, but the same is true with analogue.

When signals hover around a threshold, I prefer the analogue imperfections over the digital ones. If digital is so wonderful, how come so many people on their mobile 'phones sound like a Dalek with a dodgy intermittent microphone fault? In the future I hope to take an 'Off The Record' look at the pros and cons of DAB and explain what I hate about DRM.

## MV Communicator

Many people know of the recent history of the former Laser ship. It was in The Netherlands in rather poor condition. Dave Miller bought it, brought it over to England, did it up a bit, took it to the Orkney Islands as a base for a three month long RSL broadcast, and now the news is that he has advertised it for sale. When he bought the ship there was talk of plans to launch a large radio project called The Super Station of which the *Communicator* would be a part, but it seems that plans have changed along the way. The reasons for this remain somewhat unclear.

The station has indicated that it would like to become a permanent broadcaster in the Orkneys, but in any event it would appear that the ship is now surplus to requirements. There was much speculation before as to what form The Super Station would ultimately take, though any suggestion that it might be

unlicensed was always denied by Mr Miller.

With news of the impending sale, rumours have been circulating about various interesting names as potential purchasers and gossip has frothed up again like sea foam on a stormy day regarding the possible future of this historic vessel. The boat is being sold with no radio equipment, though I understand it does have the antenna mast, and according to some unconfirmed rumours it has a slight leak in its engine room as well. The vendor does appear to be open about the fact that the vessel is in need of work and care and attention, but to the right buyer, it sounds like a bargain.

## Community Radio Applications

I am told that Ofcom have received 192 applications for these new low-powered stations around the country. It is amazing how so many people from so many walks of life harbour a secret fantasy of becoming a radio DJ (or station owner), even if it has to be on (or of) something rather teeny-weeny.

It is an absolute disgrace that Ofcom have elected to charge an exorbitant £600 application fee. They have stipulated that these puny stations should not be primarily commercial, and that to own one you must be some sort of charity or not-for-profit organisation, providing benefit to the community you serve, and the regulator opens proceedings by demanding £600, not for the licence, but just to be allowed to ask the question. Shameful!

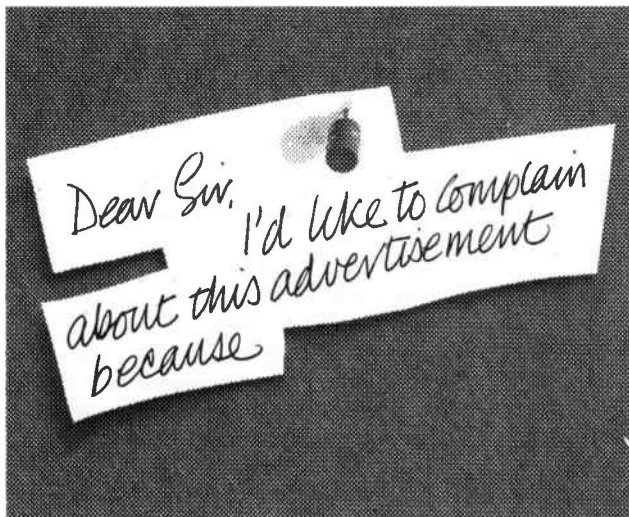
## Reports & Mentions

Short wave conditions have been a little variable, though good on occasions. Lower frequency bands have not always held up well late into the evenings and night, though around this time last year many listeners and stations reported good results around 1.6MHz.

The winter season means that 48m is usually only open for short skip from dawn to tea time. A station from Australia called Hobart Radio International has been heard relayed via the transmitters of Jolly Roger Radio. Some listeners have been reporting that Radio Rainbow is the latest to claim (probably falsely but never mind) that their s.w. transmissions are originating from a boat in the North Sea.

Test transmissions have been reported from a station identifying as Island Radio. Some fine programmes have come from the likes of Pandora, Underground, Xenon Transmitting Company and Bogus Jobseeker. With 6.2MHz getting crowded sometimes it is nice to see stations willing to experiment with something different as in the case of WNKR which has conducted tests on 4.727MHz in the 60m tropical band.

Before I dash, I must just send congratulations to former pirate Phantom FM which recently won a licence to broadcast in Dublin.



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# Bandscan

America

- **Gerry Dexter** *do SWM Editorial Offices, Arrowsmith Court, Broadstone, Dorset BH18 8PW*
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Last time we got together, we celebrated a significant improvement in reception conditions, after having suffered through a long period when 'excellent' conditions were in reality, only fair, and 'good' really meant mediocre. Since our last visit the propagation gods turned vengeful again and we suffered through total short wave blackouts, which required several days before a recovery was in place. Things (at the moment, anyway) seem to be more or less normal with the lower frequencies a little more active and the higher Hertz in hibernation for much of every 24-hour period.

The Bolivians have been making themselves known lately, with several of them almost reaching the point of being regulars. Radio Municipal in Caranavi (4.845) heard to sign off a bit after 0200. Radio Santa Cruz (6.135v) around 0100 and Radio San Miguel, Riberalta (on new 4.917v - but later 4.902v) and a reactivated (4.876v) La Cruz del Sur also making appearances.

A new Peruvian is Radio San Andres, 5.545v in Cajamarca Department. The full schedule isn't known yet, but when first noted it was running to nearly 0400.

## Bopping Around

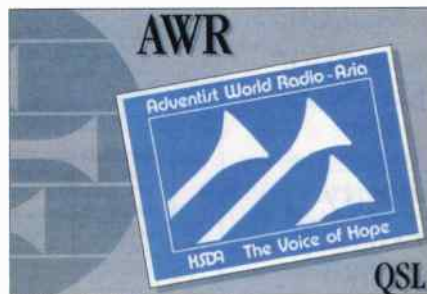
Brazil's Radio Nacional Amazonia, a nominal occupier of 6.180 has been bopping around, messing with the fine Radio Educacion (Mexico) on 6.185 - even moving as high as 6.190 at times. It's unclear whether they were seeking a better position or their transmitter was having a case of nerves. Things seem back to normal at the time of writing. Radio Marumby in Florinapolis has apparently added a new transmitter as they have recently been noted on 11.750 carrying the national 'A Voz do Brazil' program at 2200.

Their usual 9.665 frequency is in parallel. Also Radio Trans Mundial (Trans World Radio) is being heard lately carried, as it has been, by Radio Nova Visao in Santa Maria on 5.965, 9.530 and 11.735. The power level on these has been increased to 50kW.

At a recent radio board meeting of the very liberal Pacifica Foundation (which operates several f.m. stations in California) it was agreed to provide funding to help bring back Radio For Peace International in Costa Rica. RFPI was forced to close down last year by the University For Peace, from where RFPI operated. When will they return? I don't know, but considering the hullabaloo surrounding RFPI's closure, when the time is

nigh, word will surely go out far and wide!

Years ago one of the tastier DX catches was Radio Turks and Caicos from the Caribbean Islands of the same name. The short wave outlet signed off some 20-plus years ago. Don't get your hopes up! This isn't about any reappearance. However, the USA Board of Broadcast Governors (BBG) is



Adventist World Radio has many outlets and about as many QSL card designs.

planning some sort of operation on the islands, in the form of a 50kW medium wave station (perhaps a move to strengthen VOA coverage in the area?).

In general, the USA government seems to be very enthusiastic about increasing and strengthening its broadcasting outreach, especially in targeting sensitive areas. There is soon to be greatly increased focus on North Korea, for example, never mind a lack of useable radios there, or even electricity to power them! Needless to say the Arab/Muslim world will likely receive a good deal of additional attention. Whether this will take the form of more new services or increases in current efforts we can't say. But it's a pretty safe bet you can expect action in one direction or the other (maybe both!).

## Closing Down

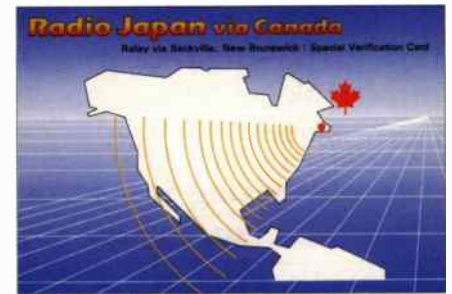
It's not just SWBC stations closing. The US Navy is closing down Project ELF, its high-powered extremely low frequency transmitting installation in the wilds of Northern Wisconsin and Michigan, which has been used for communication with submarines since the late 1980s. The system operated on a frequency of 76Hz and used antennas that ran for 11 and 23km!

XERTA/Radio Transcontinental de America in Mexico City is being heard more frequently of late. Normally the noise cluster on 4810 hides XERTA from the ear. It may be improved conditions or a lessening of the

noise but XERTA seems to 'pop through' more frequently (and with better modulation) than it used to do. The use of ECSS tuning is a definite help.

In Ecuador, HCJB has begun the large - and surely melancholy task of tearing down its historic Pifo transmitter site so as not to interfere with Quito's new airport. Meantime, HCJB's sister station in Australia has received an OK from the government to implement its expansion plans, which include huge new antennas requiring massive areas of new land.

Also from Ecuador comes word that La Voz del Upano, most recently using 4.870v and 5.040 appears to have a new transmitter in play from Lago Agrio (also known as Nuevo Loja) using 5.999 (probably intending 6.000). While this may be a welcome addition it's a poor choice for us, with Radio Havana Cuba dominating 6.000 through the local evenings as well as the early mornings.



Radio Japan is well heard in the USA, thanks in part to its Canadian relay.

## New Arrival

We all await the arrival of Wontok Radio Light, due on the air from Papua New Guinea soon. This is a joint effort by several Christian groups. The PNG government has assigned 7.120 to the new station, which should have come on the air in mid-January. Wontok already has an f.m. outlet in Port Moresby and plans a number of others throughout the country. The station's USA contact is **Life Radio Ministries, 100 South Hill St., Suite 100, Griffin, Georgia 30223**. Ecuador's HCJB has a hand in this effort as well.

The ongoing and growing access to a short wave audience now available to nearly anyone with the money to buy time on one of the several time-brokered transmissions facilities out there has now brought The Women's Forum Against Fundamentalism in Iran to the airwaves. Also identifying as Radio Sedayeh Zan (Voice of Women's Radio), it seems to be produced by WRMI and is apparently relayed by DTK-Julich, Germany.

It airs on Saturdays from 1900-1930. The group's website is: [www.wfafi.org](http://www.wfafi.org) The Key West (Florida) station of the US Armed Forces Network (AFRTS) has moved to 7.8125 from its former 7.507 spot, which it didn't occupy for all that long.

Well, that catches us up for now. See you again in three months. Until then, good listening!



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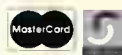
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# Coding Technologies

## Digital World Traveller

**Martin Peters gets his hands on the latest in DRM reception, the Digital World Traveller. How does it shape up? SWM brings you the low-down.**



Unless you've been on holiday off-planet for the past few years, you can't have failed to notice that a new dawn approaches. Analogue broadcasting on long, medium and short wave is set to be supplemented, and then maybe eventually replaced by DRM, a digital transmission system conceived by

the Digital Radio Mondiale consortium, formed in 1998. Since then, the group has expanded to include over 80 broadcasters, manufacturers, network operators, research institutions, broadcasting unions and regulatory bodies.

DRM offers near-f.m. quality, even stereo, over bandwidths similar to those occupied by conventional a.m. broadcasts (and is significantly more spectrally efficient than its v.h.f. counterpart, DAB). The system can integrate data and text and this additional content can be presented on the receiver's display or a PC screen.

Several levels of signal resilience can be selected by the broadcaster to cater for varying propagation conditions. Ultimately, remote receivers in or near the transmissions' target areas will control this automatically.

In addition to superior quality and textual or even multimedia add-ons, DRM offers the prospect of low cost receivers, greater choice of programming with easier tuning of stations by frequency, name or programme type.

Broadcasters have embraced DRM as it allows significant financial savings to be made as transmitters can be operated at lower power levels whilst achieving the same reach as a.m. They hope that improved fidelity and ease of tuning will tempt listeners back to short wave, which has suffered a steady decline over recent years from a mass audience perspective.

DRM on medium wave would be ideally suited to the plethora of speech and oldies stations currently broadcasting there on a.m. Renewed listener interest in these stations has implications for broadcasters' revenue derived from advertising.

Manufacturers view DRM as an opportunity to replace the estimated 2.5 billion receivers world-wide with their digital equivalents.

Hitherto, consumers have been limited to two types of

DRM receiver; conventional types, which have been retrofitted with a 455/12kHz i.f. conversion board and then hooked up to a PC or laptop, or the standalone Mayah 2010 portable receiver; a turnkey solution, but at several hundred pounds (that's if you can actually find one), out of the reach of most - (see SWM Dec 2003 for review of this set - Ed.).

### Unveiled At IBC

Germany-based Coding Technologies unveiled their Digital World Traveller at the International Broadcasting Convention (IBC) at Amsterdam last September. Realistically priced at 199 euro (£160 including VAT), the Traveller is bound to appeal to those people who can't wait to get their hands on the new technology.

The Digital World Traveller is small and, say the manufacturers, an easy-to-use receiver for the reception of DRM on long, medium and short wave. It also supports reception of conventional analogue a.m. and f.m. broadcasts. It is the first receiver of its kind to allow simple connection to a PC or laptop via a USB port.

In September, when I originally approached Coding Technologies for a review sample, I was informed that there were only three receivers in circulation. By mid-November the situation had eased somewhat and a production unit was posted out from the company's headquarters.

Order the Digital World Traveller package and you will be sent not only the receiver but also the decoding and control software on CDROM, a USB connecting cable and several metres of antenna wire terminating in a 3.5mm jack plug. There was no supporting paperwork sent out with the unit, however the CDROM includes a basic user manual.

You'll require a Pentium III, 500MHz or faster PC or laptop running *Windows 2000* or *Windows XP* (Home or Professional), 25MB of free space on the hard disk and a spare USB port.

Upon inserting the CDROM, the set-up programme was located through *Windows Explorer*. Installation of the software was easy and required only around eight steps.

Software installed, and with the receiver plugged up to the PC, an illuminated green l.e.d. on the World Traveller announced that the unit was switched on. The receiver's power is derived via the USB port thereby negating the requirement for a separate supply.

The receiver itself, made in Hong Kong, is very roughly the same length and width of an audio cassette tape box, but around 50% thicker. The actual dimensions are 110x60x30mm (LxWxH). The plastic, two-tone grey enclosure sports the DRM logo and weighs in at 110g.

At either end are the connectors: headphone socket and USB connector at one end (and power l.e.d.) and two antenna sockets at the other; one for a wire and the other for a loop antenna. Presumably, one is a high and the other a low impedance input. USB aside, all connectors are 3.5mm jack sockets.

There are no controls of any kind on the receiver itself; all functions being addressed from the PC.



# - Review

On the back is the serial number label; 173011037. I assume they began at serial number 173011040 and counted backwards.

As I don't possess a laptop modern enough to boast a USB connector, I ran these tests using the family PC - a 3GHz Dell. Instead of using the supplied wire antenna, which, I thought, would have undoubtedly picked up local interference from the PC itself, I elected to use the station Wellbrook ALA1530 loop antenna, perched atop our flat-roofed garage.

A double click on the World Traveller icon opens the programme and displays the main screen.

## First Steps

First thing to do is to set a couple of preferences, accessed via the Setup button. The dialogue box allows you to decide if the audio is fed to the PC speakers or to the headphone jack on the receiver. Here, you will also select one of the two antenna inputs.

The About button calls up a display featuring a number of links to DRM-related software and hardware manufacturers and, most helpfully, a link to the latest DRM on-air schedule.

OK. First, something easy: my local 'poptastic', hits and memories f.m. station from a site about one kilometre from my house. Click the f.m. button; enter the frequency into the box. Three blobs of r.f. appear on the meter but there's no audio. Rebooting the PC did the trick, after which Kylie Minogue sprang forth from the speakers. Lovely.

What's more, my broadband Internet connection had failed. Similarly, a reboot was in order. These were one-off events and in all probability a function of my *Windows* PC rather than a fault with the unit or its software.

Another preliminary test was carried out using a local medium wave station. I'll describe the World Traveller's abilities on conventional a.m. and f.m. later.

I was keen to get going with DRM, so with Internet connection restored, I consulted the on-line schedule, then clicked the DRM button and tapped in 5.990MHz - RTL from Junglinster, Luxembourg. After a few seconds the sync indicator illuminated, followed by the data and then the audio indicators. Seconds later, a perfect rendition of RTL Radio was being received.

They said it was easy to set up and use. I agree. From opening the box to hearing my first DRM station took 15 minutes, tops. That includes installation of the software. I didn't have to refer to the manual on the CD even once.

DRM streams can carry up to four so-called service components; anything from one high quality stereo programme to four lower quality mono strands, simultaneously. Alternatively, one audio programme with text or pictures can be broadcast.

The name of the received station appears on the service component indicator and any text present is displayed below in the message box. This can be programme and frequency information, news or contact details.

Click on the service name and any multimedia content is displayed.

## Stereo Enunciator

In the frequency window, as well as a stereo enunciator, there is a set of left and right hand arrows. In DRM (and a.m.) mode, clicking on these increases or decreases the received frequency by 1kHz increments. In f.m. mode, a click on either set of arrows sends the receiver into scan mode, where it will pause on stations with the greatest signal levels. There is no means by which to adjust the threshold.

The largest of the panels on the interface not only displays service name and scrolling text but also signal strength and sync, data and audio status. Here, you can also select some front-end attenuation - amount unknown. This only affects the a.m. and DRM reception. There's also a stereo defeat button for hiss-free reception of marginal signals on f.m.

Finally, a button marked 'expert mode' calls up a further screen of which more, later.

The left hand side of the main screen accommodates eight memory locations in which you can store your favourite channels, eight per band. Just type in your frequency of choice, right click one of the memory labels, type in the station name, frequency, whatever, and click on store. To recall a memory, simply click on it.

Beneath these is a time display, locked to the PC clock, underneath which is an audio level slider and a mute button.

Back to that 'expert screen' I mentioned earlier. In addition to r.f. and i.f. level metering, the bulk of this screen is given over to a spectrum analyser-like display, which refreshes approximately twice every second. The horizontal axis is centred on the receive frequency  $\pm 6$ kHz, whilst the vertical axis shows field strength, calibrated in decibels (dB).

In the top right hand corner of the display there is an indication of signal to noise ratio. The documentation suggests a minimum signal to noise of 13dB. In practice, DRM streams with low bit rates can be received right down to around 8dB, according to the display.

Upon entering a new frequency, the receiver immediately tunes to it. However, in DRM mode, there is a 10 second delay while the unit and the PC locks into the stream and decodes the audio.

One pleasing feature: the software remembers your band/frequency settings on exit and recalls them when firing up the program, once more.

So, what does DRM sound like using the Digital World Traveller? This will of course depend on the bit rate of the station being received and what you are using to listen to the end product. Many of the speaker systems supplied with PCs, especially laptops, are of inferior quality. I elected to monitor transmissions using my trusty pair of Sennheiser HD450 headphones.





An 11.6Kbps transmission sounds similar to medium wave radio - with little in the way of high frequency audio. At 17.4Kbps DRM is capable of sustaining stereo reception with reasonable quality. On headphones, speech contains a noticeable number of digital artefacts, and doesn't quite sound natural. At around 20Kbps, good quality stereo reception becomes a reality. I had to keep reminding myself that some of the received signals had travelled several thousands of kilometres. Impressive.

### Stretch Attempt

In an attempt to stretch the World Traveller to its limits I replaced the remote

Wellbrook loop with a 0.5m telescopic whip, plugged directly into the receiver. Reception - nil. However, when I switched off the PC modem, the speakers sputtered back into life with perfect reception of a selection of DRM transmissions.

As you might expect, there is no such thing as marginal reception of a digital signal. Audio is either as broadcast or not present at all. When the signal strength falls beneath the receiver's threshold, the final fraction of a second's audio is

heard to rapidly echo, then fade within a short time, leaving only silence. When signal strength recovers, audio is restored automatically. No reset or manual intervention required.

Over the course of a couple of days, DRM transmissions from Germany, Luxembourg, Sri Lanka, Russia, Portugal, Kuwait, Holland and the United Kingdom were all received with

perfect or near-perfect reception.

Despite a reasonable looking signal on the display from Vatican Radio on 1611kHz medium wave, the receiver failed to recognise it and refused to lock on.

During the test period, text messages and multimedia were also received. One of the text messages being sent by RTL invited listeners to E-mail them a reception report with the promise of a QSL card in return.

As for multimedia, a picture of the Junglinster transmitter site and a selection of RTL logos were received via the 6.095MHz stream from RTL. On one occasion Deutsche Welle were sub streaming pages of news, in German, onto the multimedia screen.

One unknown is how resilient DRM transmissions are to analogue co-channel and adjacent-channel interference. By way of an unscientific test, a signal generator was used to produce a carrier spike a few dB higher in level than the incoming DRM stream (see the trace). Interestingly, this was enough to knock out the digital signal completely so band congestion could be a cause for concern during the interim whilst both analogue and digital signals inhabit the bands.

Likewise, with its 10kHz wide, steep-skirted characteristics - not to mention constant modulation - interference to analogue signals from DRM is an increasing source of irritation to medium and short wave listeners.

Conversely, the possible widespread adoption of PLC (Power Line Communications), broadband Internet distribution over the national grid, is known to be of concern to the DRM consortium.

To counter fading and other propagation anomalies, receivers of the future will have RDS-like qualities, automatically selecting a better alternative, if one is available. There also is the possibility of including diversity reception, combining the streams from two different frequencies for increased durability.

### Analogue Performance

The World Traveller also provides analogue a.m. reception from 150kHz to 30MHz and f.m. from 87.5 to 108MHz.

I'll look at a.m. first. The filters are too wide for anything but strong signal reception. Deutsche Welle on 6.140MHz was audible from 6.130 to 6.150MHz. This was just on the telescopic whip. Medium wave reception provided a similar experience. Connecting up the Wellbrook loop, as expected, improved overall reception and did not overload the receiver.

Sensitivity on long wave was poor. This was easily overcome by connecting the loop into the receiver's alternative antenna socket, intended for a wire.

On to f.m., where performance was acceptable. Stereo reception of my local commercial and BBC outlets was perfect using the telescopic whip. The London stations, about 64km away, required me to switch to mono for satisfactory reception. The f.m. filter seemed about right. I was able to tune to London's relatively distant LBC News on 97.3MHz without interference from local 2-Ten FM on 97MHz.

Improvements to the user interface could include step size selection to permit rapid tuning across the bands in a.m. or DRM; 5kHz for short wave 9kHz for medium and long wave. It would be an advantage to be able to increment up the f.m. band without initialising the scan. Keyboard shortcuts and more memory locations are also on the wish list. In terms of hardware, a narrower a.m. filter is a must for anything like serious reception.

The Digital World Traveller represents a significant step forward in the evolution of digital receivers and makes the technology accessible to a new generation of listeners. Its DRM reception capabilities are impressive, even when using a barely adequate antenna. The f.m. and medium wave options are useful additions but short wave reception is compromised by the wide filter.

The Digital World Traveller costs 199 euro plus VAT and shipping. It is available now from Coding Technologies of Nuremberg, Germany, to whom grateful thanks for the loan of the receiver.

SWM

Coding Technologies can be contacted by 'phone: 00 49 911 928910, E-mail: drmrxc@codingtechnologies.com or web: www.codingtechnologies.com



# How to make a Doppler Radar Set

**It's amazing what you can do with a radio, computer and some software. Dennis Wort explains how to exploit some physics and assemble your very own aircraft detection and ranging system.**

These days, everyone knows how conventional radar works - you send a radio pulse towards an aircraft via a directional antenna, and receive a reflected echo. The time delay gives the distance and the antenna heading gives the direction to the aircraft. Somewhat less familiar perhaps is Doppler Radar, in which the frequency shift in the reflected signal is used to give the aircraft's speed component towards or away from the antenna. In this feature I outline a way for anyone with a good v.h.f. receiver to make a Passive Doppler Radar system, which will show aircraft of all sorts, civil and military, as they flit about the sky. Plus, this sort of radar would probably even show Stealth planes!

## A Reminder

First, a reminder about the Doppler effect. If an aircraft travelling away from a transmitter at velocity  $v$  receives a signal emitted at frequency  $F$ , the received signal would be measured on the aircraft to have a frequency lower than  $F$  by the Doppler shift  $f$ , and  $f$  is simply  $F \times v/c$  where  $c$  is the velocity of light (radio), or  $c = 300,000$  km/sec. For most aircraft,  $v$  will not exceed about 1000km/h which is 1000/3600km/s, so  $v/c$  will be around  $1000/3600 \div 300,000$ . Without bothering to work this out, put  $F$  as say 500MHz ( $5 \times 10^8$ Hz) and find  $f = 463$ Hz, so our hypothetical aircraft will see the transmitter frequency lower than the advertised frequency by 463Hz. If that aircraft reflected the signal back to the transmitter, it would be received there with a further 463Hz drop in frequency, so the final received signal would be lower than what was transmitted by 926Hz, i.e. by  $2F \times v/c$ .

The received signal is not at the same frequency as was transmitted, so provided the transmitter and receiver bandwidths are small enough there is no need to switch off the transmitter when listening for the return; you simply listen on a range of frequencies either side of that transmitted (either side because an approaching aircraft returns a signal raised in frequency). And listen is the appropriate word as the expected shift is in the audio frequency range, and you use an s.s.b. receiver and a computer-driven spectrum analyser to see and record the beat frequency from the returning signal. The need for a small transmitter bandwidth implies in practice that the transmitter must be effectively c.w., but the small receiver bandwidth implies low noise so megawatts of transmitter power are not required. Obviously the receiver does not have to be at the same place as the transmitter, and in fact a remote receiver is better as the directly received transmitter signal is smaller; if they are widely separated the total shift  $2f$  is slightly more complicated to work out, as it arises from the sum of the velocity component towards/away from the transmitter and that from the receiver, which involves a bit of geometry.

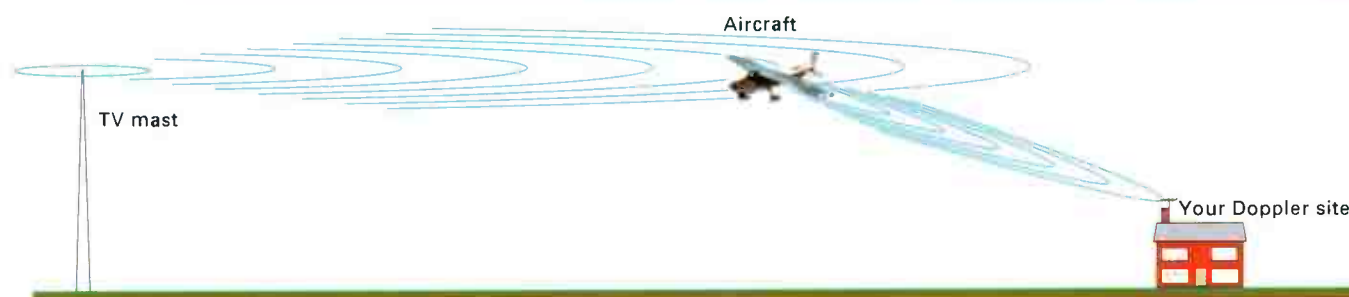
So for simple Doppler Radar we need a powerful continuous wave transmitter at a frequency of a few hundred MHz, radiating omni-directionally, and an omni-directional receiving antenna that is cross-polarised to the transmitter. If it isn't cross polarised, the directly received signal will be so strong the receiver's a.g.c. system will reduce the gain too much for weak reflected signals to be seen. The reflected signal will in general have random polarisation and we can receive the vertical component. We also need a good stable receiver, and an audio spectrum analyser covering a range of about 0 - 2kHz.

## Suitable Transmitters

By great good fortune we are liberally supplied with suitable transmitters - the main u.h.f. TV transmitters. As the TV signal is amplitude modulated, the carrier remains steady and there are no strong side-bands for many kHz either side of that carrier. Furthermore, main TV transmitters are horizontally polarised, so the receiving antenna can be a simple vertical rod, which is of course omni-directional.

At my home location here on the Yorkshire coast, I am about 40km away from the Bilsdale transmitter, my receiver

Fig. 1.



ST10076

is an Icom R8500 and the antenna a Maplin Superscan active vertical, though I found a quarter-wave ground-plane monopole also works perfectly well. There is of course always a choice of four TV channels, but one chooses whichever gives the *least* directly received signal - that a.g.c. again. With me it is Ch3 on 535.25MHz. This direct signal varies from day-to-day between about S1 and S7, and radar works best of course when the signal is least, which is probably the worst conditions for v.h.f./u.h.f. amateur radio!

I recommend that you use u.s.b. mode, set the beat note to 1.2kHz, and feed the output to that marvellous all singing, all dancing *Spectrum Lab* spectrum analyser, which was justly praised in the September 2003 issue of *SWM*. *Spectrum Lab* is Freeware from [www.qsl.net/dl4yhf](http://www.qsl.net/dl4yhf)

I use a 200-2200Hz analyser setting with the frequency axis vertical, and 750ms interval between data collections to give 10 minutes recording per screenful, and collect the screen every 10 minutes. All this becomes very much clearer when you have the analyser working in front of you! A certain amount of twiddling gains and colours is needed to get a convincing picture. My receiver is not equipped with the oven-stabilised crystal, and would take the best part of two hours after switch-on to become drift free enough for the radar to be left to its own devices - less than say 1Hz/minute - were it not for the analyser's most useful drift compensation facility. The analyser can also insert a filter to remove the inevitably strong zero-shift direct signal if preferred, or alternatively to some extent compensate for any gain against frequency variations in the receiver's i.f. or audio systems.

Having set all this up, you see a picture creeping across the computer screen which consists mainly of horizontal lines spaced 50Hz apart, these arise from the frame pulses of the TV signal. Sooner or later you will observe some sort of slanting curved trace - you've detected an aircraft.

### Interpreting The Trace

I must admit that 'interpreting' is over-optimistic - in most cases 'finding an excuse for' would be more appropriate. The simplest situation is an aircraft flying in a straight line at a steady speed, and this always gives a smooth trace which shows a monotonically falling frequency - any trace which shows a rising frequency implies either a curved path or a change in speed (or both). Airliners (to use a good old fashioned term) usually travel steadily, but military aircraft and light aircraft tend to go all over the place as the fancy takes them. The trace from an airliner (Fig. 3) first appears on the computer screen with a positive frequency shift, that is it appears near the top of the screen, and then bends downwards to cross zero shift fairly steeply, before levelling out again to show a negative shift ideally equal to the initial positive shift. The whole trace may take several

minutes to develop, so as the aircraft will be travelling at 10km/min or more, the system has followed its path for many tens of kilometres. This radar has a respectable range. No matter what the direction or distance of the aircraft, the asymptotic values of the Doppler shift, where the trace becomes level at the ends, accurately give the speed at which it is travelling. At 535MHz the speed is a shade over 1km/h per Hz, so a shift of say 800Hz implies a speed of 807km/h. The traces shown here have not been retouched, apart from changing from colour to black and white negatives to improve clarity.

