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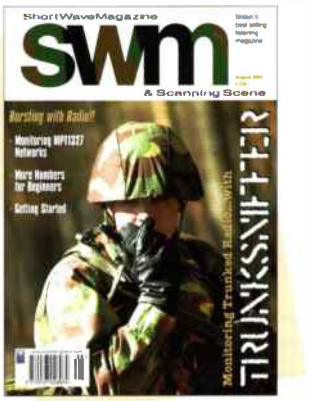

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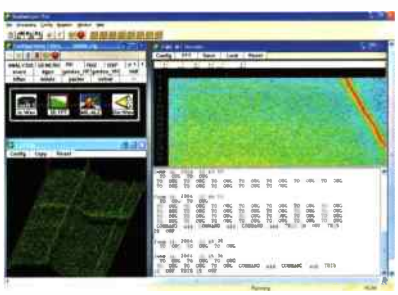

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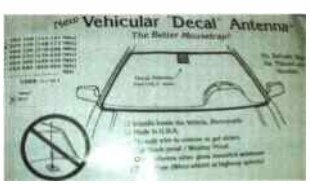

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Share your thoughts

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

Coming Next Month

in SWM September 2004

- **FREE! supplement - *Scanning Scene Extra* - £4000+ of prizes!**
- **RF Space SDR-14 Software Defined Radio - Reviewed**
- **New! - Beginner Series - Getting Started**
- **Number Stations, A Beginners Guide - Part 3**
- **Keep on top of the world of monitoring with *SWM***

**contents subject to change*

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SWM Services

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

Photocopies & Back Issues
We have a selection of back issues, covering the past three years of *SWM*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for *SWM* are £5.00 inc P&P each and photocopies are £3.00 per article inc P&P.
Binders are also available (each binder takes one volume) for £6.50 plus £1.75 P&P for one binder, £2.75 P&P for two or more, UK or overseas. Prices include VAT where appropriate.
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We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by *SWM*, then please write to the Editorial Offices, we will do our best to help and reply by mail.

ED's comments

WHS Madness!

A few years ago WHSmith acquired a chief executive who's background was 'white goods' retailing, you know, washing machines, fridges and the like. It was at this point, some observers would say, that thing's started to go wrong with the leading high street newsagent come stationery store.

Now WHS are in trouble and they've had the brilliant idea of taking magazines out of the range of items for sale in their 522 stores located around the UK. This is part of their effort to improve the company's performance.

Quite how this will have a beneficial effect is a mystery to me and the whole magazine industry in general. What it will mean is that a large number of *SWM* readers will be seriously inconvenienced.

Ian Locks, CEO of the Periodical Publishers' Association commented, "WHSmith has, over many years, positioned itself as a destination range retailer. If by its actions it is jeopardising this position, then that would be highly regrettable".

Recently WHSmith announced a range review that would downgrade or drop completely over 70 percent of its specialist title range in a bid to boost the chain's drooping profits.

The reductions emerged from a review instigated by the company's new chief executive **Kate Swann**, who is looking down the barrel of a £940m take-over bid. There appear to be some problems related to this also. The chairman of pension trustees at WHSmith recently moved to quash speculation that disagreements over the company's pension fund deficit could derail Permira's bid for the high street retailer.

Martin Taylor, who is also the former chairman of WHSmith, said that his negotiations with Permira were "extremely constructive and friendly". He has also had discussions with other venture capitalists interested in the company about the £200m to £250m pension fund hole in the past few weeks.

"There isn't a row, there is no row at all," Mr Taylor said, adding that he raised his eyebrows at suggestions that the trustees' request to have a lump sum payment made to plug the pension gap up front could push the £940m take-over off the rails.

However, he added that he is pushing for changes that would safeguard members of the pension scheme, which has now been closed to new entrants. "The pensioners should be at no more risk than they are today," he said. "We have no objection to who owns the company, but we would like the greater part of that deficit paid up-front."

Face The Chop

According to the media section of *The Independent*, many famous - but niche - magazines face the chop.

Sight and Sound magazine would be available in only 40 of the biggest WHSmith stores, down from 300 stores.

"The decision is completely crazy and what it will do is put a lot of small magazines out of business," **John Innes**, *Sight and Sound*'s publisher commented recently to *The Independent*.

History Today would be all but history itself, available in just 175 stores instead of 522.

Peter Furtado, *History Today*'s editor, said, "WHSmith represents around 50 per cent of our sales; therefore a reduction of two-thirds will make the difference between publishing on news stands being economically viable or not".

WHSmith said the review was ongoing and was a "normal part of good retail practice."

If history and cinema magazines can be impacted, how about radio magazines? The bigger titles are safe, they come from publishing houses with lots of other titles and hence have bargaining power. Niche titles from small, independent publishers have no such safety net.

Back to the implications for readers of this magazine. *SWM* is currently listed as a 'Must Stock' title in all the largest, city centre branches of WHSmith and is listed as 'Manager's Discretion' in a range of smaller WHSmith stores. Though I still receive reports of reader being unable to obtain copies from WHS.

My personal view is that WHS will realise the error of alienating a significant proportion of their customer base and giving a huge commercial opportunity to their competitors, but until this happens please be assured that we will supply your favourite radio magazine direct for the cover price including postage if you live in the UK. All it takes on your part is a 'phone call - **0870 224 7230**, E-mail - **subs@pwpublishing.ltd.uk** or FAX - **0870 224 7850** and a credit or debit card number. Or drop us a line and a cheque for £3.25 per issue. Of course, this might be the time to consider a 12 or 36 month subscription!

If none of the above methods appeal to you, then your local independent newsagent will probably be happy to arrange a Shop Save copy for you. For your convenience, there's a handy voucher to use for this very purpose on page 76 of this issue.

That's it from me this month, I must get back to investigating the RF Space SDR-14 Software Defined Radio so that I can tell you all about it in next month's *SWM*, which will also include a complementary copy of our 32 page *Scanning Scene Extra*.

Lastly, my appologies, but due to computer failure, I've lost the follow-up to the v.l.f. loop promised last month. I'll recreate and include it in a future issue.

Vy 73 Kevin

QSL

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

Drop a line to the Editor at QSL, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

topqsl

Dear Sir

I read, with some interest, as it combines two of my hobbies, John Berry's article on 'Arnhem Communications'. However, he seems to me not to have gone into it too deeply.

He has read, I am sure, the best description of the radio aspects of the Arnhem operation, in *Echoes from Arnhem* - written by the adjutant of 1st Airborne Div. Signals. In this book, the author has explained in some detail, what went wrong - and why.

As John Berry states, the parachute battalions were mainly equipped with WS 68P man-pack sets, while the glider-borne units and the RA nets used mainly the WS 22 lightweight. It appears to have been known that the combination of sandy soil and woodland in the target area would lead to serious attenuation of ground wave signals, and the RSignals officers appear to have tried to raise this issue with Divisional and 1st Airborne Army commands.

At the time, there seem to have been considerable military-political factors at play. Britain was scraping the manpower barrel and a force of nearly 20000 trained troops who had not seen active service since mid-1943, represented an attractive target for disbandment. Over 20 operations had been proposed in the months since D-Day, but most had been overtaken by the speed of the ground forces advance.

As a result, General Browning and his staff were not open to technical obstacles being raised against the proposed operation. The refusal to accept the significance of intelligence reports of German Panzer forces in the target area is the best known factor in the eventual failure of the operation. It also needs to be remembered that planning was completed in a matter of a few weeks.

The book, mentioned above, also records that no netting of radios was permitted before the operation, for security reasons. As anyone with knowledge of these wartime sets will understand, this will have seriously reduced the efficiency of the various command nets. In general the RA nets operated better than those of the infantry formations, and were used later in the operation for additional communication over and above the needs of the gunners.

It is probable that the RA operators may have been better skilled than the trained infantryman operators of the parachute and glider infantry units. Add to this battering that the sets would have been subjected to during the drop and the high equipment losses associated with such operations and theoretical studies of range based on modern radio equipment have limited relevance.

It is also interesting, and not widely appreciated that the Airborne Division had no ground-to-air signals capability. On the eve of the first drop, an American team with ground-to-air sets was supplied, but it was found that the personnel had not previously even seen the equipment. As a result, airdropping of supplies later in the operation was based solely on pre-arranged DZs, with results that are well known.

It seems somewhat incredible to me that this had not been previously addressed in setting up the Airborne Forces. At this stage in the war, the SOE S-phone equipment cannot have been unknown to the Germans, and would have been ideal. After all, the equally secret Rebecca-Eureka beacons were supplied to the Pathfinder parachutists. There also does not seem to have been any consideration given to providing the lightly equipped Airborne Forces with Tactical Air Support, which was available to the approaching 2nd Army, only 80km to the south.

It would also seem that little thought had been given to rear link communications. The B2 set was commonly issued to military units at this stage of the war - it was used by Phantom Signals, who were associated with the Airborne Forces. (It was also used by SAS units attempting to recover cut-off personnel in the weeks after the operation) Where sky-wave contact was achieved, there does not seem to have been any attempt to prevent interference from other signals nets. I believe that at one stage it was possible to hear the battle zone communications from the UK.

The failure of the Arnhem operation is largely due to the combination of rushed planning, blinkered attitudes and a serious shortage of first wave air transport. Ineffectual signals nets did not help the beleaguered paratroops on the ground, who deserved better. It is interesting to speculate what would have happened had the operation succeeded.

As the Germans demonstrated only a few months later, they were far from a spent force, and the whole of 21 Army Group might have been cut off in North Holland by destruction of the thin supply umbilical back to Normandy. A better use of the parachutists might have been to capture the North bank of the Scheldt and allow the Dutch ports to be re-activated!

Neil Mander
Devon

Neil, many thanks for a very interesting follow-up to John Berry's article. I have heard stories of similar unbelievably naive radio practices during 1980s exercises.

*I'm sure that the events and circumstances regarding the WW2 radio communications will continue to make the fascinating subject of analysis for a long time to come. More recent conflicts no doubt have their stories too. - **Ed.***

Dear Sir

I really must come to the defence of Mr. Evans after reading so many attacking and, sometimes, quite vicious comments from some of your readers regarding his views on radio reception. After all he can't be that bad if he buys *Short Wave Magazine*, can he?

In this supposedly enlightened age we must all show tolerance and understanding of other people and their views however badly afflicted and repulsive they appear. So, enough of these assaults! Just accept the fact that some people who, in earlier times, would have been 'locked away' are now roaming freely in our society.

A little anecdote might help. I make computers and a few months ago I was at the premises of one of my parts suppliers where a customer (male, about 35) was enquiring after a radio tuner to fit into a PCI slot so that he could listen to the radio and do his stuff on the PC. The supplier couldn't help, so I chimed in to suggest a couple of places where he might obtain a radio card. I established that he had a very fast single CPU but without a large cache and that speed was important to him.

He didn't seem to grasp that asking his CPU to process a continuous stream of information from the tuner would slow the CPU down as it would give priority to the ever changing data. Wouldn't it be better to buy a decent portable radio which would be far more flexible (except perhaps in recording on his PC. When recording WAV files onto a PC, it takes about 10MB of HDD storage per minute of audio MP3 takes about one megabyte for each minute of audio. As a matter of interest, I have just transferred the contents of 12CDs worth of audio onto one MP3 CD and you would not be able to discern the audio difference between the two. The only problem is the listing of contents!

He looked at me as though I had just emerged from Jurassic Park into the 21st Century. He wasn't convinced or converted! You see there are those folk around who will put on their rose-coloured spectacles (or their computer-tinted spectacles in this case) to view the world.

Although I've never read it, perhaps *Radio Active* might specialise more in the computer-related aspects of radio and television reception leaving *SWM* to the more conventional areas with both overlapping occasionally. Just a thought as you can see the way things are going.

Incidentally, what is likely to happen to the broadcast bands from v.l.f. through to u.h.f. with so much migration to digital, satellite and Internet? Would you or any other expert and knowledgeable contributors care to give some opinions as to the future of 'conventional' radio. I'm sure people like AOR and Icom and others must be planning for the future.

Dennis Ellison
Surrey

Some good points there Dennis. Just for the record, SWM's remit is to cover all things radio, emerging technologies included. Radio Active *is aimed fairly and squarely at the beginner and DAB enthusiast. - **Ed.***

Dear Sir

I am a CB user. A CB user who wishes to comment on the June 2004 *SWM* article entitled 'CB In Peril?'. The author of the article started his research well by attempting to communicate with CB clubs and individuals via E-mail addresses of people involved. Unfortunately, the response to the author's E-mails (how many were sent is not known) was not great, due to many addresses not existing any more.

Based on this, the author then concludes that he has found initial evidence to show that CB is dead. Did he consider that the E-mail addresses may have fallen prey to spam overload and are no longer used because of that? Did he accept that many humans can be lazy and so did not update the sites? Did he even go to the trouble to contact CB shops such as Truck-King, Nevada or CB Shack?

The author continues contacting a local person who claimed he knew of a couple of chaps using CB in the west of the country. I do not know where the author lives, but wherever it is, it sounds to be simply a quiet area as far as CB is concerned. A local CB user also mentioned that he used the illegal (but desired) s.s.b. CB modes and could not think of any operators within 80km. I'm not surprised! SSB CB is strictly illegal in the UK. The last time I heard that someone used it, the RA promptly arrested him!

It may surprise many radio amateurs that CB is in good use in this country. The amount of use does vary region to region as we are limited to four watts. I live in Bedfordshire, described by CB lorry drivers as being one of the few quiet areas in the country. Every day I turn on my rig to hear at least seven locals with base stations. I should point out that my antenna is not great so I cannot hear many other locals I know to be active. I also hear a huge number of people in lorries and cars. If this is a quiet area, I wonder what a moderate area would sound like?!

Len Over writes the article 'On The Road' in *Radio Active*. He recently took one and a half weeks off to drive around the country to see how much of a headache Ofcom will have if they decide to drop the 27/81 channels (UK channels) in favour of using just the CEPT European channels (legal for UK use). Many places Mr Over visited he could see new CB antennas on roofs. He heard and communicated with many CBers. Many of these CBers were in agreement that the UK40 (27/81) are British channels that we had to fight to get and will continue to use even if they become illegal. Mr Over also visited some of the CB shops I mentioned and found them to be busy places serving customers with brand new UK spec rigs and also serving many Internet and mail orders (not international). This article is published in the June 2004 issue of *Radio Active*.

The author of 'CB In Peril?', Mr Hardy, also shows data from the RA on how many licenses have been issued. The graph steadily declines from 300,000 to 50,000 between 1983 and 1993. The caption reads, "The licence statistics say it all". Mr Hardy, you claim to have done your research for this article, why did you decide to write that comment based on data over 10 years old? How is the reader to know that licence issues may have climbed back up during 1993-2004?

To be honest, not many CBers bother with licences due to Ofcom not enforcing the CB airwaves unless interference is involved. The RA failed to realise that the falling licences did not reflect the amount of CB use. So, they decided to get rid of licensing altogether to help boost CB usage. CBers, however, want to get rid of licensing because £15 a year gets you a paper booklet and an A4 sheet with your expiry date. Incidentally, I have a licence.

Another piece of research that needs clarifying is the author's scan through the 'legal 40', resulting in reception of Russian interference. Could the author state which 'legal 40' he was listening to? Was it the UK40 (27/81) or was it the EU40 (CEPT) frequencies? I'm sure that it would have been the UK40 and the interference survived due to the quietness of the area, but it needs clarifying due to the fact that nobody in Britain uses the EU40 as they are too noisy. If Mr Hardy was scanning the EU40, no wonder he did not hear anyone!

The author also comes off as a bit biased towards amateur radio when he regally puts across the notion that the only reason anyone would use a radio is to talk formally within a group doing an activity, or to DX. Us CBers DX just fine thank you. We use four watts, which makes DXing what it should be, fun. We don't want to DX Zimbabwe, Antartica or Easter Island. If we did, then great! We have fun DXing Liverpool from London and Calais from Norfolk. A PMR446 device did DX Amsterdam with only 0.5W e.r.p. **www.delboyenterprises.co.uk** which for some people is more fun and exciting than DXing New York with 1kW.

Also, "27MHz is not a good frequency for local contacts" is a quote from the article, again showing the (possibly unconscious) bias for amateur radio. What do you consider to be local? Local, for me, refers to a distance that may not always be greater than the country boundary (I'm in the centre of the country). Local, for an amateur operator, is probably anything not beyond the borders of the country! "The ground wave is short" is another related comment, which seems pointless with the idea of local contacts not normally beyond the county border.

The last point I wish to make (phew, I hear people say) is about a remark that CB equipment is bulky. When compared to the severely underpowered PMR446, this is true, but a lot of amateur equipment makes CB equipment look like it was designed for the borrowers! My Midland 77-104 was made in 1987 and is just a little bigger than my hand! My antenna cost £9.99 and was made by Moonraker, gives a s.w.r. of around 1:1.2 and is no longer than my arm. The power supply is the heaviest item but is not bulky enough for me to lift it with more than one hand. Recently I visited the Truck-king website and saw a CB with good reviews that fitted into the palm of your hand. It was so small that the entire radio fitted into a fairly standard held-held microphone case.

Next time you decide to publish an article such as this, please try to get the facts right and use an author who can write in a completely unbiased manner. As I read the article, I got the impressions that Mr Hardy was looking down at us CBers and was secretly pleased that CB seemed to be dying.

Duncan Large
Beds

Reply from Clive Hardy:

Thank you for your comments Duncan. As the question mark in the title suggests, the article was not intended as a definitive statement on the state of CB in the UK, but a suggestion, following the enquiries I had made, that CB was 'In Peril'.

To answer your specific points. I cannot know why so few people replied to my E-mails. Assuming that CB clubs and individual users put pages on the web in order to publicise their activities, it seems strange that they are disinclined to answer enquiries.

On several sites it is many years since they have been updated. I'm inclined to the view that their creators have simply left them and moved on. I could be very wrong, but no one is telling me that. As for retail suppliers, I didn't speak to them on purpose. I was looking for views from users, not from persons with a financial interest who I'd expect to present a buoyant picture, regardless of reality.

I have read Len Over's article and was struck by how little activity he heard. Apart from 'plenty of conversations at most larger towns from Dartford to Dover' (of which there are about six of no great size) in the south east, he describes southern England as 'not very busy'. His journey from there to the West Midlands 'was often quiet' and Birmingham is described as being, like London, 'very quiet'.

After leaving Birmingham to visit Fife before returning to the London area he doesn't mention any activity in mainland UK whatsoever. I have no idea if Northern Ireland, which he heard above the silence of the UK, is a hot bed of CB activity or no.

However, when I was in Eire recently, in face-to-face conversations with some users, they spoke of a CB scene similar to that which my article described for the UK. Almost all feedback from readers has also tended to agree with that view.

As I write this I am interrupted by a telephone caller from Oswestry saying that, after over 20 years on the CB, he is giving up as there is 'no-one around to talk to' and 'nothing at all' happening on those frequencies. One long time CBer in France wrote of a pattern of use and decline in that country which closely paralleled the UK situation.

Apart from your comments, the only slight divergence came from one respondent living close to the M1 in Northampton who was inspired by the article to dust off his CB, switched it on, and heard truckers on several channels.

In February this year Ofcom had a figure of 20,150 for CB licences, down about 15% on the previous February when the figure was 23,619. Other than licence take up, what other indicator is there of CB use? (The comments accompanying the graphics in the article were added by the Editor). Ofcom's motives for ending the CB licence will be totally financial, brought on by administration costs exceeding income.

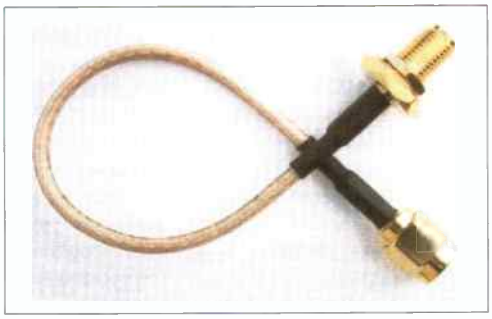
I was listening to 27/81 and I'll agree to a bias towards amateur radio and to some extent PMR446. What I was trying to convey was that, for CB, 27MHz is a poor choice of frequency. It doesn't lend itself to long distance communication for half of the time, and is inefficient for local contacts.

Amateur radio is more flexible, offering access to more appropriate frequencies for those purposes. If anyone wishes to use 27MHz that is entirely their choice. In the article I was pointing out that, in my view, there are better alternatives. You may dispute my interpretation of what is occurring with CB in the UK, but I stand by the article's factual content.

It would be a sad world without debate. Once again, thank you for your letter. - ***Clive.***

New Quick Delivery

Sample of a typical SMA cable assembly, manufactured in the UK by Coax Connectors for fast delivery.



Coax Connectors recently announced a new service that will enable customers to purchase complete SMA, MMCX and other types of cable assembly, of any specified length, on rapid 5-7 day delivery - at no extra cost. "Quick delivery is a significant benefit for many customers, especially manufacturers and installers who tend to work with a low inventory," said **James Robinson**, Coax Connectors' Managing Director.

Most suppliers source their SMA, MMCX and other cable assemblies in the Far East, which means that the customer often has to wait up to six weeks for delivery. By contrast, Coax Connectors manufacturers assemblies at its base in Richmond, Surrey, thus ensuring faster fulfilment of the order.

"There is no extra cost whatsoever in purchasing our UK made assemblies," noted James Robinson. "We're geared up to do this and we can fulfil most orders within a few days".

Coax Connectors is one of the UK's leading suppliers of coaxial interconnect products and cable assemblies. It offers a comprehensive range of high quality connectors, sold at competitive prices for applications throughout the electronics industry. The company has ISO9002 quality, together with the approval of Jaguar and other top customers. Coax can supply off-the-shelf connectors from stock for next day delivery. Its technical department can also assist in the design and development of connectors to meet individual requirements.

Coax Connectors are based at **237-241 Lower Mortlake Road, Richmond, Surrey TW9 2LL, Tel: 0208-948 7047, FAX: 0208-948 2125** or E-mail: **info@coax-connectors.com**

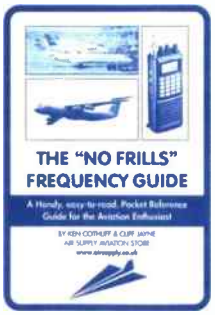
SWM At Airshows

Short Wave Magazine advertiser and specialist aviation supplier **Air Supply** have just agreed to ensure that they have a supply of *SWM* on their stand at the shows listed here. Ken Cothliff, Air Supply's owner is pleased to display *SWM* for the convenience of our airshow attending readers.

Air Supply have a long history of supplying the Aviation and airband enthusiast with radios and much more. One of their popular items is *The 'No Frills' Frequency Guide*. A cost effective pocket reference for the aviation enthusiast. Priced at a modest £4.95, this guide contains all the frequency information to get you going with both civil and military frequencies covered. If you in the vicinity then call in at Air Supply's stand, visit the shop or just call. Air Supply are located at **97 High Street, Yeadon, Leeds LS19 7TA** Tel: **0113-250 9581** or E-mail: **kencothliff@airsupply.co.uk** Their website is **www.airsupply.co.uk**

July 24-25	Breighton Air Show
August 6-8	Isle of Man Air Rally
August 21-22	Yorkshire Air Show - Elvington
September 4-5	IWM Airshow - Duxford
September 11	RAF Leuchars Air Show
September 18	RN Open day - Yeovilton
October 10	Duxford End of Season Air Show

This Air Show list is complete based on information received, changes may follow, so all dates should be checked.



