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#### Computers & Radio - Part 1

It wasn't that long ago that the joining of computers and radios for hobby use looked like a very unholy union. In this new series of features, Jack Weber shows that the combination can be a marriage made in heaven!

#### 27 An Introduction To AVL

Ian Wraith hopes to broaden your radio horizon by examining a growth phenomenon that utilises mobile radio communication to the advantage of its users - AVL.

#### 33 Storm

*SWM* regular Dave Roberts shares his personal experience of the recent frightening and fatal weather of mid January.

#### In The Ed's Shack - NRD-545

Having missed a chance to get to grips with the NRD-545 last time, there was one in the *SWM* office, Ed, Kevin has been busy 'playing' this month.

#### 61 SWM Club Listing

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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#### Share your thoughts

Join in with the on-line action on the SWM Readers' E-mail Forum - send an E-mail to swm readers-subscribe@yahoogroups.com to subscribe - don't miss the on-line action!

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#### Technical Help

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



#### nments

've had a pretty hectic month. In addition to readying March issue of SWM and the bonus SSE supplement, I've been building antennas for 260MHz, 2.4GHz and getting the RF Space SDR-14 working in conjunction with my trusty R8500. Now I can remote control the Icom via the SDR-14 over my home network and from anywhere there's Internet access. Plus, I get to view up to 150kHz of spectrum in near real-time. Simply superb! At last I can keep an eye on interesting frequencies here at work without any fear of upsetting other users of shared systems such as DX-Tuners. I'll bring you the details of what can be done and how in a future episode of 'In the Ed's Shack'.

There's no end to what can be done by coupling computers and radios. It is proving to be a serious enhancement to the monitoring hobby. Jack Weber begins his look at just what is possible with the first of his nominally bi-monthly series covering computers and radios in this issue

#### Watching Them Watching Us

The other day I was trawling through the mass of E-mails that I receive on a regular basis. I noticed in the digest from the Yahoo based 'Scanpromauk' group a reference to SWM in one of the messages. It seems that group member 'deadlyelement2002' had spotted the group's mention in our February 'Scanning' column. He said, "Dunno if anyone else noticed but on page 67

in the new Short Wave Magazine (February issue) this yahoo group got mentioned, in particular about the guy who made the Starline taxi decoding software.

Just thought I'd let everyone know :)"

I don't know how many of the 'Scanpromauk' group noticed the mention, but we certainly noticed them noticing us!

#### Goodbye Jerry

It's always sad when a regular author decides to move on. This time it's the turn of 'ShackWeb' scribe Jerry Glenwright. A few days ago Jerry wrote to me saying;

after much consideration...well, you can guess what's coming! I've been writing 'ShackWare' and 'ShackWeb' for 10 years now and it's probably time to let some new blood in. I notice you introduce a new columnist in the current issue and I think it's probably time for me to move on to pastures new and let someone else have a go. To that end, the column I submitted recently will be my last.

It's been a fantastic time and a pleasure knowing you (and Dick before you and Zoë now) and I would certainly like to be considered for an occasional review or one-off feature now and then.

Perhaps you could just mention in your next editorial that I've had a truly fantastic time corresponding with some delightful, interesting and helpful readers but now it's time for me to sit back and do some listening again!"

So there you have it. I'd like to say for the record that I've really enjoyed working with Jerry over the past 10 years and chatting about radio, computers and Land Rovers when I've visited him. Many thanks for your efforts Jerry.

#### SSE & DF

I've already mentioned the action packed edition of Scanning Scene Extra

I really appreciate the enthusiasm of those in the radio trade who have consistently supported SSE. There are thanks to go to newcomers this time too.

I hope you find this month's SSE magazine useful. If you have any comments or suggestions regarding the contents please contact me at the SWM Editorial Offices in Broadstone.

Whether you are a first-time or a seasoned reader I hope you enjoy our efforts.

I'm especially pleased with the feature that begins on page 8. The USA based Ramsey Electronics provide the DDF1 Doppler direction finding kit which is a reasonably priced solution to that age old problem of locating the source of v.h.f. transmissions. A few hours of construction leaves you with a very capable addition to either the shack or indeed your mobile monitoring station. I'm very impressed with the unit built by Clive Hardy and I've purchased my own DDF1. We are currently considering an expanded use of this already capable item of kit. If you are at all interested in direction finding, keep a close watch on SWM for some interesting developments.

#### EMC - Radio Amateurs Get Protection

It seems that a revised directive on electromagnetic compatibility (EMC) has been published in the Official Journal of the European Union. I'm advised that this means that member states have three years to pass the directives as local laws.

The key words of the 'DIRECTIVE 2004/108/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC' section of Official Journal of the European Union are:

Member States are responsible for ensuring that radiocommunications, including radio broadcast reception and the amateur radio service operating in accordance with International Telecommunication Union (ITU) radio regulations, electrical supply networks and telecommunications networks, as well as equipment connected thereto, are protected against electromagnetic disturbance'

So, amateur radio will soon be protected service? Surely that can only be a good thing?

Happy listening

111, 73 Kevin

#### 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.



#### topge

#### Dear Sir

Many thanks for the SSE prize of the Icom IC-R5 receiver. I have been reading Short Wave Magazine and Practical Wireless since I was a boy (many years ago!) and have entered many competitions before, but without success, so it was a great pleasure when the R5 arrived in the post.

May I congratulate you on the 13th edition of Ferrells Confidential Frequency List, purchased earlier in the year as about 12 months ago I bought an Icom R-75 with d.s.p. fitted and found CFL and the R75 complimentary in winkling out stations I have been trying to listen to for years on my AR88D, which although in pristine condition as I purchased it 'new' some years ago, is much more difficult to tune to an exact frequency on s.s.b. than the Icom, but, as John Wilson said in his SWM review, the AR88 sounds very nice on a.m. broadcast signals.

Although the R75 has the advantage of being able to listen on one sideband to avoid QRM. I was licensed as G8ZTF some years ago but I never took the Morse test as being a tinnitus sufferer I found listening to QSOs too much of a strain and have concentrated on v.h.f. and microwave construction and the modification of ex-p.m.r. radios for amateur and marine band use. I am also a member of RIG, but possibly not for much longer as I have received only a brief letter for this year's subscription. Keep up the good work on your excellent magazine.

As an aside, far be it for me to wish to continue the discussion over listening to radio stations on the Internet, but I cannot see how anyone can argue that this method is real radio, but up-to-date. In my humble opinion they have really lost the plot!

#### Windsor Hargraves G8ZTF

#### **Dear Sir**

It seems many people are worried about the future of two-way 'hobby' radio, with ever declining numbers. Does the fact that CB radio was responsible for the biggest ever rise in amateur radio numbers, ever spring to mind? This being so, is it not common sense to foster CB as the **real** gateway into our hobby?

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2003's announcement by the RA; "Deregulation of Citizens Band Radio and Eventual Withdrawal of the 40 UK-only Channels" states that due to low number of users, the UK's 27/81 CB allocation is to be withdrawn. It will be remembered by many that we've already lost an important and much loved two-way radio band, used by the more advanced CB operator and many amateurs as well; namely the UK's wonderful 934MHz u.h.f. CB allocation which remains unused to this day. This act resulted in the redundancy of many thousands of pounds worth of radio kit, which at microwave frequencies, was not cheap to buy and cannot be written off against tax as businesses can do with obsolete kit.

934MHz was in fact comparable to amateur equipment in terms of cost and build quality. As those in the know will recall, 934 was second to none regarding the politeness and decency of operators - who unlike many black box amateur users, knew how to solder N-types on to ultra low loss military spec.  $50\Omega$  cable!

Due to its cost (up to £500 for a radio), 934MHz (the government's preferred CB frequency) never really caught the public's imagination, and was withdrawn at the end of 1998 This is in spite of the fact that there was more activity on the meagre 1MHz of the 934MHz band in my area at the time (north London), than there was on the entire 12MHz of 2m and 70cm! If low user numbers signify the automatic withdrawal of bands, why weren't 2m & 70cm withdrawn? Indeed, the ratio between amateurs and available amateur bands makes the ridiculous 'low user numbers' argument which lost 934MHz totally unjustifiable!

Considering that the overwhelming majority of two-way radio hobbyists on air since the late 1970s, have entered our hobby by way of easy access CB radio, whether 27 or 934MHz, the entire amateur/CB community should have been up in arms about this, which should have rung alarm bells over the loss of other bands, yet there wasn't a whimper.

The RSGB was actively recruiting CB operators ten years ago, yet when I wrote to them asking if they were going to take CB frequencies under their wing, I didn't even get a reply. Many amateurs look down their noses at CB, in denial at the decline of our hobby, and amazingly, I've read letters that call for CB to 'die a natural death'. Do amateurs realise that CB radio is probably the most valuable asset we have for bringing future generations into the twoway radio hobby?

27MHz may be cheap and cheerful (and very noisy) while a reintroduction of u.h.f. CB (on preferably a lower, cheaper frequency around 500MHz), would attract more serious operators. Many shops and businesses as well as ordinary people have discovered how much better u.h.f. is for local comms by using the low powered PMR-446 radios.

Rather than being scrapped, if as should happen; CB is accepted as part of the whole two-way radio hobby, it will no doubt, still continue to allow the public access to useful radio communications, while some will advance on to the amateur bands.

With recent floods and disasters in mind, and doom and gloom stories about global warming, why on earth shouldn't the general public have access to licence and test free decent frequency two-way radio comms? Lives may depend on such a system! Bus drivers, boat owners, light aircraft owners; don't need to sit exams to use their radios. There are lots of people who don't want to - and shouldn't need to - sit in classrooms and/or take exams just to use a radio. I passed my RAE, but if I'd known about 934MHz I might not have bothered.

The r.f. spectrum is a natural resource. It doesn't belong to Ofcom or anybody - within reason the public should decide how it is used. By allowing the public a decent u.h.f. slot for 2-way comms, perhaps an extension on the popular PMR-446MHz walkie talkie band, Europe as a whole could catch up with the USA and Australasian nations with a modern CB system fit for the 21st century.

Australia has a wonderful u.h.f. CB system centred on 477MHz, with hundreds of repeaters. Indeed, some Asian nations have three or four CB or 'public access' allocations, on h.f., v.h.f. & u.h.f.!

Cheap and cheerful 27MHz on let's face it, an awfully noisy frequency which is often rendered totally useless due to overseas operators, or up market u.h.f. CB would offer a choice for consumers, rather than dictating that noisy 27MHz (which puts many people off two-way radio) is the only place for CB.

The RSGB should fight to keep these bands for all hobby radio users, which includes potential future amateurs to get their first step into the two way radio hobby. To pretend that CB is somehow worthless is a big mistake, and only serves to show that some people can't see beyond the end of their own nose! Ian Philips

lan, many thanks for your letter, some very interesting points raised there. I must point out that you are mistaken regarding the requirement for maritime and aeronautical use of radio.

Both types of users have to pass competence exams to use their radios which are needed for safety purposes. I imagine that bus drivers are also fully instructed in the use of the company p.m.r. equipment and that there will be an in-house competence test to pass. This is, of course, due to the need to avoid interference to other spectrum users. Those same users who, in the democratically administered by national and internationally coordinated organisations, are protected from intereference caused by ad-hoc unauthorised use of spectrum. I must point out that it has never been easier for enthusiasts to gain legal access to the airwaves. I firmly believe that currently hobby radio is actually growing, due to changes in the amateur radio exam structure. A good thing indeed! - Ed.

#### communiqué

#### It's Scientriffic!

The Wrexham ARS will be at the Wrexham Science Festival's 'Scientriffic' Event this year, the event coincides with National Science Week too. The event will be held on **19 March 2005** - from the North East Wales Institute Plas Coch site, on the outskirts of Wrexham. The Wrexham ARS intend to run with the callsign **GB2WSF** from about 1000 until 1700 on the Saturday, h.f./v.h.f. and h.f. data. The club also hope for SOTA to be in attendance.

'Scientriffic' is just a small part of Wrexham's annual Science Festival - it is a day of hands-on exhibits and



demonstrations, and so there is something for the non-amateur! Visit the Wrexham Science Festival's website at: **www.wrexhamsf.com** for more information.

#### Farnborough's Foundation Course

The Farnborough and District Radio Society have news of their Foundation course. The course is to be held at the Community Centre on Thursday evenings between 19 May and 9 June. The Chief Instructor for the course is John Hardy G3KND, who during the 23 years he taught the old RAE in Farnborough had more than 500 people pass the examination.

The cost for the four sessions has not been finalised, but should not be more than about £30, including the RSGB examination fee, a copy of the RSGB Foundation Course Manual and all materials. For an application form and to reserve a place please contact **Paul Whatton G4DCV** on (01252) 892804 (please leave a message) or E-mail: **paul.whatton@ntlworld.com** 

#### **New Club Details**

The former Oulder Hill ARS in Rochdale now has a new name, new venue, new meeting night and a new website address. From January 2005 the above club are now known as the Shawclough Amateur Radio Club, Rochdale and they meet on Wednesdays at 1900 at the Rochdale City Learning Centre on Falinge Road, Rochdale. Visit www.sharc.org.uk or contact Alan G4TMV on (01706) 344186, E-mail: secretary@sharc.org.uk for more details.



#### **Two New Look Websites**

The Nunsfield House Amateur Radio Group is pleased to announce a new look to their club website. The 'new look' site contains lots of information about the club and its activities and includes links to other sites of interest. A lot of hard work has been done by webmaster Kevin Davison MOBJT to ensure that the website is fully functional and that the links work correctly. The website can be found at www.nharg.org.uk

Also, the **Elvaston Castle National Radio Rally** has also got a new look to its website. The website now carries full details about the forthcoming Elvaston Castle National Radio Rally. The site will be continually updated and will include a downloadable Rally Programme, which will be available during the week prior to the event. The new website also includes a booking enquiry page to enable prospective traders to request booking forms on-line. The website can be found at **www.elvastonrally.co.uk** 

#### New Region 12 Manager

The RSGB's Region 12 Manager Malcolm G3XVV decided to retire last year having given many years of outstanding service to the Society, he'll be greatly missed. Fortunately Phillip G4NZQ, previously Deputy Regional Manager with responsibility for Norfolk and Suffolk, agreed to take over the post. Region 12 comprises Cambridgeshire, Norfolk, Suffolk, Essex and Kent, so Phillip will be doing a lot of travelling in his new role.

Both Phillip and Malcolm attended the Chelmsford Amateur Radio Society Christmas Social Evening where the picture was taken. Phillip G4NZQ and the Deputy Regional Manager **Trevor M5AKA** will be visiting the following Essex clubs during March to show the new video about the RSGB and answer members questions.



Phillip can be contacted on **(01603)** 250639 or via E-mail:

phillip.brooks@btinternet.com and Trevor can be reached on (0794) 103 9832, E-mail: m5aka@amsat.org

#### New Radio Club

Recreation Club, the South Lancashire Radio Club, meet every Tuesday evening at 1930 in the Bickershaw Colliery Recreation Club, Bolton House Road, Bickershaw, Wigan WN2 4AB. Talk-in on S22 (144.550MHz) till 2000. Further information at www.slrc.tk or by E-mail: info@slrc.tk



#### Club Changes

The Southport & District Amateur Radio Club recently held their annual AGM and the following club changes were made and agreed by members. The Hon. Sec. is now Mark Haworth G4EID (succeeding Don Atkins M1BUL), 26 Willowhey, Marshside, Southport, Merseyside PR9 9TW and the new Treasurer is now Stuart Cartlidge G0MJG (succeeding Hearly Charlesworth G4FMQ), 19 Thornfield Road, Thornton, Crosby, Liverpool L23 9XY. Hearly retires after eighteen years as Hon. Treasurer and in appreciation, was presented at the AGM with a small gift of RSGB book tokens.

#### **Bangor's Talk**

embers of the Bangor & District Amateur Radio Society meet on the 1st Wednesday of every month in 'The Stables', Groomsport at 2000. At the meeting of 2 March 2005 the club will host a talk on first aid by Eddie MIOALS. As always, visitors and new members are most welcome.

Also, a date for your diary, the club are holding their summer radio rally on **Sunday 19 June 2005**. There will be a good selection of radio and computer traders. The rally is located at the Crawfordsburn Country Club, which is near Bangor, County Down. Doors open at 1200.

More information about the club can be obtained from Mike Gl4XSF on 0284-277 2383 or Rally information from Norman Gl3YMY on 0289-146 6557 or, alternatively, visit the club website at www.bdars.com

#### Potential Interference

he USA military have approved the use of a discrete frequency band around 390MHz and this will most likely cause problems to folk living near to military bases. The 390MHz band is also used for low power devices within the civilian sector and most radio controlled garage opening doors are normally operated at 390MHz. It's thought that garage doors anything in close proximity may suffer co-channel interference with transmissions from the military. It's possible therefore that USA military bases in the UK and Europe may also use the 390MHz band and with the international marketing of electronic devices from Asia - often with little regard for regulations and standards - it may mean that 390MHz equipment is already being operated in Europe!

#### Nevada Wins Business Excellence Award

Nevada has recently been presented with the highly commended 'Business of the Year' Award at The News Business Excellence Ceremony in the Guildhall Portsmouth. Nevada won the award for recognition of outstanding performance, excellent service and achievement of a strong and growing market share in DAB Digital Radio. At the end of 2002 Nevada saw an opportunity to distribute DAB DigitalRadios for the very first manufacturers in the market. Nevada worked closely with the Digital Radio Development Bureau (funded by the BBC and other large radio networks) who promote and publicise DAB Radio.

Nevada promoted and introduced many new models during those early days of DAB Digital Radio. The company established over 500 independent dealers and opened accounts with high street retailers such as John Lewis and Dixons Stores. Mike Spencer of the Digital Radio Development Bureau said, "Nevada, due to their vision and unique core skills in customer services

and distribution, have made a massive contribution in

developing the DAB market". Looking for new

opportunities and technologies has helped the company double its turnover in the past three years. Nevada Managing Director, Mike Devereux said, "We are thrilled to win this award against tough competition. It's real recognition for the enthusiasm and talent of the Nevada team".

(right): Mike Devereux receiving the award from Derek Beaves of George Gales & Co. the sponsors.



#### Portable DAB with CD Player

The first DAB digital, f.m. radio and CD player with pause and rewind! Rich in style and unrivalled in sound quality, the Genus PR1 is the first digital radio/CD to include the unique DAB pause-rewind function. How many times has your favourite radio show been interrupted by a 'phone call or a knock at the door?

Now with a single press of a button, you can put whatever you are listening to on hold or rewind for up to 20 minutes, depending on the station you are listening to. When you're ready to rejoin the programme, press the button again and you will automatically be taken back to the point at which you left.

The PR1 comes with f.m. RDS, an alarm timer, MP3 from CD (if you choose the PR1i model) and an ultra-slim, credit-card sized remote control. Combining understated style with efficient and clever functions, the PR1 is a far cry from the garish boom boxes currently available. The high quality slot CD drive has been so discreetly integrated it takes a second look to realise it's there at all.

Together with digital quality sound from 2 x 2W speakers this is a radio at the cutting edge and will compliment any space in the home. With a suggested retail price of £149 you don't need to stretch the credit-card to get the latest in DAB technology. Available from Nevada direct, John Lewis and Dixons. For other stockists call: 02392 313090.



#### communiqué

#### RAOTA Get-together

embers of the Radio Amateur Old Timer Association (RAOTA) are spread around the UK. RAOTA itself does not hold club nights so the RAOTA committee invited members to organise social events, called Get-Togethers, where members and guests could meet, eat and chat. The next Get-together will be held in Derby, at the Brunswick Inn, on 14 May (this is the second Saturday in May). This will be a re-run of last year's highly successful Get-together in Derby, except for an earlier start and later finish!

All RAOTA members, with guests, are welcome to come along to the Get-together. They should contact the organiser Ian G4EAN so that seating and catering can be arranged. Ian Brothwell G4EAN, 56 Arnot Hill Road, Arnold, Nottingham, NG5 6LQ, E-mail: ian@bartg.demon.co.uk or 'phone: 0115-926 2360. RAOTA is on the web, visit www.raota.org



#### **MAXPAX** Meeting

he Maxpak Midland AX25 Users Group's AGM is to be held on Wednesday 6 April 2005 at 2000 at the Sir Robert Peel Public House, Bloxwich. More information from Miles G4GSB, QTHR, Tel: (01952) 585447 or visit the Group's website at www.maxpakgb.org.uk



#### **CRI & WRN**

t a signing ceremony in Beijing, China Radio International (CRI) has renewed and extended its agreement with WRN, the London-based international broadcaster and transmission service provider, for the extensive provision of global broadcast services. The new contract was signed by CRI Vice President, Mr Xia Jixuan and WRN Chairman, Mr Karl Miosga, at CRI's headquarters on 9 December 2004.

WRN has worked closely with CRI for more than six years since signing a Collaboration Agreement in Beijing in 1999. WRN works on CRI's behalf, distributing its daily programmes to reach listeners around the world using a.m. and f.m. transmissions that augment CRI's traditional short wave broadcasting from China. CRI's daily programmes can be heard on f.m. in Berlin and Moscow and on a.m. in London, St. Petersburg, across Western Europe, South West Russia, Ukraine and Romania. WRN identifies the most appropriate transmitters, undertakes local negotiations and monitors the output for CRI.

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

After the signing ceremony, Mr Karl Miosga, WRN's Chairman, said: "WRN is honoured to have signed a new agreement expanding its cooperation with CRI. 2004 saw significant growth in both local and new media outlets that carry CRI programmes. WRN's networks distribute CRI on key platforms such as Sirius satellite radio in the USA which has now achieved over 1 million subscribers, and Sky digital which is reaching over 8 million homes in the UK and Ireland. 2005 is going to be an exciting year full of new developments and WRN looks forward to bringing these to CRI".

After the signing ceremony WRN met with Mr Wang Gengnian, the new Director General of China Radio International, to discuss issues of mutual interest to the two organisations.

#### **Cup Winner**

The Havering & District Radio Club held its 2004 Constructors' Cup competition back on 15 December 2004. The club evening was well attended, but sadly there were only a few entries into the competition this year. After being put to vote, the club members decided that the winning entry was a QRP linear which had been designed and built by Chris MOJKA.

The linear was built to be operated in conjunction with this 14MHz 1W QRP PSK31 transceiver (also home-brew), taking the final power up to 5W. A single stage MRF510 m.o.s.f.e.t. was used, and whilst not ideal at 14MHz, it still gave the



required power output. If the supply voltage is increased to 18V, then 9W output is obtainable, but Chris runs the linear between 4 to 5W to remain true to QRP operation. A m.o.s.f.e.t. was chosen so the linear runs fairly cool, and does not draw an excessive supply current (800mA @ 13.8V for 4W output). The output is fed via a 5-element low pass filter. A relay is used to switch the r.f. to the input of the amplifier when in transmit and bypassed when the unit is on receive or switched off. This means it does not have to be unplugged when not in use.

The linear, although being a simple project, is well built and housed in an attractive case, so hopefully it will inspire future constructors of the club. The Constructors' Cup and certificate was handed over the club's AGM by chairman Jim MOMAC in January 2005. This is the first time Chris has won the cup, which was relinquished by last year's cup winner Fred G3MOB. Club meetings take place on Wednesdays at 2000 at Fairkytes art Centre, 53, Billet Lane, Hornchurch, Essex. Contact Oliver (Hon Sec) on (01708) 746677 or visit www.haveringradioclub.co.uk

(above): Jim M0MAC handing over the cup to Chris M0JKA (also the newly appointed Club Treasurer), who was the winner of the Construction Cup. *Picture by G3VOF.* 

#### SOTA Beams Challenge 2004

he winners of the 2004 SOTA Beams Challenge have just been announced. The Challenge is for 'Summits on the Air' activators under 18, the winner being the activator who makes contacts from the most summits In 2004 the worthy winner was 14 year old Bobbie



Brown M3DNC who activated 24 summits amazingly she only started activating in August! Runner-up was James M3OZE with 20 activations. Bobbie wins a SOTA Beam and pole while James wins a WaterLog. The SOTA Beams Challenge will run again in 2005.

Summits on the Air (SOTA) is a popular award scheme that encourages portable operating from hilltops across the UK. It started in 2002 and already has over 600 participants making it the fastest growing amateur radio award in the World! www.sota.org.uk

SOTA Beams makes specialised portable equipment designed with hill-walking radio amateurs in mind www.sotabeams.co.uk

(above): **Bobbie Brown M3DNC** with her prize SOTA Beam.

#### March 12: The Lagan Valley ARS are holding their rally at the Lagan Valley Hospital Recreation Hall. Doors open from 1100. There will be the usual stalls, plus a Bring & Buy, talk-in on S22 and refreshments. Ample car parking. More information from **Ron McCaughey GI4NTO** on **0289 260 1941**.

Pallias

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 GOEYO on (07710) 412819, E-mail: g0eyo@blueyonder.co.uk or visit www.wrcrally.co.uk

March 19: The South Normanton Alfreton & District Amateur Radio Club, in association with the G-QRP Club are holding their 5th Junction 28 QRP Rally at the Village Hall Community Centre, Market Street, South Normanton, near Alfreton, Derbyshire. Fully signposted, and open to the public from 1000. There will be Amateur Radio, electronics and related items, Bring & Buy and special interest group stalls, outdoor flea market (weather permitting) and refreshments. More information from Russell Bradley GOOKD on (01773) 783394, E-mail: russel.bradley@ntlworld.com or Mike Jeffs MORMJ on (01949) 876523, E-mail: mike.jeffs@ntlworld.com

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 GOGKP on (01954) 200072, E-mail: j.bonner@ntlworld.com or from Ian Alexander G4AKD on (01954) 782974, E-mail: g4akd@thersgb.net

#### **Special Event**

The SWM Newsdesk has recently heard from Phil Archer G6AKK, on behalf of the Macclesfield Wireless Society GX4MWS, who informs us that they are co-operating with the local silk museum to put on a special event for the Cheshire School's pupils in KS2. This is taking place on 14/15/16 March, but National Science Week actually runs from Friday 11 to Friday 18 March. This will include lectures, hands-on experiments and also the chance to pass messages on 2m and h.f. (7 and 14MHz). The theme will be to try and track the journey of Marianne Brockelhurst, a victorian lady who brought back the Macclesfield museum's Egyptian artefacts. She travelled through France, Switzerland, Italy, across the Mediterranean and up the River Nile to Aswan.

The really interesting bit reports Phil, is that they will be using a half sized G5RV strung up in the rafters of the auditorium on the top floor of the town's original Sunday School (now Macclesfield Heritage Centre), built by public subscription of the towns folk. The Society did a test last week and contacted Norway, Poland and Sicily - who said loft antennas don't work well! So, all you *SWM* readers, please listen out for **GB4MHS**. Visit **www.gx4mws.com** for more information.

#### 2005 Catalogue Out Now!

Fluke, the world leader in compact professional electronic test tools, has just released its 2005 Test Tools Catalog. Always packed with useful information, the catalogue has become a standard work of reference for engineers, technicians and troubleshooters everywhere. The 2005 edition is even better than before, and has 76 pages in a new colour-coded layout that makes choosing product families even easier.

The catalogue contains summary pages of Fluke's most recent products and complete descriptions of features and specifications for Fluke's full line of test tools. Sections include handheld digital multimeters (DMMs), electrical testers and clamp meters, installation meters, field calibration tools, power quality tools, digital thermometers and accessories. Furthermore, the catalogue includes handy section guides to pick the right test tool for your needs and includes background articles on safety standard, basic electrical installation testing, troubleshooting adjustable speed drives and more. It also explains how to receive *E-Test-It1*, Fluke's electronic newsletter, which is issued six times per year. The newsletter provides advice on how users can get more out of Fluke tools, includes exclusive offers on Fluke merchandising and ex-demo equipment and features the latest Fluke products.

The 2005 catalogue will automatically be sent to all those who requested the 2004 edition. A catalogue can also be requested via the Fluke website at **www.fluke.co.uk** or can be obtained by contacting Fluke directly on **0207-942 0700**, FAX: **0207-942 0701** or E-mail: **industrial@uk.fluke.nl** 



ong, Medium & Short Wave Bands

**Tropical Band Table** 

Service

WWCR, Nashville All India Radio, Simla All India Radio, Bhopal Radio Sonder Grense BBC World Service

Radio France Int'l Vatican Radio

Laser International Huanta 2000?

Trans World Radio CNR1 Shijiazhuang CPBS 2 Beijing

All India Radio, Mumbai ORTM Nouakchott All India Radio, Delhi Radio Clube Do Para All India Radio, Kurseong Virano, Lassa

All India Radio, Jaipur

UTC

2151 2300

0500 2304

2300

1<u>355</u> 1630

2327 1325 0510

0200 0042 1640

MHz

315

3.965

4.005 4.025 4.747

4.760 4.800

4.800

4.840

4.860

4.895

4.905

- Martin Peters 11 Jilbert Drive, Reading RG31 5D2
- E-mail: Ims@pwpublishing.ltd.uk

y mention of ionospheric cross modulation (ICM) a couple

of months back prompted a number of comments from readers. **Harry Richards** maintains that the term 'Luxembourg Effect' is ironic as the phenomenon is rarely a result of the Grand Duchy's transmitters. Quite the contrary; Harry is able to hear BBC World Service, originating on 6.48MHz,

as ICM in the background of 1440kHz.

Jacques d'Avignon sent an E-mail detailing his experiences during his 2004 DXpedition to Miscou Island, New Brunswick, off Canada's Atlantic coast. The team experienced one instance of IMC on the Roumoules transmission on 216kHz, where 162kHz France Inter was of almost equal strength. These happenings are not often reported from the USA but it does surface from time-to-time.

Thanks for the info, Jacques. A quick Google search on the web reveals Miscou to be a fascinating destination, which, incidentally, was enjoying night-time lows of -24°C at the end of March, despite being at a more southerly latitude than the UK.

If you'd like to read more about this or other DXpeditions just click over to

#### Listeners

A Thomas Williams, Truro B Sheila Hughes, Morden C Eddie McKeown, Newry D Charles Hendry, Amersham E Simon Hockenhull, Bristoi David Bullock, Kilburn, Derbyshire

#### Long Wave Table

kHz	Service	TX Location	Country	Power (kW)	Listener
153	Deutschlandfunk	Donebach	D	500/250	C*EF
153	Radio Romania	Brasov	ROU	1200	
162	France Inter	Allouis	F	2000/1000	A B'C* F .
171	Medi 1	Nador	MRC	2000	C*
171	Radio Chechnya Svobodnaya	Tibilsskaya	RUS	1200	
171	Radio Rossi	Bolsakovo	RUS	600	C* D.E
_177	Deutschlandradio Berlin	Zehlendorf	D	500	C* E F
183	Europe 1	Saarlouis	D	2000	B C*F
189	Rikisutvarpid	Gufuskalar	. ISL	150	C*
198	BBC Radio 4	Droitwich	G	500	B C* F <sup>P</sup>
198	Radio Parliament	Raszyn	POL	200	D
198	Mayak	Many	RUS	150	D*
207	Deutschlandfunk	Aholming	D	500	ABC*EF .
216	Radio Monte Carlo	Roumoules	F	1400	AC*EF
225	Polish Radio 1	Solec Kujawski	POL	1000	B* C* EF
234	RTL	Beidweiler	LUX	2000	ABC*F
243	Denmark Radio 1	Kalundborg .	DNK	300	BC*EF
252	RTE Radio 1	Clarkstown	<b>i</b> RL	500/150	AB*CF
252	Algiers Radio 3	Tipaza	ALG	1500/750	B*
261	Radio Rossi	Taldom	RUS	2500	C* D*
270	Czech Radio 1	Uherske-Hradiste	CZE	650	C*EF
279	Belarussian Radio 1	Sasnovy	BLR	500	C**E

Li: D I

tener	MHz	UTC	Service	Country	Listener
F	4.910	1920	ZNBC Radio 1	ZMB	G
	4.915	0515	GBC 1 Accra	GHA	E
	4.920	0042	Xizang Lhasa	CHN	F
	4.930	1930	Turkmen Radio	TKM	AFG
	4.940	2009	Voice of America	USA/STP	G
	4.940	0240	AIR Guwahati	IND	F
	4.950	0205	All India Radio Srinigar	IND	E
	4.950	0525	Voice of America	USA/STP	E.
	4 976	1940	Radio Uganda, Kampala	UGA	A G
	4,980	0206	PBS Xinjiang	CHN	F <sup>e</sup>
ì	5.010	1420	All India Radio, Thiru puram	IND	A-F
	5.015	2321	Turkmen Radio	TKM	CG
CEFG	5.015	0207	Radio Brasil Tropical	В	F
G	5.025	2030	Radio Tashkent	UZB	G
FG	5.025	0535	Radio Rebelde	CUB	E
G	5.030	2215	University Network	USA	E
3	5.030	2334	Radio Burkina	BFA	Ç.
	5.060	0209	Xinjiang Urumgi	CHN	FG
3	5.070	0650	WWCR, Nashville	USA	BCDEH
-	5.240	1415	Xizang Lhasa	CHN	AC.

#### http://dxing.info/dxpeditions/ for a great selection.

MCO/SWZ

MTN

CHN

Meanwhile, Swiss radio's German-language service on 531kHz has been observed suffering the effects of ICM, again from France Inter. Take a listen.

Charles Hendry has not only observed the 216/162kHz effect but also BBC Radio 4 (198kHz) underneath RTE 1 on 252kHz. Charles says he can now rest easy that there isn't a fault with his system!

He goes on to mention that the 'other Luxembourg Effect' is RTL's DRM transmissions on 1440kHz, mentioned in last month's 'LM&S'. Testing all through the night, they kill off any chance of hearing much else on this frequency. After close down, the hitherto relatively clear channel provided a Transatlantic gateway, as well as to the giant 1.6MW facility in Damman, Saudi Arabia.

An unfortunate characteristic of DRM is its increased potential to cause interference to cochannel analogue stations owing to its wide and dense waveform.

> Having turned his attention to the east, Charles netted several Russian Mayak outlets, Saudi, China, VoA out of Kuwait (like a local) and Armenian Radio. All of this on a Sony ICF-M400L.

> Charles' experiences reminded me what a powerful tool a portable medium wave radio with a built-in ferrite rod is. The ability to null out cochannel interference with minimum effort is one of those magical effects that continues to impress.