In the broadest of terms, the steeper the trace where it crosses zero shift, the closer the aircraft is to the receiver. It is possible, but tedious, to show mathematically that if the rate of change of the Doppler frequency as the trace crosses the zero-shift axis is  $q$ Hz/s, the aircraft must be passing at a distance less than  $d$  where;

$$d = \pm 3cf^2/4Fq$$

Here  $f$  is the **maximum** shift where the trace has levelled out. As an example, a  $q$ -value of 1kHz/min on a trace with maximum shift 800Hz from a 535MHz transmitter implies a distance no greater than 9.4km (there is a hidden approximation here -  $d$  must be small compared to the separation between transmitter and receiver). The distance  $d$  includes a contribution from the height of the aircraft - it is a slant distance. For the aircraft in Fig. 3, the speeds were 860 and 750km/h, and their maximum possible distances at zero shift were 17.5 and 14.2km (left and right traces).

Plot Fig. 4 shows amongst others a trace (emphasised with dots) which wanders up and down regularly between about +530 and -530Hz, drawing a severely distorted wave-shape with a period of about six minutes. The 'excuse' for this trace is that it arose from a (military) aircraft which at 540km/h was following a circular track about 18km diameter, with its centre about 24km away. Considerable support for this 'excuse' was provided by a beautiful circular vapour trail appearing high up some distance out to sea - a rare confirmation of the radar trace! Off the coast here the chart shows a 'Submarine Exercise Area', and we frequently see aircraft hurtling by. I even hear them making enigmatic calls back and forth, but, of course, not when the receiver is being used as a radar set. This particular trace shows that there is in fact an appreciable amount of transmitted power at several thousand metres altitude, though the radar trace is rather fainter than most.

A meandering propeller-driven light aircraft gives a remarkable effect, arising from reflection from the propeller blades which in effect produces a signal strongly amplitude-modulated at the blade repetition frequency, whose many side-bands are duly displayed, even more so a helicopter (Fig. 5).

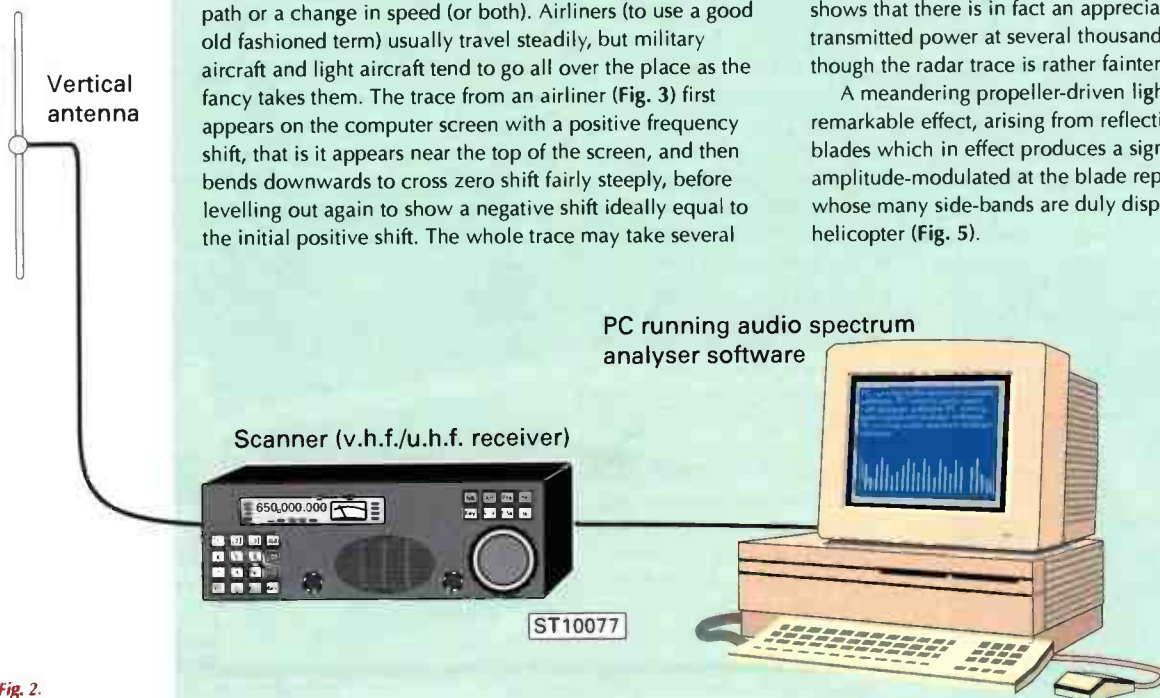


Fig. 2.

### Not Symmetrical

It might be expected that the transmitter-receiver system was symmetrical, so that one couldn't tell whether an aircraft was near the transmitter or the receiver. However, the television people do their best not to send power into the sky, and the beam pattern of the transmitter antennas is as near to a horizontal disc as they can make it, so aircraft near (but above!) the antenna system will be out of the beam and so will not deliver a reflection to the receiver. However, even if no power at all were transmitted above the horizontal, the antennas are over 500m higher than my receiver, to which add 200m or so due to the curvature of the Earth, so there would be power available to illuminate aircraft at my location if they were lower than 700m. In practice as Fig. 4 shows there is evidently plenty of high-altitude power at a distance of 50km.

When looking at a 'mish-mash' of traces (e.g. Fig. 6) it is important not to lose sight of what one is seeing - the trace tells you nothing directly about course, distance or velocity, but merely tells you the variation of a rather obscure velocity sum. Thus a sudden kink in the trace does not mean the pilot has suddenly pulled a 10G manoeuvre - he could merely have opened the throttle, or changed course quite gently by a few degrees. Similarly, two traces crossing do not necessarily imply a near-miss - there is no immediate distance information in them.

It is natural to wonder if it is possible to deduce anything 'useful' from this system other than the aircraft's speed. In principle, yes it is in strictly limited circumstances, such as uniform speed straight line flight, when measuring the Doppler shift, i.e. the speed components, at a series of successive instants can in theory yield distance and course. In practice it is impossible (for me) to untangle the mathematics. I would expect that combining the results from several receivers with a clever computer program would give quite definite flight parameters, and the Silent Sentry passive radar project in the USA presumably does just that. Oddly enough, if the aircraft flies in a circle the resulting trace is usually quite simply analysed. If you were very keen, you could swap to a steerable directional receiving antenna, such as an old TV antenna, and get some idea of the direction of the aircraft.

One final off-beat, (no pun intended), use for Doppler radar is bird-watching. I find that by confining the spectrum to a width of 100Hz either side of the carrier, I can detect seagulls up to about 200m distance. Indeed, some of the aircraft traces show 'bird noise' close to the centre.

### Give It A Try

So, if you have a receiver and live at a suitable distance from a main TV transmitter, I urge you to try Doppler radar. If nothing else you will be impressed by the spectrum analyser!

### Bonus Offer!

If any reader would like to play with a couple of computer programs which plot the Doppler trace for a chosen straight or circular flight path, I will E-mail simple stand-alone *Quick Basic 45* programs on request. They work here without problems, but I cannot accept any responsibility for what they may do to your computer!

Send request to [dandd@btinternet.com](mailto:dandd@btinternet.com)

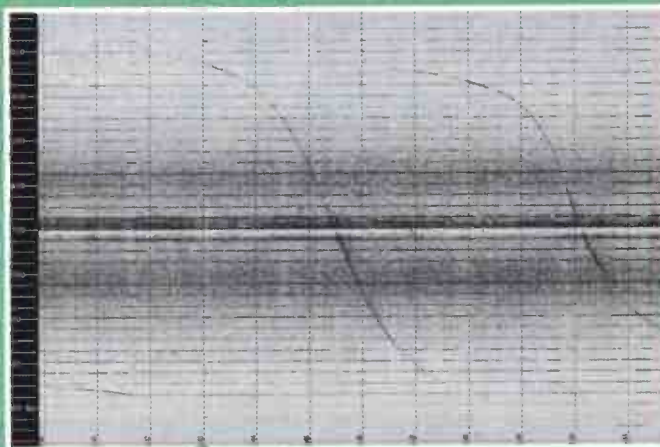


Fig. 3.

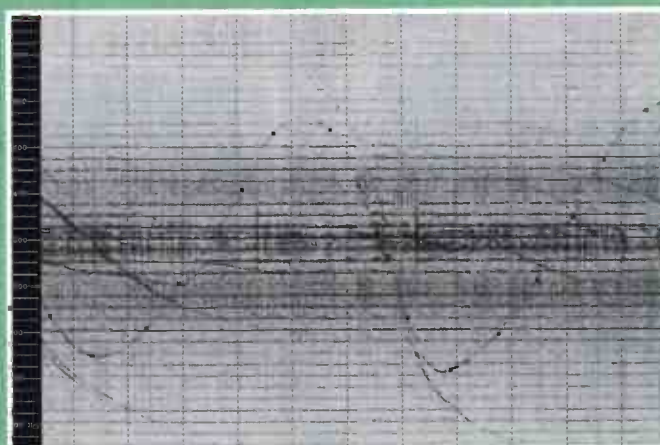


Fig. 4.

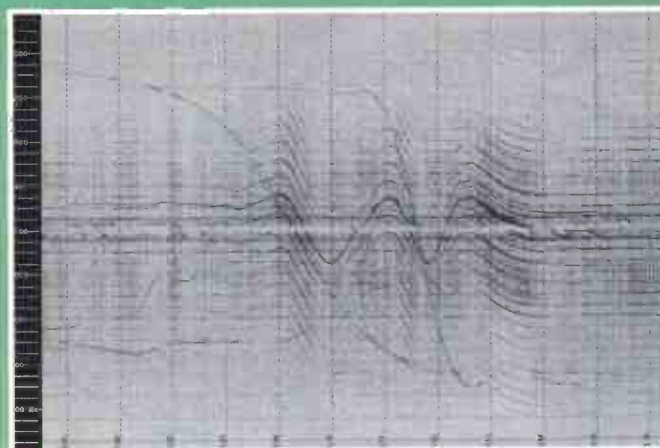


Fig. 5.

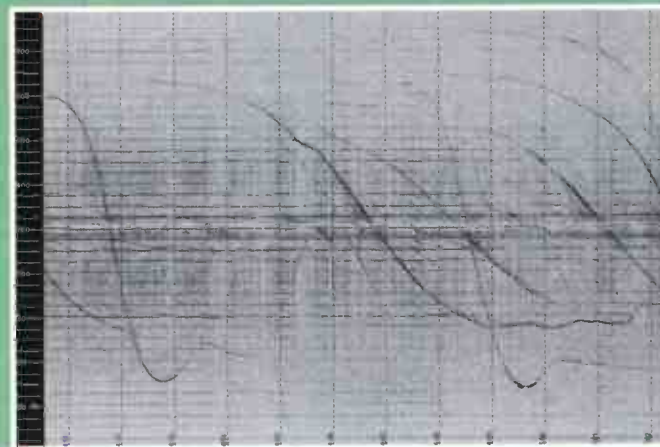


Fig. 6.

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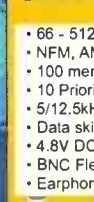
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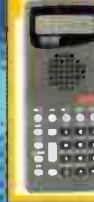


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- WHXX-270 BNC 2m/70cm Rubber Duck 40cm £19.95 A
- WSMA-801 Sma Reg/Gain 25-1900MHz 21cm £12.95 A
- W-801 BNC Reg/Gain 25-1900MHz 21cm £12.95 A
- WSMA-881 Sma Super-Gainer 25-1900MHz 40cm £19.95 A
- W-881 BNC Super-Gainer 25-1900MHz 40cm £19.95 A
- W-901 VHF/UHF airflex ibndi 10cm BNC £19.95 A
- ANT-60 Portable SW ant. 7m long 3.5mm jack £9.95 A

**WATSON SP-2B BASE SPEAKER**

- \*Tailored response for speech
- \*Cast alloy construction
- \*Extremely Rugged
- \*Matches modern radios
- \*Includes patch lead
- \*Size 12W x 18H x 11D cm.
- \*Weight 0.85kg



£29.95 B

**WDP-30 Short Wave Dipole**



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

£49.95 B

**WATSON HP-200 & HP-100**



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

£22.95 B

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

£19.95 B

SPECIAL OFFER!!!



PLACE AN ORDER OVER £100 AND GET THIS STEEPLETONE SVR-202 VALVE EFFECT RADIO

FREE!

(Worth £9.95)

# Win!

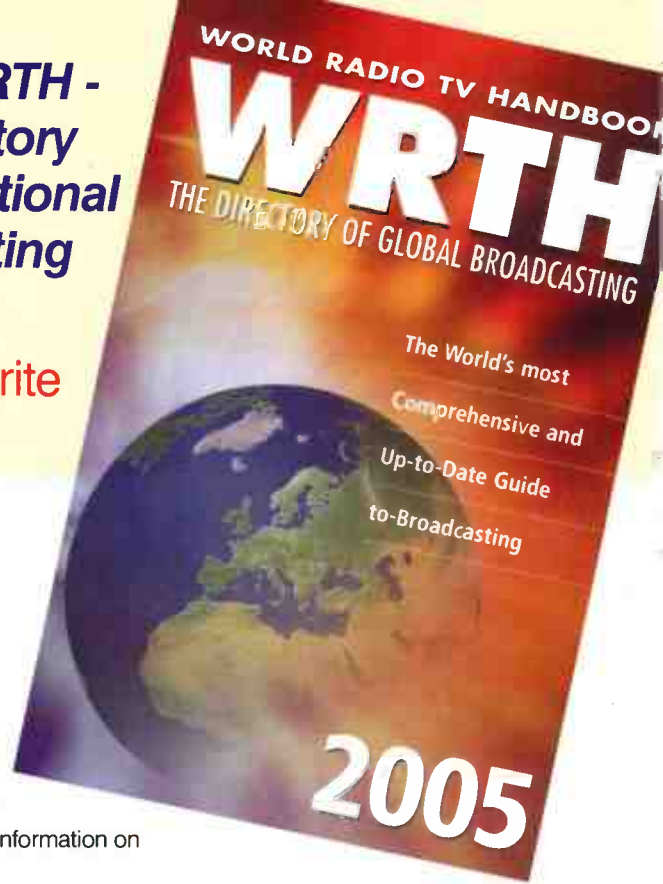
a 2005 WRTH -  
The Directory  
Of International  
Broadcasting

Here's a chance to win an annual favourite  
of *Short Wave Magazine* readers.

The latest edition of the renowned *World Radio TV Handbook* is now available. The publishers of *WRTH* have kindly donated five copies for *SWM* readers to win. Whether you are an annual reader, or someone who's never picked up a copy before, why not enter this competition and have a go at winning the 2005 *WRTH* worth £22.50 - all for the price of a stamp.

**The *WRTH* is an absolute must-have book for broadcast listeners!**

With nearly 700 information-packed pages and now in its 59th year, *WRTH* remains the single most authoritative source for listeners, broadcasters and engineers throughout the world. The 2005 edition features an extensively updated national radio section, the unrivalled 'SW Stations of the World' listing and added information on clandestine broadcasters.



Total Prizes worth  
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This year's *WRTH* features:

More pages - even more information - yet the same price as previous years.

More data extensively revised with even more authoritative information.

Hour-by-hour lists of international broadcasts in English, French, German and Spanish.

## Entry Form

To enter this prize draw, please fill in your details on the entry form, (photocopies can be accepted with the original corner flash attached), answer the two questions and post your entry to: **SWM WRTH 2005 Competition, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.**

Name.....

Address.....

Tel:.....

E-mail:.....

Do you receive *SWM* every month?: .....

Where do you buy *SWM*?: .....

**Q1:** How many international broadcast languages are listed in *WRTH*?

**Q2:** How many years has the *WRTH* been published?

The closing date for this competition is 24 February 2005, the winner will be drawn on 4 March 2005 - the first four correct answers drawn will be winners. The winners will be announced in the April 2005 *SWM*. The Editor's decision is final.

If you wish not to be contacted by PW Publishing Ltd. or associated companies please tick here. [ ]

WRTH COMP  
Feb '05



# No need to be kept in the dark...

*The terrific NEW IC-R5 handheld receiver from Icom gives a truly enlightening experience in a truly portable package - no need to miss a thing!*

The IC-R5's combination of small size, powerful performance and outstanding features will get you straight to the action.

Although compact to the extreme, the IC-R5 wideband receiver (0.150~1309.995MHz), covers virtually everything from AM broadcast to UHF TV audio. Every TV broadcast channel is programmed into the IC-R5. Listen to AM and FM radio stations, utility comms and much more. For the motor racing fan, the IC-R5 will put you so close to the asphalt that only the man on the track experiences more!

## IC-R5 features include...

- Side Socket allows you to work from external DC.
- Built-in, Ferrite AM Broadcast Antenna
- AA Nicads are Rechargeable using the Wall-charger supplied
- 1250 Alphanumeric Memory Channels
- Convenient Power and Charging
- Computer Programmable
- FM Earphone Cord Antenna
- DTCS and CTCSS Tone Squelch Monitor
- Offset Monitor for Semi-duplex Monitoring
- Auto Memory Write Scan stores detected Frequency, Mode and Tone into Specified Memory
- Reversible UP/DOWN buttons and Dial Knob for Volume, Frequency, Memory Channel, Scan Direction and Set Mode Settings
- Auto-Squelch and Squelch Monitor
- Built-in Attenuator
- Low-Battery Indicator and Beep
- Power-save Function
- Backlit LCD with Timer
- Priority Watch Function
- 30~120 Minutes Auto Power-off Timer
- 100 Preprogrammed Worldwide Shortwave Channels

**How do we squeeze so much in? Pay a visit to your local authorized Icom dealer and try one out... you'll end up taking the IC-R5 everywhere with you!**

**SAVE £20**

## MAYCOM FR100

**Civil & Military HANDY AIRBAND SCANNER**

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

**Maycom FR100 SPECIAL PRICE £79.95**

**LIMITED OFFER** £99.95 **£79.95**

**MAYCOM AR100**

- Airband: 108-136.975MHz VHF: 136-180MHz
- Selective Channel Steps: 5, 10, 12.5, 15, 25, 1MHz
- Modes: AM or FM
- Memories: 99
- Supplied c/w Belt Clip, Carrying Strap
- Mains Charger **£8.95 £2.75 p&p**

**£69.95**

**JIM M75**

**Pre-Amp**

- 24MHz to 2150 MHz
- Variable gain: -10dB to +20dB
- 12V DC or internal Battery
- BNC plug & socket
- Size 95 x 50 x 33mm
- Weight 180g

**£79.95**

**ICOM JC-R3**

**Wideband Scanner + TV**

- 495kHz - 2451MHz
- 450 memories
- FM, AM, WFM, AM-TV, FM-TV
- Supplied c/w:
  - Telescopic antenna
  - Belt clip
  - Charger
  - LI/ION battery pack

**SPECIAL PRICE** £449 **£339** (3 cheques of £116.33) **PAY BY CHEQUES/PREPAID**

**Easy to pay & GENUINE INTEREST FREE WITH CHEQUES/PREPAID**

- Pay by 3 post dated cheques
- No forms to fill in!
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- No hassle!
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• Simply divide the price (including carriage) into 3 equal payments.

• Write 3 cheques dated in consecutive months starting with today's date.

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• Post them to us, enclosing your name and address and we will (subject to status) send your goods immediately.

**CHEQUES/PREPAID AVAILABLE ON ITEMS OVER £100 ONLY**

**COMET High Quality Japanese Has-been Replacement Antennas**

**SMA Type**

RX5.....Flexi Ant 118-960MHz 44cm long...£26.95  
 SMA3.....Flexi Ant 118-960MHz 25cm long...£22.50  
 SMA99  
 Telescopic Whip 70-1000MHz 1135mm max...£14.95

**BNC Type**

SH95.....Flexi Ant 118-1200MHz 37cm long...£27.95  
 RX7.....Flexi Type 118-960 MHz 44cm long...£27.50  
 Add £2.75 p&p for all above antennas

**Scanmaster Pilot**  
 A centre loaded Civil Airband "optimised" scanner replacement antenna  
 PILOT (SMA)...connector 40cm length...£14.95  
 PILOT (BNC)...connector 40cm length...£14.95  
 Add £2.75 p&p for all above connectors

**SSE 128 Airband Base Antenna**  
 Commercial grade Civil Airband antenna  
 • Covers 118 - 138 MHz  
 • Gain 2.15dBi  
 • Fibreglass no radials  
 • Supplied c/w N to BNC adaptor lead, sealing tape, mounting brackets

**SSE 128 £59.95 ADD £8.00 P&P**

**AR5000A + 3**

- 10kHz-2.6GHz
- Modes: AM, FM, USB, LSB, CW
- 1000 memories
- 45 ch/sec scan
- 20 search banks
- DTMF decoder
- RS232 port
- N type & SO239 sockets
- Audio 1.7W (8Ω)
- 12V DC @ 1A

**SPECIAL PRICE** £1,999 **£1,799** (3 cheques of £603.00) **PAY BY CHEQUES/PREPAID**

**ADR AR-2600**

**All Mode Wideband Base Receiver**

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

**NEW MK II VERSION** **OPTIONAL PSU AVAILABLE**

**£699 £599** (3 cheques of £203.00) **PAY BY CHEQUES/PREPAID**

**FAIRHAVEN RD500 VX**

**Full featured wideband scanning & communications receiver**

- Latest database (over 20,000 freq)
- 0-1750MHz (gap at 36-46MHz)
- LSB, USB, AM, CW, Synchronous AM (USB, LSB and DSB), NBFM, Wideband FM, STEREO FM, Video output
- Tuning steps Auto/user
- 54,700 definable memories
- Stereo, Record & Video outputs
- Data Slicer
- 50 memories/steps per sec
- Mains power unit supplied as standard. 1A 230V AC

**£899 £699** (3 cheques of £236.33) **PAY BY CHEQUES/PREPAID**

**CABLE DEALS at WHOLESALE PRICES HIGH QUALITY MILITARY SPEC**

**50Ω Coax per 100 metre drums (ADD P&P £10)**

RG58 C/U Mil spec .....**£98 £25**  
 RG213U Mil spec low Loss .....**£76 £55**  
 H100 Semi Airspaced .....**£96 £65**  
 Westflex 103 Ultra Low Loss .....**£90 £89**  
 300 Ohm Twin feeder (slotted) .....**£90 £69**  
 450 Ohm Twin feeder (slotted) .....**£90 £79**

**FLEXWEAVE (style) ANTENNA WIRE HIGH QUALITY VERY FLEXIBLE**

- 168 strands of 14 AWG copper wire.
- Ideal for all your antenna projects

**FLEXWEAVE**  
 per metre.....**55p** .. +10p/metre P&P  
 per 100 mtr Drum ..**£40** .. +£6.50 P&P

**YAESU VR-1000**

**Yaesu's Flagship Desktop "Ultra Wideband" Scanning Receiver**

- 0.1 to 2600 MHz
- Tons of features!

**£699 £599** (3 cheques of £203.00) **PAY BY CHEQUES/PREPAID**

**YAESU VR-400**

**Compact all mode wideband handheld, PC Programmable with ADMS-3 Software**

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

**£199.95** (3 cheques of £69.31) **PAY BY CHEQUES/PREPAID**

**YAESU VR-1700**

**New D model with:**

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

**£139.00** (3 cheques of £49.00) **PAY BY CHEQUES/PREPAID**

**YUPITERU MVT 7100**

**All mode, wideband handheld Our No.1 Seller**

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

**£249 £199** (3 cheques of £69.66) **PAY BY CHEQUES/PREPAID**

**YUPITERU MVT 1300**

**200 Channels with Switchable AM/FM**

- 66 - 98MHz, 108 - 170MHz, 300 - 470MHz, 806 - 1000MHz
- Modes: AM/NFM
- Memories: 200

**SPECIAL OFFER** £498 **£129** (3 cheques of £46.66) **PAY BY CHEQUES/PREPAID**

**Used Equipment**

**ALL SAFETY TESTED & GUARANTEED for 3 MONTHS**

Ainco DJX3...H/held Scanner c/w accs & book 119.00  
 Ainco DJX10E...H/held Scanner All Modes.....199.00  
 ADR AR8200 MkII...Wideband Scanning RX .....249.00  
 ADR AR8200 MkIII...Wideband H/H Scanner.....299.00  
 Bearcat 220XLT...Handheld Scanning Receiver.....99.00  
 Fairhaven RD500...Database RX with remote.....499.00  
 Icom R2...VW/band AM/FM/WFM H/H Scanner.....95.00  
 Icom R5.....H/held scanner as new.....119.00  
 Icom R8500.....0-2Ghz All Mode Comms RX.....999.00  
 Maycom FR100...H/H AM/FM Compact Scan RX.50.00  
 Yupiteru MVT7100...All Mode Scanner as new...175.00  
 Yupiteru MVT7300...Handheld Scanning RX .....189.00  
 Yupiteru MVT9000...All mode Scan RX + case...275.00  
 Grundig YB500...Portable shortwave receiver.....99.00  
 Grundig Sat800...HF + Airband Receiver.....349.00  
 NRJ JRC545DSP...HF Base Receiver.....849.00  
 Palstar R30...Receiver.....325.00  
 Roberts 9914...FM/MW/LW/SW Receiver.....65.00  
 Steepleton MBR747...Portable Receiver.....65.00  
 Yaesu VR1200...Handheld Scanner .....115.00  
 Yaesu VR5000...All Mode Handheld Scanner...149.00  
 Yaesu VR5000...All Mode 100kHz-2600MHz Base RX..469.00  
 Perstel Bluenote...Personal DAB Radio .....59.00

**ICOM R2U**

**NEW ICOM R20 Ultra Wideband Scanning receiver** **NEW**

- "Twin Band" receive
- Record facility
- RF gain control
- freq: 150kHz to 3.3 GHz
- Memories: 1050
- Modes: AM/FM/SSB/CW
- plus lots more features

**NEW LOW PRICE!** £369 (3 cheques of £126.33) **PAY BY CHEQUES/PREPAID**

**BEARCAT UBC780XLT**

**Desktop with trunktracking & PC programming (via 3rd party software) - a MUST HAVE for enthusiasts**

- 500 channels
- 25-1300 MHz (with gaps)
- AM, FM, WFM

**SPECIAL OFFER** £299 (3 cheques of £103.00) **PAY BY CHEQUES/PREPAID**

**BEARCAT UBC276C17**

**Base Scanner with MW/FM Radio & Alarm Clock**

- 25-956 MHz (with gaps)
- VHF Radio: 88-108MHz
- 100 Memories
- 20 Radio Presets

**£159.95** (3 cheques of £56.65) **PAY BY CHEQUES/PREPAID**

**BEARCAT UBC 280XLT**

**SPORTCAT Twin Turbo Handheld**

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

**£179.95** (3 cheques of £63.31) **PAY BY CHEQUES/PREPAID**

**YUPITERU MVT 1300**

**Top of the range airband handheld with 8.33 kHz steps**

- 520kHz -1.32GHz
- 1000 Memories
- 8.33kHz Airband
- Duplex reception
- Describable function
- Supplied c/w: Mains adaptor • 12V DC lead • NiCads • Belt clip

**£299 £239** (3 cheques of £83.00) **PAY BY CHEQUES/PREPAID**

**MAHA C-401 FS NEW LOW PRICE £39.95**

- Rapid charge NiMH AA batteries in under 100 minutes coolly and efficiently
- The unique charging system developed by battery experts allows the battery to accept a more complete charge
  - Four independent charging circuits to ensure optimum charging for each battery
  - Ultra low temperature charging using Power Ex's unique Flex Negative Pulse algorithm
- Manually switch between 100 minute fast charge and 8 hour gentle charge, both microprocessor controlled
- Can be powered by AC adaptor or cigarette-lighter car adaptor
- Supplied complete with:
  - Four AA 2, 200mAh NiMH batteries
  - Car adaptor kit
  - Battery carrying case
  - Multi-Voltage adapter (100-240V, 50/60Hz) fitted with UK 13 Amp plug

**MAHA C-401 FS 100 minute cool Rapid charger Ideal for Scanner enthusiasts who travel the world**

**£44.95 £39.95**



**NEW**

**ROBERTS C9950**

**Programmable Cassette Recorder**

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

**IDEAL FOR THE RADIO ENTHUSIAST**

£80.00



**SAVE £150**

**GRUNDIG SATELLIT 800**

**We have a limited quantity of 'B' GRADE mail order returns - fully refurbished by Grundig and sold with a full year's guarantee!**

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

**YOUR CHANCE TO OWN THE ULTIMATE PORTABLE SW RADIO!**

£399 ~~£549~~ **£136.33**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**



**YAESU FRG-100**

**Shortwave Communications Receiver**

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

**FREE MAINS PSU**

£149 ~~£299~~ **£153.00**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**

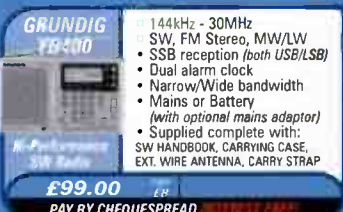


**ICOM IC-M8500**

**Communications Receiver**

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

£1499 ~~£1799~~ **£505.00**  
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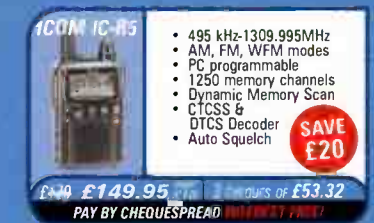


**GRUNDIG YB-400**

**Multiband Receiver**

- 144kHz - 30MHz
- SW, FM Stereo, MW/LW
- SSB reception (both USB/LSB)
- Dual alarm clock
- Narrow/Wide bandwidth
- Mains or Battery (with optional mains adaptor)
- Supplied complete with: SW HANDBOOK, CARRYING CASE, EXT. WIRE ANTENNA, CARRY STRAP

£99.00 ~~£149~~ **£153.00**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**



**ICOM IC-R5**

**Shortwave Communications Receiver**

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

**SAVE £20**

£149.95 ~~£169.95~~ **£53.32**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**



**STEEPLETONE MBR747**

**Multiband Receiver**

- Covers LW, MW and: Shortwave (2.3 - 22MHz)
- Marine/Airband (108 - 175MHz)
- Battery/Mains

£79.95 ~~£119~~ **£153.00**



**PALSTAR AA30**

**Active Antenna and/or Matcher for Receiver use only.** A low loss antenna tuner suitable for random long wire, dipoles, Beverages, Delta loops, inverted V's, Verticals, G5RV and most receiving antennas. Or use as a standalone active antenna.