Website Welcomes 2000th Visitor

In a little over two years, the **Southport & District Amateur Radio Club**'s (SADARC's) website has attracted more than 2,000 visitors. The 2000th web surfer visited the site on **Sunday 27 June 2004**, which is quite an achievement for a small club website. When established, the SADARC website's goals were defined as raising the awareness of the Southport & District Amateur Radio Club and becoming a respected source of news and information for the Amateur Radio community.

The site's designer and Webmaster **Derek Hughes G7LFC** said, "I am pleased that the website is meeting it's first goal. Over the last year, several Radio Amateurs and would-be Radio Amateurs have attended our club meetings as a result of visiting the website. In addition to this, the site's weekly visit figures have been going steadily up during the last year, so we are on the way to fulfilling our second goal. We hope to achieve our 3,000th visitor by Easter 2005". The SADARC website was awarded a Golden Web Award last year and has been nominated for a Maestro Award of Excellence during June.

A little background information about the club. The Southport & District Amateur Radio Club has it's roots set way back in time and is an amalgam of several different clubs that existed in south west Lancashire. Having gone through a lean period, the club has emerged over the last three years to become a strong club with 25 members regularly attending our monthly meetings.

It is now well established as an active club, running several special event stations each year and taking Amateur Radio into local schools and Scout groups. In 2003 the club made history by running a maritime mobile special event station which they hope to repeat again in 2005.

The interests of the club's members vary widely and the club has specialists in everything from simple 2m phone (voice) operations, through c.w. (Morse code), digital communications, IRLP (Internet linking over radio), slow scan television, to computing. The club has several active mountain-top operators who practise their art under the banner of Summits on the Air (SOTA).

The Southport & District Amateur Radio Club has got something for everyone. From the person who is interested in becoming a Radio Amateur, to the seasoned expert. The club extends an open invitation to everybody to come along and meet them at their regular monthly meetings in Scarisbrick, on the air on a Monday evening (not on a club night), or at one of their special events.

More details about the club and its activities can be found on the club's website at **www.southportarc.org.uk**

Dover Deceives Hitler

A massive force was collecting secretly in the South and West of England. It was 5 June 1944 and they were preparing to travel to the Normandy coast. The code-name for the undercover operation was *Overlord*.

During the night, soldiers embarked, ships put to sea and aeroplanes, some dragging gliders, took off. By the gloomy dawn of the next morning, the D-Day landings had started, heralding the start of operations which aimed to bring World War Two to an end.

Most of this is well documented history. It therefore comes as a surprise to many people that, at the same time, a massive plan of deception was taking place in Dover. Artificial ships were docked in Dover Harbour, cardboard lorries and inflated rubber tanks stood on the roads approaching the coast, bogus tents were erected on the hillsides and, from high up on the hill at Dover Castle poured a stream of important sounding radio messages, many of them often in meaningless code. The signallers operated their red-hot radio sets in the tunnels underneath the Castle, feeding their antenna arrays on the surface through three ventilation ducts. This was a known as Operation *Fortitude South*.

It was all a hoax. The object was to deceive Hitler into thinking that the invasion by the Allies was going to take place at Calais some weeks later. It worked. The deception was so successful, that Hitler even moved one division of his army from Normandy, right up to the *Pas de Calais* coast. Rommel felt so secure that he even took the weekend off and returned to Germany to celebrate his wife's birthday.

Without the operations in the Dover Area and the radio messages from Dover Castle, the D-Day landings would have been extremely hazardous, not to say almost impossible. This year is the 60th anniversary of the D-Day landings and many events took place along the south coast of England and along the coast of Normandy in France. At many of these events, there were amateur radio stations keeping contact with each other and spreading the news of what is happening.

But Dover was not forgotten either, although little was actually organised by the Town to commemorate the events, nor by the Castle itself, which had been the centre of the vital operations.

Dover Amateur Radio Club, well-known locally for their support of historic local events, set-up an exhibition by the Lookout in the grounds of Dover Castle, in the original surroundings. Many of the members appeared in authentic uniforms. They had modern radio stations, h.f. and v.h.f., keeping in touch not only with their fellow radio amateurs both locally and throughout the world, but also with the D-Day radio stations in the south-west of England and the coast of Normandy. Their main task was to tell the story of Operation *Fortitude South* and how Dover contributed to the success of the D-Day landings.

Under the callsign **GB6OFS**, they made over 200 contacts in 26 countries, including Utah Beach on v.h.f. thanks to a Tropo opening and an unconfirmed contact with Juno Beach on h.f. In addition, there were three vintage radio sets working and operational, plus five Army portable sets which were also still functional. They were able to work amateurs as far away as Scotland, plus stations on the Normandy beaches Gold and Omaha using a.m. and c.w.

But this is only a small part of what was on show. One of the most exciting parts, perhaps, because it was live and immediate. But the historical side was not forgotten.

Over the weekend 5 and 6 June, a large number of people visited the site. They came from all over the world, from as far afield as Japan, Australia, the USA and Russia. One German visitor had an exceptionally interesting tale to tell, as he had been a boy in Berlin when, in 1945, the Russians marched in just after Hitler had committed suicide.

Two of Dover Radio Club's younger members Nathan De-Thabrew 2E1NFD (aged 15) and Martyn Austin M3MSN (age 12) in the field station produced by G3ROO with the No.19 set used to contact Special Event stations on the Normandy beaches.

John Elgar-Whinney sits behind his display of Second World War radio collection. A suitcase radio can be clearly seen and left of the picture is a fully restored Enigma machine. The circular chart hanging up is one of the early circular plotting charts used by the Royal Observer Corps, this particular chart was used to chart the path of the first flying bomb to cross into England.

Refreshment time.

The tourists and local residents were able to inspect the historic tunnels under Dover Castle from where the actual radio messages were sent and the operation was controlled, and then visit the Dover Radio Club site to look at some of the extremely interesting exhibits. These comprised a wide range of vintage radio equipment, actually used during World War Two, including some fascinating spy sets normally only appearing in novels and histories, and also a genuine working German Enigma coding machine (a valuable rarity).

Apart from this, club members prepared displays of relevant wartime photographs, carefully collected and researched. Altogether, a most worthwhile and successful venture, well in the tradition of the Dover Radio Club. Visit **www.darc.org.uk**

Portable Radio

With 85% of the population expected to be able to receive DAB signals this year, digital audio broadcasting (DAB) is here to stay and, to celebrate this new era in radio, Roberts has launched its first DAB only portable radio at just £99.

Until now, Roberts' DAB radios have also featured f.m., so if you have been in an area without a DAB signal, you could simply switch to f.m. Now that the signals are more widely available, the new Roberts Gemini 12, DAB only portable radio is a great buy for radio enthusiasts.

A wide range of additional exclusive radio programmes are offered by DAB that aren't available on analogue - you are simply spoilt for choice. Treat your ears to BBC7, BBC Five Live Sports Extra, Planet Rock, Core, Primetime, Saga, Oneword and many, many more.

The Gemini 12 is finished in a stylish silver/dark blue colourway, with large front facing speaker. Features include: 10 station pre-sets, DAB waveband, easy to read l.c.d. with green display backlight, menu display/selection of all major functions, search/manual tuning, rotary tuning and volume controls, headphone socket, a.c. mains socket and uses six C-cells.

Roberts is paving the way in DAB radio and has got some other ground-breaking new DAB models planned for later this year, so watch this space!

First Sharp FV-DB1E DAB Radio

Sharp launches its first portable DAB digital radio, just as the BBC DAB coverage area reaches 80% of the United Kingdom. The slim-line radio will look at home in any room of the house, particularly the bedroom, with its alarm clock function. The FV-DB1E's stylish compact design, means it will fit in well with modern or traditional styled homes.

Unlike the majority of DAB radios, the FV-DB1E comes with both f.m. and DAB capabilities allowing you to pick-up stations that aren't being broadcast digitally. However, when you listen to digital broadcasting on the FV-DB1E and the increasing amount of radio stations broadcasting in DAB only, you may rarely need the f.m. facility.

The radio's DAB and f.m. tuner has 20 station presets, which can be easily selected via the buttons on the top edge of the unit, and most other functions can be accessed from the front control panel beneath the blue backlit l.c.d. screen.

The FV-DB1E, which comes in a high-gloss white or silver, has a large l.c.d. display and weighs 1.6kg, is mains or battery powered and an integral carry handle. It also has a 'line-out' enabling DAB radio to be output via a separate sound system if you require it.

The Sharp FV-DB1E DAB Digital Radio is priced at £129.99. Call **Nevada** on **(02392) 313090** or visit **www.nevada-radios.co.uk**

Annual Hamfest

The **Lincoln Shortwave Club** are holding their Annual Hamfest on **Sunday 19 September** at the Showground, Newark, Nottinghamshire. Doors open 1000 and it's just £2 entrance fee per person.

There will be all the usual radio rally attractions, plus craft stalls, classic cars and a 'fly-in' from a Second World War Auster V reconnaissance plane. Lots to see and do for all the family. Visit their hamfest web page at **www.hamfest2004.secretbunker.org.uk** There are some trade-space left, all enquiries to: **Baz Matthews** via E-mail: **m3dmv@btopenworld.com** or 'phone **(01636) 612440**.

rallies

August 1: The Kings Lynn Amateur Radio Club are holding their 15th Great Eastern Radio Rally at the Fosters Sports & Social Club, Sports Field, Clenchwarton, King's Lynn. Doors open 1000 and there will be plenty of boot pitches, pay on the day. There will also be a licensed bar and catering. For more details of this forthcoming rally, please visit **www.wsl.net/g3xyz**

August 1: The 4th Lorne ARS Radio & Computer Rally is to be held at Crianlarich Village Hall (18km north of Loch Lomond, junction of A82/A85), from 1100. Please note that this is a new venue. There will be a talk-in, traders and a Bring & Buy. More information from **Shirley GM0ERV** on **(01631) 566518** or **John GM8MLH** on **(01838) 200304**.

***August 8:** The Flight Refuelling Amateur Radio Society's Hamfest takes place at the Flight Refuelling Sports & Social Club, Merley, Wimborne, Dorset. Gates open at 0930, official opening at 1000. Features include large marquees full of radio, computing and electronics traders, plus food and drink, a licensed bar, car boot area and overnight camping available. Admission £3 adults, under 14s go free.
E-mail: **hamdest@frars.org.uk** or visit **www.frars.org.uk**

August 13: The Cockenzie & Port Seton Amateur Radio Club are holding their 11th Annual Radio Junk Night at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton, East Lothian. Bring along your own 'junk' and sell it yourself! Tables will be provided on a first come, first served basis. A raffle will be held at approx 2100. Disabled access and refreshments available. Only £1 entrance fee. *All money will be donated to the British Heart Foundation*. **Bob Glasgow GM4UYZ** on **(01875) 811723** or E-mail: **bob.glasgow@services.fujitsu.com** or **bob.gm4uyz@btinternet.com**

August 29: The Torbay Amateur Radio Society are holding their Communications Fair at Churston Ferrers Grammar School, Churston, Brixham, Devon. There will be a free car park and it's just £2 entrance free. Contact **Anna M3LMG** on **(01803) 812117** or via E-mail at **rally@tars.org.uk**

August 30: The Huntingdonshire Amateur Radio Rally is to be held on the Annual Bank Holiday Monday at Ernulf Community School, St. Neots, Cambridgeshire (near Tesco superstore on A428). Doors open at 1000 and admission is £1.50. Hot and cold refreshments will be available. There will be a hall and car boot sale on hard standing. Talk-in on S22. Further information from **Peter Herbert M5ABN** on **(01480) 457347** (between 1800 and 2200) or E-mail: **peterherbert@aol.com**

ECHO Launched

A recent AMSAT News Service Bulletin reports the following: Chuck Green N0ADI reported by 'phone from the Baikonur Cosmodrome that the launch of AMSAT *Oscar Echo* and the other satellites occurred on time at 29 June 2004 at 0630. He watched the rocket climb out and said it appeared to be flying straight and true. A second 'phone call from Chuck 18 minutes later confirmed that the launch carrying AMSAT *OSCAR Echo* was successful and that all spacecraft had separated successfully.

Chuck was assisted in the final integration and checkout process at Baikonur by the team from SpaceQuest which included Dr. Dino Lorenzini KC4YMG, Mark Kanawati N4TPY and Lyle Johnson KK7P. The SpaceQuest team members are also AMSAT members and volunteers.

A first attempt to turn on *'Echo* will be made during its pass over the US at about 1430. Initial transmissions will be short, just enough to gather some telemetry and analyse the performance of the power system. Those first downlink signals will be on 435.150MHz f.m. at 9600bps.

The correct callsigns for *'Echo*'s Pacsat Broadcast Protocol Digital system are: Broadcast: PACB-11; BBS: PACB-12. The callsigns reported in ANS-180.01 were incorrect.

A telemetry decode program, *TLMEcho*, is available for those who would like to view and report data from *'Echo*. It may be downloaded from: **web.infoave.net/~mkmk518/echo.htm**

If you record telemetry, please send the CSV files to: **ke4azn@amsat.org** A database for all telemetry has been established and will be tested over the next few days. When testing is complete it will be made available for direct upload of telemetry files as well as queries on any and all data.

Please do not transmit to *'Echo* until checkout and commissioning has been completed and the satellite is made available for general use.

New Yuasa Range

Yuasa have introduced a complete range of rechargeable NiMH and NiCad Button Cells to complement their series of NiMH and NiCad cylindrical cells. Yuasa 1.5V NiMH Button Cells offering a choice of five capacities, range from 15 to 320mAh and are ideal for CMOS memory back-up, vending machines, on-board car computers, cordless 'phones, transmitters and transceivers. They are environmentally friendly with no mercury and with all cells, fast charging is possible. Both tag and pin terminal options are available in 320mAh capacities.

This new range is also available in Button Cell Packs, making them ideal for memory back-up, alarm equipment and instrumentation. As p.c.b. mounted pack power sources with capacities ranging from 15 to 320mAh, they offer a very competitive solution. Cell Packs currently available cover 2, 3, 4 and 5 cells and are suitable as drop-in replacements for NiCad and NiMH cells of equivalent sizes.

Further information on the full range of Yuasa cells is available through Yuasa at **www.yuasa-battery.co.uk** or E-mail: **enquiries@yuasa-sales.co.uk** Alternatively telephone on **(01793) 645700** or FAX: **(01793) 645701**.

New range of rechargeable NiMH and Niad Button Cells launched by Yuasa.

LM&S

Long, Medium & Short Wave Bands

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As the summer months roll by, it's obvious that a number of our regular contributors are pursuing outdoor pursuits as the numbers and volume of logs is down on last month. There's still plenty to get on with, though, so here goes...

True to his word, **Michael Wasley** managed to send some logs detailing his listening antics whilst on-board ship; off the Norwegian and UK coasts. Michael comments that from his most northerly reporting point, a grand total of four long and medium wave stations were received. He also points out that, at 31°E, the north-east corner of Norway is as far east as Istanbul. I didn't believe him either but I invite you to look this up in your atlas.

Vic Prior (thanks for your logs, Vic - they're in precisely the correct format) has been doing battle with his new PC. But he admits to conceding defeat on a number of fronts.

Computer control of Vic's Fairhaven receiver has turned out to be "an unmitigated disaster". Despite the receiver being in a different room to the PC, and the antenna 20 metres away, there's an unacceptable level of hash every 40kHz or so through the bands. Vic also decries the disappointing level of functionality of the control software, so has decided that it's either radio or computing...but definitely not at the same time.

Sorry to hear your tale of woe, Vic. Computer generated interference is the bane of many a listening post. Careful positioning of an external antenna, fed with balanced open wire or screened feeder, or use of a laptop PC, or a PC with an l.c.d. screen are just two of many ways that can help reduce the problem.

The component of our home PC that kicks out the highest level of noise is the switched-mode supply that powers the outboard cable modem. I wonder if any of you have successfully lessened the levels of interference from your PCs. Perhaps you could drop me a line and tell us what worked for you.

From one hard luck story to another. Ernie Strong not only had his computer crash, taking all contained therein with it; his printer has packed up and there's also an intermittent audio fault with his receiver. The icing on the cake is that Ernie's gone down with some dreaded lurgy, making him feel somewhat

Long Wave Table

kHz	Service	TX Location	Country	Power (kW)	Listener
153	Deutschlandfunk	Donebach	D	500/250	A* B C F
153	Radio Romania	Brasov	ROU	1200	C* D
153	RTA 1	Bechar	ALG	1000	C*
153	NRK Europakanalen	Ingoy	NOR	100	E
162	France Inter	Allouis	F	2000/1000	C D F
171	Radio Chechnya	Tbilisskaya	RUS	1200	C
171	Radio Rossii	Bolsakovo	RUS	600	A* B C*
177	Deutschlandradio Berlin	Zehlendorf	D	500	A* B* C D F
183	Europe 1	Saarlouis	D	2000	C D
189	Georgian Radio 1	T'bisi	GEO	500	C*
189	Rikisutvarpid	Gufuskalar	ISL	150	B* C*
198	BBC Radio 4	Droitwich	G	500	A C D F
207	Deutschlandfunk	Aholming	D	500	C D
207	RTM Network A	Azilal	MRC	400	C*
207	Rikisutvarpid	Eidar	ISL	100	B* C* F
216	Radio Monte Carlo	Roumoules	F	1400	B C D
225	Polish Radio 1	Solec Kujawski	POL	1000	A* B* C* D
225	Turkish Radio 4	Van	TUR	600	C*
234	RTL	Junglinster	LUX	2000	C D
243	Denmark Radio 1	Kalundborg	DNK	300	A B C D F
252	RTE Radio 1	Clarkstown	IRL	500/150	A B C D
252	Algiers Radio 3	Tipaza	ALG	1500/750	B* C*
261	Radio Rossii	Taldom	RUS	2500	B* C
270	Czech Radio 1	Uherske-Hradiste	TCH	650	B* C*
279	Belarussian Radio 1	Sasnovy	BLR	500	A* B* C

* = dark

Listeners:-

A Sheila Hughes, Morden
B Simon Hockenhull, Bristol
C Ernie Strong, Ramsey, Cambs
D Michael Wasley - North Sea (100 miles NE Tynemouth)
E Michael Wasley - Off Varangerfjord, Norway (approx 70N, 31E)
F Michael Wasley - Off Bergen, Norway

Local Radio Table

kHz	Service	Svc area/TX site	kW	SWL
558	Spectrum	Crystal Palace	1	B
603	Capital Gold	Littlebourne	0.1	A B
630	BBC 3CR	Luton	0.2	A B
657	BBC Radio Cornwall	Bodmin	0.5	B*
666	BBC Radio York	York	0.5	A C
666	Classic Gold	Exeter	0.34	B
729	BBC Essex	Manningtree	0.2	A B
738	BBC Hereford & Worcester	Worcester	0.037	B
756	BBC Radio Cumbria	Carlisle	1	C
756	Magic Maldwyn	Newtown	0.63	B
765	BBC Essex	Chelsmford	0.5	A
774	BBC Radio Leeds	Leeds	0.5	C
774	BBC Radio Kent	Littlebourne	0.7	A
801	BBC Radio Devon	Barnstaple	2	B
828	Magic 828	Leeds	0.12	C
828	Classic Gold	Bournemouth	0.27	B
828	Classic Gold	Luton	0.2	B
837	BBC Radio Cumbria	Barrow in Furness	1	C
837	BBC Asian Network	Leicester	0.5	B
855	BBC Radio Norfolk	Norwich	1.5	A C
855	Sunshine 855	Ludlow	0.15	B
873	BBC Radio Norfolk	West Lynn	0.3	A C
936	Fresh AM	Skipton	1	C
945	Capital Gold	Bexhill	0.7	A
954	Classic Gold	Torbay	0.4	B
954	Classic Gold	Hereford	0.16	B
963	Asian Club	Hackney	0.95	A B
972	Asian Club	Southall	1	A B
990	BBC Radio Devon	Exeter	1	B
990	Classic Gold	Wolverhampton	0.09	B
999	BBC Radio Solent	Fareham	1	A B
999	Magic 999	Preston/Blackpool	0.8	C
999	Valleys Radio	Ebbw Vale	0.3	B
1017	Classic Gold	Shropshire	0.63	B
1026	BBC Radio Jersey	Trinity	1	B
1026	BBC Radio Cambridgeshire	Cambridge	0.5	B
1035	Easy Radio London	Crystal Palace	1	B
1035	Northsound 2	Aberdeen	0.78	C
1107	Moray Firth Radio	Inverness	1.5	C
1116	Valleys Radio	Ebbw Vale	1	B
1116	BBC Radio Guernsey	Rohais	0.5	B
1152	Capital Gold	Birmingham	3	B
1152	Classic Gold Amber	Norwich	0.83	B
1161	Tay AM	Dundee	1.4	C
1170	Swansea Sound	Swansea	0.58	B
1170	Magic 1170	Teesside	0.32	C
1170	Classic Gold Amber	Ipswich	0.28	B
1170	Capital Gold	Portsmouth	0.12	A
1242	Capital Gold	Maidstone	0.32	A
1251	Classic Gold Amber	Bury St Edmunds	0.76	B
1260	BBC Radio York	Scarborough	0.5	C
1296	Radio XL	Birmingham	10	B
1323	Capital Gold	Brighton	0.5	A
1413	Fresh AM	Ilkley	0.007	C
1431	Classic Gold	Reading	0.14	B
1449	BBC Asian Network	Peterborough	0.15	B
1449	URB Bath Universtity RSL	Bath	0.001	B
1458	Sunrise	London	125	B
1458	BBC Asian Network	Birmingham	5	B
1458	BBC Radio Devon	Torquay	2	B
1485	BBC Radio Humberside	Hull	2	C
1485	Clasic Gold	Newbury	1	B
1503	BBC Radio Stoke	Staffordshire	1	B
1530	Capital Gold	Worcester	0.52	B
1548	Forth 2	Edinburgh	2.2	C
1557	Capital Gold	Southampton	0.5	A
1566	BBC Somerset Sound	Taunton	0.6	B
1575	Hospital Radio Tyneside	Newcastle	0.001	C
1584	BBC Hereford & Worcester	Woofferton	0.3	B

* = dark

Listeners:-

A Sheila Hughes, Morden
B Simon Hockenhull, Bristol
C Michael Wasley - North Sea (100 miles NE Tynemouth)