Using this technique, those of you who are usually tethered to a long wire antenna may like to go low tech every once in a while and use the battered kitchen radio to net a surprising number of stations.

**DXers** 

John Parry, Cyprus Peter Pollard, Rugby Rhoderick Illman, Oxted Bernard Curtis, Stalbridge Vic Prier, Seaton Eddie McKeown, Newry Michael Casey, Manchester Fred Wilmshurst Freddy McGavin

One transmission you may be nulling out is that from a digital-compatible Telefunken transmitter which has been installed in Arganda near Madrid, Spain.

The official start of test transmissions was planned for 26 January. Over a period of four weeks the programme of RNE 1 was to be transmitted in the DRM format daily from 0700 to 1500 on 1359kHz, according to a press release from Telefunken. It goes on to say that the University of Bilbao would be conducting propagation and quality measurements to ascertain the medium's suitability as a transmission standard for Spain.

Following the hoped-for successful test phase, it is assumed that regular DRM transmissions and an increased network of digital transmitters would follow...

#### Staff Missing

The world of broadcasting did not survive unscathed in the wake of the Asian tsunami. Included among the countless victims were many who worked for the broadcast industry. Worst hit was Indonesia, with over 30 staff missing from the Aceh province alone.

Hardware was also a casualty, with transmitters and antennas near the coastline bearing the brunt of the earthquake and its aftermath. Elsewhere, several TV installations on the Nicobar Islands had been badly damaged. Deutsche Welle's Asia relay in Trincomalee, Sri Lanka escaped damaged, located, as it is, away from the coast.

Radio broadcasters, quickly galvanised to provide a lifeline to people seeking lost relatives or desperate to establish the status of

#### incoming relief aid.

All India Radio (AIR) broadcast hundreds of welfare messages around the Andaman and Nicobar Islands, after normal communications links were lost following the disaster.

The BBC, Deutsche Welle and others broadcast additional and extended programming in a number of Asian languages to the region.

Amateur radio operators on an expedition to the Andaman and Nicobar Islands switched to emergency communications traffic within 30 minutes of the quake striking. Using transceivers running off generators or car batteries and with just a mobile whip for an antenna, they were able to despatch and take scores of messages at the request of the local authorities.

Radio Netherlands is setting up a number of emergency radio stations in Indonesia, which will later be developed into permanent installations whilst Deutsche Welle is supporting the reconstruction of radio stations in Aceh. Eight stations were entirely destroyed by the Boxing Day disaster leaving the local people with no access to information about aid or other matters.

The broadcaster also funded the purchase of roughly 1000 radios and their distribution to refugee camps of the province.

Elsewhere, the Asia-Pacific Broadcasting Union (ABU) has appealed to its members to assist fellow broadcasters in the stricken region and is helping to co-ordinate a project aimed at restoring broadcast operations through the establishment of temporary transmission facilities and through the donation of portable radios.

I'm expecting short wave reports for January to be fewer in number as a result of the radio blackouts we suffered from around the middle of the month. This was all thanks to some major

#### **Medium Wave Table**

#### Listeners:-A Sheila Hughes, Morden B Charles Hendry, Amersham C Simon Hockenhull, Bristol

Oavid Bullock, Kilburn, Derbyshire

activity on the sun and the unleashing of numerous solar flares straight towards our planet. Short wave signals became very fluttery and v.h.f. communication by radio amateurs via Aurora was possible for a short time.

Visible auroras produced by the increased solar activity were spotted over northern parts of Europe and North America and above New Zealand on 18 and 19 January while two major USA airlines re-routed planes away from the polar areas to avoid additional radiation exposure to their passengers.

Short wave from Equatorial Guinea has been reactivated recently. Radio Africa was positively identified with an on-air announcement at 1700. The station broadcasts religious programming in English and has been putting a good signal into the UK since mid January.

#### **Local Radio Table**

HzService	Svc area/TX site	kW	SWL		
558	Spectrum	Crystal Palace	1	C	
603	Canital Gold	Littlehourne	0.1	AC	
630	BBC Badio Comwall	Redruth	2	C*	
630	BBC 3CB	Luton	0.2	A C	
657	BBC Badio Comunal	Bodmin	7	P#	
007	DDC Radio Vark	Vork	0.5	A	
000		TUIK	0.04	A	
000	Classic Gold	CXEIEr	0.34	A.C.	
129	BBC Essex	Manningtree	0.2	AL	
738	BBC Hereford & Worcester	Worcester	0.037	<u> </u>	
756	Magic Maldwyn	Newtown	0.63	<u> </u>	
765	BBC Essex	Chelsmford	0.5	AC	
792	Classic Gold	Bedford	0.275	A	
801	BBC Radio Devon	Barnstaple	2	C	
828	Classic Gold	Bournemouth	0.27	<u>C</u>	
828	Classic Gold	Luton	0.2	AC	
828	BBC Asian Network	Wolverhampton	0.Z	C	
837	BBC Asian Network	Leicester	0.5	С	
855	BBC Badio Norfolk	Norwich	1.5	C*	
855	BBC Radio Devon	Plymouth	1	C*	
855	Sunshine 855	Ludinw	0.15	C	
036	Freeh AM	Skinton	1	B*	
054	Classic Gold	Inchay	0.4	A C	
954	Classic Gold	Horoford	0.16	C , ,	
904	Classic Oulu	Heakson	0.10	C .	
.963	Asian Club	Flackiey_	0.50	C	
9/2	Asian Liub	Southall	1	0	
990	BBC Hadio Devon	Exeter	0.00	L .	
990	Classic Gold	vvolvernampton	0.09	- U i	
999	Classic Gold GEM	Nottingham	0.25	0-	
999	BBC Radio Solent	Fareham	1	C .	
999	Valleys Radio	Ebbw Vale	0.3	C	
1017	Classic Gold	Shropshire	0.63	C	
1026	BBC Radio Jersey	Trinity	1	_C	
1026	BBC Radio Cambridgeshire	Cambridge	0.5	C	
1035	Easy Radio London	Crystal Palace	1	C D*	
1116	Vallevs Radio	Ebbw Vale	1	C	
1116	BBC Radio Derby	Derby	1	D*	
1116	BBC Badin Guernsey	Rohais	0.5	. C	
1152	Capital Gold	Birmingham	3	C D*	
1161	Manic	Hull	0.35	D*	
1170	Swansea Sound	Swansea	0.58	C	
1170	Signal's Big AM	Stoke on Trent	0.2	D*	
1260	Sabras Sound	Laicester	0.29	D*	
1200	Padio VI	Birmingham	10	CD* '	
1200	Classic Gold	Peterborough	0.6	D*	
1421	Classic Cold	Reading	0.1/	C ·	
1451	Ciassic dolu	Lendon	125		
1458	Sumse	Tashau	120	C*	
1458	BBC Haolo Devon	Toroay	1	C	
1485	Clasic Gold	Ivewbury		C	
1485	BBC Southern Counties Madio	Brighton		C* D	
1503	BBC Radio Stoke	Staffordshire	1	0.0	
1521	Classic Gold	Heigate	0.64	0	
1530	Capital Gold	Worcester	0.52		
1530	BBC Radio Essex	Southend	0.15	104	
1530	Classic Gold	Huddersfield		8*	
1566	BBC Somerset Sound	Taunton	0.6	C .	
1584	BBC Hereford & Worcester	Woofferton	0.3	G.	
1602	BBC Radio Kent	Rustall	0.25	C*	
1602	Desi Radio	Southall	0.07	C*	

\* = dark

kН

kHz	Service	Location	Country	kW	Listener
531	RIA 1	Ain-El-Beida	ALG	600/300_	5
531	Utvarp Foroya	Akraberg	FRU_	200/100_	<u> </u>
531	RNE 5	Many	E	10-25	B
531	Swiss Radio (German)	Beromunster	SUI	600	BEEF
540	Radio Twee	Wavre	BEL	150	ABEE
540	Radio Barcelona	Barcelona	E	50	<u>A</u> *
549	Mayak	Many	RUS	50-1 <u>200</u>	
549	Deutschlandfunk (DLF)	Nordkirchen/Thurnau	J D	100	A* E
549	UCB Europe	Dundalk	IRL	70	BEF
558	YLE Radio	Helsinki	FIN	50	<u>B*</u>
567	BTE 1	Tullamore	IRL	500	BE
567	BNE 5	Murcia	6	50	E
576	Sudwestrundfunk (SWR)	Muhlacker	D	100	B* E
585	RNF 1	Madrid	E	600	B° E°
585	FIP	Paris	F	8	B* E
585	BBC Badin Scotland	Dumfries	G	2	В
503	HR Skyline	Frankfurt	D	250	8° E
50A	RTM A	Quida	MBC	100	8*
602	Erapeo lofo	lyon	F	300	8* E
602	DNEE	Sovillo	F	5	8*
613	DTM A	Sebaa-Ainun	MBC	300	B*
012	DNIE 1	Vitoria	F	10	B* F
012	DTDE 1	\Alouro	BEL	300	B° F F
021	DNET	Monu	F	10	R°
6Z1	HINE I	Diodoido	THIN	600	F*
630		Diegend	NOP	100	B
630	NHK Euuropakanajen	Vigra	NUN	10.000	D* E
639	RNE 1	Many	TOU	10-300	DE
639	Czech Hadio Z	Prague	IVA.	500	
648	BBC World Service	Urtoroness	6	500	AD E
657	RNE 5	Madrid	E .	50	DE
657	BBC Radio Wales	Wrexham	G	2	BEF
666	Radio Vilnius	Sitkunai	LIU	500	
666	Sudwestrundfunk (SVVR)	Rohrdorf	D	150	B.
666	RDP Antena 1	Vila Real	POR	10	B*
675	Arrow Classic Rock	Lopik	HOL	120	B* E F
684	RNE 1	Seville	E	600	B* E*
693	BBC Radio 5 Live	Many	G	1-150	
693	RNF 1	Many	E	10-20	B*
702	Trans World Badio	Col de la Madone		40	8°
702	NDB 4	Flensburg	p	5	E*
711	Badio Bleu	Bennes	F	300	B* E
720	WOR	Langenherg	D	85	E
720	PBC Padio A	Lisnanarvey	6	10	F
720	PBC Radia 4	London	G	0.75	E
720	DDU ndulu 4	Many	F	10-100	B* F*
129	DTC Destin 1	Code	1PI	10	Rº E
129	HIE Hadio I	COIK	ini,		

kHz	Service	Location	Country	kW	Listener
738	RNE 1	Barcelona	Ę	500	E* F*
738	Radio France International	Paris	F	5	B* E*
747	Radio 747	Flevolanc	HOL	400	BE
756	Deutschlandfunk (DLF)	Many	D	100-200	B* E* <u>F*</u>
765	Option Musique	Sottens	SUI	600	A* B* E* F*
774	RNE 1	Many	E	20-100	B* E* F*
774	BBC Radio 4	Enniskillen	G	1	В
783	MDR Info	Leipzig	D	100	B* E*
783	Radio Mirimar	Barcelona	Ę	50	8*
792	France Info	Limoges	F	300	B* E
792	BBC Radio Foyle	Londonderry	G	. 1	B*
801	RNE 1	Many	E	10-20	8*
801	Bayern	Munich	D	100	B* F*
810	BBC Radio Scotland	Westergien	G	100	BEF*
810	Radio Madrid	Madrid	E	50	E
819	ERTU1	Batra	EGY	1000	D* E*
819	Sud Radio	Toulouse	F	20	B* E*
819	BAI Uno	Trieste	1	20	0*
819	Radio Euskadi	San Sebastian	E	10	E*
828	Arrow Classic Rock	Heinenoord	HOL	20	B*
837	France Info	Nancy	F	200	B* E* F*
846	R Radonezh	Moscow/Noginsk	RUS	150	<u>D</u> *
846	RAI Due	Rome	1	60	B* E*
855	BNE 1	Murcia	E	300	<u>B* E F*</u>
864	La City Radio	Paris	F	300	B* E F*
873	SER	Many	E	10-25	<u>B</u> *
873	American Forces Network	Frankfurt	D	150	A* B* E.*
873	BBC Radio Ulster	Enniskillen	G	1	A* B
882	COPE	Many	E	2-5	B°
882	BBC Radio Wales	Washford	G	100	B C F*
891	BTA 1	Algiers	ALG	600/300	E*
891	Badio 538	Hulsberg	HOL	20	B*
900	BALLIno	Milan	1	600	8° E*
909	BBC Badio 5 Live	Many	G	0.25-200	F*
918	Badio Slovenia	Domzale	SVN	600/100	B" E" F"
918	Badio Intercontinental	Madrid	E	20	B* E*
027	Radio Fen/927 Live	Wolvertem	BEI	300	B*
036	Bromen 1	Bremen	D	50/10	B* D*
045	Erance Blue	Toulouse	F	300	B* E F*
06/	Crech Badia 2	Brino	C7F	200	B*
054	Ondo Cora Radio	Madrid	F	20	AB*
904	VIE Padia	Pori	FIN	600	B* E* F*
903	Nord Douteshor Rundtunk IN		Hamburg	000	100 B* F* F*
9/2	DTA 2	Algoire	ALG	600/300	F*
981	Dautashlandfunk (DLE)	Borlin	0	100	R*
990	Deutschlandfullk [DLF]	Bilbao	E	10	B*
990	Radia 10 Cold	Floveland	HOL	400	B*CEE*
8001	Radio IU GOIO	Malfahaim	HUL	100	B* F*
101/	Sudwestrunatunk (SWH)	Parte Alto	POP	100	D*
1033	Nadio Nacional	FOILO AILU	- un	100	0

kHz	Service	Location	Country	kW	Listener
1044	MUK Into	Dresden	U	20	DE
1044	Radio San Se <u>bast</u> ian	San Sepastian	C	10	D C
1033	Taiksport	Dronwich .	G	200	0 U F *
1002	RAI Uno	iviany	DMIK	2-20	D.C.
1002	Denmark Radio P3	Kalunborg	DINK	230	DE
1071	Euskadi Inaua	Bilbao	E	50	DeCe
10/1	laiksport	Lipstone	<u>u</u>	5140	BF
1080	SER	Many	E	5-10	Br
1089	Taiksport	Brookmans Park	6	400	Br
1098	HINES CIT	Almaria	E	10-25	B. De Le
1098	Madio Slovensko	Nitra	SAK	.50	BE
1107	American Forces Network	Bavaria	USAVU	10	B
110/	talksport	Many	U	2	BF
1125	Croatian Radio HR1	Deanovac	HHV	100	E*
1125	Radio 21	Houdeng	BEL	10	Ber
1125	BBC Radio Wales	Llandrindod Wells	G	1	B* E
1125	RNE 5	Many	÷		t
1134	Croatian Radio HR1	Zadar	HRV	600	<u>B* E*</u>
1143	COPE	Many	3	2-5	A* E
1143	American Forces Network	Many	USA/D	0.3-10	A*
1143	Voice of Russia/Mayak	Bolshakovo	RUS	150	A* D*
1179	Swedish Radio	Solvesborg	S	600/300	B* E
1179	SER	Valencia	E	50	E.
1188	VOA/RFE	Marcali	USA/HNG	500	B
1188	Radio Twee	Kuume	BEL	5	A*_B*
1197	VOA/RFE	Munich	USA/D	300/150	A*
1197	Virgin Radio	Many	G	0.2-2	A* B F*
1197-	Euskadi Irratia	Vitoria	E	50	B.*
1206	France Info	Bordeaux	F	300	B* E
1215	Virgin Radio	Many	G	0,32-200	BF*
1224	Radio Horizont	Vidin	BUL	500	B*5
1224	Radio Popular	San Sebastian	E	10	B*
1233	Virgin Badio	Many	G	0.1-0.5	B* F*
1242	Virgin Radio	Many	G	0.5-2	B* E
1242	France Info	Marseille	F	150	8* E
1251	Badin 747	Hulsberg	HOL	10	B* F*
1260	Virgin Badio	Lvdd	G	1	B* 1
1269	Deutschlandfunk (DLF)	Neumunster	D	300	B* F*
1278	France Bleu	Strasbourg	F	300	B* E*
1278	BTE Badio 2	Dublin/Cork	IBI	10	B*
1287	Cm 6	Litomysl	CZE	150	B*
1296	BBC World Service	Orfordness	G	500	B* F*
305	BNE 5	Many	F	10.25	B*
1314	NBK Euuropakanalen	Kvitsov	NOR	1200	BEF*
1323	Voice of Russia	Wachephrunn	BUS/D	800/150	BIE
1323	BBC World Service	Limasén	G/CVP	100	F*
1332	8AU Ino	Bome	0/011	300	Be
1341	BBC Badio Illister	Lienanaryey	G	100	Δ* F
1043	DEG HOULD DISTEL	F19110761AC)	0	100	A L

Hz 350	Service Radio Orient	Location Nancy	Country LBN/F	<b>kW</b> 300	Listener B* E*
359	BNE 3	Madrid	E	600	E*
368	Manx Badio	Douglas, IOM	G	20	B F*
377	France Info	Lille	F.	300	BEF
386	Voice of Bussia	Sitkunai	RUS/LTU	750	B*
386	Radio Baltic Wayes Internationa	al	Sitkupai	LTU	.750 E
395	rans Norld Radin	Filake	MCO/AL8	500	B* F
395	Armenian national radio	Yerevah	ARM	150	D*
404	France Into	Brest	F	20	B* E* F
413	BNE 5	Many	Ë	5-10	B* E*
422	Deutschlandfunk (DLF)	Heusweiter	D	1200/600	B* E .
440	RTL + China Radio International	Marnach	(CHN)/LUX	1200/300	BEF.
440	Saudi Badio	Damman	ARS	1600	Bal
449	RAI Due	Squinzano		50	8*
449	Libvan Radio	Misurata	LBY	20	B*
449	BBC Radio 4	Redmoss	G	2	B*
467	Trans World Radio	Romoules	MCO/F	1000	8* E* F
476	Radio 1476	Vienna	AUT	60	B* E* F
494	Voice of Russia	Krasnyy Bor	RUS	600	B** E*
494	France Info	Clermont-Ferrand	F	20	B* E*
503	Radio Sarasyre	Bushehr	IRN	500	B*
512	Radio Vlaanderen/Radio Een	Wolvertem	BEL	300/25	B* E*
521	Saudi Radio	Duba	ARS	2000	D*,E*
521	China Radio International	Urumgi	CHN	500	D*
521	BBC Slovakia	Koscise	G/SVK	200	. B*
521	Mayak	Kazan	RUS	20	D*-
530	Vatican Radio	Vatican City	CVA	150/450	B**E*
530	Voice of America	Sao Tome	USA/STP	600	.Dt
539	Evangeliums Rundfunk	Mainflingen	D	700/120	B* E*
557	France Info	Nice	F	300	E*
575	RAI Uno	Genova	1	:50	B* E*
575	SER	Many	E	'5	B*
593	Voice of America	Kuwait	USA/KWT	150	B* D*
593	Radio Actualitati	Miercurea Ciuc	ROU	14	D*
602	Radio Vitoria	Vitoria	E	25	8*
611	Vatican Badin	Vatican City	CVA	100	R*

\* = dark

Listeners: ners:-Sheila Hughes, Morden Eddie McKeown, Newry Henry Brice, Comwall Charles Hendry, Amersham Simon Hockenhull, Bristol David Bullock, Kilburn, Derbyshire ABC D

If you have a copy of this year's WRTH (or even if you don't), an update to the international broadcasting section is available for download from their website - www.wrth.com

The 100KB file contains the latest international broadcaster updates, schedule changes and new stations, including the aforementioned Radio Africa, so promises to be right up-to-date.

That's it for this time. Just time to welcome David Bullock to the 'LM&S' family. David used to listen to short wave his teens and has taken up the hobby again since his wife bought him a Sangean ATS-505 for Christmas.

His new receiver has been a revelation instant, pin-point tuning, scanning, s.s.b. and very good sensitivity. Thanks for taking the trouble to write in, David. Your logs included in with this month's listing, which, by the way, refers to stations heard throughout December.

Please send me your contributions by the 10th of the month. Perhaps you could confine your logs for March to those stations heard after the clock change on the 27th. If not, please indicate clearly which entries apply to before and after the move to summertime. See you next month.

Short I	Nave'	Table					0600-0700	016	Service	country	Lang	SINPO	24AF
		Teaste					5.810	0630	WYFR	USA	Ger	44323	VP
							5.765	0615	AFRTS (u.s.b.)	USA	Ena	22222	VP
Ball.	UTC	Constant	0	1	010100	CLAU	5.825	0640	WEWN	USA	Ena	34433	VP
IVITIZ	016	Service	Country	Lang	SINPU	SAAF	5.890	0645	Vatican Radio	CVA	Lat	34343	PP
0000 0000							5.935	0610	University Network	USA	Ena	32222	VP
0000-0000	DAIE	Malan of Crosses	600	Car	AFFAA	1/0	5.955	0615	Radio Nederlands	HOL	Dut	55444	VP
5.000	0645	Voice of Greece	GAL	Gre	40044	VP	6.145	0655	Deutsche Welle	D	Eng	32242	pp
5.900	0001	nadio Bulgaria	BUL	spa	34333	VP	7.355	0620	WYFR	USA		24112	EM
5.900	0001	Madio Kitia	1104	- ! From	44333	H	0700-0800						
5.920	0007	Padia Minak	USA	cng	33332	014/	6,155	0700	ORF Radio Austria Int.	AUT	Ger	55555	PP
5.970	0212	Radio Willisk Radia Housea Cuba	BEL	Eng	04400	<u>BVV</u>	11.600	0747	Radio Bulgaria	BUL		44232	EM
6,000	0411	PPC World Camino	CUB	- En a	20232	CINI	11.760	0746	BBC World Service	G/CYP	Eng	44454	JP
G.005	0911	Chine Redin let	CUM	Eng	· 44334	GWV	11.765	0752	BBC World Service	G/ASC	Eng	33543	MC
6.020	0/12	Vaice of Turket	TUP	Eng	00040	CIAL	11.855	0705	China Radio Int.	CHN	Ger	55555	PP
6.025	0320	Volce of America	AQUI	Eng	00400	CIA	13.600	0746	Radio Bulgaria	BUL		45344	EM
6.045	0045	Doutscho Walle	D	Eng	40004	CIAV	0800-0900						
6.055	0043	Padia Exterior do Econo	r r	Eng	00000	CIAL	5.825	0813	WEWN	USA		44232	EM
6.065	0500	Swedish Badio Int	C C	Eng	50445	DP	5.965	0806	Radio Vlaanderen Int.	BEL		55354	EM
6 115	0333	Radio Tirana	ALR	Eng	E2445	C)A/	6.140	0856	Deutsche Weile	D	Eng	44344	GW
6 1/10	0108	Radio Romania Int	ROLL	Eng	11111	EU	6.855	0820	WYFR	USA	Eng	44333	ShH
6 145	0100	Radio tanan	nuu	Eng	22242	ENA	7.345	0807	Radio Prague	CZE		35444	EM
6165	0102	Radio Nederlande	LOI	Eng	AAAAA	ELI	9,880	0807	Radio Prague	CZE		44444	EM
165	0102	Radio Nederlands	HOL	Ling	33232	EB A	11.855	0810	China Radio Int.	CHN	Eñg	55435	GW
6 200	0215	Radio Praque	CZE	Eng	55455	CIAL	12.005	0830	Voice of Russia	RUS/ARM	Eng	45555	MC
6.200	0255	Radio Prague	CZE	Eng	E ADAA	CIA	15.085	0810	V. of Islamic Rep. Iran	IRN	Ara	34433	VP
7 115	0102	In P of Sarbia & Mant	SCC/DILL	Eng	194044	GIV	15.225	0845	KTWR	USA/GUM	Eng	34333	ShH
7.160	0112	Rodin Tachkont	117P	cng	20122	Ch i	15.350	0840	Voice of Turkey	TUR	Tửr	55545	VP.
7 190	0214	Voice of Russia	DUC	Eng	23122	CIVE	15.630	0840	Voice of Greece	GRC	Gre	35433	VP
7 100	0214	Voice of Russia	nus pue	Elig	00000	GVV	17.490	0811	China Radio Int.	CHN	Eng	45243	FM
7.100	0/22	Voice of Russia	RUS	Eng	55445	CIA	17.510	0845	All India Radio	IND	Hin	24422	VP
7.100	0432	Voice of America	105	Eng	22222	CIANA	17.630	0830	Africa No 1	GAB	Frie	35433	VP
7.200	0502	Voice of America	USA	EUg	33333	FH	21,530	0825	Voice of Greece	GRC	Gre	55555	·VP
7 200	0114	Deutsche Wene	CUV	ng	55555	UB	- 21.620	0830	Radio France Int.	F	Gre	55555	VP.
7,200	0212	Dadia Caira	DVA		00000	ENI	21,660	0835	BBC World Service	G/CYP	Ara	35423	VP
7.200	0504	Tubicion redio	TUAL	A	31432	EM	0900-1000			0/011		00100	- m
7 200	0304	Canadian Dadia	TUN	Ara	33343	UB	5.825	0915	WEWN	LISA	Eno	55434	BC
7.290	0002	Unice let	UHU	Eng	34223	GVV	5.860	0940	WHRI	USA	Ara	54434	BC
7.300	0020	Volice III.	AUS	Eng	33333	FIM	9.885	0940	Badio New Zealand Int	NZI	Foo	44333	RC
7.000	0000	Vatican Radio	UVA	Eng	55444	GW	17,490	0900	China Badio Int	CHN	Eng	54444	ShH
7.400	0000	Radio Bulgaria	BUL	Eng	50055	GVV	17 535	0900	Kol Israel	ISB	Heh	45544	VP
7.400	0325	Hadio Bulgaria	BUL	Eng	55555	GVV	17 555	0930	Voice of America	LISA/MRC	Eng	55445	B
7 440	0110	Radio Ukraine Int.	UKH	-	24122	EM	17 875	0930	All India Badio	IND	Hin	24322	VP
7.440	0403	Hadio Ukraine Int	UKR	<u>Eng</u>	55345	GW	21 620	0945	Badio Sobl	LISA/G	1.011	55555	BC
7.445	0123	Hadio Ukraine Int.	UKH	, Eng	54434	GW	1000-1100	0010	Hours out	O'ON' GI		00000	0
1.535	0100	WHRI	USA	-	44334	BC	- 5.825	1045	MARIAN	AZLI	Eng	33727	01
1.545	0044	Kol Israel	ISR	Eng	55445	GW	5 860	1040	W/HBI	AZU	Eng	12222	DI
/.580	0059	WHRA	USA		44334	BC	5.885	1032	Vatican Radio	CVA	Eng	40000	DI
/.580	0303	WHRI	USA	Eng	55445	GW	6 120	1015	Badio Japan	1 Ce VIII	city	44333	DV4
9.555	0033	V. of Islamic Rep. I an	JRN	Spa	44444	EM	9 590	1051	Badio Australia	ALIS		24122	Chi
9.700	0001	Hadio Bulgaria	BUL	Eng	55555	GW	9.790	10/7	Radio Mederlande	LIDI	Eng	24122	CIVI TIA/
9./75	0210	Hadio Budapest	HNG		25122	EM	9.885	1025	Radio New Zealand in	NZ	Eng	26222	CoC.
11.870	0355	Hadio Remania Int.	ROU	Eng	55444	GW	9.895	1025	Radio Mederlands	HOL	Dut	30333	TNA
							1.1.1.1.1.1	a supervise a	A STATE OF A	1.11.11		A CANADA COL	P. 1014

MHz 11 740	UTC	Service Vatican Barlin	Country	Lang	SINP0	SWL	MHz 21 455	UTC 1315	Service HCJB	Country EQA	Lang Eng	<b>SINPO</b> 43333	SWL
12,065	1052	Radio Nederlands Voice of Mongolia	HOL	Eng	44444 25122	TW	21.470 21.850	1345 1310	BBC World Service Vatican Radio	G/ASC CVA	Eng	44333 34434	8C TW
12.095	1030	BBC World Service	G	Eng	44444	ShH	1400-1500	1/128	NoweRadio 098	SMG	Eng	43343	EM
13.720	1030	Radio Exterior de Espana	E	Spa	55555	VP	7.405	1408	China Radio Int.	CHN	Eng	25333	MC
13.730 13.840	1030	IRRS			45243	EM	9.475	1450	Voice of America	USA/PHI	Eng	25433	MC
15.415 15.585	1049	Radio Australia Radio Exterior de Espana	AUS	Spa	24222 55555	EM VP	<u>9.725</u> 9.795	<u>1403</u> 1430	Radio Thailand China Radio Int	CHN	Eng	44242 54444	EM DB
15.595	1032	Vatican Radio	CVA	Heh	44444	TW	11.660	1440	Radio Australia	JOB	Eng	44333	BC
17.490	1048	China Radio Int.	CHN	Eña	44433	TW	13.610	1410	China Radio Int.	CHN	Eng	54444	BC
17.515	1005	Vatican Radio	CVA	CIRC	44444	TW	15.120	1445	Voice of Nigeria	NIG	Eng	43444	FM
17.585	1025	Radio Japan Radio Japan	J	Eng	<u>55445</u> 44444	ShH	15.310	1400	BBC World Service	G/THA	Eng	45454	JP
17.835	1000	Radio Pakistan All India Radio	IND	Urd	<u>35423</u> 44334	TW.	15.595 15.760	1414 1424	Radio Nederlands Kol Israel	ISR	Heb	34333	PP
21.455	1048	BBC World Service	G	Ara	33333	TW	17.535	1426	Kol Israel High Adventure Radio?	ISR USA	Heb Enc	554 <b>55</b> 54444	PP PP
21 705	1025	Saudi radio	ARS	?	53444	VP	18.820	1425	Radio Canada Int.	CAN	Eng	44334	BC
<b>21</b> ,820 <b>2</b> 1,840	1032	Deutsche Welle	D	Ger	44444	TW .	21.600	1435	Saudi radio	ARS	- opa	55445	BC
<u>5.815</u>	1105	World Music Radio	DNK		35433	GeG	21.745	1400	Radio Prague	CZE -		55555	EM
5,955 6.005	1106	Radio Nederlands Deutschland Radio	D	Dut Gër	<u>44434</u> 34232	RI	1500-1600 6.145	1505	Deutsche Welle	D	Eng	55455	PP
6.025	1111	Radio Budapest	HNG	Hun	34222	BI	9.440	1510	China Radio Int. Badio Australia	CHN	Eng	44344	FW
6.085	1125	Bayerischer Rundfunk	D	Ger	44343	RI	9.480	1517	Radio Australia	AUS	Eng	34333	PP
6.165	1128	Croatian Radio	HRV	Cro	24333	RI	9.545	1525	Deutsche Welle	D	Ger	55445	PP
6.190 6.890	1131	Deutschlandfunk WYFR	D USA	Ger	34343 35232	EM	9,940 11,520	1530 1500	V, of Islamic Hep. Inan Radio Fiee Asia	USA/ARM	Eng	43334	BC
9.375	1109	Voice of Greece	GRC	Cro	45243	EM	<u>11.660</u> 11.690	1520	Radio Australia Radio Jordan	AUS	Fin	44323 54434	GW
11,620	1135	Ali India Radio	IND	Eng	44334	BC	11.755	1530	YLE Radio Finland	FIN	Eng	55545	VP
13.665	1135	China Radio Int.	CHN/ALB	Eng	55555	FW	13.570	1555	WINB	USA	Eng	23332	FM
<u>13</u> .830 13.840	1127	Croatian Radio IRRS	CRO	Eng	25332 33333	SH ShH	13.65 <u>5</u> 15 <b>225</b>	1535	Adventist World Radio	USA/UAE	Eng	25233	EM
15.100	1 00	Radio Pakistan Radio New Zealand Int	PAK	Eno	34343	EM	15.530 17.560	1530	Sudan Radio Service WHBA	USA/G USA	Eng	44444	ShH
15.630	1107_	Voice of Greece	GRC	Mix	35333	EM	17.770	1524	Channel Africa BBC World Service	AFS	Eng	35233	EM
17.490 17.835	1100	Radio Pakistan	PAK	Eng	44444	ShH	17.870	1515	Radio Rhino Int.	D	Eng	15432	MC
21.455	1139	HCJB BBC World Service	EQA G/SEY	Eng	24333 24332	RI	<u>1600-1700</u> 6.125	1624	Voice of Russia	RUS	Eng	55445	GW
21.480	1147	Voice of America	USA 1BY/F	Ara	24332	RI BI	7.290	1620	Voice of Russia Xizang - Tibet	_ RUS CHN	Eng	54545 2444 <b>2</b>	MC
21.495	1154	Saudi radio	ARS	Ara	34333	RI	9 560	1645	Radio Ethiopia	ETH LISA/GBC	Eng	22332	FM
21.540	1157	RTBF	BEL/D	Fre	33332	RI	9.760	1610	Voice of America	USA/PHL	Eng	43334	BC
21.745 21.800	1140	Radio Prague YLÉ Radio Finland	FIN	Eng Fin	44444	TW	9.955	1625	V, of Islamic Rep. Iran	IRN	Eng	44333	FM
21.840	1125	Deutsche Welle	D	Ger_	15521	SH	11.615	1632	Radio France Int. Radio Jordan	JOR	Eng	44343	GW
5.955	1250	Radio Nederlands	HOL	Eng	55555	08	11.860	1638	BBC World Service	G	Eng	22222	EM
9.475	1206	Radio Australia	AUS	1 114	34232	EM	13.655	1605	Radio Canada Int.	CAN	Eng	33323	HB
11.700 11.880	1233	Radio Bulgaria Radio Australia	AUS	Eng	55454 4 <b>2</b> 242	EM	13.700	1645 1640	WEWN	USA	Eng	44444	ShH
11.980	1210	China Radio Int. Voice Int	CHN		24222	EM EM	17.550 17.650	<u>1625</u> 1624	WHRI	USA	Eng	44233	EM
13.685	1207	Voice Int.	AUS	Eng	43243	EM	17.820	1606	Radio Canada,Int.	CAN CHN/MU	Eng	42432	HB
13.790	1210	China Radio Int.	CHN	city	52553	EM	17.895	1654	Voice of America	USA/BOT	Eng	24232	RI
15.190 15.275	1201 1200	BBC World Service Radio France Int.	FIN		44243	EM	18,930	1641	WYFR	USA	Ita	25122	EM
15.425	1204	HCJB BBC World Service	EQA		42332	EM	18,980	1647	Family Radio WYFR	USA	Eng	343 <u>33</u> 4433 <u>3</u>	TW
15.575	1213	BBC World Service	G	Eng	34222	EM	21 470	1644	BBC World Service Badio Japan	G/ASC	. Eng	24433	RI
15.675	1205	Radio Ukraine Int	UKR	Eng	45434	GeG	1700-1800	1755	Morld Music Padio	DNK	Eng	AAAAA	FM
15.700	1227	China Radio Int.	CHN	Eng	54454_	EM	5.855	1735	Trans World Radio	MCO/AHM	City_	34233	EM
17,535	1210	Kol Israel Radio Cairo	ISR EGY	Heb	55445 25232	EM	<u>5.930</u> 5.960	1700	R DMR (Dniester Moldovan	Rep) MDA	Eng	32431	SH
19.010	1219	Voice of America Radio France Int	USA	N4i=	25212	EM,	5.960 6.025	1711 1745	Radio Pridnestrovve Radio Budanest	HNG	Eng	<u>33442</u> 54445	BC
21.600	1202	Saudi radio	ARS	Ara	44344	R	6.055	1753	Radio Slovakia Int.	SVK	Eng	35332	MC .
21.620	1204	Radio France Int.	F	Eng	34333	RI	9.345	1740	Kol Israel Rible Voice Metworth	ISR	Heb	54434	VP FM
21.640	1211	Saudi radio RDP Portugal	POR	Por	44444 34222	RI	9.460 9.645	1705	Vatican Radio	CVA	Eng	55545	MC
21 660	1221	BBC World Service	G/THA LBY/F	Chi Ara	33332 22322	RI	9.895 11.615	1708	Radio Nederlands Radio Erance Int.	F	Eng	43333 23221	SH
21,700	1228	Radio Exterior de Espana Bodio Procuo	E	Spa	34433	RI BI	11.675	1700	Adventist World Radio Deutsche Welle	USA D	Ger	33333 34 <b>233</b>	TW VP
21.745	1229	Radio France Int	F	Fre	44334	RI	15.285	1716	Channel Africa Badin, Japan	AES.	Eng	44444	FM
21.80	1236 1 <b>2</b> 40	PLE Radio Finland Deutsche Weile	D	Ind	24333	Rit	15.695	1705	WEWN	USA	Eng	45444	GeG
1300-1400	1335	Kol Israel	ISR	Heb	45454	JP.	17.595	1721	WHRA	USAVUAE	Eng	44333	FM
6.110	1305	Voice of America	USA/PHL D	Eng	33453 42353	JP	17.690 17.715	1713 1710	Family Radio Radio Exterior de Espana	E	Spa	24322	RI
130	1300	Deutsche Welle	D	Eng	44444	DB	17.760	1708	Family Radio BBC World Service	USA G/ASC	Ger .	44434 23332	RI
9.525	1325	Radio Polonia	POL	Eng	55555	DB	21.455	1707	WYFR	USA		25212	EM
9.645	1325	Radio Australia Deutsche Welle	AUS D	Eng	33333 54454	DB	1800-1900	1831	Radio Bulgaria	BUL.	Eng	45455	MC
9.645	1304	Vatican Radio Badio Tashkeot	CVA UZB	ita Lbb	44444	DB	<u>5.850</u> 5.910	1831 1830	Radio Canada Int. Radio Vlaanderen Int.	BEL	Eng	44 <b>2</b> 22	EM
9.760	1330	Voice of America	USA	Eng	33333	TVV	5.915	1850	Radio Slovakia Int. Badio Pranue	SVK	Eng	44444 555 <b>55</b>	VP VP
9.770	1306	Radio New Zealand Int.	NZL		25222	EM	5.955	1815	Voice of Vietnam	VTN/AUT	Eng	44444	ShH
11.550	1325 1302	Swedish Radio Int. BBC World Service	S G/OMA	Sw/e Eng	44444 13431	MC	6.055 6.065	1820	Swedish Radio Int.	SVK	Eng	55545	VP
11.850	1310	Radio Polonia	POL	Eng	35544	FW	6.195	1830	BBC World Service Radio Romania Int.	ROU	Eng	<u>44423</u> 55545	VP
13.610	1 <b>3</b> 44 1 <b>3</b> 25	China Radio Int	CHN	Eng	54444	HB	7.185	1826	Radio Bangladesh Badio Bangladesh	BGD	Eng	33442	MC VP
13.685	1327	Voice Int. Radio Romania Int.	ROU	Eng	35433 44344	PP.	7.185	1813	Radio Polonia	POL	41.13j	43443	EM
15.155	1346	Voice of Turkey	TUR		55555 45333	EM	7,270	1812	Trans World Radio	MCO/ALB	Får	34343	VP
15.240	1341	Swedish Radio Int.	S	Swe	55555	EM	7,490	1844	Radio Vlaanderen Int Kol Israel	BEL/RUS ISR	Eng	35544 44434	FM
15.825	1350	WWCR	USA	Eng	45333	HB	9.410	1830	BBC World Service	S	Swe	55534	VP VP
17.745	1314	Radio Romania Int. OBE Badio Austria Int	AUT	Eng	43243	EM	9.445	1815	Trans World Radio	MCO/SW.	2	25232	EM