- Frequency: 100kHz-30MHz

£69.95



**ROBERTS R861**

**Digital Worldband Radio with RDS**

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

**We stock the COMPLETE RANGE of ROBERTS RADIO!**

£189 ~~£219~~ **£66.33**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**

**SCANMASTER Quality Antennas**



**SCANMASTER LP1300**

**WIDEBAND BEAM ANTENNA 16 EL LOG PERIODIC DESIGN**

- 105 - 1300MHz
- Gain 11-13dB
- 'N' type connector
- 500W

£129.00



**SCAN AIRMASTER**

**DEDICATED CIVIL & MILITARY AIRBAND ANTENNA**

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

£59.95



**SCANMASTER DESKTOP WIDEBAND SCANNING ANTENNA**

A complete desktop antenna covering 25 - 1300 Mhz, just 36" high with 4 m of cable, fitted BNC plug with a magnetic base. £4.75 P&P

£49.95



**SCANMASTER B128 AIRBAND BASE SCANNER**

A dedicated CIVIL AIRBAND base antenna designed to give long distance reception on 117-140MHz. Supplied c/w mounting tube & mast clamps. £4.75 P&P

£39.95

**SHORTWAVE RADIO'S BEST KEPT SECRET PALSTAR R30 Portable Communications Receiver**



**WRTH NEW**

**2003**

**WRTH HANDBOOK BEST HF DESIGN 2002**

**★★★★**

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

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

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

£449 ~~£549~~ **£153**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**

**ALINCO THE POWER TO PERFORM**



**ALINCO DJ-X2000**

**'Intelligent' scanning receiver**

- Covers 100kHz - 2,149.99MHz
- 2000 channel memory
- AM/NFM/WFM/LSB/USB/CW
- Flashtone
- Transweeper
- Record up to 160 secs of audio
- Descrambler
- CTCSS decoder & search facility
- FM Stereo receive
- PC programmable

- INCLUDE FREE: Multi Voltage Mains Charger
- Nicad batt pack
- Belt clip
- Carrying strap
- Antenna

£399 ~~£499~~ **£136.33**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**



**ALINCO DJ-X10**

- Receives 100kHz - 2000MHz
- AM - WFM - NFM - SSB - CW
- 1200 memory channels
- Channel scope spectrum analyser
- Advanced scanning features
- PROGRAMMED SCAN, PROGRAMMED MEMORY SCAN, ANY MEMORY SCAN, MODE SCAN, VFO SEARCH, DUAL VFO SEARCH, BAND ENCLOSURE SCAN, PRIORITY SCAN, ANY CHANNEL SHIP SCAN
- Clone another set facility

£249 ~~£349~~ **£86.33**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**



**ALINCO DJ-X3**

**Ultra modern scanning receiver**

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

with 8.33kHz for airband  
£129 ~~£179~~ **£46.65**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**

**Bearcat AFFORDABLE QUALITY**



**UBC 3300XLT**

- 1000 channel memories
- Twin Turbo Scan & Search
- Scans 100ch / second!
- 25.00 - 512.00 MHz
- 806.00 - 960.00 MHz
- 1240.00 - 1300.00 MHz

£229 ~~£279~~ **£79.00**  
PAY BY CHEQUES/PRECARD **INTEREST FREE!**



**BEARCAT UBC 105XLT**

- Frequency: 29 - 512 MHz (with gaps)
- 8.33 kHz steps for AM Airband
- Large liquid crystal display with backlight
- Search Skip
- Frequency Search
- Ten Channel storage banks
- Two Second Auto Scan Delay
- Lockout Function
- Priority Channel

£99.95



**NEW UK BAND SCANNER**

**BEARCAT UBC 68XLT**

- UK Search Bands
- 66 - 512MHz (with gaps)
- Pre-programmed UK Search Bands
- 80 Channels
- Programmable Chain Search
- Priority Channel Scanning
- Scan+ Search rate: 10 Ch/Sec
- Supplied c/w: Antenna, Earphone, Beltclip, Operating Guide

£79.95

**We Deliver FAST** • MEGA FAST DELIVERY • ENORMOUS STOCKS • AMAZING SERVICE!

**TRUST US TO GET IT RIGHT!**

**ALL GOODS SHIPPED FOR 24 HR DELIVERY**

P&P: £10 (UK MAINLAND) unless otherwise stated £6OE



**nevada**

World Radio History COME AND VISIT OUR SHOWROOMS OPEN MON-FRI 9.30-5.30

# Phased Vertical Array

More antenna interest from the late Joe Carr K4IPV.

Vertical array antennas can be used at any frequency from lower medium wave, through short wave, to v.h.f. and u.h.f. bands. The only thing that limits their use is the amount of garden space that you have - which can be a serious limit at lower frequencies! But regardless of the difficulties in implementing the lower frequency antennas in small urban gardens, there is a tremendous use for phased vertical array antennas.

## Quarter Wavelength Verticals

The quarter wavelength vertical antenna is a marvel to behold. It usually consists of a single or telescoping aluminium tube that rises one quarter wavelength in the air. The feedpoint impedance can vary quite a bit depending upon the design. From a low impedance of several ohms, to a maximum of 37Ω, the impedance is dependent on the ground system used and whether it is mounted above the ground or on the ground.

In the case of a very low impedance, a broadband transformer is used at the feedpoint to match the antenna to 50Ω. But at 37Ω, the feedpoint is connected directly to 52Ω coaxial cable. This results in a 1.41:1 v.s.w.r., but that is well within limits for all but a few amateur transceivers should you wish to use the antenna for transmitting. It is well within limits for receiver operators.

The diagram Fig. 1 shows two quarter wavelength verticals spaced half wavelength apart. This is the 'standard' configuration for phased verticals. The impedance of the feedpoint will be lower than 37Ω, but the actual feedpoint impedance that you achieve will depend on local installation characteristics.

The dimensions of the antenna is given by:

$$A = \frac{73}{F_{\text{MHz}}}$$

The spacing is defined by:

$$B = \frac{150}{F_{\text{MHz}}}$$

The spacing of the antennas sets the pattern to the figure-of-eight type, but the orientation of the pattern depends on the phasing of the two

antennas. Figure 2a shows the pattern for a pair of antennas fed in-phase with each other. The pattern is oriented 90° from the line between the antennas. This is the so-called 'collinear' arrangement.

If the antennas are fed 180° out of phase with respect to each other, then the pattern of Fig. 2b is obtained. This is the so-called 'end-fire' arrangement. The pattern of the antenna lies along the line between the two antennas.

If the spacing between the antennas is reduced to quarter wavelength, and the antennas are fed 90° out of phase with each other, the cardioid pattern of Fig. 3 results. Various versions of cardioid, figure-of-eight and circular patterns exist for various spacings ( $\lambda/8$ ,  $\lambda/4$ , and  $\lambda/2$ ) and phasings (0 to 315°) of the two antennas, not just the simple cases that we have illustrated here.

## Bobtail Curtain

The antenna shown in Fig. 4 is called the Bobtail curtain. It is essentially a truncated version of the Sterba curtain array, and produces a gain of about 5 to 5.5dB above a dipole (dBd). The nice thing about the Bobtail curtain is that it gives a very low angle of radiation, even at low frequencies, so is ideal for long-haul DX work. Typically, at 7MHz the path length is on the order of 4000km per hop.

The Bobtail curtain antenna consists of three quarter-wavelength vertical radiators, spaced half wavelength apart. Oddly enough, all three of the antennas are fed at the top by straight conductors between them. The array is fed at the bottom of the centre element. Because of impedance considerations, the antenna is fed by a tuned antenna tuner arrangement that has a reactance of about 1kΩ. A tap on the inductor (or a link) connects the L-C tank circuit to the coaxial cable and to the receiver.

The lengths are given by:

$$A = \frac{150}{F_{\text{MHz}}}$$

and

$$B = \frac{73}{F_{\text{MHz}}}$$

The horizontal directivity of the Bobtail curtain is about equal to that of three co-phased verticals fed with equal currents.

## Thorne Array Antenna

An improvement on the Bobtail curtain is the Thorne array shown in Fig. 5. This antenna gives the same 5 to 5.5dB gain over a dipole. The Thorne array antenna is sort of an inverted Bobtail curtain. I saw this antenna in operation in Texas at the 'antenna farm' of the late Johnnie Harper Thorne K4NFU/5 - he invented it. It worked as well as a Bobtail curtain antenna, producing the same low angle of radiation. The version that I saw was on the 20m amateur band.

The Thorne array consists of three quarter-wavelength vertical antennas, spaced half wavelength apart, just like the Bobtail curtain. The length of the antenna elements and the spacings are calculated the same as for the Bobtail curtain above.

The difference between the Thorne array and the Bobtail curtain array lies in the feed system of the two antennas. In the Thorne array, the antennas are fed at the bottom, not at the top. A conductor connects the outer two antennas to the shield of the coaxial cable. The centre vertical is fed from the centre conductor of the coaxial cable, without the need for an antenna tuner. This results in a non-unity s.w.r. reading, but it is not serious.

## Four-Element Array Antenna

Take a look at Fig. 6 and you'll see an antenna made up of half wavelength elements. This is in contrast to the previous antennas that we've considered, which were quarter wavelength radiators. This antenna gives a gain of about 5.5 to 7dB over a dipole. It is like the Bobtail curtain and the Thorne array in that it has a very low angle of radiation.

The four element array uses four half-wavelength radiators spacing half-wavelength apart. Because of the velocity factor of the conductors used for the radiator elements they are slightly shorter than the spacings. These are:

$$A = \frac{150}{F_{\text{MHz}}}$$

and

$$B = \frac{144}{F_{\text{MHz}}}$$

The interesting thing about this antenna is

# Antennas

Here Joe explains the use of vertical arrays.

that it uses 600Ω parallel or 'open' line to connect the antennas. This line consists of two parallel conductors separated at intervals by spacers. The transmission line is twisted over on itself at two points. The outer antennas are fed 180° out of phase with the inner antennas by the twisting. The 4:1 Balun transformer is connected to the bottom conductor of the parallel transmission line.

## Eight-Element Array Antenna

The four-element array antenna can be extended to eight elements for a further 3dB increase in gain (over a dipole), and a very low angle of radiation.

There's an illustration of the antenna in Fig. 7 shows this antenna. The antenna's elements are either quarter or half

wavelength, with the half wavelength being preferred. One half of the elements (four of them!) are connected to the top of the 600Ω parallel transmission line and four are connected to the bottom. The feed-line of the antenna is coaxial cable, fed to the centre points of the parallel line through a 1:1 Balun transformer.

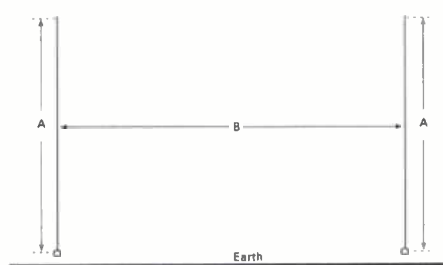


Fig. 1.

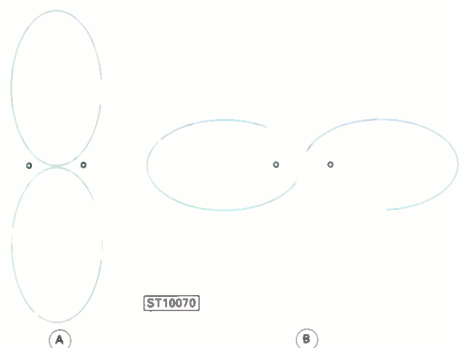


Fig. 2.

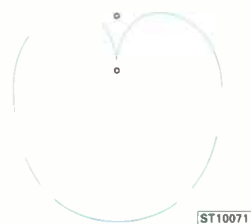


Fig. 3.

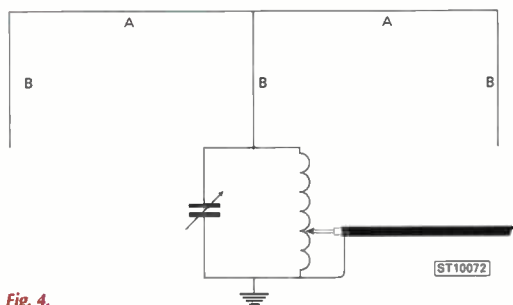


Fig. 4.

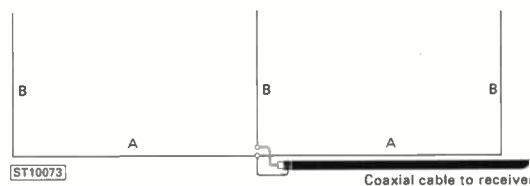


Fig. 5.

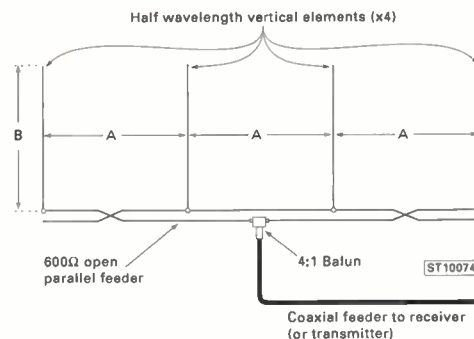


Fig. 6.

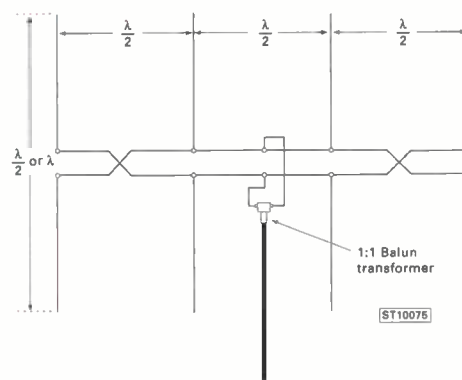


Fig. 7.

### Space Vs Frequency

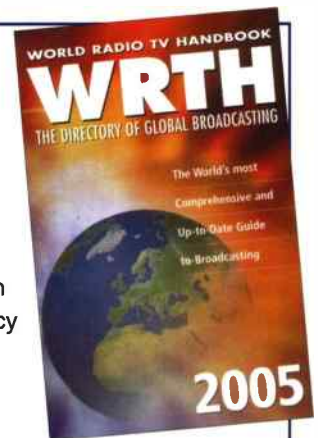
The array antennas depicted here may be for those with a large garden at low frequencies, but become increasingly useful as frequency increases!

# BOOK

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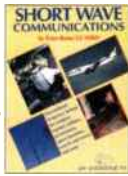
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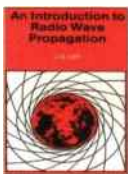
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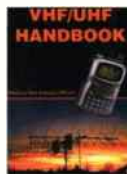
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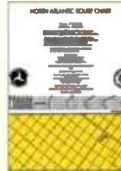
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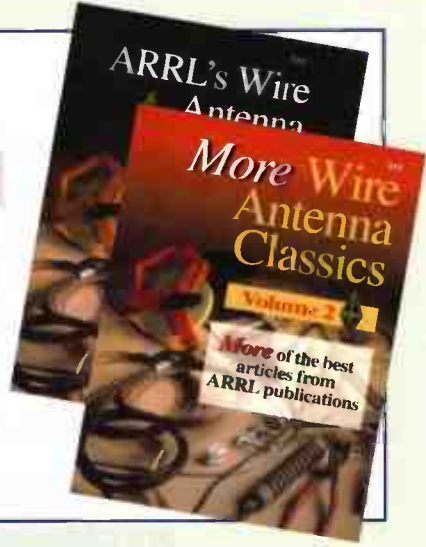
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swm

# WRN - Global

***There's no doubt that international broadcasting is changing.***

***Traditional analogue short wave continues to be the best method for reaching global audiences, but competing technologies such as Digital Radio Mondiale and satellite are chipping away at the analogue audience. Jason Walsh spoke to Jeff Cohen from World Radio Network, an international station that has been pioneering a new form of broadcasting for over a decade.***

**T**here are few readers of this magazine who haven't tuned into stations like Radio Budapest, Deutsche Welle and Radio Canada International, but for many expatriates from these and other countries there is now a better way to hear voices from home than by fighting with the vagaries of skywave propagation - and WRN is it.

The company rebroadcasts a range of programmes from international and public broadcasters world-wide. In Europe it already broadcasts dedicated stations in English, French,



Karl Miosga, WRN Chairman



*With sixteen distinct networks feeding every corner of the globe, twenty-four hours a day, WRN is clearly no lightweight*

German and Russian and around the world operates a range of single-language and multi-lingual stations.

WRN - formerly World Radio Network - was founded in London in 1991 by three former BBC staff: Karl Miosga, Tim Ashburner and Jeff Cohen. How did it get started? According to Jeff Cohen it was a case of an opportunity appearing at the right time, or rather, creating opportunity in the face of adversity. "It was a time when the BBC was encouraging staff to seek opportunities elsewhere", as Cohen, who had had a long career with BBC News, diplomatically puts it. "Also, it was the end of the Cold War and international radio was changing, plus we saw that new platforms for radio would emerge and took the chance to become pioneers".

"We rented an audio subcarrier on a Sky channel for a week, just to show that we could do it. It was a great success and proved to many potential client stations that we knew what we were doing". Soon afterwards WRN moved to the *Eutelsat IIF1* satellite at an orbital position of 13°E (now the home of the *HotBird* fleet).

## Important Implications

Whatever motivated WRN's decision, it had two important implications: Eutelsat's fees were lower than those on SES's Astra, savings which were presumably passed on to WRN when they rented an audio subcarrier and the *IIF1* bird had a much larger footprint than Astra, allowing for a far greater audience reach. These days its various networks are scattered across a range of satellite fleets including both *Astra 2* and *HotBird* in Europe.

WRN's main clients are second-tier international broadcasters, but as Cohen points out, "In the anglophone world at least, there's the BBC World Service and then there's everybody else".

Certainly many other major broadcasters such as Radio

# Perspectives

Canada International have scaled back their operations whilst others have responded to a changing world. "The Voice of America has certainly seen tremendous change, and will undoubtedly see more. These days a lot of their programming seems to concentrate on issues of geopolitical threat to the United States", said Cohen.

The financial pressure on foreign stations to cut costs in their English-language broadcasts makes WRN a compelling alternative to broadcasting on short wave. "One of the key reasons for our success is that we can deliver audiences. Single language channels are better for the audience than simply broadcasting half an hour a day in English".

There are however, some difficulties associated with WRN's approach. "The audience is different from that of short wave. Short wave listeners are often hobbyists who aren't particularly interested in the programming, whereas on satellite the converse is true. We get committed listeners, but they don't really write to us with reception reports", said Cohen. "Our listeners are closer to what many of these broadcasters are seeking than the traditional short wave audience, but they're not as active when it comes to communicating with the station".

However as WRN's audio feeds are available on all continents via various satellites and local terrestrial distribution deals and they also offer multilingual channels alongside the English broadcasts.

With sixteen distinct networks feeding every corner of the globe, twenty-four hours a day, WRN is clearly no lightweight, but what of its listeners? "We do have heavyweight listeners - 'aspirants and cosmopolitans' in BBC-speak - some global opinion-formers, anyone who wants to hear news and views from around the world", explained Cohen.

Cohen notes that the international audience, though difficult to measure, certainly does exist. For example, Alan Greenspan of the USA state bank, the Federal Reserve is a keen listener. "Greenspan told the Australian ambassador to the US that he listened to Australian radio on WRN, saying



*The On Air team*



*Jeff Cohen, Director of Development*



*Aside from its work on satellite and terrestrial radio, WRN has also been a pioneering Internet broadcaster*



**Tim Ashburner,**  
*Director of Technical  
Operations and IT*

that it was one of the only ways to get news of the Asia-Pacific region if you were in the USA".

### Uplink Facilities

Alongside its own stations, WRN currently provides uplink facilities to one third of the radio stations on the Sky Digital platform, excluding the BBC. According to Cohen, broadcasting audio via satellite is an increasingly cost-effective medium. WRN charge in the region of £24,000 per year for uplink and related facilities, plus a further £1,000 - £5,000 for the EPG services. A separate fee of £20,000, payable to BSkyB, is incurred for the channel without which any prospective station

will have to encourage listeners to manually tune in.

### Next Big Venture

WRN's next big venture is launching a terrestrial station in Moscow in early-2005. Obtaining the licence was no easy task, but the deal is signed and the station will take to the air soon. "There was an election in the spring and ministry work ground to a halt, but now things are back on track".

The Russian experience is going to be a particularly interesting one for WRN as the local radio market in Moscow is significantly different from elsewhere in Europe. "In the days of the Soviet Union there was obviously a lot of

propaganda on the air, but now the competition on the radio is intense", said Cohen, going on to explain: "In some sense the Muscovites don't quite get speech radio. At the moment most



**Carl in the Master  
Control Room.**

of what's out there is mainly either Western pop music or Russian music. We hope to change that".

Despite the fierce competition in Moscow, Cohen is confident that WRN's new station, which will air on 738kHz, will attract an audience through being unique: "Thirty percent of programming will be originated locally and will include some of the formats which have been successful elsewhere in the world - 'phone-ins to the doctor, the therapist and so on". The remaining seventy percent of the programming will be Russian-language material originated elsewhere in the world.

### Internet Broadcaster

Aside from its work on satellite and terrestrial radio, WRN has also been a pioneering Internet broadcaster. WRN's first 'net-casts' occurred in 1993 using the now defunct GSM audio standard, derived from mobile 'phone technology. "That's part of why WRN exists. We took an interest in new platforms. We produced Vatican Radio's website for a number of years, complete with streaming audio. In fact, Vatican Radio were our first big customer and continue with us to this day".



*Alongside its own stations,  
WRN currently provides  
uplink facilities to one third  
of the radio stations on the  
Sky Digital platform,  
excluding the BBC*

Back when WRN commenced broadcasting Vatican Radio couldn't get an uplink to Eutelsat from the Holy See so WRN stepped in and got them onto the satellite. "Prior to using us they were using 'phone-line quality audio and it was tremendously expensive. By going with us they saved a lot of money", explained Cohen.

What about the future? One recent venture for WRN has been a new station on Sky Digital called On Air. WRN On Air is a dedicated open station, which any prospective broadcaster can lease for a period of time.

Hiring airtime on radio stations is nothing new - WWCR, WBCQ and WMRI are all well known stations which lease out their a.m. short wave transmitters, but On Air does things differently. Rather than leasing on an hourly basis, stations fully take over the channel for a period of days, weeks or, possibly months. Cohen is sure that On Air's model will work: "We could lease hourly blocks of airtime, but right now we're having success leasing the entire channel for periods of time".

### Try Before Committing

Launched late last year, On Air allows prospective stations to try out a format before committing serious money to a project. If a station isn't in a position to immediately launch a full satellite station, WRN On Air can be used instead - the benefits for radio training and restricted service licence stations are immediately obvious.

With all of its success on satellite television platforms and even on dedicated satellite radio such as WorldSpace in Europe, the Middle-East, Africa and Asia and Sirius in North America, is WRN advocating and abandonment of terrestrial radio? Not at all. Aside from the new Russian venture WRN already runs several successful terrestrial radio operations.

Cohen has just returned from China where he has signed a deal to broadcast China Radio International on 1440kHz - the old Radio Luxembourg frequency operated by the RTL group. "This is the deal for 2005. We've been broadcasting them to Europe on 1440kHz for a number of years and this deal ensures that this will continue", explained Cohen. WRN leases the hours between 1900 and midnight on 1440 from RTL - a shrewd move as any former Radio Luxembourg listeners will know, as the propagation is much better in the evenings.

### Overnight Hours

WRN also lease the overnight hours on London's Spectrum Radio at 558kHz, a station dedicated to serving London's

diverse ethnic minority communities. "On Spectrum we broadcast shows from a range of broadcasters such as Canada's CBC, Radio Romania and, again, China Radio International. We've been running CBC programming since 1995 and from a technical perspective it's been flawless, which can be difficult to achieve".

Furthermore, WRN owns a stake in a Berlin f.m. radio station and leases another in the former Soviet republic of Moldova, which covers a large part of Eastern and Central Europe.

A member of the DRM Consortium, WRN also sees a future in digital terrestrial radio. Will DRM be a success? Cohen thinks so: "It certainly could be. RTL's plans are there for all to see. It will be particularly interesting to explore what opportunities DRM opens at a local level. We will be releasing something in a few months in the DRM area - DRM could be the answer for many broadcasters".

Of course, a company like WRN does not pin all of its hopes on a single technology and alongside all of the aforementioned methods of getting programming to listeners, it is currently working on some distinct, but complimentary services.

"We're working with MBN in the States - Mobile Broadcast Network - who are pioneering the idea of bringing radio content to mobile 'phones and with AudioFeast who are working on Internet downloads", explained Cohen.

AudioFeast is an intriguing concept - dubbed 're-igniting radio' the service allows users to download thousands of up-to-the-minute radio shows to their computer - or portable digital music player.

The service is the professional analogue to the amateur audio phenomenon of 'Podcasting', a popular way of distributing audio content on the Internet in downloadable form for later listening on portable MP3-players such as Apple's successful iPod. Ironically however, AudioFeast does not support the iPod which doubtlessly will cause severe problems for the project, as Apple's portable audio player has a staggering ninety-plus percent of the digital audio player market.



*WRN's next big venture is launching a terrestrial station in Moscow in early-2005*

### Varied Output

At the end of the day, WRN's varied output all centres on the single idea of radio as a communication medium - something which short wave listeners have always been acutely aware of, but commercial stations often only pay lip-service to. Cohen recalls one occasion when this really hit home for him: "I was visiting Bush FM in South Africa, which serves the poorest of the poor black townships in Cape Town. They take a lot of our programming and I was told that our feed of NPR's Car Talk show was one of the most popular programmes on the station".

Initially nonplussed as to why an American programme

## Listening to WRN

### WRN English for Europe

WRN's English service for Europe is a unique radio service that brings together programmes from leading international public service broadcasters in Europe, Africa, Asia Pacific, North America and Latin America. The network majors on news - national, regional and international. Additionally, WRN brings coverage of science and the arts, sports and history.

### Tuning In

#### Via Digital Satellite for the UK & Ireland

Sky Digital, Channel 872 (*Eurobird 1*, 28.5°E, Transponder D7S, 11.585GHz, Horizontal, Symbol Rate 27.500Mbaud, FEC 2/3, MPEG2 DVB audio stream. Select WRN Europe from audio menu.

#### Via Digital Satellite for Europe

Eutelsat *HOT BIRD 6*, 13°E, Transponder 94, 12.597GHz, Vertical, Symbol Rate 27.500Mbaud, FEC 3/4, MPEG2 DVB audio stream. Select WRN English from audio menu.

#### Via WorldSpace *AfriStar*

WRN broadcasts two exclusive networks on the WorldSpace *Afristar* satellite service. The footprint of the *Afristar* satellite covers Southern, Western and Eastern Europe.

#### Via local Radio

Across London and the South East of England via Spectrum Radio 558 AM from 0100 each night. For detailed times and schedule please visit [www.spectrumradio.net](http://www.spectrumradio.net)

#### Via Cable

WRN's English service is available on Local radio stations and cable systems in cities across Europe for full and up-to-date information visit WRN's website.

WRN can be contacted at: **WRN, PO Box 1212, London SW8 2ZF. Tel: +44 20 7896 9010, Fax: +44 20 7896 9007**  
E-mail: [mail@wrn.org](mailto:mail@wrn.org) website [www.wrn.org](http://www.wrn.org)

dedicated to repairing cars would appeal to people who, more often than not, were too impoverished to own cars, Cohen inquired further. "They told me that people like hearing about the problems which other people face as it makes them feel closer to them. Similarly, they run our feed of Radio Téléfís Éirrean's Radio One which includes a 'phone-in show'. Seemingly the day-to-day lives of people in Ireland, now one of Europe's richest countries, is not massively removed from the lives of people a world-away in South Africa, in terms of sharing a common humanity at least.

These are exciting times for Radio - news of radio station mergers and the opportunities afforded by DAB digital radio has filled the media supplements of the *Independent*, *Guardian* and *Financial Times* for the past year, but WRN never seem to get a look-in, which is strange. WRN may not be well known inside the UK, but they are a successful small media company with a massive global presence that many much larger broadcasters can only dream of and a strong commitment to new technologies - the international broadcaster of tomorrow? Time will tell.

SWM

# Starting Out

## Part 8

**The beginner's series that's back due to reader demand. This month we continue the rerun of the excellent beginner series from the past, originally brought to you by the late Brian Oddy G3FEX.**

**A**lthough the very early superhet receivers had to convert the incoming signal ( $f_c$ ) to a low frequency i.f. to avoid losses, subsequent improvements in components reduced many of the losses. This improvement in capabilities, made it possible to process a signal in the h.f. spectrum with little loss and relative ease. But despite these and further technical advances, the practice of using a low frequency i.f. continued. The low i.f. frequency of around 455kHz is still employed in many inexpensive modern receivers, mainly because i.f. tuned circuits can be sharply tuned to provide the selectivity needed in the i.f. chain at a reasonable cost.

Simple receivers using such a low i.f. of 455kHz are often satisfactory up to about 10MHz. But above that frequency, the tuned circuits associated with the input of the mixer start to become less selective due to losses and often unwanted image signals arise (see 'Starting Out' *SWM* January 2005). Adding tuned r.f. stages ahead of the mixer can help improve the image frequency rejection ratio and also enhance the weak signal performance of the receiver.

Consequently, many of the older valved communication receivers, which used a low frequency i.f. often employed at least one gang-tuned r.f. amplifier stage ahead of the mixer. The famous National HRO, for example, had two such stages and used a plug-in coil assembly for each band to reduce losses and simplify wave-changing. The later RCA AR88 used a complex wavechange switch to select the appropriate coils for the two r.f. stages, the mixer and the local oscillator on each of its six ranges.

As we have seen, image signals stem from a band twice the i.f. away from the wanted signal,  $f_c$  and on the same side of  $f_c$ , as the local oscillator ( $f_o$ ). So, an easy way of improving the image rejection ration is to operate  $f_o$  at several (or even many) megahertz above the signal frequency  $f_c$  so that a high frequency difference (i.f.) signal ( $f_o - f_c$ ) results. The selectivity of the mixer tuned circuit will then be adequate to reject the unwanted image signals because of the large frequency difference involved.

Unfortunately, it is not a simple matter to provide adequate selectivity in high frequency i.f. stages so, now a conflicting choice arise. Do we choose, the higher i.f. for good image response or, do we go for a lower i.f. for good selectivity?

### Dual Conversion

One choice, in answer to the low or high i.f. question, is to combine the effects of both i.f.s and to use both options. Most of the more advanced modern superhet designs combine these two concepts and convert the incoming signal  $f_c$  initially to an high i.f. (IF1) to ensure that a high image ratio exists. Then there's a second mixer, used to change IF1 to a lower intermediate frequency (IF2) where adequate selectivity can be achieved by using a sharply tuned i.f. circuit. Then further processing takes place in subsequent stages of the receiver. A receiver of this type is known as a dual conversion receiver, or double superhet.

The block diagram of one type of dual conversion receiver is shown in Fig. 8.1. In this version, the r.f. amplifier, first mixer and first local oscillator stages are tuned by ganged variable capacitors, so that they remain in step throughout each range. The correct coils would be

selected by the wavechange switch (not shown). However, the first local oscillator ( $f_{o1}$ ) always operates above the desired signal ( $f_c$ ) by an amount corresponding to the first intermediate frequency (IF1).