Medium Wave Table

kHz	Service	Location	Country	kW	Listener
531	Utvarp Foroyo	Akreburg	FRO	100	D F
540	Radio Twee	Wavre	BEL	150	B C D
549	Deutschlandfunk (DLF)	Thurnau	D	100	B* D
549	UCB Europe	Dundalk	IRL	70	C D
567	RTE Radio 1	Tullamore	IRL	500	B C D
576	Sudwestrundfunk (SWR)	Muhlacker	D	100	B* C*
585	RNE 1	Madrid	E	600	8* C*
585	FIP	Paris	F	8	C
585	BBC Radio Scotland	Dumfries	G	2	D
594	HR Skyline	Frankfurt	D	250	B* C*
603	France Info	Lyon	F	300	B* C*
603	BBC Radio 4	Newcastle	G	2	C D
612	RTE 2	Athlone	IRL	100	8*
612	RNE 1	Vitoria	E	10	C*
621	RTBF 1	Wavre	BEL	300	A B C D
630	RTT National Network	Tunis-Djedeida	TUN	600	C*
630	NRK Euuropakanalen	Vigra	NOR	100	D F
639	RNE 1	Many	E	10-300	C*
639	Czech Radio 2	Prague	TCH	1500	B*
648	BBC World Service	Orfordness	G	500	B C D
657	Radio Rossii	Murmansk	RUS	150	E
657	RNE 5	Madrid	E	50	B*
657	BBC Radio Wales	Wrexham	G	2	A B C D
666	Sudwestrundfunk (SWR)	Rohrdorf	D	150	B*
675	Arrow Classic Rock	Lopik	HOL	120	A B C D
684	RNE 1	Seville	E	600	B* C*
693	BBC Radio Five Live	Droitwich	G	150	B D F
711	Radio Bleu	Rennes	F	300	B* C
720	West Deutscher Rundfunk (WDR)	Langenburg	D	85	C*
720	BBC Radio 4	Lisnagarvey	G	10	B C*
720	BBC Radio 4	London	G	0.75	C D
729	RNE 1	Many	E	10-100	B* C*
729	RTE Radio 1	Cork	IRL	10	C
738	RNE 1	Barcelona	E	500	B*
738	RFI	Paris	F	5	C*
747	Radio 747	Flevoland	HOL	400	A B C D
756	Deutschlandfunk (DLF)	Braunschweig	D	200	B* C*
765	Option Musique	Sottens	SUI	600	C*
783	MDR Info	Leipzig	D	100	B*
792	France Info	Limoges	F	300	B* C*
801	Bayern 1	Munchen-Ismaning	D	100	B*
810	Radio Scotland	Westerglen	G	100	B* C* D F
819	RAI Uno	Trieste	I	20	C*
819	Radio Euskadi	San Sebastian	E	10	C*
837	France Info	Nancy	F	200	C*
846	RAI Due	Rome	I	60	C*
855	RNE 1	Murcia	E	300	B* C*
864	La City Radio	Paris	F	300	B* C*
873	American Forces Network	Frankfurt	D	150	B* C*
873	SER	Zaragoza	E	25	B*
882	BBC Radio Wales	Washford	G	100	A B D
891	RTA 1	Algiers	ALG	600/300	B* C*
900	RAI Uno	Milan	I	600	8* C*
909	BBC Radio Five Live	Brookmans Park	G	150	8 D
918	Radio Slovenia	Domzale	SVN	600/100	8* C*
927	Radio Een/927 Live	Wolvertem	BEL	300	B C* D
945	France Blue	Toulouse	F	300	B* C*
954	Czech Radio 2	Brno	TCH	200	B*
954	Onda Cera Radio	Madrid	E	20	B* C*
963	YLE Radio	Pori	FIN	600	C*
972	Nord Deutscher Rundfunk (NDR)	Hamburg	D	100	B* C*
981	RTA 2	Algeirs	ALG	600/300	C*
990	Deutschlandfunk (DLF)	Berlin	D	100	B*
990	Radio Bilbao	Bilbao	E	10	C*
990	Radio na Gaidheal	Redmoss	G	1	D
999	COPE	Madrid	E	50	B*
1017	Sudwestrundfunk (SWR)	Wolfsheim	D	100	C*
1044	MDR Info	Dresden	D	20	C*
1044	Radio San Sebastian	San Sebastian	E	10	B*
1053	Talksport	Droitwich	G	500	B D
1062	Denmark Radio P3	Kalunborg	ONK	250	B* C* D
1071	Euskadi Irratia	Bilbao	E	50	B* C*
1071	Talksport	Clipstone	G	1	B D
1080	SER	Many	E	5-10	B* C*
1089	Talksport	Brookmans Park	G	400	B D
1098	Radio Slovensko	Nitra	SVK	50	B*
1107	Talksport	Lydd	G	0.5-2	B
1107	American Forces Network	Bavaria	D	10	C*
1116	Radio Pontevedra	Pontevedra	E	5	B*
1125	Croatian Radio HR1	Deanovic	HRV	100	B* C*
1125	Radio 21	Houdeng	BEL	10	C*
1125	BBC Radio Wales	Llandrindod Wells	G	1	C
1134	Croatian Radio HR1	Zadar	HRV	600	B* C*
1134	Mayak	Murmansk	RUS	75	E
1179	Swedish Radio 1	Solvesborg	S	600/300	8 C*
1188	VOA/RFE	Marcali	USA/HNG	500	8*
1197	VOA/RFE	Munich	USA/D	300/150	8* C*
1197	Virgin Radio	Many	G	0.2-2	B
1206	France Info	Bordeaux	F	300	B* C*
1215	Virgin Radio	Many	G	0.32-200	B D
1233	Virgin Radio	Many	G	0.1-0.5	B
1242	Virgin Radio	Many	G	0.5-2	D
1242	France Info	Marseille	F	150	C*
1269	Deutschlandfunk (DLF)	Neumunster	D	300	B
1278	France BIEAU	Strasbourg	F	300	B* C*
1287	Radio Lleida	Lleida	E	10	B*
1296	COPE	Valencia	E	20	C
1314	NRK Euuropakanalen	Kvitsoy	NOR	1200	B C* D F
1323	Voice of Russia	Wachenbrunn	RUS/D	800/150	B* C
1332	RAI Uno .	Rome	I	300	B*
1341	BBC Radio Ulster	Lisnagarvey	G	100	A* B* C* D
1341	Onda Cera Radio	Many	E		A*
1359	RNE3	Madrid	E	600	B* C*
1368	Manx Radio	Douglas, IOM	G	20	B C
1377	France Info	Lille	F	300	B C
1395	Radio 10 FM	Trintelhaven	HOL	120	B C* D
1404	France Info	Brest	F	20	B* C
1413	RNE 5	Many	E	5-10	B*
1422	DLF	Heusweiler	D	1200/600	B* C
1440	RTL	Marnach	LUX	1200/300	C*
1449	BBC Radio 4	Redmoss	G	2	C* D
1467	TransWorld Radio	Romoules	F	1000	B* C
1476	Radio 1476	Vienna	AUT	60	A* B* C
1485	SER	Many	E	2-5	B*
1494	France Info	Clermont-Ferrand	F	20	B C
1512	Radio Nederland	Wolvertem	BEL/HOL	300/25	A* C*
1512	Radio Een/Vlaandaren	Wolvertem	BEL	300/25	B*
1521	Mayak	Kazan	RUS	20	E
1521	SER Radio Castello	Castello	E	2	C*
1530	Vatican Radio	Vatican City	CVA	150/450	B* C
1539	Evangeliums Rundfunk	Mainflingen	D	700/120	B* C
1557	France Info	Nice	F	300	C*
1575	RAI Uno	Genova	I	50	C
1575	SER	Many	E	5	B*
1602	Radio Vitoria	Vitoria	E	25	B* C

* = dark

Listeners:-

A	Sheila Hughes, Morden
B	Fred Wilmshurst, Northampton
C	Simon Hockenhull, Bristol
D	Michael Wasley - North Sea (100 miles NE Tynemouth)
E	Michael Wasley - Off Varangerfjord, Norway (approx 70N, 31E)
F	Michael Wasley - Off Bergen, Norway

under the weather. Despite all this, he still managed to send some logs in, for which I'm most grateful. He's going to have to bow out from sending in reports until everything is up and running once more.

Ernie needs sight of the service manual for an FRG-8800, so if anyone can assist, please get in touch. I hope you're well again, Ernie, and I look forward to receiving your reports in the not too distant future.

Thanks to **Peter Pollard** for his contribution this month. Peter heard a couple of unidentified stations you may be able to help him with. The first, on 11.755MHz at 1826, was carrying religious programming, possibly in Portuguese. The second was at 1840 on 11.940MHz. In American English, the narrative was "very anti-Bush". Could be anyone then!

Bernard Curtis has been observing poor conditions on the higher frequency bands, despite the onslaught of summer conditions. WHRA out of the USA on 17.650MHz being considerably weaker than its 7.580MHz counterpart. Assuming these outlets are both being targeted to Europe, it's possible that the current lack of sunspots during this phase of the sun's 11-year cycle is taking its toll.

Bernard picked up on **Sheila Hughes'** loop antenna atop her dining room table. Just to go one better, Bernard's would not look out of place on the breakfast table as it's constructed from two Corn Flakes packets, end-to-end. As it resides on the top shelf of the dresser, the antenna has been adorned with wallpaper so as to match the room's décor. All those years watching *Blue Peter* not gone to waste, then.

A new DAB receiver and loft-mounted three element Yagi have been put to work and Bernard reports a total of 48 stations.

Grovelling apologies are due to **Thomas Williams** and **Eddie McKeown**. I somehow managed to mislay details of their equipment so had to use 'no information' next to their names in the list of contributors. Don't know how this fell though the cracks - twice. Thomas' details are now in the system whilst Eddie promises to remind me soon.

Nice to hear from **John Cook** for the first time. A witty ditty from him expressed surprise at hearing Radio Slovakia International some time in June, despite my lament at its 1 May demise. "Could it be some radio waves trapped for several weeks in the ether?", muses John. Well actually, yes. A little-known (and comparatively rare) form of propagation has the ability to slow electromagnetic waves right down to around one mile per hour, meaning that the journey from Slovakia to St. Albans (where John lives) takes around six weeks. Before I take another puff on this rather unusual cigarette, I have to be honest, admit that last sentence was a lie and reaffirm last month's good news that the station is still on the air, at least until a final decision has been made.

Gerald Guest wrote an interesting letter including a few details about himself. Gerald's enthusiasm for short wave listening began way back in the 1950's (before I was born). Radio Canada and the Voice of

Tropical Band Table

MHz	UTC	Service	Country	Listener
3.200	0400	Trans World Radio	MCO/SWZ	G
3.210	0425	WWCR, Nashville	USA	F G H
3.240	0405	Trans World Radio	MCO/SWZ	G
3.255	2200	BBC World Service	G/AFS	F G
3.265	2143	BBC World Service	G/AFS	B
3.279	0400	La Voz Del Napo	VEN	G
3.306	0135	Zimbabwe Broadcasting, Gweru	ZWE	G
3.320	0005	SABC Meyerton	AFS	G
3.345	2153	Channel Africa	AFS	B G
3.350	0450	Radio Exterior Espana	E/CTR	F G
3.915	2158	BBC World Service	G/SNG	B F G H
3.965	2201	Radio Taiwan International	TWN/F	B C D H
3.965	0300	Channel Africa	AFS	H
3.975	1900	Radio Budapest	HNG	E H
3.995	2034	Deutsche Welle	D	E H
4.005	2210	Vatican Radio	CVA	B E F H
4.635	2135	Radio Tajikistan	TAJ	F H
4.765	0140	Radio Emissora Rural	B	G
4.770	2219	FRCN Kaduna	NIG	B F G
4.783	2340	RTM Bamoko	MLI	G
4.800	2222	CPBS 2 Beijing	CHN	B F G H
4.800	0100	All India Radio, Hyderabad	IND	G
4.805	0010	Radio Dif Do Amazonas	B	G
4.815	0120	Radio Difusora Londrina	B	G
4.820	2229	Xizang Lhasa	CHN	B F G H
4.830	2200	Radio Ulan Bator	MNG	G
4.835	2234	RTM Bamoko	MLI	B F G
4.840	0155	All India Radio, Mumbai	IND	G
4.845	2238	ORTM Nouakchott	MTN	B F G H
4.860	0100	All India Radio, Delhi	IND	G
4.875	0355	Radio Dif Roraima	B	G
4.880	0115	All India Radio, Lucknow	IND	G
4.885	0355	Radio Dif Acreana	B	G
4.885	0400	Radio Clube Do Para	B	F G
4.890	0440	Radio France Int'l	F/GAB	F H
4.895	2205	Radio Ulan Bator	MNG	G
4.895	0110	All India Radio, Kurseong	IND	G
4.905	2241	Xizang Lhasa	CHN	B G H
4.910	2120	Radio Zambia	ZMB	F G
4.910	0015	All India Radio, Jaipur	IND	G
4.915	2215	GBC 1 Accra	GHA	F G H
4.915	0355	Radio Anhanguera	B	G
4.915	0500	Radio Difusora, Macapa	B	F G
4.920	2244	Xizang Lhasa	CHN	B F G H
4.920	0130	All India Radio, Chennia	IND	G
4.930	2215	All India Radio, Shimla	IND	F H
4.945	0405	Emissora Rural	B	G
4.950	2048	Voice of America	USA/STP	B H
4.950	0105	All India Radio, Srinigar	IND	G
4.960	0510	Voice of America	USA/STP	F
4.965	2205	Christian Voice Radio	ZMB	G
4.975	1900	Radio Uganda, Kampala	UGA	A B G H
4.985	0455	Radio Brasil Central	B	F G H
5.010	0115	All India Radio, Thiru'puram	IND	G
5.025	2031	Radio Tashkent	UZB	H
5.025	0410	Radio Rebelde	CUB	F G H
5.030	2100	Radio Burkina	BFA	G
5.030	0120	University Network	USA	G
5.040	0140	All India Radio, Jepore	IND	G
5.050	0400	WWRB, Manchester	USA	G H
5.070	0515	WWCR, Nashville	USA	F G H
5.085	0455	WWRB, Manchester	USA	F G H
5.105	0510	WBCQ, Maine	USA	F G H

DXers:-

A	Geraint Gill, Llanfairfechan
B	Rhoderick Illman, Oxted
C	Bernard Curtis, Stalbridge
D	Fred Wilmshurst, Northampton
E	Simon Hockenhull, Bristol
F	Vic Prier, Seaton
G	Jim Edwards, Wigan
H	Michael Casey

Turkey were amongst the first to be logged.

He's contributed by mail to a number of programmes, including on Radios Australia and New Zealand, and visited the studios of the Voice of America in Washington DC. I found myself outside their HQ once, too. It being post 9/11, and I with no ID, I was respectfully invited to take a running jump.

Four years ago, Gerald and his wife arranged to visit the studios of China Radio International whilst they were holidaying in Beijing. Once the taxi driver had found the station's new premises by reading the address at the top of the Messenger newsletter Gerald had fortuitously brought along, and once they had negotiated the armed guard at the entrance, Mr and Mrs G were given the tour which included a display of some original equipment dating back to 1949.

Simon Hockenhull observes that Radio France International finally switched off their 25.820MHz outlet and wonders if it'll be reactivated in the autumn, given the declining solar activity.

Simon continues to DX via his baby alarm, which appears to be most susceptible to strong signals in the 9MHz band. A number of signals out of Europe on the lower short waves can be incredibly strong, hence the requirement for radio's robust front-end designs for use in this part of the world. One of these days, time permitting, I'll knock up a short wave crystal set to see just how many countries can be logged on such a simple, passive device.

Club Time

This month's look at radio oriented clubs takes in the British DX Club (BDXC). The club, formed in 1974, specialises in all aspects of broadcast DXing, from long wave through v.h.f.

Fans of newer technology are not forgotten as reports of web-based and satellite listening are regularly featured. UK and world-wide developments on the broadcasting scene are well reported and, as the lead time on the monthly A5 format magazine, *Communication*, is only a matter of days, news can be right up-to-date.

The magazine for June, at 68 pages long, includes listeners' reports, a pirate and QSL report; members' letters; a feature on radio museums around the UK; another about Radio Havana and yet another concerning Black propaganda radio stations during the war. Then there's the regular look at radio developments on the web; propagation report; a book review and a huge amount of broadcast news - country by country.

Besides Communication, there's an E-mail news service for members and, for a small supplementary fee, you can subscribe to the BDXC Tape circle; a monthly taped audio news programme of 'news, views and recordings from the world of radio'.

Regular get-togethers are quite common, usually involving a pub or restaurant, and trips to radio stations and DXpeditions have featured in the past.

Finally, the club offers *WRTH* and other radio-related publications at substantially reduced prices.

Interested? Then contact **Colin Wright** at the **BDXC, 126 Bargery Road, London SE6 2LR**. Return postage appreciated. Alternatively, you can contact them via the BDXC website: **www.bdxc.org.uk**

Now Some News...

Not that you'll have ever heard these 'broadcasts', however, worthy of note is that the cross-border propaganda loudspeaker broadcasts between North and South Korea came to an end mid-June, according to a report by the south's Yonhap news agency.

The Koreas started border loudspeaker broadcasts between the late 1950s and the early 1960s, trying to lure opposing soldiers to defect.

While North Korea stressed ideology, South Korea focused on non-political themes such as pop music and weather forecasts.

Back in 2000, the two Koreas held their first ever summit, at which it was agreed that these broadcasts would halt. And so, just before midnight on 15 June, the North's final broadcast wound up with, "Let's meet on the day of national unification", whilst the south thanked the (North) Korean People's Army soldiers who had listened to the Voice of Freedom broadcasts, ending "We pray for your permanent happiness".

A press release from Radio Free Syria announced the start of regular short wave broadcasts as from 20 June. The station, managed by the Reform Party of Syria, announced that the "first ever pro-democracy grassroots-based Radio Free Syria", would go live with broadcasts to the Middle-East at 1800 on 13.650MHz.

The station, run by a team of Syrian broadcasters, journalists and writers, will concentrate on educational and entertainment programming as well as programmes about democracy and the rule of law. Another one for your logbook. For more information, look at www.radiofreesyria.org

Your contributions, large or small, by the 10th of the month, please. Until next time, adios!