#### DONRAKER

#### Manufacturers of radio communication antennas and associated products

Scanner Base Verticals		G ing Mobile	
SUPERSCAN STICK I (WIDEBAND) "FE0.0-2000 MHZ "LENGTH:100cm "SOCKET SO239 "RADIALS: 3X17cm SUPERSCAN STICK II (WIDEBAND) "FREQ.0-2000 MHZ "GAIN:3.004B OVER SSSI "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:30 (AIR BAND) "FREQ.CIVIL & MILITARY AIR "GAIN 2.0:60dB "LENGTH.100cm "SOCKET:SO239 "RADIALS:3X17cm AP.50 (AIR BAND)	629.95 £600p+p £39.95 £600p+p £39.96 £600p+p £49.95	G.SCAN II MOBILE (WIDEBAND) TYPE TWN COIL *FREO 25-2000 MHZ *LENGTH: 65cm *BASE:MAGNETIC *CABLE: 4m WITH BNC SKYSCAN MOBILE (WIDEBAND) TYPE 4 TUNED WHIPS *FREO:25-2000 MHZ *LENGTH:65cm *BASE MAGNETIC *CABLE 4m WITH BNC Don't loose those signals while on the move, get high performance reception where ever whenever. Portable Antennas	15 30+0 15 30+0
<ul> <li>*FREQ:1-50 MHZ *LENGTH 200cm *SOCKET.SO239</li> <li>*RADIALS: NOTAL 200cm *SOCKET.SO239</li> <li>*RADIALS: 3X50cm These dedicated fibreglass external antennas are pre-tuned for both air band frequencies. Get the gain and don't miss take off:</li> <li>X1-MF VERTICAL (DEDICATED MF)</li> <li>*FREQ:1-50 MHZ *LENGTH 200cm *SOCKET.SO239</li> <li>*RADIALS:NOVIE</li> <li>This MF vertical antenna incorporates helical traps and is an ideal afternative to a long wire.</li> </ul>	£49.95 £6009*p	SKYSCAN DESKTOP (INTERNALWIDEBAND) £49.9 'TYPE DISCONE STYLE' 'FREO 25-2000 MHZ' £6.00 'LENGTH:90cm' 'CABLE 4m WITH BNC TRI SCAN III DESKTOP (INTERNALWIDEBAND) £39.9 'TYPE. TWIN COIL 'FREO 25-2000 MHZ 'LENGTH. £6.00 90cm 'CABLE 4m WITH BNC SWP-2000 (GLASS MOUNTAVIDEBAND) £29.9 'TYPE. SUCTION MOUNT 'FREO 25-2000 MHZ LENGTH:55cm 'CABLE 4m WITH BNC SWP 4F500 (GLASS MOUNTAVED HF) £39.9	95 Dp+p 95 Dp+p 95
Discone Base Antennas		*TYPE SUCTION MOUNT *FREO.HF 0.05-30 MHZ *LENGTH: 80cm *CABLE:4m WITH BNC	jo•p
STANDARD DISCONE (WIDEBAND) "FREQ:25-1300 MH2 "LENGTH:100cm "SOCKET.SO239 "RADIALS: 16 SUPER DISCONE (WIDEBAND) "FREQ:25-2000 MH2 "GAIN:3.004B OVER STANDARD "LENGTH:140cm "SOCKET:SO239 "RADIALS:16 HF DISCONE (WIDEBAND:HF SENSITIVE) "ERED:0.05.2000 NH72 "LENGTH:185cm "SOCKET.SO239	£29.95 £6 00p*p £39.95 £6 00p*p £49.95 £6 00p*p	MAX-5 ACTIVE (INTERNAL/EXTERNA	io Jp+p
RADIALS: 16 ROYAL DISCONE 2000 (MDEBAND/STAINLESS)	<b>q</b> +q00∂2		
*FREQ RX 25-2000 MHZ FREQ TX 50-52 144-146 430-440 900-906 1240-1325 MHZ *LENGTH: 155cm GAIN:4 5dB OVER STANDARD *SOCKETN-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. Chose the best one for your station or call us for advice.		Shortwave Wire Antennas MWA-HF MKII (EXTERNAL DELUXE HF ANTENNA) "TYPE WIRE BALUN MATCH "FRED 0-40 MHZ "LENGTH. 25M "CABLE: 10m WITH PL259	,95 0p+p
Beam Antennas		HF ANTENNA) TYDE BALLIN MATCH SEPECO.40	95 0p+p
MLP-32 (LOG PERIODIC) "FREQ:100-1300 MH2 TX & RX "GAIN 11-13dB "LE NGTH:140cm "SOCKET: N-TYPE MLP-62 (LOG PERIODIC) "FREQ:50-1300 MH2 TX & RX "GAIN 10-12dB "LENGTH 300cm "SOCKET: N-TYPE	£99.95 £6 00p+p £169.95 £6 00p+p	MHZ "LENGTH 25M "CABLE:10m WITH PL259 LONG WIRE BALUN (ON ITS OWN) £19.9 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.	95 0p+p
These two beam antennas are sold mainly to our military & commercial		Handheld Antennas	
over the whole frequency, for performance it just doesn't get better. AR300XL Rotator for both anternas	£49.95 £6.00 P+P	MRW-100 (SUPER GAINER BINC)         £19.9           *FREO: 25-1800 MHZ *LENGTH:40cm *FITTING:BINC         £2.00           MRW-210 (SUPER GAINER SMA)         *FREO: 25-1800MHZ *LENGTH:40cm *FITTING:SMA         £22.9           *FREO: 25-1800MHZ *LENGTH:40cm *FITTING:SMA         £22.9	95 Op+p 95 Op+p
Getting Rigged Up		Gront and 2 Dant mire and Get a Score Gainer	
We have a massive shock of all mounting hardware products, brackets, p cables & connectors etc. Phone, email, or check the Web for details !! Remember we can make up any cable leads. Filted with connectors of your of	choice at	Something Extra	
ROYAL DOUBLE DISCONE 2000 FREQ RX: 25-2000 MHz FREQ TX: 130-175/410-475 MHz GAIN:5.5dB LENGTH:150CM SOCKET:N-TYPE This artenna has a superior wideband coverage for received low SWR match right across the VHF and UHF spectrum	PRICE 2.95 PRICE 95 c with a	TURNSTILE 137 (DEDICATED WEATHER SATELLITE) 'FREC:137.5 MHX "LENGTH: 100cm "SOCKET.SO239       £39.9         "FREC:137.5 MHX "LENGTH: 100cm "SOCKET.SO239       £6.00         "RADIALS:4       For use with receiving weather satellite pictures. MRP-2000 (ACTIVE WIDEBAND PRE-AMPLIFIER)       £49.1         "CABLE:1m BNC-BNC       CABLE:1m BNC-BNC       £6.00         "FRED:137.5 MHZ "GAIN 25.0dB "POWER:9-15y"       £6.00         "CABLE:1m BNC-BNC       £44.9         "CABLE:1m BNC-BNC       £6.00	95 Op+p .95 Co+p 95 Op+p
WWW.SCANNERANTENNAS.CO	DM	CALL MAIL ORDER 01908 28170	)5
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#### SWM, March 2005

MHz 9.510	<b>UTC</b> 1830	Service Trans World Badin	Country MCO/AFS	Lang	SINPO	SWL	MHz	UTC 1	<ul> <li>Service</li> <li>Badia Romania Int</li> </ul>	Country BOU	Lang	SINPO	SWL
9.690	1810	Voice of Nigeria	NIG	Cor	34233	EM	6.035	2105	Radio Japan	100	0	44142	EM
9.780	1845	Republic of Yemen Radio San'	a YEM	Eng	24333	FM	6.090	2140	Radio Japan	ل ا	Ger	22222	EM_
9.950	1806	All India Radio	IND	Eng	34333	FM	6.235	2136	Voice of Russia Badin Romania Int	BOU	Mix	22222	TW
11.980	1825	Voice of Vietnam	VTN	Eng	43333	BC	6.280	2138	Kol Israel	ISR	Heb	34333	TW
15.240	1835	BBC World Service	G/ASC	Eng	24422	Nb RC	7.185	2130	Radio Romania Int. Radio Tashkent	UZB	Eng	43323	ShH FH
1900-2000 5 800	1910	Radin Bulgaria	BUI	2	2/222	pp	7.190	2150	China Radio Int.	CHN	Eng	33333	TW VR
5.895	1914	Voice of Russia	RUS	Rus	32323	PP	7.300	2100	Voice of Russia	RUS	Eng	55545	VP
5.915	1939	Radio Slovakia Int. ORF Radio Austria Int	- SVK AUT	Eng ?	44444	HB PP	7.360	2141	Family Radio Voice of Greece	GBC	Eng	55445 55534	GW VP
5.955	1928	Voice of Vietnam	VTN/AUT	Eng	45444	MC	7.555	2135	Radio Ukraine Int.	UKR	Ger	55555	VP
6.010	1936	Radio Sri Lanka	CLN	rre	34222	EM	9.390	2100	Kol Israel	ISR	Heb	45323	VP
6.035	1915	Voice of America RAI	USA/STP	Eng	43333	BC FM	9.445 9.540	2101	All India Radio Radio Romania Int	IND BOU	Eng	22222	TW EM
6.035	1936	RAI		Eng	24332	SH	9.615	2151	Deutsche Welle	D	Eng	33333	FH
6.075	1931	Deutsche Welle	DW	Ger	44444	PP	9.830	2152	Adventist World Radio	USA	Eng	35544	HB
6.085	1933	Bayerischer Rundfunk	D SCG/BIH	Ger	55555	PP MC	9.990	2115	Radio Cairo Radio Brasil Central Goias	EGY	Por	45343	EM
6.110	1945	V. of Islamic Rep. Iran	IRN	Eng	33443	MC	15.345	2150	RAE Buenos Aires	ARG	Spa	34333	FM
6.165	1945	Croatian Radio	HRV	Eng	43443	FH	17.680 2200-2300	2140	Voz Cristiana	CHL	Eng	24332	FM
6.195		BBC World Service	G	Eng	34343	HB	5.800	2200	Radio Bulgaria Chica Badio lot 2	BUL	Eng	54444	ShH
6.235	1900	Voice of Russia	RUS	Eng	54445	BC	5.800	2252	Radio Bulgaria	BUL	Eng	55455	GW
<u>6.400</u> 7.120	1910	Radio Tohl ( Pirate) Radio Nederlands	HOL	Eng	33333	FM FH	5.840	2235	Radio Ukraine Int Radio Prague	CZE	Eng	45333	FH .
7.140	1945	Radio Romania Int.	ROU	Ger	55444	VP	6.025	2225	Radio Budapest	HNG .	Hun	5545	DB
7.215	1945	Voice of Russia	RUS	Fre	54434	VP	6.100	2222	Ind. R. of Serbia & Mont,	YUG	Eng	35433	EM
7.275	1950	Radio Exterior de Espana Voice of Vietnam	E VTN	Spa	23332	HB	6.155	2230	ORF Radio Austria Int. Croatian Radio	HRV	Eng	55555 54444	DB .
7.295	1900	China Radio Int.	CHN	Eng	42343	VP	6.195	2236	BBC World Service	G	Eng	55444	DB
7.345	1951	Radio Slovakia Int.	SVK	Eng	44434	VP	6.225	2245	Kol Israel	ISR	Heb	25343 44444	TW
7.365	1945	Vatican Radio	CVA	Lat	55534	VP	7.120	2230	Radio Tirana BTM Morocco	ALB	Eng	43333	ShH
7.430	1948	Voice of Greece	GRC	0110	55243	EM .	7.170	2220	China Radio Int.	CHN/RUS	Eng	35555	EW .
9.375	1900	Swedish Hadio Int. BBC World Service	G	Swe	45445	MB H	7.210	2241	Voice of Russia	TUN	Ara	53444 34343	DB
9.445	943	All India Radio	IND	Eng	44444	FH_	7.275	2245	Radio Exterior de Espana	E DI D	Spa	45444	DB
9.555	1910	Saudi radio	ARS	Ara	55343	VP	7.410	2200	All India Radio	IND	Eng	45534	VP
9.655	1910	Deutsche Welle Radio Exterior de Espana	D E	Spa	43333	VP	7.450	2230	ERT 3 Radio Bulgaria	GRC	Gre	55555	VP VP
9.680	1919	Christian Voice	G/SNG	Eng	34232	EM	7.535	2243	WHRI	USA	Eng	35444	FW
9.965	1935	Voice of Armenia	ARM	Eng	55444	HB	7.935	2250	China National Radio	CHN	Chi	22222	VP
11.630	1925	RDP Portugal Badin Nederlands	POR	Por	45434	VP FM	9.355	2240	Radio Taiwan Int. Voice of Greece	GBC	Eng	45555	FW DB
11.865	1939	Deutsche Welle	D	Eng	33323	HB	9.445	2213	All India Radio	IND	Eng	33333	FH
15.105	192	BBC World Service	G	Eng	35232	HB	11.620	2200	All India Radio	IND	Eng	22222	RH
15.565	1910	WYFR BDP Portugal	USA	Eng	44334	BC	13.620	22.43	Radio Australia	AUS	Eng	22222	FH
17.885	1922	BBC World Service	G	rut	25132	EM	5.840	2342	Voice of Russia?	RUS	?	44433	RI
18.980 2000-2100	1910	WYFR	USA	Eng	33223	BC	5.865	2348 2351	BBC World Service	GRC	Ara	44434	RI
5.775	2034	IRRS Padia Six Int	64	Eng	35333	HB	5.885	2335	Vatican Radio	CVA	Ita	44444	TW.
5.885	2052	Vatican Radio	CVA	Eng	45555	FW	5.930	2335	Radio Prague	CZE	Eng	35555	FW
5.945	2016	ORF Radio Austria Int. China Radio Int.	CHN	Ger Eng	34433	SH MC	5.945 5.955	2301	URF Radio Austria Int. Voice of Turkey	TUR	Eng	44434	GW
6.025	2010	Radio Budapest	HNG	Eng	43433	SH	5.960	2335	Voice of Turkey	TUR	Eng	55555	FM
6.055	2015	Voice of Turkey	TUR	Eng	35544	FW	6.135	2340	Radio Romania Int	ROU	Eng	35544	FW
6.075	2055	V of Islamic Rep. Iran	IBN	Ger	35433	MC VP	6.140 6.150	2318	Radio Romania Int. NewsRadio 938	SNG	Eng	55435 33333	GW FM
6.145	2001	Voice of Russia	RUS	Eng	44343	MC	6.165	2330	Adventist World Radio	USA/ATN	Spa	35544	FW.
6.195	2030	BBC World Service	G/CYP	Eng	35544	FW	7.285	2325	Croatian Radio	HRV	Eng	44343	EM +
6.235	2014	Voice of Russia	RUS	Eng	34322	TW	9.320	2327	WINB	USA	Eng	25444 34555	FW
6.280	2016	Kol Israel	ISR	Eng	33333	TW	9.550	2340	Radio Havana Cuba	CUB	Eng	25343	FW
7.105	2053	Radio Nederlands	HDL/MDG	Eng	33442	MC	9.855	2330	Radio Kuwait	KWT	Ara	25544	FW
7.130	2000	China Radio Int.	- CHN TUR	Ser	55434	VP	<u>9.870</u> 12.035	2345	ORF Radio Austria Int. Deutsche Welle	D	Eng	35555 44334	FW
7.180	2045	China Radio Int	CHN	ita	55555	VP							
7.1857.190	2047	China Radio Int.	CHN	Eng	33333	FH	DXers:-		FM Freddy M	cGavin	RI	Rhoderic	k Illman
7.225	2050	Tunisian radio Vatican Badio	CVA	Ara Eng	55534 33333	TW TW	BC Berna	ard Curtis	GW Graham V	White	SI	H Sheila Hi	ughes
7.280	2030	Voice of Vietnam	VTN	Eng	55534	VP	CH Charl DB David	es Hendry 1 Bulliack	HB Henry Bri JP John Parr	CB TV	SI	hH Simon Ho N Thomas V	ockenhull Williams
7.285	2032	China Radio Int.	CHN/ALB	Eng	13442	MC	EM Eddie	McKeown	MC Michael (	Casey	VI	P Vic Prier	
7.330	2045	Voice of Russia Family Radio	RUS USA/MDA	Eng	54444	 FM	HH Franc	cis Hearne	PP Peter Poli	lard			
7.410	2025	All India Radio	IND	Hin	54434	BC							
9.375	2035	BBC World Service	G	Eng	33323	TW							
9.420	2050	Voice of Greece	GRC	<u>Gre</u>	55555	GeG							
9.535	2035	Radio Thailand	THA	Eng	45444	GeG	Equipm	ent Use	ed:				
9.595	2035 2028	China Radio Int.	CHN	Eng	44434	FM	Bernard Curt	is • Realistic	DX-390 + outdoor wire				
9.630	2000	BBC World Service	G/SEY	Eng	44323	VP FH	Charles Hend	dry - Sony ICI	F-M400L				
11.655	2023	Radio Nederlands	HOL	Eng	44444	FH	Eddie McKec	k - Sangean own - Grundi	ig YB400 + whip				
12.025	2005	Adventist World Radio Deutsche Welle	D/CLN	Eng	25343	FW	Francis Hear	ne - Sharp W	VQT370 or Yaesu FRG-7 Vega Selu ublin - Roberts BC828 + indeer with	ena + wire re			
12.085	2020	Radio Damascus	SYR	Eng	25322	SH	Geraint Gill -	Grunding YE	8400 + whip				
15.240	2015	Voice of America	USA	Eng	44444	FH	Graham White - Icom ICR2 + dipole Henry Rrice - Roberts R9914						
15.295	2000	Adventist World Radio BBC World Service	G/ASC	Eng	33222	ShH	John Pary, Cyprus						
2100-2200	04.40	000		Ere	AAAAA	Shu	Peter Pollard	I - Sony ICF20	001D + whip	or outdor 75	ni niverted	arpoid	
5.775	2125	WYFR	USA	Eng	25444	FW	Rhoderick III	man - Kenwo	cod R5000 + wire or Sony AN1 7030 + RE Systems antenna				
5.840	2125	Radio Ukraine Int. Radio Canada Int	UKR	Ger	34333	PP PP	Sheila Hugh	es - Panason	ic DR48 or Sony ICF7600DS + 16r	m outdoor wire	e or home-b	rew loop	
5.890	2120	Radio Bulgaria	BUL	Fre	44444	PP	Simon Hocke Thomas Will	enhull - Grund liams - Grund	aing YB400 + whip dig YB400 or <b>YB</b> 206				
5.925	2130	Radio Prague	CZE	Eng	54444	ShH	Vic Prier - Fa	irhaven RD50	00VX + Datong AD-270 or vertica	I			
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Greg Baker PO Box 3307, Manuka, Australia

Bandscan

• E-mail: greg@worldgraphics.com.au

ince I last wrote, Australia has had federal elections at which the conservative Liberal National Party coalition romped home again, this time with an increased majority. The most interesting thing about this is that the government has managed to wrest control of the Senate from anti-conservative forces. This is a rare event in Australia and will occur (because of the way the Senate election process works) from 1 July 2005.

This, it is widely believed, will lead in the latter part of the year to the complete sale of the now partly-privatised national telecommunications carrier Telstra and a change to Australia's restrictive media ownership laws. This latter is significant for Australia's domestic commercial radio operators as it is expected that there will be a flurry of ownership changes.

However, commentators do not expect the UK Daily Mail and General Trust (DMGT) group to sell DMG Radio Australia. They believe that current profits are not sufficient for DMG to command a good selling price so will stay put. However, there are reports that DMGT will be looking to other media assets to buy after the laws are changed.

#### **Bushfire Radio**

Australia's bushfire season is well and truly underway again with devastating fires, particularly in Western Australia and South Australia taking lives, property and livestock. In this context, the South Australian government has let contracts to provide 425 Country Fire Service brigades with v.h.f. radio equipment to manage local area communications.

Readers of this column may remember that much bushfire brigade radio communications were to go to state-based trunk radio networks. Well, it seems there is still a need for fire ground control which has been neglected in the process. The contract will involve the provision of 1800 hand-held transceivers and a thousand vehicle mounted units over a five-year period. The company providing the hardware sees this as a lucrative niche market now the bigger players have deserted it for long-distance trunked radio systems.

Australia

The same company, Tetracom, has also provided equipment to a 17-site network linking Aboriginal communities in South Australia's remote north-west and radio facilities for the Alice Springs to Darwin railway project.

#### Tsunami

The devastating effects on life and property of the Boxing Day tsunami in this part of the world have started to move back off our newspaper front pages. But many things remain to be done and many questions remain unanswered.

One question being raised is the role that Radio Australia could have played in disaster mitigation. The organisation known as Friends of the ABC has suggested that had Radio Australia been transmitting from its old site on the Cox Peninsula near Darwin many lives could have been saved with some advance warning (*SWM* readers will recall that the current government closed this facility effectively reducing Australia's reach in countries such as Indonesia).

Opposition spokesman for foreign affairs, Kevin Rudd, has taken the opportunity though to press for the re-building of Radio Australia to get Australia's message out throughout the Indonesian archipelago. Rudd has said that it should be a priority to restore funding for RA's Indonesian language broadcasts. He says that Australia has committed to long-term large-scale role in the rebuilding of tsunami affected areas without the broadcast capability to tell local communities what Australia is doing. Also, the industry lobby group Commercial Radio Australia is sending 50,000 a.m./f.m. radio receivers, and engineers, studio equipment and transmitters to affected areas.

Not surprisingly much transmission infrastructure was lost and many people lost access to receivers. Indonesia's public broadcasters are said to have lost 30 employees dead or missing. Radio Republik Indonesia is reported to have set-up a temporary studio in the capital of Aceh province, one of the worst hit areas. Sri Lanka Broadcasting Corporation has also requested f.m. radio receivers and the Maldives is seeking battery-operated receivers. HCJB is reported too to be putting in studios and transmitting equipment in the worst affected areas.

#### **Reception Reports**

Geraid Guest from Dudley in the West Midlands has heard Radio Australia on 9.475MHz at 1100 at SINPO 33233. He has also pulled in Radio New Zealand on 15.530MHz at 1100, 33323 and 9.885MHz at 1000, 34434 and another day at 44334. He reports a clash between Radio Prague, presumably on 9.880MHz at 1100 and RNZI on 9.870MHz.

Martyn Gardiner from Portsmouth hasn't had a lot of joy with RA of late finding that the bands have been very noisy from his QTH. He has managed to catch a positive identification of RA on 9.475MHz at 1810.

Michael Beesley has had pretty good reception of RA from his QTH in Romsey in Hampshire. He has heard RA on 9.475MHz at 1445 rated SINPO 45444 and 1515, 35343; on 9.500MHz at 1930, 25222; on 11.660MHz at 1430, 55544; on 13.630MHz at 0730, 45444; on 15.160MHz at 0730, 43543; on 15.415MHz at 0730, 42542 and on 17.750MHz at 0730, 25432.

Radio New Zealand International has a good signal on 9.885MHz at 0830, 44544 and 0945, 45333; on 11.820MHz at 0530, 44433 and at 0630, 35222 and on 15.530MHz at 1200, 34232. Michael has also received HCJB Australia on 15.390MHz at 1500, 32542 and Voice International on 13.685MHz at 1100, 35522 and 1230, 43543 and on 13.635MHz at 1215, 25332. Michael runs a Sony ICF-2001D and ICF-SW100 with random wire in his loft.

#### **Other News**

The convergence of broadcast systems and information technology has led to a re-structuring of ABC's IT department. The IT department will take over the management of archived audio and video material and will continue with its seven-year program to digitise the vast ABC repository of audio and video recordings.

#### Send Me Your News, Comments and Interesting Snippets!

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

#### E COMPUTERS E RADIO PART 1

It wasn't long ago that the joining of computers and radios for hobby use seemed like a very unholy union. In this new series of features, Jack Weber shows that the combination can be a marriage made in heaven!

> n recent years computer technologies such as digital signal processing, software defined radio and spectrum analysis have opened up a whole new world of possibilities in radio monitoring. Once the exclusive and expensive prerogative of the professionals, these techniques are now available to anyone. And they certainly don't cost a fortune any more.

In this series of articles, I'll be looking at some of the ways that computers can expand and enhance



Fig. 1: A Spectran plot showing All India Radio on 9.875MHz with a weaker unidentified station about 120Hz below it. The block of noise on the right is Radio Kuwait's DRM transmission on 9.880MHz. This plot was obtained with Spectran's default settings, but could be improved with some adjustment.

whatever type of listening you do, with whatever type of receiver you use - even if it's a 50-year old valved radio or a pocket portable. In particular, I'll be spending some time exploring the vast range of observations made possible by modern spectrum analysers. If you have a PC - and it needn't be a very fancy one - free spectrum analysis software can reveal astonishing details about the signals you receive.

Regular readers of the 'Decode' column will know that spectrum analysis is widely used to study digital modes, but as we'll see, it's a powerful technique for pursuing analogue signals too. Later articles will look at other ways that computers can be used - for example, to digitally process and record audio or to provide remote control operation of receivers. We'll start though with those spectrum analysers.

#### Look At A Range

All spectrum analysers look at a range of frequencies and plot a graph of the signal strength across that range. Some do this just for audio frequencies and are used for things like measuring the frequency response of an amplifier or finding the resonant frequencies of a room. Others work at radio frequencies to show how signals and noise are distributed across a band. Like their a.f. cousins, they're also used as test instruments to measure filter characteristics, show intermodulation effects, plot antenna performance and so on.

In many ways, the spectrum analyser is closely related to the oscilloscope, except that the 'scope shows you how a voltage varies with time, while the spectrum analyser shows you how it varies with frequency. The former is said to operate in the time domain, and the latter in the frequency domain. Fortunately, it's possible to convert between the two using a mathematical procedure called the Fourier Transform. I say 'fortunately' because making an instrument that works directly and accurately in the frequency domain is very complicated. A calibrated professional spectrum analyser covering l.f. to v.h.f. could easily set you back £10,000 to £50,000.

This is where computers come to the rescue. The Fourier Transform in its pure mathematical form is difficult to compute and actually not of great practical help, but it has a simplified form called the Fast Fourier Transform (FFT) which is much more efficient and very well suited to computer calculation. Finding a time-domain signal is easy - every radio receiver works in the time domain because that's how we hear

#### COMPUTERS & RADIO

the transmitted programme or message. So all you need to do is feed a suitable output from your receiver into the computer, run an FFT to analyse it in the frequency domain and out pops a graph that's the same as you'd get from a very expensive spectrum analyser. Well, almost - there are inevitable compromises, but if you can live with those, it really is as simple as that!

#### **Compromises**

Before diving into the practicalities of what you can do with this and how to go about it, we should look at some of those compromises that have to be made - not just with FFTs, but with all spectrum analysers because they define the possibilities of these machines. There's no such thing as a universal spectrum analyser that can do it all.

There are three main parameters that are constantly having to be traded off against each other in spectrum analysis. They are: bandwidth, speed and precision. Reduce any one of them and you have more resources available for the other two, but you also change the nature of what the analyser can do.

If you maximise the bandwidth, you'll get a wideband analyser of a type that's used for finding stations and checking activity. Just like a radio scanner, it tunes across a broad sweep of spectrum and shows you what's there. But instead of stopping and letting you listen to each transmission that it finds (that's a time-domain job), it measures the signal strength and presents you with a frequency-domain graph where each signal rises above the noise as a clearly visible peak.

Of course, it takes time to do all this tuning and measuring so, as the bandwidth goes up, the speed inevitably goes down. Similarly, if you want more precision, you'll need to scan in smaller frequency steps which means there'll be more of them so it will take longer than if you'd used coarse steps. A wideband scan of this sort may take several minutes before delivering a result. As a means of spotting activity though, it's incomparably faster than tuning manually across the same range and noting what you find.

Conversely, if you were to reduce the bandwidth and aim for maximum speed, you'd end up with a real-time bandscope. These frequently offer only a narrow view, but you see the signal fluctuations as they happen. The main aim isn't to find activity across a chunk of spectrum, but to provide a fast, responsive aid to tuning and to help you spot any sources of interference. Compared to tuning blind, it's dramatically more effective because you can see a carrier even when you can't hear its modulation, and you can identify exactly where a heterodyne whistle is coming from without having to tune around to find it. These days, real-time bandscopes are usually digital and use the FFT calculation.

If you don't need either massive bandwidth or a real-time display, you can pursue the third limit maximum precision. The spectrum analysers that provide this option are invariably computer-based and use FFTs. The frequency window may be narrow and the display sometimes jerky, but the level of detail that can be squeezed out of a signal is astonishing. Even on a desktop PC, you could resolve differences down to fractions of 1Hz.

That may be going a bit far for most purposes, but once you start to look at radio signals down at the Hz level, all sorts of unexpected detail starts to emerge. You can clearly see transmitters drifting as they warm up, track propagation effects in the ionosphere and see transmissions that are well below the broadband noise floor, and therefore completely inaudible.

#### Enormously Powerful

Taken together, these three main types of spectrum analyser - wideband, real-time and high precision offer an enormously powerful set of tools to augment any type of listening. In practice, the easiest to implement as an add-on is the high precision FFT and, as it's also the most versatile, we'll begin with this.