### Stability

The first local oscillator must possess good stability. Where a frequency synthesiser is used as the local oscillator, the control for the r.f. amplifier and first mixer ganged tuning, is often brought out as a separate front panel control marked pre-selector, and this has to be peaked up on the desired signal once the synthesiser has been set to the correct frequency. Receivers of this type often employ a digital frequency display to indicate the nearest 100Hz to the frequency tuned (these days 10 or 1Hz is more common).

The output of the first mixer (IF1) is passed through a ceramic filter (FL1) to attenuate the unwanted frequencies before it enters the first i.f. amplifier. The second mixer input is pre-set tuned to IF1 and the second local oscillator ( $f_{o2}$ ) operates on a frequency equivalent to  $IF1 + IF2$ , it is derived from a quartz crystal (X1) to ensure stability. Both local oscillators need to be well screened if spurious signals resulting from their harmonics are to be avoided.

### Variable Selectivity

The second i.f. stages are pre-set to the chosen low intermediate frequency (IF2) and a choice of quartz filters (FL2 and FL3) enable the selectivity to be varied. Since short wave a.m. broadcasts are spaced at 5kHz intervals throughout the bands, the wide filter FL2 will usually have a bandwidth suitable to allow all of the incoming signal to be accommodated.

When adjacent channel interference arises, the narrow filter FL3 with a bandwidth of perhaps 2.4kHz may be selected. Such a narrow filter will degrade the received signal since it will cut off its higher frequency sidebands, but the unwanted interference will be substantially reduced. Some receivers have additional filters, in addition to cater for s.s.b. and c.w. signals. But the need for them will become apparent when reception of these modes is discussed later in the series.

Part of the signal output from the last i.f. amplifier may be converted into a d.c. potential which varies with signal level. This analogue of the signal level can be used to automatically control the gain (a.g.c.) of each i.f. stage. Often a three position switch marked Fast/Slow/Off may be provided to vary the attack and decay time constants, Fig. 8.2, of the a.g.c., or turn the control off.

### Relative Signal Strength

In some receivers, the a.g.c. potential is also used to unbalance a bridge circuit so that a meter placed across the bridge may indicate relative signal strength in SINPO 'S' units from 1-5 or in 'S' units of the RST code from 0-9. The a.g.c. potential is not usually applied to the r.f. stage because high amplification at low noise is required there to enhance the overall signal-to-noise ratio of the receiver.

A potent, but undesired signal at the front-end of the set, may be amplified to the point where it swamps a later stage and causes cross



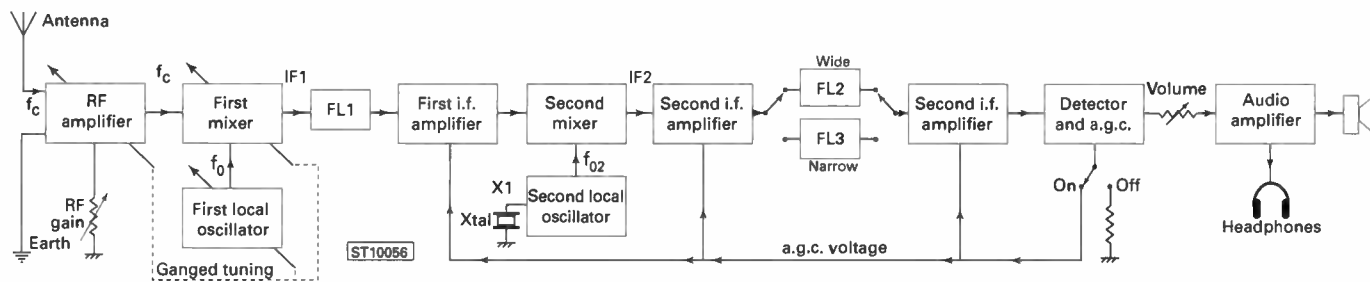


Fig. 8.1: The block diagram of one form of dual conversion receiver. See text for more detail.

modulation effects. This effect causes the modulation of the wanted signal to be superimposed by the unwanted signal. To counteract this effect, a manual r.f. gain control is often provided. An alternative approach is to use an r.f. attenuator ahead of the r.f. amplifier so that the amplitude of all signals from the antenna may be reduced in steps of 10dB from 0-40dB.

And finally, on the signal side, the detector stage demodulates IF2 to recover the original modulating audio. This is then amplified sufficiently to drive headphones or a loudspeaker.

### Other Designs

The above described form isn't the only type of dual conversion. In another system, the tuning of the r.f. stage, first mixer and first local oscillator is fixed and the tuning of the first i.f., second mixer input and the second local oscillator are all made variable, see Fig. 8.3. The block diagram only covers the stages up to the output of the second mixer, since the second i.f. and subsequent stages are similar to those shown in Fig. 8.1.

In the version, shown in Fig. 8.3, a band-pass filter at the input to the r.f. amplifier allows a narrow band of signals, including the desired one ( $f_c$ ) to be amplified. When this narrow band of signals is mixed with the crystal controlled output from  $f_{01}$ , the resulting mixer (IF1) is also spread over a narrow band. The tuning of the first i.f. amplifier, second mixer and second local oscillator is ganged and variable, but it may only be varied within the narrow band of IF1, so that a wanted signal may be selected and converted to the fixed low intermediate frequency (IF2) and then processed in the subsequent stages of the receiver.

Now the receiver, in effect, only tunes across a narrow segment of the h.f. spectrum - perhaps just 1MHz wide. To change the range, it will be necessary to select an appropriate band-pass filter and a suitable first oscillator crystal. The tuning rate of the second oscillator will be the same on every band and since it only has to cover a limited tuning range, it may be easier to achieve good stability.

The first three building blocks of Fig. 8.3, namely r.f. amplifier, mixer and crystal oscillator form the basis of many of the commercial add-on converters which may be used ahead of an existing s.w. receiver to extend its range or improve its performance for example, a converter with a 144-146MHz input and a 28-30MHz output will enable a receiver just covering the 28MHz band, to tune across the 144MHz amateur band!

### General Principles

Although the block diagrams have served to illustrate the general principles behind receivers of this type, many superior designs using variations of these principles have evolved during the last decade or two. It's not uncommon to find that

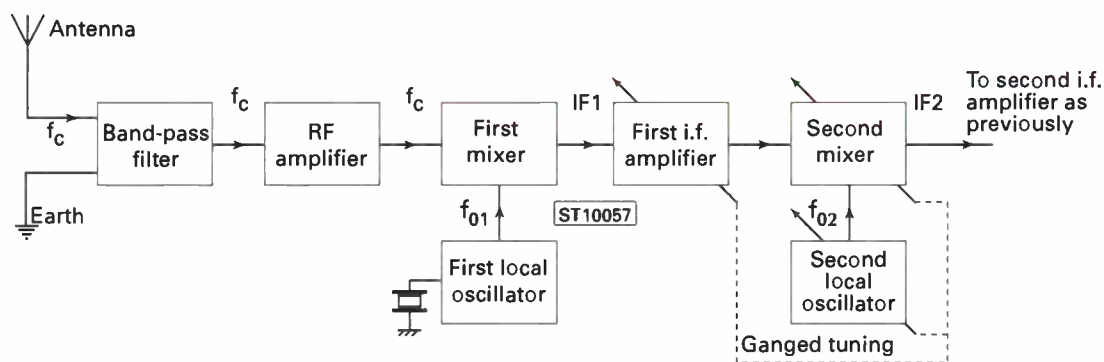
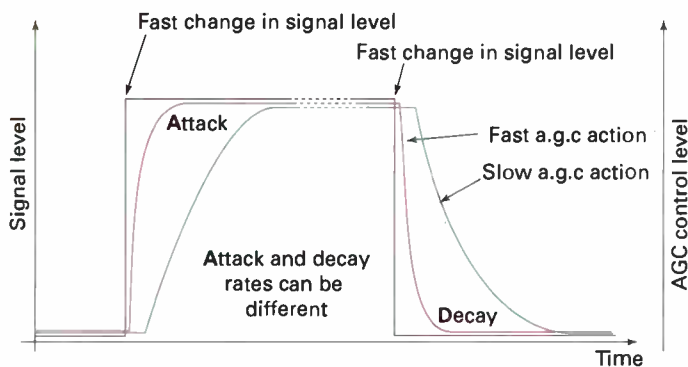


Fig. 8.3: An alternative front-end that is a variation of that shown in Fig. 8.1. See text for more detail.



some modern communications receiver designs use triple or even quadruple conversion systems to enhance their performance and often convert the incoming signal to a first i.f. in the v.h.f. region - often to 70MHz or higher.

A popular second i.f. is one of 9MHz with the third i.f. at 455kHz, if a fourth i.f. is included, a frequency of 50kHz is frequently chosen. In such complex designs, of course, the local oscillator frequencies have to be chosen with great care to avoid spurious responses, and high stability is essential.

With the advent of computers, there are systems, that could make the ideas above, obsolete. I'm talking about r.f. digital signal processing (r.f.d.s.p.) to be found on several exciting new designs for radio. But I think it'll be quite a few years before these techniques take over for all radios. However, make no mistake the change is underway.

Next time, we'll cover oscillator stability, frequency synthesisers and the Wadley-Barlow loop system.

# DX

## Television

● Keith Hamer & Garry Smith  
17 Collingham Gardens, Derby DE22 4FS

There was plenty of hectic Sporadic-E action throughout November. The 10 and 11th were extremely productive and very reminiscent of summer, apart from the weather!

### Reception Reports

A two-hour opening into south-east Europe had established itself by mid-morning on 1 November. Italy (RAI UNO) Channels A and B, Croatia (HRT-1) E4, Slovenia (SLO-1) E3, Hungary (RTL KLUB) R2 and ARD (Germany) E2 were the first signals identified by **Simon Hockenhill** (Bristol).

The path eventually tracked towards the Iberian Peninsula with Spain (TVE-1) E2 and E3 and Portugal (RTP-1) E3 logged by **Stephen Michie** (Bristol) and **Peter Barber** (Coventry). Towards midnight, **Tom Crane** (Hawkwell) discovered a 'rumbling' carrier on E2, tentatively thought to have been Auroral-E propagation. On the 5th, Spanish signals were visible late morning while on the 8 and 9th, early evening Italian openings materialised.

Tom Crane became aware of an Italian opening as early as 0612 on the 10th, the start of an all-day extravaganza. Signals included the RAI UNO 'TG1' News programme (Telegiornale) on A, Italian private services Tele A+ just below E2 on 47.723MHz and TVA on 54.250MHz, which is located just h.f. of Channel A. Canal Plus L2 from Corsica was also present with unencrypted sound and video.

By late morning, Hungary (RTL KLUB) R2 and Switzerland (SF-1 DRS) E2 co-channelling with Germany (ARD) were providing the entertainment with the latter emerging intermittently until late afternoon. From 1620, Peter Barber logged Croatia (HRT-1) E4 with lots of multi-path distortion, Hungary (RTL KLUB) R2 and Denmark (DR) E3 via short-skip.

Over in Bristol, Stephen Michie was tuning into NOVA (Czech Republic) on R2 and R1, the latter co-channelling with Hungary (MTV-1). Slovenia (SLO-1) E3 and Croatia (HRT-1) E4 appeared from 1713, with HRT-1 showing their version of *The Weakest Link*. The opening culminated with Peter Barber receiving Italy (RAI UNO and Tele A+).

### Mystery Italian Station

On the 10th, Band I was awash with Italian

signals by 1030 with RAI UNO present on Channels A and B. Around 1130, but below E2, there was an Italian male singer with video and sound at an exceptionally high level. The broadcast seemed far too strong for Tele A+ (on 47.720 MHz) which is normally a shopping channel, typically with bands of scrolling text at the foot of the screen.

The logo in the lower right-hand corner at first resembled the squiggly one of RAI UNO but the programmes were different. Later, a second station could be resolved with a larger offset than the first signal but with a washed-out look about the picture! This confirms that more than one Italian

private station is operating below E2 - the strength of the first signal suggests that this could be a new station to watch out for.

Canal Plus L2 from Bastia, Corsica, was drifting in and out and by 1235 the carrier became strong enough for the video to invert using a D-100 converter, revealing an unencrypted panel game and even sound, of sorts, bearing in mind an f.m. receiver was being used to resolve the a.m. sound! Several Italian f.m. links were also heard. **Kevin Hughes** (Tamworth) also experienced the opening and immediately sent an E-mail with various pictures confirming the high levels of video present.

**Roger Bunney** (Romsey) reports a late afternoon opening on the 13th with video on E4 and E2, the latter possibly being TVE-1.

**Rana Roy** (Northern India) has been enjoying an upsurge in TEP (Trans-Equatorial Propagation) with typical fluttery and smeary images. Since 18 November, Bangkok TV has



Fig. 1: The ITV-3 countdown clock on Freeview Channel 34, prior to its astonishingly lack-lustre launch at 2100 on 1 November.

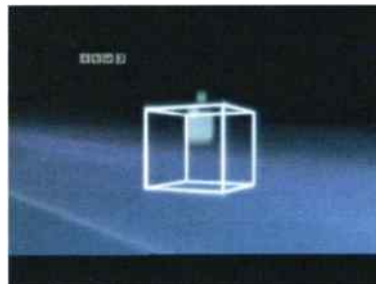


Fig. 2: The ITV-3 cube logo, shown at the start of programmes and between commercials.



Fig. 3: The BBC-tv 'Bat's Wings' Clock caption used during the Fifties. It was discontinued during 1960.

been identified four times on E3 with audio, accompanied by an E2 signal, possibly TV3 Thailand. Pictures on R1 from the south-east are thought to be from Vietnam.

### Meteor-Shower DX & 2005 Dates

Peter Barber describes the Leonids meteor-shower event on Channels E3 and E4 as 'almost continuous' between 0900 and 1130 on the 18th. Activity was a flop on the 19th, the day the peak was forecast. Earlier in the month, on the 8th, Peter noticed a flurry of activity on E2 at around 0830.

The more productive showers affecting TV and f.m. reception in 2005 are the *Quadrantids* (peaking 3 Jan at 1000), the *Perseids* (12 August at 1200), the Leonids (17 November at 1600) and the *Geminids* (13 December at 2200). If Band I is awash with signals resembling patchy Sporadic-E reception, then it is worth checking Band III. Our thanks to Roger Bunney for submitting the 2005 peak dates.

**Nick Brown** (Rugby) advises that in Denmark, DR are building a new 'multi-media' extravaganza of a broadcasting centre at Oerestadens Nord to replace the 12 sites currently in Copenhagen. The new centre is out near the entrance to the Oeresunds Bron, the bridge that links Copenhagen

to Malmö (Sweden). According to Nick, the Maori Television website in New Zealand is giving channel allocations (u.h.f.) and service area maps.

### Another One Bites The Dust

The way transmitter masts are disintegrating, we might have a few clear frequencies for DX reception! Apart from the Peterborough collapse, publicised in the December *SWM*, Roger Bunney reveals that the Solent TV transmitter (Ch. 54, horizontally polarised with 2kW e.r.p.) at Rowridge on the Isle of Wight, was struck by lightning on 14 October with the antenna, feeder and transmitter severely damaged. At the time of writing, delivery of new equipment is anticipated in December, once the transmitter has been constructed. The transmitter is a one-off unit and, as such, is hand-made. Broadcasts are still available via the station's website by visiting [www.solent.tv](http://www.solent.tv) via the Internet.

### Keep On Writing!

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

Our DXTV and Archive TV website can be visited at [www.test-cards.fsnet.co.uk](http://www.test-cards.fsnet.co.uk) via the Internet.

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3rd order IP	+38dBm typical PidB = +22dBm
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
Dimensions	Length 450mm. Diameter 90mm
Weight	2kg
Accessories	Mains wall plug adaptor (230V A/12V DC). Interface unit (remote supply unit) 12m coaxial cable and mast mounting clamps



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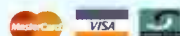
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- **Peter Bond** *do Editorial Offices, Broadstone*
- **E-mail** *skyhigh@pwpublishing.ltd.uk*

**H**aving waited since last July for an operation, it eventually took place in mid November but all did not go to plan. Unfortunately, due to a complication the outcome was that I was in more discomfort after the Op than before and consequently, sitting at the computer for more than very short periods was not a viable option, (not a lot of use when a fair percentage of your work means writing for a living). This was further complicated by getting an on-going infection, (standard procedure in hospital these days!). Consequently, I am having to improvise for a month or three until hopefully the problem is sorted and so the contents of the column may be off at a bit of a tangent and will include material I had already researched for part of next year's Airband Special, (some information on Heathrow this month), so please bear with me...

### An 8.33 Anticlimax?

One quick bit of important news. After all the years of waiting, the hype, the uncertainties and the questions, 8.33kHz spacing was finally introduced into the UK Airspace with what can only be called a whimper rather than a bang! A small insignificant NOTAM, (that I hardly noticed), in the middle of a large sheet of information suddenly sprang to life as I noticed the contents. On the 10 December 2004, 132.84 became our first 8.33 frequency, replacing 135.425 on the London Upper Sector West, (as predicted). On the morning of Monday 13 December the new frequency was in regular use and all seemed to be working fine.

But, by the next day, (Tue 14), 135.425 was back in use and in the two or three hours that I listened 132.84 was silent. Even though the new frequency directly replaces 135.425 the new frequency is almost certainly on operational trial so switching back to the old

frequency during this period is to be expected. The new frequency is expected to broadcast from both the transmitters at Ventnor and Winstone. Just to confuse me, on the morning of Wed 15 Dec both frequencies were in use simultaneously and by Saturday 19th, 132.84 was once again silent! Watch this space...

### Heathrow - The Future

As part of the 2005 Airband Special I had intended to take a look at the progress of the development at London Heathrow, but the problems I detailed above plus the fact that an anonymous reader kindly sent me a recent map of the airfield, tied neatly in with work I had already collated. So we will have a quick overview of Heathrow at present.

Heathrow is to get a new Air Traffic Control Tower, which is at present scheduled to be into operation sometime in 2006. A new Tower was needed to ensure future proofing of Air Traffic services as the airfield continued to be developed into the future. It needed to be taller than the old building and more strategically placed so as to give the controllers a 360° view of the airfield including the new Terminal 5.

The construction of the new Tower has



been under way for some time, but rather than being built on site, it was partially constructed on the south side of the airfield near the Terminal 4 Cargo Area. On the night of the 29 October with the southern runway closed, the structure which weighed approximately 900Tonnes was moved the 1.9km to its final site using three, 144 wheel computer/remote controlled hydraulic flatbed trailers. The move was completed in a very respectable time of one hour 41 minutes, quite a feat of engineering !

The new Tower is located on the West side of the Central area between the Foxtrot and Gulf cul-de-sacs, if you look on the map this is between Blocks 322 and 363. Currently, 32m high, (about the size of the old Tower), the structure is to be slowly jacked up in situ and extra 12m segments added until the planned height of 87m is achieved, an intriguing piece of construction! The estimate for the jacking process to be completed is the Autumn of 2005.

### Terminal 5 Statistics

The extensive construction of Terminal 5 on the old Perry Oaks site on the west of the airfield is now well underway with Phase 1 planned to be completed in 2008 and Phase 2 in 2011. When completed, there will be an extra 107 aircraft stands, (Phase 1 = 47, Phase 2 = 60), capable of handling in excess of 30 million passengers per year this will be a 50 percent increase over the 60 million currently handled at Heathrow.

Some of the statistics relating to the project make quite interesting reading. The total area of the Terminal 5 site will be 260 hectares, which is the equivalent area to Hyde Park. The new building will be almost 396m long and 176m wide with the satellite building being 442m long and 52m wide. Consequently, just the Terminal 5 satellite building will be bigger than Terminal 4!

Including all types of usage, there will be 13.5km of new bored tunnels which will be the equivalent to one third of the underwater section of the Channel Tunnel. This includes a 3.4km extension (two tunnels), to the existing Piccadilly underground Line and the underground diversion of two rivers. There will be 6km of new roads with parking for 4000 vehicles. All in all a massive challenge and one of the largest construction projects ever to be attempted in the UK.

- GMC1 - 121.9kHz or ATC Channel 1
- GMC2 - 121.7kHz or ATC Channel 9
- Runway 27L/09R 118.7/118.5kHz or Channel 11
- Runway 27R/09L 118.8/118.5kHz or Channel 1
- Runway 23 Channel 11 (only when 23 is LIVE)

## Heathrow Frequencies - Air Traffic Control

Approach	119.725	Primary
Approach	120.4	As directed by ATC
Approach	127.525	As directed by ATC
Approach	134.975	As directed by ATC
ATIS	121.85	Departure Information
ATIS	128.075	Arrival Information
Clearances	121.975	Clearance Delivery
Fire	121.6	Heathrow Fire Service (BAA)
Ground	121.7	
Ground	121.9	
Raclar	119.9	Special VFR Director
Radar	125.625	As directed by ATC
Tower	118.5	Primary
Tower	118.7	Primary (0600 - 2200 Z)
Tower	124.475	Standby

## Airline/Handling Agents

122.35	Gulf Air	Sep 2003
123.65	British Airways Exec	Mar 2004
130.65	Singapore Airlines	Nov 2002
131.425	Aviance/Midland Handling	Nov 2002
131.425	Cathay Pacific	Nov 2002
131.425	Saudia	Aug 2004
131.425	Virgin Airways	Dec 2004
131.45	Air Canada	Aug 2003
131.45	Alitalia	2002
131.45	Pakistan Airways	Sep 2003
131.45	Thai International	Jan 2002
131.5	Air France	Dec 2004
131.5	Kuwait Airways	Dec 2004
131.55	British Airways (Term 1)	2003
131.65	Japan Air Lines	*
131.65	KLM	Jan 2002
131.7	SAS	Dec 2004
131.7	Turkish Airlines	2003
131.75	Aer Lingus	*
131.75	Swiss Intl Ops	Jul 2002
131.775	British Mediterranean	2003
131.8	British Airways	Dec 2004
131.875	Qantas	Nov 2002
131.85	British Airways (Nationwide)	Dec 2004
131.9	British Airways (Term 4)	Jun 2004
131.925	Air India	Dec 2004
131.925	Finnair	Fec 2002
131.925	Globeground	2002
131.925	Lufthansa	Nov 2002
131.95	El Al	*
131.95	Iberia	Nov 2002
131.95	Olympic	*
131.975	United Airlines	Dec 2004

Most of the Heathrow Airline/Company frequencies listed in the table I have seen reported in use between 2002 and 2004, those marked with a (\*) have not been reported for some time and may no longer be in use. I spent around 10 hours listening to the various frequencies over three days with variable results. For example, I tuned into 131.95 for over four hours and only picked up a distant signal from a French source possibly one of the Paris airfields? As usual any additions, corrections or comments anyone?

My thanks this month to **Robby, Roger D**, the British Airports Authority and the Civil Aviation Authority. Lastly a special thank you to **Maggie** who has very kindly done a lot of typing for me over the past six weeks including most of my last two columns.

# Amateur

Bands

- **Clive Hardy** SWM, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW
- **E-mail** [clive@pwpublishing.ltd.uk](mailto:clive@pwpublishing.ltd.uk)

**A** multinational team of five amateurs are expecting to operate a DXpedition from the 11 to the 15 of February on the Rennell Islands, south of the Solomon Islands east of New Guinea. Activity will be from 3.5 to 29MHz s.s.b. and c.w., with two stations on the air using the call CE8A. The web page for the expedition is at [www.ce6ne.cl/rennell.htm](http://www.ce6ne.cl/rennell.htm).

Way west across the Indian Ocean Didier, F5TNI will operate as FR/F5TNI from Reunion Island, the French territory to the east of Madagascar from 2 February for three weeks. Sometime during that time he'll move north east across the same ocean and operate as 3B8/F5TNI from Mauritius. No details of frequencies, but c.w. will be the main mode, with some RTTY and PSK31 thrown in now and then.

Moving north, half a dozen Italian amateurs will operate for a couple of weeks from the Horn of Africa country of Somalia starting on 3 February. Two stations will be operated from Top Band 1.8MHz to 'six metres' 50MHz. Callsigns will be 6O0G (six - oscar - zero - golf) for s.s.b. and 6O0CW for c.w. and RTTY operation.

One of the DXpedition members, **Silvano I2YSB**, explained the reason for the trip. "One of the main aims of this DXpedition is to bring amateur equipment to the Somali radio amateurs, fostering in a concrete way the development of amateur radio in the country. To this end, we shall donate Yagi antennas, verticals, dipoles, h.f. and v.h.f./u.h.f. transceivers, power supplies, a laptop, coaxial and accessories for the operation of one or two stations at the local radio club. We are investing all our efforts to make such a difficult and exotic country regularly active on the bands, so as to provide all amateurs world-wide a better



possibility to get a rare new one. Donations towards the expenses of the DXpedition and helping in the procurement of the equipment to be donated are highly welcome".

If you can help with donations to this worthy cause then contact **Silvano Borsa I2YSB, PO Box 45, 27036 Mortara - PV, Italy;** E-mail [2ysb@i2ysb.com](mailto:2ysb@i2ysb.com). For further information visit [www.i2ysb.com/60/](http://www.i2ysb.com/60/)

## Down South

Going almost as far south as it's possible to go **Mario IOQHM** is active as IOQHM/KC4 from Terra Nova Bay, Victoria Land, Antarctica. He's in that part of the continent south of New Zealand and will be there until around the middle of February. This is the first activity this year from the Italian 'Mario Zucchelli' station (formerly known as Baia Terra Nova for the Antarctica Award). Listen out for him around 1830 - 1915 on 14.180MHz. For more information look at [www.italiantartide.it/spedizioni/xx/](http://www.italiantartide.it/spedizioni/xx/)

In warmer climes, **John G4RCG** and **Bruce KI7VR** will be operating until 6 February as KP2/G4RCG and KP2/KI7VR respectively from St. Croix which, with an area of 210km<sup>2</sup>, is the largest of the US Virgin Islands. They started operating on the 21 January and John will be on that air as KP2ZZ for the CQ 160 c.w. contest on the 29 and 30 January.

Back down south, four Kiwi amateurs are off to the central south pacific Cook Islands from the 31 January until the 3 March. Although using all the h.f. bands, mostly using s.s.b., they plan to concentrate on the 18 and 14MHz bands. Look out for the calls **ZK1SDE**, **ZK1SDZ**, **ZK1XMY** and **ZK1WET**, with the latter operating using RTTY and c.w. modes, including participation in the CQWW RTTY WPX Contest on the 12 and 13 February. First stop for the team is Aitutaki, South Cook. Next, from the 17 February for a week, is Manihiki Atoll, North Cook, then back to Aitutaki.

Several Mexican operators, including **Porfirio XE1HPT**, will be active on all the h.f. bands using c.w. and s.s.b. and the call sign 6F1IHF from the 6 to the 13 February. They'll be on Ixtapa Islan, just off Mexico's Pacific coast, near Zihuatanejo, about 240km north west of Acapulco.

## Exam Time

After discussions with Ofcom the exam for the Full amateur licence has been revised slightly by the RSGB, and a new set of dates when it can be taken has been published. Just to confuse us, the RSGB is calling it the Advanced Radio Communications Examination even though it's for the Full licence. Why?

What's wrong with Full Amateur Radio Licence Exam, or is that just too easy and obvious? Or are there plans for an Advance licence, and for the current Full licence to be downgraded to, say, Ordinary? Anyway, here are the (local) times and dates:- 1830 Wednesday 16 March, 1830 Tuesday 17 May, 1430 Saturday 9 July, 1830 Monday 22 August and 1030 Sunday 9 October.

## Find That QRM!

A local amateur had been troubled for two or three years by mains borne interference in the form of on/off pulses causing havoc with his h.f. operation. Centered around 2.840MHz, its square wave signal produced harmonics all over the amateur bands.

Attempts to d.f. it with a portable receiver were unsuccessful as the signal radiated strongly from all the mains cabling of his home and along the street for many tens of metres. As is the way of corporate bodies, the electricity company denied all responsibility and suggested contacting the RA (now Ofcom).

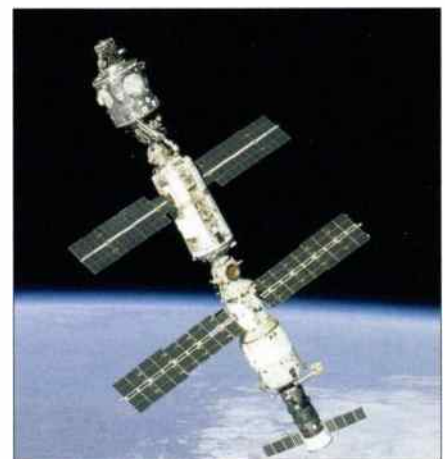
The RSGB's EMC committee advised likewise, and the RA said that, as an amateur, he was not entitled to protection from interference so they couldn't help. Stalemate. Meanwhile, about a hundred metres from the amateur's home, an old street lamp that had long ago lost the cover to its time switch, was flickering so much that the nearby residents complained to the electricity company.

Eventually, one Sunday morning just before Christmas last year, the complete lamp standard was replaced. No prizes for working out what happened to the interference. So if you're looking for QRM, check your street lights!



## International Space Station Frequencies

Voice and Packet Downlink: 145.800MHz - World-wide. Packet Uplink: 145.990 - World-wide. Voice Uplink: 145.200 for Europe, Central Asia and Africa, 144.490 for the Americas and the Pacific.



- **Ben Hogan** *co SWM Editorial Offices*
- **E-mail** *ssb.utilis@pwpublishing.ltd.uk*

Not being terribly fond of hot climates, I have made a life decision to never visit the Caribbean. Friends that have spent time in that area assure me that I am certainly missing out, but nevertheless like many of us from northern latitudes I'm happier spending my days in cooler climes. Not to say that the weather south of 29°N is boring. This is the region in the world renowned for hurricanes, tropical storms and other interesting and weather systems that focus the minds of mariners and landlubbers alike.

Although the hurricane season is generally thought to run from 1 June to 20 November each year there is a need for weather information to be passed to cruising vessels, racers, hobby sailors and those delivering boats throughout all four seasons. Such mariners lack the corporate back up and expensive electronic systems that are available to commercial ships' crews.

This is where David Jones came in. A business executive and keen amateur weather forecaster he had been working in Sweden, but eventually found himself in Tortola, British Virgin Islands where he somehow ended up as the weatherman on ZBVI (780AM) the local radio station.

Realising that many of his listeners were cruising the region in small vessels he founded the Caribbean Weather Centre in 1998. Based in Road Town, Tortola CWC provides custom forecasts to individual subscribers via s.s.b. radio and the Sail Mail Pactor data system providers. A variety of subscriptions are marketed with the \$175 base level subscription allowing participation in the s.s.b. radio weather nets.

Sadly David, who became known as The Caribbean Weatherman, died of liver failure on Friday 7 November 2003, but the Caribbean Weather Centre and the radio networks continue with the nets being hosted by professional meteorologist Chris Parker. Chris broadcasts from his sloop the *Bel Ami* while he cruises the area. For those of you who are yacht types the *Bel Ami* is a 1966 Morgan thirty four footer! Currently the nets are active as follows.