Short Wave Table

MHz	UTC	Service	Country	Lang	SINPO	SWL
0000						
6.180	0033	Radio Nacional de Amazonia	B	Por	35533	MC
9.580	0024	I R Serbia and Montenegro	FRY/BIH	Eng	43333	SH
0100						
5.745	0120	WHRI, South Bend, IN	USA	Eng	35444	MC
5.825	0118	WEWN, Birmingham, AL	USA	Eng	35444	MC
5.920	0127	WBOH, Newport, NC	USA	Eng	33442	MC
5.935	0129	WWCR, Nashville, TN	USA	Eng	24453	MC
5.970	0132	BBC World Service	G/ATG	Eng	35433	MC
6.010	0134	Radio Sweden Int.	S/CAN	Eng	24443	MC
6.190	0118	Deutschlandfunk, Cologne	D	Ger	35444	MC
7.345	0118	Radio Prague	TCH	Eng	45545	MC
7.405	0140	Voice of America	USA	Eng	45444	MC
7.580	0158	WHRA, South Bend, IN	USA	Eng	45545	MC
9.545	0158	Deutsche Welle	D	Ger	55545	SH
0200						
7.210	0207	Radio Minsk	BEL	Eng	45444	MC
7.385	0239	WRMI, Radio Miami Int.	USA	Eng	25342	MC
7.490	0207	WJIE, Louisville, KY	USA	Eng	35443	MC
9.650	0206	Radio Minsk	BEL	Eng	33333	FH
9.665	0205	Voice of Russia	RUS	Eng	55445	SH
9.700	0230	Radio Bulgaria	BUL	Eng	43433	SH
9.750	0232	BBC World Service	G/SEY	Eng	42432	SH
9.825	0234	BBC World Service	G/ASC	Eng	33433	SH
9.860	0235	Voice of Russia	RUS	Eng	43333	SH
11.700	0210	Radio Bulgaria	BUL	Eng	55545	SH
11.855	0220	Radio Cairo	EGY	Eng	34433	SH
12.095	0225	BBC World Service	G/ASC	Eng	25422	SH
0300						
5.770	0357	The Overcomer Min. (via WWCR)	USA	Eng	15343	MC
5.950	0346	Radio Taiwan Int.	USA	Eng	14442	MC
6.000	0339	Radio Havana Cuba	CUB	Eng	45444	MC
6.065	0327	WYFR, Okeechobee, FL	USA	Eng	34443	MC
6.140	0307	Voice of Turkey	TUR	Eng	45444	MC
0400						
6.165	0410	Radio Nederland	HOL/ATN	Eng	45445	MC
15.140	0410	Radio Romania Int.	ROU	Eng	44333	ShH
0500						
5.890	0548	Vatican Radio	CVA	Lat	44444	PP
5.975	0535	Radio Japan	J	Eng	44444	ShH
12.134	0505	AFRTS	USA	Eng	35553	JP
0600						
6.035	0618	Voice of America	USA	Eng	24442	MC
6.180	0623	Voice of America	USA	Eng	25432	MC
7.230	0605	Radio Japan	J/G	Eng	54433	SE
9.615	0650	Radio New Zealand Int.	NZL	Eng	43333	SE
9.820	0630	Radio Havana Cuba	CUB	Eng	54433	SE
13.630	0610	Radio Australia	AUS	Eng	44433	SE
15.160	0655	Radio Australia	AUS	Eng	44333	SE
15.415	0615	Radio Australia	AUS	Eng	44433	SE
15.515	0630	Radio Australia	AUS	Eng	44333	SE
15.570	0640	Vatican Radio	CVA	Eng	54544	SE
0700						
5.905	0740	Bible Voice	G	Eng	5555	FW
5.980	0725	Radio Prague	TCH	Eng	45555	FW
5.985	0710	Radio Vlaanderen Int.	BEL/D	Eng	55444	FW
6.005	0745	Deutschland Radio, Berlin	D	Ger	44444	VP
7.265	0735	Sudwestrundfunk	D	Ger	34323	VP
9.410	0745	BBC World Service	G/CYP	Eng	44444	VP
9.545	0740	Deutsche Welle	D	Ger	55555	VP
9.575	0730	RTM Morocco	MRC	Fre	45543	VP
9.870	0745	Trans World Radio	MCO	Eng	55555	VP
9.880	0700	Radio Prague	TCH	Eng	55555	VP
11.600	0715	Radio Prague	TCH	Eng	55555	FW
11.755	0730	YLE Radio Finland	FNL	Fin	45534	VP
11.765	0720	BBC World Service	G/ASC	Eng	55555	VP
11.830	0725	Radio Romania Int.	ROU	Eng	55555	FW
11.865	0730	Trans World Radio	MCO/ALB	Eng	44333	ShH
13.650	0750	Swiss Radio Int.	SUI/D	Eng	35444	FW
13.840	0759	IRRS	I	Eng	55354	EM
15.120	0750	Voice of Nigeria	NIG	Eng	33423	VP
15.400	0730	BBC World Service	G	Eng	32423	VP
15.460	0700	Radio Slovakia Int.	SVK	Eng	54444	ShH
15.565	0745	BBC World Service	G/ASC	Eng	54544	VP
15.630	0745	Voice of Greece	GRC	Gre	44454	VP
17.535	0730	Kol Israel	ISR	Heb	44434	VP
17.605	0740	Radio Japan	J/ANT	Jap	22322	VP
17.630	0700	Africa No. 1	GAB	Fre	34423	VP
21.530	0722	Voice of Greece	GRC	Gre	24322	RI
21.580	0725	Radio France Int.	F	Fre	34423	RI
21.605	0728	UAE Radio Dubai	UAE	Ara	34433	RI
0800						
5.815	0815	World Music Radio	DNK	Eng	22222	PP
5.905	0854	Bible Voice	G/D	Eng	35444	MC
6.190	0815	Deutschland Radio, Berlin	D	Ger	55334	BC
7.580	0825	WEWN, Birmingham, AL	USA		44334	BC
9.710	0850	Radio Vilnius	LTU	Eng	55544	SE
9.885	0820	Radio New Zealand Int.	NZL	Eng	44333	BC
11.730	0825	WHRA, Greenbush,ME	USA	Eng	53444	BC
15.120	0815	Voice of Nigeria	NIG	Eng	44433	SE
15.270	0810	Voice of Armenia	ARM	Eng	43443	EM
15.565	0821	BBC World Service	G	Eng	45242	EM
15.575	0820	BBC World Service	G	Eng	35233	EM
15.810	0820	World Music Radio	DNK	Eng	34223	BC
17.640	0815	BBC World Service	G	Eng	55555	BC
17.750	0815	Radio Australia	AUS	Eng	24112	EM
17.830	0819	BBC World Service	G	Eng	42332	EM
17.835	0820	Radio Pakistan	PAK	Urd	43333	BC
21.605	0840	UAE Radio Dubai	UAE	Ara	54445	BC
21.660	0814	BBC World Service	G	Eng	45232	EM
0900						
6.140	0900	Deutsche Welle	D	Eng	54445	BC
9.370	0952	WTIC	USA	Eng	43333	TW
9.420	0945	Voice of Greece	GRC	Eng	45444	FW
9.885	0945	Radio New Zealand Int.	NZL	Eng	33333	TW
11.880	0927	Radio Australia	AUS	Eng	34333	TW
13.685	0940	Voice Int.	AUS	Eng	34333	TW
13.700	0932	Radio Nederland	HOL	Dut	24222	TW
13.720	0932	Radio Exterior de Espana	E	Spa	33333	TW
13.730	0935	ORF Radio Austria	AUT		34333	TW
13.780	0934	Deutsche Welle	D	Ger	44444	TW
13.830	0937	Croatian Radio	CRO	Cro	44444	TW
15.190	0905	BBC World Service	G	Eng	24122	EM
15.210	0905	China Radio Int.	CHN	Eng	44333	ShH
15.400	0940	BBC World Service	G	Eng	53353	EM
15.485	0940	BBC World Service	G	Eng	35343	EM
15.595	0938	Vatican Radio	I		55555	TW
15.630	0930	Voice of Greece	GRC	Eng	43333	ShH
15.650	0937	Voice of Greece	GRC	Eng	24122	EM
15.760	0945	Kol Israel	ISR	Heb	44434	TW
15.785	0945	Kol Israel	ISR	Heb	44434	TW
17.515	0932	Vatican Radio	I		44444	TW
17.535	0927	Kol Israel	ISR	Heb	34243	PP
17.605	0930	China Radio Int.	CHN	Chi	34323	PP
17.630	0935	Africa No. 1	GAB	Fre	24343	PP
19.010	0940	Voice of America	USA	Ara	34333	PP
21.540	0944	Radio Exterior de Espana	E	Spa	34323	PP
21.605	0946	UAE Radio Dubai	UAE	Ara	44344	PP
21.615	0948	Radio Exterior de Espana	E	Spa	33433	PP
21.705	0950	Saudi radio	ARS	Ara	34333	PP
21.745	0900	Radio Prague	TCH	Eng	55454	EM
21.790	0825	Voice of Russia	RUS	Eng	25432	SH
21.790	0941	UN Mission in Ethiopia & Eritrea		USA/UAE		Eng
25212	EM					
1000						
5.955	1033	Radio Nederland	HOL	Dut	35454	MC
9.785	1004	Radio Nederland	HOL/ATN	Eng	15343	MC
9.850	1015	WHRI, South Bend, IN	USA	Eng	15433	MC
9.880	1030	Radio Prague	TCH	Eng	44434	GeG
9.885	1000	Radio New Zealand Int.	NZL	Eng	22222	TW
9.895	1012	Radio Nederland	HOL	Dut	44444	TW
11.615	1050	Radio Prague	TCH	Eng	55544	FW
12.020	1022	RDP Portugal	POR	Por	44444	TW
12.085	1007	Voice of Mongolia	MNG	Eng	33333	TW
13.700	1023	Radio Nederland	HOL	Dut	44444	TW
13.720	1005	Radio Exterior de Espana	E	Spa	44444	TW
13.740	1014	Voice of Vietnam	VTN	Vie	22222	TW
13.820	1055	The Overcomer Ministry	USA/D	Eng	35544	FW
13.840	1024	IRRS	I	Eng	44444	TW
15.825	1009	WWCR, Nashville, TN	USA	Eng	34333	TW
17.535	1018	Kol Israel	ISR	Eng	44444	TW
17.660	1055	Voice of the Islamic Rep. of Iran	IRN	Eng	24222	EM
17.690	1042	China Radio Int.	CHN	Eng	34333	FW
18.960	1043	Sweden Radio Int.	S	Swe	55545	SH
19.010	1025	Voice of America	USA	?	55444	TW
21.470	1020	BBC World Service	G	Eng	44444	TW
21.800	1031	YLE Radio Finland	FNL	Fin	44444	TW
21.810	1014	Sweden Radio Int.	S	Swe	44444	TW
21.820	1026	Radio Japan	J	Ita	44444	TW
21.830	1042	RDP Portugal	POR	Por	35433	SH
13.855	1003	AFRTS (u.s.b.)	USA	Eng	34333	TW
1100						
5.815	1115	World Music Radio	DNK	Eng	34433	SE
11.700	1130	Radio Bulgaria	BUL	Eng	54444	ShH
15.415	1153	Radio Ukraine Int.	UKR	Eng	35544	FW
15.700	1152	Radio Bulgaria	BUL	Eng	45434	EM
17.790	1100	BBC World Service	G/ASC	Eng	44333	ShH
21.465	1106	Radio Pakistan	PAK	Eng	45544	SH
21.470	1107	BBC World Service	G/SEY	Eng	15421	SH
21.480	1142	Radio Nederland	HOL/MDG	Ind	24332	RI
21.500	1139	Voz Christiaa	CHL	Por	34322	RI
21.530	1136	Radio Farda	USA/CLN	Far	44434	RI
21.540	1133	Radio Exterior de Espana	E	Spa	24232	RI
21.550	1130	UN Mission in Ethiopia & Eritrea	USA/UAE	Eng	24332	RI
21.565	1127	RTBF Int.	BEL/D	Fre	23332	RI
21.570	1104	Radio Exterior de Espana	E	Spa	45433	SH
21.630	1120	Radio Vlanderen Int.	BEL/AFS	Dut	44434	RI
21.655	1118	RDP Portugal	POR	Por	34433	RI
21.670	1114	Saudi Radio	ARS	Ind	24422	RI
21.670	1154	Voice of Africa	LBY	Fre	25222	EM
21.675	1113	Voice of Africa	LBY/F	Ara	24432	RI
21.705	1111	Saudi Radio	ARS	Ara	44434	RI
21.725	1108	RDP Portugal	POR	Por	34434	RI
21.800	1105	YLE Radio Finland	FNL	Fin	55545	SH
21.820	1100	Radio Japan	J	?	35433	SH
21.850	1100	Vatican Radio	CVA	Ita	35433	SH
1200						
9.525	1230	Radio Polonia	POL	Eng	43333	ShH
11.820	1210	Radio Polonia	POL	Eng	43433	SE
11.880	1205	Radio Australia	AUS	Eng	25342	MC
13.580	1230	Sweden Radio Int.	S	Eng	44444	ShH
13.685	1240	HCJB	USA/AUS	Eng	54444	BC
15.225	1245	Voice of Turkey	TUR	Eng	55555	EM
15.240	1242	Sweden Radio Int.	S	Eng	53454	EM
15.535	1246	Voice of Turkey	TUR	Eng	35232	EM
15.595	1215	Vatican Radio	CVA	Ita	55545	TW
17.670	1215	Radio Cairo	EGY	Eng	25112	EM
17.715	1250	ORF Radio Austria	AUT	Eng	35333	SH
17.775	1202	Radio Tashkent	UZB	Eng	33322	EM
17.815	1200	Radio France Int.	F	Eng	44333	ShH
19.010	1230	Radio Free Afghanistan	USA/?	?	25432	SH
19.010	1240	Voice of America	USA	Far	45454	EM
21.460	1257	Saudi Radio	ARS	Ara	43333	RI
21.530	1217	Radio Farda	USA/CLN	Far	25433	MC
21.540	1254	Radio Exterior de Espana	E	Spa	35344	MC
21.570	1254	Radio Exterior de Espana	E	Spa	15342	MC
21.620	1200	Radio France Int.	F	Eng	35233	EM
21.830	1200	RDP Portugal	POR	Por	34333	TW
25.820	1225	Radio France Int.	F	Eng	15421	SH
1300						
6.110	1349	The Overcomer Ministry	USA/D	Eng	35343	MC
6.140	1300	Deutsche Welle	D	Eng	44444	GG
11.660	1300	Radio Australia	AUS	Eng	34333	GG
11.690	1300	Radio Japan	J	Eng	33224	GG
11.690	1320	Radio Jordan	JOR	Eng	54433	SE
13.830	1330	Croatian Radio	CRO	Cro	33433	SH
17.560	1315	WHRA, Greenbush,ME	USA	Eng	44434	BC
17.720	1335	Radio Canada Int.	CAN/CHN	Eng	23422	SH
17.815	1320	Radio France Int.	F/ASC	Eng	43333	BC
17.830	1300	BBC World Service	G/ASC	Eng	35444	FW
21.470	1309	BBC World Service	G/ASC	Eng	15443	MC
21.610	1305	Radio Exterior de Espana	E	Spa	44444	RI
21.640	1308	Saudi Radio?	ARS	Ara	43433	RI
21.665	1310	Deutsche Welle	D/RWA	Hau	44434	RI
21.685	1313	Radio France Int.	FRGUINEA	Fre	24432	RI
21.695	1315	Voice of Africa	LBY/F	Ara	34444	RI
21.745	1320	Radio Prague	TCH	Eng	54444	BC
21.790	1317	Deutsche Welle	D/RWA	Ara	44434	RI
1400						
5.815	1400	World Music Radio	DNK	Eng	54444	ShH
6.110	1450	The Overcomer Ministry	USA/D	Eng	54445	BC
11.675	1419	China Radio Int.	CHN	Eng	34343	MC
12.075	1435	Radio Nederland	HOL	Eng	44333	ShH
15.160	1456	Voice of America	USA/PHL	Eng	25533	SH
15.735	1430	Sweden Radio Int.	S	Eng	45243	EM
17.560	1410	WHRA, Greenbush,ME	USA	Eng	35553	JP
17.645	1410	Voice of Russia	RUS	Eng	55445	BC
17.800	1443	Radio Canada Int.	CAN	Eng	25343	MC
1500						
9.675	1555	Radio Australia	AUS	Eng	35544	FW
11.660	1509	Radio Australia	AUS	Eng	43433	SH
11.690	1549	Radio Jordan	JOR	Eng	45555	FW
12.040	1558	Voice of America	USA	Eng	44443	MC
12.075	1520	Radio Nederland	HDL/UZB	Eng	44434	SH
12.130	1515	KTWR	USA/GUM	Chi	45554	JP
13.640	1504	China Radio Int.	CHN/CUB	Eng	45544	SH
15.225	1541	Adventist World Radio	USA	Eng	34132	EM
15.235	1542	Vatican Radio	CVA	Eng	55454	EM
15.245	1505	Voice of Korea	KRE	Eng	53444	BC
15.585	1500	Radio Exterior de Espana	E	Spa	45544	SH
15.650	1503	Pan American Broadcasting	?	Eng	43142	EM
15.745	1510	Sri Lanka Broadcasting Corp.	CLN	Eng	43333	BC
17.750	1540	WYFR, Okeechobee, FL	USA	Eng	24112	EM
17.770	1500	Channel Africa	AFS	Eng	44444	ShH
21.470	1505	BBC World Service	G/ASC	Eng	45434	BC
21.490	1515	BBC World Service	G/ASC	Eng	45354	JP
21.660	1503	BBC World Service	G/CYP	Eng	35433	SH
1600						
7.345	1600	Radio Slovakia Int.	SVK	Eng	45555	FW
9.475	1645	Radio Australia	AUS	Eng	34233	VP
9.760	1643	Voice of America	USA/GRC	Eng	35433	MC
11.660	1600	Radio Australia	AUS	Eng	44344	GeG
11.860	1618	BBC World Service	G/SEY	Eng	14342	MC
11.900	1619	China Radio Int.	CHN	Eng	34443	MC
11.940	1653	BBC World Service	G/AFS	Eng	15342	MC
11.965	1640	China Radio Int.	CHN	Eng	45444	GeG
13.600	1640	Voice of America	USA/THA	Eng	35444	FW
15.395	1630	UAE Radio Dubai	UAE	Ara	34323	VP
21.660	1657	BBC World Service	G/CYP	Eng	35444	MC
1700						
9.725	1711	Voice of Vietnam	VTN	Eng	54545	MC
9.890	1745	Voice of Russia	RUS	Eng	54445	BC
11.805	1703	Radio Liberty	USA/D	Rus	44555	MC
15.310	1710	BBC World Service	G/THA	Eng	43343	VP
15.410	1750	Voice of America	USA/MRC	Eng	54445	BC
15.570	1741	Vatican Radio	CVA	Eng	34232	EM
17.605	1725	Radio France Int.	F	Fre	34553	JP
17.650	1738	WHRA, Greenbush,ME	USA	Eng	35553	JP
21.455	1704	WYFR, Okeechobee, FL	USA	Eng	45454	EM
1800						
5.890	1817	Vatican Radio	CVA	?	33323	PP
5.920	1825	Radio Slovakia Int.	SVK	Ger	44334	PP
5.945	1857	ORF Radio Austria	AUT	Ger	44434	SH
6.040	1852	Voice of America	USA/GRC	Eng	33433	SH
6.045	1853	All India Radio	IND	Urd	35433	MC

MHz	UTC	Service	Country	Lang	SINPO	SWL
6.055	1849	Radio Slovakia Int.	SVK	Eng	43554	MC
6.075	1836	Deutsche Welle	D	Ger	44444	PP
6.085	1840	Bayerischer Rundfunk, Munich	D	Ger	44444	PP
6.175	1840	Radio Japan	J/G	Jap	55555	BC
6.185	1843	Vatican Radio	CVA	Lat	44333	PP
6.195	1835	BBC World Service	G	Eng	55555	BC
7.150	1817	China Radio Int.	CHN	Ita	32333	PP
7.170	1820	China Radio Int.	CHN	Ger	44444	PP
7.250	1825	Vatican Radio	CVA	Ger	44444	PP
7.265	1828	Sudwestrundfunk	D	Ger	34333	PP
7.275	1830	Radio Exterior de Espana	E	Spa	45555	PP
7.325	1831	China Radio Int.	CHN	Ita	43543	PP
7.360	1835	Vatican Radio	CVA	?	43444	PP
7.410	1840	All India Radio	IND	Eng	23222	PP
9.410	1849	BBC World Service	G/CYP	Eng	55545	SH
9.475	1840	Radio Australia	AUS	Eng	43333	BC
9.480	1820	Voice of Russia	RUS	Eng	43433	SH
9.530	1825	Radio Canada Int.	CAN/D		54444	BC
9.660	1850	Vatican Radio	CVA	Lat	43444	VP
9.785	1832	Voice of Turkey	TUR	Eng	33333	FH
9.950	1830	All India Radio	IND	Eng	44434	VP
11.510	1807	Voice of Russia	RUS	Eng	34233	PP
11.570	1840	Radio Pakistan	PAK	Urd	53334	BC
11.615	1814	Radio France Int.	F	Fre	34233	PP
11.630	1825	Voice of Russia	RUS	Eng	54434	BC
11.650	1820	China Radio Int.	CHN	Ger	44444	PP
11.670	1825	China Radio Int.	CHN	Eng	33223	PP
11.755	1826	?	?	Por?	55555	PP
11.940	1808	Radio Romania Int.	ROU	Eng	32222	SH
11.940	1810	China Radio Int.	CHN	Eng	43423	SH
11.940	1840	?	?	Eng	43333	PP
12.105	1834	Voice of Greece	GRC	Eng	45433	SH
12.160	1820	WWCR, Nashville, TN	USA	Eng	25552	JP
13.580	1830	Radio Prague	TCH	Fre	34433	VP
13.605	1845	All India Radio	IND	Eng	44333	VP
13.640	1804	Voice of Vietnam	VTN	Eng	34433	SH
13.730	1815	Radio Canada Int.	CAN/D	Eng	53444	BC
13.740	1805	Voice of Vietnam	VTN	Eng	43434	BC
13.745	1845	BBC World Service	G	Eng	55555	BC
13.855	1850	AFRTS	USA/ISL	Eng	45554	JP
15.190	1848	Radio Philipinas	PHL	Eng	45344	EM
15.255	1834	Radio Canada Int.	CAN/G	Eng	44243	EM
15.380	1820	Radio Romania Int.	ROU	Eng	53444	BC
15.400	1845	BBC World Service	G/ASC	Eng	45444	FW
15.420	1841	BBC World Service	G	Eng	24122	EM
17.720	1847	Radio Philipinas	PHL	Eng	45343	EM
17.830	1830	BBC World Service	G/ASC	Eng	45454	JP
21.700	1830	Radio Exterior de Espana	E	Spa	43454	JP
1900						
5.775	1935	IRRS	I	Eng	44554	FW
5.860	1911	Radio Farda	USA/UAE	Far	23442	MC
5.890	1951	Vatican Radio	CVA	Eng	45545	MC
5.970	1939	RAI Int.	I	Eng	45433	SH
5.995	1915	Radio Canada Int.	CAN/G	Fre	43443	MC
6.025	1901	Radio Budapest	HNG	Eng	44443	MC
6.030	1920	Sudwestrundfunk	D	Ger	34443	MC
6.065	1940	Sweden Radio Int.	S	Eng	55555	FW
6.115	1900	Radio Rossii	RUS	Rus	23442	MC
6.120	1951	YLE Radio Finland	FNL	Fin	44444	TW
6.130	1939	RAI Int.	I	Hun	34443	MC
6.155	1950	ORF Radio Austria	AUT	Ger	44444	TW
6.195	1900	BBC World Service	G	Eng	44434	SH
7.155	1900	Radio Thailand	THA	Eng	44444	GeG
7.250	1954	Vatican Radio	CVA	Eng	33333	FH
7.295	1900	China Radio Int.	CHN	Eng	42334	GG
7.440	1929	Voice of Russia	RUS	Eng	33333	FH
7.450	1945	ERT3	GRC	Gre	55545	VP
9.420	1915	Voice of Greece	GRC	Gre	44434	VP
9.445	1930	All India Radio	IND	Eng	32333	VP
9.500	1903	Radio Australia	AUS	Eng	34433	SH
9.605	1937	RAI Int.	IND	Eng	33333	FH
9.645	1953	Vatican Radio	CVA	Eng	54544	MC
9.890	1925	Radio Vlanderen Int.	BEL/RUS	Eng	55555	FW
9.925	1945	Voice of Russia	RUS	Eng	55555	FW
9.960	1940	Voice of Armenia	ARM	Eng	55555	VP
11.720	1914	Radio Budapest	HNG	Eng	44444	FH
12.070	1958	Voice of Russia	RUS	Eng	33333	FH
12.105	1945	Voice of Greece	GRC	Gre	33323	VP
12.160	1902	WWCR, Nashville, TN	USA	Eng	25333	MC
13.590	1952	Deutsche Welle	D	Eng	34333	TW
13.700	1900	Radio Canada Int.	CAN	Fre	32433	VP
13.740	1910	Voice of Vietnam	VTN	Eng	43433	VP
15.545	1905	Deutsche Welle	D/CLN	Eng	44554	JP
15.615	1920	Kol Israel	ISR	Eng	55544	FW
17.810	1942	Radio Nederland	HOL	Eng	45243	EM
18.980	1935	WYFR, Okeechobee, FL	USA	Eng	34333	BC
21.455	1930	WYFR, Okeechobee, FL	USA	Fre	44333	BC
2000						
5.775	2022	United Nations Radio (via IRRS)	USA/I	Eng	35442	MC
5.800	2056	Radio Bulgaria	BUL	Fre	44333	RI
5.815	2059	World Music Radio	DNK	Eng	44333	RI
5.850	2010	Radio Canada Int.	CAN/S	Eng	55555	FW
5.930	2008	Radio Prague	TCH	Eng	33333	TW
6.005	2056	Deutschland Radio, Berlin	D	Ger	45455	MC
6.040	2013	Voice of America	USA/GRC	Eng	33442	MC
6.050	2011	Xizang, Lhasa, Tibet	CHN	Chi	24342	MC
6.085	2048	Bayerischer Rundfunk, Munich	D	Ger	45443	MC
6.185	2030	RAI Int.	I	Eng	45444	MC
6.195	2050	BBC World Service	G	Eng	55555	VP
7.170	2030	Adventist World Radio	USA	Eng	32332	ShH
7.235	2040	Radio Canada Int.	CAN/G	Eng	54445	BC
7.295	2030	China Radio Int.	CHN	Eng	44434	VP
7.350	2045	WYFR, Okeechobee, FL	USA		54445	BC
7.410	2040	All India Radio	IND	Hin	43334	BC
7.935	2036	China National Radio 1	CHN	Chi	32232	VP
9.410	2018	BBC World Service	G	Eng	44344	PP
9.430	2022	China Radio Int.	CHN	Eng	32243	PP
9.570	2050	Radio Exterior de Espana	E	Eng	44444	GeG
9.600	2026	China Radio Int.	CHN	Eng	55555	PP
9.630	2047	BBC World Service	G/SEY	Eng	44444	FW
9.660	2010	Vatican Radio	CVA	Eng	54445	BC
9.685	2035	Radio Thailand	THA	Eng	33323	PP
9.740	2037	Deutsche Welle	D	Ger	43444	PP
9.760	2045	Voice of America	USA	Eng	33333	PP
9.860	2040	Radio Thailand	THA	Eng	35444	FW
9.950	2047	All India Radio	IND	Eng	45544	PP
11.625	2013	Vatican Radio	CVA	Eng	44444	FH
11.880	2025	RAI Int.	I	Eng	45544	FW
12.070	2049	Voice of Russia	RUS	Eng	33333	TW
12.080	2025	China Radio Int.	CHN	Eng	55544	FW
13.700	2020	Radio Canada Int.	CAN	Eng	55545	GeG
13.740	2040	Voice of Vietnam	VTN	Eng	34333	GeG
15.195	2015	WYFR, Okeechobee, FL	USA	Eng	33222	TW
15.205	2018	Deutsche Welle	D	Eng	44333	TW
15.400	2044	BBC World Service	G	Eng	34333	TW
15.455	2010	Voice of Russia	RUS	Eng	34333	TW
2100						
5.800	2100	Radio Bulgaria	BUL	Eng	44444	GG
5.815	2140	World Music Radio	DNK	Eng	55534	VP
5.890	2105	Vatican Radio	CVA	Ita	44434	RI
5.900	2108	Radio Bulgaria	BUL	Gre	44333	RI
5.915	2129	Radio Rossii	RUS	Rus	44434	RI
5.930	2136	Radio Prague	LTU	Cze	44333	RI
5.945	2141	ORF Radio Austria	AUT	Ger	44434	RI
5.960	2143	Voice of Turkey	TUR	Tur	44333	RI
6.005	2145	Deutschland Radio, Berlin	D	Ger	44334	RI
6.025	2147	Radio Budapest	HNG	Spa	43333	RI
6.055	2157	Radio Japan	J/G	Eng	43343	RI
6.065	2134	Sweden Radio Int.	S	Eng	44433	FH
6.075	2121	Deutsche Welle	D/POR	Ger	45545	MC
6.100	2102	I R Serbia and Montenegro	YUG	Eng	43443	MC
6.120	2110	YLE Radio Finland	FNL	Fin	44444	TW
6.155	2138	ORF Radio Austria	AUT	Eng	45555	MC
6.180	2109	Radio Japan	J	Eng	4444	FH
7.130	2130	Radio Tirana	ALB	Eng	32334	GG
7.170	2100	Voice of Turkey	TUR	Eng	33333	ShH
7.190	2100	China Radio Int.	CHN	Eng	43334	GG
7.410	2102	All India Radio	IND	Eng	45322	SH
7.420	2122	Radio Ukraine Int.	UKR	Eng	35332	SH
7.500	2120	Radio Bulgaria	BUL	Eng	55555	VP
7.500	2125	Radio Bulgaria	BUL	Eng	45433	SH
9.600	2111	China Radio Int.	CHN	Eng	44444	FH
9.675	2150	Radio Cabcao Nova	B	Eng	25444	FW
9.950	2153	All India Radio	IND	Eng	35544	FW
9.990	2120	Radio Cairo	EGY	Eng	35544	FW
11.865	2130	Deutsche Welle	D	Eng	44444	ShH
11.905	2130	Radio Tashkent	UZB	Eng	45444	GeG
15.130	2136	Adventist World Radio	USA	Eng	4232	EM
15.205	2120	Deutsche Welle	D	Eng	45444	GeG
15.245	2115	Voice of Korea	KRE	Eng	35434	GeG
15.285	2151	Radio Romania Int.	ROU	Eng	25232	EM
15.375	2111	Radio Cairo	EGY	Eng	25232	EM
15.390	2122	BBC World Service	G/USA	Eng	34433	SH
15.400	2120	BBC World Service	G/ASC	Eng	45434	SH
15.410	2128	Voice of America	USA/MRC	Eng	45444	SH
15.825	2149	WWCR, Nashville, TN	USA	Eng	54243	EM
17.595	2148	WEWN, Birmingham, AL	USA	Eng	25122	EM
17.830	2112	BBC World Service	G/ASC	Eng	35322	SH
18.930	2137	WYFR, Okeechobee, FL	USA	Eng	34132	EM
18.980	2137	WYFR, Okeechobee, FL	USA	Eng	24122	EM
2200						
5.925	2249	WMLK, Bethel, PA	USA	Eng	45545	MC
5.965	2211	BBC World Service	G/THA	Eng	15442	MC
5.975	2259	BBC World Service	G/ATG	Eng	35423	SH
6.045	2220	The Overcomer Ministry	USA/D	Eng	34443	MC
6.055	2242	The Overcomer Ministry	USA/D	Eng	23443	MC
6.060	2229	RAI Int.	I	Ita	34443	MC
6.075	2200	Deutsche Welle	D	Ger	44333	RI
6.115	2204	Radio Japan	J/G	Jap	43343	RI
6.120	2210	YLE Radio Finland	FNL	Fin	43332	RI
6.165	2200	Croatian Radio	CRD	Cro	45545	MC
7.115	2221	Deutsche Welle	D	Eng	44444	FH
7.335	2200	CPBS2	CHN	Chi	45544	FW
7.345	2230	Radio Prague	TCH	Eng	54444	ShH
9.415	2236	Radio Prague	TCH	Eng	44444	FH
9.420	2258	Voice of Greece	GRC	Eng	45333	SH
9.440	2255	Radio Prague	TCH	Eng	45433	SH
9.445	2208	All India Radio	IND	Eng	33333	FH
9.720	2246	Deutsche Welle	D	Eng	33443	MC
9.830	2247	Voice of Turkey	TUR	Eng	33333	FH
13.620	2240	Radio Australia	AUS	Eng	22222	TW
13.785	2252	Radio Canada Int.	CAN	Eng	35433	SH
15.240	2206	Radio Australia	AUS	Eng	23222	EM
15.600	2207	Radio Taiwan Int.	TWN	Eng	45243	EM
15.695	2209	WYFR, Okeechobee, FL	USA	Eng	35233	EM
15.770	2208	WYFR, Okeechobee, FL	USA	Eng	22222	EM
2300						
5.960	2322	Radio Canada Int.	CAN	Eng	35422	SH
6.060	2301	RAI Int.	I	Ita	34333	SH
7.350	2310	Radio Romania Int.	RDU	Eng	44444	ShH
9.590	2309	Radio Romania Int.	ROU	Eng	44444	FH
11.940	2355	Radio Romania Int.	ROU	Eng	34443	MC
11.965	2306	Voice of America	USA	Eng	45344	MC