The good news is that some extremely competent and powerful FFT programs are available for download absolutely free. What's more, several of these have been specifically designed for use in radio monitoring. There are also many others, some free, some available for a fairly nominal sum, that are aimed at audio applications. They too can be useful for some radio-related purposes.

The important point with any FFT is that it always starts out with an analogue signal that has been digitised. It's just like the process that takes analogue music and samples it to produce a digital signal for recording on a CD. In both cases, Nyquist's Theorem states that the digital samples will accurately describe the original analogue signal provided that the sampling rate is at least twice the highest frequency that's present in the analogue signal. A slight safety margin is useful so, in the case of CDs the sampling rate is set at 44.1kHz, which means that it can accurately record sounds up to around 20kHz.

Doing this at audio frequencies is relatively easy, but when we get to r.f., things become more difficult. To digitise a 10MHz signal, you'd need to sample the level more than 20 million times per second. That's feasible, but not entirely trivial. Once you move into v.h.f., it rapidly becomes difficult and then impossible. If, however, you're prepared to compromise on bandwidth then you can employ a simple trick to



make any frequency whatsoever amenable to the FFT.

Suppose you want to look at a narrow window centred on 10MHz. You could do this by tuning the receiver to 9,999kHz, (i.e. 1kHz below the required frequency) and switching your receiver to u.s.b. mode. The receiver will inject a local carrier corresponding to 9999kHz, so any signal at 10MHz will beat with it to produce a 1kHz output. Any signals slightly above or below 10MHz will appear correspondingly above or below 1kHz. It's almost as if we've given the receiver an extra i.f. stage with a 1kHz intermediate frequency.

This 1kHz value is just a convenient round number. You could de-tune the receiver by any offset, but making it too small will limit the bandwidth that you can observe, while making it bigger may exceed the bandwidth that the FFT can handle. 1kHz turns out to be a practical value that also makes it easy to work out the correct tuning.

Now suppose we want to see a 1kHz-wide window (i.e. 500Hz either side of 10MHz), this now corresponds to the range from 500Hz to 1500Hz in the receiver's output. In order to digitise this you'd need a sampling rate of more than twice the highest frequency, so any rate above 3kHz should do the trick. That's no problem because just about any PC soundcard can digitise audio at rates up to the CD standard of 44.1kHz, and some go even higher. So, all we need now is a suitable FFT program.

#### Several Options

There are several options, but two stand out as exceptional. They are *Spectrum Laboratory* (generally known as *SpecLab*) and *Spectran. SpecLab* was written by **Wolfgang Buescher DL4YHF** and is available for download from

http://people.freenet.de/dl4yhf/spectra1.html Spectran is the work of Alberto di Bene 12PHD and Vittorio de Tomasi IK2CZL and can be downloaded from www.weaksignals.com. Both programs are absolutely free. Obviously at this price, you don't get support or professionally produced manuals, although both do come with on-line documentation.

Each of these programs has its own useful features and I would strongly advise getting both. Even if you end up primarily using one, there'll be times when you'll want the other. In broad terms, *SpecLab* is more powerful, but it's also more daunting. This is a vast gothic mansion of a program where you can easily get lost and where you'll stumble across unsuspected features long after you thought you'd explored it all. *Spectran* is slimmer, more polished looking and less overwhelming, it also has some useful features not found in *SpecLab*, but doesn't offer as much overall power or flexibility.

Both programs will run under Windows 95 or

above. They'll certainly benefit from a fast PC, but it's not essential - even a 333MHz processor will do useful things, though 1GHz or more is ideal.

Download and installation are very simple. SpecLab downloads as a zip file. Once this has been expanded, just double-click on SpecLab.exe and select Start Sound Thread in the Start/Stop menu. Spectran downloads as an installer which you need to run to install the program and its associated files. Once that's done, double-click spectran.exe to run the application and click the Start button at the bottom of its window.

When you launch *Spectran* for the first time, it will ask for your latitude and longitude. This is because the program was developed for EME (Earth-Moon-Earth) amateur communications. Unless you intend to use it for that purpose, you can enter any co-ordinates you like - they won't affect the spectrum analyser's operation.

For both programs, you'll need to connect an audio cable from the auxiliary or headphone output of your receiver to the input of your soundcard. Use the computer's 'Line In' socket if at all possible and open the Sound control panel to check that Line In is selected as the source and that all other sources are switched off. Some computers, especially laptops, only have a Microphone input. This should be fine, but you may need to turn the level down quite low in the control panel or reduce the output level of the receiver.

For a first look at FFTs, pick a frequency with an a.m. transmission. Better still, look for one where you can hear two or more stations together. A good place to try is one of the m.w. broadcast channels. Alternatively, there will be numerous suitable frequencies on the s.w. broadcast bands. It's best to avoid the amateur and utility bands at this stage because initially we want to be sure of finding a.m. signals on a predictable channel.

Remember to tune 1 kHz below the frequency you want to observe, select u.s.b. mode and open the i.f. filter to its widest setting. If possible, switch off the receiver's a.g.c. After you launch your spectrum analyser, it will take a while to initialise and will then show you a display with a moving trace at the top and a 'waterfall' display building up below that.

#### Essential Waterfall

Having a waterfall display is absolutely essential for radio monitoring because we're usually concerned to see how signals vary over time - in effect, we want to see the frequency domain in the time domain. The waterfall does this by taking a snapshot of the spectrum analyser trace at regular intervals and displaying it as a straight line in which signal strength corresponds to brightness or colour. The whole display

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scrolls down as each new line is added so any constant signal, like the carrier of a transmitting

Fig. 2: This SpecLab plot shows two stations that are nominally on 11.805MHz. The frequency axis goes from -100 to +300Hz with 11.805MHz corresponding to 0 on the scale. The time axis is vertical with grid lines every 30 minutes.

The trace on the left that runs from 0701 to 0835 is Radio Georgia. It's their first transmission of the day on this channel and you can clearly see the transmitter drifting as it warms up. They normally put a good signal into the UK, but with extremely weak modulation, so you may not hear much audio. Generally, each station has its own characteristic drift pattern, but Radio Georgia is quite unpredictable, perhaps indicating that they use different transmitters on different days.

The trace on the right that begins at 0759 is Radio Globo in Rio de Janeiro, Brazil. Again, starting from cold and drifting, but much more erratically. This is not a happy transmitter - the drift is quite ragged and notice how the signal strengthens (the colours get brighter) before it suddenly jumps up in frequency by about 15Hz and becomes weaker again.

The fainter lines that run parallel to the two stations are spaced at 50Hz and are local interference that is mixing with the incoming signals. The stronger the received signal, the stronger the mixing products, which is why they are not so obvious after Globo loses power.

Globo's signal is generally broader and fuzzier than Georgia's. This is quite a common effect that can be caused by variations in the ionosphere's refractive index. Radio Georgia's signal took a single hop through a fairly stable region of the ionosphere, so it appears relatively crisp. Globo's signal needed two hops and was travelling very close to the greyline where the ionosphere was changing rapidly, which is probably why it exhibits more frequency spread.

The short bright blip at about 0910 is a mystery, but from its position we can guess that Radio Georgia's transmitter may have been switched back on for a while, either accidentally or to test something.

Finally, the band of grey at the bottom of the waterfall is just atmospheric noise. As soon as Radio Georgia's carrier starts up, it slightly overloads the receiver's front-end causing 'blocking' which desensitises the receiver and makes the noise seem to disappear. The same effect is visible in Figs. 3 and 6. station, appears over time as a thin line because it's always there on the same frequency. Any speech or music modulation is spread thinly over the sidebands and is constantly varying so it simply shows up as random blobs and streaks with no real pattern. Meanwhile, white noise coming from the atmosphere or the receiver's electronics just produces an overall grey speckle. It's this ability to emphasise an active carrier while largely ignoring everything else that is key to the FFT's uses.

If all's gone well, you should see something like the display in Fig. 1, which shows a couple of broadcast station carriers on 9.875MHz. In theory, the frequency we're interested in appears at 1000Hz on the display because of the 1kHz offset in the receiver. In fact, it may be some way off as a result of inaccuracies in the receiver or the PC. A modern synthesised communications





receiver with a digital readout shouldn't be more than 100Hz out (hopefully much less), but an older receiver with analogue tuning could easily be off by 1kHz or more. Next time, I'll look at how to track down errors and do basic calibration, but for now, the easiest option is to adjust the receiver's tuning to bring the dominant line to around the 1000 mark.

As you explore different frequencies, you may want to vary the bandwidth shown by the spectrum analyser so as to zoom in or out on the plot. In *Spectran*, click the Show Controls button and use the up and down arrows to alter the resolution (a higher resolution shows more detail but reduces the bandwidth). If the frequency you want to see is off to one side, the horizontal slider beneath the waterfall lets you centre it.

In SpecLab, there are three boxes on the left marked Min, Max and Offs (Offset). To show a 200Hzwide window for example, you'd enter 900 and 1100 as the Min and Max respectively (there's no need to press Enter - anything you type into these boxes will be accepted a few seconds after you finish). This will centre the display and provide more detail. Now enter -1000 into the Offs box. This compensates for the

Fig. 3: This is a Spectran plot of 14.1MHz, showing some of the h.f. propagation beacons on this frequency. This is a horizontally scrolling waterfall with time running left to right and a red mark every ten seconds. The stronger signal is DH2B in Finland, the other is RR9O in Russia (notice the frequencies are about 10Hz different). Each beacon transmits in a ten second window starting with a c.w. ID followed by an unmodulated carrier in decreasing power steps.

You might expect a c.w. signal to be very narrow, just a single carrier frequency, but the keying creates sidebands just like any other modulation does. Because the beacons use machine-generated Morse, the keying speed is very regular and you can clearly see two narrow sidebands corresponding to the dot and dash frequencies (some harmonics are visible too). After the c.w. ID, the sidebands disappear leaving just the carrier visible.

Fig. 4: Spectran's control window. The arrows on the right set the resolution - because Spectran has a fixed-size window, increasing the resolution reduces the bandwidth and vice versa. You can vary the sampling rate up to the maximum that your sound card will support. A higher rate increases the available bandwidth, but a lower rate will allow finer resolution. As you change the resolution and the scroll speed, keep an eye on the overlap value in this window. If it gets too high the waterfall will become smeared along the time axis. Try to aim for an overlap value below 10. You can also use this window to choose whether you want a vertical or horizontal waterfall.

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More spectrum display settings	con the next and on the "Radio Direction Finder" tab >>>

Fig. 5: One of SpecLab's many control windows. This is the one you'll see if you select Spectrum Display Settings from the Options menu. Most of these controls can safely be ignored for basic operation. The important ones here are the Waterfall Scroll Interval, which sets the scroll speed of the display, and the Waterfall Time Grid, which lets you set how frequently time markers will appear and how they will be labelled.

1kHz de-tuning and means that our centre frequency appears at zero with any deviation from that being directly readable as a positive or negative shift.

Changing the display's colour mapping can help to bring out subtle features that may be getting lost in the general noise. In *SpecLab* this is done with the B (Brightness) and C (Contrast) sliders to the left of the waterfall. *Spectran* has similar sliders as well as an Auto Brightness button (if this is selected, the Brightness slider disappears).

One other essential control is the rate at which lines are added to the waterfall. This is set by the Speed slider in *Spectran*. If you push it higher than your PC can cope with, it will automatically come down to the fastest speed achievable. To alter the



Fig. 6: 1470kHz is quite a clear channel overnight and various transatlantic stations can be heard here at different times. A whole cluster of these carriers is visible in this slow overnight plot. Most are within 20Hz of their nominal frequency, but some are off by as much as 170Hz. The gap between 0445 and 0515 is a result of Trans World Radio's 1000kW transmitter on 1467kHz being on air in German at that time.

Several of the carriers can be seen becoming stronger or weaker as propagation conditions change. You can also see some stations closing down at 0300 and 0400. The dominant audio signal at the time of this plot was XEAI Radio Formula in Mexico City.

#### 

speed in *SpecLab* go to Spectrum Display Settings in the Options menu and then alter the value of Waterfall Scroll Interval in the box that appears. An interval of 500ms should be fine for most purposes, but for long term unattended monitoring you can set this to several seconds or even minutes.

#### **Hidden Carriers**

There are many things that can be explored with an FFT spectrum analyser. For example, observing how distant broadcast stations appear and disappear at different times of day as propagation conditions change. Because the spectrum analyser is very sensitive to the level of any carrier, you'll generally see



Fig. 7: Two CB transmitters showing the fuzzy trace that's often seen with narrow f.m. signals.

stations quite some time before they become audible. You can also easily see carriers which are hidden beneath interference that would make them completely undetectable when listening.

This technique can be particularly effective on m.w. where there is a big difference between daytime groundwave and nighttime skywave propagation. Try checking some of the 10kHz channels (540-1700kHz) at night and you may well see North and South American stations fading in after sunset reaches there.

With a very slow scroll speed, you could leave the spectrum analyser running unattended to plot the operating times of utility stations throughout the day.

Alternatively, turn the scroll speed right up and observe the h.f. beacons on frequencies such as 14.1 or 18.11MHz. If your PC's clock is accurately set, you should be able to identify the different beacons by noting when they come on.

You'll soon discover that some stations have very stable transmitters while others drift quite badly. The changes are usually too small to be detectable by listening or normal tuning, but show up clearly on a spectrum analyser. You may also find some mysterious carriers that drift about seemingly at random and some that scan very precisely and slowly across a band.

True s.s.b. signals can't be seen by this technique because they have no carrier to provide a fixed line on the waterfall. However, some apparent s.s.b. transmissions do have a vestigial carrier that may be visible. On the other hand, c.w. always shows up well and narrow f.m. often appears as a broad fuzzy line.

> One obvious drawback with all this is that you can't listen to the receiver while it's feeding the spectrum analyser, so it helps if you have a second receiver and antenna available. The main requirement for spectrum analysis is a stable source that doesn't drift and, if possible, that has a digital frequency readout. Other than that it doesn't need to be anything special, stability is more important than sensitivity, and selectivity is irrelevant so long as it's not too narrow. Even a good quality portable with a whip antenna can give useful results so long as it has s.s.b.

Learning to interpret the waterfall displays takes time. Things are not always what they seem and there are many spurious effects that can confuse the issue. I'll look at some of them next time when we deal with accuracy and calibration. In the meantime, **Fig. 2** shows a plot that contains several commonly found features that you're likely to see.

If you get lost in *SpecLab* and can't get back to a sensible display, go to the Quick Settings menu and select Restore All Factory Settings. You can do the same in Spectran by going to the Set-up menu and selecting Load Default Settings.

These high-precision FFT programs have a myriad of uses that range from observing v.l.f. whistlers in the ionosphere to finding TV DX, and from direction finding to reading ultra-slow Morse. I'll look at more of these in future articles. For now, I hope this has provided enough information to encourage you to download these programs and to start exploring what they can do.

#### *Next time, Jack continues with his look at the harmonious combination of technologies.*

#### An Introduction to



*Ian Wraith hopes to broaden your radio horizon by examining a growing phenomenon that utilises mobile radio communication to the advantage of its users - AVL.* 



AVL to be one of the most useful new features of modern radio systems, but most radio hobbyists have never heard of it. The purpose of this article is to explain what AVL is, how it works, why users consider it so useful and how it will effect your listening.

What you might be asking is AVL? Well it stands for Automatic Vehicle Location and it is the name for a kind of technology that finds out where a radio user is then transmits this information to the users' headquarters. In the past if a courier company received a call to say a package needed to be urgently picked up from a customer and they needed to send the closest van to collect it then, there was a problem. The only way to find out where each van was, would be to call up each of them on the radio, so they could ask the driver where he was. There are a number of problems with this method. If the company had a fleet of 30 vans, then 'phoning all of them could take a long time and to make things worse, sometimes the drivers would lie about where they were. They may well have been doing something they shouldn't, such as nipping home for a cup of tea! If the company's vans had been fitted with AVL, then they would all be automatically transmitting their location every few minutes. When the call asking for a package to be collected was received the company's dispatcher would simply look at a computer screen displaying a map with all the vans locations marked on it. They could quickly see who was the closest to the pick up point and could call that van on the radio and assign them the job. So it's easy to see why AVL is popular with courier companies.

#### How Do They Know?

At this point you are probably asking how does a vehicle know where it is? Well, there are a number of ways of finding this out but the most common way is by using Global Positioning Satellites or GPS. Each vehicle is fitted with a GPS receiver which listens on frequencies around 1.5GHz for signals transmitted by a fleet of 24 active USA military satellites that are in non-stationary orbit around the earth. In simple terms, each of these satellites constantly transmit a radio signal sending both the satellite's three dimensional location and the time from a very accurate clock onboard the satellite. When the receiver in the vehicle receives one of these satellite signals, it compares the time it received the signal, with the time transmitted by satellite. Since radio waves travel at a fixed speed, it is possible by comparing these times for the receiver to calculate how far it is from the satellite.

Once the receiver has heard and decoded such signals from a couple more satellites, it is able to calculate its position on the earth to within twenty metres. The GPS receiver is only a receiver and at no time does it have to transmit a signal to the satellites. However, it is by no means a simple device, due to the complex mathematical calculations it must do. This means the miniature computer built into a GPS receiver will be more advanced than a PC sold in 1990! The GPS receiver in the van doesn't have a display like the ones you see on sale in the high street, but instead usually looks similar to a computer mouse with just a thin cable linking it back to the radio. Some modern vehicles sometimes have GPS receivers built into roof panels and are barely visible.

GPS isn't the only way of determining where you are with radio. Another way is to take advantage of a feature in GSM digital mobile telephone networks. As a mobile 'phone may lose contact with a base station unexpectedly, it must know the frequencies used by other base stations around it and how strong the signals are from those base stations. That way, if a 'phone loses contact with the base it is using for a 'phone call (perhaps the 'phone's user drives into a valley), it can quickly switch to another base station without dropping the call. To make this possible the 'phone is constantly



two methods to send this data. The first of these methods is the Fleetcomm network. This is a nationwide MPT1327 trunked radio network that operates in the 176 to 185MHz frequency band. The system is mostly a trunked voice network, but can also be used to send small amounts of data.

Users of the *FTrunk* and *Trunksniffer* programs who monitor Fleetcomm, will no doubt have noticed an increase in the number of Short Data Messages that they would have seen on control channels during 2004. The vast majority of these data messages are vehicles sending their position back to headquarters. Some bus companies use their own private MPT1327 trunked networks which usually

A Maxon GSM module which is a mobile 'phone minus the speaker, microphone and keypad. Instead it communicates with a computer via a serial port. scanning the frequencies used by its network and storing not only the frequency and signal strength of each base station, but also a unique number which each base station transmits to identify itself. Some AVL products take advantage of this and contain the circuit of a GSM mobile 'phone (but without the speaker and microphone). A small computer is linked to this GSM circuit and keeps requesting the list of nearby base stations. The computer has been programmed with a list of all the GSM base stations, their locations and their identity numbers. So as the computer knows the location of the base stations that the 'phone can hear and the strength of their signals it can calculate the position of the vehicle. The companies who make such AVL systems claim the use of this method can be as accurate as using GPS.

There are also a few older, less flexible methods that can be used by a vehicle to find out where it is. Some bus companies have installed wire loops in road surfaces or put low power microwave transmitters at certain points on bus routes. The company's buses are fitted with sensors which then detect the wire loops or microwave signals so knowing where the bus is located.

The Kenwood TK-715 radio uses MPT1327 trunked networks and GPS receivers such as the Garmin one can be connected to it to provide an AVL system for a vehicle.

#### Back To HQ

So now you know how a vehicle can work out where it is. The next question to be addressed, is how does it send this information back to its headquarters? Well, almost any radio network can be used, as long as it supports the transmission of computer data. In general however, companies use one of operate in the 201.5 to 207.5MHz band to send the data. Other AVL users send their position data via one of the commercial GSM digital 'phone networks, (O2, Vodafone, Orange and T-Mobile in the UK). The AVL data is sent using one of the GSM modules I mentioned above. It is transmitted either by encoding the position data so it can be sent as a text message or on the more modern GSM modules the data is sent by General Packet Radio Service (GPRS). This provides a faster and cheaper way of sending data over a GSM 'phone network.

For the companies using AVL though, just how vehicles find their location and how they send this data back is unimportant. What is important, is what is what they can do with that information. I think the best way of describing this, is using the example of an AVL software package I know well. The software is called Look@Fleet Locator and is produced by Zycomm Electronics Ltd. The software consists of the Look@Fleet server software which runs on a PC. connected to one or two MPT1327 trunked radios, via a serial data link. When a vehicle sends its position data, it sends it to one of these radios as a short data message. The base radio receives the data and then passes it to the Look@Fleet server PC for further processing. The data is actually viewed by PCs running a program called Look@Fleet Locator. Anything up to 10 PCs running this program connect to the Look@Fleet server over a companies internal data network or via the Internet. The Look@Fleet Locator screen shows a map of the UK with each vehicle equipped with AVL shown as an icon. The user can set the

> program so they can zoom in on vehicles and see the map down to street level. In addition the program stores all the past locations of vehicles, so a system user can look back to see the whereabouts a vehicle at any previous time whilst monitored by the *Look@Fleet* system.

#### Passenger Convenience

Several bus companies now use AVL information from their buses for what are called passenger information systems. Research has shown that more people would be willing to use public transport if they had a accurate information on timetables. So some bus companies have programs which take the locations of their buses and use these to calculate the time it will



take them to reach the various bus stops along their routes. This information is then transmitted to electronic displays at the bus stops which show the passengers exactly how many minutes they have to wait before a bus arrives. Other bus companies have gone even further and made this information available on the world-wide web. So if it's a rainy day, passengers can look on their PC when a bus is due and don't have to get wet through waiting for the bus.

#### Other Users

So now you can see why companies benefit from the use of AVL. Who else other than the courier and bus companies la have already mentioned, use AVL systems? Already taxi companies are starting to use AVL. With AVL, they can quickly see which taxi is the nearest to a particular job and dispatch that one. In addition, taxi companies take advantage of another feature of AVL which is safety. If a taxi driver is attacked he only needs to press a single button and his base will know not only that he needs help, but also exactly where he is, so that assistance can get to him as guickly as possible. Taxis usually send the position data back to their base using the taxi company's existing radio data systems. These operate on frequencies around 81 or 164MHz. In addition to taxi companies, local councils are also beginning to use AVL.

One of the first users was Fife Council in Scotland who have fitted AVL units to their entire 900 strong fleet of vehicles. This enables the council to monitor which roads its gritters have made safe and also to find the best routes for their fleet of buses that transport the elderly to day centres. All of the vehicles in Fife transmit their position data back to the council's headquarters using the council's Band 3 MPT1327 trunked radio system that is also used for voice communications.

In England, Cambridge council have also fitted their vehicles with AVL units. They have programmed the computer at council headquarters which receives the data in such a way so that it triggers an alarm when vehicles move outside of normal working hours. This arrangement came in useful recently, as just months after the AVL units were installed, an alarm was triggered when a council vehicle signalled it was moving out of its depot in the early hours of

the morning. A control room operator called the vehicle's usual driver who was surprised to hear this as he was in bed at home. The Police were alerted and as the control room operator knew exactly where the vehicle was, the Police guickly found it and arrested the thieves.

Finally, one other type of user who are increasingly using AVL is the emergency services. AVL offers the same advantages to them as it does to a small taxi company. If the Police are requested at a certain location the dispatcher can guickly see which patrol car is closest to the incident. If the patrol car is attacked on the way to that incident then the dispatcher can see where they are and send help without delay. Already a few Police forces including Hampshire and

Lancashire already use AVL, but I am sure that in say, five years time, all British emergency service vehicles will be fitted with AVL units. So far, the Police cars fitted with AVL units send their position data back to the control room using Airwayes, which is the Police's new digital radio system operating in the 380 to 400MHz band.

#### The Future

In the future, I suspect AVL is going to be almost commonplace for radio users. as the electronics required and especially the GPS receivers seem to become smaller and cheaper everyday. The latest development in AVL is for people, rather than for vehicles. This is achieved by building a GPS receiver into a hand-held radio. One example is the Sepura SRP 3000 handheld which can be ordered with an optional GPS receiver. This set is already used by a few British Police forces on the Airwaves network and allows the control room to see the location of officers even if they are out walking the beat. This is a pretty amazing technological achievement which, I am sure will save the lives of many Police officers in the years to come.

**SWM** 

#### **Can AVL Systems Be** Monitored?

OK, so after reading this article you now know what AVL is, but I know a fair few of you will be wondering if AVL data can be decoded with special software. As I mentioned earlier, AVL data sent on MPT1327 trunked networks can be received and seen on the FTrunk and Trunksniffer decoders. However, both programs simply display the data being sent as raw data bytes and don't decode them into position data. The main reason for this is simply that there are lots of different AVL systems out there and each one sends the data across the trunked network in different ways. So before any software could decode the data, it would have to be told which of the hundreds of different AVL systems the data was sent by. In addition, some manufacturers encrypt the data before it is transmitted and so without knowing the encryption key, the data couldn't be decoded. Sadly, the other methods of sending AVL data can't be monitored either. The GSM based digital mobile 'phone networks encrypt their data using a mathematical formula called A5. Airwaves the emergency services new digital radio network, also encrypts all the data it transmits using another mathematical formula this time called TEA1. So the answer for the moment has to be, no, AVL data can't be decoded.



m look@deet V1.03

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This screenshot shows Look@Fleet Locator in action. The icon shows the location of a vehicle when the map is zoomed in Thanks to Zycomm

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Bealach is the mountain pass a few miles away.

The small mast on which the discone lives was in great shape, but was bending alarmingly.

Corrugated iron sheets from my neighbour's shed, which had been next to his house about a kilometre away, were slicing through the air at head height. The h.f. multi-band dipole and my 60m long wire had both

succumbed to the storm, gravity or the flying debris. This only left a 30m wire 📃 The view behind my house. antenna



For practical purposes, it would have to be v.h.f. I

always keep an 85A deep cycle leisure battery charged

v.h.f./u.h.f. radio, one scanner and my FT-817 operating

for the next three days. The FT-8800 dual-bander was the

A friend called me on 145.500 to tell me that his

weather station had just registered 142 miles per hour

(230km/h) and then had ceased to function. (It has not

vet been found, presumably its way out in the Atlantic

somewhere). Another weather station suffered a similar

fate, having registered 150mph (242km/h). I 'necked' a

bottle of red wine and hit the sack at eleven.

up and this, together with a gel-cell battery, kept the

only practical communications tool for that time.

n Tuesday 11 January I was writing E-mails with one ear to a scanner. I wasn't really taking any notice of the marine weather forecasts that were being broadcast, then I realised that I was listening to something rather out of the ordinary.

and fatal weather of mid January.

SWM regular Dave Roberts shares his

personal experience of the recent frightening

"Winds - south westerly. Storm force ten increasing hurricane force twelve" he said. Now that filtered through to my rather slow brain. After the forecast was over on channel 67, it was repeated on Channel 10 and he said it again. By this time, he'd got my attention.

The wind was increasing and on looking through the window I realised that in fact it was extremely windy. As the

afternoon wore on I could hear the antenna wires screaming - this was serious stuff

By four thirty the wind had stopped screaming. It was roaring and it became evident that something serious was happening with the weather. The sea appeared to be boiling with huge waves heralding the highest tide that the region was to experience for many years.

A friend called me on the 2m band radio. He's retired from service with the meteorological office and had downloaded some pictures from a weather satellite that showed a very serious storm was ongoing. "The pressure is very low and still dropping", he said.

#### **Remote Home**

My home is a remote croft on the Isle of Skye. All electrical power and telephone lines are fed to the area by overheads, so it was just a matter of time. First, the telephone lines went out and at ten to five all electrical power was lost. This was a bit of a nuisance as it meant that I had to light the fire and that meant I'd have to clean it out in the morning!

The mobile 'phones died in alphabetical order. This area is only covered by Orange and Vodafone. Orange lasted just five minutes after the power went out and then Vodafone disappeared about an hour later.

Looking outside after I had thrown coal on the fire I could see that the tall trees in the front garden area were bent almost horizontally. Illumination of the croft house was now by candles and antique oil lamps, one of which my

indeed I

grandmother was given when she was

first married in 1910. Hermits never chuck anything out - good job too! I had to

break out the gas hob to fry some steaks

for dinner. This was now very inconvenient

It became apparent that there'd be no

communications at all unless I got a radio

window and shone a powerful flashlight

on the antennas. The v.h.f./u.h.f. collinear appeared to be fine apart from a slight tilt.

on line. I peeked through the kitchen



The storm.



Portree Harbour.

Morning Realisation

Morning brought with it the full realisation of the damage caused by the storm. Reports came in on-air of homes rendered uninhabitable, parked cars blown about and houses flooded by the tide. I doubt that there is a single touring caravan in the Hebrides that hasn't been totally wrecked.

Worst of all, people had been killed, including a whole family with two young children from South Uist. We sat next to them at a wedding last year, they were very good people and everyone is terribly upset by their deaths.

One lady, Mrs. Hill, had been staying in a mobile home at Waternish. The wind started moving it about and she went outside to check for damage. She was unable to open the door to return inside and died of hypothermia.

Many small townships now look like junkyards. Roofless houses gape at the sky. My tiny house is hunkered down against the side of a hill. I didn't suffer so much as a broken slate. All my trees seem unaffected by their experience and I can't believe my luck.

Scottish and Southern Electricity had taken heed of the weather warnings and, with masterful planning, had previously filled hotels in Portree with their engineers. These guys were working at first light to repair lines.

Electricity was restored here late on Thursday 15 January and worked sporadically for the next twenty four hours before settling down. The 'phones were fixed on Saturday. My Orange mobile 'phone is still out of commission and some people are still without mains electricity as I write this on the 16 January.

#### Weather Prediction

Early last year I attended a presentation by a meteorologist called Heather Reid. Aided by her husband Professor Miles Paget she told the audience how weather forecasts are created. At the conclusion of their lecture she explained that, for whatever reason, there is so much more energy flying around in our atmosphere and that we should expect much stormier weather world-wide, than has previously been experienced. If the hurricane of the 11 January 2005 was a precursor of this climate change, then there are some frightening times ahead for us all. SWM







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# **In the Ed's Shack** At Last - The NRD-545!

It's been a long wait, but Kevin has finally got his hands on a JRC NRD-545 DSP receiver.

ou simply can't fail to be impressed by the NRD-545, I mean even the protective packaging is impressive. It's certainly up to the job of protecting its valuable and highly engineered contents. The £1400, 7.5kg radio certainly must test the packaging to the limit when roughly handled by those couriers we all know and...

I've been getting to know the Japan Radio Company's h.f. heavyweight for a while now, courtesy of W&S, the manufacturer's new importers. Seven years ago when John Wilson reviewed the NRD-545 for *SWM*, the set was brand new to the market place and was urgently required to be shipped out to the next reviewer in line. Because of this I didn't get a chance to get acquainted with the set. It has taken this long to finally get my hand on the '545 to take this journey of discovery.

The main reason for the loan was to confirm reports of whether or not it would be possible to use the d.s.p. based passband shift facilities to demodulate DRM transmissions directly, without the need for an additional conversion stage to produce a 12kHz baseband signal, which is required for either the DREAM software or the official DRM Fraunhöfer utility.

As it happens, **Jeff Stanton** at **W&S** kindly loaned me a complete set of accessories for the radio, including the rather pleasant matching external speaker and JRC headphones.

#### Looks The Business

This sleek satin black cased receiver certainly looks the part. It most definitely integrated well with my radio room's other inhabitants.

The set is also pleasant to use. The rotary controls are a joy to operate, they are weighted and precise in feel. The control layout is very similar to that of the NRD-535, as is the display because they are virtually identical apart from the change from green/blue frequency digits on the NRD-535 to yellow on black in the '545. This makes the NRD-545 very easy to read at all light levels.

The buttons, which are grouped around the almost perfectly weighted main tuning knob, start with a pair of left and right arrow keys, which step the tuning in the same tuning increments as the tuning knob. If you are using the finest resolution of the tuning system and you prod the left or right button, you may be misled into thinking that nothing is happening, because there are ten tuning steps to each increment shown on the frequency display, but by use of the 'Step' button you can change the increments by factors of ten, in other words, change to 10Hz, 100Hz, 1kHz and back to 1Hz. The system does not end here, because a dig through the operating manual tells you that JRC have provided facilities to set-up the receiver to your own specification, and that includes the options of 1, 5, 6.25 and 9kHz, which neatly covers medium wave, short wave band plan channel steps. Very clever and very thoughtful.

On the subject of the user set-up options, there is a list of optional settings on page 23 of the manual which should cover everything that an owner would need to customise the NRD-545, covering even such obscure items such as bypassing the front-end filters, changing the RTTY shift. There's also a peak-hold facility on the signal strength meter - very useful!

A well known JRC design aim of not using dual concentric controls, is continued in the NRD-545 with the exception of three dual function controls. The panel layout could hardly be bettered for operating convenience and every control seems to be exactly where you need it and all in a logical pattern. Some will be unhappy about the vertical keypad, but the keys operate easily, provided you don't have very long fingernails. I actually found it very comfortable to rest the fingers of my right hand on the top corner of the receiver and used my thumb to operate the keypad buttons a technique I've used for many years with many items of equipment. The location of the keypad does favour those who are right handed and I don't know how the technique would work for someone who is naturally left handed - but at least the tuning knob is right in the middle of the set's front panel and convenient for any user.

#### **RF** Performance

Back in *SWM* July 1998 John Wilson said; "How does the '545 compare in r.f. performance to other receivers in the market place? Well, whilst its behaviour under my normal testing regime was good enough to put it into the 'A' stream, there were no areas in which it advanced much beyond the NRD-535, but of course the '535 was a good performer in the r.f. department. Using the default 'INTER' filter settings of the d.s.p. i.f., which were 2.4kHz for s.s.b. and 4.5kHz for a.m., the sensitivity came out at -123dBm on s.s.b. and -105dBm for a.m., both for 12dB SINAD. This is quite in line with current receivers but as I have explained before, I like to normalise my dynamic range testing to a sensitivity of around -117dBm so that the intercept point measurements can be directly compared, and having done that the NRD-545 delivered a +19.5dBm 3rd order intercept point and a dynamic range of 96dB on s.s.b. at 20kHz signal spacing, and using my test for 2nd order performance with input signals of 6.5MHz and 7MHz whilst measuring the product at 13.5MHz (you will recall that this is to show up any problems with strong signals from two broadcast bands producing spurious signals due to a lack of front-end preselection) I obtained a 2nd order intercept point of +82dBm and a dynamic range of 204dB. This is a good result and shows the beneficial effects of having front-end preselection, but it still ain't as good as a Collins 515-1.