MHz (u.s.b.)	UTC
4.045	1130
8.104	1230
8.137	1100
12.359	1300
16.351	1330

No nets operate on Sundays unless there is a threat of severe weather.

When any bad weather is expected an additional schedule is established at midnight, the frequency being announced on all the morning nets.

These transmissions are not the easiest to monitor, but CWC is a successful enterprise and their frequencies are often quite busy with many check-ins. Reception in northern Europe is dependant on the location of participating vessels as well as the vagaries of propagation. The sloop *Bel Ami* should be in the Bahamas throughout February 2005.

The Caribbean Weather Centre's Managing Director is **Mary Finlay-Jones** (David's widow) and CWC are contactable at: **PO Box 3069, Road Town, Tortola, British Virgin Islands.**

## Lure Of The Sea

The lure of the sea has a hold on various land based operators. One being **Herb Hilgenberg** of Burlington, Ontario, Canada. Herb uses the Callsign 'South Bound 2' and provides a daily ship routing and weather forecasting service on a hobby basis. He can be found on 12.359MHz starting at 1940 for check-ins, concluding at 2200 or when all the traffic has been passed. His coverage area is the North Atlantic between the Eastern Seaboard of North America and Europe. He also includes the Caribbean, the Bahama Islands and the Gulf of Mexico. If propagation allows he also broadcasts to the South Atlantic and Eastern Pacific.

Herb uses 8.294 and 16.531 if 12.359MHz is out of commission and vessels are asked to call in with their name and position and are encouraged to check in daily until their voyage is completed.

For yachting and associated traffic that is nearer to the UK and Europe there are a few other nets that may be of interest to monitors in the region. Between about 0800 and 0900 there's a natter type net on 4.417MHz.

Real early birds can try tuning into 6.240MHz at 0500 and at 0645 on 12.353MHz to catch gossip on these two informal nets for boats operating in the Greek and Turkey areas. A general Mediterranean net operates on 8.122MHz starting at 0530 as well. (All u.s.b.).

In the hurricane season the Hurricane Watch net on the amateur 20m band (14.325MHz u.s.b.) is always worth monitoring even if it is only to hear the abuse and interference suffered by the operators from USA and mainland European based stations. If you have an interest in this type of small boat operation and are prepared to monitor amateur radio frequencies a host of maritime mobile nets operate on a daily basis.

These include:

MHz	Net	UTC
7.088	Eastern Mediterranean	0530
7.237	Caribbean Maritime	1100
14.303	UK Maritime Mobile	0800
14.303	North Sea, Atlantic & Mediterranean	1800
14.316	Durban Maritime	0630 & 1130
14.300	Pacific Maritime	0200-0400
14.313	Pacific Maritime	0200-0400

So you see there is plenty to monitor just take some 'Quells' beforehand.

## Back On Land

Back on land at 5MHz there are five channels available to amateurs in the UK on a shared basis for propagation experiments. Use of these frequencies is not exclusive to radio amateurs and on occasions they can be heard in use by military personnel from the UK and beyond.

In the last few weeks it appears that Hungarian stations have been using the channel designated as 'FB', 5.280MHz. Traffic has been heard on c.w. and on u.s.b. (note that the u.s.b. frequency will read 5.2785 on your radio). The signals have been received pretty early in the morning at 0600, which is 0700 Central European Time, in Hungary.

Traffic appears to have mostly consisted of signal reports but the callsigns heard have been NVIS 11, NVIS 12, etc. One can assume that NVIS refers to Near Vertical Incidence Skywave. This would indicate that a) the stations have a knowledge of the English Language and b) that they are, indeed, engaging in experimental transmissions in connection with NVIS research.

Are they legal? Are they actually in Hungary or just pretending to be there? Finally, are they really engaged in experimentation?

More land based traffic although this time the net is that of the USA Federal Aviation Authority. The task of the FAA is to keep skies safe in the USA. They have an h.f. net on the first and third Wednesday of each month at about 1730 (12.30 Eastern Time). Listen for them on 13.457MHz u.s.b. Callsigns heard have included KMR96 and KPC63.

## Radio Traffic

Anyone that monitors radio traffic regularly cannot fail to notice the different way that words are pronounced by various nationalities. On 30 November I was listening to 'Black Hat' operations on 5.2045 u.s.b. and heard a flier in 'Shadow 21 flight' (big USA helicopters) saying that he was heading north at Naw-Witch. Yes, I was a bit slow but cottoned on after a few seconds that he was over Norwich, Norfolk.

It does help to be aware of how others may pronounce words that we in the UK don't think once about, let alone twice. I've just had a conversation with a lady manning an Internet service provider's help line and similar problems occurred. She was, however, charming and helpful and in India. She said her name was Ramona, but you know I think that she may have just said that so that it sounded easier to my 'English' ears.

# Propagation

Forecasts

- Jacques D'Avignon VE3V9A
- E-mail: Jacques@pwpublishing.ltd.uk

## How to use the Propagation Charts

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

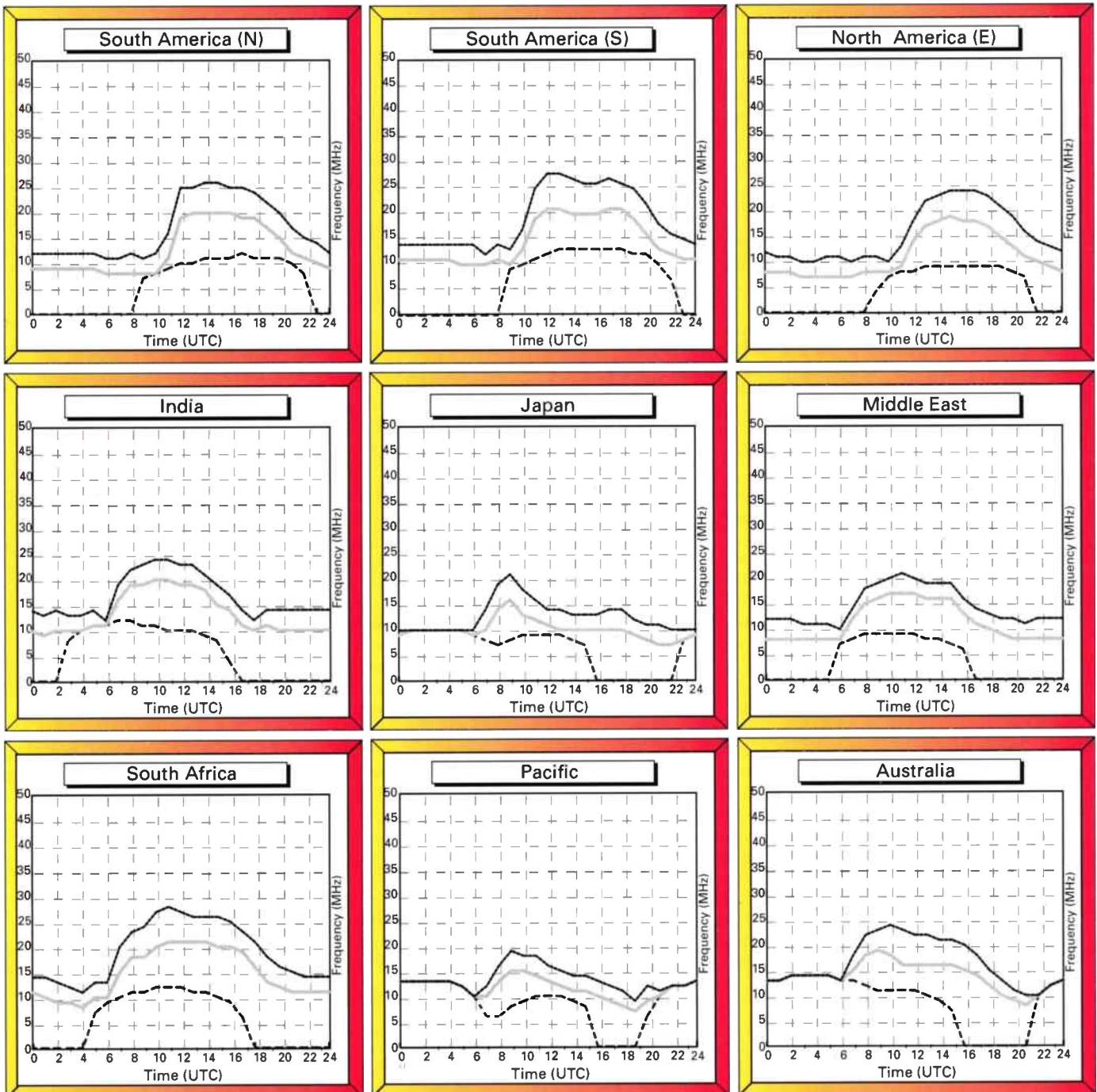
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50% probability of success for the path and time.

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

Good luck and happy listening.

February 2005  
Circuits to London



SK10078

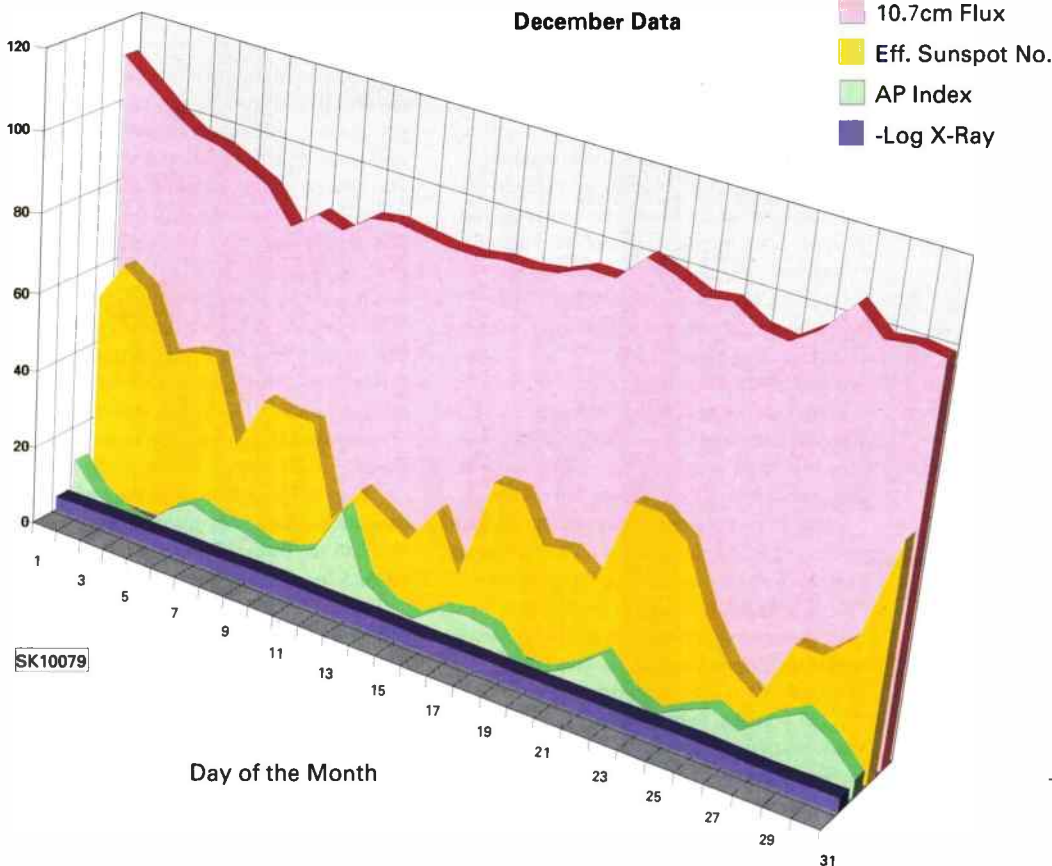
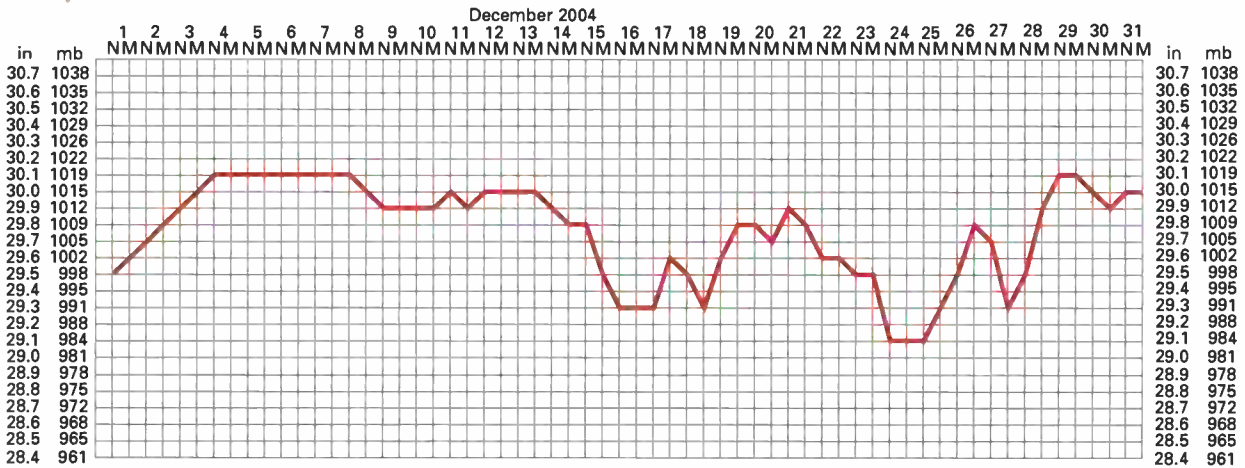


# Propagation

Extra

- **Kevin Nice** G3UNR, M3SWM,  
SWM Editorial Offices, Broadstone
- **E-mail:** kevin.nice@pwpublishing.ltd.uk

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



## guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity. The K and AP indices are measures of geomagnetic activity. The K index ranges from zero (very quiet) to nine (severely disturbed). K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions. The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.

# Decode

- **Mike Richards G4WNC**, 49 Cloughs Road, Ringwood, Hants BH24 1UU
- **E-mail** [decode@pwpublishing.ltd.uk](mailto:decode@pwpublishing.ltd.uk) **Web site** [www.mikespage.btinternet.co.uk](http://www.mikespage.btinternet.co.uk)

A few new items for you this month, starting with an ACARS decoder I haven't mentioned previously. **ACARSD** is a completely free ACARS decoder that boasts a wide range of sophisticated features to support your airband monitoring. One of the interesting points is that it's available for **LINUX** as well as **Windows** platforms - escape from Microsoft at last! To get a copy and take a look at more detailed information you will need to pay a visit to their website at: [www.acarsd.org](http://www.acarsd.org)

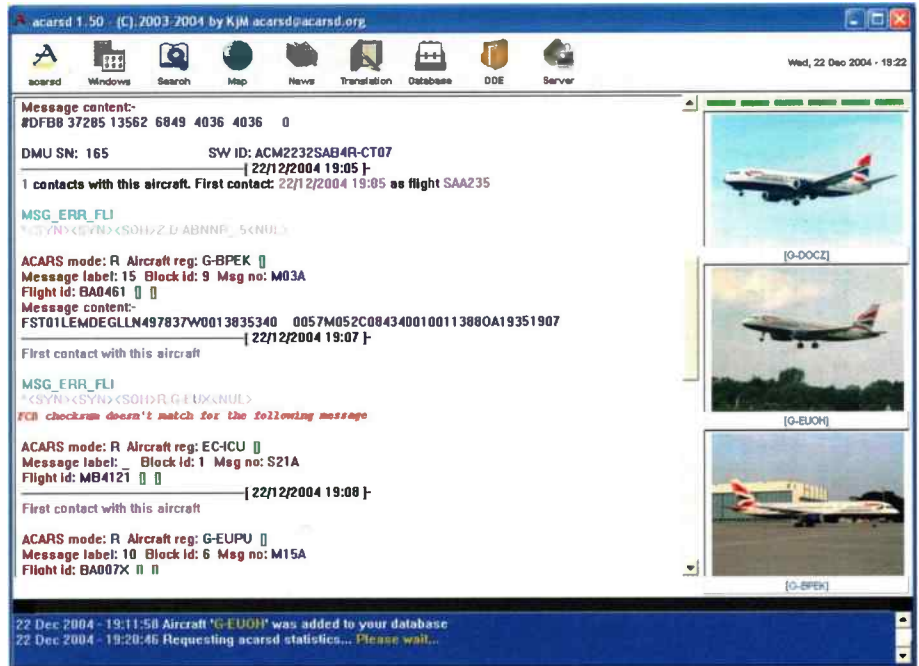
The site is a bit sparse, but does contain all the information you're likely to need to get going. As well as supporting live ACARS decoding, ACARSD has the tools to operate as a Web server so you can share your loggings with colleagues via the Internet.

For this review I have been using version 1.5, but the website promises the release of version 1.6 towards the end of December, so it should be available by the time you get to read this. You will see that the program is very undemanding and can run on any version of **Windows**, except the **Palmtop CE** edition. One of the penalties of wide compatibility is a slightly dated look and feel, but that a small price to pay for the robustness of a backward compatible product.

When you've downloaded the 'Zip' file you will need to unpack it to a directory of your choice. Once extracted you should run **Quickinstall.exe** to start installation process. The routine is a little more basic than the InstallShield driven applications you may be used to, but you just need to follow the instructions. If you hit a problem, take a look at the installation guide on the Web page as you'll probably find the answer there.

When you've completed the installation, you just need to connect a v.h.f. airband radio to the 'line-in' on the PC's soundcard and you're in business. In its default start-up state the program will be sat looking at the soundcard and trying to make sense of the audio signals. To check out the decoder connect up your scanner, set it to a.m. and try the following frequencies:

MHz	Use
131.725	Main UK ACARS
136.925	ARNIC ACARS
131.525	EU Secondary ACARS
131.55	ACARS World-wide
136.9	London ACARS



## ACARSD in action with photos!

Depending on where you live, you may have to be patient before hearing an ACARS signal. Most signals are very short bursts of a second or so and are easily missed. A short while after receiving a burst of data you should see the decoded output appear on-screen. If you have an open Internet connection, such as Broadband, this decoded output will be promptly followed by a photograph of the received aircraft. These images come from the Plane-Spotting network

### [www.planespotting.net](http://www.planespotting.net)

Though not as comprehensive as [www.airliners.net](http://www.airliners.net) I found that ACARSD was able to find an image for the vast majority of the aircraft I monitored during the review.

Just to complete the features, the standard version of ACARSD includes a Web server so you can set your machine up to share your ACARS logs with others via the Internet. To get this working you need to go to the Server menu and select Start Server. This fairly obviously starts the server running on your PC, but you also need to let the host site know that you're active. To do this you use the Server menu again but select 'Add server to online serverlist'. This will take you to a small text-box where you need to enter your Server name and location.

To enter a server name you will need to

go to [www.no-ip.com](http://www.no-ip.com) to get yourself a free IP name. The process is very simple and free and you get use of their name server so others can find your PC and the ACARS server. The name you choose needs to be in the format xxxxxxacars.no-ip.info. You then need to complete the text box with your location, i.e. town or village.

If you run a firewall on your PC, you will need free-up a port for external connections. If you don't do this your request to join the serverlist will be rejected. The default port for connections is 2202 so you will need to check your firewall documentation to see how to do this.

One other nice touch is the inclusion of a news-ticker feed from [www.skyliner-aviation.de](http://www.skyliner-aviation.de). You can see this scrolling just below the main ACARS receive window.

## Stand-Alone WINRADiO

The WINRADiO range has been growing from strength to strength over recent years and their G303 and G313 receivers are exceptionally good. Although I haven't yet had a chance to play with the new G313, I did have the opportunity to use the very first USB version of the WR-G303e.

If you've seen John Wilson's excellent review of the G303i you will know that it was a

landmark receiver being the first PC based receiver to exceed the performance of many of the mainstream traditional receivers. WinRADIO have managed to not only design a very capable receiver, but have also overcome the complex screening issues necessary to separate sensitive r.f. amplifiers from noisy PCs. Just to complete the triumph the WR-G303i was released at an amazing price.

If there was a downside to the G303i it was the fact that you had to delve into your PC to fit the card and route the antenna to the rear of the PC. For many people with compact PCs the G303i was not an option, simply because all the PCI slots were occupied. WinRADIO recognised the problem and have come-up with the solution - a USB version of the G303! No excuses now, if you've got a USB port and are looking to upgrade you really ought to consider the G303e.

Whilst delivering a USB version was a master stroke in itself, WinRADIO have excelled themselves and refined the design to make it even more attractive to Decode readers. The first point to note is the power unit. All too often these days manufacturers are moving to switch mode power supplies to save both cost and space. However, these are inevitably noisy devices, not well suited to radio environments. WinRADIO have recognised the limitations and stuck with a trusty linear p.s.u. for the new G303e.

The next refinement concerns the way the d.s.p. element of the receiver has evolved. In the original G303i the final intermediate frequency processing was done at 12kHz using the PC's built-in soundcard. In fact, this d.s.p. handling of the final i.f. is one of the highlights of the receiver and gives the user access to a huge range of features. The only snag is that most utility enthusiasts also want to use the soundcard for their decoding programs.

With the addition of the USB version, WinRADIO have taken the opportunity to update the d.s.p. section and the 12kHz processing is now handled outside the soundcard. This is a huge benefit and leaves the soundcard uncommitted and available to deal with our decoding. These two improvements are not currently very well publicised in the literature, but are certainly worth noting.

Other than the improvements I've noted here, the changeover to USB interface has had no detrimental effects that I can detect. Should you be considering buying the G303e (or G313) I would recommend that you pay that bit extra and go for the Professional Demodulator. This is a sophisticated software plug-in that delivers a huge range of extra features. The range of modes supplied



The new G303e.

includes: a.m. (narrow and synchronous), f.m. (3, 6kHz and narrow), c.w., s.s.b. plus d.s.b. & i.s.b. For each mode, the receiver allocates 10 bandwidth buttons along the bottom of the display. The idea is that the mode starts with the default bandwidth, but you can then choose slightly wider or narrower bandwidths depending on the prevailing band conditions.

The range of bandwidths offered up with each mode can be customised through the set-up menu. This is hugely powerful and gives you an almost infinitely variable bandwidth on any mode. To help you make the best of the filters, the demodulator also includes an excellent spectrum display that shows the r.f. activity across a 20kHz range ( $\pm 10$ kHz) with the current filter setting highlighted. This is very helpful for setting the best bandwidth as you can see any adjacent stations or interference sources and adjust your tuning and bandwidth for the best result. You also have the facility to customise the automatic gain control performance for each mode.

Another module that might prove of interest is the DRM plug-in. This gives access to the new Digital Radio Mondiale (DRM) transmissions that are spreading on the short

wave bands. This is a fascinating system that provides high quality text and audio broadcasting over a short wave radio channel. The system is very impressive and well worth a look.

As you would expect, the WinRADIO DRM decoder is very comprehensive and works a treat. In its default set-up it will automatically detect DRM signals and extract the stereo audio signal along with any text content that may be present. Through the set-up menu you have the option to customise the operation to suit your preferences. This concept of software plug-ins is one of the great strengths of the WinRADIO design as pretty much any new mode can be accommodated through the installation of an updated plug-in. No need to upgrade the receiver anymore - just get yourself the latest software!

For those of you with software development skills the WinRADIO open access to XRS and RadioBasic give you the power to develop customised applications to take full advantage of WinRADIO's software architecture. For more information it's worth paying a visit to the WinRADIO site at: [www.winradio.co.uk](http://www.winradio.co.uk)



The G303e Professional Demodulator.



## “Best Sat Nav System 2004”

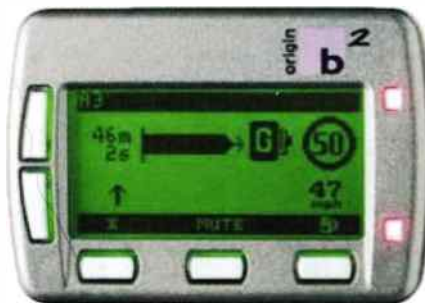
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# Info<sup>in</sup> Orbit

● **Lawrence Harris** 55 Richville Road, Shirley, Southampton SO16 4GH  
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**A** New Year, but I must start by acknowledging the sad loss to the weather satellite community of **Cedric Roberts MBE**, whose contributions to the field of amateur weather record collecting - see later - are perhaps second to none. Also included are some fascinating reminiscences from contributors about early weather satellite reception.

A lot of WXSAT activity is scheduled for this year. Hopefully *SICH-1M* will have been launched two or three weeks back; *NOAA-N* should be launched in February and *MSG-2* - the next of the METEOSAT Second Generation satellites - is on the way. According to a press release the launch plan of *MTSAT-1R* (Japan's next meteorological WXSAT) - see **Fig. 1** - expected during the eight weeks following 1 January.

*MTSAT-1R* will replace *GMS-5* (*Himawari-5*) in carrying a meteorological and aeronautical payload. Currently, *GOES-9* is collecting imagery in place of *GMS-5* and this is available via the *METEOSAT-8* relay.

## 2004 Satellite Direct Readout Conference

This important Conference was held in December in Miami, USA, ending too late for inclusion here. Tuesday 7 December was the day for presentations by **Francis Bell** on behalf of the Group for Earth Observation (GEO) followed after lunch by **Dave Cawley's** "The Rise and Fall of Amateur Direct Reception of Weather Satellites" on behalf of the Remote Imaging Group (RIG).

Amongst many significant developments and discussions, Dave reported that NOAA confirmed that *GOES-E* will terminate WEFAX with effect from the end of March and *GOES-W* will terminate WEFAX from the end of the year. Dave noted "the upgrade cost from WEFAX to LRIT is in the order of \$3,000 to \$3,500 and a complete system for \$4,500, although as time goes on these prices are



Fig. 1: *MTSAT-1R* Japanese Meteorological Satellite.

expected to fall". I hope to include a comprehensive, illustrated summary of this Conference in the next edition.

## News From UK WXSAT Groups

**Les Hamilton** reports "GEO (Group for Earth Observation) will be holding its second Symposium in 2005 on 30 April and once again will be in the inspiring setting of the National Space Centre, Leicester. The GEO Symposium will provide the ideal opportunity for enthusiasts to see the systems in operation, and to seek advice from experts on setting up their own new hardware and software".

Dave Cawley reports "Members of RIG (Remote Imaging Group) will be aware that there has been a significant hiccup in the production of their journal; however there is much more to RIG than meets the eye. RIG has many friends in high places, a 20-year history and pedigree and more than its fair share of very technical people. Protecting the interests of the amateur weather satellite user is very important and RIG was taken extremely seriously at this conference and invited to participate at many levels. RIG will continue its good work; the RX2 is coming back and maybe the HRPT receiver kit too".

## The Intray

**Kevin Hughes** received **Fig. 2** - a transmission from *NOAA-17* - showing the cloud circulating under the high pressure area for many days in December. **Patrick Prokop** collects h.r.p.t. images from all NOAA WXSATs daily and posts them on his web site. **Figure 3** shows the eastern USA from *NOAA-16*.



Fig. 2: *NOAA-17* 1103 10 December from Kevin Hughes.



Fig. 3: *NOAA-16* h.r.p.t. on 10 December over America from Patrick Prokop.

## The Alps

The different views available from *METEOSAT-8* and *NOAA-17* are illustrated in **Fig. 4**, **Fig. 5** and **Fig. 6**, received from *METEOSAT-8* and *NOAA-17* within minutes of each other. The different sensor resolutions and aspects are seen vividly in these images.

## Early Days Of WXSAT Monitoring

A recent discussion on the Remote Imaging Group mailing list involved the early days of amateur WXSAT monitoring. Fascinating stories came to light, some of which I am summarising here, courtesy of the correspondents.

**John (Gus) Gale G3LLK** of Thatcham told me he has a print of an early WXSAT image, probably taken during the 1960s by the late Paul Sollom G3BGL. Newbury Club had visited the RC College where Paul (Father Wilfrid) was a Physics master. He had modified a 405-line TV receiver to scan satellite pictures line-by-line and taped a piece of photographic paper to the front of the tube. This was done during the club's visit, and the resulting print developed and published in the club newsletter. During the pass a crossed Yagi array on a timber framework was steered by a group of schoolboys under Paul's direction.

NASA published information about a low cost WXSAT system during the 1960s, featuring a crossed Yagi array feeding transistorised and valved decoders. A raster was scanned onto a cathode ray tube with the CRT beam being modulated by the signal.

**Cliff Goddard** provided some information from very early days. He told me about John Tuke's work in the 1960s. Cliff had worked as a sound recordist in television production and had suggested making a programme featuring John's WXSAT monitoring work in Stranraer. When Cliff met John he already had about two years of weather pictures in his archive. Their visit coincided with a pass from a TIROS satellite - see **Fig. 7** - and the result was edited down into a 30 minute documentary, transmitted locally around 1964-1965.

The BBC noticed the transmission and later featured John Tuke in their programme *Tomorrow's World* - as one of the first individuals in Britain to receive WXSAT transmissions. The BBC adopted a rather trivial approach, and shortened the item to about three minutes. Someone at the American Embassy saw it and contacted NASA which invited John and his wife to Cape Canaveral to view a satellite launch. They arranged for John to lecture them on low cost weather satellite reception with the aim of aiding Third World (developing) countries in the new technology.

Cliff mentioned that he had originally been involved with the *Blue Streak* project - see



Fig. 4: METEOSAT-8 HRIT view 1015 12 December © EUMETSAT 2004.



Fig. 5: NOAA-17 h.r.p.t. view 1022 12 December at Southampton.



Fig. 6: NOAA-17 a.p.t. view from same pass.

Fig. 8 - before joining Border Television in late 1961. Back in 1958 Britain was two years into the *Blue Streak* programme, which was an intermediate-range ballistic missile capable of delivering a one-megaton nuclear warhead, launched from underground silos in south-east England. It was not intended as a first-strike weapon, but only for launch in response to an incoming Soviet missile strike.

A later idea was to combine *Blue Streak* and *Black Knight* as the first and second stages of a larger vehicle, and to then add a small third stage to make a satellite launcher. The Macmillan government decided to abandon *Blue Streak* in April 1960. I personally remember hearing this (as a 15-year old) and feeling sad that it had not been developed for peaceful purposes. I was gaining an interest in space and wanting Britain to take an active role.

Dave Emery N1PRE of Weston, Massachusetts, USA told me about his early experiences of setting up a.p.t. monitoring equipment. Dave was undoubtedly one of the earliest pioneers of a.p.t. reception and possibly the first 'high school age kid' to achieve this. He told me that his teachers and parents knew little about electronics, so he worked without any real technical help from

adults. Dave recalls hearing about some USA-based amateur setups that predated his by at least a couple of years.