DXers:-

BC	Bernard Curtis, Stalbridge.
CP	Clare Pinder, Appleby.
DH	David Hall, Morpeth.
EM	Eddie McKeown, Newry.
FH	Francis Hearne, Bristol.
FW	Fred Wilmshurst, Northampton.
GeG	Geraint Gill, Llanfairfechan.
GG	Gerald Guest, Dudley.
MC	Michael Casey, Manchester.
PP	Peter Pollard, Rugby.
SE	Stan Evans, Hailsham.
SH	Simon Hockenhull, Bristol.
ShH	Sheila Hughes, Morden.
TW	Thomas Williams, Truro.
VP	Vic Prier, Seaton.

Equipment Used

Bernard Curtis - Realistic DX400 + outdoor wire.
Eddie McKeown - no info.
Ernie Strong - Yaesu FRG-8800/FRT-7700 ATU + outdoor wire.
Francis Hearne - Sharp WQT370 or Yaesu FRG-7 + wire or Vega Selena + whip.
Fred Wilmshurst - JRC NRD-525 + indoor wire or Sony 2001D.
Geraint Gill - Grundig Yacht Boy.
Gerald Guest - Roberts RC818 + 10m wire.
Jim Edwards - JRC NRD-545 + 85m wire.
John Cook - Sony ICF SW7600GR + whip.
John Parry - Yaesu FT-767 + dipole.
Michael Casey - Roberts RC828 + CTU-9 + 60m indoor loop or outdoor 75m inverted dipole.
Michael Wasley - Grundig YB400 + whip .
Peter Pollard - Sony ICF2001D + whip.
Rhoderick Illman - Kenwood R-5000 + wire or Sony AN1.
Sheila Hughes - Panasonic DR48 or Sony ICF7600DS + 16m outdoor wire or home-brew loop.
Simon Hockenhull - Roberts R876, R617,R817 + whip or AKD Target HF3 + 4m indoor wire.
Stan Evans - Kenwood R-2000 + Balun/11m indoor antenna.
Thomas Williams - Grundig YB400 or YB206.
Vic Prier - Fairhaven RD500DX + Datong AD-270 or vertical.

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

Signal Strength
5 excellent
4 good
3 fair
2 poor
1 barely audible

Interference
5 nil
4 slight
3 moderate
2 severe
1 extreme

Noise
5 nil
4 slight
3 moderate
2 severe
1 extreme

Propagation Disturbance
5 nil
4 slight
3 moderate
2 severe
1 extreme

Overall Merit
5 excellent
4 good
3 fair
2 poor
1 unusable

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SONY SW-100E

★ Miniature portable all mode SW receiver ★ Station presets for 50 frequencies ★ Single side band system ★ Synchronous detector ★ Tuning in 100Hz + 1kHz steps ★ Includes compact antenna/ stereo earphones/ carrying case. Great things can come in small packages. Superb quality receiver with fantastic SSB performance.

240V Power Supply.....£24.95

OUR PRICE **£159.95** P&P £10

SANGEAN ATS-909

IDEAL FOR NAVTEX RECEPTION

A superb performance all mode synthesized world receiver with true SSB and 40Hz tunning for ultra clean reception. The same radio is sold under the Roberts name at nearly twice the price. Other features include RDS facility, 306 memories and WFM.

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240V Power Supply £16.95

OUR PRICE **£139.95** P&P £10

SANGEAN ATS-505

DUAL CONVERSION

NEW! Wins Dutch "Automobile" award. Excellent small short wave receiver (digital). 0.15-30MHz (AM, SSB, CW, WFM). 88-108MHz FM stereo. Includes carry case.

BEST BUY

Optional PSU

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OUR PRICE **£79.95** (P&P £10)

SANGEAN QSR-1

Voice activated desktop recorder with quarter speed record. (Sold for more under Roberts name:- C-9950). Superb accessory for the radio enthusiast. Optional PSU available (£7.99).

Can be used with any receiver subject to correct connection leads (some supplied).

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OUR PRICE **£69.95** Del £10

JRC NRD-545 DSP

The ultimate short wave receiver with DSP - for the real perfectionist. Clear, distortion free sound reproduced by digital siganl processing. A truly professional receiver built primarily for the commercial markets. Features inlcude: DSP pass-band shift, DSP all-mode detection, DSP notch filiter, DSP noise reduction and much more.

Send SAE for review

OUR PRICE **£1299.00** Del £10.00

NVA-319	Extention speaker	£199.00
CHE-199	VHF/UHF converter	£289.00
PC software		£19.99

AOR AR7030

A superb top of the range HF receiver. This product has certainly proved itself in both the commercial and domestic markets.

OUR PRICE **£699.99**

AR-7030 + version.....£849.00

ICOM IC-718R

This is an HF transceiver version of the R-75. Same sensitivity & selectivity as R-75 & transmit has been inhibited. Features a wide dynamic range with superior receive IMD, especially from in-band near-by interfering signals. 0.03-30MHz (AM/SSB/CW). Optional DSP available.

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Optional DSP unit.....£85.00
Optional extension speaker.....£74.99

REALISTIC DX-394

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

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OUR PRICE **£199.95** P&P £10

OUR BEST SELLING LOW PRICED RECEIVER

HD-1010 optional headphones.....£9.99

items of interest to enhance your listening

SP-1 TWO WAY COMBINER (PROFESSIONAL)

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

Can be used in reverse

SEND SAE FOR DATA SHEET

£64.95 P&P £3.50

SP-3 (PROFESSIONAL)

Two way combiner. one antenna feeds two scanners (without mismatch). 10-2500MHz. High isolation (BNC sockets).

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Can be used in reverse

£64.95 P&P £3.50

DPX-30 ANTENNA DUPLEXER/COMBINER

Can be used in reverse

Allows two antennas to be connected to one receiver without interaction.

SEND SAE FOR DATA SHEET **£59.95** P&P £3.50

Ant A (0-30MHz)
Ant B (30-2000MHz) } To receiver low insertion loss

FERRELL'S CONFIDENTIAL FREQUENCY LIST

13th edition Packed full of exciting frequencies for the short wave listener

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KENWOOD HEADPHONES

Superb padded professional communications headphones. Designed specifically for SWL. 1/4" jack.

HS-5 £56.99 Del £5.00

A professional lightweight pair of dedicated short wave listening head-phones. 1/4" and 3.5mm jack. HS-6 £36.99 Del £5.00

KENWOOD SP-31

"TWO SPEAKERS IN ONE"! Not quite - this superb desk speaker has two inputs for two radios and a change over switch built-in. Ideal for any radio station requiring better sound reproduction.

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hf antennas for every location

AT-2000 ANTENNA TUNER

Deluxe SW ATU
0-30MHz.
SO239 fittings.

(Probably the best ATU around)

ONLY **£89.00** P&P £6.00

PL-259 to PL-259 patch lead (0.6m) £5.99
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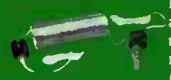
BNC SO239 adapter £3.95

E.M.F. ANTENNA

(150kHz-30MHz). Ideal for indoor or outdoor use and at only 5mtrs long you most certainly will find the space! Using magnetic transfer technology, interference & noise is minimised. Ready assembled + PL-259/coax.

ONLY **£62.95** P&P £5

MLBA (R.F. SYSTEMS)



Ready assembled wire antenna offering low noise reception on long, medium, short wave (100kHz-40MHz) adjustable from 6mts to 20mts long. Magnetically coupled transfer system ensures reduced static noise levels leak harmlessly to earth without damaging the receiver. (Subject to being earthed).

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£64.95 POST £5.00

Q-TEK STEALTH SR-60

Covers 0.2-50MHz. Superb, ready assembled wire antenna system. Not only is this end fed for ease of installation, it is also constructed from extremely high quality components. New 'plyweave' PVC coated wire makes this virtually invisible. Antenna length up to 20m. (Feeder supplied up to 10m).

OUR PRICE **£69.95** DEL £10.00

DX-10 (R.F. SYSTEMS)

A superb quality active antenna with a very high intercept point ideal for weak signal reception without increases in radiated noise. Freq: 100kHz-30MHz. Bomb-proof over loading figures, 90cm long, mains PSU + controller supplied (coax optional).

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£189.95 DEL £11.00

DX-1 PRO (R.F. SYSTEMS)

Professional active S/W antenaa constructed for commercial use. Includes indoor (low noise controller). Ideal for the serious enthusiast. This antenna is currently in use by many embassies as well as military & governments monitoring stations.

(20kHz-54MHz) **£359.95** DEL £15.00

we stock a superb range of scanning antennas

Q-TEK APOLLO 3000

A brilliant new compact indoor antenna that covers 0.1-3GHz and is just 24" when collapsed. Features "horizontal or vertical" adjustable elements. Ideal for table top mounting or by the window. Patch lead with BNC plug fitted. (Frequency range: 0.1-3GHz).

£59.95 P&P £6.00

Q-TEK SS-2000

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

50MHz-2.6GHz and under 1.3m long

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Q-TEK D.C. 2000 DISCONE

A high performance wideband discone offering superb performance from 0.2-2000MHz. Transmit range:- 6m, 2m, 70cm (power handling 200W). Fitted with low loss 'N' type socket. Supplied with mounting brackets. (N-plug & coax not supplied).

as used by government agencies world-wide

OUR PRICE **£59.95** P&P £11.00

Comments from John Griffiths

Putting the DC-2000 up gave me a tremendous boost to all signals with the ancient AR-2000 coming alive! Signals were well received and I found that I wandered out of airband.

Q-TEK INTREPID 2000

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

Freq range: 0.5-2GHz. PL-259 fitting (not supplied). *Length* 3m. Mast clamps supplied. (Gain up to 9dB is easily obtained). Reports have shown this to be an excellent performer!

ONLY **£89.95** P&P £11.00

DX-500

Frequency Range: 30kHz - 350MHz

It's unobtrusive and can be mounted almost anywhere!

- High intercept point, low noise
- Stainless steel construction
- Static discharge protection (when earthed)
- Height: 40cm, Dia: 35mm
- Includes in-line low noise amplifier(240V) + 12m coax (can be extended)
- Connectors supplied - PL-259 termination
- Ideal for modern buildings & covert installation

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scanning aids and gadgets for the real enthusiast

M-75 SCANNER PRE-AMP

Superb BNC in-line amplifier to boost signals! Fits on top of your scanner and away you go. (Powered by PP-3 battery - not supplied). Freq: 24MHz-2.1GHz. Gain: -10dB to +20dB.

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SUPER-GAINER RH-9000 (BNC)

BNC 40cm flexible whip for the ultimate in gain. (Rx:- 25MHz-2GHz).

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Ideal for airband

SUPER-GAINER RH-9090 (SMA)

SMA fitting

SMA 40cm flexible whip that is ideal as replacement.

Ideal for airband

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DB-2000

A superb "BNC" black telescopic whip. Ideal for scanners. Folds neatley away. (0.1-2GHz).

Ideal for airband

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DB-22

Superb SMA antenna at under 3½" long. (Less than 90mm). This antenna is ideal for use at airshows or undercover surveiliance work.

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Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).

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Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on.

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QS-200

Superb quick fit dash mount for hand-helds.

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Target HF-3S	£99.99	MVT-7300	£175.00
AOR AR-8200 MkIII	£299.99	MVT-7100	£159.99
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0.1-2.6GHz all mode receiver with (optional) DSP plus bandscope/world clock and too much more to print. (Incl's power supply).

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Bandscan America

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

All the negative news we hear and read about short wave broadcasting doesn't seem to be bothering the big religious broadcasters very much. Governments may be cutting broadcast budgets but the 'God Guys' keep expanding.

Last time I told you that The Christian Science station WSHB in Cypress Creek, South Carolina, had been placed on the sale block. They've found a buyer in World Harvest Radio/LeSea Broadcasting, which also owns WHRI, South Bend, Indiana, WHRA in Greenbush, Maine and KWHR, Naalehu, Hawaii.

World Harvest will fork over $2 million for the property. Many of the more popular Christian Science programs will be broadcast in a variety of languages over various local media here and abroad and (of course!) be available on the Internet. At this time of writing, World Harvest Radio had not yet made public any specific plans for WSHB other than having agreed to keep the current operating staff in place, although it seems that WHRI began airing its programs on the WSHB facility as soon as the sale was confirmed in the Christian Science news release.

Station News

Family Radio (WYFR, Okeechobee, Florida) seems to be all over the short wave dial. In fact, they are! Now they've added yet another outlet - they're on via the Radio Netherlands 50kW Madagascar relay, beaming to Mozambique and Angola in Portuguese from 0500-0600 on 9.525.

Bible Voice Broadcasting is teaming up with Mission Centre International, an Australian group, to set-up a studio in Western Australia and thus offer Australian religious program producers time on BVB transmissions (even though Bible Voice doesn't own any short wave transmitting facilities). The groups making up MCI include US based High Adventure Ministries.

HCJB-Australia is seeking approval to add another 31 antenna masts to its site near Kununuma. The station says the upgrade would allow it to reach 60% of the world's population.

But there always seems to be an exception. Amidst all this expansion, The Trinity Broadcasting Network, which operates KTBN, Salt Lake City, Utah, (the former KUSW) is running announcements to the effect that the short wave station may close down due to a lack of listener response. They are (or were) begging for E-mails, 'phone calls and letters. KTBN, currently on 7.505, airs the audio portion of Trinity's satellite TV network. One has to wonder if the religious broadcasting market isn't just about saturated. My guess is that KTBN will be gone by the time you read this.

Now Reactivated

The once poorly heard Radio Verdad in Guatemala (4.0525) has been reactivated, apparently with upgraded equipment as it is frequently heard at surprisingly good levels during the early evening (0000 and later). Radio Verdad appreciates reception reports and has proven to be friendly and reliable with replies.

We still note fairly regular reception of Radio Cultural (TGNA) on 3.300. A couple of years ago the CE there was talking about closing down this transmitter permanently. Incidentally, by law, all the short wave stations in Guatemala must be religious or cultural in nature.

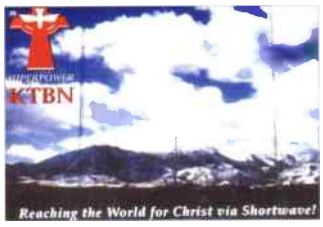
The Brazilian religious station Radio IPB in Campo Grande has added 'Novo Tempo' to its name, sometimes IDing as 'Radio Novo Tempo'. This one uses 4.895. Another Brazilian religious station is Radio Nossa Vaz (formerly Radio Mundial) in Sao Paulo, active on 3.325. Yet another name change involves Radio Rio Grande del Sul, Porto Alegre, now known as Radio Boa Vontade. It operates on 6.150, 9.550 and 11.895.

Radio Trans Mundial in Sao Paulo, Brazil has been testing a new 50kW transmitter on 11.735. This unit may be in full use by now. Reports go to: **Departamento Tecnico, C.P. 18300, 04626-970, Sao Paulo, SP, Brazil** or they can be E-mailed to **rtm@transmunidal.com.br** Also, Brazil's Radio Guaruja in Florinapolis has begun using 5.930MHz.

Back On Air

There was quite a bit of excitement in North America when Denmark returned to the air in the form of World Music Radio. WMR's signals were heard by many in the Eastern Time Zone and a few people way out west, but listeners in the middle of North America have had a much more difficult time picking WMR's 10kW signal.

Gone! Christian Science station WSHB is now owned by World Harvest Radio.



Nearly gone? KTBN is in trouble.

A new one in Peru is Radio La Voz del El Faique, Faique district in Cajamarca Department. It's being heard on variable 6.329 until close down around 0230.

The rarely noted Radio Universidad in Costa Rica has been heard a few times on its 6.105 position running to 0600 close with classical music and occasional announcements in Spanish and often suffering from a lot of adjacent channel splash.

Radio Havana Cuba facilities have begun carrying the programming of Radio Nacional de Venezuela - no doubt a result of the close friendship of their respective heads of state. The broadcasts run off and on throughout the day and night and in most cases don't remain on a particular frequency for more than an hour.

Spot checks of the following frequencies should turn up one or more of these broadcasts. Tune 6.000, 9.550, 9.820, 11.760, 11.875, 13.740, 15.230, 17.705 and 17.720 - all of them regular RHC frequencies. Radio Nacional de Venezuela has not been active on its 9.540 frequency in quite some time. When it was it seemed sporadically so at best and was only on the air for a few scattered hours each day.

Incidentally, Cuba is reported to be upgrading its transmission facility at Bauta. Six of the transmitters there are being automated and RHC says that will help them 'recover the spaces' they've lost (probably meaning coverage areas) in Latin America. Radio Rebelde is to get a transmitter at the Bauta facility as well. We are all well aware that RHC has been having technical problems for quite some time (poor modulation, weak signals, noise in the signal, distortion, etc.

Quicker Replies

Radio Free Asia, the US government's Asian equivalent to RFE/RL has had a rather cavalier attitude toward QSLing, virtually since its inception. Now, someone named A.J. Janitschek has taken over the RFA QSL operation so replies are starting to come through more quickly. But RFA is still reluctant to include actual transmission sites since some of these arrangements are looked upon as politically sensitive, never mind the fact that some annual short wave directories as well as online lists and schedules make no attempt to omit that information.

Of course you can ask them to include the site when you send them a report, but don't expect them to acquiesce. Reports to RFA go to the person mentioned above at **Radio Free Asia, 2025 M Street NW, Washington, DC 20036** or E-mailed to: **qsl@rfa.org**

Many monitors are burning the midnight oil, keeping an ear on 9.825, hoping to pick up signals from the returned Radio Kiribati. That Pacific Island station has been off the air for several years, but now they're pulling things back together. The short wave broadcasts will be aimed at listeners in the 'nearby' Line Islands. Kiribati was formerly the Gilbert and Ellice Islands. When at full strength the station will be running 10kW.