The reciprocal mixing performance was good and this is a reflection of the cleanliness of the synthesised local oscillator. The figures are given in **Table 1**.

These figures place the NRD-545 high on the totem pole, but the result at 5kHz spacing was





#### The NRD-545 making itself totally at home in the Ed's Shack.

difficult to determine because of a plethora of audio tones generated within the receiver at close signal spacing. I can only deduce that the d.s.p. system was being slightly confused by what was going on, because I have not experienced this effect on other, more traditional receivers. The measurements were taken, as in all my reviews, in the u.s.b. mode with 2.4kHz i.f. bandwidth".

I really don't have anything additional to say on this front, as John's findings were certainly proven during my use of the NRD-545.

#### Accessories

I'm unable to comment on all of the supplied accessories supplied, as the PC control software, which still appears to be version 1, is high on my list of suspects for breaking my previously stable *Windows 98SE* based shack PC. It will no longer boot post install. I'm in the process of debugging the problem and will report my progress in a forthcoming edition of 'In The Ed's Shack'. From what I did see of the

#### Table 1

Signal spacing Level of interfering signal **Reciprocal mixing** ratio (dB) (kHz) to degrade wanted signal SINAD by 3dB (dBm) -62 69 5 10 -45 86 -40 91 20 99 -32 50 108 -23 100

application before the fatal reboot it seems to do little more than mimic the front panel of the NRD-545. A shame as there is so much more that is possible with third-party control software. I'll give more details when I'm back in the land of Microsoft GUI and able to run my DRM software too.

I can however comment on the NVA-319 external speaker and the ST-3 communications headphones. Both are superb performers. The external speaker transforms the audio to a similar quality to that I normally enjoy when listening. My normal set-up allows the

feeding of all the outputs of the various receivers into my cheap and cheerful audio mixer and then on to a 20+20W stereo amplifier which drives a pair of hi-fi speakers. To save the neighbours the annoyance of Shanwick and digital burbles I wore the ST-3 for a considerable time during my acquaintance with the NRD-545 - they perform well both from an audio point of view and are comfortable to wear for an extended listening period.

The NRD-545 and accessories are available from Waters & Stanton, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835. You can also visit their website at www.wsplc.com

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f you have over thirty million US dollars to spare, why don't you buy a Gulfstream V turbojet. Order up a new one and you get Rolls Royce engines, satellite telephones, two lavatories, a galley, crew quarters and an interior customised to your requirements.

When Premier Executive Transport Services ordered their new Gulfstream V in 1998 we can only guess at what interior fittings they specified because it seems that Premier, whose only address is a lawyer's office in Dedham, Massachusetts, USA, aren't in the business of shipping holidaymakers about.

PETS are a CIA 'front' company specialising in 'rendition' flights. In this case, rendition refers to their practice of 'rendering' terrorist suspects available for detention and interrogation in another location. Hence they need an aeroplane or two.

In fact, PETS purchased another aircraft, a Boeing 737-700 in 2001. Their Gulfstream, delivered to them in November 1999 with the tail number N581GA, has now had several registration changes. In it's most recent incarnation it exists as N44982. Known as the Guantanamo Bay Express it's 7300 mile range has seen it visit such diverse countries as Pakistan, Libya, Germany, India, Saudi Arabia, Iraq, Dubai, Uzbekistan, Germany, Jordan and the USA.

On 18 December 2001 masked Americans working with the Swedish security police loaded some terrorist suspects on board at Stokholm's Bromma airport and flew them to Cairo where they were wanted by the authorities. No stranger to our region, this airplane made three visits to Shannon last year and was at Glasgow's Prestwick airport on 25 June 2004 wearing one of its previous identities - N8068V. In its current guise as N44982, it is authorised to land at any USA military airfield world-wide which is some honour for what is officially a private jet.

As people have become aware of the existence of the Guantanamo Bay Express so the registration has changed and more recently has its ownership. Current owners are shown as Bayard Foreign Marketing LLC of 921 SW Washington Street, Portland, Oregon.

Bayard's owners are equally invisible as are the new owners of PETS 737-700, previously registered as N313P, but now known as N4476S and owned by Keele and Tate Management of 245 East Liberty Street SW, Reno, Nevada, another company whose officers only seem to exist on paper. Both aircraft are devoid of company markings or logos.

The terrorists are fighting a very cruel, dirty war and they abide by no rules. The plain fact is that if our governments play a straight, fair game then we are bound to lose. No question. So while I have no comment to make on the cargo of the two aircraft it will be interesting to monitor their progress around the world on the h.f. and v.h.f. air frequencies.

It's a fair bet that callsigns will either consist of the tail numbers or perhaps an abbreviation of the owner's name. Having said that they may just use a 'Reach' callsign denoting the Strategic Air Command. Interesting times for radio monitors.

It seems that suspects transported in this way are stripped of clothing, given a suppository and placed in nappies and clothed in orange coveralls prior to being manacled to a customised transit board, thereby rendering them immobile for the entire flight. If, on your next EasyJet flight to Spain, you espy the captain donning the Marigolds then may I suggest a week in Skeggy instead!

#### Time To Recover

The South Asian region will take decades to recover from the tsunami that has destroyed so many lives. Communications in the region has largely relied upon satellite and cell technology. Some remote areas will not have access to such technology for many months and h.f. radio networks have been established, mostly on amateur bands, to provide links from remote areas affected, to the outside world.

Although the frequencies are within amateur allocations and some amateurs will be operating link stations, I believe that not all the 'field' operators will be licensed amateur operators. Try the following: 7.050, 7.060, 7.063, 7.090, 7.160MHz (l.s.b.) and 14.125, 14.160, 14.190, 14.200, 14.265 and 21.240MHz (u.s.b.). Clearly these frequencies may well be used by normal amateur operations, but at the time of writing these are the only frequencies that I understand to have been established.

#### **Joint Maritime Course**

Just a reminder that when this issue of *SWM* is published the Joint Maritime Course

(JMC051) will be in full swing. It started on 19 February and concludes on 5 March. JMC 052 is from 4 to 18 June and 053 runs from 22 October to 5 November.

I have listed frequencies ad nauseam in the past. A search between 4 and 7MHz should locate some strong signals in connection with the exercise. You'll hear some very interesting traffic indeed and as the action takes place off the north west coast of Scotland and they all seem to have high power transmitters, well...it's so easy to monitor.

#### Sloppy CW

"You don't have to send sloppy c.w. but it helps". That was what an amateur op in California thought at 0535 on 5 January. He had been tuning around 10MHz and having heard nothing of interest he wandered out of the amateur band and up to 10.168MHz. There he heard what sounded like some very sloppily sent 'V's (di-di-di-dah). He says he heard around twenty of them sent one after the other.

Our man was sure that the op was sending using a straight key. After some more nonsensical stuff, the amateur thought that he identified the letter 'AS', which means 'stand-by'. The unidentified station then disappeared, but was located about a minute later on 10.472MHz. Exactly the same sort of sequence ensued, but this time there was no 'AS' sent.

Matey disappeared again, but this time our operator went a-hunting and located him on 10.130MHz at 0538. Well this is an available ham allocation in the USA and so the ham man hit his key and mimicked the sloppy sender. So they parried back and forth for about 15 seconds sending shoddy old 'V's to each other. The sloppy chap then sent 'AS' and then sent blank carrier for about 15 seconds. So did our man.

After that no more was heard from him. The signal was an S8-9 in California. A debate then ensued regarding the origin of the sloppy Morse signal. A very experienced monitor believes that it was probably a North Korean diplomatic or military operator stationed in Cuba. The poor fellow was probably bored and enjoyed the diversion. Following the incident he has probably received five years hard labour working a shovel in a salt mine or something in that people's paradise!

#### **Radio Signals**

It was most kind of Gerry Murphy to take the time to write to me and explain that our earth itself creates a plethora of radio signals. "The earth emits a very strong frequency at 7.8MHz", he writes and goes on to say that he believes the 'Buzz Saw' signal received on 7.2MHz by many listeners is actually a harmonic of the 7.8MHz signal created by the earth.

Gerry's letter was most interesting and I'm still researching some of the ideas that he has promulgated.



Keith Hamer & Garry Smith
 Gardens, Derby DE22 47S

settled spell of weather produced some stunning displays of tropospheric reception during the second week of December 2004. It was an impressive event with the f.m. and TV bands jammed with German signals. Our old friend Sporadic-E surfaced on a couple of days, livening up an otherwise empty Band I.

#### **Reception Reports**

Tuning around Band I on 1 December, **Peter Barber** (Coventry) discovered Sporadic-E from Italy from 1035 until noon. Apart from the state-owned RAI UNO on channels A and B, private services TELE A+ (located just below E2) and TVA (just above channel A) made an appearance. On the 29th, a late afternoon opening produced Italy, Hungary and Rumania.

On the 6th, an excited Kevin Hughes (Tamworth) E-mailed to say that tropospheric reception was producing pictures on all Band III channels on his D-100 converter with exceptionally clear German pictures with sound on E8 and E9.

At times the f.m. band, Band III and u.h.f. were choc-a-bloc with French, Belgian, Dutch and German stations and as the reception intensified on the 9th there were reports of Poland (TVP-1) on R7. **Stephen Michie** (Bristol) turned in a good log which included Denmark TV-2 with subtitled programmes at 2330 on channels E26 (Hadsten) and E30 (Hedensted), the latter being completely free of co-channel interference from Crystal Palace which is normally a problem. DR-1, the Danish 1 Network was present on E7 co-channeling with NED-1 from Markelo.

Living in the west of England, **Simon Hockenhull** (Bristol) missed out on the German stations, but instead was rewarded with RTL Plus (Luxembourg) on E7 from the Dudelange outlet. Using a loft antenna, **Gordon Still** (Ruislip) bagged Canal Plus (France) on Band III channels L5, L7 and L9 and Belgium on E8 and E10.

George Garden (Edinburgh) identified Dutch local station TV Noord on E36 while over on E10, the German *Tagesschau* news programme from ARD was received. George's main receiver was out-of-action but all ended well by using the v.h.f. tuner of his Toshiba video recorder fed from an amplified DAB antenna. After closedown at 0300, German DB railway cab rides were shown, the journey terminating at a station called 'Junkerath'.

On the 9th, the entire f.m. band was heavily congested with German stations, including Bavaria on 99.2 and 103.3MHz. At 1232, France Info was heard on 105.2MHz from the 400kW Lille outlet, but by midafternoon it had vanished without trace.

#### **Christmas Yawns!**

Television

The BBC-1 bouncing Christmas Pudding graphics failed to impress Stephen Michie, but they were far better than the effort made by BBC-2. In fact, **no** effort at all was made by BBC-2 because, yet again, repeats from previous years were dragged out of the dusty cupboard at Television Centre. ITV made some effort, even if it was a just a hint of tinsel around its cube logo.

#### **Digital TV Deprivation**

Viewers served by the Ferryside relay in South Wales are having a cruel experiment inflicted upon them which will deprive them of the ability to easily record TV programmes. The relay has been equipped for digital and the plan is to switch off the analogue in March 2005 to see how viewers will cope with digital-only delivery. The project is likely to be the only one of its kind conducted before enforced analogue switch-off occurs throughout the United Kingdom over the coming years.

Only four digital multiplexes are being transmitted: 1, 2, A and B. These occupy receiving Group A, the same as the current analogue channels, to avoid antenna upgrades.

Three years ago, a project in the Sutton Coldfield area used volunteers to see how they would cope with digital-only reception. Video recorders were fed from set-top boxes but few of the participants (around 30) were able to grasp the technicalities of single-event timed recordings, let alone multiple events which required timers being set in both the recorder and the set-top box.

To prevent the TV set-top box remote control from affecting the recording box, different set-top brands were installed with the inevitable complexity of at least four remote controls for the viewer to manipulate. With a sofa full of remote controls, no wonder



Fig. 1: Belgian identification logo received by Kevin Hughes on E10 from Wavre.



Fig. 2: Flemish-speaking News programme received from Belgium on E10 by Kevin Hughes.

Fig. 3: The 2004 BBC-1 Bouncing Christmas Pudding Ident Symbol. BBC-2 totally forgot that it was Christmas!



some of the volunteers 'cheated' by begging neighbours and friends to record their favourite programmes on their behalf. The recording side of the experiment highlighted a problem which will not easily be solved. Needless to say, analogue recordings were allowed in the second phase of the trial which involved a further 200 homes.

Ferryside viewers are being given free settop boxes, but it will be interesting to see whether the rest of the United Kingdom will be able to share this generosity of free receiving equipment during the switch-over years, but perhaps by then, the programmes on offer will be so dire that few viewers will care whether they have access to a TV service or not.

#### Service Information

**Éire**: The Northern Ireland BBC and ITV services will be available throughout the country once a digital service is fully established. Many viewers in Éire who are viewing direct or 'relayed' UK analogue services are watching Welsh channels. **Belgium**: RTBF-2 (La Deux) has two lowpower outlets using E30H: Bruxelles and Couvin, both with 800W e.r.p. The Léglise transmitter (E11H 10 kW ERP) is also airing the RTBF La Deux service.

#### 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 VHS video and DVD recordings.

Our DXTV and Archive TV website can be visited at www.test-cards.fsnet.co.uk via the Internet.



irstly, a truly grovelling apology. Do you remember the 'tracking device' that I featured in January? I hope you don't, because it wasn't a tracking device at all! Two very

kind (and polite) readers informed me that it wasn't anything like that, but a novelty badge whose diodes will spell out messages like 'Happy Birthday'.

What can I say? Obviously I had never seen or heard of these things at all. I shall not waste any more reader time or print on this matter apart from expressing my thanks to the fellows who pointed out this error.

#### **Bugging Device**

On 16 December the United Nations announced that a sophisticated bugging device had been found in Salon Francais at the UN Headquarters in Geneva, Switzerland. This does not mean that it was discovered on that date. The room was used by ministers of major powers in 2004 following the coalition then shut down again. Atkinson also thinks that the bug can be remotely controlled with the audio being downloaded on command, the receiving post being located no more than 30m away, probably just a few rooms or floors away within the same building.

Interestingly Mr Atkinson reckons that the people who built the device into the room would have had knowledge of the type of equipment being used by the countermeasures people working for the UN, but he's sure that a thorough examination of the room by skilled people using normal equipment would have revealed it.

The components used in construction seem to have come from France, China and the USA. The likelihood is that the bug was built into the Salon Francais by those employed in fitting out the room, or by contractors employed by them.

The conclusion is that the device, albeit sophisticated, was deliberately engineered so as not to be located by the 'normal' sweep



undertaken by UN staff, but was made so as to be detectable by more specialised professional TSCM personnel. This

provokes the next step within the process that makes one believe that the device was so sophisticated as to be missed by a standard

sweep but, by design, was not covert enough to be oblivious to a thorough search. It's likely, therefore, that there are more devices within the room that have not been found. If not - why not?

#### **TETRA** Radio

O2 Airwave are the people who provide the TETRA public safety radio system in the UK. One **Peter Richardson** is the Managing Director. Peter attended the TETRA World Congress held in Vienna between 23 and 25 November 2004. During the event Peter gave a speech regarding the Airwave system in the UK. I quote a very small section below:

"In terms of the police, the first and probably most important fact they have found is that criminals couldn't listen in - they were able to come along and pick up criminals who were holding scanners to listen in to the old network in one hand, and stolen goods in the other hand. The criminals were surprised that the police turned up. We have found across Great Britain now a number of scanners in skips and refuse tips. They are no use any longer".

You know, I noticed a grubby old feller going through a skip near Hounslow last month. That's who it must have been!

Apart from the fact that the above quotation was obviously not intended to be taken seriously, it would not have been in 02 Airwaves financial interest to point out that the existing police u.h.f. systems had an encryption option fitted and that the v.h.f. schemes could have been so enabled for a few pounds per unit. But that doesn't increase 02's profits, does it?

#### Z Cars

I'm not that ancient - honestly - but I do remember watching Z cars on the black and white 405-line valve telly when I was a lad. The two cars (Ford Zephyr 6s as I recall) were Z Victor 1 and Z Victor 2. When their base called them it was always, "BD to Z Victor 1" or whatever. BD really existed. It was Lancashire Police's very own, the full call being M2BD.

Since the aforementioned Airwave rollout BD's channels have been quiet apart from some sporadic police vehicle check activity on BD Ch.4 (154.075) but on this channel and on BD Ch. 2 (154.9375) local listeners have heard some long range cordless 'phone calls. Illegal 'long range' cordless 'phones have been mentioned here before, but these are operating on frequencies that access the old police repeater system that was 'BD'. It follows that these cordless 'phones have outputs on the BD Ch.4 input frequency of 146.175 and BD Ch. 2 which is 146.275.

The 'phones being used appear to have an output power of 2W. A search of the 146MHz area may well dig them out. The other possibility is that the transmissions are the third harmonic of an old 49MHz band cordless 'phone.

If you happen to receive one of the transmissions on any 146MHz frequency and you own an h.f. receiver then take a listen between 1.642 and 1.825MHz a.m. mode. You may well hear the same conversation as this is the 'other half' of the frequency pair used in UK and American 'phones of that type. There are few of these type units in use that were sold in the eighties and early nineties and they are somewhat 'long in the tooth' these days.

forces invasion of Iraq. From the picture it seems that the unit was built into a floorboard or other panel within the structure of the room.

The photograph has been examined by a Technical Surveillance Countermeasures specialist,

one James Atkinson. He says that the device has a sophisticated power section that draws power from the mains supply and charges batteries to actually power the unit. Two microphones are fitted that have openings through the wooden fitting to 'aim' the mics at the areas to be targeted within the room.

He believes that the unit digitally stores received audio and then turns on the transmitter stage and sends the recorded audio in a burst or packet. The transmitter is



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his edition includes notes about the new NOAA weather satellite (*NOAA-N*), an update about *SICH-1M*, the new oceanographic satellite that we have been eagerly anticipating for some years, but which has failed to achieve orbit, and a summary of the 2004 Satellite Direct Readout Conference held recently in Miami Florida. This important 3-day event continued the discussions initiated during the previous Satellite Direct Readout Conference. Some satellite images of the horrendous Asian tsunami and readers' pictures of January's storms are also included.

#### NOAA-N - Launch Scheduled 19 March

The latest polar-orbiting operational environmental satellite (POES) developed by NASA for the National Oceanic and Atmospheric Administration (NOAA), called *NOAA-N*, arrived at Vandenberg Air Force Base in California. It was undergoing final testing and launch processing in January prior to the scheduled 19 March launch at about 1022. The satellite will be launched from the Western Range at Vandenberg AFB by a twostage Boeing Delta II 7320-10 space launch vehicle. It is to be a 1400 north-bound and 0200 south-bound satellite - see **Fig. 1**.

NOAA-N was prepared for launch in a NASA payload processing facility. After removal from its shipping container it was rotated from the horizontal to the vertical position. It was then mated to the Delta II payload attach fitting and placed on a test stand prior to system testing of the actual spacecraft.

It is the latest satellite in the Advanced Television Infrared Observational Satellites - N (ATN) series built by Lockheed Martin Space Systems Company. This spacecraft will continue to provide a polar-orbiting platform to



Fig. 1: NOAA-N orbit illustration.

support environmental monitoring instruments. Imaging, surface and cloud cover, Earth radiation, atmospheric ozone, sea surface temperature and measuring vertical profiles in the troposphere and stratosphere continue. It will assist in measuring proton and electron flux at orbit altitude, collecting data from remote platforms and will assist the Search and Rescue Satellite-Aided Tracking system. It carries dedicated microwave instruments to measure temperature, moisture, surface and

hydrological products in cloudy regions where visible and infrared instruments have decreased capability. *NOAA-N* is a civilian weather satellite.

Once in orbit, NOAA-N will be renamed NOAA-18 and is scheduled to transmit a.p.t. (low resolution data) on either 137.1 or 137.9125MHz. Those monitors whose receivers use crystals for frequency selection will need to check that they can fit the new hardware. I am

informed by **Timestep** Weather Satellite Systems of Dartmouth that they can supply new crystals for their Proscan receiver for about £10 each. Contact Timestep either by Email **information@time-step.com** or by telephone (**01803**) 833366 for more details.

a.p.t.	137.100 or 137.9125MHz
h.r.p.t.	1698 or 1707MHz
beacon:	137.35 or 137.77MHz

My thanks again to NOAA for providing information and illustrations.

#### SICH A Pity

The Ukranian remote sensing satellite *SICH*-*1M* was launched from Russia's Plesetsk spaceport on 24 December. Although the intended orbit was approximately 640km circular, early US orbital data showed it to be 280 x 640km x 82.6° inclination, a highly elliptical orbit suggesting that the second burn of the upper stage had been a partial failure.

The *Tsiklon-3* launch vehicle is Ukrainian built and also carried the MK-1TS Mikron, a small satellite 66kg test payload with a miniature visible-band camera. The flight had proceeded normally for the first 40 minutes, but the third stage burn ended almost a minute early, sending the vehicles to an elliptic orbit. On Christmas Day, we quickly realised from the early orbit data that things were badly wrong.

For early news of the launch, I frequented the National Space Agency of Ukraine's website. They have an English translation as well as the Ukrainian version. Not long after launch, **Ian Deans** posted a note giving an early potential failure announcement, as posted on the basic Ukrainian site.

Official reports (such as that from Commersant) suggested that the craft had a thruster motor for nominal orbit manoeuvre and claimed that it would be possible to raise the perigee from 280km to a more nominal height (around 640km). It would use up much of the fuel, but would at least allow *SICH-1M* to function for about a year instead of the original planned three years.

The other craft, the *KS5MF2*, which has no engines, will descend into Earth's atmosphere and burn up. Although I checked the English translation page regularly, I never saw any mention of *SICH-1M*'s problems.

If you want to follow its orbit, you can collect the latest Kepler elements

from Space-Track (see later) by selecting NORAD number 28505 (*SICH-1M*). **Douglas Deans** has been monitoring the orbit very carefully and noted that between 4 and 12 January, the perigee (nearest point to the earth, and therefore the most vulnerable to upper atmospheric friction) increased from 287 to 297km.

#### Fig. 2: 2004 Miami Conference poster.

Douglas said, "I am convinced that those changes are idiosyncrasies of the current elliptical orbit (rather than man-made intervention) where apogee and perigee positions are changing within the orbit (slowly). Projecting forward current Keplers shows a change to decay in about a month followed by an improvement; however each successive decay is more prominent so if there is not any intervention the satellite seems doomed. There is still no confirmation as to whether there is any form of 'engine' on-board".

My own searches through published literature on the Internet have not revealed



Fig. 3: Current Meteorological Satellites - courtesy NOAA.



Fig. 4: Dr. Colleen Hartman and Gregory Withee.

information on the exact construction of the platform, such as showing a thruster motor. Previous satellites have apparently not had a thruster, though I personally suspect that the new platform has one because of the reference by the Russians to the orbit adjustment. Time will tell.

#### Satellite Direct Readout Conference

The National Oceanic and Atmospheric Administration (NOAA) Satellite and Information Service hosted the 2004 Satellite Direct Readout Conference: A Decade In Transition, in Miami, Florida, 6-10 December 2004. NOAA operates both the Polar-orbiting **Operational Environmental Satellites (POES)** and the Geostationary Operational Environmental Satellites (GOES). The data from NOAA satellites are freely available to all countries and users world-wide, and are used to support a variety of meteorological, oceanographic, terrestrial, solar, climatic and other specialised data collection activities and services. The conference was organised for users of environmental satellite direct broadcast around the globe and for those operating their own satellite data receiving stations.

During the next decade, the transition to new technologies for environmental satellites systems will result in significant changes. These will affect all current and future users of environmental satellites, particularly those who receive direct data. In time, all users will have to modify or replace current receiving equipment and basic processing software, as the next generations of satellites begin operation. The goals of this conference were to ensure user readiness for upcoming changes to environmental satellite systems and to facilitate



Fig. 5: Basic Satellite Data Flow Overview - Darrell Robertson of NOAA.

discussions and information sharing among environmental satellite operators and the user community. The purpose of the Direct Readout Conference formed the continuing effort to prepare for these changes.

There were many speakers at the Conference, mostly those representing official bodies such as NOAA itself and the World Meteorological Organization. Also present were Francis Bell representing Britain's Group for Earth Observation

(GEO) and Dave Cawley who attended on behalf of the Remote Imaging Group (RIG).

The keynote address was given by **Dr. Colleen Hartman,** Deputy Assistant Administrator, NOAA Satellites and Information Services. She put the role of

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NOAA in perspective by explaining that coastal and marine water activities generate over \$54 billion per year to goods and services, and support over 28 million jobs. NOAA's improved El Nino forecasts benefit USA agriculture by some \$300 million per year. The power outage in 2003 had cost \$4 to \$6 billion, so reliable warnings of geomagnetic storms could save \$450 million in three years. NOAA's vision was to be the premier source of comprehensive environmental data and information.

Dr. Hartman described current GOES satellites and their 24-hour monitoring of the environment. The future GOES-R satellite



Fig. 7: Before - METEOSAT-5 23 December 0700 ©EUMETSAT 2004.



Fig. 8: After - METEOSAT-5 26 December 0700 © EUMETSAT 2004.



Fig. 6: Sri Lanka's Kalutara beach after the tsunami - courtesy DigitalGlobe.

would provide higher resolution information. She explained that the NPOESS program (future NOAA WXSATs) was within cost, schedule and performance specification and that the sensors were generally better than expected. The NOAA-N Prime satellite will be re-built for a 2007 launch date and would ensure continuity.

NOAA has built up a first class satellite data recovery system through its ground stations

and archiving facilities and planned to continue this work. As shown by the Conference, NOAA wanted to help organisations and individuals to continue to be able to receive direct transmissions, acknowledging the changes that were being implemented during the current decade.

Fig. 9: Kepler Manager version 1-0-6-11 from David Taylor.

Francis Bell explained about the formation of GEO and the sequence of publications of its new quarterly journal. GEO has an international membership of over 500, of which 30% live outside Britain. He described GEO's attendance at various venues, including those abroad, and discussed the activities of many GEO members who were building reception systems.

Core

Dave Cawley described the role of amateur WXSAT monitors over the years, particularly following the formation of RIG in 1984. It was believed that there were 10000 private METEOSAT users, and 5000 GOES users, yet it was only three years after *Sputnik-1* that the USA had orbited the first weather satellite that transmitted the first images of earth.

By 1967, NOAA had the first geostationary pictures of the earth. By 1984, the BBC computer facilitated software writers (a new breed of enthusiast) to write WXSAT display programs for educational use. At this time, a German publication described a framestore that could analyse data from a receiver and display it with up to 64 grey levels. This became a very popular project and really brought WXSAT monitoring into the hobbyist domain.

Other computers were manufactured, encouraging writers to develop software for the newer, higher specification machines. By the late 1980s, high quality imagery was standard,

Fig. 10: NOAA-17 4 January 1133 from Kevin Hughes.



leading to the formation of RIG. Dave described the development of low cost h.r.p.t. systems, galvanised by work done by John DuBois.

Darrell Robertson said that the latest NOAA figures for world-wide users and equipment usage via voluntary registration were:

APT	5,000 to 10,000
HRPT	1,000 to 2,000
WEFAX	5,000 to 10,000
HR/GVAR GOES)	1,000 to 2,000

My thanks to Darrell Robertson of NOAA for providing pictures and speech summaries from the delegates for use here. Owing to the large amount of significant material from the Conference, I plan to include more extracts during future months.

#### The Asian Tsunami

Nature showed us its worst face on Boxing Day at 0058:53. An under-sea earthquake measuring magnitude 9, according to the USA Geological Survey, off the west coast of northern Sumatra, caused an immense tidal wave - the tsunami - that devastated many countries around the Indian ocean.

DigitalGlobe kindly supplied Fig. 6, a satellite image showing the tidal waters receding from Kalutara beach on Sri Lanka, leaving death and destruction in its wake.

#### **Keplers - New Source**

The well-known Celestrak site (operated by Dr T S Kelso) and the OIG (Orbital Information Group) sites will probably cease from the end of March. New American Laws delegate new responsibilities and dissemination limitations that appear to end the former freedom of individuals to provide selected element sets to various hobbyist groups. Visit the new Space-Track site: www.space-track.org

You have to register, but this is a simple, cost-free process, and enables you to obtain a large number of elements, and to set-up your own preferences for future requirements. I registered early on and have found no difficulty in obtaining data. To facilitate the future easy collection of data from this site, David Taylor has issued a new program called *Kepler Manager* - see Fig. 9 - and I have been able to test an early version. The program requires you to enter your personal username and password



Fig. 11: *NOAA-12* 11 January 1543 from George Newport.



#### Fig. 13: The first image from SICH-1M.

for access to Space-track, and provides a selection of satellite groups for optional download. The program is simple and worked flawlessly first time. David tells me that he plans to issue it in a basic, free form, with an enhanced version available for registered users.

#### January Storms

The residents of northern Britain took the brunt of two of the storms that hit the UK in early January. With forecasters announcing winds to 160km/h and more, Scotland and northern Britain experienced flooding and wind damage.

#### **METEOSAT Decontamination**

The January decontamination of *METEOSAT-8*'s infra-red sensors coincided with severe weather systems crossing Britain. Fortunately there are already two other METEOSATs (7 and 6 - see Fig. 12) providing Europe with excellent continuous imagery. Decontamination is a regular maintenance process carried out every few months. Every satellite with which I was formerly involved had to undergo routine decontamination.



Fig. 12: METEOSAT-7 1530 11 January infra-red © EUMETSAT.

When satellites are finally in orbit, they still carry a small amount of water vapour trapped within the satellite body. During the period between mid-October and mid-February some of the water vapour molecules on METEOSAT-8 are deposited on the infra-red detectors, the coldest part of the satellite, as a thin film of ice. The rate of accumulation of this ice is at a maximum around the winter solstice and causes a degradation in the response of the IR and WV detectors. This degradation, and the corresponding reduction in dynamic range, can be compensated by increasing the onboard gain of the detectors. However, due to signal to noise ratio considerations, it eventually becomes necessary to decontaminate the detectors. This is achieved by heating them to a temperature of about 35°C in order to evaporate the ice. During this process some of the water molecules are released into space, so the amount of water vapour molecules within the satellite reduces over time. The amount of contamination, and hence the need to perform decontamination, reduces over the years that the satellite remains in orbit.

#### Stop Press

The first image from *SICH-1M* (Fig. 13) was received at 0812 on Saturday 29 January 2005 by a few monitors tuned to 137.40MHz. Transmissions may be rare due to the spacecraft's orbit problems. Thanks to David Taylor of Edinburgh for this first image.

#### Frequencies

#### a.p.t.

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

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

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

NOAA-18 should be transmitting a.p.t. on either 137.100 or 137.9125MHz after launch.

#### h.r.p.t.

NOAA-12 and NOAA-16 transmit h.r.p.t. on 1698.0MHz. NOAA-14 (faulty) transmits on 1707MHz. NOAA-15 transmits on 1702.5MHz. NOAA-17 transmits on 1707MHz. NOAA-18 should be transmitting h.r.p.t. on either 1698 or 1707MHz.

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

WEFAX: *METEOSAT-7* (geostationary) transmits WEFAX on 1691 and 1694.5MHz and Primary Data on 1691.0MHz until the end of 2005. *METEOSAT-8* HRIT, HRIT and other formats transmitted via *HotBird-6* at 13°E on transponder 117- 10.85344GHz as EUMETCast data.



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#### Many Happy Returns!

The Polish Amateur Radio Union (PZK) is celebrating its 75th anniversary this year. Keep an ear open for the special prefixes and callsigns that will be in use until the end of March, most of which contain the number 75. A few examples are 3Z0IU, 3Z75GFI, HF75PZK, SN75CYG and SQ75HQQ, but there are many more.

#### **Island Activity**

Whether or not the Peter I Island DXpedition has taken place when this appears in print, who can say? The 3YOX team was expected to leave for the Antarctic island from Punta Arenas on 14 January, with the station being active a week later for two weeks. As I write this, a delay of about three weeks, at least, is anticipated due to problems with the renovation and registration of the ship on which they intended to travel.

Late in the month, from the 24th to the 28th look for five Greeks operating from their country's Skyros Island using their own SV1 callsigns with a /8 suffix. There will three stations active on the h.f. bands with s.s.b. and some digital modes. They'll also be listening on 50.140 and 144.300MHz s.s.b. for opening in those bands.

#### PLT Or PLC?

In January the New Scientist magazine ran an article concerning the threat to h.f. amateur bands from power line communications (PLC), or Power Line Technology (PLT). With the important role that amateurs played in the aftermath of the tsunami highlighted, it suggested that PLC might severely inhibit similar radio activity in the future by spreading electrical noise across the spectrum. Although I mentioned it in my column in the December 2003 SWM, a quick re-cap won't go amiss.

Power companies are developing the technology to deliver broadband Internet services to homes and businesses via mains electricity cables using carrier frequencies up to 30MHz. The nub of the problem with this is that mains wiring isn't designed to carry such frequencies, and the fear is that the data signals will leak out at strengths which will overwhelm radio transmissions. The New Scientist article suggested that unless interference of this kind is tightly controlled, it could spell the end for emergency shortwave communications. Hilary Claytonsmith, past president of the RSGB and UK's representative of the International Amateur Radio Union is quoted as saying, "A few extra decibels of interference from future networks and I would

not have been able to hear the news from amateurs in Sri Lanka, India and the Andaman Islands".

Filtering of the power line signals has been put forward as a possible cure at specific locations, but the nature of the frequencies is such that, if they do escape the confines of the power line system, they could bounce around the globe and turn up anywhere, and everywhere. Whilst filters may reduce potential interference, they'll also reduce the efficiency of the system as a data carrier. Balancing the pros and cons of PLC could be difficult. The regulators are certainly well aware of the potential conflicts of interest. Encouragingly, the idea that PLC providers should engineer the system so that the likelihood of interference occurring in the first place is reduced, rather than wait for problems to arise and then try and solve them, is definitely on the authorities' agenda.