Dave had become aware of the experimental a.p.t. package on an early satellite and was setting up his own reception hardware. He had no independent funds, but had access to a USA federal government 'Aid to Education' program that provided surplus electronic gear to qualified schools and colleges at prices only based on shipping and handling costs. NASA considered it was hugely successful at demonstrating that \$20-50k (in 1962 dollars) could fund small ground stations to actually receive useful real time satellite cloud cover photos of their area.

Although Dave knew of these early transmissions, he was still developing his

receiver for the .137MHz band when the first satellite failed. He told me that several private individuals - scientists and engineers who were radio amateurs - had been able to receive the very earliest pictures. Dave

completed his receiver, and when the new satellite was launched and started transmitting, he was able to receive the first signals from it - and later printed the pictures.

He recorded the a.p.t. signals on one track and a reference audio tone on the other track of his stereo tape recorder in order to recover the pictures. Dave explained to me how he built and adjusted the receiver with its specialist tuning system, and hand-guided the antenna. Without computer facilities as we know them, high gain antenna pointing was done using RTTY (radio-teletype) pass predictions to know when and where to point the antenna. Using orbital elements mailed from NASA, and logarithm tables (remember log tables? This was the 1960s) Dave obtained pointing angles for his antenna. Dave can be counted as one of the early pioneers of a.p.t. reception.

My own interest in WXSAT reception was sparked around 1969 by a colleague who spotted an article about modifying an f.m. receiver kit to match a.p.t. specifications from WXSATs. We completed the receiver and built a simple dipole for 137MHz band reception. Unfortunately my colleague then changed jobs and I was transferred to another group where such lunch-time experimentation was not possible - so the project died because I could not take the test equipment home!

In 1985 I re-entered the satellite field as an amateur and finally completed the project - albeit in a completely different form - successfully receiving signals from NOAA-9 on the very first test, without predictions! A good satellite receiver with the necessary circuitry for reliable a.p.t. and a hardware decoder called a framestore were used.

### Cedric Roberts MBE

Dave Wright of Dartcom, Yelverton reported that Cedric Roberts MBE passed away peacefully in the Mary Stevens Hospice, Stourbridge, West Midlands on 27 November



Fig. 7: Early TIROS satellite - courtesy NOAA archive.

2004. Cedric had become very ill during a pain management program in the Hospice and lost his fight against the slowly progressive cancer he had had for some years. Cedric was notable in having a long record of making serious meteorological observations over decades, and being a recognised weather monitor by the Meteorological Office, providing daily observations to them for many years.

Cedric was born in 1931 in Halesowen, West Midlands and lived there almost all his life. He entered the RAF and did his basic training at RAF Locking, then spent two years' service at RAF Scampton, Lincolnshire, where he worked as a Radio/Radar technician, mainly on Lancasters. He was not involved directly with meteorology at RAF Scampton, although Cedric wanted to be the Met man; the RAF would not agree!

Cedric later took up his chosen career as a teacher at Three Dwelling's school, Halesowen and then at Windsor High School until 1986 when he retired as Deputy Head Teacher at the age of 55.

From an early age he was intensely interested in all aspects of meteorology, and maintained continuous weather records for a period of 57 years. He had been involved with computers since the introduction of the first BBC micros and spent twelve months transferring forty years of written hard copy data to spreadsheets. As technology improved he became particularly interested in weather satellite systems.

Before his illness took a real hold he gave talks to local groups on the weather, illustrated with an excellent slide presentation of his own. He was a keen photographer, particularly of cloud formations. Over the years Cedric contributed many interesting articles and satellite images to the RIG and GEO Journals, and to this column.

Cedric was a Volunteer Observer Station for the Meteorological Office, providing daily observations to them for many years and was awarded the MBE for 'Services to Meteorology' in March 1998. BBC Midlands TV frequently used his site for live interviews when any extremes of weather occurred. Amazingly he managed to continue his weather monitoring through a long illness right up to three weeks before his death. "He will be missed". My thanks to Dave Wright for providing notes from information supplied by **Alan Davies**, a close friend of Cedric's for 25 years.

**Ben Ramsden** of Basingstoke also wrote to tell me that he was deeply saddened at the news of Cedric's passing. "I had the privilege of knowing Cedric for about 15 years, and have benefited enormously from his tremendous kindness and infectious enthusiasm. Whilst I was living locally to him in Halesowen he was very helpful when I first tried to establish a WXSAT station.

Cedric wanted to use the latest technology to help him further his passion for weather recording and study. He was one of the first people to connect to the Internet from home, using the latest, ultra-fast 28.8K modem! He operated a fully automated



Fig. 8: Section of *Blue Streak* courtesy Nick Catford.

electronic weather monitoring and logging station alongside his tried and tested (manual) Met Office standard equipment. He caused quite a stir at Met. Office HQ when he noticed that their standard equipment was under recording 'wind run' on days of light wind because the weight of their anemometer propeller was missing wind that his smaller and lighter electronic acrylic version was recording!

One of my favourite memories of Cedric was walking around his local area with him carrying a dipole antenna and portable weather satellite receiver trying to locate the source of some interference that was causing a

problem with his NOAA APT images! We weren't successful, but I remember the looks that we received from passing motorists!" My thanks to Ben for his contribution.

**David Taylor** told me "It was always a treat to hear his voice and his articles brought back fond memories". He had exchanged E-mails, but "I never had the pleasure of meeting him. It was real treat to get a copy of his Met. Office report as a present one year! He was very enthusiastic about updating his system to receive *METEOSAT-8* data, although his health prevented him from having full-time enjoyment of the hobby. A gentleman like Cedric will be sorely missed".

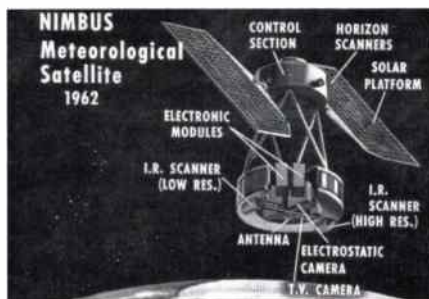


Fig. 9: Early *NIMBUS* Satellite - 1962 courtesy NOAA. TIROS-1 satellite on test stand during preliminary test stage. USA Navy Research Facility, December 1960.

Fig. 10: Cedric Roberts OBE courtesy Black Country Bugle.



## Frequencies

### a.p.t.

*NOAA-12* and *NOAA-15* transmit a.p.t. on 137.50MHz.

*NOAA-17* transmit a.p.t. on 137.62MHz.

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

### h.r.p.t.

*NOAA-12* and *NOAA-16* transmit h.r.p.t. on 1698.0MHz.

*NOAA-14* transmits failed imagery on 1707MHz.

*NOAA-15* transmits on 1702.5MHz.

*NOAA-17* transmits on 1707MHz.

*FENGYUN-1C* (failed) and *-1D* transmit on 1700.5MHz.

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

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# Scanning

Scene

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

Over the last few months we have shown one or two pictures of radio equipment cabins that are deployed at remote sites to house relay equipment. These days when a new building is required the preferred option is to purchase a small metal hut that can be taken to the remote site, plugged into some electricity and a few antennas, filled up with kit and switched on.

'Remote' and 'site' are the operative words here as by the natural requirement for radio base transceivers to be located at higher locations, transporting the gear up the hill can be a bit of a challenge. Small all terrain vehicles are often utilised, but when the location is too high or just too far up the mountain, the only answer is the aviation option.

When a new hut was required to house the O2 Airwave base equipment on a desolate site, those wealthy people at Airwave decided to rent some air support to lift the one tonne box up to the top of the hill. These photographs, taken by my neighbour, show an AeroSpatial AS315B Lama helicopter loading and lugging the cabin to its new home on a wild and lonely hilltop.

Just for those interested in aviation matters, the Lama can lift just over its own weight (over one tonne) and is specifically designed to operate at high altitudes. Primarily utilised in remote areas for mountain rescue and supply, the Lama holds the world helicopter altitude record of 40,820 feet.

## Clever Chap

As most readers with Internet will be aware, the Scanpromauk list on Yahoo Groups provides the most up-to-date scanning information in the UK. As with all Yahoo Groups there is a 'Files' section that allows users to upload pictures, data or programs to the database.



A clever chap called John has written a Windows based program that, although purely written for his own amusement, he has thoughtfully made available for everyone. Located in the Taxi folder it is labelled as STARLINE.ZIP. It decodes data from the radio system of his local taxi company which operates at 163MHz.

John makes no guarantees regarding the efficacy of the program in other areas or when used with other systems, but he obviously believes that it's worth a shot. The program is freeware and once unzipped to the computer's desktop or folder only requires a



connection to the 'line-in' of the soundcard. If you are hearing short data bursts every few seconds this may open a new window of monitoring for you. It's certainly worth the few minutes to get it up and running and may provide hours of amusement.

## New Scanner

There's a new scanner making waves in America. The folks at Uniden, who for many years have been right at the front of the pack when it comes to hobby scanning, have parted the winner's tape again. This time it's the BC246T. Although this hand-held set is a trunk tracker designed for systems in use in North America and as such has limited use here, the memory management is innovative and impressive.

Basically the unit has an available memory allocation, which the user can configure pretty much how he or she wants to. This makes entering frequencies for a particular area or agency much more channel economical. Whereas a conventional scanner may have say, ten banks of 100 channels as available memory, the BC246T's available memory can be allocated to frequencies or alpha numeric tagging.

This little box has a fascinating frequency capture device that Uniden call 'Close Call' and it works in a similar way to other frequency grabber units. This will also tune the receiver (as does the Alinco DJ-X2000) and runs the data through a number of checks

to ensure that the signal received is a proper transmission and not just interference and also to check that the frequency displayed and stored is accurate. It will simultaneously log any DCS or CTCSS encoding present. According to the brochure it will also try and locate the 'other half' of two frequency or repeater transmissions. Maybe one day I'll get a peek at one of these neat looking radios.

To think that when I first became interested in scanning the hottest item on sale was a small crystal controlled hand-held unit made by Standard (I think) that had about 10 channels, one of which was capable of transmission on the amateur 2m band. I could never afford one at the time, but still wonder how it performed. Has anyone got one?

## Help Needed

Another question I'm afraid. Does anyone have frequencies for the pub/club watch system in use in Norwich? It seems that there are two nightclubs in the city that operate on 460.150 and 461.4625 respectively, but Norwich now has a volunteer 'SOS Bus'. This acts as a first response for drunks and injured folk during the night hours of revelry (we've all been there?) and I am advised that the Bus staff have radios on the 'pub watch' channel. I'd like to be able to pass on the frequency if possible. I bet it's not boring!

## There's Always One!

Most scanner operators try to keep their interest well hidden from almost everyone. Whenever the words 'radio' and 'scanner' are found in the pages of the press, it is almost always in a negative context and this helps those in authority who would like to see the activity even more restricted that it already is.

So there's always one more no hoper to fuel the fire isn't there. This time it's one **Mark Bryning** from Penrhynside, near Colwyn Bay. You see, as an unemployed scaffolder, life wasn't too challenging so, he collected some police equipment including police badges, handcuffs, a thumping stick and a police radio and so armed he hit the streets of Rhyll together with his radio scanner.

Basically this idiot was arrested for impersonating a police officer after approaching a real policeman. But the real officer wasn't fooled and Bryning got scarfed off. He had also committed a similar offence in February when he had attempted to pay for cigarettes with one and two penny pieces. The cashier asked him for larger denomination currency and he had replied, "It's the law. You've got to serve me. I'm a special constable".

On 25 November at Llandudno Magistrates Court he was convicted of impersonating a police officer and was given a two month community rehabilitation order (whatever that is) and was curfewed for two months. He has had to have one of those little tags fitted, to monitor the curfew, as he's not allowed out at night time.

After his conviction he told the magistrates that they were, "Just a bunch of do-gooders", which doesn't actually indicate remorse does it. Outside the court he said that police had told him that he would make a good officer but that he "didn't know whether they were joking or not". We know don't we!

# Attn' 123

● **Enigma** 17-21 Chapel Street, Bradford, West Yorkshire BD1 5DZ. **Fax:** (01274) 725046  
● **E-mail** [enigma@pwpublishing.ltd.uk](mailto:enigma@pwpublishing.ltd.uk)

**C**ontinuing from our last offering back in December 2004, we'll now look more closely at the various kinds of transmission schedules.

## Non-schedules

Transmissions which don't appear in any way linked with a set of transmission times are assumed **at our present state of knowledge** not to be part of any schedule. (Often their frequencies appear to be chosen at random, too). Such transmissions are only found by chance. Examples: **M39, M51, M52**, etc. Some appear to send real-time (continuous) data/messages, e.g.: **M5, M26, M52**, etc.

## Foxed Schedules

Usually transmission-time and frequency linked. These do not follow active/inactive cycles, but operate continuously at regular transmission times, ranging in frequency from several times daily to one transmission per month. Seasonal frequency and summer-time adjustment may take place. Examples: **G3, G8, OLX, M10** (some), **M27/S8, S10, S17, S25, M2/E12, M3** (some), **M4/G2, E23, M16, M53**.

## Sliding Schedules

Message-linked: Certain E3 schedules are of this type, where the timing is progressively changed, by one hour each day, over a weekly cycle. As the same message is sent each day, this could be to optimise reception in different target areas, or to disguise a single target area from enemy monitors. Frequencies may also change with the transmissions. Examples: **E3A** (and possibly also **E3B**).

## Cyclic Scheduled

Usually transmission-time linked. Frequencies change seasonally or monthly. Operate over a set period or periods of the year interspersed by inactive periods. Periods are usually related to calendar months. They seem to be serving regular 'tours of duty' of fixed duration. A schedule's inactive period may sometimes be taken over by another schedule. Timing of such interleaved schedules indicate that they are mission-related and are actually sub-schedules of a continuous (non-cyclic)

compound schedule. These seasonal sub-schedules attempt to optimise propagation paths over the year. Examples: certain schedules of **M1, M3, M7, M10/S10, M12**, family I, etc.

## Dedicated Schedules

Usually transmission-time and frequency linked. One-off, varying duration, long or short term mission-specific. These are irregular and are only bought into operation to serve a particular mission, after which they do not return. Their lives may be prolonged (at either end) to provide dummy cover - disguising the actual period of genuine activity. Examples: **E5, M23** (all), and certain schedules of **M3, M10, M12, M13, M14, M1B, G16**, family I, etc.

## Erratic Schedules

Transmission do not always appear when and where they are expected, but generally conform to a pattern. For example, a 'daily' schedule may sometimes miss a day at random. Erratic schedules are usually associated with stations noted for poor technical quality or poor time keeping. Human error (forgetting to switch transmitters on!), power cuts, enemy sabotage, moving of the site, other more pressing duties, inefficiency (drunkenness on duty), poor maintenance (awaiting new p.a. valve!), antenna blown down - all are possible causes. Examples: **M1** (rarely), some **M10** schedules, **M50, E17, M53** (probably not due to error), **E9/V8, V20, V21**, etc.

## Schedule Types

Note that some stations tailor their scheduling specifically to a mission/agent's requirements, and several different schedule types may be in use by the same station. This applies especially to families I, III and XIV.

For efficient and successful monitoring it is important to understand the habits of a station and these mainly concern the type of scheduling used. Several stations use schedule numbers, such as families I, II, IV, XV, etc. These numbers are not to be confused with addressee numbers (or agent numbers), but represent the particular schedule concerned. Sometimes these numbers change with a schedule's seasonal/monthly frequency/time changes,

sometimes the same schedule number is used throughout. It is important for tracking purposes to include these numbers in logs wherever possible.

## Return of S25

Finally, some important news. We must never assume that a station has become entirely extinct, for over the years there have been several cases of stations reappearing after years of absence. Our latest such reappearance is S25, the once-daily Russian 'control station'. It is now back with us, thanks to **ENIGMA 2000** monitors finding it, although its format is somewhat changed, so really needs to become the new variant **S25D**.

Originally the station operated daily at 0800. Transmissions consisted of two 20 minute blocks, each on a different frequency. The schedule number was always 615 - sent three times, followed by a non-random 5-figure group sent twice, the whole being repeated for ten minutes, after which a new non-random 5-figure group was sent. Each 40-minute transmission therefore sent only four different 5-figure groups. After many years, the scheduling was cut to 0800 Mondays only - on 14.890MHz, followed by the 0820 transmission on 11.270MHz.

The new version uses a different schedule number, different time and frequency and only has a duration of four minutes total on one (much lower) frequency - although it could well continue for another four minutes on a second frequency. More information in our next column. Despite these differences, it is clearly the same station that's come back to life.

The CIA once ran a similar 'control station'; four times daily on four parallel frequencies. This sent no schedule number of ID and merely repeated a string of between 2 and 8 random 4-figure groups for ten minutes. You never know, this one may return to the airwaves one day!

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If you have any Numbers Station news or queries then contact Enigma at **17-21 Chapel Street, Bradford, West Yorkshire BD1 5DJ**. E-mail [enigma@pwpublishing.ltd.uk](mailto:enigma@pwpublishing.ltd.uk) or FAX: (01274) 725046. Replies via this column. Happy monitoring.

# GEO

<http://www.geo-web.org.uk>



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# Satellite

TV News

- **Roger Bunney** 35 Grayling Mead, Fishlake, Romsey, Hants SO51 7RU
- rogerbunney@pwpublishing.ltd.uk

Just after my last column was completed a dramatic event unfolded over *Eutelsat W1*, 10°E 16 November. Live pictures via 10.972GHz-V (SR. 4167 + FE 5/6). NASSAU had been working on 'Scram Jet motor' powered craft for a world record attempt. NASA-TV featured the vintage B-52, carrying beneath it an X-43A rocket plane, flying out of the Edwards AF Base and over the Pacific off the Californian coast. The 'Scram Jet' is a development of the Dryden Research Centre has no moving turbines, air is compressed as it is forced through a reducing duct where it mixes with hydrogen, ignited and the gases expelled producing the forward thrust. On the 'zero' countdown and "drop, drop, drop" instruction from NASA (Hampton, Virginia), the X-43A falls, the engine fired - live pictures both from the B-52 and an observation plane flying alongside. The jet reached Mach 10, that is 10 x the speed of sound and the test firing was confirmed a success, the craft eventually fell into the Pacific. Great pictures and space history in the making.

A few days later (20th) and **Roy Carman** (Dorking) checked out 'Channel 1' slot on the Globecast multiplex on *Atlantic Bird-1*, 12.5°W - 11.014GHz-HG (20145+3/4) and found the delayed launch of the space probe 'Swift' was about to depart from Cape Canaveral. The Swift mission is to research deepest space and to gather information on gamma ray burst from the distance cosmos which may reveal more on the evolution of the Universe, the cost for gathering this information is a cool \$250million.

Undoubtedly, most of the dramatic news over the past weeks has been the elections in the Ukraine, the local folk have been demonstrating in the main square of Kiev. A march on the new president's HQ, 22 November looked like the start of a Russian Revolution-2. Democracy is a word that is still not understood in much of Russia and the newly forming states. Moscow obviously supported the newly 'elected' hard-liner Viktor Yanukovich whereas the locals wanted the popular Viktor Yushchenko. For over a week the demonstrations continued with live pictures across Europe via *Eutelsat W1*, 10°E - 10.967GHz-V (4167+5/6) and the Russian 'NTV' channel placed their sat truck to provide interviews, which again were carried live over *Eutelsat W2*, 16°E - 'NTV RUS-5 0070'. The downlink frequency varied nightly though would generally appear between 12.535-12.560GHz (5632+3/4).

Weekend of 20 November and colour bars + the 'APTN Santiago' identification appeared over 10°E on several occasions. Not the Spanish Santiago but a sighting of President Bush confirmed this was Santiago, the capital city of Chile and another 'Bush mini world tour'. Pictures courtesy of Channel 13, Santiago.

President Putin has been on Russian TV, not to discuss fixed elections but a chat show. Over at 53°E is the *Express AM-22* satellite which in recent months has been carrying an increasing level of TV channels easily received here in the UK. In early December a countdown of TV programmes reveals more entertainment of interest if you're an ex-Ukrainian or are thinking of spending a holiday in the region between the Ukraine and the Caspian. There are three small digital multiplex available and the largest is 11.046GHz (29812+3/4) and carries '1-MUZ BY', 'NEO TV', 'CTC-2', 'CTC-0', 'MuzTV-LOVR', 'MNS'. A single 'TV PROG' appears at 11.083GHz (3750+3/4). At 11.099GHz (10942+3/4) is 'UTR', 'HTH', 'KTM'. Finally the educational channels 'SGU TV1' and 'SGU TV2' appear - 11.186GHz (8882+3/4). All signals are vertically polarised. 'MNS' early December was just showing pictures of rivers and mountains, a new channel about to take the air and the 'KTM' channel carried their star guest 18 November with President Putin earning a few extra Roubles on the side.

*Eutelsat W2*, 16°E often carries live news and sports feeds for various RTL networks across central Europe appearing

between 12.525-12.545GHz-H (5632+3/4), look for 'ENEX' - European News Exchange captions. On 20 November 'RTL TELEWIZWA' appeared at 12.541GHz-H with live pictures of the local police running around at the scene of a bomb or the aftermath of a large fire. More smoke on the 28th but this time over 12.533GHz-H, again for RTL. Dutch fireman at a residential suburb with land subsidence, smoke pouring from earth fissures and trees tilting at distressed angles. Nearby, fireman are entering an archway which suggested an underground car park inside of which has been a massive explosion sufficient to cause massive land movement and localised destruction. Major news in Holland but nothing in the UK press.

Bad news for racing enthusiasts with the encryption of the former 'Tellytrack' South African horse racing channel. It's gone upmarket and now called 'Racing International', still downlinking at 11.497GHz-V (3253+7/8) over *Europe\*Star*, 45°E. A partner TV channel on the same frequency has appeared that may give consolation for the loss of racing. 'Pulse' is the partner channel which transmits religious programming both European and American. One evening for example a prolonged prayer event featured live hook-ups between the USA and Jerusalem, courtesy of the 'Joyce Meyer Ministries'. Unfortunately, encryption seems to be increasing on many of the established news feeders, losing many breaking and important news events. At least the 'FINA World Swimming Cup' competitions from South Africa were carried in the clear on 20 November over *Europe\*Star* courtesy of 'Globecast Africa' running at 11.522GHz-V (SR 11552 + FEC 3/4).

There is a chink of good news, again thanks to the ever alert Roy Carman at the Dorking receiving site. The inclined orbiting *Eutelsat 2F3* (21.5°E) has now been replaced with *Eutelsat W3*, formally at 48°E. The new kid on the block therefore will hopefully suffer less inclination and has already been seen carrying downlinks in both Ku low and Ku high bands. Initial observations show that the 11.020-11.100GHz-H and 12.675-12.725GHz-V have been most active into early December with SISLink and other pan-UK feeds. Many however have been using MPEG-4:2:2 which may be invisible to many enthusiasts using standard MPEG-2 equipment. A known regular user is the ITN main feeder - 11.041GHz-H (4224+7/8) in 4:2:2. Meanwhile in the West we have more good news, if you're familiar with the *NSS-7* orbital slot at 21.5°W, then just before you arrive stop over at 20°W where is the newly active *Intelsat 603* - and old bird and is running apparently at 2° inclination - it will disappear for long periods during the day on its outermost swings but in early/mid December was appearing between 1200-1500 in Southern UK. Now this is good news as between 10.973-11.200GHz-H and 11.455-11.485GHz-H are being carried many UK feeds for BBC, SISLink, ITN and ITV. Again we have a mix of MPEG-2 and the greater majority in 4:2:2 with horseracing from various UK/Irish courses (via SISLink), BBC regional inserts, ITN news inserts etc. Checking Roy's listing we seem to favour preset parameters such as 3437+7/8; 4224+7/8, 5632+3/4 and 6111+3/4. Being this is an environment of news, activity will be intermittent and of short duration, you're best advised to use a blind search receiver e.g. Coship and scan the above frequency segments rather than the whole band.

**Nick Harrold** (Essex) advises that the *Telstar-12*, 15°W slot carries several variations on USA programming, signals are intermittent. VOA - 12.608GHz-H (SR 12608, FEC unknown); CNN New York 12524GHz-H (19125+2/3); 'DAD-5' NBC early morning show around 1100 @ 11.518GHz-H (3744+7/8) - encrypts; 'DAD-2' - 11.522GHz-H (1500+7/8) MS-NBC programming + news packages.

A final tip for lottery anoraks - the 'Euro Lottery' has appeared Friday evenings on *Telecom 2D*, 8°W - check out 12.541GHz-H (5632+3/4).



Bin Laden is alive and well over Al Jazeera TV.



USA election night via Telstar 12 - 15°W.



The X-43A - Scram Jet test flight path off California.



Close-up 'rear' view of the Scram Jet X-43A from the B-52 camera.



Computer simulation of the X-43A flight.



The vintage NASA-TV B-52 aircraft.



BTR bmp Experimental TV programming from 62°E.



Epitel MCR bmp Vote America, reports from Rome, Italy.

# SWM UK Radio Club Listing

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

## NORTH WEST

### CHEESHIRE

**CHESTER & DRS, G3GIZ.** Meets at the Burley Memorial Hall, Waverton. Details from Chris Wild. Tel: (01244) 683629.

**HALTON RADIO CLUB, MOBKZ.** Meets at the Play Centre, Norton Hill, Windmill Hill, Runcom. Details from Alan Parker 212DSF. Tel: (01928) 790228.

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

**MID CHEESHIRE ARS, G3ZTT.** Meets at the Cotebrook Village Hall, Cotebrook Nr. Tarporley, Cheshire. Details from Neil Reilly G0VOK.

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

**RADIO OFFICERS ARS, MORQA.** Details from Mr J. Bell G0CMM.

**UKFM GROUP WESTERN, G83MP.** Meets at the Morley Green Club, Moberley Road, Winslow, Cheshire. Details from Gordon Adams G3LEQ. Tel: (01965) 652632, FAX: (01965) 634560.

**WARRINGTON & DARS, G0WRs.** Meets at the Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington, Cheshire. Details from John Riley G0RPG. Tel: (01925) 762722.

**WIDNES & RUNCORN ARC, G0FWR.** Meets at the Scout Hut, Castle Road, Halton Castle, Runcorn, Cheshire. Details from Martin Tull G4LUQ. Tel: (01928) 714843.

### CUMBRIA

**EDEN VALLEY RS, G0AMT.** Meets at the BBC Club, Penrith. Details from John Roze G0VMP. Tel: (01931) 716421.

**FURNES ARS, G4ARF.** Meets at the Farmers Arms Hotel, Newton-in-Furness. Details from Mr K. Moore M1BWA. Tel: (01229) 465691.

**WHITEVALE ARC, MOBEE.** Details from Mr N. Williams M0CRM.

### GREATER MANCHESTER

**BURY RS, G3BRS.** Meets at the Mosses Centre, Cecil Street, Bury, Lancs BL9 0SB. Details from Steve Gilbert G30AG. Tel: 0161-881 1850.

**DOUGLAS VALLEY ARS, G3BPX.** Meets at the Wigan Sea Cadet HQ, Training Ship Sceptre, Brookhouse Terrace, off Warrington Lane, Wigan. Details from Mr D. Snape G4GWG. Tel: (01942) 211397.

**ECOLLS & DARS, G3G0.** Meets at the Eccles Liberal Club, Wellington Road, Eccles, Manchester. Details from Chris Hamson G4KRG. Tel: 0161-773 7899.

**THE MANCHESTER WIRELESS SOCIETY, G5MS.** Meets at the Simpson Memorial Community Hall, Moston Lane, Moston, Manchester. Details from Ian M0IPR. Tel: 0161-288 730 or visit [www.g5ms.com](http://www.g5ms.com)

**OLDHAM ARC, G4ORC, G1ORC.** Meets at the Royston Air Training Corps, Park Lane, Royston, Oldham. Details from Michael Crossley M1CVL. Tel: (01706) 367454.

**\*OLDER HILLS ARS, G0JQA.** Meets at the Oldler Community School, Hudsons Walk, Oldler Hill, Rochdale. Details from Alan G4TMV. Tel: (01706) 344186. E-mail: [info@olderhills.org.uk](mailto:info@olderhills.org.uk)

**ROCHDALE & DARS (RADARS), G0RDC.** Meets at the Barnfield & Fieldhouse, Cricket Club, Barnfield Village. Details from John Cannell G70AJ. Tel: (01706) 376204.

**SOUTH MANCHESTER RAD & COMB CL, G3FVA.** Meets at the Sale Cricket Club, Dawe Road, Sale, Cheshire. Details from Chris Ward G4HQN. Tel: 0161-483 5174.

**STOCKPORT RS, G6UQ, G8SRs.** Meets at the T.S. Hawkins, Stockport Sea Cadets HQ, Pearmill Ind. Est., Stockport Road, West Howe, Lower Bredbury, Stockport. Details from David Simcock M1ANT. Tel: 0161-456 7832.

**TRAFFORD ARC, G0TRC, G1TRC.** Meets at the Watch House, Crusing Club, Canal Bank, Stretford, Manchester M32 8WE. Details from Roger May G4VYQ. Tel: (01457) 8666575.

**TRAFFORD RADIO GROUP, G0TRG.** Meets at 17th Stretford Scouts HQ, Barton Road, Stretford, Manchester. Details from John Mossman G7JKK. Tel: 0161-895 5699.

**WEST MANCHESTER RC, G4MWC.** Meets at the Astley & Tidesley Miners Welfare Club, Meanly Road, Astley, Tidesley, Manchester. Details from Jeffrey Moran M0BGU. Tel: (01204) 497694.

**WIGAN & DARC, G0HRW.** Details from Mr D.H. Barkley G0DPL. Tel: (01942) 237162.

### ISLE OF MAN

**ISLE OF MAN ARS, G03FLH.** Meets in the Sea Cadets Hall, Tromode Road, Tromode, Douglas. Details from Dave Walton M0D0X. Tel: (01624) 815308.

### LANCASHIRE

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

**CENTRAL LANCS ARC, G0FDX.** Meets at the Priory Club, Broadfield Drive, Leyland, Lancs. Details from Steve Shearing M1ACJ.

**DARWEN ARC, G4JLS.** Meets at the Darwen Catholic Club, Wellington Fold, Darwen, Lancashire. Details from Ian Jackson G0N9J.

**FISTS CW CLUB, G0PFX.** Details from Mr E. Longien G3ZQS. Tel: (01254) 703948.

**FLYDE ARS, RS53939.** Meets at the A.N.T. Flying Clubhouse, Blackpool Airport. Details from Ken Randall G3RPH. Tel: (01253) 407952.

**MORECAMBE BAY ARS, G4YBS.** Meets at the Trimpell Sports & Social Club, Outmost Lane, Morecambe, Lancs. Details from Paul 2E0DXD. Tel: (01524) 427793, E-mail: [2e0dx@mbars.co.uk](mailto:2e0dx@mbars.co.uk)

**PRESTON ARS, G3KUE.** Meets at the Lonsdale Club, Fulwood Hall Lane, Fulwood, Preston. Details from Eric Eastwood G1WQC. Tel: (01772) 686708.