Some people have suggested that Guyana might be off the air. Not so. The station has been heard on a number of occasions, sometimes even fairly well - especially on 3.291 from mid-evening (0200) way into the early morning hours (0900). Their variable 5.950 frequency is more likely to be picked up in the 0800 range or later

The spring of 2004 brought a lot of rain to the Midwestern USA, which, for your correspondent, meant a wet shack! It was the worst 'hit' we've taken in the 30 plus years our antennas have gathering signals at this location. All told, we were unable to access the radio desk for nearly a month!

That covers things for this time. I'll be back on these pages in another three months. Until then, good listening!

Off the Record

● **Oscar** *do SWM Editorial Offices*
● **E-mail** *off.the.record@pwpublishing.ltd.uk*

Those who know me will tell you that I am certainly not a fan of Restricted Service Licences, or of the stations that use this method of getting on air (briefly!). One RSL station, which has however generated a good deal of interest among free radio anoraks is **Susy Radio**. The station is based in the Reigate/Redhill area and during the last few years broadcasts have been made each summer on the interesting frequency of 531kHz medium wave.

The transmitter was a salvaged and modified aeronautical beacon unit, designed to operate on the frequencies between m.w. and l.w. and the antenna was an inverted 'L' wire strung between trees, as often used very effectively by the a.m. land-based pirates. In spite of the low permitted power output, the station achieved remarkable coverage on what is of course the lowest of the m.w. frequency channels, and thereby offers the best available ground wave propagation within the band.

Some of the programme content was given over to looking back at the history and significance of free radio, though most of that stuff bores me these days, and for me the highlights of the programmes were Christopher England's talk shows. I feel that we need more speech-content, personality and humanity in our broadcast radio these days. You may disagree of course, and if so please feel free to write in and let me know what, if anything, you feel is lacking in our licensed radio stations.

This summer, the news is that unfortunately, Susy Radio will not be on 531kHz, and we may have come to the end of a mini era as far as that is concerned. The station is hoping to be on air for 16 days starting in late August, but on f.m., and the plan is then to apply for one of the forthcoming community radio licences on f.m. as and when they become available.

Interestingly, Susy Radio's big boss Colin Pearce has written some technical and frequency-allocation proposals for the new f.m. community radio licences and has had his work published by Ofcom. His ideas include the widespread use of the 87.5 to 88.0MHz sub-band, as well as the spot frequency of 108.0MHz and also a prediction that demand for RSL licences will decline dramatically, with stations seeking instead to apply to operate as permanent community radio stations. I still can't help wondering what the future holds for 531kHz though.

WMR Times Three

I can confirm reception here in the UK of the former pirate World Music Radio (WMR) on both frequencies, 5.815 and 15.810MHz at certain times of the day. The station is now licensed and broadcasts from Denmark. Early test transmissions have consisted of continuous music and uninspiring jingles.

Hopefully, the station will offer some more interesting listening when it begins regular programmes, though since it is in Denmark, and also has a local f.m. outlet, I wonder if they will be allowed to speak extensively in languages other than Danish. Interesting that Denmark has decided to award an h.f. licence to a private station. Perhaps other stations (and countries) will want to explore this avenue in future. The UK regulators have flatly refused to consider this idea, even in the face of sound arguments and legal challenges, notably from Trevor Brook of RADIOFAX.

Meanwhile, Scotland's Weekend Music Radio continues to make fairly regular broadcasts on 48m and station boss Jack Russell continues to be mystified as to why another unidentified station (known as The Hoax WMR) insists on recording the broadcasts off air and re-transmitting them. This has been happening on and off for a number of years now with no explanation and nobody owning up to it.

Jack's offers to supply programme tapes to this station for authorised relay have been ignored. The hoaxing also happened briefly to Radio Underground earlier this year, but it is mostly WMR that someone seems obsessed with.

The other day, Chris of Valley Wave Radio was on 6.400MHz calling for a QSO and The Hoax WMR came back to him. Despite Chris' requests for the operator to identify himself (he even suggested that headphones could be used as a makeshift microphone) only a recorded snippet of WMR was played and the mystery remains.

BIG L

The original June 2004 deadline for the launch of Big L on 1008kHz from The Netherlands has passed and the station has not yet appeared. A number of rumours have been doing the rounds, so I put in a call to Ray Anderson in an attempt to clarify the situation. I think my call was diverted (via Pluto) to his mobile and the line was dreadfully broken-up, so if I have got anything wrong that is my excuse, but here are some of the things I think he told me.

The three month extension to licence deadlines which has been widely reported applies to the f.m. frequencies and the Dutch authorities are considering offering a 12 month extension to the a.m. ones, but he will not need that long and hopes to be on-air before the end of this year. He has not had any dialogue with the owners of the MV *Communicator*, though the station is considering the option of housing its studios on a different ship (one in better condition).

Studios will be in Britain and not in International waters. The original 1008kHz antenna system has not yet been altered, but this can be done quickly and affordably to provide a radiation pattern, which will give satisfactory coverage over a substantial portion of the UK. The prices being asked for by Dutch transmission facilities provider NOZEMA are extremely high when compared to other similar providers across Europe.

The ownership structure of the transmission towers will be changing in the next few months, and should mean a more favourable pricing structure, so the wait will work to the advantage of Big L.

STOP PRESS: It is being reported that Radio 10 Gold will now take over the 1008kHz frequency and Big L will look for other options.

Band Comments

Conditions have been as expected for the mid-summer period. Storm static crashes are often an irritation. Signals on 48m are good for short skip in the evenings and early mornings, but dip down quite dramatically for several hours during the day. Lower frequency bands like 76m and MW/X band come alive later in the evenings and hold up well through the few hours of darkness.

A character known as The Ghoul has been heard in recent weeks with some interesting programmes including tales of goings on aboard the *Peace Ship* some years ago. Another personality with past VOP connections is Tony 'The Tipple' Stevens who has been active again after a quiet spell.

Laser Hot Hits have been concerned about problems with other broadcast stations on their 6.220 frequency, and have been testing a fifth parallel outlet on 6.210MHz. West and North Kent Radio have now resumed fairly regular weekend transmissions on 48m, with good signals across the UK and reports from as far away as the USA on several occasions.

WNKR has also recently introduced a Medium Wave service on 1476kHz. This new outlet has been on air for at least a couple of weekends per month, featuring programmes from Dave Martin, Andy Walker and Steve Jameson, with others also poised to join the team soon.

Monitoring MPT1327 Networks

Serious scanning enthusiast Terry Bain is a long term follower of Trunked Radio technology and techniques. Here he guides us through what's needed to get to grips with MPT1327 Trunked Networks.

What are MPT1327 networks? The name comes from a standard set by the now defunct Ministry of Post and Telecommunications and it was the 1327th standard they set back in 1988.

MPT1327 is a wide-area trunked analogue radio network for business users. It could be likened to a mobile telephone network and it works in a similar way to the old ETACS analogue mobile 'phone network. The main difference is that it is possible to call, and speak to, all stations at the same time as well as make person-to-person calls. It is also possible to set up transmitter sites over a wide area and connect them together so that one station can speak to another station even if they are working through a different transmitter site. Each site is made up of a Control Channel and a number of voice channels. The largest site I have found utilised a control channel and 17 voice channels.

I will not bore you with the technicalities of how the system works. It has been covered in some detail previously in *SWM*, for instance **Ian Wraith** explained the workings of the MPT1327 system in December 2002.

Basically, when a radio set is turned on it scans around and stops on the strongest control channel. Control channels sound like a continuous buzzing noise and are very easy to detect. The radio then listens until the computer in overall control sends out commands to move it to a voice channel when called. If the radio moves out of range of that control channel, it will start scanning again until it finds another one.

The system was first widely used by a group called National Band III Communications who took over the frequencies that had been used by the old Band III television. Does anyone remember black & white, 405-line television? MPT1327 trunked radio is now used by a wide variety of private firms, bus companies, local authorities and other groups. Even the Ministry of Defence use it.

How Can You Monitor MPT1327?

So how can you monitor this widely used radio system? In the beginning, the only way was to have a scan around until you found all the voice channels in an area. Then program all those channels into your scanner and set it to scan. Today, there are four options available (five if you count the old fashioned programmed scanner). In order of seniority, oldest first, the options are: WiNRADiO with Trunking Option, *FTrunk*, *Trunkito*, and *TrunkSniffer*. Let me expand a little on these solutions.

WiNRADiO

WiNRADiO was the first company to offer a way of monitoring a network. You had to buy one of their radios. They offered two versions, one that fitted inside a computer and a stand-alone box that connected to the computer via the serial port. The radio came with a software to control the radio via the computer. You then had to buy the Trunking Option, which was another program that ran on the same computer in another window.

The idea being that you fired up the computer and ran the control software. You then tuned the radio to the frequency of a local control channel. Then the Trunking Option program was run, this decoded the control channel and showed a scrolling list of commands. After many hours of listening it was possible to work out the frequencies of all the voice channels, program them into the Trunking Option program and save them. You could then buy a second WiNRADiO which could be connected to a second serial port and could be set to automatically tune to the voice channel.

When WiNRADiO first burst onto the market it was leading edge technology and gave you the feeling that you were doing the impossible, but there were a couple of problems with the set-up. The first WiNRADiO I brought was a WR1000E model. This connected to my laptop by a serial cable. It cost over £400 (which in those days was a whole month's wages). The Trunking Option software was another £85. The computers to run it would set you back another £1000 each, at least. I never got around to buying the second WiNRADiO!

The WiNRADiO WR1000E model appeared to have a wide-open front-end. Strong local signals could be heard all over the full frequency range of the WiNRADiO. It wasn't necessary to tune the radio to the local police v.h.f. channel or even know what frequency they were on, WiNRADiO would pick them up anywhere. I also had a lot of trouble with a baby listener on 49MHz that could be heard anywhere on the v.h.f. p.m.r. allocation. Pagers were a nightmare. I knew I had to find something else when I heard an amateur, who was sending Morse on 40m, in the u.h.f. military airband!

WiNRADiO still produce derivatives available today. They appear to have sorted out the problems and I know at least one person who uses it quite happily.

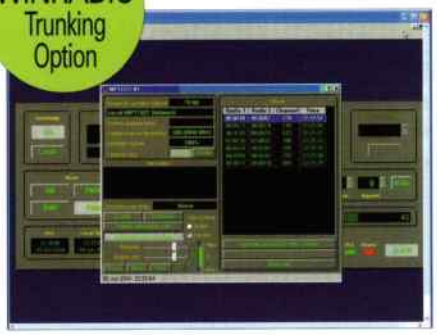
FTrunk

The hardware for *FTrunk* comes from Australia, made by a firm called Talkback Systems, but the software is written Ian Wraith in here in the UK. The *FTrunk* system uses a modem in a box.

Audio from any radio, tuned to a control channel, is fed into one side of the modem. A computer is connected up via the serial port and the software fired up.

Trunksniffer

WiNRADiO Trunking Option



WiNRADiO

The software has a lot of pre-set networks already programmed in and all you have to do is select your network and then click on 'connect' and the control channel commands start to scroll down the screen. Unless you are listening to a new or unknown system, *FTrunk* even displays the frequency of the voice channels! A second radio is then connected to the computer via a second serial port on the computer and after selecting 'tracking', it automatically tunes to the voice frequency.

It would seem that any radio can be used to capture the audio. I have tried many different models and every one has worked. It also works taking the audio from the earphone socket, the record socket and from a suitable discriminator tap.

I have run the *FTrunk* software on many different computers from a Pentium 75 running *Window 95* to a Pentium4 3GHz machine running *Windows XP Pro*.

The only restriction on the radio used to track the voice channels is that it must be capable of being tuned by a computer. Almost every suitable radio you can think of is already programmed into the software and can be selected by drop down menu.

The program has an excellent help file and the software support given by Ian Wraith is first class.

You may have gathered that I like *FTrunk*. Everything about it is easy and it can be in use minutes after it is unpacked. I didn't have to look at the help file for days.

You have to buy the system from Australia and it costs just over £100, depending on the exchange rate. Customs and Excise also insist on slapping duty on it when it comes into the country, so expect to pay out another £30 to the postman. I have three of the modems which cost me between £120 and £180 each.

The only criticism would be about the box that the modem comes in. The hardware comes mounted in a plastic box which isn't very pretty to look at.

However, all you have to do is plug in power, 'audio-in' and a serial cable and never have to look at it again. The board inside the box is well made and one of them has been in use for several years without problems (touch wood!).

Trunkito

Trunkito started life as a program called *Tronquito* or *Tronkito* which was written for *Unix* users but has been re-written and is now available for *Windows* users. The program has copyright notices for somebody called Warezzman and Stefan Petersen, but it is open source and is free.

All you have to do is tune any radio to a control channel, feed the audio from the radio into the 'line-in' socket of your computer, run the program and it decodes and displays every command on the channel.

If you know nothing about MPT1327 trunking and you want to learn, this is the program for you. It is simple to set up and run and will not cost you a penny. There are plenty of websites on the Internet that have all the information you need to start understanding what is going on and it won't be long before you will be able to discuss GTCs and ALOHAs with the best of them!

It is possible to set the program up so that it's customised for the channel you are listening to. To do this you will need to edit a file called 'Tronquito.ini'. When you first look at the file it does not seem to make much sense, but after playing with it for a while, everything becomes clear, or less cloudy at least!

The program does not allow you to connect another radio and will not tune to the voice channels, so you will have to do that the old fashioned way.

There is no help file with the program - but does it need one? There is no support available either, but what can you expect for free?

TrunkSniffer

TrunkSniffer is the new boy on the block. Written by **Michael Puchol**, the program decodes and tracks voice channels by using the soundcard. It is available in a professional version and the author promises a standard version soon. It costs 90 Euros (which I am reliable informed is about £60), and is available as a download from the *TrunkSniffer* website at **www.trunksniffer.com**

TrunkSniffer appears to be a very good program and the features available in it appear to be endless. However, it is a professional version and I feel that you have to have some knowledge of MPT1327 trunking before you can start. I am still in a steep learning curve with the program, so I have not checked out everything, yet.

It is possible to just plug the audio from a scanner into the sound card and get it to decode the control channel or plug the scanner into the serial port as well and get the program to control it. The list of compatible scanners is not very long at the moment, but no doubt the number will increase once more people use the program. It is possible to plug another scanner into the second serial port which will track voice channels.

I think that you should be able to fire up a new computer program and work at least the basic functions without referring to the manual. I have always felt that 'Handbooks are for Sissies' but with this program I had to read the help file within seconds of running the program. If you just plug the audio in to the soundcard and run the program, nothing happens. Everything is switched off by default and you have to find out how to start everything up. If you are familiar with this sort of program, it is not too difficult to do though.

Even so, this appears to be an impressive program and I am enjoying working everything out. Perhaps I will have to report back later once I have go to grips with it.

Conclusion

So, which solution do I prefer? I have always thought of myself as an Operator and not a Technical type, so my likes and dislikes are slanted more towards non-technical things.

Ftrunk is my favourite program. I like the way that you can just plug it in and it works. I think the software support is superb, nothing seems to be too much of a problem for Ian Wraith and in my experience things are put right at the speed of light!

I am sure that I am going to enjoy using *TrunkSniffer* too. There is a support group on Yahoo groups and, now that the program is becoming increasing popular, more and more help is appearing. Mike Puchol, the author, has also uploaded a couple of videos on how to work the program. I found these to be very useful indeed.

Trunkito is a very useful starter program, which should help the beginner get an insight into the world of MPT1327 trunking. I still use it when I want to check something out but do not want to waste too many resources. Did I mention that it was also **free**? (my favourite word!)

I found the Trunking option from WiNRADiO also to be a very good program. It does everything that they say it does. However, I feel that the early radio offering I used rather let it down. Provided the modern radio front-ends are improved it is still a useful program, if a little on the pricey side for my pocket.

SWM

Number Stations
a beginners guide
Part 2

Welcome back to the world of Number Stations! Number stations have been around a long time, their origins come from the First World War. Paul Beaumont, front man of the numbers specialist group ENIGMA 2000, continues his explanation.

Last month we looked at the purpose of numbers stations based on historical and anecdotal evidence. We began to examine regular station parameters. This month we continue that in-depth scrutiny. The Morse equivalent of S10d is likewise well documented on a chart that predicts and shows a schedule for M10, M10e, S10d and S17c. To fully understand why some stations have a lower case letter as a suffix perusal of the *ENIGMA Control List* is a necessity. However a simple explanation, in this case, is that the traits are similar to the 'nominal' S17 but a variation is such that it demands separation and a separate identification. (E03 and E03a being another example. E03a was E04 and originally wrongly classified. ENIGMA corrected that, but some monitors incorrectly and persistently use E04 today).

We have already looked at the Slavic language Number Station S17c with a translation. S10d, 'Bulgarian Betty' can be heard seven days a week and the schedule taken from the ENIGMA 2000 newsletter. The schedule as shown in the newsletter is updated every two months, by DoK, and it is usual for any serious change, such as day, time or frequency to be posted to the ENIGMA 2000 Number Station Monitors group.

M10 6.763MHz 0410z 27/04/03 [ICW]
444 200 18 946 31 [Header repeated for five minutes].
200 200 200 99 99 18 18 ==
94294 94294 31350 31350 82233 82233 95872 95872 22988 22988
42544 42544 00696 00696 79984 79984 39544 39544 87850 87850
61550 61550 33789 33789 62953 62953 24812 24812 01972 01972
64783 64783 25121 25121 74046 74046 ==
99 99 18 18
946 946 946 78 78 31 31 = =
84503 84503 49328 49328 00154 00154 43915 43915 03915 03915
08034 08034 89644 89644 38003 38003 31305 31305 13528 13528
22485 22485 49715 49715 21248 21248 72794 72794 73169 73169
80764 80764 00411 00411 29756 29756 84552 84552 19018 19018
31003 31003 19138 19138 60858 60858 05331 05331 75156 75156
43101 43101 67596 67596 67529 67529 nnnnn nnnnn nnnnn nnnnn
56654 56654 ==
78 78 31 31 0 0 0
ended 0425z 27/04/03

M10 messages start with an intro that is sent slowly, around 8w.p.m. The message is sent somewhat faster. In the course of the entire sending as each message ident comes up the sending reverts to the slower sending. I copied this full example whilst was on holiday on the Isle of Wight. I often wonder what the hotel chambermaid thought of the slip of paper with the message copied down in Biro! See the table bottom left.

So far we have already examined E03, E03a, E10, E11, S10d, S17c, M03 and M10.

Recapping we have seen that both E03 and E03a start off with a five figure identifier and send the same number of groups with every transmission. E10 is different in that it uses a letter form rather than numerals and that M03 and M10 differ in their message structure.

What we have not looked at is how messages indicate who the recipient is, what is needed to decode it and how many groups are sent.

All these messages start with a header of sorts; the tune and five figure group used in the intro by E03 and E03a, the identifier and group count of E11 and M03, all very different, but nevertheless, all still headers.

The M10 header seen in the example above is very useful to explain header construction.

The message started with '444 200 18 946 31' and that is all the recipient, in this case two recipients, need to ascertain what to expect.

'444' is a rare start, 222 or 555 are much more common and are no more than just a call-up, an immediate identifier to allow the recipient to tune his receiver in correctly. Remember, the recipient is an agent and not a skilled radio operator, so he needs all the help he can get to be ready for his message. The fact that 444 or 222 is used instead of the very common 555 may well indicate urgency or importance of the message, or that it is a training message, or whatever.

'200' will be an ident for a particular operator, remember ex GCHQ analyst Geoff Prime had a list of frequencies with his allotted radio ident noted on it.

'18' tells the recipient [agent 200!] how many groups he/she is going to receive.

The header also contains '946 31' and that means that the particular recipient with the ident '946' is about to receive a 31 group message. Obviously if you were agent '946' you would not be bothering to copy down agent 200's radio traffic and vice versa. There would be no point, as we shall see.

At best, most messages will have a 'decode key' (dk) and/or a 'group count' (gc). In the above M10 example we do not see the dk until we move on to the preamble for 200's message. It reads, '200 200 200 99 99 18 18 =='. The repeated 200 is now obvious, '99' is the decode key, dk, which presumably tells the recipient how to start with his eventual decode of his message of 18 groups. Then we have the long break '==' or -...- -...-. Not only would that indicate to agent 200 that his message was about to be sent but in the case of M10 it would inform him/her that the speed of transmission is about to increase for the 18 groups of five figures. Each group is sent twice and rattled off very smartly.

At the conclusion of 200's 18 groups, each sent twice, the long break is sent == at slow speed, leading into the dk/gc, each sent twice 99 99 18 18, no doubt ensuring that the recipient is aware of his dk/gc.

At this point agent 946's ears should prick up and his pencil poised, in still slow rate we move into the preamble which reads 946 946 946 78 78 31 31. Agent 946 is to receive 31 groups for which he must use the dk 78. His message will be totally different to that decoded by Agent 200, the dk is not the same, which is why there is no reason or need for either to copy any message other than their own.

As an aside, in the example discussed here, there are two groups represented by nnnnn. That is because local electrical interference overcame the very weak signal being listened to. A Sony SW100E was in use with 2m of wire hanging over third floor balcony of an iron framed building.

Note that at the end of the message you'll see == 78 78 31 31 0 0 0. We already know about the dk/gc but look at the final three characters 0 0 0. They were sent double-spaced and represent the end of that particular transmission. All zeroes are sent as a cut number in M10, in this case a 'T'. As a result the final three characters would have been T T T.

Another copy of M10 shows the header with a more common intro:

M10 1630z 5.078//7.745MHz [Sun, Mon, Wed, Sat]
MCW
555 571 25 275 24 049 36 435 36 [Rptd 5 mins]
571 42 25 = = text 25 grps = = 42 25
275 45 24 = = text 24 grps = = 45 24
049 89 36 = = text 36 grps = = 89 36
435 58 36 = = text 36 grps = = 58 36
0 0 0 [ended 1657z Saturday 10/04/04]

Unlike my off-air sample, which was a two-message format (for 200 and 946), this sample of an M10 transmission, from E2k's Slavic Desk, is a four message format for 571, 275, 049 and 435.

S17c has a header too, '555 313 42 313 42 05'. Slightly different because the 05 does not describe the groups sent - it could be the number of characters that make up the message though.

The frequencies stated here for the Slavic stations M10, S10d and S17c were in use at the time of writing. If a change occurs between writing and publication, then the current frequencies may be obtained from the current E2k newsletter, or special chart posted to the E2k Number Monitors Group - *The current* Enigma 2000 Newsletter *is available from the* ***SWM-Readers*** *E-mail group files area - see end of this feature.* ***- Ed.***

For effective station identification the methods of start, 'the call up' and ending of a transmission is of paramount interest, as is the gender of the operator or the language used. If the station uses Morse then the speed of the call up, message, cut numbers used, header, with dk/gc and the ending. Again perusal of the *ENIGMA Control List* illustrates a wide variation of starts and endings, and in some cases what goes on in between.

German Lady

German Language stations exist and G06 is such an example. Originally called 'German Lady', the station typically sends in a.m. mode with an ending 00000.

A G06 null message, one without any traffic for the particular recipient was sent on 4.860MHz at 2000z on 03/12/01, it read '328 328 328 00000'. This 'null' message was sent until 2005z.

More current reports can be seen in the *ENIGMA Newsletter*, some showing the method used to identify the station: 4.518MHz 1830z 26/02/04 [271 589 589/47 47] AnonUK.