#### **Perfect Timing**

There's not much doubt that events on Boxing Day in and around the Indian Ocean late last year have had a prominent place in people's mind since they occurred. That amateur radio managed to play a significantly useful part in the post tsunami situation can only put the hobby and its practitioners in a good light. That there were radio amateurs in one of the affected areas was a matter of serious good fortune.

Sometimes when the locations of DXpeditions are mentioned it's a struggle to think of where in the world they are. Avid DXers would have been very aware of the Indian controlled Andaman Islands, because of the lack of any radio amateur activity from there for many years. A state of affairs, that placed them very high on many amateurs' lists of 'most wanted' countries. I suspect that the more casual operator would have struggled to find these islands on the map. The activity rarity were due in no small part to amateur radio operation having been banned on the islands since 1987. India is famed for its bureaucracy, so the obtaining of permission for five Indian amateurs led by Bharathi Prasad VU2RBI, together with VU2DBP, VU3DVS, VU2MYH and VU3RSB to operate special event stations on the Andaman and Nicobar Islands with the callsigns VU4NRO and VU4RBI during December 2004 was an achievement in itself.

Accompanied by visiting American, Charles Harpole K4VUD, they were operating from the Sinclair Hotel, Port Blair, on the Andaman Islands when the tsunami struck. Although mains power was cut off, within two hours of the incident occurring the station was back on the air, set up on a table outside the hotel with a mobile whip antenna, running from the hotel's generator. When that needed a rest, vehicle batteries were used to keep the station operational, albeit on reduced power.

VU2MYH, and another of the team were despatched to Car Nicobar, one of the islands hardest hit, and together with the Port Blair station, contact was made with club and other stations in India, mostly on the 7 and 14MHz bands. This resulted in tens of thousands of messages being passed. The amateurs' actions have been given a good deal of publicity in the mainstream media who have dubbed Bharathi 'Angel of the Seas'. Hopefully the good work she and the other amateurs did to assist the relief effort will be recognised by the Indian authorities, and will enable the country's National Institute of Amateur Radio to obtain some easing of the restrictions on amateur operation that currently apply. Those of us who take amateur operation for granted shouldn't forget that, elsewhere in the world, and not necessarily under oppressive regimes, amateurs can still face many obstacles to operating.



At the Sinclair Hotel in Port Blair, Andaman Islands. At the microphone Bharathi VU4RBI assisted by Charles K4VUD/VU3CHE 21 December 2004. *Photo by Henryk Kotowski, SM0JHF/VU3HKE* 

#### In Next Month's Radio Active...



#### Introducing You to Hobby Radio

#### RADIO ACTIVE March ISSUE ON SALE 10th February 2005

Radio Active is published on the third Friday of each month available from all good newsagents or direct by calling 0870 224 7830 priced at only \$2.85.

# Image: State of the state

features packed with Informat for the radio enthusiast...

#### Sport on the Radio

How to find the best games and matches from all around the world

Contest Operating Give it your best shot with this helpful guide

Kenwood PMR 446 Reviewed Professional PMR 446 radios put through their paces

Digital Measurement Getting the most out of a digital mutimeter







Jerry Glenwright clo SWM Editorial Offices, Broadstone

ello and welcome to *SWM*'s bi-monthly look at the world of Internet for s.w.l.s. There's help for those struggling with broadband and webcasts in this instalment but first, a look at an excellent new website from a *SWM* reader.

#### Reader's Own

It gives me great pleasure to start this 'ShackWeb' by telling you about a 'homegrown' website that is a must-visit for readers. A little before Christmas, **Graham White** E-mailed me to tell me about his newly-launched listener's forum entitled the UK Shortwave and Scanning Forum, a place where like-minded listeners could gather to swap anecdotes, ask for help and advice even post pictures of their equipment. Magazine lead times being what they are, it's taken until now for a mention of the new site to find its way into *SWM* so without further ado let's have a look at what the new site has to offer.

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	UK Shortweve and S the star as fruit. For it has been than a fruit. For the star been that the star as a star of the star as a thread the star as a star of the star as a star thread the star as a star of the star as a star as a star of the star as a star as a star of the star as a star a	Canning Forum measure And Secondary Insect Description		
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The forum is divided into a number of sections each of which is devoted to a particular topic area. Beginning with the General section there are sections for news, new member introductions and general 'slightly off topic' stuff that doesn't fit elsewhere. Pressing on into the forum proper there are discussion areas for short wave and scanning listening, antennas and equipment, data decoding, hints and tips, a QSL gallery and even a virtual logbook! There's also a section devoted to pictures of member's equipment which, as devotees of 'the other man's shack' pictures will testify, is always jolly interesting!

Rounding off the listening forum is the obligatory sales and wants and a collection of links to other sites of interest. For those with a ticket there's an amateur radio discussion and associated sections devoted to propagation conditions, receivers and equipment and antennas as well as a hints and tips section.

"I'd been looking around the Internet for a similar forum and I never really found much so that's what inspired me to create this one", says forum creator Graham White. "I hope with time it can become a thriving community full of detailed information for the beginner and for people with experience alike".

It's early days yet - forums of this kind take some time to acquire the necessary strength of numbers - but if the current state of play is anything to go by, the UK Shortwave and Scanning Forum is going to be a true success. The members are friendly (though I'm still a 'lurker' and have yet to make a post there), the discussions lively and interesting and the subject matter is sure to be of interest to many readers with web access (those without a computer can visit the forum online at a local library).

Well worth a visit and I wish Graham every success with the forum. And now it only remains to tell you how to get there, point your browser at

#### www.ukradioforum.r8.org

#### Cast Aside?

I've had a number of communications from readers who have tried listening to online transmissions - webcasts - but without success. Typical of the E-mails I've received is this from Mark Simmons who lives in a little village near Ely: "Having read in your column and elsewhere about listening to broadcasts and other transmissions on the web I was keen to try but did not meet with much success using a dial-up Internet account and modem. The transmission 'stuttered' or else stopped altogether and the quality was awful to say the least. I thought this might be down to the speed of connection so recently I took the plunge and had broadband installed. My house is in a rural location so it was some time before the exchange could be made to provide the service but following a petition from local people, broadband was made available. I decided that in for a penny in for a pound I would choose a 1MB connection to be sure I had the capability to hear what I wanted. Imagine my disappointment when the same problems existed! Webcasts frequently stall or else stutter continually and the whole exercise of 'listening' is extremely frustrating! Am I doing something wrong or simply doomed not to hear anything beyond a few minutes over the web?"

Frustrating indeed Mark, and I have personal experience of exactly the problem you describe. My first act with access to broadband (at work not at home) was to try out the BBC's Listen Again service - a huge disappointment. The broadcasts stuttered, stopped and started or simply hung up altogether. After a week or two I stopped trying and gave up. My connection was rated 1.5MB which should have been more than fast enough and the service was from a leading provider (arguably the leading provider) who shall remain nameless, not a fly-by-night operation.

There is, however, a happy ending. I now have broadband at home. A 'half-meg' connection provided cheaply by Tesco and listening is a full-on, high quality experience that is never anything but utterly reliably. In fact, I'm listening to *Steptoe & Son* on BBC Radio 7 as I write this, on a laptop with a comparatively slow 802.11b (11Mbs) WiFi wireless card, and the transmission is perfect.

The problem then? Is almost certainly with your ISP's server and not with the webcast provider or your machine (given that you have a computer with reasonable specs). Unfortunately, that's probably the one problem that can't be resolved other than by changing ISP - not easy if you're tied to a contract.

Perhaps the best advice is to canvass the opinion of anyone you know with a broadband connection to determine who can listen with ease and who can't. Low tech, yes, but there's no substitute for this kind of personal recommendation. And while I hesitate to recommended any particular broadband service, I confess I'm more than pleased with Tesco's offering.

Incidentally, if your BT exchange is yet to make broadband available there may be a local campaign that you can get involved in. BT sets an exchange 'trigger' number for subscribers who register an interest (not an obligation) in receiving broadband. When the trigger is reached, the exchange is converted (be aware though that some exchanges have been deemed 'not viable'). Visit **ready4broadband.co.uk** which has details of many campaigns and news on the progress of broadband as well as reviews of ISPs and so on.

#### Surf Time

No space to witter in my usual way about all the sites to visit this time so here's a quick picklist that are well worth a look:

homepages.ihug.com.au/~vk5vka, www.tetrascanner.com/links-todigital-online-scanners.html (excellent!), worldaerodata.com, home.kabelfoon.nl/~pdw/alp, www.strongsignals.net, www.blackcatsystems.com/radio/ shortwave.html (always worth a visit), www.scanning.radiouk.com and espresso.ts.uvic.ca



 Peter Bond clo Editorial Offices, Broadstone

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fter my comments in last month's column, my thanks go to those readers who kindly sent me get well messages. Further surgery has now taken place and I hope to resume normal service in the not too distant future.

#### ACMI Waddington (RIP)

There had been some speculation that the ACMI (Air Combat Manoeuvring Instrumentation) deployments to Waddington would end in 2005 with a final NOMAD exercise sometime during April or May. But sadly it is not to be and after more than 14 years it was announced that the ACMI exercises were to end.

Deployments to Waddington have been cancelled on a regular basis in recent years and it was becoming obvious that this could be the beginning of the end for this type of training at a specific base. Consequently, the final detachment of aircraft finished on the 2 December 2004 with the departure of French Air Force Mirage 2000s.

Probably, the first nail in the coffin for this facility was the withdrawal of the USAF three years ago and the closure of the Lakenheath de-briefing unit. That coupled with significantly reduced Air Force budgets plus advances in the available technology meant that some of the NATO Air Forces were able to complete this type of training 'In House' without the expensive need to deploy a number of aircraft to a specialist facility. So sadly another source of airband listening and aviation photographs passes into history, the deployments will be sorely missed by all enthusiasts. With thanks to Terry P. and Martin for the information

#### TADS

The emotive subject of the UK TADS has been fairly prominent amongst my E-mails in the past few months. Whilst it would be very handy, I must point out that I do not have a hotline to the TAD Allocation Cell, so those readers who ask me detailed questions regarding this subject are often disappointed. Like everyone else I have to glean information from all the usual sources including of course, regular listening.

Since I reported the changes to the UK Tactical Air Designators (TADS) last year, there has been a fair bit of speculation amongst airband listeners as to what format the overall changes were, rather than specific frequency changes.

Considering that modern security regarding

TAD lists is nothing like it was 20 years ago, I may be wrong but it seems to me that the odd copy of an official TAD list seemed to materialise more regularly 10 years ago than it does today. Even so, I did have sight, (albeit briefly) of an 'official' list in the middle of last year.

The format of the TAD listing was different to those I had seen previously, in that the TAD and frequency were listed, but not the operating agency. This raised some questions which myself a some fellow listeners have pondered over for a few months, we expected that a definitive answer would become available, but this has not happened. So, whilst it is generally best not to speculate we were left with no option but to put forward the following theory.

Taking into account a variety of information including various reports from the latter part of last year, the main conclusion which has been suggested by several sources is that apart from specific TAD allocations such as OTAs, AWACS, etc., the main Air Defence TADS that were allocated to Buchan, Neatishead and Boulmer have been pooled. They are perhaps now selected by one or more central allocation cells using just the TAD number with no specific title?

With further research we were surprised to find that 'Neatishead' as a callsign appears to have been withdrawn in early August 2004. This would possibly tie in with the 'pooled' theory and the TAD listing having no operators listed.

As I mentioned in November's 'Sky High', Neatishead is due to re-locate to Scampton in early 2005 as part of the Defence review, so you could conclude that this does support our theory? One item not mentioned in the Defence review was that the RAF News announced that the ADR Control and Reporting Centre (CRC) at Buchan closed on the 30 November 2004 and is now a remotely controlled Reporting Post (CRP).

A further check on the Buchan callsign showed that it had not been reported since 9 November. As Buchan has been downgraded to a CRP the standby CRC at Boulmer has been temporarily re-designated as a primary CRC. I am sure there will be more on this subject in future columns - if anyone can help with this theory, supply information or even send in a recent listing we would like to hear from you. (Thanks to Jim, John and Ron).

#### **USAFE** Movements

With the closure of Frankfurt Rhein-Main as a military base in the middle of this year, their

busy selection of transport movements are to be moved to other USAF Europe airfields. Spangdahlem and Ramstein will take some of the traffic but it also brings some good news for airband listeners who visit or listen in to Mildenhall.

My local correspondent tells me that it is expected that between 4 and 8 USAF C-17s per day will start to transit through Mildenhall from June or July. It is also expected that there may be a small rise in visitors and also some extra civil movements, Boeing 747s has been suggested.

Other speculative news from local people is that the US Navy C-12 is to move to Naples within the next three months, ending many years of a Naval Aviation presence at Mildenhall. It doesn't seem that long since their three based C-131s were gracing the skies. It is also suggested that the SOG units may move to a more advanced location possibly in Romania. Also both Lakenheath and Spangdahlem may also lose one Squadron once again to a more advanced location, one source suggesting that Turkey might be a possible destination.

More good news for USAFE aviation enthusiasts comes from RAF Fairford. With thanks to James and Mathew H for leading me to this excerpt from an article which comes from the Whiteman AFB magazine Whiteman Spirit.

"The B-2 now has a permanent home when deployed away from Whiteman AFB. The Royal Air Force at Fairford in the United Kingdom recently unveiled two B-2 climate-controlled permanent hangars, 10 December 2004. The new 50,000-square-foot facilities allow specialised low-observable surface maintenance to be performed. "Low-observable maintenance is the backbone of the B-2", said Col. Chris Matson, 509th Maintenance Group Commander. "Having the LO dock at Fairford allows us to do this critical process faster and better". LO maintenance is critical in maintaining stealth attributes of the B-2. Specialised coatings cover the aircraft's composite and metal skin. The process of putting on these coatings, and ensuring it cures correctly and fully must be done in a climatecontrolled environment.

"It's a great day for the US Air Force and a great day for the United Kingdom," said General Lindell. "We're looking forward to seeing history happen at Fairford." Forward basing the B-2 at RAF Fairford will save about 16 hours of flight time for reaching targets across the Atlantic Ocean. That time can now be spent recovering a B-2 after a combat sortie



This month's photo shows a based US Navy C-131F on the approach to Mildenhall in 1981.

and getting it ready for another mission, Colonel Matson said after returning from the unveiling ceremony at RAF Fairford".

The new hangers which cost \$19 million were finished some seven months ahead of schedule and are the final piece in the Fairford re-development Jigsaw that will see the airfield fully operational as a B-2 Forward Operating Location. From an enthusiasts/airband point of view this presumably will mean that in the near future we will hopefully be seeing regular deployments of B-2s to the UK.

#### 8.33 Anticlimax?

Well it didn't last long! After the introduction of 132.84 onto the London Upper Sector West to replace 135.425 on 10 December, a new era for the airbands had arrived, (at last). The new frequency was noted on several occasions after this date, but then fell silent and 135.425 was back in regular use. (So as yet it is not a direct replacement).

Regular monitoring by myself of 132.84 over the next few weeks proved uneventuful and it has remained silent. It is interesting to note that as of mid January the new frequency was not listed in the Air Pilot. A word with a couple of people in the know has indicated that the frequency is still available but is being used as a secondary.

#### Eagles Eye (Part 2)

My thanks go to **Steve F.** who sends in this follow up to the earlier report on Exercise *Eagles Eye* as the participating aircraft moved from the South UK to Scotland.

"Further to your notes in the latest SWM,

I monitored some activity on the 15 November. 'Magic 53' was working the helicopters as they transferred from Keevil to West Freugh in Scotland. I could not hear the helicopters transmissions as they were out of range but the AWACS was loud and clear. Frequency in use was 263.45 (TAD 501 -AWACS Primary), changing to 248.7 (TAD 503) with the following callsigns heard, Wagtail 40 reported as an 8 ship of Chinooks, Wagtail 54 Combine was possibly more Chinooks although a 3 ship of Merlin's was reported. I believe the large helicopters routed via Lyneham - Gloucester -Manchester while the Lynx and Apaches refuelled at Shawbury".

#### Further callsigns noted :

Call	Aircraft
Solon 60	Lynx
Sumo 62	Lynx x2
Schubert 64	Lynx x2
otter 70	Apache x2
Cashmere 72	Apache x2
Linseed 74	Apache x3
Mowgli 76	Apache

#### **Airband Travels**

It seems that the period between Christmas and New Year is when people start to think of the next year's holidays as I had two E-mails both asking for information during this period.

**Rob** M asks: "I am making my first trip to Brittany in June with my family to stay in a Gites about 7km west of Morlais. As the Aeronavale base at Landivisiau is only around 14km away, I thought I would take my handheld to listen in and perhaps also pay a visit to the airfield. Do you know any airband frequencies for the airfield and do you or your readers know if there are any good places for landing or taxing photos".

#### Frequencies are as follows:

Approach	122.4, 119.7, 357.275
Radar	118.8, 120.9, 249.65, 360.525
(Primary)	140.0, 259.4, 247.0, 256.4
(Secondary)	119.2, 259.95
ATIS	142.225

The last time I went to Landivisiau was a few years ago on a press trip onto the airfield so I am not sure about landing or taxing photographs - can any of our readers help?

Also on his travels is **Brian L**, he writes: "Some time ago I remember you mentioning the Emmantina Hotel close to Athens Airport being very good for photographs. Now that the new Athens Eleftherios Venizelos airport is open, is the original airport still operational and if so is there any aircraft worth photographing?".

As far as I am aware the airfield is still in operation but as to what aircraft route through there I really cannot help. I have not seen any reports and I have been told that the airfield is very quiet compared with the old days. I also believe that there are future plans to redevelop the site. Can any of our readers help with information? The usual warning - be careful of the Gendarmes in foreign countries they may not be as accommodating to radios and cameras as the UK Police - as recent history has proven!



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#### How to use the Propagation Charts

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

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

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

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

Good luck and happy listening.

#### March 2005 Circuits to London



SK10080

Propagation

Extra

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celebration plus a brand new mode for this month! The celebration is for the tenth anniversary of Worldwide Utility News Club or WUN

Club, as it's come to be known. Back in the 1990s utility monitoring was essentially a solitary hobby with very few opportunities for like minded people to get together to further their knowledge. The only outlets for sharing came when some of the established clubs such as Speedx and the Benelux DX-Club started introducing specialist utility columns. However, this was rather late in the life of those clubs and, by the mid-90s, the Speedx club had packed-up. Salvation came through the increased availability of Internet access and the fact that utility listeners tended to be early adopters due to the nature of the hobby. This growing Internet access spawned the idea of an on-line Utility club with international availability.

Although paper versions were produced in the early days, this soon gave way to a totally electronic version of the club. The original club started with just a few specialist editors: Rick RD Baker, Tony Orr, Jim Navary, Mike Wolfson, Jim Pogue and Ary Boender. In addition, Jason Berri was (and still is) the WUN Webmaster and Tim Braun was responsible for the paper edition of the WUN Newsletter. One of the innovations of the WUN club was the listserver that was started by Canadian Joel Bedard. The listserver is at the very heart of the WUN Club and provides a mechanism for near 'real-time' exchange of hot utility information and logs. This information can transform your listening success and bring some new life back into the hobby. It's dead easy to join - you just follow



AISLive showing far-eastern port details.



AISLive Southampton area, complete with a ship's photo.

the instructions at the address listed here: http://mailman.qth.net/mailman/listinfo/wun

Once signed-up, you can choose to have the daily information passed through to you as it happens, or packed-up into convenient daily batches. If you've not tried this before I can thoroughly recommend it - as it's guaranteed to add a new dimension to your monitoring experience. In addition to the listserver and excellent monthly magazine, the WUN club site has a stack of useful information to help the utility enthusiast. If you want to find out more about an h.f. data mode the Digital FAQ should be your first stop. This is a hugely powerful resource that's been created and maintained by Stan Scalsky and Mike Chace. You should find details of just about every mode that's ever been on the h.f. bands!

Another great asset is the Digital Sounds page that has both audio samples and waveforms of a huge range of digital signals. As well as being extremely useful for ear training, most of the samples are long enough to be used to test decoding systems. This makes them invaluable for familiarising yourself with a new decoder. If you'd like to take a look at the excellent facilities provided by WUN Club why not pay a visit to their website at: www.wunclub.com

#### AIS

Now for that new mode I promised earlier and the new mode is called Automatic Information System (AIS). With so many of the 'old faithful' modes disappearing, it is very refreshing to find a new mode hitting the radio waves. Although it's not an h.f. mode, it is a broadcast mode, so is available to a wide audience. The acronym AIS relates to a relatively new system that's been introduced to improve maritime safety in busy shipping areas. In very simplest form AIS broadcasts a ship's speed, position and identity to other ships in the locality. Because the transmission contains very accurate positional data, the information can be used to build-up a radar-like plot of the local shipping activity. This is immensely powerful and is being used by most harbour authorities to provide a very accurate picture of ship movements in and around the harbour.

The system has been internationally recognised as a significant aid to safety and has now been formally incorporated into the mandatory requirements for all vessels of greater than 300 gross tonnes. These are defined by the International Convention for SOLAS (Safety Of Life At Sea). The incorporation into SOLAS is good news for listeners because the system is sure to spread and you can expect a reasonable life. That assurance opens-up the potential for software developers to invest some time to create both commercial and amateur decoding systems. There is already one program available for download on the Internet and I've no doubt others will follow in due course. If you spot any new ones, please drop me an E-mail so I can share with other readers.

#### **Inside Story**

Let's start by taking a closer look at the technology behind AIS as there are a number of new techniques that have been employed to give the system the level of reliability necessary to be used as a safety support tool. Each AIS installation comprises a number of components. For the radio section, the installation includes a v.h.f. transmitter, two v.h.f. Time Division Multiple Access (TDMA ) receivers and one v.h.f. Digital Selective Calling (DSC) receiver. The radio kit is linked to the ship's standard instrumentation using a conventional IEC61162 maritime communications link. For positional data, AIS uses the ship's GPS system which would normally be enhanced through the use of medium frequency DGPS to provide the very accurate positioning necessary when ships are in close proximity in harbours and busy waterways.

The radio transmission mode used to support AIS is 9.6Kb GMSK frequency modulation using 12.5 or 25kHz channels with common packet protocols. Whilst the system can operate using just a single radio channel, most installations make use of two channels to help overcome interference problems and to aid seamless changeover between frequencies. The two frequencies currently used to support AIS internationally are 161.975MHz (VHF87B as AIS1) and 162.025MHz (VHF88B as AIS2).

One of the new techniques that have been employed to make AIS a practical reality is the use of Self Organising Time Division Multiplex or SOTDM. Any of you that have monitored Packet signals will know that collisions are an inevitable consequence of a large number of stations using the same frequency. For a safety system such as AIS the collision rate in a busy shipping area could potentially kill the system. The SOTDM technique has been developed to provide a more sophisticated solution to the collision problem. As the name implies, the transmission system itself provides data so that other stations can automatically adjust their schedules to avoid collisions.

To do this each station sends regular bursts of data that include the current transmission periodicity, i.e. how frequently the transmission occurs. This is supplemented with a mini-schedule showing the proposed future transmission schedule. As the AIS 9.6Kb system is able to send all its data in very short bursts, the SOTDM technique is able to create an impressive 2250 time slots per minute.

Whilst this in itself is pretty impressive, there will still be times when collisions occur but this robust system has been proven to be able to stand overload levels of 500% whilst still maintaining a near 100% throughput of data. By way of a fail-safe feature the system has been configured so that the more distant stations are the first ones to drop out.

#### Inside The Message

Whilst the original concept of AIS was to provide detailed positional data, the system has been enhanced significantly and can include a huge range of information. The transmissions take place in the v.h.f. marine band using the AIS 1 & 2 frequencies I mentioned earlier. The transmitter output is normally fixed at 12.5W and is fed to an omni-directional antenna. As operation at sea guarantees a good earth, this should provide a reliable range upwards of 80km. Of course 'lift' conditions would extend that significantly and you can expect to hear signals over considerable distances under enhanced propagation.

Each Class A AIS unit sends the following detailed information every two to 10 seconds while underway, and every three minutes while at anchor:

MMSI number - This is the Maritime Mobile Service Identity number assigned to every vessels carrying AIS. Navigation status i.e. at anchor, underway, etc. Rate of turn - right or left, 0 to 720° per minute Speed over ground - with a resolution of one tenth knot Position accuracy - differential GPS Longitude and Latitude - to 1/10000 minute accuracy Course over ground - relative to true north to one tenth degree True Heading - 0 to 359° Time stamp - UTC of transmission

This critical information is supplemented by the following supplementary information every six minutes:

MMSI number IMO number Radio callsign - The ship's international callsign Name - Name of ship Type of ship/cargo

#### Dimensions of ship

The location on the ship where its reference point for position reports is located this is particularly important for larger vessels.

Type of position fixing device - GPS, etc. Draught of ship - To one tenth metre Destination - This is discretionary Estimated time of Arrival at destination month, day, hour and minute in UTC - also discretionary.

It's the huge range of information that's transmitted that makes AIS a very interesting mode for utility enthusiasts. The only real drawback of course is that you need to be relatively close to the coast in order to receive AIS signals.

#### **Internet AIS**

Even if you are well and truly land-locked and unlikely to get a sniff at a real AIS signal there is still a way to enjoy this mode. The solution is to log-on to the AISLive website which can be found at:

#### www.aislive.com/InfluxPortal/ DesktopDefault.aspx

AISLive is an experimental site that provides access to extensive AIS data from around the world. To bring the data to life it has been processed to make it user friendly and is shown displayed on detailed maps of many of the World's great ports. The maps are great and can be zoomed to show an amazing level of detail. I've shown a couple of screen shots in the column. Even if you're not intending to follow-up on AIS, the website is still worth a visit. You have to register to get to the detailed maps but registration is free.

#### Software

At the time of writing I'm only aware of one source of software that can be used to decode AIS signals and that's *Ship Plotter* - their website can be found at the following link: www.shipplotter.com

The software can be downloaded and used free of charge for 21 days and after that time a modest 21 Euro registration fee is required. Ah! I've come to the end of my space so, I'll have to give you more information on this mode in a later column.



The new *Ship Plotter* website where the AIS software is to be found.



Robert Connolly 21 Eleaston Park, Kilkeel, Co. Down, N. Jreland BT34 4DA

E-mail beacons@kilkeel7.freeserve.co.uk

n recent columns I have been promoting maritime beacon DXing to the newcomer to this area of the hobby. A few listeners have written to me advising that they have tried with unfortunately little success. I would suggest that the newcomers try the stronger maritime beacons that are easier to receive and progress from there. The best ones to try are BA 292.5 (Spain), MY 337.0, AB 381.0 and NL 404.0 (all from the Faeroes). These are best received after dark although can also sometimes be heard during daylight.

Again I must stress the importance of careful listening I would suggest trying to listen using either the s.s.b. mode of your receiver (u.s.b. or l.s.b.) initially as this usually provides a slightly wider filtering on most receivers and on most receivers automatically activates the b.f.o. (beat frequency oscillator) of the receiver. I listen to these beacons for about an hour or three or four times a week and of course nightly results depend on current propagation conditions.

#### Non Directional Beacons

Non Directional Beacons (NDBs) are classified as three different types depending on usage. The most common classification is Aero where the beacon is certified for use by aircraft, many coastal aero beacons are could also be used by shipping and were detailed in nautical almanacs and official publications. The majority of aero beacons transmit their ident continuously.

The next classification is Marine where the beacon is certified for use by shipping. Although shown on aero navigational charts these were not really useful for aircraft due to the fact that often their ident signal was only sent over a ten second period in a minute or even six minutes in the case of former beacon chains. Not very useful if you are flying a commercial aircraft at over 400mph although small slower aircraft may have found them beneficial in an emergency.

The third category is Aeromarine where the beacon is certified for use by both aircraft and shipping as they send continuous idents. A number of these still operate in Norway, Iceland, Faeroes and Greenland and this category eliminated the need to have separate aero and marine beacons in what is usually a difficult to access hostile environment due to weather, snow and ice.

#### **Online Receivers**

I have been advised by www.dxtuners.com whose online receivers were reviewed by the Editor last summer, that they now have a

dedicated NDB receiver available online. Access requires 'Professional' membership level and they are still experimenting with suitable antennas. Last summer I tried one of their demo receivers in Sweden and managed to hear several marine

NDBs from the Ukraine, While I would not actually log beacons received by this means, it is a good way of checking what is still active and receivable from another location.

#### Propagation Conditions

Propagation conditions have again not been great and several log contributors have confirmed this. Conditions did improve here during late December when a number of NDBs were received from Spain and Faeroes during daylight.

Tony Moore from Cleveland reported only one Spanish beacon despite as he states 'not for the want of trying'. Not to be outdone he packed his radio and went for his winter break in Spain so I look forward to his logs from there next time

Stephan Walther-Larsen, a new contributor, reports successfully receiving MY 337.0 from the Faeroes. Giorgio Casu reports receiving EI 291.5 from Bulgaria at his location in Sardinia. In Sweden Bo Nensén reports receiving EYa 309.5 from Ukraine. Roelof Bakker from the Netherlands kindly sent me his log and then the day before I was about to compile

the column forwarded an additional log reporting successful reception of SW, EYa and WR 309.5 from the Ukraine and advises that TD and OD were missing from that chain of beacons

Arnie Nessbitt is still using his crystal set Mk3 with no external batteries, gadgets or gizzmos for beacon DXing and tells me that he is now using an electric fence with 700µA of rectified current flowing through it as an antenna. Arnie does his DXing outdoors of course even on these cold nights.

In the French Alps Pat Vignound also reported receiving EYa, TR and WR 309.5 from the Ukraine but his regular Spanish MA, AS. MY, FI and SN were missing when he checked the band over the New Year period.

#### Long Wave Maritime Beacon Chart

kHz	C/S	Location	Country	DXer
283.5	NA	La Entallada	Canaries	A* B* D* H*
284.5	MA	Cabo Machicharo	Spain	A*
285.5	AS	Castellon	Spain (Med)	A* D*
289.5	MY	Cabo Ma <b>yor</b>	Spain	A
290.5	BT	Biargtangar	Iceland	A*
291,5	EI	Nos Emine	Bulgaria	D*
292.5	BA	Estaca De Bares	Spain (N/W)	A B C* D* E H
293.5	MH	Mahon	Balearics	A*
294.0	FI	Cala Figuera	Majorca	A*
296.5	FI	Cabo Finisterre	Spain (N/West)	A* B* D* H
298.8	HO	Hornbjarg	Iceland	A*
299.5	KN	Skrova	Norway	A* B C*
300.0	GA	Malaga	Spain (S/East)	A*
300.0	LT	La Isleta	Canaries	A*
305.0	KA	Klaipeda Rear	Lithuania	A* E* H*
305.7	DA	Dalatangi	Iceland	A* B* C* D*
309.5	EYa	Mys Yevpatoriyskiy Lt.	Ukraine	B* F* H*
309.5	SW	Mys Khersonesskiy	Ukraine	A* B*
309.5	TR	Mys Tarkhankutskiy	Ukraine	B*
309.5	WR	Odesa/Vorontsovskiy Front	Ukraine	B* H*
312.5	AT	Mys Aytodorskiy	Ukraine	A*
312.5	BK	Balitysk	Baltic Russia	A* H*
312.5	BT	Mys Taran	Baltic Russia	A* H* -
312.5	DB	Doobskiy/Mys Doob	Russia	A*
314.0	SN	San Sebastian	Spain (North)	A*
337.0	MY	Myggenaes	Faroes	A B C E* G* H*
372.0	OZN	Prins Christian Sund	Greenland	A* B* D*
381.0	AB	Akraberg	Faroes	A B C D*
404.0	NL	Noslo	Faroes	ACH*

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

#### Equipment Used

- A) Robert Connolly, Kilkeel, N. Ireland. Equipment. Receiver: JRC NRD-525. Antenna: Datong AD-370 antenna & Timewave DSP-9+ filter.
- B) Roelof Bakker, Middelburg, Netherlands. Equipment: Active whip and active loop + two tuneable pre-amplifiers. "The output from the pre-amps is routed to a phasing unit and than into the main receiver, a Wandell & Goltermann SPM-3 selective level meter. The output from the SPM-3 at 1500Hz, is down converted to 500Hz. Here follows a Datong FL-3 filter and/or a LC-filter with a bandwidth of 25Hz. With exception of the SPM-3 and the FL-3, the station is home-made".
- C) Tony Moore, New Marske, Redcar, England. Equipment. Receiver: Lowe HF-225. Antenna: Datong AD-370 Active Antenna Vert. Filter: Datong FL-2.
- D) Giorgio Casu, San Gavino Monreale, Sardinia. Equipment. Receiver: Icom 756 Proll Antenna: Wellbrook LF1010.
- E) Arnie Nesbitt, near Whitby, England. Equipment. Receiver: Xtal. Antenna: Sheep fence, earthed by a water trough.
- F) Bo Nensén, Örnsköldsvik, Sweden. Equipment. Receiver: AOR AR7030+ with a 300Hz JRC c.w. filter (CFL-231). Antenna: Beverages 156° - 500m, 222° - 760m, 245° - 740m, 261° - 930m, "279° - 1270m, 296° - 1240m, 317° - 940m, 333° - 700m.
- G) Stephan Walther-Larsen in Denmark, Equipment not specified.
- Patrick Vignoud, French Alps. Equipment. Icom R-75 + Wellbrook ALA100 loop, H) Timewave 599sx d.s.p. filter.

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he year 2004 will be remembered for being the year of the Asian Tsunami that swept across the Bay of Bengal to wreak damage and death on the distant shores - and in mid January the death toll across the several countries that were hit has exceeded 150,000. A Sri Lankan former TVS work colleague, Sam, who retired back to his country and lived in a beach-house was reading his paper Boxing Day morning and noted rocks normally visible on a submerged reef had disappeared, minutes later the whole reef, never previously seen was uncovered, then disappeared again. When Sam noticed that the waters had receded from the beach making it twice as wide, he and his wife locked their house and ran, they knew what was coming. It was so quick. At their gate the oncoming wave had already hit the neighbouring house, they ran up the narrow crowded road with the waters chasing behind until a slope stopped the waters, he luckily survived but neighbours and relations have all been lost.