**ROLLS-ROYCE ARC, G3RR.** Meets at the Club Room, Rolls-Royce Sports Ground, Barnoldswick. Details from Mr J.A. York G3KJL.

**ROSSDALE ARS, G1RRS.** Meets at the Old Fire Station, Burnley Road, Rawtenstall, Rossendale, Lancs BB4 8EW. Details from Ken Slaughter. Tel: (01706) 830306.

**THORNTON CLEVELYS ARS, G4ATH.** Meets at the Frank Townsend Centre, Beach Road, Thornton Clevelys, Lancs. Details from Mr J.E. Duddington G4BPH. Tel: (01253) 853554.

### MERSEYSIDE

**LIVERPOOL & DARS, G3AHD.** Meets at the Churchill Conservative Club, Church Road, Wavertree, Liverpool L15. Details from David G. Parr G8DEJ.

**SOUTH WIRRAL CONTEST GROUP, G3CSA.** Details from Mr T.B. Saggerson G4WSE. Tel: 0151-339 0842.

**SOUTHPORT & DARC, G20A.** Meets at St. Marks Church Hall, Scarisbrick, Lancs. Details from Don Atkins M1BUL.

**WIRRAL & DARC, G4MGR.** Meets at the 19th Cricket Club, Mill Hill Road, Wirral. Details from Tom G4BHF. E-mail: [secretary@wadarc.com](mailto:secretary@wadarc.com). Tel: (07050) 291850.

**WIRRAL ARS, G3NWR, M0JARC.** Meets at the Club Room, Ivy Farm, Anwoy Park Road, Wirral L49 5LW. Details from Alan Upton G3UZU. Tel: 0151-677 3266.

### NORTH EAST

#### CLEVELAND

**EAST CLEVELAND ARC, G4CRS.** Meets at the New Marske Institute Club, Gurney Street, New Marske (near Redcar). Details from Alistair Mackey G4OLK. Tel: (01642) 475671.

**STOCKTON & DARG, G4XQG.** Meets at the Billingham Community Centre, Billingham, Cleveland. Details from David J. London G0VGB. Tel: (01642) 896395.

#### CO DURHAM

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

**DERWENTSIDE ARC, G4PFO.** Meets at the Steel Club, 36 Merdonsley Road, Consett, Co. Durham. Details from Mr G. Derby G7GJU. Tel: 0191-370 2032.

**GREAT LUMLEY AR & ES, G4EUZ.** Meets at the Community Centre, Great Lumley, Chester-le-Street, Co. Durham. Details from Nancy Bone G7ULR. Tel: 0191-477 0036, mobile (07990) 760920.

**PETERLEE RADIO CLUB, G0KJV.** Details from Andrew Pennell G0NSK.

### HUMBERSIDE

**EAST YORKSHIRE ARS, G0EGR.** Meets at the Northern Foods Sports & Social Club, Millhouse Woods Lane, Cottingham, E. Yorks. Details from David Taylor G4EBT. Tel: (01482) 876702.

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

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

**HORNSEA ARS, G4EKT.** Meets at The Mill, Awick Road, Hornsea, North Humberside. Details from Jeff Southwell G4IGY. Tel: (01964) 533331.

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

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

**SCUNTHORPE STEEL ARC, G4FUH.** Details from Alistair Butler M1EFC.

### NORTH YORKSHIRE

**DARLEY ARC, G0FOS.**

**HAMBLETON ARS, G0JQA.** Meets at the Mencap Centre, Northallerton, N. Yorks. Details from Ian Brickwood G0JQA. Tel: (01609) 775998.

**QUEEN MARY ARC, G6QM.** Meets at Blazefield, Pateley Bridge, Hamgate, North Yorks HG3 5DR. Details from Frank Hams G4IEY. Tel: (01242) 236715.

**RIPON & DARS, G4SJM.** Meets at The Bunker, rear of Ripon Town Hall, North Yorkshire. Details from Nigel Drumm M1B0Z. Tel: (01423) 884733.

**ROYAL SIGNALS SCARBOROUGH ARC, G0RCS.** Details from Mr A.W.W. Timme G3CWW. Tel: (01484) 842330.

**SCARBOROUGH ARS, G4BP.** Meets at the Scarborough Cricket Club, Pavilion, North Marine Road, Scarborough, North Yorks Y012 2TJ. Details from Mr D.P. Tipper G3JBR. Tel: (01723) 377296.

**SCARBOROUGH SE GRP, G0X00.** Details from Roy Clayton G4SSH. Tel: (01723) 862924.

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

**YORK ARS, G3HWW.** Meets at the Guppy's Enterprise Club, 17 Nunney Lane, York, Details from Keith Cass G3WV0. Tel: (01904) 422084.

**YORK RADIO CLUB (AMATEUR) G4YRC.** Meets at the Bishopthorpe Social Club, Bishopthorpe Main Street, York. Details from Gareth Foster G1DRG. Tel: (01904) 421392.

### NORTHUMBERLAND

**NORTHUMBRIA ARC, G4AAX.** Meets at the Old Telephone Exchange, Cresswell Road, Ellington, Morpeth, Northumberland. Details from Charles Quirmin G0EQC. Tel: (079747) 99881.

### SOUTH YORKSHIRE

**FINNINGLEY ARS, G7HAH.** Details from John Fennell G4HOY. Tel: (01427) 872522.

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

**MEXBOROUGH & DARS, G4BTS.** Meets at the Harrop Hall, Mexborough, South Yorks. Details from Mr R.T. Sheppard

G0KSK. Tel: (01709) 586329.

**SHEFFIELD ARC, G0INF, N1RAE/RAE** *tuition provided.* Meets at the Sheffield University Staff Club, 197 Brook Hill, Sheffield. Details from Mrs Irene Giosso G0SFP.

### TYNE & WEAR

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

**SOUTH TYNESIDE ARS, G0XWQ.** Meets at the Boldon Scout Hut, Grey Horse Car Park, Front Street, Boldon. Details from William Wilson M0BVI. Tel: 0191-421 9921.

**TYNEMOUTH ARC G0NMM.** Meets at the Linskill Centre, Linskill Terrace, North Shields, Tyne & Wear. Details from Mr G.N. Thompson G0SBN.

**TYNESIDE ARS, G3ZQM.** Meets at the St Teresa's Club, 200b Heaton Road, Newcastle-upon-Tyne NE6 5HP. Details from Mr J. Pickersgill G0DZG. Tel: 0191-265 1718.

### WEST YORKSHIRE

**DENBY DALE & DARS, G4CDD, G8MKM.** Meets at the Pie Hall, Denby Dale, West Yorkshire. Details from Mr J.P. Morley G4FSQ.

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

**KEDGHLEY ARS, G0KRS.** Meets at the Cricket Club, Ingrow, Kedghley, West Yorkshire. Details from Mr I. Townson M1BGY. Tel: (01274) 723951.

**LEEDS & DARS, G4LAD.** Meets at The Radio Shack, Yambury (Horsforth), RUFC Grounds, Browning Lane, Horsforth, Leeds LS18 5HB. Details from Mr E. Howden G0IBU.

**NORTH WAKEFIELD RC, G4NOK.** Meets at the East Ardsley Cricket Club, Nr. Wakefield. Details from Mrs Olga Parker 2EJASV. Tel: 0113-253 9087.

**OTLEY ARS, G3XNO.** Meets at The RAOB Club, Westgate, Otley, West Yorkshire. Details from Jack Worsnop G0SVN. Tel: (01274) 636197.

**PONTEFRACT & DARC, G3FYQ.** Meets at the Carleton Community Centre, Pontefract, West Yorkshire. Details from Colin Wilkinson G0NQE. Tel: (01977) 677006.

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

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

**WAKEFIELD RPTR GP, G0KNR.** Details from Mike Charlton G60XZ.

**WHITE ROSE ARS, G3XEP.** Meets at the Moorstown RUFC, Moss Valley, Kings Lane, Leeds LS17 7NT. Details from Mr M. Wilson G7SDW. Tel: 0113-273 6039.

### MIDLANDS

#### BEDFORDSHIRE

**DUNSTABLE DOWNS RC, G4DDC.** Meets at the Chews House, 77 High Street South, Dunstable, Beds LU6 3SF. Details from Phil Sealord G8XTW. Tel: (01525) 384419.

**SHEFFORD ARS, G3FJE.** Meets at the Church Hall, Amphill, Shefford, Beds. Details from John West. Tel: (01462) 812739.

**ST. SWITHUN'S ARC, M0AIV.** Meets at St. Swithun's Church, Rectory Rooms, Sandy, Beds. Details from Kelynn Daron G0WOD. Tel: (01767) 683179.

### CAMBRIDGESHIRE

**CAMBRIDGE & DARC, G2XV.** Meets at the Coleridge Community College, Radegeund Road, Cambridge. Details from Ron Huntsman G3K8R. Tel: (01223) 501712.

**DUXFORD ARS, G2UFM.** Meets at Building 177, Imperial War Museum, Duxford Airfield, Cambs. Details from Mrs B.I. Pope. Tel: (01279) 656149.

**GTR PETERBOROUGH ARC, G4EHW.** Meets at the 6th Form Building, Stanground College, Farcol Road, Fletton, Peterborough. Details from Alan D. Ralph G8XLH.

**HUNTINGDONSHIRE ARS, G0HSR.** Meets at the Medway Centre, Medway Road, Huntingdon. Details from David Leach G7DIU. Tel: (01480) 431333.

**MARCH & DRAS, G3PMH.** Meets at the British Legion Club, Rockwood Road, March, Cambs PE15 8DP. Details from Mr J. Bradthwaite G3PWF. Tel: (01353) 698885.

**PETERBOROUGH R & ES, G3DQW.** Details from Mr V. Edwards G8NGZ.

**WISBECH AR & ELEC. CLUB, M5ARC, G4PQL, G8NED.** Meets at RAFA Club, Old Market, Wisbech. Details from Alan Bindgeland M0DUQ. [www.warec.org.uk](http://www.warec.org.uk)

### DERBYSHIRE

**BOLSOVER ARS, G4RSB.** Meets at the Blue Bell, High Street, Bolsover, Derbs. Details from Colin Morris G0RXT. Tel: (01246) 822885.

**BURTON RA, G4SPA.** Meets at the Leewood Hotel, Burton. Details from Derek Carson G4IHO. Tel: (01298) 25506.

**DERBY & DARS, G2DJ.** Meets at Carlton Road United Reform Church, Carlton Road, Littleover, Derby. Details from Martin Shardlow G3SZJ. Tel: (01332) 556875.

**EREWASH VALLEY ARG, G0PFX.** Meets at The Stowell Arms Public House (between Horsley Woodhouse and Woodside). Details from Peter Russell M0AQL.

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

**NOTTS & DERBY BORDER ARC, G4NID.** Meets at Maripool United Reform Church, Chapel Street, Maripool, Ilkeston. Details from Graham Bromley G4UTN. Tel: (01773) 834308.

**NUNSFIELD HOUSE ARC, G3EED.** Meets at the Nunsfield House, Boulton Lane, Avaston, Derby. Details from William F. Smith G7PJJ.

**STH DERBYS & ASHBY W ARG, G0SRC.** Meets at the Moira Reformatory, South Yorks. Details from Mrs Swadincote,

Derbyshire DE12 6DJ. Details from Mrs B. Waikey. Tel: (01283) 760822.

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

### GLOUCESTERSHIRE

**CHELtenham AR ASSN, G5BK.** Meets at the Prestbury Library, Prestbury, Cheltenham. Details from Ian Wilson G4BGW. Tel: (01452) 731956.

**CHELtenham CLUSTER SUPP GP, G87DXC.** Details from Mr A.M. Davies G0HDB. Tel: (01684) 72178.

**GLOUCESTER AR & ES, G4AYM.** Meets at the Churchdown School, Churchdown. Details from Mr A.J. Martin. Tel: (01452) 618930.

**SMITHS INDUSTRIES RS, G4MEN.** Meets at the Sports & Social Club, Evesham Road, Bishops Cleeve, Cheltenham GL52 4SF. Details from A.J. Hooper G1JMF.

**STROUD RS, G4SRs.** Meets at the Minchington Youth Centre, Nr. Stroud. Details from Mr S.G. Spencer G3ILO.

**WHITE NOISE LISTENING GOWNL.** Details from Adnan Deane DEANE G7KCC.

### HERFORD & WORCESTER

**BROMSGROVE & DARC, G3VGG.** Meets at the Avoncroft Arts Centre, Bromsgrove, Worcs. Details from Mr J.F. Burford G4OAZ.

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

**DROTWHICH ARC, G4PVO.** Meets in the Community Hall, Drotwhich Spa, Worcs. Details from Hector Wragg M1BIV. Tel: (01905) 794399.

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

**KIDDERMINSTER & DARS, G0WRK.** Meets at The Chairwell Club, Zorch Avenue, Kidderminster. Details from Mr A.W. Saunders G0OZB. Tel: (01299) 400172.

**MALVERN HILLS ARC, G4MHC.** Meets on the second Tuesday of the month at the Town Club, Great Malvern. Details from Mike G3TGD. Tel: (01905) 830752. E-mail: [mike@allenison.fsnet.co.uk](mailto:mike@allenison.fsnet.co.uk)

**REDDITCH RC, G4ACZ.** Meets at the WRVCS Centre, Ludlow Road, Redditch, Worcs. Details from Mr J.L. Mutton G3EVT. Tel: (01879) 762041.

**VALE OF EVESHAM RAC, G0ERA.** Meets at the BBC Club, High Street, Evesham, Worcs. Details from Mr A.C. Lindsay G4NRD. Tel: (01386) 41508.

### LEICESTERSHIRE

**1F AIC, G7MCD.** Details from Sqn. Cdr. Adnan Utting G1WZQ.

#### BEAUMONOR ARC, G3BMR

**DEMONTFORT UNIVERSITY, G3SDC.** Open to past & present students. Details from Mr R.G. Titterton. Tel: 0116-257 7059.

**HINCKLEY AR & ES, G3VGL.** Meets at the United Services Club, St. Mary's Road, Hinckley. Details from Mr R.A. Bennett G8BFF. Tel: (01455) 846493.

**LEICESTER RS, G3LRS.** Meets at Gilroes Cottage, Groby Road, Leicester LE3 9QJ. Details from Mr S.P. Hay G3HYH. Tel: 0116-224 2598.

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

**MELTON MOWBRAY ARS, G4PFX.** Meets at the St. John Ambulance Hall, Asfordby Hill, Melton Mowbray, Leics. Details from Mr R. Winters G3NVC. Tel: (01664) 63369.

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

**TAMWORTH ARS, G3BTR.** Details from Mr A.I. Dyson G0HUW. Tel: (01827) 830437.

**WELLAND VALLEY ARS, G4WVR.** Meets at The Village Hall, The Green, Great Bowden

Northampton. Details from Norman Miller G0GBZ. Tel: (01327) 349188.

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

**PARALLEL LINES CG, G4LUP.** Details from Mr P.S. Lindsay G4CLA.

## NOTTINGHAMSHIRE

**ARC OF NOTTINGHAM, G3EHW.** Meets at the Haywood Road Community Association, Haywood Road, Mapperley Road, Nottingham NG3 6AD. Details from Ron Hague G4XOU. Tel: 0115-919 9177.

**DUKERIES ARS, G4XTL.** Meets at Ambleside Community Centre, Ambleside, New Olerton, Notts. Details from Colin Foster G7DXX.

**HUCKNALL ROLLS ROYCE ARC, G5RR.** Meets at the Hucknall Rolls Royce Sports & Social Club, Watnall Road, Hucknall, Nottingham. Details from Mr P. Hart G4JSM.

**MANSFIELD ARS, G3RQC.** Meets at the Debdale Park Sports & Recreation Club, Debdale Lane, Mansfield Woodhouse, Notts. Details from David Peat G0RDP. Tel: (01623) 631931.

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

**SIEMENS ARC, G8ZK, G8GKQ.** Meets at the GPT Sports Ground, Beeston, Nottinghamshire. Details from Chris Archer G4VFK. Tel: 0115-943 3387.

**SOUTH NOTTS ARC, G0OAU.** Meets at the Fairham Community College, Farnborough Road, Clifton, Nottingham NG11 9AE. Details from Gary Bishop G0WUG. Tel: (01509) 672846.

**WORKSOP ARS, G3RCW.** Meets at the Club House, 59-61 West Street, Worksop, Nottingham S80 1JP. Details from Terry Calvert G4GBS. Tel: (01302) 743130.

## SHROPSHIRE

**SALOP ARS, G3SRT.** Meets at the Telepost Club, Railway Lane, Abbey Forge, Shrewsbury. Details from John Burnford G0XN. Tel: (01434) 249943. E-mail: john.burnford@virgin.net

**TELFORD & DARS, G3ZME.** Meets at the Dawley Bank Community Centre, Dawley, Telford, Shropshire. Details from Mr M. Vincent G3UKV. Tel: (01952) 259416.

## STAFFORDSHIRE

**BURTON-ON-TRENT & DARS, G3NFC.** Meets at the Stapehill Institute, Main Street, Stapehill, Burton-on-Trent, Staffs. Details from Mr M.W. Cotton G4HBY.

**CANNOCK CHASE ARS, G6SW.** Meets at the Four Crosses Inn, Watling Street, Hatherton, Cannock. Details from Arnold Matthews G3FZW. Tel: (01543) 262495.

**CHAD RC, G4CAR.** Meets at the Swinford Officers Club, Swinford, Lichfield, Staffs. Details from Bernard Jayne G8FR. Tel: (01543) 286569.

**LICHFIELD ARS, G3WAS.** Meets at the Queens Head, Sandford Street, Lichfield. Details from Roger Smethers G3NLY. Tel: (01543) 672762.

**MOORLANDS & DARS, G4NHT, G3MAD.** Meets at the Creta Works, Blythe Bridge, Stoke-on-Trent, Staffs ST11 9LJ. Details from Mr B.J. Butcher G4HKG. Tel: (01782) 395793.

**NEWCASTLE-U-LYME SCOUT AR COM GR, G7UQG**

**STOKE-ON-TRENT ARS, G3GBU.** Meets at the '45' Club, 92 Lancaster Road, Newcastle-under-Lyme, Staffs. Details from Albert Allen G4DHO. Tel: (01782) 638801.

**SUTTON COLDFIELD RS, G3RSC.** Meets at the Rugby Club, Walmeley Road, Sutton Coldfield, West Midlands. Details from Paul G. Turner G7MWD. Tel: 0121-350 4263.

## WARWICKSHIRE

**AVON VALLEY AREA, MORAD.** Details from Mr Peter Bradham G0WJ. Tel: (01905) 724531.

**MID WARWICKSHIRE ARS, G3UDN.** Meets at the St. John Ambulance HQ, 61 Ermscote Road, Warwick. Details from Bernard Pittaway. Tel: (01526) 420913.

**RUGBY ATS, G4APD.** Details from Tony Humphres G0OLS. Tel: (01922) 552683.

**STRATFORD-UPON-AVON & DRS, G0SOA.** Meets at the Home Guard Club, Tiddington, Stratford-upon-Avon, Warks. Details from Ron Horsley G0MRH. Tel: (07970) 148204.

## WEST MIDLANDS

**ALDRIDGE & BARR BEACON ARC, G0NEQ.** Meets at the Aldridge Central Hall Community Centre, Middlemore Lane, Aldridge WS9 8AN. Details from Mr C.J. Baker G0NOL. Tel: (01922) 636162.

**COVENTRY ARS, G2ASF.** Meets at the Binley Church Hall, Binley Road, Coventry. Details from John Beech G8SEQ. Tel: (01203) 673999.

**DUDLEY ARC, G4DAR.** Meets at the Community Centre, Sedgley, Central Library, St. James Road, Dudley. Details from Tony Lucas G4LVA. Tel: (01384) 277925.

**HILLDRETT ARS, G0SPM.** Meets at the College, Simms Lane, Netherpton, Dudley, West Midlands. Details from Stuart Viny. Tel: (01384) 232457.

**KYNOCH R & TVS, G3HPP.** Meets at the Club Workshop, IMI Ltd., Sportsfield, Perry Bar, Birmingham. Details from Mr G. Nicholas. Tel: (01922) 635376.

**MIDLAND ARS, G3MAR.** Meets at Unit 22, 60 Regent Place, Hockley, Birmingham (jewelry quarter). Details from John A. Crane G0LAI. Tel: 0121-628 7632.

**SANDWELL AMATEUR RADIO CLUB, G0CWC.** Meets at Sandwell ARC, Broadway, Oldbury, Warrley, West Midlands B68 9DP. Details from Stuart Collins M0BTO. Tel: 0121-561 4663.

**SIERRA HOTEL ARCG, G0OBS.** Details from Warwick M. Hall G4WMM.

**SOLIHULL ARS, G3GEI.** Meets at The Shirley Centre, 274 Stratford Road, Shirley, Solihull, West Midlands. Details from Paul Gaskin G8AVY. Tel: 0121-783 2936.

**SOUTH BIRMINGHAM RS, G3OHM.** Meets at Hampstead House, Fairfax Road, West Heath, Birmingham. Details from The SBRS Secretary.

**STOURBRIDGE & DRS, G6OI, G6SRS.** Meets at the Old Swinford Hospital/School, Stourbridge, West Midlands. Details from Tom Edwards.

**WEST BROMWICH CENTRAL RC, G4WBC.** Meets at the Sandwell Public House, High Street, West Bromwich,

West Midlands. Details from Ian Leitch G0PAL. Tel: 0121-561 2884.

**WEST MIDLANDS POLICE ARC, G0COP, G1WMP.** Details from Steven Jones G6LRL.

**WILLENHALL & DARS, G4ETW.** Meets at The Liberal Club, Villiers Street, Willenhall, West Midlands. Details from Dave Bradbury. Tel: (01902) 411252.

**WOLVERHAMPTON ARS, G8TA.** Meets at the Electricity Board Sports Club, St. Marks Road, Chapel Ash, Wolverhampton. Details from Mrs J. Smith. Tel: (01902) 751936.

**WORDSLEY RC, G4WRA.** Meets at the Brick Maker's Arms, Mount Pleasant, Briery Hill, West Midlands. Details from Andy Evans G1PKZ.

## LONDON & CENTRAL

### BERKSHIRE

**ARBORFIELD ARC, G3IHH.** Details from Mrs E.W. Harding 2E1AUQ.

**BRACKNELL AEG, G4BRA.** Meets at the Coopers Hill Community Centre, Bagshot Road, Bracknell, Berks. Details from John Ellerton G3NCN.

**BURNHAM BEECHES RC, G3WIR.** Meets at the Farnham Common Village Hall, Victoria Road, Farnham Common, Bucks. Details from Mrs Eileen Chislett G6EIL. Tel: (01628) 625720.

**MAIDENHEAD & DARC, G3WYK.** Meets at the Red Cross Hall, The Crescent, Maidenhead, Berkshire. Details from Neil Savin G0SVN. Tel: (01628) 626210.

**NEWBURY & DARS, G5XV.** Meets at the Rugby Club, Monk's Lane, Newbury. Details from Max Maxwell G7DXX. Tel: (01693) 253233.

**READING ARC, G3ULT.** Meets at the Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Reading. Details from Mamoch Standen G0JMS. Tel: 0118-972 3504.

**BUCKINGHAMSHIRE**

**AYLESBURY VALL RS, G4VRS.** Meets at the Hanwick Village Hall, Aylesbury, Bucks. Details from Mr L.I. Cropley G0DFC.

**CHESHAM & DARS, G3MDG, G1MDG.** Meets at The White Hill Centre, Chesham, Bucks. Details from Mr T.J. Thirwell G0VFW. Tel: (01442) 832169.

**CHILTERN ARC, G3CAR.** Details from Roy Page G4YAN. Tel: (01494) 534216.

**MILTON KEYNES ARS, G3HIU.** Meets at Blechley Park Museum (The Green Room, B Block Annex), Writon Avenue, Blechley, Milton Keynes. Details from Malcolm Bay M0MBO on (01525) 874075.

**MILTON KEYNES SCOUT ARS, G0SMK.** Meets at The Quaries, M.K. Scout Campsite, Cosgrove. Details from Mr P.A. Orchard G0RYZ. Tel: (01908) 648186.

### GREATER LONDON

**ADDISCOMBE ARC, G4ALE.** Meets at the Lion Inn, Pawsnors Road, Croydon. Details from Mr Q.G. Collier G3WRR. Tel: 0208-653 6948.

**BARKING R & ES, G3XBF.** Meets at the Parkside Community Centre. Details from Bill Chewter G0JQK. Tel: (01708) 474443.

**BROMLEY & DARS, RS89030.** Meets at the Victory Social Club, Kechill Gardens, Hayes, Bromley. Details from Alan G. Messenger G0TJK.

**CLIFTON ARS, G3GHN.** Meets at the Kidbrooke House, Community Centre, 90 Mycenae Road, London SE3 7SE. Details from Mr J. Veaney G7BK4.

**CRYSTAL PALACE & DRC, G3VCP.** Meets at the All Saints Church, Parish Rooms, Beulah Hill, London. Details from Bob Burns G30OU. Tel: (01713) 952170.

**DARENTH VALLEY RADIO, G0KDV.** Meets at the Crockerhill Village Hall, Swanley, Kent. Details from Mr K.W. Halls G8VJG. Tel: (01322) 663022.

**ECHELDFORD ARS, G3UES.** Meets at The Community Centre, St. Martin's Court, Kingston Crescent, Ashford, Middlesex. Details from Robin Hines G3TDR. Tel: (01784) 456513.

**EDGWARE & DRS, G3ASR.** Meets at the Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware, Middlesex. Details from Stephen Slater G0PQB. Tel: 0208-953 2164.

**HAVERING & DARS, G4HRC.** Meets at the Fairlytes Arts Centre, 51 Billet Lane, Hornchurch, Essex.

**RS OF HARROW, G3EFX.** Meets at the Harrow Arts Centre, Uxbridge Road, Hatch End, Middlesex. Details from Mr C. Frie G4UAF. Tel: (01895) 621310.

**SILVERTHORNE RC, G3SRA, G2HR, G8CSA.** Meets at the Chingford Adult Education and Community Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. Details from Dave Chisny G0KHC. Tel: 0208-504 2831.

**MITCHAM & DISTRICT ARS.** Meets at the ATC Hut, Commonside West, Mitcham, Surrey CR4 4HB. Details from Mr M. Krott G0WCR.

**SOUTHGATE RC, G3SFG.** Meets at the Winchmore Hill Cricket Club, Firs Lane, London N21 3ER. Details from Mr D.F. Berry G4DFB.

**ST. DUNSTONS COLLEGE ARS, G4SDC.** Details from Sam Kennard G4OHX. Tel: 0181-690 1274.

**SURREY RADIO CONTACT CLUB, G3SRC.** Meets at the T.S. Terra Nova, 34 The Waldrons, Croydon, Surrey. Details from Maurice Fagg G4DDY. Tel: 0208-669 1480.

**WEST LONDON ARS, RS95599.** Details from Robin Clay G0VJI.

**WHITTON ARC, G0MIN.** Meets at the Whitton Community Centre, Percy Road, Whitton. Details from Ian Clabon G0GFN. Tel: 0208-894 9131.

### HERTFORDSHIRE

**BISHOPS STORTFORD ARS, G5ZG.** Meets at the Royal British Legion Club, Windhill, Bishop's Stortford, Herts. Details from Tony Judge G0PQF. Tel: (01279) 506933.

**DACORUM ARS, G7RIH, G0WHH.** Meets at the Guide Meeting Rooms (next to the Royal British Legion), Queensway, Hemel Hempstead. Details from Ian Hamilton G0TCD. Tel: (01442) 211925.

**HODDESDON RADIO CLUB, G0TSN.** Meets at the Rye Park Conservative Club, Rye Road, Hoddesdon, Herts. Details from Don Platt G3JNJ. Tel: 0208-292 3678.

**MIMRAM CONTEST GP, M0ABC.** Details from Alan Hildsworth G80U. Tel: (01707) 392950.

**RADIO SCOUTING TEAM, G62RST.** Meets at Tolmers Scout Camp, Tolmers Road, Cuffley, Herts EN6 4JS. Details from

Mill Lvens G2CKB. Tel: (01992) 558493.

**STEVENAGE & DARS, G3SAD.** Meets at the Stevenage Day Centre, Chells Way, Stevenage, Herts SG2 0LT. Details from Don Bache M0XJP. E-mail: d.bache1@ntworld.com

**VERULAM ARC, G3VER, G3VER.** Meets at the RAF Association HQ, New Kent Road, St. Albans, Herts. Details from Walter Graie G3PMF. Tel: (01923) 262180.

**VERULM (ST. ALBANS) RADIO CLUB.** Meets at the RAFA, New Kent Road, off Marlborough Road, St. Albans, Herts. Details from Ralph G1BSZ. Tel: (01923) 265572.

**WELWYN & HATFIELD ARC, G3WVC.** Meets at the Royal Naval Association, Black Fan Road, Welwyn Garden City, Herts. Details from Dean Jackson G7PKF. Tel: (07973) 560649.

## SURREY

**BENTLEY ARC, G0VZS.** Details from Derek Gilbert G0NFA.

**CATERHAM RG, G0SCR.** Details from Mr P.N. Lewes G4APL.

**COULSDON AMATEUR TRANS. SOC., G4FUR.** Meets at St. Swithuns Church Hall, Grovelands Road, Purley, Surrey. Details from Andy Bners G0XZT. Tel: (01737) 552139.

**DORNING & DRS, G3CZU, G7DOR.** Details from John Greenwell G3AEZ. Tel: (01306) 631236.

**FARNBOROUGH & DRS, G4FRS.** Meets at The Community Centre, Meudon Avenue, Farnborough, Hants. Details from Mr Steve Austen-Jones M0CYF. Tel: (07759) 215842. E-mail: scaj@btopenworld.com

**GUILDFORD & DRS, G6GS.** Meets at the Guildford Model Engineers HQ, Stoke Park, Guildford, Surrey. Details from Stella Whitbourn G0SWE.

**KINGSTON & DARS, G3KIN.** Details from Mrs Mary Ashdown G0BQV.

**REIGATE ATS, G5LJK, G7RAT.** Details from Mr A.C. Embling G1JNT. Tel: (01883) 344723.

**SUTTON & CHEAM RS, G2XP, G7SAC.** Meets at the Sutton United Football Club, Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Details from John Puttock G0BWW. Tel: 0208-644 9945.

**THAMES VALLEY ARTS, G3TVS.** Meets at the Thames Ditton Library, Watts Road, Gigg's Hill, Thames Ditton, Surrey. Details from Cdr. J. Pegler G3ENI. Tel: (01483) 284279.

**WIMBLEDON & DARS, G3WMM.** Meets at St. Andrews Church Hall, Herbert Road, Wimbledon, London. Details from Jim Bell. Tel: 0208-874 7456 or E-mail: james@bell0144.fsnet.co.uk

## SOUTH & SOUTH EAST

### EAST SUSSEX

**BRIGHTON RADIO CLUB, G4GQR.** Meets at Vallance Community Centre, Sackville Road, junction of Connaught Road, Hove. Details from Hon. Sec G0RNS. Tel: (01273) 699104.