Here E2k monitor AnonUK has put the full identification down - recipient id 271, dk/gc 589/47 and each sent twice]. This transmission was also reported by German Monitor 'H-FD' showing a slight +1kHz change in frequency 4.519MHz 1830z 26/02[271 589 47=09172] and H-PhD shows the first group after the break. You can never have too much information about any station.

Ana Belen Montes.

When certain stations speak numerals they place an inflection upon them to allow a chance of understanding them should interference affect the audio. The German numerals have the same shortcomings and one can expect to hear a deliberate inflection. The numbers in question are:

2 ZWEI pronounced by some, as TSWO.
5 FUNF some pronounce it as FUNUF.
9 NEUN pronounced by some as NEUGEN.

This is totally in keeping with some German armed forces stations and corresponds to the English WUN [1], FOWER [4], FIFE[5], NINER[9].

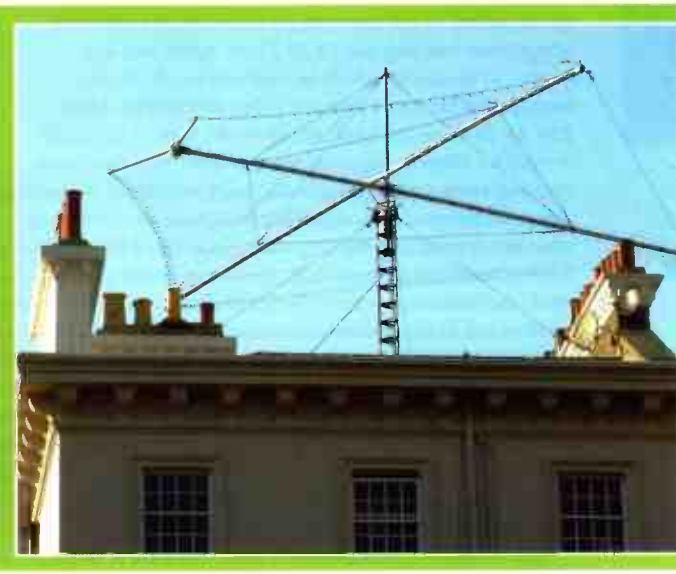
Our friend **HJ Hagermann** was the source of the information concerning the enhanced phonetic German pronunciation. At the time he wrote of the Number Station announcers, "I would suggest that these are service trained operators, or ex, or even possibly, serving signals personnel".

Arrest & Trial

Examples of Number Stations being used in the British theatre in the 1980s were given at the start of this article. Modern proof can be had from the arrest and trial of the American Defence Intelligence Agency's Cuba analyst Miss Ana Belen Montes. Her arrest on 21 September 2001 was prompted by the events of '9/11' although the FBI had maintained surveillance on her movements previously. Her instructions were sent by radio and received by Miss Montes on a portable Sony Receiver. Unlike spies Geoff Prime and van Haarlem, there were no one time pads to be discovered. What took their place was a Toshiba laptop computer

Number Stations

a beginners guide



405CS, programmed to decode the number groups input from the messages that Miss Montes received. In fact, forensic examination of the hard disk drive of the laptop revealed a coded message and decoded plain text from a Cuban transmission, on 7.887MHz sent on 6 February 1999. The encrypted message was, in part, 'Attencion, Attencion 30107 24624...' The transmission was recognised as being a 150 group message format used by the Cuban Intelligence Services. A previous case involving a Cuban group 'La Red Avispa' also used similar methods.

The station mentioned above is regularly intercepted by numbers monitors in Great Britain, Europe and America and has the ENIGMA designation V02a.

V02a always starts with 'Attencion, attencion'. It is almost always transmitted in a.m. although u.s.b. has been reported. Like its sister V02, of which V02a is a variant, the transmissions have very poor quality signals, sometimes a 60Hz hum is very prevalent, sometimes Radio Cuba can be heard mixing in the background or sometimes its Morse equivalent M08a. On a really good day all three mix together! These are best heard in the early mornings. For frequencies used, see **Fig. 2.1**.

The reports at the time of writing from European monitors [2004] were:

Station	MHz	UTC	Date	Monitor
V02	6.768	0107	20/03	E - GB
V02a	4.028	0600	25/03	Gert - Holland
V02a (a.m.)	9.063	0700	10/03	RN - GB
V02a (a.m.)	9.063	0700	17/03	RN - GB
V02a (a.m.)	9.063	0700	26/03	RN - GB
V02a (a.m.)	9.153	0700	27/03	RN - GB

Time (UTC)	Frequency Used (MHz) Sun	Mon	Tue	Wed	Thu	Fri	Sat
0100			13.436				6.768
0200			3.292	12.180	12.180	5.417	5.763
			12.180			12.215	
			12.215				
0300	7.555	5.800	10.126*	4.479	4.479*	11.565	
		6.855		10.446	10.446*		
		10.446					
0400			3.292	10.446	9.223*	11.565	3.292
						4.479*	5.762
0500					8.097	4.028	5.883
0600						4.028	8.095
						8.010	9.153
							9.323
0700						9.063	6.782
1000							4.035

*used by or mixed with M08a

Fig. 2.1.

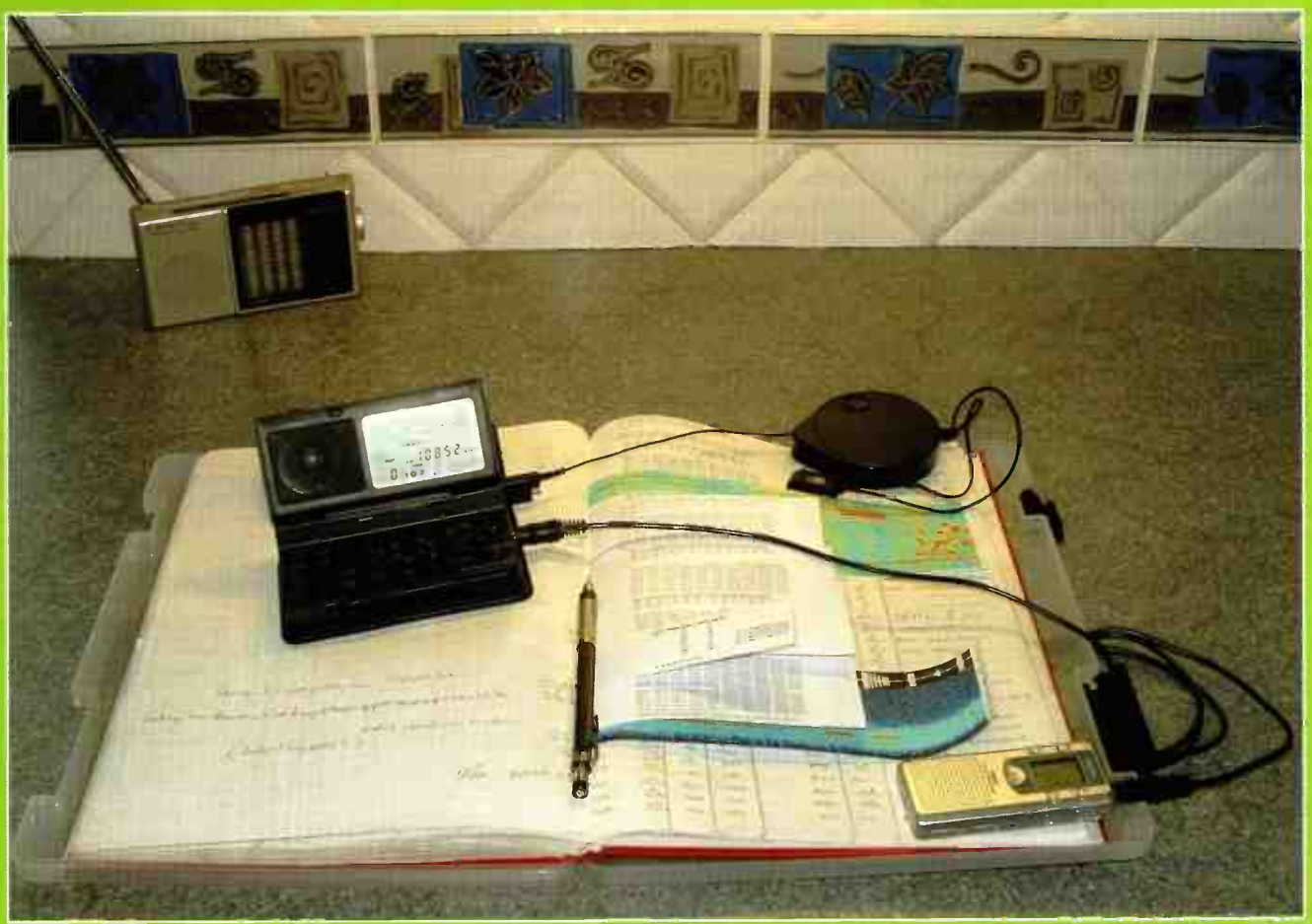
Cuban Number Stations employ many frequencies throughout the day. This is one station where the American monitor has a decent bite of the cherry, M08a, V02a and E10 being the most regularly reported stations.

For interest, the contents of the damning message to Miss Montes contained instruction concerning two computer disks; Disk S1 to cipher information to be sent, and Disk R1 to decipher information received via radio or disk. These disks were passed to Miss Montes by members of the Cuban Diplomatic Mission to the UN, who subsequently were declared persona non grata and expelled from the USA after Miss Montes' arrest.

Miss Montes, who received 25 years prison sentence, made her return messages via the public paging system. A previous spy case involving a Cuban group 'La Red Avispa' also used similar methods, including communications from V02a.

Next time, Paul concludes this in-depth beginners' guide to the world of number stations.

M10 3808kHz 0400z 28/07/03 555 288 20 279 40 [Note additional character 2016ms



You don't need much to receive numbers stations.

...there is no great need to spend vast amounts of cash on this hobby...

Down to Definition

Are you a utility listener? Ben Hogan suggests that utility monitoring can be an any place any time activity. Go on, give it a try!

The word Utility is derived from the Latin *utilitas* meaning usefulness. I'm sure that every broadcaster, amateur radio operator and CB user considers his or her transmissions to be of use, but in the context of radio monitoring the term generally indicates the use of the radio frequency spectrum below 30MHz for communications that are intended for the reception of specific individuals or groups.

Conversely it may be just as accurate to describe utility signals as every transmission below 30MHz except entertainment broadcast stations. Most utility signals used for two-way or commercial communications will be decipherable using u.s.b. mode.

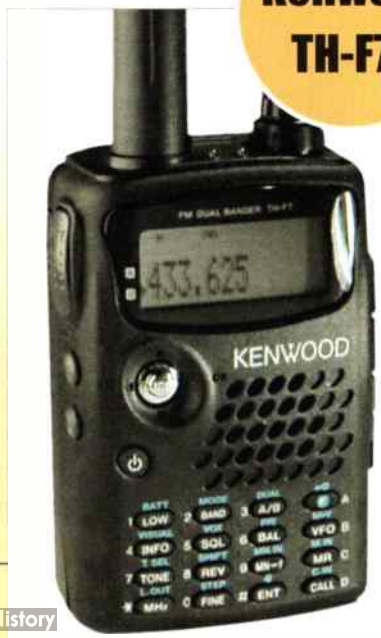
As transmissions of this nature are often targeted at mobile stations such as aircraft, vehicles or sometimes at portable equipment, signals are often transmitted at high power making them very easy to receive using only modest equipment. Someone who is considering passing time by listening to these stations can make a start using simple and relatively inexpensive equipment. Basically any radio that covers from around 500kHz to 30MHz and has the facility to monitor s.s.b. traffic, whether by switching filters or the use of a Beat Frequency Oscillator (b.f.o.) will do the trick. Some commercially available battery operated portable radios are in use by very experienced utility monitors with marvellous results. Although it is possible to hear some traffic using the built-in telescopic whip antenna, it is much better to rig up an antenna outdoors.

A length of wire of around thirty metres makes a good start. Get it up as high and as straight as you can. Make sure that it is kept away from anything that may ground it and see how you get on. As time goes by you may become more interested and progress to more complex antennas, but remember that many of the stations to whom these signals are directed have wire antennas that are probably less efficient than your length of wire. Much more expensive and effective radio and equipment is available but you will certainly hear many signals on a simple set-up.

Several illegal foreign intelligence agents have been found in possession of simple short wave broadcast receivers with telescopic whips and they have been receiving instructions from their employers abroad via coded signals from hundreds, if not, thousands of kilometres away. These signals are covered in depth in the bi-monthly 'Attention 123' column in *SWM*.

Often utility monitors will concentrate on a specific area of activity. There are many listeners who sit on the frequencies used by the High Frequency System operated by the United States. Most of this traffic concerns the activities of their Air Forces and for many people these frequencies provide the first experience of h.f. utility listening. The Americans have stations throughout the world that generally identify the transmitter site by simply naming the base from where it's transmitted (e.g. Andrews, Croughton, etc.) and coupled with high power transmitter systems and first rate antennas their main frequencies can often be used as references to ensure that an antenna or radio is performing as it should be. I don't intend to cover territory owned by Peter Bond but there are many HFS frequencies in use. Try 8.992, 11.175 and 13.200MHz for starters.

AKD HF3E



Kenwood TH-F7E

Another reliable source of signals are the aviation weather forecasts known as VOLMET broadcasts. In Europe these can be heard on 3.412, 5.505, 8.957 and 13.264MHz with RAF transmissions on 3.413, 5.450 and 11.253MHz. Also the main Search and Rescue frequency of 5.680MHz is a good place to lurk and the traffic received can be riveting.

AOR AR8600

HF-150 running on internal batteries

Alinco DX-70

3/8 inch Whitworth thread. The coaxial cable is then threaded through the radiator grille and into the vehicle by utilising a small hole that I found in the bulkhead at the rear of the engine compartment.

I've spent many happy motoring hours listening to Kinloss Rescue or the US forces using this set-up.

On Foot

My favourite mobile option is, however, my own feet. For this is the time where a listener can get well away from every source of interference and purely concentrate on elevating a suitable wire antenna, connecting it up to an antenna tuner and settling down to some serious listening unencumbered by noise. If I find myself with the luxury of good weather or a tent then the radio of choice is the Yaesu FT-817. If I'm just stopping for a few minutes rest or I'm stuck in the open then the Kenwood TH-F7E is a tremendously useful item. This is a really small hand-held amateur transceiver that incorporates scanning capability. But from our point of view, the delight of this little radio is that it has a really good general coverage receiver with both u.s.b. and l.s.b. reception as well as a.m., f.m. and c.w. modes. It's necessary to unscrew the v.h.f./u.h.f. antenna supplied with the set and make up a small lead with an SMA plug on one end (to fit the set) and a BNC connector on the other. I make the point that a small length of lead is preferable to a hefty adapter that can cause stress damage to the radio's antenna socket. Connect a length of about six metres of wire to this and prepare to be amazed at the radio traffic that you'll pick up. Icom have just introduced a fantastic hand-held that coupled to a suitable antenna will be ideal for any receiving purpose. Keep your eyes peeled for the Icom R20. Expensive but well worth it. *See the Icom R20 review in SWM May 2004 - back issues available - **Ed**.*

Fairhaven RD500

Mobile Fun

Just because you are out and about in your vehicle doesn't mean that you can't listen to the radio. Most of us do that every time we get into the car. The only difference being that you will be listening to a different set of frequencies from those on which Radio 2 is available.

No one would recommend that you spend your time on the motorway spinning a dial in order to receive that elusive station but should you have an interest in a particular frequency or set of frequencies then these may easily be entered into the memory of a suitable radio and monitored. This is where things can get expensive. The most suitable equipment for this activity are amateur radio sets that have general coverage on receive such as the IC-706 or IC-703 manufactured by Icom. The Alinco DX-70 is a less expensive alternative.

These transceivers have the advantage of having remotely mounted control heads that allow them to be installed in the rather minimal dashboard area preferred by car manufacturers these days.

Antennas for mobile use are readily available but I prefer the cheapest option and this has always meant that I end up purchasing a Watson mobile whip that mounts onto a bracket on the bumper of my vehicle using a

TIME & EFFORT

To summarise there is no great need to spend vast amounts of cash on this hobby although it is tempting to do so. The one thing that is required, however, is a fair amount of time to spend searching the radio spectrum for fascinating radio communications. ***SWM***

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- 5/12.5kHz channel steps
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- BNC Flexible Antenna
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- 100 Ch/sec scan speed
- Priority channel
- 4.8V 600mAh Ni-Cd int.
- AC Charger
- BNC Flexible Antenna

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- NFM, AM (Airband)
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- 5/12.5kHz channel steps
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- BNC Flexible Antenna
- Earphone

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- Modes AM, FM
- Memories 200 (10x20)
- Search speed 50 steps/sec
- Scan speed 25Ch/sec
- 4xOne-touch search banks
- 8.33kHz steps in airband
- Audio 180mW into 8 Ohms int. spkr
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- 200 Memories
- 5 Tuning steps
- Fast scan speed
- Very sensitive
- Requires 4xAA cells (not supplied)
- Includes flexible antenna, earpiece and carry strap

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- 530kHz-1650MHz
- LSB, USB, AM, WBFM, NBFM
- 1000 Memory channels
- High Sensitivity
- Illuminated keypad
- High Speed search & scan functions
- Battery save function
- Priority channel
- Individual power/volume and squelch controls
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*100kHz 30MHz
*SO-239 socket
*Size: 150 x 67 x 146mm
*Weight 300g

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Improves any short wave receiver. Lets you hear more! A 'Q' switch adjusts the front-end selectivity to match the band and QRM conditions. Handles end fed wires and coax systems.

ALINCO DJ-X3

Many extra features make this a top-selling budget scanner

- 100kHz-1300MHz
- AM, FM, WFM
- 700 Memories / 8.33kHz
- Stereo FM (with headphones)
- Audio Descrambler
- Bug Detector
- 3xAA dry cell battery case

£109 B

SGC ADSP-2-HLM HIGH LEVEL MODULE

DIY DSP for any receiver!!

Made by SGC in USA, this adjustable DSP unit also includes adjustable bandwidth filtering for SSB and CW. Just fit in-line with speaker, connect 12V and use the supplied dual micro-button control panel to select parameters. It's pure magic and great value.
See our April advert. Order as: ADSP-2-HLK

£89.95 B

GENERAL ENQUIRIES:
01702 206835/204965
FREEPHONE ORDERLINE:
08000 73 73 88

THE ONLY THING WE WON'T DISCOUNT • CUSTOMER SERVICE •

PRICE MATCH

UNIDEN-BEARCAT UBC-60XLT-2

- 66 - 512MHz *with gaps*
- NFM
- 80 memories
- 1 Priority channel
- 5/12.5kHz channel steps
- Data skip (lockout channels)
- 4x AA cells (not provided)
- BNC Flexible Antenna
- Earphone

"BUDGET VALUE"

£69 B

ALINCO DJ-X2000 "FABULOUS FEATURES"

100kHz - 2150MHz
AM, NFM, SSB, CW
2000 memories
- 23 tuning steps
- Channel scope
- Fully programmable
4.8V Ni-Cd battery pack
8-15V DC ext.
Telescopic Antenna

PAY 2005

£419 B

UNIDEN-BEARCAT UBC-780XLT

25-1300MHz with gaps
NFM, WFM, AM
- 500 memories
- Analogue Trunk Tracking
- Alphanumeric display
- Automatic Tape recorder option
- Antenna BNC
- 13.8V DC 700mA

PAY 2005

£299 C

AOR AR5000A/AR5000A+ NEW

The new AR5000A now offers a frequency coverage of the entire radio spectrum that is practical to cover. The +3 version offers even more with synchronous AM (USB/LSB/DSB) AFC & Noise Blanker.
**10kHz-3GHz *AM, FM, USB, LSB, CW*
**2000 memories *45 CH p/s scan speed*
**Audio 1.7W (8 Ohms)*
**Supply: 12V DC @ 1A*
**217x100x260mm *3.5kg*

PAY 2005

AR5000A	AR5000A+
£1599 C	£1799 C

YAESU VR-5000 "DESKTOP RECEIVER"

100kHz - 2599MHz
- FM, AM, SSB, CW
- 2000 memories
- Large digital display
- Real-time band scope
- DSP Noise & notch filters (Opt)
- Super HF performance
- Automatic Tape recorder option

PAY 2005

£549 C

YAESU VR-500

100kHz-1300MHz
- NFM, WFM, AM, USB, LSB, CW
- 1000 Memories
- 100 Skip channels
- Smart search feature
- 8 char. alphanumeric display
- Band scope
- PC programmable

£199 B

YAESU VR-120D

- 100kHz-1300MHz
- AM, FM, WFM
- Adjustable steps
- Over 600 memories
- Skip channels
- Smart search
- Alphanumeric tags
Requires 2xAA cells

£119 B

OPTOELECTRONICS X-SWEEPER NEW

A fully featured nearfield receiver that displays analogue signals in spectrum format.
**30MHz-3GHz*
**FM Analogue*
**64x128 graphical display with white LED backlight*
**20 memory banks, 100 freqs in each*
**Sens: 100uV @ 500MHz*
**Pwr: 8xAA alkaline or AC adaptor (optional) 12V DC 350mA*
**Size: 203x108x22.5mm*
X-SWEEPER with GPS: £1599.95

PAY 2005

£1399.95 C

ICOM IC-R5

- 150kHz-1310MHz
- AM, FM, WFM
- 1250 Memories
- Name Tagging
- AM Ferrite antenna
- Civil & Military
- Emergency Services
- 2xAA cells (extra)

£159 B

ICOM IC-R3 SCANNER & TELEVISION

- 495kHz - 2450MHz
- AM, FM, WFM, AM-TV, FM-TV
- TV mode PAL (UK)
- 450 memories
- 50.8mm (2in) TFT colour display
- Simple bandscope
- BP-206 Lithium-ion battery
Telescopic Antenna

PAY 2005

£339.95 B

20-004 PREAMPLIFIER SPECIAL OFFER

RADIOSHACK HANDHELD SCANNER AMPLIFIER
Specifically designed for handheld scanning receivers using BNC antenna connectors (male/female) for ease of connection. **100-1000MHz *Gain variable 0-20dB *Bypass switch *Requires PP3 batt or ext. 9V DC 100mA min. *In/Out BNC connectors *Size: 40x95x35mm *Weight: 100g*
SPECIAL OFFER WAS: £69.95

£29.95 C

ICOM IC-R8500 "THE EDITOR'S OUT ONE!"