As Boxing Day dawned in the UK the first media reports gave news of a large tidal wave, but as the hours went past the magnitude of the disaster became apparent and over each of the following days the disaster became more tragic and widespread. Initially videophone reports were carried, but soon the first satellite uplinks from the devastated regions were operational.

'ABC NEWS COLOMBO' were running almost continuous reports over a Europe\*Star 45°E circuit @ 11.481GHz-V (SR5632+FEC3/4) with NTSC output into New York via their London bureau. 'COLOMBO PATH 1' fired up over Eutelsat W1, 10°E @ 10.967GHz-V (4167+5/6) with content for several European networks and curiously an Australian station. Eutelsat W3, 7°E had a 3-ch bouquet with 'PHUKET\_U19'; 'NON E/S PATH 1' and CAT SNG THAILAND' with single feeds on other frequencies such as 'TV' and 'NL.USS D14'. Both MPEG-2 and 4:2:2 were used on these feeders. Eutelsat W3A, 7 also fed disaster content over 'EBU-REUT-COLOMBO' 11.098GHz-H and 'SCOPUS.NET-TE' 11.104GHz-H (both using 4433+7/8). Sky News flew out reporters to Sri Lanka who provided live reports into their hourly news on 3 January from the beach at Galle again over 45°E linking into Osterley - 11.537GHz-V (3199+3/4) using hired in 'NEWSLINK' SNG capacity. The same day the NBC crew arrived at Galle feeding live into New York over 'SRI LANKA 1' - perhaps using similar 'NEWSLINK' equipment as the same 3199+3/4 rates were used. Respected news reporter Dan Rather fronted the NBC New York news programme each evening for some days. The arrival of 'CBS NEWS GALLE' ensured that all the main American networks were present in Sri Lanka - CBS used 11.598GHz-V (5632+3/4), once more over 45°E

Apparently within a few km of the decimated tourist coastlines, Radio 5 reported that commercial life continued as ever with all the tourist activities operating on as normal.

As the SE Asian disaster unfolded on Boxing Day in Kiev another lesser drama was being played out, that of the re-election process between the Kremlin hard-liner Viktor Yanukovich and the peoples' favourite Viktor Yushchenko, his face now lined and haggard after the poisoning attempts. Mr. Yushchenko of course won much to the delight of the crowds in Kiev's main square - though his rival reckoned to dispute the result! The election results and speeches were carried late and live over *Eutelsat W1*, 11.100GHz-V (5632+3/4).

Though Europe\*Star @ 45°E seems to carry little signal throughput, it's worth checking out the bird, after the Bali bombing the satellite became very active with feeds into the UK providing a very strong footprint across Western Europe. One regular user is 'GLOBECAST AFRICA' and 6

January saw 'MOTO GP S-AFRICA' running a report about AIDS in Africa, the day the funeral of Nelson Mandela's son from AIDS was extensively carried over the 'GLOBECAST AFRICA' circuit on the Globecast 'usual' lease at 11.525GHz-V (5632+3/4). BBC News London ex Jo'burg also used the feeder for several reports into their UK news programmes.

Just before Christmas 11.525GHz carried 'GLOBECAST AFRICA' colour bars tests for over an hour, then just switched off with nothing carried. Satellite carriers are expected to sign off each transmission on close down with an identification of the originating uplink (such as 'BT TES-43' or 'NTV RUS-5 0070') but this seems to be ignored on many feeds over 45°E with ends like a tape play-off, blank screen and...switch off!

From Globecast in the east to Globecast in the West and this company is well represented on the *Atlantic Bird-1* satellite @ 12.5°W. At 1900 on 9 January, General Motors unveiled their latest creation to an audience in Detroit, USA. The GM 'GRAPHITE CONCEPT VEHICLE'! received applause as it appeared on the stage. It looks like any other 4x4 but computer generated graphics revealed much underneath, hydrogen fuel cells and miniature electric motors all controlled by one central onboard computer. The two mode hybrid graphite concept vehicle will soon hit the highways of America and the Channel 4 slot within the 5 channel Globecast multiplex carried the news first -11.107GHz-H (20145+3/4).

Noting above the several frequencies carrying Tsunami news film over *Eutelsat W3A* @ 7°E, Eutelsat at the end of last November moved their *W3* satellite to the 21.5°E slot to replace their highly inclined *2F3* satellite. Eutelsat, at the time of writing are still using these two satellites named as *W3A* and *W3* at 7° and 21.5° respectively, one Internet listing has renamed the *W3* ex 48°E as *W6* but at the time of writing Eutelsat have not changed any numbering.

Israel also has their own orbital slot with the Amos 1 and Amos 2 satellites downlinking in two target areas, that of Central Europe and Israel itself. Curiously there are many Russian TV channels using the European beam such as 1+1; OTV; Kiev (Knib); M1 and others. Amos takes a little more skill to find and signal levels can vary across the day, certainly my 1.2m dish and a 0.3dB LNB can resolve signals OK for the European beam near Southampton, UK.

December saw President Chirac open the Millau bridge over the River Tarn in the Massif Central mountains of central France. The bridge completes the long motorway route between Paris and the Mediterranean coast. It's a remarkable site, the road is some 270m above the river and is 2.5km long. There are seven supporting pillars, the highest reaches to 343m high. The bridge presents an impressive site particularly as the mists swirl around the structure, the opening speeds the traffic South and bypasses the small bottleneck town of Millau. Roy Carman (Dorking) watched the official ceremonies over the Telecom 2A satellite @ 3°E which was carried over six downlink frequencies between 12.551 - 12.61GHz - interesting to see that 3 Globecast (French), 1 Globecast (UK), 1 French and 1 German SNG units carried the satellite feeds, obviously a major French flag waving event!

And finally 'Merry Christmas' Sky News satellite feeds were seen on the morning of 25 December, the London SIS crew were at a London traffic problems - though the M1 near Leicester was enjoying a white Christmas. Meanwhile SIS UK-176 was at Malvern hospital with the nurses and patients experiencing an NHS Christmas. Seen at 11.172 and 11.185Ghz-H (4224+7/8) respectively over Intelsat 603, 20°W during its closest approach on its 2.2°inclined orbital track.



the 'Motor World' 4x4 team event in the Gibson Desert, Australia (12.5°W).



The new Hamburg to Berlin express takes 90 minutes and is on time! (21.5°W).



Iraqi anti-coalition fighters and their "training' video promoting the downfall of the West (16°E).



The Tsunami strikes in Sri Lanka (45°E).



The impressive Millau road bridge, central France (3°E).



Crowds in Kiev celebrate the announcement of a new election (via 12.5°W).



Colin Powell announces \$350m of help to the Tsunami disaster relief (via 10°E).



# **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

#### CHESHRE

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

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

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

MID CHESHIRE ARS, G3ZTT. Meets at the Cotebrook Village Hall, Cotebrook Nr. Tarporley, Cheshire. Details from Niali Reilly GOVOK NORTH CHESHIRE RC, GOBAA. Meets at the Morley Green Club, Mobberley Road, Wilmslow, Cheshire. Details from Jill Gourley GOOZJ. Tel: 0161-485 5036.

RADIO OFFICERS ARS, MOROA. Details from Mr J. Bell GOCMM.

UKFM GROUP WESTERN, GB3MP. Meets at the Moriey Green Club, Mobberley Road, Wilmslow, Cheshire. Details from Gordon Adams G3LEQ. Tel: (01565) 652652, FAX: (01565) 634560.

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

WDNES & RUNCORN ARC, GOFWR. Meets at the Scout Hut, Castle Road, Halton Castle, Runcom, Cheshire. Details from Martin Tust G4LUQ, Tel: (01928) 714843.

#### CLMERIA

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

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

WHITEHAVEN ARC, MOBEE, Details from Mr N. Williams MOCRM

#### GREATER MANCHESTER

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

DOUGLAS VALLEY ARS. G3BPK. Meets at the Wigan Sea Cadet HQ, Training Ship Sceptre, Brockhouse Terrace, off Wamington Lane, Wigan. Details from Mr D. Snape G4GWG. Tel: (01942) 211397.

ECCLES & DARS, G3GXI. Meets at the Eccles Liberal Club, Wellingtor Road, Eccles, Manchester. Details from Chris Harrison G8KRG, Tel: 0161-773 7899.

THE MANCHESTER WIRELESS SOCIETY, G5MS. Meets at the Simpson Memorial Community Hall, Moston Lane, Moston, Manchester. Details from Ian MOIPR. Tel: 0161-288 730 or visit www.g5ms.com

OLDHAM ARC, G40RC, G10RC. Meets at the Royston Air Training Corps, Park Lane, Royston, Oldham. Details from Michael Crossley M1CVL. Tel: (01706) 367454.

ROCHDALE & DARS (RADARS), GOROC. Meets at the Bamfield & Fieldhouse, Cricket Club, Bamfield Village. Details from John Canr G70AI. Tel: (01706) 376204.

SHAWCLOUGH ARC, GOUQA. Meets at the Rochdale City Learning Centre, Falinge Road, Rochdale, Details from Alan G4TMV. Tel: (01706) 344186, E-mail: info@sharc.org.uk webiste:

SOUTH MANCHESTER RAD & COMP CL, G3FVA. Meets at the Sale Cricket Oliub, Dawe Road, Sale, Cheshire. Details from Chris Ward G4HON. Tel: 0161-483 5174.

STOCKPORT RS, GGUQ, GBSRS. Meets at the T.S. Hawkins, Stockport Sea Cadets HQ, Pearmill Ind. Est., Stockport Road, West Howe, Lower Brechury, Stockport, Details from David Simcock MIANT, Tel: 0161-456 7832.

TRAFFORD ARC, GOTRC, G1TRC. Meets at the Watch House, Cruising Club, Canal Bank, Stretford, Manchester M32 8WE. Details from Roger May G4YLQ. Tel: (01457) 8666575.

TRAFFORD RADIO GROUP, GOTRG. Meets at 17th Stretford Scouts HQ, Barton Road, Stretford, Manchester, Details from Jon Mossma G7JKK. Tel: 0161-865 5609.

WEST MANCHESTER RC, G4MWC. Meets at the Astley & Tyidesley Miners Weifare Club, Meanly Road, Astley, Tytöesley, Manchester. Details from Jeffrey Moran MOBGU. Tel: (01204) 497694.

WIGAN & DARC, GOHRW. Details from Mr D.H. Barkey GODPI. Tel: (01942) 237162.

#### ISLE OF MAN

ISLE OF MAN ARS, GD3FLH. Meets in the Sea Cadets Hall, Tromode Road, Tromode, Douglas, Details from Dave Walton MDOBXX. Tel: (01624) 816308.

#### LANCASHIRE

BURNLEY & DARS, RS87674. Meets at Barden High School, Barder Lane, Burnley, Lancashire. Details from Bill Scrivener GOBQC.

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

DARWEN ARC, G4JS. Meets at the Darwen Catholic Club, Wellington Fold, Darwen, Lancashire. Details from Len Jackson GONPJ.

FISTS CW CLUB, GO/PX. Details from Mr E. Longden G3ZQS. Tel: (01254) 703948.

FYLDE ARS, RS53939. Meets at the A.N.T. Flying Clubhouse, Blackpool Airport. Details from Ken Randail G3RFH.

\*MORECAMBE BAY ARS, G4YBS. Meets at the Trimpell Sports & Social Club, Outmoss Lane, Morecambe, Lancs. Details from Pau 260DX0. Tel: (01524) 427793, E-mail: 2e0dxo@mbars.co.uk

PRESTON ARS, G3KUE. Meets at the Lonsdale Club, Fulwood Hall Lane, Fullwood, Preston. Details from Eric Eastwood G1WCQ. Tel: (01772) 686708.

ROLLS-ROYCE ARC, G3RR. Meets at the Club Room, Rolls-Royce Sports Ground, Bamoldswick. Details from Mr J.A. York G3KYJ. ROSSENDALE ARS, G1RRS, Meets at the Old Fire Station, Burnley

SWM. March 2005

Road, Rawtenstali, Rossendale, Lancs BB4 8EW. Details from Ken Slaughter. Tel: (01706) 830306.

THORNTON CLEVELEYS ARS, G4ATH. Meets at the Frank Townsend Centre, Beach Read, Thomton Cleveleys, Lancs. Details from Mr J.E. Duddington G4BFH. Tel: (01253) 853554.

MERSEYSIDE LIVERPOOL & DARS, G3AHD. Meets at the Churchill Conservative Club, Church Road, Wavertree, Liverpool L15. Details from David G. Parr G8DEY.

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

SOUTHPORT & DARC, G2OA. Meets at St. Marks Church Hall, Scarisbrick, Lancs. Details from Don Atkins M1BUL.

WIRRAL & DARC, G4MGR. Meets at the Irby Cncket Club, Mill Hill Road, Wirral. Details from Tom G4BKF, E-mail: secretary@wadarc.com Tel: (07050) 291850.

WIRRAL ARS, G3NWR, MX1ARC. Meets at the Club Room, by Farm Arrowe Park Road, Wirral L49 5LW. Details from Alan Upton G3UZU Tel: 0151-677 3266.

#### NORTH BAST CLEVELAND

EAST CLEVELAND ARC, G4CRS. Meets at the New Marske Institute Sub, Gumey Street, New Marske (near Redcar). Details from Alistaii Mackey G4OLK. Tel: (01642) 475671.

STOCKTON & DARG, G4XXG. 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 Stanley Village Hall, Rear High Road, Stanley, Crook, Co. Durham. Details from Mark Hill GOGFG. Tei: (01388) 745353.

DERWENTSIDE ARC, G4PFQ. Meets at the Steel Club, 36 Medomsley Road, Consett, Co. Durham. Details from Mr G, Darby 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 G7UUR. Tel: 0191-477 0036, mobile (07990) 760920. PETERLEE RADIO CLUB, GOKVJ. Details from Andrew Pennell GONSK.

#### HUMBERSIDE

EAST YORKSHIRE ARS, GOECR. 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, GOOLE. Meets at the West Park Pavillion, Goole, South Humberside.

GRIMSBY ARS, G3CNX. Meets at Cromwell Social Club, Cromwel Road, Grimsby, South Humberside. Details from Mr G.J. Smith G4EBK. Tel: (01472) 887720.

HORNSEA ARS, G4EKT. Meets at The Mill, Alwick Road, Homsea, North Humberside, Details from Jeff Southwell G4IGY. Tel: (01964) 533331.

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

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

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

#### NORTH YORKSHRE

DARLEY ARC. GOFOS HAMBLETON ARS, GOJQA. Meets at the Mencap Centre, Northallerton, N. Yorks. Details from Ian Brickwood GOJQA. Tel: (01609) 775598.

QUEEN MARY ARCG, G6QM. Meets at Biazefield, Pateley Brdge, Harrogate, North Yorks HG3 5DR. Details from Frank Harris G4IEV. Tel: (01242) 236715.

RIPON & DARS, G4SJM. Meets at The Bunker, rear of Ripon Town Hall, North Yorkshine. Details from Nigel Drumm M1BDZ. Tel: (01423) 884733.

ROYAL SIGNALS SCARBOROUGH ARC, GORCS. Details from Mr A.W.W. Tjimme G3CWW. Tel: (01484) 842330.

SCARBOROUGH ARS, 648P. Meets at the Scarborough Cricket Club, Pavilion, North Manne Road, Scarborough, North Yorks YO12 21. Details from Mr D.P. Tipper G3JBR. Tel: (01723) 377296.

SCARBOROUGH SE GRP, GX0000. Details from Roy Clayton G4SSH. Tel; (01723) 862924.

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

YORK ARS, G3HWW. Meets at the Guppy's Enterprise Club, 17 Numery Lane, York. Details from Kerth Cass G3WV0. Tel: (01904) 422084.

YORK RADIO CLUB (AMATEUR) G4YRC. Meets at the Bishopthome Social Club, Bishopthome 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 Quinnin GOECQ, Tel: (079747) 99881.

#### SOUTH YORKSHIRE

FINNINGLEY ARS, G7HAH. Details from John Fennell G4HOY. Tel (01427) 872522.

MALTBY & DARS, G4SKM. Meets at the Centenary Hall, Clifford Road, Heliaby, 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, GOINF. NRAE/RAE tuition provided. Meets at the Sheffield University Staff Club, 197 Brook Hill, Sheffield. Details from

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

CHELTENHAM AR ASSN. G5BK. Meets at the Prestbury Library, Prestbury, Cheltenham. Details from Ivan Wilson G4BGW. Tel: (01452) 731956.

CHELTENHAM CLUSTER SUPP GP, GB7DXC. Details from Mr A.M. Davies GOHDB. Tel: (01684) 72178.

GLOUCESTER AR & ES, G4AYM. Meets at the Churchdown School, Churchdown, Details from Mr AJ, Martin, Tel: (01452) 618930.

SMITHS INDUSTRIES RS, G4MEN. Meets at the Sports & Social Out, Evesham Road, Bishops Cleeve, Cheltenham GL52 4SF. Details from A.J. Hooper G1JMF.

STROUD RS, G4SRS. Meets at the Minchampton Youth Centre, Nr. Stroud, Details from Mr S.G. Spencer G3ILO.

WHITE NDISE LISTENING GOWNL. Details from Adrian Deane G7KCG.

BROMSGROVE & DARC, G3VGG. Meets at the Avoncroft Arts Centre, Bromsgrove, Worcs. Details from Mr J.F. Burford G4OAZ.

BROMSGROVE ARS, G4TUI, Meets at the Likey End WMC, Bromsgrove, Worcs, Details from Barry Taylor G0TPG, Tel: (01527)

DROITWICH ARC, G4PVO. Meets in the Community Hall, Doitwich Spa. Worcs. Details from Hector Wragg M1BUV. Tel: (01905) 794399.

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

\*KIDDERMINSTER & DARS, GOKRC. Meets at The Chainwire Club, Zortech Avenue, Kidderminster, Details from Mr A.W. Saunders GOOZB, Tel: (01299) 400172.

MALVERN HILLS ARC, G4MHC. Meets on the second Tuesday of the month at the Town Club, Great Malvern. Details from Mike G3TGD. Tel: (01905) 830752, E-mail: mike@allenson.fsnet.co.uk

REDDITCH RC, G4ACZ. Meets at the WRVS Centre, Ludlow Road, Redditch, Worcs. Details from Mr R.J. Mutton G3EVT. Tel: (01789)

VALE OF EVESHAM RAC, GOERA. Meets at the BBC Club, High Street, Evesham, Worcs. Details from Mr A.C. Lindsay G4NRD. Tel: (01386) 41508.

1F ATC, G7MCD. Details from Sqn. Cmdr. Adrian Utting G1W20.

DEMONTFORT UNIVERSITY, G3SDC. Open to past & present students. Details from Mr R.G. Titterington. Tel: 0116-257 7059.

HINCKLEY AR & ES, G3VLG. Meets at the United Services Club, St Mary's Road, Hinckiey. 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, Shepshed, Loughborough, Leics. Details from Chris Walker G1ETZ. Tel: (01509) 504319.

MELTON MOWBRAY ARS, G4FOX. Meets at the St. John Ambulance Hail, Asfordby Hill, Melton Mowbray, Leics. Details from Mr R. Winters G3NVK. Tel: (01664) 63369.

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

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

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

EAGLE RADIO GROUP, MOERG. Meets at the Eagle Hotel, Victoria Road, Mablethorpe. Details from Terry Stow GOSWS. Tel: (01507) 478590.

FIVE BELLS GROUP, G4SIV, Details from Mr B.K. Tatnall G40DA GRANTHAM RC, COGRC. Meets at the Kontak Social Club, Barrowby Road, Grantham, Lincs. Details from the Secretary. Tel: (01476) 657436.

LINCOLN SHORT WAVE CLUB, G5FZ. Meets At The Railway Glub, Triton Road, Lincoln. Details from Mrs Parn Rose G4STO. Tel: (01427) 788356.

RAF WADDINGTON ARC, GORAF. Meets at Pyewipe Inn, Fossebank, Saxilby Road, Lincoln. Details from Robert Pickles G3VCA, Tel: (01522) 528708.

SPALDING & DARS, G4DSP. Meets at The Old Fire Station, Spalding, Lincs. Details from Raymond Pearson G8ELV. Tel: (01775) 711953, website: www.sdars.org.uk

SPILSBY ARS, RS91468. Details from Clive Ironmonger G6HYF. Tel: (01790) 752712.

KETTERING & DARS, G5KN. Meets at The Lilacs Public House, 39 Chuch Street, Isham, Kettering, Northants NN14 1HD. Details from Fay Banveil G6AKS. Tel: (01536) 390954.

MID NORTHANTS AR EXP. GOING. Details from Lionel Parker G5LP.

NORTHAMPTON RC, G3GWB. Meets at the British Timken, Social & Athletic Club, Cotswold Avenue, Duston, Northampton. Details from Norman Miller GOGBZ. Tel: (01327) 349188.

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

PARALLEL LINES CG, GALIP, Details from Mr P.S. Lidsay G4CLA

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RAF CONINGSBY ARC, G3LQS. Meets at Essex Block, RAF Coningsby, Details from Peter Hanson GONVY.

LEICESTERSHIRE

BEAUMANOR ARC, G3BMR

LINCOLNSHIRE

NORTHANTS

HEREPROR & WORCESTER

Bromsgrove 542266.

GLOUCESTERSHIRE

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HOUGHTON-LE-SPRING ARC, @3NMD. Meets at the Dubmire Royal British Legion, Dubmire, Fencehouses, Tyne & Wear DH4 6LJ. Details from Foster Aungles GOABF. Tel: 0191-584 4673.

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

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

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, G8KMK, Meets at the Pie Hall, Denby Dale, West Yorkshire. Details from Mr J.P. Morley G4FSQ.

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

KEIGHLEY ARS, GOKRS. Meets at the Cricket Club, Ingrow, Keighley, West Yorkshire, Details from Mr I. Townson M1BGY. Tel: (01274) 723951.

LEEDS & DARS, G4LAD. Meets at The Radio Shack, Yambury (Horsforth), RUFC Grounds, Brownberne Lane, Horsforth, Leeds LS18 5HB. Details from Mr E. Howden G0IBU.

NORTH WAKEFIELD RC, G4NOK. Meets at the East Ardsley Cncket Club, Nr. Wakefield. Details from Mrs Olga Parker 2E1ASV. Tel: 0113-253 9087.

OTLEY ARS, G3XNO. Meets at The RAOB Club, Westgate, Otley, West Yorkshire, Details from Jack Worshop GOSNV. Tel: (01274) 636197. PONTEFRACT & DARC, G3FYQ. Meets at the Carleton Community Centre, Pontefract, West Yorkshire, Details from Colin Wilkinson GONQE, 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, GOKNR. Details from Mike Charlton G60XZ. WHITE ROSE ARS, G3XEP. Meets at the Moortown RUFC, Moss Valley, Kings Lane, Leeds LS17 7NT, Details from Mr M. Wilson G7SDW, Tel: 0113-273 6039.

#### MIDLANDS

CAMBRIDGESHIRE

DERBYSHIRE

#### BEDFORDSHIRE

DUNSTABLE DOWNS RC, G4DDC. Meets at the Chews House, 77 High Street South, Dunstable, Beds LUG 3SF, Details from Phil Seaford G8XTW, Tel: (01525) 384419.

SHEFFORD & DARS, G3FJE. Meets at the Church Hall, Ampthill Shefford, Beds. Details from John West. Tel: (01462) 812739. ST. SWITHUN'S ARC, MOAJV. Meets at St. Swithun's Church, Rectory Rooms, Sandy, Beds. Details from Kelvyn Darton GOWOD. Tel: (01767) 683179.

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

DUXFORD ARS, GB2IWM. Meets at Building 177, Impenal 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, Farcet Road, Fletton, Peterborough. Details from Alan D. Ralph G8XLH.

HUNTINGDONSHIRE ARS, GOHSR. Meets at the Medway Centre, Medway Road, Huntingdon, Details from David Leech G7DIU. Tel: (01480) 431333.

MARCH & DRAS, G3PMH. Meets at the British Legion Club, Rookswood Road, March, Cambs PE15 8DP. Details from Mr J. Bralthwaite G3PWK. 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 Bridgeland MODUQ. www.warec.org.uk

BOLSOVER ARS, G4RSB. Meets at the Blue Beil, High Street, Bolsover, Derbys. Details from Colin Monts GORVT. Tel: (01246) 822856.

BUXTON RA, G4SPA. Meets at the Leewood Hotel, Buxton. Details from Derek Carson G4IHO. Tel: (01298) 25506.

DERBY & DARS, 62DJ. Meets at Carlton Road United Reform Church, Carlton Road, Littleover, Derby. Details from Martin Shardlow G3SZJ. Tel: (01332) 556875.

EREWASH VALLEY ARG, GOPCX. Meets at The Sitwell Arms Public House (between Horseley Woodhouse and Woodside). Details from Peter Russell MOAQI.

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

NOTTS & DERBY BORDER ARC, GANID. Meets at Maripool United Reform Church, Chapel Street, Maripool, Ilkeston. Details from Graham Bromley G4UTN. Tel: (01773) 834308.

NUNSFIELD HOUSE ARG, G3EEO. Meets at the Nunsfield House. Boulton Lane, Alvaston, Derby. Details from William F. Smith G7PJJ.

STH DERBYS & ASHBY W ARG, COSRC. Meets at the Moira Replan Centre, 17 Ashby Road, Moira, Swadlincote, Derbyshire DE12 6DJ. Details from Mrs B. Walley. Tel: (01283) 760822.

#### NOTTINGHAMSHIRE

ARC OF NOTTINGHAM, G3EXW. Meets at the Haywood Road Community Association, Haywood Road, Mapperley Road, Notlingham NG3 6AD. Details from Ron Hague G4X0U. Tel: 0115-939 9377.

DUKERIES ARS, G4XTL. Meets at Ambleside Community Centre, Ambleside, New Ollerton, Notts. Details from Colin Foster G7DEX.

HUCKNALL ROLLS ROYCE ARC, G5RR. Meets at the Hucknall Rolls Royce Sports & Social Club, Wathall Road, Hucknall, Nottingham. Details from Mr P. Hart G4JSM.

MANSFIELD ARS, G3GQC. Meets at the Debdale Park Sports & Recreation Club, Debdale Lane, Mansfield Woodhouse, Notts. Details from David Peat GORDP, Tel: (01623) 631931.

NORTH NOTTS DATA GROUP, GOWNN. Details from Tony Jenkins G876F.

SIEMENS ARC, G8ZK, G8IGQ. Meets at the GPT Sports Ground. Beeston, Nottinghamshire. Details from Chris Archer G4VFK. Tel 0115 943 3387.

SOUTH NOTTS ARC, GOOAU. Meets at the Fairham Community College, Famborough Road, Clifton, Nottingham NG11 9AE. Details from Gary Bishop GOWUG. Tel: (01509) 672846.

WORKSOP ARS, G3RCW. Meets at the Club House, 59-61 West Street, Worksop, Nottinghan S80 1JP. Details from Terry Calvert G4GBS. Tel: (01302) 743130.

#### SHROPSHIRE

SALOP ARS, G3SRT. Meets at the Telepost Club, Railway Lane, Abbey Forgate, Shrewsbury. Details from John Burnford GOGTN. Tel: (01743) 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) 255416.

#### STAFFOROSHIRE

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, Wating Street, Hatherton, Cannock. Details from Arnold Matthews G3FZW. Tel: (01543) 262495.

CHAD RC, G4CAR. Meets at the Swinfen Officer's Club, Swinfen, Lichfield, Staffs, Details from Bemard Jayne G8BFL. Tel: (01543) 268569.

LICHFIELD ARS, G3WAS. Meets at the Queens Head, Sandford Street, Lichfield. Details from Roger Smethers G3NLY. Tel: (01543) 672762.

MOORLANDS & DARS, G4NHT, G1MAD. Meets at the Creda Works, Bythe Bridge, Stoke-on-Trent, Staffs ST11 9U. Details from Mr B.J. Butcher G4HKG. Tel: (01782) 395793.

NEWCASTLE-U-LYME SCOUT AR CDM GR. G7U0G

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, Waimley Road, Sutton Coldfield, West Midlands. Details from Paul G. Turner G7MWD. Tel: 0121-350 4263.

WARWICKSHIRE

AVON VALLEY ARA, MORAD. Details from Mr Peter Bradham GOWXJ. Tel: (01905) 724531. MID WARWICKSHIRE ARS, G3UDN, Meets at the St. John Ambulance HQ, 61 Emscote Road, Warwick. Details from Bernard Pittaway. Tel: (01926) 420913.

RUGBY ATS, G4APD. Details from Tony Humphries GOOLS. Tel: (01455) 552683.

STRATFORD-UPON-AVON & DRS, GOSOA. Meets at the Home Guard Club, Tiddingham, Stratford-upon-Avon, Warks. Details from Ron Horsley GOMRH. Tel: (07970) 148204.

#### WEST MIDLANDS

ALDRIDGE & BARR BEACON ARC, GONEQ. Meets at the Aldridge Central Hall Community Centre, Middlemore Lane, Aldridge WS9 8AN. Details from Mr C.J. Baker GONOL. Tel: (01922) 636162.

COVENTRY ARS, G2ASF. Meets at the Binley Church Hall, Brink Road, Coventry. Details from John Beech G8SEQ. Tel: (01203) 673099

DUDLEY ARC, G4DAR. Meets at the Community Centre, Sedgley, Central Library, St. James Road, Dudley. Details from Tony Lucas G4LVA. Tel: (01384) 277925.

HILLCREST ARS, GOSPM. Meets at The College, Simms Lane, Netherton, Dudley, West Midlands. Details from Stuart Viney. Tel: (01384) 232457.

KYNOCH R & TVS, G3HPP. Meets at the Club Workshop, IMI Ltd., Sportsfield, Perry Bar, Birmingham. Details from Mr G. Nicholis. Tel (01922) 635376.

MIDLAND ARS, G3MAR. Meets at Unit 22, 60 Regent Place, Hockley, Birmingham (jewelry quarter). Details from John A. Crane GOLAI. Tel: 0121-628 7632.

SANDWELL AMATEUR RADIO CLUB, GOCWC. Meets at Sandwell ARC, Broadway, Oldbury, Warley, West Midlands B68 9DP, Details from Stuart Collins MDBTO. Tel: 0121-561 4663.

SIERRA HOTEL ARCG, GOOBS. Details from Warwick M. Hall G4WMH.

SOLIHULL ARS, G3GEI. Meets at The Shirley Centre, 274 Stratford Road, Shirley, Solihuli, West Midlands. Details from Paul Gaskin G8AYY. Tel: 0121-783 2996.

SOUTH BIRMINGHAM RS, G3OHM. Meets at Hampstead House, Fairfax Road, West Heath, Birmingham. Details from The SBRS

STOURBRIDGE & DRS, G60I, G6SRS. Meets at the Old Swinford Hospital/School, Stourbridge, West Midlands. Details from Tom

WEST BROMWICH CENTRAL RC, G4WBC. Meets at The Sandwell Public House, High Street, West Bromwich, West Midlands. Details from Ian Leitch GOPAI. Tel: 0121-561 2884.

WEST MIDLANDS POLICE ARC, GOCOP, 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.

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WORDSLEY RC, G4WRA. Meets at the Brick Maker's Arms, Mount Pleasant, Briefley Hill, West Midlands. Details from Andy Evans G1PKZ.

LONDON & CENTRAL

BERKSHIRE

ARBORFIELD ARC, G3IHH. Details from Mrs E.W. Harding 2E1AUQ. BRACKNELL AEC, G4BRA. Meets at the Coopers Hill Community Centre, Bagshot Road, Brackneli, 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, G3WKX. Meets at the Red Cross Hall, The Crescent, Maldenhead, Berkshire. Details from Neil Savin GOSVN Tel: (01628) 626210.

NEWBURY & DARS, G5XV. Meets at the Rugby Club, Monk's Lane, Newbury. Details from Max Maxwell G7DXC. Tel: (01635) 253233

READING ARC, G3ULT. Meets at the Woodley Pavillion, Woodford Park, Haddon Drive, Woodley, Reading, Details from Marmoch Standen GOJMS. Tel: 0118-972 3504.

#### BUCKINGHAMSHIRE

AYLESBURY VALE RS, G4VRS. Meets at the Harwick Village Hall, Aylesbury, Bucks. Details from Mr L1, Cropley GODFC,

CHESHAM & DARS, G3MDG, G1MDG, Meets at the White Hill Centre, Chesham, Bucks. Details from Mr TJ. Thirdwell GDVFW. Tel: (01442) 832169.

CHILTERN ARC, G3CAR. Details from Roy Page G4YAN. Tel: (01494) 534216.

MILTON KEYNES ARS, G3HIU. Meets at Bletchley Park Museum (The Green Room, B Block Annexe), Wilton Avenue, Bletchley, Milton Keynes. Details from Malcolm Bay MOMBO on (01525) 874075.

MILTON KEYNES SCOUT ARS, GOSMK. Meets at The Quarries, M.K. Scout Campsite, Cosgrove. Details from Mr P.A. Orchard GORYZ. Tei: (01908) 648186.

#### GREATER LONDON

ADDISCOMBE ARC, G4ALE. Meets at the Lion Inn, Pawsons Road Croydon. Details from Mr Q.G. Collier G3WRR. Tel: 0208-653 6948.

BARKING R & ES, G3XBF. Meets at the Parkside Community Centre. Details from Bill Chewter GOIQK. Tel: (01708) 474443.

\*BROMLEY & DARS, RSB9030. Meets at the Victory Social Club, Kechill Gardens, Hayes, Bromley. Details from Alan G. Messenge

CLIFTON ARS, G3GHN. Meets at the Kidbrooke House, Community Centre, 90 Mycenae Road, London SE3 7SE. Details from Mr J. Veaney G7BKH.

CRYSTAL PALACE & DRC, G3VCP. Meets at the All Saints Church, Parish Rooms, Beulah Hili, London. Details from Bob Burns G300U. Tel: (01737) 552170.

DARENTH VALLEY RADIO, GOKDV. Meets at the Crockenhill Village Hall, Swanley, Kent. Details from Mr K.W. Halls G8VJG. Tel: (01322) 663022.