**CROWBOROUGH DARS, G0CRW.** Meets at the Plough & Horses, Walsley Road, Jarvis Brook. Details from Mrs M. Clark. Tel: (01892) 663666.

**EAST SUSSEX AMATEUR TV GROUP, RS178475 was G83VX.** Details from Keith Ellis G8HGM. Tel: (01323) 720220.

**HASTINGS ELEC. & RC, G8HH, G1MH, G6LL.** Meets at the William Parker School, Parkstone Road, Hastings, East Sussex. Details from Peter Firmin G0FUU. E-mail: peter.firmin@virgin.net or visit www.g4cus.freeseve.co.uk

**SOUTHDOWN ARS, G3WQK.** Details from Jim Hams G4DRV. Tel: (01323) 728479.

**THE ORZ ARG OF SUSSEX, G83VX.** Meets at the Coach Station, Warring Road, Eastbourne. Details from Stuart Constable M0CWH. Tel: (01435) 863020.

### HAMPSHIRE

**ANDOVER RAC, G0ARC.** Meets at the Village Hall, Withern, Andover, Hants. Details from Mr R.S. Coleman G0WYD.

**BASINGSTOKE ARC, G3TRC, G8JYN.** Meets at the GEMS Social Club, Lister Road, Basingstoke, Hants. Details from Bob Brown M0CJ1.

**FAREHAM & DARC, G3VEF.** Meets at the Portchester Community Centre, Westlands Grove, Portchester, Hants. Details from Andrew Sinclair G0AMS. Tel: (01329) 235297.

**HIGHFIELD PARK RC, G4WD.** Meets at Highfield Park RC, National Air Traffic Service, Highfield Park, Heckfield, Hants RG27 0LD. Tel: (01734) 225019.

**HORNDEN & DARC, G4FBS.** Meets at Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. Details from Stuart Swan G0FYX. Tel: (01705) 472846.

**ITCHEM VALLEY ARC, G0NVR.** Meets at the Scout Hut, Brickfield Lane, Chandlers Ford, Eastleigh, Hants. Details from Sheila Williams G0VNI. Tel: (01703) 813827.

**SONY BROADCAST ARC, G4S2C.** Accredited C&G RAE centre. Meets at Sony Sports & Social Club, Priestley Road, Basingstoke. Details from Stephen Harding G4GJS. Tel: (01256) 550111.

**SOUTH HAMPSHIRE INT. TELE SOC., G3DIT.** Meets at G3JZY's QTH, space is limited. Details from Rev. T.R. Mortimer G3JZV. Tel: (02329) 649254.

**SUBMARINE ARC, G3BZU.** Meets at HMS Collingwood, Newgate Lane, Fareham, Hants PO14 1AS. Details from Mr B.W. Blyth G0PFF. Tel: (01329) 232386.

**THREE COUNTIES ARC, G4WWR.** Meets at the Bramshot Parish Inst. & Club, Headley Road, Liphook, Hants. Details from Darman Kamm G7RFV. Tel: (01428) 724456.

**WATERSIDE ARS, G4JYN.** Meets at the Applemore Scout HQ, Applemore, Hythe, Southampton. Details from Tony Horton G0JUG. Tel: (01703) 841794.

### ISLE OF WIGHT

**BRICKFIELDS ARS, G0BAR.** Meets at Brickfields Horse Country Cent, Newnham Road, Binstead, Isle of Wight. Details from Mr P. Pebody.

**ISLE OF WIGHT RS, G3SKY.** Meets at The Old Cafe, Whitecliff Bay, Holiday Park, Bembridge. Details from Alan Reeves G4ZFP. Tel: (01983) 294309.

### OXFORDSHIRE

**BANBURY ARS, G0BRA.** Meets at St. John's Church Social Club, South Bar, Banbury, Oxon. Details from Mr R.S. Marsden G1YSY. Tel/Fax: (01295) 253509.

**HARWELL ARS, G3PRA.** Meets at the Social Club, Harwell Laboratory, Didcot, Oxon. Tel: (01235) 223250.

**OXFORD & DARS, G5L0.** Meets at the Grove House Club, George Street, Summertown, Oxford. Details from Mr D. Walker G3BLS. Tel: (01865) 247311.

**VALE OF WHITE HORSE ARS, G5RPF, G4WMM, G6WMM.** Meets at The Fox, Steventon, Details from Ian White G3SEK. Tel: (01235) 631559.

## WEST SUSSEX

**CHICHESTER ARC, G2NIM.** Meets at the St. Pancras Hall, Chichester. Details from Graham Swann G0FSD.

**CRAWLEY ARC, G3WVC.** Meets at the Tigate Forest Rec. Centre, Hut 18, Tigate Forest, Crawley, West Sussex. Details from Keith Farrow G8KZZ. E-mail: keith.farrow@btinternet.com

**HORSHAM ARC, G4HRS.** Meets at the Guide Hall, Denne Road, Horsham, West Sussex. Details from Alister Watt G3ZBU. Tel: (01403) 253432.

**MID SUSSEX ARS, G3ZMS.** Meets at Marle Place, Leylands Road, Burgess Hill, West Sussex. Details from Mr C. Childs 2E1DPC. Tel: (01444) 244689.

**T.S. WINDICATRIX ASN, G0WVB.** Details from Don Stull G000C.

**WORTHING & DARC, G3WOR.** Meets at the Lancing Parish Hall, South Street, Lancing, West Sussex.

**WORTHING & DISTRICT VIDEO RG, G83VR.** Details from the Treasurer. Tel: (01903) 211919 (wv).

## WILTSHIRE

**CHIPPENHAM & DARS, G3VRE.** Meets at the Sea Cadet HQ, Chippenhams, Details from Jon Ange G4LZG. Tel: (01249) 426210.

**SWINDON & DARC, G3FEC.** Meets at the Eastcott Community Centre, Savenake St., Swindon. Details from Den Forrest M0AQM.

**TROWBRIDGE & DARC, G2BQY.** Meets at the Southwick Village Hall, Southwick, Trowbridge, Wills. Details from Ian Carter G0GRI. Tel: (01225) 864698.

## SOUTH WEST & CHANNEL ISLANDS

### AVON

**BRISTOL ARC, G3TAD.** Meets at the Lodgeside Club, Lodge Row, Kingswood, Bristol. Details from Dave Bendrey G7BYN.

**GORDANO ARC, G6GRG.** Meets at The Shp, Redcliffe Bay, Portseahead, Avon. Details from Mr R.T. White G8SPC. Tel: (01275) 874001.

**NORTH BRISTOL ARC, G4GCT.** Meets at the Self Help Enterprise, 7 Braemar Close, Northville, Bristol. Details from David Conrad G0GHM. Tel: (01275) 790448.

**SEVERNIDEAN TV GROUP, G83ZZ.** Meets at NBARC, Fitton, Bristol. Details from Paul Stevenson G8YMM. Tel: 0117-965 5386.

**SHIREHAMPTON ARC, G4A4G.** Meets at the TS Enterprise Sea Cadet Unit, Station Road, Shirehampton. Details from Mr R.G. Ford G4GTD. Tel: (0117) 985 6253.

**SOUTH BRISTOL ARC, G4WAW.** Meets at the Whitchurch Folk House, East Dundry Road, Bristol. Details from Mr L.F. Baker. Tel: (01275) 834282.

**THORNBURY & SOUTH GLOS ARC, G4ABC.** Meets at the United Reform Church Hall, Rock Street, Thornbury, Bristol. Details from Stan Greenhill G0RYM. Tel: (01454) 413177.

**WESTON-SUPER-MARE RS, G4WMM.** Meets at the Woodspring Hotel, High Street, Worle, Weston-Super-Mare. Details from Stephen Cole G3YOL. Tel: (01934) 843144.

## CORNWALL & SCILLY IS



Community Centre, Kinson, Bournemouth, Dorset. Details from Chris R. Ellis M5AGG, Broken Ridge, Fir Tree Close, St Leonards, Ringwood, Hants BH24 2QW. Tel: (01202) 893126.

**CHRISTCHURCH ARS, GOMUD.** Meets at the Siemens Plessey Sports & Social Club, Grange Road, Somerton, Christchurch, Dorset. Details from Mr K.P. Harris G7VSN. Tel: (01202) 484892.

**FLIGHT REPELLING ARS, G4RRF.** Meets at the Flight Refuelling Social Club, Weymouth, Dorset. Details from Martin Aton 2E1DFZ. Tel: (01202) 693334.

**POOLE RS, G4PRS.** Meets at the Bournemouth & Poole CFE, Constitution Hill Site, Poole, Dorset. Details from Phil Mayer G0WKL. Tel: (01202) 700903.

**PORTLAND ARC, G0VOPG7VOP.** Meets at Clifton Hotel, Grove Road, Portland. Details from Kerry Morris G3WIK. Tel: (01305) 788591.

**SOUTH DORSET RS, G3SDS.** Meets at the Church Hall, Chickering, Weymouth, Dorset. Details from John Rose M0BQO. Tel: (01305) 832057.

**SWANAGE & PURBECK ARC, MOBLL.** Meets at Kings Arms, Langton Huttrons, Dorset. Details from Peter Wakefield M1WCHW3WCH. Tel: (01929) 424413.

**WESSAX AMATEUR WIRELESS CLUB, G1WAW.** Details from Ken Powell G1NCG. Tel: (01202) 549376.

## JERSEY

**JERSEY ARS, G3DVC.** Meets at the German Signal Station, Rue Basal, Le Moye, St. Breville. Details from Mrs Anne Mourant MJOBU. Tel: (01534) 734948.

## SOMERSET

**PRESTON COMMUNITY SCHOOL ARC, G0PCS.** Details from Craig Douglas G0HDI. Tel: (01935) 71131.

**TAUNTON & DARS, G3XZW.** Meets at The Memorial Hall, Trull, Taunton. Details from David Rosewar MOCIF.

**WEST SOMERSET ARC, G0WVK.** Meets at the West Somerset Community College, Minehead, Somerset. Details from Robert Bonar G1ONW/M3ONV. Tel: (01643) 863462.

**WINCANTON ARC, G0WRA.** Meets at King Arthur's Community School, West Hill, Wincanton. Details from Mr G.A. Fingemur G0ENW. Tel: (01963) 370506.

**YEOVIL & DARC, G3CMM, G8YEO.** Meets at the British Red Cross HQ, 72 Grove Avenue, Yeovil, Somerset. Details from George Davis G3KOC. Tel: (01935) 425669.

## ESSEX

**BARKING RADIO & ELECTRONIC SOCIETY, G3XBF.** Meets 1930-2200 on Thursday evenings at Parkside Community Centre, Goodmayes Lane, Ilford, Essex. Details from Bill Chewter G0JQK. Tel: 0208-478 4758, E-mail: billchewter@btinternet.com Website: <http://www.barkingradio.org.uk/>

**BRAINTREE AND DISTRICT ARS, G3GX.** Meets 2000 on 1st and 3rd Mondays in the month at the Braintree Hockey Club, Church Street, Braintree. Details from John Button M5AUB. Tel: (01376) 325587, E-mail: club@badars.org.uk Website: <http://www.badars.org.uk/>

**CHELMSFORD ARS, G0MWT.** Meets 1915 for 1930 start on the 1st Tuesday in the month at Marconi School Club, Beehive Lane, Chelmsford, Essex. Details from Martyn Medcalf G1EFL. Tel: (01245) 469008, E-mail: info@chelsfordars.org.uk Website: <http://www.chelmsfordars.org.uk/>

**CHELMSFORD SCARF, M5CDS.** Scout Amateur Radio Fellowship. Details from the Secretary, E-mail: [info@chelsfordscarf.org.uk](mailto:info@chelsfordscarf.org.uk) Website: <http://www.chelsfordscarf.org.uk/>

**CLACTON RADIO CLUB, G3CRC.** Meets at 2000 on the 1st Wednesday of month at the Clacton-on-Sea Sailing Club, Holker Haven, Clacton-on-Sea. Details from Geoff Axford G4QAZ. Tel: (01225) 429117.

**COLCHESTER RADIO AMATEURS, G3CO.** Meets 1930 on alternate Thursdays at the Colchester Institute or St Helena's School, Silver Street, Colchester, Essex. Details from Frank R. Howe G3FU. Tel: (01206) 851189, E-mail: cra@mcgrty.net Website: <http://www.g3co.com.co.uk/>

**DENGIE HUNDRED ARS, G0UIT, G7SDH.** Meets at 1930 on 2nd and 4th Mondays in the month at the Herby 2 Samuel Hall, Mayland, Essex. Details from Mark Barnaby EDDJQ. Tel: (01621) 829548, Mobile: (07985) 401993, E-mail: ze@doj@dhars.org.uk Website: <http://www.dhars.org.uk/>

**ESSEX REPEATER GROUP, G8BDA.** Details from Murray Niman G6JYB. Tel: (01245) 242617, E-mail: che.ward@btinternet.com Website: <http://www.essexrepeatergroup.org.uk/>

**ESSEX RAYNET GROUP, G6ZV.** Details from Nigel Hull G6ZV. Tel: (07850) 243459, E-mail: nigel@essexraynet.co.uk Website: <http://www.essexraynet.co.uk/>

**BeeSYSTEMS BASILDON RADIO CLUB G0GEC.** Meets at BeeSystems Social Club, Gardeners Lane, Basildon, Essex. Details from Peter Shepherd. Tel: (01268) 687402, E-mail: peter.shepherd@beesystems.com

**HARLOW & DARS, G8UT.** Meets 2000 on Tuesdays at the Mark Hall Barn, First Avenue, Harlow, Essex. Details from Len Brackstone G7UUF. Tel: (01279) 864973, Mobile: (07931) 207184, E-mail: g8ut@qsl.net Website: <http://www.qsl.net/g8ut/>

**HARWICH AMATEUR RADIO INTEREST GROUP, G0RGH.** Meets 2nd Wednesday in the month at the Park Pavilion, Barneck Lane, Harwich, Essex. Details from Tony Free G4EYE. Tel: (01225) 889095, E-mail: g4yrg@amsat.org Website: <http://members.ycos.co.uk/harwh/>

**HAVERING & DARC, G4HRC.** Meets 2000 on Wednesdays at the Fairlyties Arts Centre 51 Biller Lane Homchurch, Essex. Details from Tony Free G4EYE. Tel: (01708) 746577, E-mail: g4hrc@hotmail.com Website: <http://www.haveringradioclub.co.uk/>

**LOUGHTON & EPPING FOREST ARS, G4QNP.** Meets 1945 on alternate Fridays at All Saints House, Romford, Chigwell Row, Essex. Details from Marc Ullmann G10TC. Tel: 0208-502 1645, Mobile: (07743) 456058, E-mail: info@lefers.org.uk Website: <http://www.lefers.org.uk/>

**SOUTHEAST & DISTRICT RADIO CLUB, G5QK.** Meets 1945 on Wednesdays at the Alexandra Yatch Club, Clifton Parade, Southend-On-Sea, Essex. Details from Alan Radley G0TTM. Tel: (01288) 741229, E-mail: alanradley@0800dial.com

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

**SOUTH ESSEX ARS, G4RSE.** Meets 2000 on 1st and 3rd Wednesdays in the month at the Padstow Long Road, Carvey Island, Essex. Details from Betty Maynard G6LJO.

Tel: (01268) 695474, E-mail: southessex.ars@btinternet.com Website: <http://www.southessex.ars.btinternet.co.uk/>

**VANGE ARS, G3YCW.** Meets 2000 on Thursdays at the Barstable Community Centre, Basilion, Essex. Details from Dore Thompson. Tel: (01268) 552806, E-mail: info@vans.freewire.co.uk Website: <http://www.vans.freewire.co.uk/>

## KENT

**BREDHURST RX & TX SOC., G0BRK.** Meets at Rock Avenue Working Mens Club, Rock Avenue, Gillingham, Kent. Details from Mr T.M. Wheeler G7WIM.

**CRAY VALLEY RS, G3RCV, G1RCV.** Meets at the Progress Hall, Admiral Seymour Road, Etham, London SE9. Details from Bob Treacher BRS32525 via [www.cvs.org](http://www.cvs.org)

**DOVER RADIO CLUB, G3YMD.** Meets at the Dover Grammar School for Boys, Astor Avenue, Dover. Jim Cairns M1BKJ. Tel: (01304) 852773.

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

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

**HOME COUNTIES ATV GRP, G8HCT.** Meets at the Binfield Club, Binfield (near M4/J10). Details from Mr A. Brooker G4WZC.

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

**MEDWAY ARTS, G5MM, G8MWA.** Meets at Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham. Details from Mr J. Hale G3PHT.

**NORTH KENT RS, G4CWF.** Meets at The Pop-in-Parlour, Graham Road, Bedyheath, Kent. Details from Mr A.V. Friebens G8MLQ. Tel: (01474) 365694.

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

**THE MORSE CLUB, G0XOX.** Meets at The Five Wents Memorial Hall, Swanley/Hextable Road. Details from Ken M3CZA. Tel: 0208-306 3544.

**WEST KENT ARS, G3WKS.** Meets at St. Marks School Hall, Tunbridge Wells, Kent. Details from Malcolm Sheppard G4FWG. Tel: (01892) 652272.

## NORFOLK

**ANGLIA TELEVISION ARS, G0TVF.** Meets at Anglia TV, Norwich NR1 3JG. Details from Jim Bacon G3YLA. Tel: (01603) 615151.

**GREAT YARMOUTH RS, G3YRC.** Meets at the Bradwell Community Centre, Bradwell, Great Yarmouth, Norfolk. Details from Mr A.D. Besford G3NHU.

**GRESHAM'S SCHOOL ARC, G3PXD.** Details from Rev. R.N. Myerscough G3PXD.

**KINGS LYNN ARC, G3XYZ.** Details from Derek Franklin G0MQL.

**NORFOLK ARS, G4ARN.** Meets at Norwich Aviation Centre, Norwich Airport. Details from John Wadman G0VZD. Tel: (01953) 604769.

**NORTH NORFOLK ARC, G82MC.** Details from Tony Smith G4FAL. E-mail: g4fal@connectfree.co.uk

## SUFFOLK

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

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

**FRAMLINGHAM COLLEGE ARC, MOCBB.** Tel: (01728) 727232.

**IPSWICH RADIO CLUB, G4IRC.** Meets at the Golden Hind, Nacton Road (3rd Wednesdays) at The Hollies, Budeham Straight Road, Ipswich. Details from Keith Gaunt G7CYY. Tel: (01394) 420226.

**LEISTON ARC, G0BFS.** Meets at Leiston Town Athletic Assn., Victory Road, Leiston, Suffolk. Details from Paul Cattermole M3MVG. Tel: (01728) 746044.

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

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

**SUDBURY & DRA, G0SWI, G7SRA.** Meets at the Old School, Wells Hall Road, Great Comard, Sudbury, Suffolk. Details from Bryan Pantion G1TWY.

**SUFFOLK DATA GROUP, G8TMM.** Details from Peter Pryke G8HUE. Tel: (01473) 631313.

## NORTH WALES

### CLWYO

**CONWAY VALLEY ARC, G8WMT.** Meets at the Studio, Penrhos Road, Colwyn Bay, Clwyd. Details from Mr R.W. Evans G6WPM. Tel: (01745) 855068.

**MILD & DRC, G4GHR.** Meets at the Mold Rugby Club, Mold, Flintshire. Details from Les Chesters M0CJC. Tel: (01244) 545389, E-mail: mw1bcb@therug.net or Eddie Hewins G6GSI. Tel: (01352) 780334.

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

**WRECHAM ARS, G4WXM.** Meets at the Community Centre, Maesgwyn Road, Wregham. Details from Mr P. Moran G6WDF.

### GWYNEDD

**MELROUN ARS, G4WZP.** Meets at the Royal Ship Hotel, Dogelau, Gwynedd. Details from Gerase Chavasse G4WJUR. Tel: (01341) 421028.

**PORTHMADOG & DARS, G6WMI.** Meets at The Yacht Club, The Harbour, Porthmadog, Gwynedd. Details from Mr G. Cadwaladr M11DFN.

**THE DRAGON ARC, G4T4P.** Meets at the Ebenezer Church Hall, Lon Foel Graig, Llanfairpwll, Isle of Anglesey. Details from Stewart Rolfe G6WTF. Tel: (01248) 362229.

### POWYS

**POWYS ARC, G4W4N.** Meets at the ATC HQ, Park Lane,

Newtown, Powys. Details from Mrs Jean Brown 2W1CEZ. Tel: (01686) 640814.

## SOUTH WALES

### OYFED

**ABERPORTH YMCA, G4W5ZV.** Meets at the Hut B17, The Airfield, Aberport, Details from Mr G. Carruther G6W4HJ. Tel: (01239) 811205.

**ABERYSTWYTH & DARS, G6W0AR.** Meets at the Scout Hut, Plascurg Avenue, Aberystwyth. Details from John Woodward G6WIDK. Tel: (01970) 890657.

**CARMARTHEN ARS, G4V4CT.** Meets at The Aelwyd Care Home, Carmarthenshire County Council, Tregynwg Road, Llangunor, Carmarthen SA31 3BS. Details from Mr W.D. Hughes G6W4ZK. Tel: (01267) 231359.

**CLEDDAU ARS, G6W5GJ.** Details from Trevor Perry G4W4XQ. Tel: (01646) 600725.

**LLANELL ARS, G6W0EZ.** Meets at the Furnace Community Hall, Furnace Square, Llanelli. Details from Roy Jones G6W0JZK. Tel: (01554) 820207.

**PEMBROKESHORE RS, G6W0EJ.** Meets at Furzy Park Community Centre, Furzy Park, Haverfordwest. Details from Ian M. Jones M0W0AB. Tel: (01437) 763028.

### GWENT

**ABERGAVENNY RS, G4W6FL.** Meets at the Hill Residential College, Pen-y-Pound, Abergavenny, Gwent. Details from John Hughes G6W0DY. Tel: (01633) 483186.

**BLACKWOOD & DARS, G6W6W.** Meets at the Oakdale Comprehensive School, Oakdale, Blackwood, Gwent. Details from John Evans G6W8IT. Tel: (01495) 225178.

**EBBW VALE COLLEGE RS, G6W0IW.** Meets at the Gwent Tertiary College, Ebbw Vale Campus, College Road, Ebbw Vale, Gwent. Details from Mr T. Hayden G6W0HCN. Tel: (01495) 305192.

**NEWPORT ARS, G6W4EZW.** Meets at the Brynagas Community Centre, Brynagas Road, Newport, Gwent. Details from Paul Nicholas.

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

**MID-GLAMORGAN BRIDGEND & DARC, G6W4LNP.** Meets at the Club Brynmynny, Brynmynny, Bridgend. Details from Alun Hulmes. Tel: (01686) 721574.

**HOOVER (MERTHYR) ARC, G6W3RDB.** Meets at the Hoover Physically Handicapped Centre, Ailensbank Road, Cardiff. Tel: (01222) 561542.

**MID GLAMORGAN ARG, M0WCNA.** Meets at Aberkenfig Sports & Social Club. Details from Mervyn Carey G6W4VSE. Tel: (01656) 734668.

**SOUTH GLAMORGAN BARRY ARS, G6W3VL.** Meets at Sully Sports & Leisure Club, South Road, Sully, S. Glamorgan. Details from Richard Mortimore G6W4BYJ. Tel: (01446) 738756.

**HIGHFIELDS ARC, G6W4FD.** Meets at the Highfields Physically Handicapped Centre, Ailensbank Road, Cardiff. Tel: (01222) 561542.

**SWANSEA ARS, G6W4CC.** Meets at the Applied Sciences Building, Swansea University. Details from Frank Burrow G6W8ME. Tel: (01792) 390233.

**PORT TALBOT (BS PLC) ARS, G6W3EOP.** Meets at the British Steel PLC Sports & Social Club, Margam, Port Talbot, West Glamorgan. Details from Mr J. Chinnock M0W0AGE.

**WEST GLAMORGAN PORT TALBOT (BS PLC) ARS, G6W3EOP.** Meets at the British Steel PLC Sports & Social Club, Margam, Port Talbot, West Glamorgan. Details from Mr J. Chinnock M0W0AGE.

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**SCOTTISH DIGITAL COMMS. GRP, G6TYSR.** Details from Stuart Clark G6T1VE. Tel: (01698) 884803.

**WEST OF SCOTLAND ARS, G5A4GG.** Meets at the Multi Community Centre, 21 Rose Street, Glasgow. Details from Hon. Sec.

## SCOTLAND EAST & HIGHLANDS

### BORDERS

**BORDERS ARS, G6OBR.** Meets at the St. John Ambulance Hall, Berwick-upon-Tweed. Details from A.M. McCreadie G6OBPY. Tel: (018907) 50492.

**GALASHIELS & DARS, G6M4YE.** Meets at the Focus Centre, Galashiels. Details from Jim Keddie G6TJUN.

**HELSDO ARS, G6M4KHS.** Meets at the Abbey Row Community Centre, Helmsdale. Details from Margaret Chalmers G6M0ALX. Tel: (01573) 226372.

### FIFE

**GLENROTHES & DARC, G6M4GR.** Meets at the Football Pavilion, Station Road, Thornton, Fife. Details from Alexander Adam G6M0FV. Tel: (01592) 874374.

### GRAMPIAN

**ABERDEEN ARS, G6M3BSQ.** Meets at the Red Cross HQ, 22 Queens Road, Aberdeen. Details from Robert Duncan. Tel: (01224) 896142.

**BANFF & DARC, G6M0PY.** Meets at the Princess Royal Park Football Ground, Conference Room (Deveronvale F.C.), Banff. Details from Steve Roberts G6M4HWS. Tel: (01888) 551377.

**MORAY FIRTH ARS, G6M3TV.** Meets at the Grant Arms Hotel, Fochabers. Details from Geoff Crowley G6TJJC. Tel: (01542) 882818.

## HIGHLAND REGION

**FORT WILLIAM ARS, G6M0RFL.** Details from R. Johnstone G6T2GV. Tel: (01397) 703046.

**INVERNESS ARC, G6M4TF.** Meets at The Emergency Operations Centre, Inverness (except July and August). Details from R.F. Goodall G6M0GZ. Tel: (01463) 813701.

### LOTHIAN

**COCKENKIE & PORT SETON ARC, RS177035.** Meets at the Throemee Inn, Lounge Bar, Old Cockenzie High Street, Cockenzie, E. Lothian. Details from Mr Bob Glasgow

# International Radio Clubs

## AMSAT-UK (G0AUK)

Information from Jim Heck G3WGM, Badgers, Letton Close, Blandford, Dorset BH11 7SS. E-mail: g3wgm@amsat.org or visit [www.uk.amsat.org](http://www.uk.amsat.org)

## British Amateur Radio Teledata Group (BARTG - G4ATG, GB2ATG)

Contact Membership Secretary Andrew Thomas G8GNI, M5AEX, Dame School House, 103 High Street, Stony Stratford, Buckinghamshire MK11 1AT, E-mail: members@bartg.demon.co.uk or visit [www.bartg.demon.co.uk](http://www.bartg.demon.co.uk)

## British Amateur Television Club (BATC - RS38114)

Enquiries to Dave Lawton G0ANO, 'Grenehurst', Pinewood Road, High Wymcombe, Bucks HP12 4DD. Tel: (01494) 528899. E-mail: memsec@batc.org.uk or visit [www.batc.org.uk](http://www.batc.org.uk)

## British DX Club (BDXC-UK)

Enquiries to Club Secretary Colin Wright, 126 Bargery Road, London SE6 2LR. E-mail: secretary@bdxc.org.uk or visit [www.bdxc.org.uk](http://www.bdxc.org.uk)

## Danish Shortwave Club

Information from Treasurer Bent Nielsen, Egekrogen 14, DK-3500 Vaerloese, Denmark or visit [www.dswci.org](http://www.dswci.org)

## International Listeners' Association (RS88763)

Details from Trevor Morgan GW4OXB, 1 Jersey Street, Haford, Swansea SA1 2HF. E-mail: gw4oxb@net.nfl.com

## International Short Wave League (ISWL - G4BJC)

Information from Honorary Secretary Bill Mackie G-9137/G4AIE, 23 College Park, Horncastle, Lincs LN9 6RE. E-mail: bill.mackie@zetnet.co.uk or visit [www.iswl.org.uk](http://www.iswl.org.uk)

## Military Wireless Amateur Radio Society (G0PTZ)

Further details from John Taylor-Cram, 7 Hart Plain Avenue, Cowplain, Waterlooville, Hampshire PO8 8RP. Tel: 0239-225 0463.

## Radio Amateurs Invalid and Blind Club (RAIBC - G4IBC, G8OIBC, GB1IBC)

Enquiries to Honorary

Treasurer/Membership Secretary Mrs Shelagh Chambers, 78 Durley Avenue, Pinner, Middlesex HA5 1JH. Tel: 0208-868 2516.

## Radio Amateur Old Timers' Association

Enquiries to Membership Secretary Ted Rule, G3FEW, 15 Norwich Road, Lenwade, Norwich NR9 5SH. Tel: (01603) 872309, E-mail: edit@raota.fsnet.co.uk or visit [www.raota.supanet.com](http://www.raota.supanet.com)

## Remote Imaging Group (RS88803)

Further details from the Membership Secretary John Din, 59 Woodend Road, Coalpit Heath, Bristol BS36 2LH. FAX: (01454) 887880. E-mail: membership@rig.org.uk

## Royal Air Force Amateur Radio Society (RAFARS - G8FC, G8RAF)

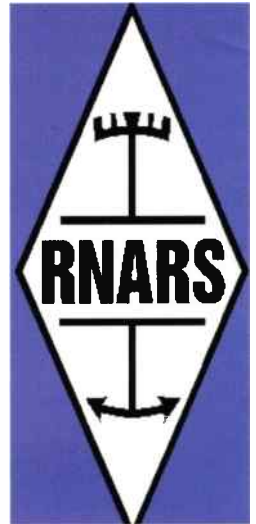
Details from the Administrator, HQ RAFARS, RAF Cosford, Wolverhampton WV7 3EX. Tel: (01902) 372722, E-mail: administrator@rafars.org

## Royal Navy Amateur Radio Society (RNARS - GB3RN, G3CRS, G1BZU)

Enquiries to Secretary Philip Manning G1UKJ/M3UKJ, 1 Waverley Gardens, Ash Vale, Surrey GU12 5JP. Tel: (01252) 334929, E-mail: g1ukj@amsat.org or visit [www.rnars.org.uk](http://www.rnars.org.uk)

## Royal Signals Amateur Radio Society (RSARS - G4RS)

More information from General Secretary, HQ RSARS, Cole Block, Blandford Camp, Dorset DT1 8RH. Tel: (01258) 482814, E-mail: gensec@rsars.org.uk or visit [www.rsars.org.uk](http://www.rsars.org.uk)



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