COHELFORD ARS, G3UES. Meets at The Community Centre, St. Martin's Court, Kingston Crescent, Ashford, Middlesex. Details from Robin Hewes G3TDR. Tel: (01784) 456513.

EDGWARE & DRS, G3ASR. Meets at the Watling Community Centre, 145 Orange Hill Road, Bumt Oak, Edgware, Middlesex Details from Stephen Slater GOPQB. Tel: 0208-953 2164.

HAVERING & DARS, G4HRC. Meets at the Fairkytes 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. Friel G4AUF. Tel:

SILVERTHORNE RC, C3SRA, G2HR, G8CSA, Meets at the Chingford Adult Education and Community Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH, Details from Dave Christy GOVHC. Tel: 0208-504 2831.

MITCHAM & DISTRICT ARS. Meets at the ATC Hut, Commonside West, Mitcham, Surrey CR4 4HB. Details from Mr M. Knott GOWCR.

SOUTHGATE RC, G3SFG. Meets at the Winchmore Hill Cricket Club, Firs Lane, London N21 3ER. Details from Mr D.F. Berry G4DFB.

ST. DUNSTANS COLLEGE ARS, G4SDC. Details from Sam Kennard G40HX. 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 GOVJI.

WHITTON ARG, GOMIN. Meets at the Whitton Community Centre Percy Road, Whitton. Details from Ian Clabon GOOFN. Tel: 0208 894 9131.

#### HERTFORDSHIRE

BISHOPS STORTFORD ARS, G52G, Meets at the Royal British Legion Club, Windhill, Bishop's Stortford, Herts. Details from Tony Judge GOPQF, Tel: (01279) 506933.

DACORUM ARTS, G7RIH, GOWIH, Meets at the Guide Meeting Rooms (next to the Royal British Legion), Queensway, Hernel Hempstead. Details from Ian Hamilton GOTCD. Tel: (01442) 211925.

HODDESDON RADIO CLUB, GOTSN. Meets at the Rye Park Conservative Club, Rye Road, Hoddesdon, Herts. Details from Don Platt G3J/U, Tel: 0208-292 3678.

MIMRAM CONTEST GP, MOABC. Details from Alan Holdsworth G800, Tel: (01707) 392950.

RADIO SCOUTING TEAM, GB2RST. Meets at Tolmers Scout Camp, Tolmers Road, Cuffley, Herts EN6 4JS. Details from Mill Livens G2CKB. Tel: (01992) 558493.

STEVENAGE & DARS, G3SAD. Meets at the Stevenage Day Centre, Chells Way, Stevenage, Herts SC2 OLT. Details from Don Bache MOXUP, E-mail: d.bache1@ntlworld.com

VERULAM ARC, G3VER, G8VER. Meets at the RAF Association HQ, New Kent Road, St. Albans, Herts, Details from Walter Craine G3PMF, Tel: (01923) 262180.

VERULM (ST. ALBANS) RADIO CLUB. Meets at the RAFA, New Kent Road, off Mariborough Road, St. Albans, Herts. Details from Ralph G1BSZ. Tel: (01923) 265572.

WELWYN & HATFIELD ARC, G3WGC. Meets at the Royal Naval Association, Black Fan Road, Welwyn Garden City, Herts. Details from Dean Jackson G7PKF. Tel: (07973) 560649. SUPPEY

Hut 18, Tilgate 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:

MID SUSSEX ARS, G3ZMS, Meets at Marle Place, Leylands Road, Burgess Hill, West Sussex. Details from Mr C. Childs 2E1DCP. Tel: (01441) 244689.

T.S. VINDICATRIX ASN, GOWVB. Details from Don Still GOOOC.

WORTHING & DARC, G3WOR. Meets at the Lancing Parish Hall, South Street, Lancing, West Sussex.

CHIPPENHAM & DARS, G3VRE. Meets at the Sea Cadet HQ, Chippenham. Details from Jon Ainge G4LGZ. Tel: (01249) 462610.

SWINDON & DARC, G3FEC. Meets at the Eastcott Community Centre, Savenake St., Swindon. Details from Den Forrest MOACM.

TROWBRIDGE & DARC, G2BQY. Meets at the Southwick Village Hall, Southwick, Trowbridge, Wilts. Details from Ian Carter GOGRI Tel: (01225) 864698.

South West & Channel Islands

BRISTOL ARC, G3TAD. Meets at the Lodgeside Club, Lodge Road, Kingswood, Bristol. Details from Dave Bendrey G7BYN.

GORDANO ARG, GGGRG. Meets at The Ship, Redcliffe Bay, Portishead, Avon. Details from Mr R.T. White GBSPC. Tel: (01275) 874001.

NORTH BRISTOL ARC, GAGCT. Meets at the Self Heip Enterprise, 7 Braemar Close, Northville, Bristol. Details from David Coxon GOGHM. Tel: (01275) 790448.

SEVERNSIDE TV GROUP, GB3ZZ. Meets at NBARC, Filton, Bristol. Details from Paul Stevenson G8YMM, Tel: 0117-965 5386.

SHIREHAMPTON ARC, G4AHG. 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, Thombury, Bristol. Details from Stan Greenhill GORYM. Tel: (01454) 413177.

WESTON-SUPER-MARE RS, G4WSM. Meets at the Woodspring Hotel, High Street, Worle, Weston-Super-Mare. Details from Stephen Cole G3YOL, Tel: (01934) 843144.

CORNISH RAC, G4CRC. Meets at the Perran-ar-Worthal Village Hall, Perranwell, Nr Truro, Comwall. Details from Mrs Cheryll Hammett 2E1ADQ. Tel: (01726) 882758.

NEWQUAY & DARS, G4ADV. Meets at the Treviglas School, Newquay. Details from Mrs Maggie Reed GOKEM. Tel: (01726) 882752.

POLDHU ARC, GB2GM. Meets at the Club House, Poldhu Cove, Mullion, Comwail TR12 7JB. Details from Mrs Carolyn Rule MOADA Tel: (01326) 240144.

SALTASH & DARC, G4GXK, G8SAL. Meets at the Toc H Hall, Warraton Road, Saltash, Comwall. Details from Brian Giles. Tel: (01752) 844321.

ST AUSTELL ARC, GOECC. Meets at Poltair School, Details from Reg Pears G4TRV, Tel: (01726) 72951.

APPLEDORE & DARC, G2FKO, Meets at the Appledore Football Club. Details from Mr B. Jewell MOBRB,

AXE VALE ARC, G8CA, G7AXE. Meets at the George Hotel, Avminster, Devon. Details from Pat Cross GOGHH, Tel: (01297) 33756.

DARTMOOR RADIO CLUB, G1RCD, GODRC. Meets at the Yeiverton War Memorial Village Hall, Meavy Lane, Yeiverton, Devon. Details from Ron Middleton G7LLG. Tel: (01822) 852586.

EXETER ARS, G4ARE. Meets at the Moose Centre, Spinning Path Lane, Blackboy Road, Exeter. Details from Ray Donno G3YBK.

EXMOUTH ARC, GOXRC. Meets at The Scout Hut. Maripool Hill, Exmouth.

NORMAN LOCKYER OBSERVATORY ARG, GOAXC. Meets at the Norman Lockyer Observatory, Salcombe Hill, Sidmouth. Details from Ron Hamson GONOC. Tel; (01395) 515349.

NTE (PAIGNTON) ARS, GOOSH. Meets at Paignton Community College, Upper School, Waterleat Road, Paignton. Details from Rod Maude GOSWM. Tel: (01803) 521066.

\*PLYMOUTH RADIO CLUB. G3PRC, G3PRC. Meets at the Welbeck Manor Hotel, Sparkwell, on the 1st & 2nd Tuesdays of the month. Details from Frank Russell G7LUL Tet: (01752) 263222 or E-mail: frank@foxonezero.fsnet.co.uk

TORBAY ARS, G3NJA. Meets at the Highweek Family & Social Club, Highweek, Newton Abbot, Devon. Details from John Olway G3RMA. Tel: (01803) 556425.

UNIVERSITY OF PLYMOUTH ARS, GOUOP. Details from Alan Santillo GOXAW

BLACKMORE VALE ARS, G4RBV. Meets at Shaftesbury Club for Young People, Coppice Street, Shaftesbury, Dorset SP7 8PF. Details from Mr A. Marriott GOGFL. Tel: (01258) 860741.

BOURNEMOUTH RS, G2BRS, Meets at the Kinson Community Centre, Kinson, Bournemouth, Dorset, Details from Chris R, Ellis MSAGG, Broken Ridge, Fir Tree Close, St. Leonards, Ringwood, Hants BH24 2QW. Tet: (01202) 893126.

CHRISTCHURCH ARS, GOWUD. Meets at the Siemens Plessey Sports & Social Olub, Grange Road, Somerford, Christchurch, Dorset. Details from Mr K.P. Harris G7WSN. Tel: (01202) 484892.

\*FLIGHT REFUELLING ARS, G4RFR. Meets at the Fight Refuelling Social Club, Merey, Wimbome, Dorset. Details from Torry Baker G3PFM. Tel: (01202) 622262, websiteL www.frars.org.uk

POOLE RS, G4PRS. Meets at the Bournemouth & Poole CFE, Constitution Hill Site, Poole, Dorset. Details from Phil Mayer GOKKL. Tel; (01202) 700903.

PORTLAND ARC, GOVOP/G7VOP, Meets at Clifton Hotel, Grove

SWM, March 2005

CORNWALL & SCILLY IS

DEVON

DORSET

WORTHING & DISTRICT VIDEO RG, GB3VR. Details from the Treasurer. Tel: (01903) 211919 (w).

(01403) 253432 MID SUSSEY 400

WILTSHIRE

AVON

BENTLEY ARC, GOVZS, Details from Derek Gilbert GONFA. CATERHAM RG, GOSCR. Details from Mr P.N. Lewis G4APL.

COULSDON AMATEUR TRANS. SDC., G4FUR. Meets at St. Swithuns Church Hall, Grovelands Road, Purley, Surrey. Details from Andy Briers GOKZT. Tel: (01737) 552139.

DORKING & DRS, G3CZU, G7DOR. Details from John Greenw G3AEZ. Tel: (01306) 631236.

\*FARNBOROUGH & DRS, G4FRS. Meets at The Community Centre, Meudon Avenue, Famborough, Hants. Details from Mr Steve Austen-Jones MOCYF. Tei; (07759) 215842, E-mail: sca@bloperworld.com

GUILDFORD & DRS, G6GS. Meets at the Guildford Model Engineers HQ, Stoke Park, Guildford, Surrey, Details from Stella Whitbourn

KINGSTON & DARS, G3KIN. Details from Mrs Mary Ashdown G0BOV.

REIGATE ATS, G5LK, G7RAT. Details from Mr A.C. Embling G1LNT. Tel: (01883) 344723.

SUTTON & CHEAM RS, C2XP, G7SAC. Meets at the Sutton United Football Club, Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Details from John Puttock GOBWV. Tel: 0208-644 9945.

THAMES VALLEY ARTS, G3TVS. Meets at the Thames Ditton Library, Watts Road, Giggs Hill, Thames Ditton, Surrey. Details from Cor. J. Pegler G3ENI. Tel: (01483) 284279.

WIMBLEDON & DARS, G3WIM. Meets at St. Andrews Church Half, Herbert Road, Wimbledon, London. Details from Jim Bell, Tel: 0208-874 7456 or E-mail: james@bell0144.fsnet.co.uk

#### SOUTH & SOUTH BAST

EAST SUSSEX

HAMPSHIRE

RIGHTON RADIO CLUB, G4GQR. Meets at Vallance Community Centre, Sackville Road, Junction of Connaught Road, Hove.. Details from Hon. Sec GORNS, Tel: (01273) 699104.

CROWBOROUGH DARS, GOCRW. Meets at the Plough & Horses, Walshes Road, Jarvis Brook. Details from Mrs M. Clark. Tel: (01892) 663666.

EAST SUSSEX AMATEUR TV GROUP, RS178475 was GB3VX. Details from Keith Ellis G8HGM. Tel: (01323) 720220.

\*HASTINGS ELEC. & RC, G6HH, G1HHH, 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.freeserve.co.uk

SOUTHDOWN ARS, G3WQK. Details from Jim Hams G4DRV. Tel: (01323) 728479.

THE ORZ ARG OF SUSSEX, G83VX. Meets at the Coach Station, Warding Road, Eastbourne. Details from Stuart Constable MOCHW. Tel: (01435) 863020.

ANDOVER RAC, GOARC, Meets at the Village Hall, Wildhem, Andover, Hants, Details from Mr R.S. Coleman GOWYD.

BASINGSTOKE ARC, G3TCR, G8JYN. Meets at the GEMS Social Club, Lister Road, Basingstoke, Hants. Details from Bob Brown MOCU.

FAREHAM & DARC, G3VEF. Meets at the Portchester Community Centre, Westlands Grove, Portchester, Hants. Details from Andrew Sinclair GOAMS. Tel: (01329) 235397.

HIGHFIELD PARK RC, G4WD. Meets at Highfield Park RC, National Air Traffic Service, Highfield Park, Heckfield, Hants RG27 OLD. Tel: (01734) 225019.

HORNDEAN & DARC, G4FBS. Meets at Lovedean Village Hall, Lovedean Lane, Lovedean, Hants. Details from Stuart Swain GOFYX. Tel: (01705) 472846.

ITCHEN VALLEY ARC, GOIVR. Meets at the Scout Hut, Brickfield Lane, Chandlers Ford, Eastleigh, Hants. Details from Sheila Williams GOVNI. Tel: (01703) 813827.

SONY BROADCAST ARC, G4S2C. Accredited C&G RAE centre Meets at Sony Sports & Social Club, Prestley Road, Basingst Details from Stephen Harding G4JGS, Tel: (01256) 55011.

SOUTH HAMPSHIRE INT. TELE SOC., G3DIT. Meets at G3JZV's QTH, space is limited. Details from Rev. T.R. Mortimer G3JZV. Tel (02392) 649254.

SUBMARINE ARC, G3BZU. Meets at HMS Collingwood, Newgate Lane, Fareham, Hants P014 1AS. Details from Mr W.S. Blyth G0PPH. Tel: (01329) 232386.

THREE COUNTIES ARC, G4WWR. Meets at the Bramshott Parish Inst. & Club, Headley Road, Liphook, Hants. Details from Damlan Kamm G7RFV. Tel: (01428) 724456.

Applemore, Hythe, Southampton, Details from Tony Horton GOLKG. Tel: (D1703) 841794.

BRICKFIELDS ARS, GOBAR. Meets at Brickfields Horse Country Cent, Newnham Road, Binstead, Isle of Wight. Details from Mr

ISLE OF WIGHT RS, G3SKY. Meets at The Old Cafe. Whiteciff Bay Holiday Park, Bembridge. Details from Alan Reeves G42FQ. Tel: (01983) 294309.

BANBURY ARS, COBRA. Meets at St. John's Church Social Club, South Bar, Banbury, Oxon. Details from Mr R.S. Marsden G1YSY. Tel/FAX: (01295) 253509.

OXFORD & DARS, G5LO. Meets at the Grove House Club, George Street, Summertown, Oxford. Details from Mr D. Walker G3BLS, Tel: (01865) 247311.

VALE OF WHITE HORSE ARS, G5RP, G4VWH, G6VWH. Meets at The Fox, Steventon, Details from Ian White G3SEK. Tel: (01235) 531559.

CRAWLEY ARC, G3WSC. Meets at the Tilgate Forest Rec. Centre,

CHICHESTER ARC, G2NM. Meets at the St. Pancras Hall, Chichester. Details from Graham Swann GOWSD.

HARWELL ARS, G3PIA. Meets at the Social Club, Harwell Laboratory, Didcot, Oxon. Tel: (01235) 223250.

ISLE OF WIGHT

OXFORDSHIRE

WEST SUSSEX

Road, Portland. Details from Kerry Moms G1WIK. Tel: (01305) 788591.

SOUTH DORSET RS, G3SDS. Meets at the Church Hall, Chickerell, Weymouth, Dorset. Details from John Rose MOBQO. Tel: (01305)

SWANAGE & PURBECK ARC, MOBLJ. Meets at Kings Arms, Langton Matrawers, Dorset. Details from Peter Wakefield M1WCH/M3WCH. Tel: (01929) 424413.

WESSEX AMATEUR WIRELESS CLUB, G1WAW. Details from Ken Poweli G1NCG. Tel: (01202) 549376.

#### JERSEY

JERSEY ARS, GJ3DVC. Meets at the German Signal Station, Rue Baal, La Moye, St. Brelade. Details from Mrs Anne Mourant MJ0BJU. Tel: (01534) 734948.

#### SOMERSET

PRESTON COMMUNITY SCHOOL ARC, GOPCS. Details from Cralg Douglas GOHDJ. Tel: (01935) 71131.

TAUNTON & DARS, G3XZW. Meets at The Memorial Hall, Trull, Taunton. Details from David Rosewarn MOCIF.

WEST SOMERSET ARC, GOOWX. Meets at the West Somerset Community College, Minehead, Somerset. Details from Robert Bonar G1DNV/M3ONV. Tel: (01643) 863462.

WINCANTON ARC, GOWRA. Meets at King Arthur's Community School, West Hill, Wincanton. Details from Mr G.A. Fingerhut GOENW. Tel: (01963) 370506.

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

#### ESSEX

BARKING RADIO & ELECTRONIC SOCIETY, G3XBF . Meets 1930-2200 on Thursday evenings at Parkside Community Centre, Goodmayes Lane, Ilford, Essa: Details from Bill Cheveter G0IQK. Tel: 0208-478 4758, E-mail: billicheveter@lineone.net Website: bit/cheveterbit/gradio.org/line/ http://www.barkingradio.org.uk

BRAINTREE AND DISTRICT ARS, 63%. Meets 2000 on 1st and 3rd Mordays in the month at the Braintree Hockey Club, Church Street, Bocking, Braintree, Details from John Button M5AB. Telt: (03167) 325587. Email: club@badars.org.uk Website: http://www.badars.org.uk/

CHELMSFORD ARS, GOMWT. Meets 1915 for 1930 start on the 1st Tuesday in the month at Marconi Social Club, Benive Lane, Chernsford, Essex. Details from Martyn Medzilf G1FL: Tel: (01245) 469008, E-mail: Info2005@g0mwt.org.uk Website: http://www.eomwt.org.uk/

CHELMSFORD SCARF, M5CDS. Scout Amateur Radio Fellowship. Details from the Secretary, E-mail: info@chelmsford-scarf.co.uk Website: http://www.chelmsford-scarf.co.uk/

CLACTON RADIO CLUB, G3CRC. Meets at 2000 on the 1st Wednesday of month at the Clacton-on-Sea Sailing Club, Hollond Haven, Hollond-on-Sea. Details from Geoff Avford G4AQZ. Tel: (01255) 429117.

COLCHESTER RADIO AMATEURS, G3CO. Meets 1930 on alternate Thursdays at the Cochester Institute or St Helena's School, Sheepen Road, Cochester, Essex. Details from Frank R. Howe G3RI. Tet: (D1008 B51189, E-mail: cra@mcginty.net Webste: http://www.g3co.ccom.co.ul/

DENGIE HUNDRED ARS, GOUTT, G7SDH. Meets at 1930 on 2nd and 4th Mondays in the month at the Henry Samuel Hall, Maylan Essex. Details from Mark Bamaby 2EDUQ, 7:1e1 (01621) E29548 Mobile: (07985) 401993, E-mail: 2e0dyq@dhars.org.uk Website http://www.dhars.org.uk/

ESSEX REPEATER GROUP, G83DA. Details from Mur G6/Y8. Tel: (01245) 242617, E-mail: clive.ward@b Website: http://www.essexrepeatergroup.org.uk/

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

BacSYSTEMS BASILDON RADIO CLUB GOGEC. Meets at BacSystems Social Club, Gardiners Lane, Basildon, Essex, Details from Peter Shepherd, Tel: (01268) 887402, E-mail: peter.shepherd@bacsystems.com

HARLOW & DARS, GGUT. Meets 2000 on Tuesdays at the Mark Hall Bam, First Avenue, Harlow, Essex. Details from Len Brackstone G7UFF, Tei. (D1279) 864973, Mobile. (07931) 207184, E-mail: g6ut@qsl.net Website: http://www.qsl.net/g6ut/

ARRVICH AMATEUR RADIO INTEREST GROUP, GORGH. Meets 2nd Wednesday in the month at the Park Pavillion, Barrack Lane, Harwich, Essex. Details from Tony Free G4EYE. Tel: (01255) 886065, E-mail: gold;@amsatud: Website: http://members.lycos.co.uk/harig/

HAVERING & DARC, G4HRC. Meets 2000 on Wednesdays at the Fairkytes Arts Centre 51 Billet Lane Homchurch, Essex. Details from Oliver Tillett G3TPJ. Tel: (01708) 746677, E-mail: ghrc@hottmail.com Website: http://www.haveringradioclub.co.uk dioclub.co.uk/

LOUGHTON & EPPING FOREST ARS, G4ONP. Meets 1945 on alternate Fridays at All Saints House, Romford Road, Chigwel Row Esex, Detais from Marc Linchman GOTOC. Tel: 0208-502 1645, Mobile: (07743) 456058, E-mail: info@lefars.org.uk Website: http://www.lefars.org.uk/

SOUTHEND & DISTRICT RADIO CLUB, 650K. Meets 1945 on Wednesdays at the Alexandra Yatch Club, Clifton Parade, Southend-0n-Sea, Essen, Detalls from Alan Radley GOTM, Tel: (D1268) 741229, E-mail: aianradley@0800dial.com

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

SOUTH ESSEX ARS, G4RSE. Meets 2000 on 1st and 3rd Wednesdays in the month at the Paddocks, Long Road, Canwey Island, Essex. Details from Betty Maynard GGLUD. Tel: (D1268) 695474, E-mail: southessex.ars:@btintemet.com Website: http://www.southessex.ars.btintemet.co..uk/

VANCE ARS,G3YCW. Meets 2000 on Thursdays at the Barstable Community Centre, Basildon, Essex. Details from Doris Thompson Tel: (01268) 552606, E-mail: info@vars.freewire.co.uk Website: ntp2/Jwww.vars.freewire.co.uk/

#### KENT

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

CRAY VALLEY RS, G3RCV, G1RCV. Meets at the Progress Hall, Admiral Seymour Road, Etham, London SE9. Details from Bot Treacher BRS32525 via www.cvrs.org

DOVER RADIO CLUB, G3YMD. Meets at the Dover Grammer School for Boys, Astor Avenue, Dover. Jim Caims M1BKJ. Tel: (01304) 852773.

SWM, March 2005

EAST KENT RADIO SOCIETY, GOEKR. Meets at St. Bartholomew' Church Hall, Herne Bay. Details from Paul Nicholson G3VJF. Tel: (01227) 743070, FAX: (01227) 742288.

HILDERSTONE ARS, GOHRS. Meets at Hilderstone A.E.C., Broadstairs, Kent. Details from Mr G. Shaw MOAQA. HOME COUNTIES ATV GRP, G6HCT. Meets at the Binfield Club, Binfield (near M4/J10). Details from Mr A. Brooker G4WGZ.

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

MEDWAY ARTS, G5MW, G8MWA. Meets at Tunbury Hall, Catkin Close, Tunbury Avenue, Walderslade, Chatham. Details from Mr J. Hale G3FTH.

NORTH KENT RS, G4CW. Meets at The Pop-in-Parlour, Graham Road, Bevleyheath, Kent, Details from Mr A.V. Fribbens G8MLQ. Tel: (01474) 365694.

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

THE MORSE CLUB, GXODXE. Meets at The Five Wents Memonal Hall, Swanley/Hextable Road. Details from Ken M3CZA. Tel: 0208-306 3544.

WEST KENT ARS, G3WKS. Meets at the St. Marks School Hall, Tunbridge Wells, Kent. Details from Malcolm Sheppard G4FWG. Tel: (01892) 652272.

#### NORFOLK

ANGUA TELEVISION ARS, GOTXV. 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, GX3PXO. Details from Rev. R.N. Myerscough G3PXO.

KINGS LYNN ARC, G3XYZ, Details From Derek Franklin GOMQL

NORFOLK ARS, G4ARN. Meets at Norwich Aviation Centre, Norwich Airport. Details from John Wadman GOVZD. Tel: (01953) 604769. NORTH NORFOLK ARG, GB2MC. Details from Tony Smith G4FAL-E-mail g4ai@connectfree.co.uk

#### SUFFOLK

BURY ST. EDMUNDS ARS, G2TO. Meets at the Culford School Culford, Bury St. Edmunds, Suffolk. Details from George Wood

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

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

IPSWICH RADIO CLUB, GAIRC. Meets at the Golden Hind, Nacton Road (3rd Wednesdays at The Hollies, Bucklesham Straight Road) Ipswich. Details from Keith Gaunt G7CIY. Tel: (01394) 420226.

LEISTON ARC, GX6FS. Meets at Leiston Town Athletic Assn., Victory Road, Leiston, Suffolk. Details from Paul Cattermole M3MIG. Tel: (01728) 746044.

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

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

SUDBURY & DRA, GOSWI, G7SRA. Meets at the Old School, Wells Hail Road, Great Cornard, Sudbury, Suffolk. Details from Bryan Panton G1TWY.

SUFFOLK DATA GROUP, GB7MXM. Details from Peter Pryke G8HUE, Tel: (01473) 631313.

#### NORTH WALES

CONWAY VALLEY ARC, CW6TM. Meets at the Studio, Penrhos Road, Colwyn Bay, Clwyd, Details from Mr.R.W, Evans GW6PMC, Tel: (01745) 855068.

\*MOLD & DRC, GW3HRG. Meets at the Mold Rugby Club, Mold, Fintshire, Details from Les Chesters MWOELC, Tei: (01244) 545369, E-mail: mw1blo@ithersgb.net or Eddle Hewins GW3GSJ, Tei: (01352) 780334.

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

WREXHAM ARS, GW4WXM. Meets at the Community Centre, Maesgwyn Road, Wrexham. Details from Mr P. Moran GW0WER.

#### GWYNEDD

MEIRION ARS, GW4LZP. Meets at the Royal Ship Hotel, Dolgellau, Gwynedd. Details from Gervase Chavasse GW4URJ. Tel: (01341) 421028.

PORTHMADOG & DARS, GWOMVI. Meets at The Yacht Club, The Harbour, Porthmadog, Gwynedd. Details from Mr G. Cadwaladr MW1DFN.

THE DRAGON ARC, GW4TTA. Meets at the Ebenezer Church Hall, Lon Foel Graig, Llanfaipwil, isle of Anglesey. Details from Stewart Rolfe GW0ETF. Tel: (01248) 362229.

#### POWYS

POWYS ARC, GW4HVN. Meets at the ATC HQ, Park Lane, Newtown, Powys. Details from Mrs Jean Brown 2W1CEZ. Tel: (01686) 640814.

#### SOUTH WALES DYFED

ABERPORTH YMCA, GW4SZV. Meets at the Hut B17, The Airfield, Aberporth. Details from Mr G. Carruther GW4HGJ. Tel; (01239) 811205.

ABERSYSTWYTH & DARS, GWDARA. Meets at the Scout Hut, Plascrug Avenue, Aberystwyth. Details from John Woodward GW6IDK, Tel: (01970) 890657.

CARMARTHEN ARS, GW4YCT. Meets at The Aelwyd Care Home, Carmarthenshire County Council, Tregynwr Road, Langunnor, Carmarthen SA31 38S. Detailis from Mr W.D. Hughes GW4ZKL Tel: (01267) 231359.

CLEDDAU ARS, GWOSYG. Details from Trevor Perry GW4XQK. Tel: (01646) 600725.

KELSO ARS, GM4KHS. Meets at the Abbey Row Community Centre, Kelso. Details from Margaret Chalmers GM0ALX. Tel: (01573) 226372.

GLENROTHES & DARC, GM4GRC, Meets at the Football Pavillion, Station Road, Thornton, Fife. Details (rom Alexander Adam GM0FVD, Tel: (01592) 874374.

ABERDEEN ARS, GM3BSQ. Meets at the Red Cross HQ, 22 Queens Road, Aberdeen. Details from Robert Duncan. Tel: (01224) 896142.

BANFF & DARC, GMOPYC. Meets at the Princess Royal Park Football Ground, Conference Room (Deveronvale F.C.), Banff. Details from Steve Roberts GM4HWS. Tel: (01888) 551377.

MORAY FIRTH ARS, GM3TKV. Meets at the Grant Arms Hotel, Fochabers. Details from Geoff Crowley GM7SJC. Tel: (01542) 882818.

FORT WILLIAM ARG, GMOFRG. Details from R. Johnstone GM1YGV. Tel: (01397) 703046.

INVERNESS ARC, GM4TPF, Meets at The Emergency Operations Centre, Inverness (except July and August). Details from R.F. Goodall GM00GZ. Tel: (01463) 811701.

COCKENZIE & PORT SETON ARC, R\$177035. Meets at the Thomtree Inn, Lounge Bar, Old Cockenzie High Street, Cockenzie, E. Lothian, Details from Mr Bob Glasgow GM4UYZ. Tel: (01875) 811723.

LOTHIANS RS, GM3HAM. Meets at the Holyrood Room, Royal Ettrick Hotel, Ettrick Road, Edinburgh. Details from Toby Sigouin MMOTSS on (07739) 742367.

ORKNEY ARC, RS181749. Details from Mrs Terry Penna. Tel: (01856) 741233.

ERWICK RC, GM3ZET. Meets at the Islesburgh Community Centre, King Herald Street, Lerwick, Shetland. Details from Ian C. Millar GM 7RKD, Teit (01950) 460306.

DUNDEE ARC, GM4AAF. Meets at the Dundee College, Graham Street Annex, Dundee. Details from Martin Higgins MMODUN, c/o Dundee ARC, 60 Duns Crescent. Dundee DD4 ORZ

RTH & DARG, GM4EAF. Meets at the Perth Sports & Social Club, Leonard Street, Perth. Details from Ron Harkess GM3THI. Tel: 1738) 643435.

STRATHMORE & DARC, GM3GBZ. Meets at 2231 Sqdn ATC, 1 Lochside Road, Forfar. Details from Graham Scattergood MM0BSX. Tel: (01307) 468824.

ANTRIM & DARS. Meets at the Greystone Community Centre on the Ballycraigy Road in the town of Antrim. Details from David Hutchinson GI4FUM or visit www.gn4stw.co.uk

BALLYMENA RC, GI3FFF. Meets at 70 Nursery Road, Gracehill, Ballymena, Co. Antrim. Details from Jeffery Clarke GI4HCN. Tel: (01266) 659769.

CARRICKFERGUS ARG, GIOLIX. Meets at the Downshire Community School, Downshire Road, Carrickfergus. Details from John Branagh GI3YRL. Tel: (01960) 367208.

GLENGORMLEY ELECTRONICS ARS, GNDXYZ. Meets at Knockagh Lodge, 236 Upper Road, Greenisland, Co. Antrim. Details from James Hoey GIOBJH, E-mail: glObjh@ntlworld.com

LAGAN VALLEY ARS, GI4GTY. Meets at the Harmony Hall Arts Centre, Harmony Hill, Lisburn, Co. Antrim. Details from Ron McCaughey GI4NTO.

MARCONI RADIO GROUP. Meets on the first Thursday of each month at 2000 at the Ballycastle Museum, Castle Street, Ballycastle, N. Ireland, Details from Metryn Irvine MIOMSR. Tel: 02820 741693, E-mail: metryn.irvine@btinternet.com

ROYAL NAVY (ULSTER) ARC, GIOURN, Club affiliated to the Royal Navy Amateur Radio Society. Details from Alex Miller GI4SFV.

ARMAGH & DARC, GIOADD. Meets at County Armagh Golf Club, 7 Newry Road, Armagh City. Details from John A. Murphy. Tel: D283-752 2153.

BANGOR & DARS, GI3XRQ. Meets at The Stables, Groomsport, Co. Down. Details from Terry Barnes GI3USS. Tel: 0289-147 3948.

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

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ABERGAVENNY RS, GW4GFL. Meets at the Hill Residential College, Pen-y-Pound, Abergavenny, Gwent. Details from Gyn Hughes GW0DQY. Tel: (01633) 483186.

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CENTRAL SCOTLAND FM GROUP, RS38728. Details from Thomas Stalker GM7TZU. Tel: (01698) 816793.

DALRY ARG, MMOARG. Meets at The Turf, In Dairy Court, Hill Street, Dairy. Details from Alex McKeeman MMOABM. Tel: (01294) 823295.

DUNOON & DARS, GMOCOD. Meets at the Edward Street Community Centre, Edward Street, Duncon. Details from A.B. Horton GMOBUL. Tel: (01369) 840217.

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INVERCLYDE ARG, GMOGNK. Meets at the Cardwell Bar, Cardwell Road, Gourock, Strathclyde. Details from Andrew Givens GM3YOR. Tel: (01475) 638226.

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LORN ARS, GMOLRA. Details from T. Olsen GMOEQW. Tel: (01866) 2580.

MID LANARK ARS, GM3PXK. Meets at the Newarthill Community Ed. Cent., High Street, Newarthill, Motherwell, Lanarkshire ML1 5GU. Details from John Neary GM0XFK. Tel: (01698) 822860.

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WEST OF SCOTLAND ARS, GS4AGG. Meets at the Multi Cultural Centre, 21 Rose Street, Glasgow. Details from Hon. Sec.

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

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British Amateur Radio Teledata Group (BARTG - G4ATG, GB2ATG) Contact Membership Secretary Andrew

Thomas G8GNI, M5AEX, Dame School House, 103 High Street, Stony Stratford, Buckinghamshire MK11 1AT, E-mail: members@bartg.demon.co:uk or visit www.bartg.demon.co.uk

British Amateur Television Club (BATC - RS38114)

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> Military Wireless Amateur Radio Society (GOPTZ) 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, GBOIBC, 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.org

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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

The Medium Wave Circle Details from c/o C. Rooms, 59 Moat Lane, Luton LU3 1UU. E-mail: contact@ mwcircle.org

World Association of Christian Radio Amateurs & Listeners M1CRA Details from Membership Secretary Derek Chivers G3XNX, 51 Alma Road, Brixham, South Devon TQ5 8QR. Tel: (01803) 854504 or visit www.wacral.org



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