- 100kHz - 2000MHz
- USB, LSB, CW, AM, FM, WFM
- 1000 Memories
- 3x Antenna Connectors
- Audio 2.5W (8 Ohms)
- Supply 13.8V DC
- Free PSU included
Weight 7kg

PAY 2005

£1149 C

ICOM IC-PCR1000IS

- 100kHz - 1300MHz
- USB, LSB, CW, AM, FM, WFM
- Unlimited memories
- Synchronous AM detection
- RS-232 interface D-sub 9-pin
- BNC Antenna connector
- New Icom version 2 software
- Requires PC (Not included)

£309 B

bhi NEIM1031

NOISE ELIMINATING IN-LINE MODULE
** Noise attn 9-35dB * Noise Attn levels 8 * Audio output power 2.5W RMS max (8 Ohms) * Audio connections: Line level in/out (RCA Phono), Audio in/out 3.5mm mono jack * Line i/p impedance 10K * Line o/p impedance 100 Ohms * Line in sensitivity 300mV -2V RMS * Headphone socket 3.5mm mono jack * Power 12-24V DC 500mA*

£129.95 B

bhi NES10-2 & NES-5

NES10-2

NES-5

**Speaker with built-in DSP noise filters *Dip switches for 8 filter settings (NES10-2) *DSP settings preset, no user adjustment (NES-5) *Plugs directly into 3.5mm speaker socket *Handles up to 5 Watts input *Max 2.5 Watts output *Requires 12V at 0.4 Amps max *Use mobile with cigar adaptor*

£99.95 B **£79.95 B**

SGC ADSP-2-EXT SPEAKER

The ADSP® Speaker has three modes of operation - no noise reduction - original ADSP noise reduction - or the new ADSP® noise reduction mode which provides up to 26dB of noise reduction within the passband.

£99.95 B

OPTOELECTRONICS SCOUT

The Scout frequency recorder automatically stores frequencies as it locks onto them
**10MHz-1.4GHz *Input: 50 Ohm*
**Sens:<3mV @ 150MHz *Measurement: 10mS *Records: 400 freqs *Display: LCD*
**Bargraph: 16 segments *Supply: Int Ni-Cads*
**Battery life: 8hrs*
**AC adaptor AC90*
**Size: 94x70x30.5mm*
**Weight: 240g*

PAY 2005

£299.95 B

ROBERTS R9914

- 153kHz-30MHz, 87.5-108MHz
- AM, SSB/CW, FM (Stereo)
- 45 Station preset memories
- Stereo through earphones
- Dual time
- Clock/Alarm
- 4 x AA cells (Alkaline)
230V AC adaptor

£99.95 B

SONY ICF-SW-7600

150kHz-30MHz (LW/MW/SW)
76-108MHz (FM)
- AM, SSB, CW (FM)
- 100 memory presets
- Audio output 380mW
- Supply: 4 x AA
- Size 190 x 118.8 x 35.3mm
- Weight 608g

Included:
AN-71 wire antenna, Hand strap, Soft case, Wave handbook, Instruction book.

£119 B

WATSON SP-2B SPEAKER

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

£ 29.95 B

GARMIN GPS-III+

Compact handheld GPS with cartographic capabilities. Offers flip-flop display, vertical for handheld or horizontal for installation in vehicle. Many optional accessories available. Includes Atlantic International database & basemap with up to 1.44MB downloadable from optional Roads & Recreation MapSource CD-ROM.

PAY 2005

£299.95 B

WATSON FC-130 "SECRO COUNTER"

- Off-air Frequency Counter
10MHz - 3GHz range
- 4 Switched Gate Spreads
- Hold Display Button
- 2 Switched ranges
- Internal ni-cad battery
- Whip Antenna
- AC Charger

£59.95 B

WDP-30 Short Wave Dipole

£49.95 B

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

WATSON HP-200 & HP-100

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

£22.95 B

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

£19.95 B

CAN'T DECIDE? PHONE FOR EXPERT ADVICE

SAVE £20

MAYCOM FR100

Civil & Military HANDY AIRBAND SCANNER

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

Maycom FR100 SPECIAL PRICE £79.95

LIMITED OFFER

~~£99.95~~ £79.95

SPECIAL PURCHASE £29.95 + P&P £5

MICRO 454

33 Channel UHF RECEIVER

Originally intended for monitoring "Mosques" or other Wide Area Paging systems. We have a quantity of these radios for sale at a **VASTLY REDUCED PRICE.**

Features

- Frequency: 454.025 - 454.825
- Steps: 25 KHz
- Channels: 33
- Power: 2 AA batteries (not supplied)
- Scan Function
- Channel up/down button
- Low battery indicator
- Automatic Key lock
- Earphone Socket
- Low Battery indicator
- Supplied c/w:
  - Rubber Antenna
  - Operating manual

limited quantities ONLY

OUR SPECIAL CLEARANCE PRICE £29.95 + P&P £5

MAYCOM AR108

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

Mains Charger £8.95 ~~£2.75~~

£69.95

AR5000A+3

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

SPECIAL PRICE

~~£1,000~~ £1,799 P&P £10 3 CHEQUES OF £603.00

PAY BY CHEQUESPREAD

JIM M75

Pre-Amp

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

£79.95 P&P £4.75

ADR AR-8600

SAVE £20

All Mode Wideband Base Receiver

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

NEW Mk II VERSION

OPTIONAL PSU AVAILABLE

~~£699~~ £599 P&P £10 3 CHEQUES OF £203.00

PAY BY CHEQUESPREAD

ICOM IC-R3

Wideband Scanner + TV

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

SPECIAL PRICE

~~£449~~ £339 P&P £10 3 CHEQUES OF £116.33

PAY BY CHEQUESPREAD

FAIRHAVEN RD500 VX

Full featured wideband scanning & communications receiver

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

SAVE £200

~~£899~~ £699 P&P £10 3 CHEQUES OF £236.33

PAY BY CHEQUESPREAD

Easy to pay & GENUINE INTEREST FREE *WITH* CHEQUESPREAD

- Pay by 3 post dated cheques
- No forms to fill in!
- No hidden charges!
- No hassle!
- No catch!
- No problem!

- Simply divide the price *(including carriage)* into 3 equal payments.
- Write 3 cheques dated in consecutive months starting with today's date.
- Write your telephone number, cheque card number and expiry date on the back of each cheque.
- Post them to us, enclosing your name and address and we will *(subject to status)* send your goods immediately.

CHEQUESPREAD AVAILABLE ON ITEMS OVER £100 ONLY

Used Equipment

ALL SAFETY TESTED & GUARANTEED for 3 MONTHS

Alinco DJX2	Handheld Scanner 522Khz-999 995MHz	89.00
Alinco DJX3	Handheld Scanner c/w accs & book	159.00
AOR AR8000	Wideband Scanning Receiver	185.00
AOR AR8200 Mk III	Handheld Scanning Receiver	299.00
AOR AR8200 Mk III	W/band Hi spec Scanner c/w CTCSS Card	345.00
Yaesu VR120D	Handheld Scanning Receiver	120.00
Yupiteru MVT9000 Mk I	Handheld Scanning Receiver	225.00
Icom ICR71E	HF Receiver	399.00
Icom R75	Base Receiver c/w Filters & DSP	599.00
Icom R75	Base Receiver	499.00
Roberts 9914	FM/MW/LW/SW Receiver	65.00
Sony ICFSW07	All mode s/w RX & Active Loop Antenna	159.00
Videologic ORX601ES	DAB Tuner	159.00
Yaesu FRG8800	General Coverage Receiver	299.00
Yaesu FRG8800V	HF Receiver + VHF Converter	325.00
Yaesu VR120	Wideband Handheld Scannner	99.00
Palstar R30	HF Receiver 0-30 MHz	325.00
Sony SW100e	Compact Receiver	89.00
Yaesu VR5000	Base Receiver 0.1 - 2600.995MHz	465.00
Scanmaster SP55	PreAmp for scanners etc BNC fitting	49.00

YAESU VX-5000

GUARANTEED! price match GUARANTEED

Yaesu's Flagship Desktop "Ultra Wideband" Scanning Receiver

- 0.1 to 2600 MHz
- Tons of features !

~~£699~~ £599 P&P £0 3 CHEQUES OF £203.00

PAY BY CHEQUESPREAD

YAESU VR-500

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

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

£199.95 P&P £10 3 CHEQUES OF £69.31

PAY BY CHEQUESPREAD

YAESU VR-120D

New D model with:

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

GUARANTEED! price match GUARANTEED

£159.00 P&P 3 CHEQUES OF £55.66

PAY BY CHEQUESPREAD

YUPITERU MVT 7100

All mode, wideband handheld Our No.1 Seller

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

~~£249~~ £229 P&P £10 3 CHEQUES OF £79.66

PAY BY CHEQUESPREAD

YUPITERU MVT 9100

200 Channels with Switchable AM/FM

SPECIAL OFFER

- 66 - 88MHz, 108 -170MHz, 300 - 470MHz, 806 - 1000MHz
- Modes: AM/NFM
- Memories: 200

~~£159~~ £129 P&P £10 3 CHEQUES OF £46.66

PAY BY CHEQUESPREAD

YUPITERU MVT 7300

Top of the range airband handheld with 8.33 kHz steps

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

~~£289~~ £239 P&P £10 3 CHEQUES OF £83.00

PAY BY CHEQUESPREAD

CABLE DEALS at WHOLESALE PRICES!

HIGH QUALITY MILITARY SPEC

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

RG58 C/U Mil spec	~~£38~~ £25
RG213U Mil spec low Loss	~~£76~~ £55
H100 Semi Airspaced	~~£85~~ £65
Westflex 103 Ultra Low Loss	~~£99~~ £89
300 Ohm Twin feeder (slotted)	~~£89~~ £69
450 Ohm Twin feeder (slotted)	~~£99~~ £79

FLEXWEAVE (style) ANTENNA WIRE HIGH QUALITY VERY FLEXIBLE

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

FLEXWEAVE

per metre.....55p .. +10p/metre P&P

per 100 mtr Drum..£40 .....+£6.50 P&P

ICOM R20

NEW ICOM R20 Ultra Wideband Scanning receiver

NEW

With

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

SAVE £100 LIMITED INTRODUCTORY OFFER usually £499 offer price £399

~~£499~~ £399 P&P £10 3 CHEQUES OF £136.33

PAY BY CHEQUESPREAD

BEARCAT UBC180XLT

A stylish new Sports Scanner with 8.83kHz Airband steps

NEW

- Frequency: 25 - 87, 108 - 174, 406 - 512, 806 - 960 MHz
- AM/FM
- 100 Memories
- Twin Turbo Scan
- Alpha Numeric display
- Supplied c/w: Mains Adaptor/charger, Nicad re-chargeable batteries, Earphone, Belt clip.

£129 P&P £8 3 CHEQUES OF £46.33

PAY BY CHEQUESPREAD

BEARCAT UBC780XLT

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

GUARANTEED! price match GUARANTEED

SPECIAL OFFER

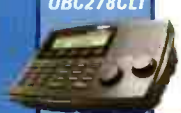
- 500 channels
- 25-1300 MHz *(with gaps)*
- AM,FM,WFM

~~£249~~ £299 P&P £10 3 CHEQUES OF £103.00

PAY BY CHEQUESPREAD

BEARCAT UBC278CLT

Base Scanner with MW/FM Radio & Alarm Clock



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

£159.95 P&P £10 3 CHEQUES OF £56.65

PAY BY CHEQUESPREAD

BEARCAT UBC 760XLT

SPORTCAT Twin Turbo Handheld

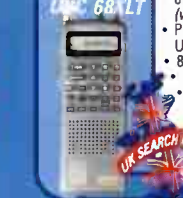
- Triple conversion RX
- 25-956MHz (with gaps)
- 200 memories
- Comes complete with: Antenna, Earphone, Belt Clip, Nicad battery, 240V UK Mains adaptor

£179.95 P&P £8 3 CHEQUES OF £63.31

PAY BY CHEQUESPREAD

BEARCAT UBC 68XLT

NEW UK BAND SCANNER



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

£79.95 P&P £8

BEARCAT UBC 220XLT

Easy to use with Airband and Turbo Search

- 66 - 956 MHz *(with gaps)*
- AM/FM
- 200 memories
- TURBO SCAN/SEARCH
- Data Skip facility
- 10 Priority Channels
- Memory Backup
- Supplied c/w: earphone, belt clip, charger and rubber duck antenna

£119 P&P £8 3 CHEQUES OF £43.00

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• fax: 023 9231 3091

YAESU FRG-100

Shortwave Communications Receiver

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

FREE MAINS PSU

£449 P&P £10 3 CHEQUES OF £153.00

PAY BY CHEQUESPREAD

ICOM IC-R8500

Communications Receiver

This receiver is everything we hoped it would be, covering 100kHz - 2GHz.

LOTS of FEATURES including computer control

SAVE £177

~~£1376~~ £1199 P&P £10 3 CHEQUES OF £403.00

PAY BY CHEQUESPREAD

GRUNDIG YB400

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

Hi-Performance SW Radio

£99.00 P&P £8

PAY BY CHEQUESPREAD

ICOM IC-R5

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

SAVE £20

~~£179~~ £159 P&P £10 3 CHEQUES OF £56.33

PAY BY CHEQUESPREAD

Multiband Receiver

Covers LW,MW and:

- Shortwave (2.3 - 22MHz)
- Marine/Airband (108 - 175MHz)
- Battery/Mains

£79.95 P&P £8

PALSTAR AA30

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

- Frequency: 100kHz-30MHz

£69.95 P&P £8

ROBERTS R861

Digital Worldband Radio with RDS

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

We stock the COMPLETE RANGE of ROBERTS RADIO!

~~£209~~ £179 P&P £10 3 CHEQUES OF £63.00

PAY BY CHEQUESPREAD

WorldSpace Digital Satellite Radio

Crystal clear digital radio, almost anywhere in the world!

BPL CELESTE MkII

Digital Satellite Radio

- FM / AM reception
- 10 Preset memories
- Dataport provision
- Stereo Line output socket

£139 P&P £10 3 CHEQUES OF £49.66

PAY BY CHEQUESPREAD

WS-0110 Compact

Digital Satellite Radio

- 10 Memories + LCR
- Headphone socket
- line out socket
- Built in speaker
- 4AA battery powered
- Mains adaptor inc

£119 P&P £10 3 CHEQUES OF £43.00

PAY BY CHEQUESPREAD

SCANMASTER quality antennas

SCANMASTER LP1300

WIDEBAND BEAM ANTENNA 16 EL LOG PERIODIC DESIGN

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

£129.00

SCANMASTER B128

AIRBAND BASE SCANNER

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

- 'N' Type connector
- length: 1mtr

£4.75 P&P

£39.95

SCANMASTER DESKTOP

WIDEBAND SCANNING ANTENNA

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

£4.75 P&P

£49.95

SCAN AIRMASTER

DEDICATED CIVIL & MILITARY AIRBAND ANTENNA

- Covers 117 – 137 MHz, 224 – 400 MHz

Antenna contains :

- 2 dipoles for Civil Band
- 6 dipoles for Military Airband
- Uses "N" Type connector

£59.95

COME AND VISIT OUR SHOWROOMS

OPEN MON-FRI 9.30-5.30

ALL GOODS SHIPPED FOR 24 HR DELIVERY

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

the new ROBERTS DAB collection

Enjoy the STUNNING QUALITY of DAB digital radio

RD-3 GEMINI 3

Mains/battery portable DAB/FM radio

- Easy to read multi-function LCD display
- 20 station presets
- Menu display/selection of all major functions
- Search/Manual tuning
- Rotary controls
- External DAB aerial socket
- AC mains socket
- 6 x LR14 (C size) batteries
- Size mm 260w x 160h x 76d

NEW

£139.00 P&P £10 3 CHEQUES OF £49.66

RD-6 GEMINI 6

DAB / FM Mains radio with RDS display

- Long throw speaker
- 5 W power output
- 10 presets
- Full remote control
- Clock (which remains on)
- Digital Optical Output
- Tone control
- Headphone Socket

NEW

£179.99 P&P £10 3 CHEQUES OF £63.33

RD-4 GEMINI 4

Mains/battery Portable Personal DAB Digital Radio

- Joystick control of tuning/volume
- Select stations by name
- 10 Station Pre-sets
- Search/Manual tuning
- Clock/Date display
- 6 Preset tone settings
- 20 hour battery life (3x AA size - supplied)
- External Power Adaptor
- AC Adaptor included
- 65(w) x 110(h) x 20(d) mm

NEW

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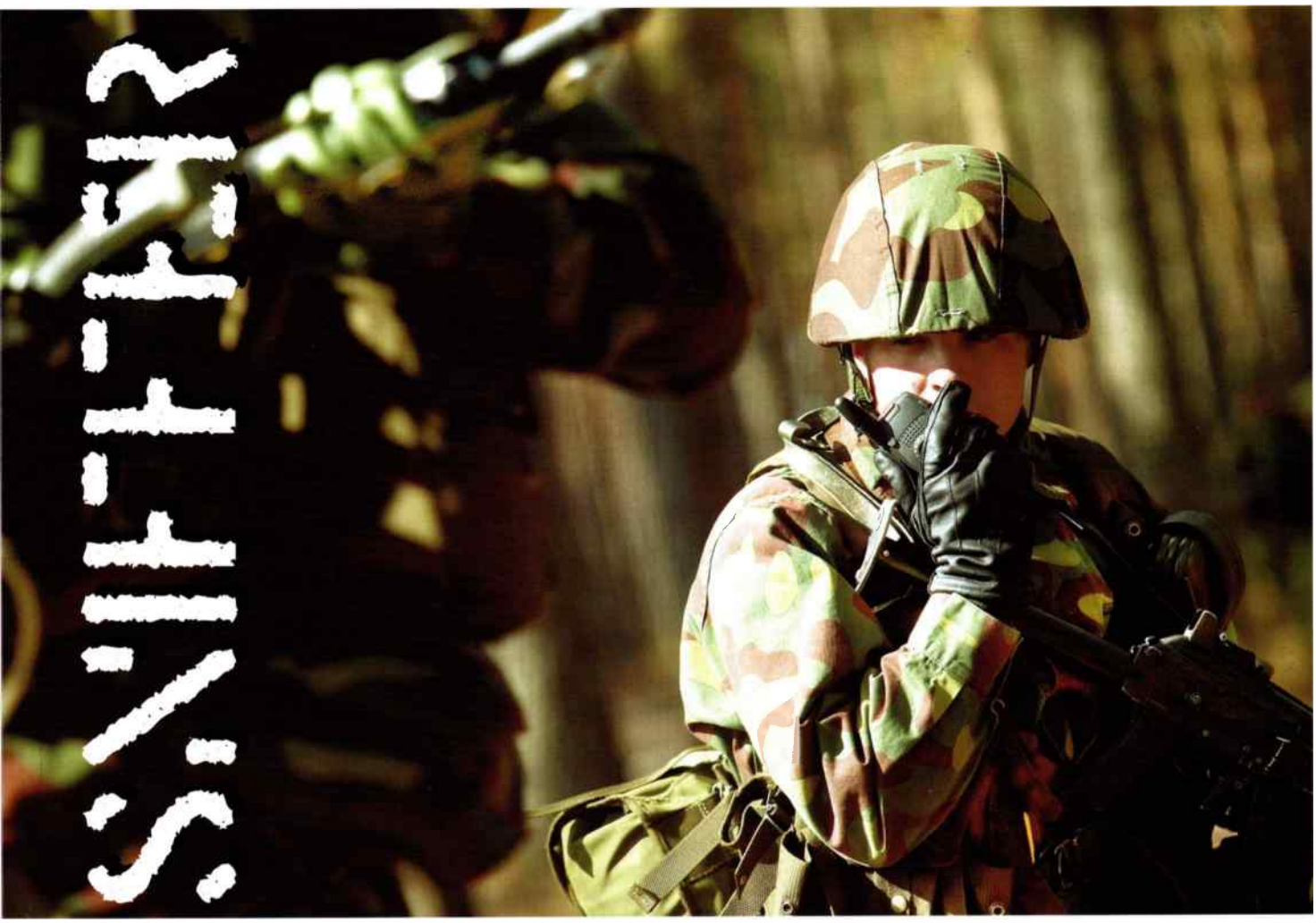


TrunkSniffer reviewed

Another long term trunked radio enthusiast and author of Midland Scanner website, Melvyn Rattenbury picks up where Terry Bain left off and takes an in-depth look at the operation of TrunkSniffer.

I have been taking an interest in MPT1327 type trunked networks for some time now. The only problem with monitoring these types of transmissions, is that there are no scanners available that will automatically track conversations when the system instructs a frequency change to the network users' radios. I have previously experienced software which does the job very well, but that needs an external modem to allow it to function.

The only problem I found with this modem based solution, was the price! It's fine for professional radio engineers, but a little steep for enthusiasts. Additionally, you need to send your hard earned cash to the other side of the world and just hope that you would get what you have paid for - which can be a concern for those of a nervous disposition.

Then I heard of a software based decoding and control solution, which you could download and try out before you buy. And not only that, if you like it you pay for it on-line. This results in an unlock code being returned to enable the program fully. A method which in my opinion makes for a lot less hassle. Not only that, but you don't need any external hardware, as *TrunkSniffer* is totally software based. I really had to find out if it was as good as it sounded.

The *TrunkSniffer* website boasts the following, "TrunkSniffer is a revolutionary monitoring software for MPT1327 trunked radio networks. It works by sampling the audio from any radio receiver capable of tuning the frequencies of the control channels, and extracting and decoding the FSK data. This data is then presented in a very ergonomic and pleasing user interface, which makes monitoring these kind of networks an excellent experience.

For the professional user, decoding of control frames can help in diagnosing network problems (registration failures, call time-outs, RU roaming, etc.)".

TrunkSniffer Pro is now available from **www.trunksniffer.com** There is also a

reduced function, cheaper, version for the less demanding user planned for the near future. The *TrunkSniffer Pro* author **Mike Puchol** was very keen for his program to be reviewed, something that always instils confidence with me.

What Is Required?

In order to use *TrunkSniffer* there are some essential items required, these are, a suitable (computer controlled) receiver, a PC moderately capable (PII 200MHz) PC running *Windows*, installed soundcard and audio lead to interconnect the radio and the PC. Also needed is an RS-232 cable for connection to the serial port.

First impression

Initially, when I tried *TrunkSniffer* my impression was one of trepidation. I had a play around with it, but to be honest, I found it very daunting. I had a brief attempt at getting it running and must admit I nearly gave up. Mike chased me up, asking if I had started the review. I relayed my findings to him and he soon had me up and running.

I explained to him that I found it a little daunting. You see after using *FTrunk* I found *TrunkSniffer* a completely different 'ball game' when it came to getting set up.

Mike's solution was create some video step-by-step help files in Macromedia *Flash* format. Incidentally, these animated help files can be downloaded from the *TrunkSniffer* Yahoo group - see section at the end. By making use of this new form of help, I wanted to see if I could achieve the essential stage of creating a 'Network Profile'.

I chose the program option which allows you enter a control channel frequency. *TrunkSniffer* then identifies the system in use, determining its system code, network ID and other information required for the software to work.

In Use

First of all, I searched on a second receiver for an MPT1327 control channel. I then entered the frequency into the appropriate dialog box in the *TrunkSniffer* window. The software automatically tunes the connected receiver, in my case a UBC780XLT to that frequency. Next, by using the 'Audio Tuner' function, I was able to collect all the information required to set-up the parameters for the new network definition in *TrunkSniffer*. With the 'Audio Tuner' tool armed with this information, I went to the next stage, 'Create/Edit' profile.

Since I already knew the frequencies in use by the trunked network, I entered them along with the control channel data and then did a 'Network Hunt' as the system I was investigating uses a custom band plan as opposed to a logical one, where the frequencies fall into a 'normal 'channel allocation.

It was very interesting to watch *TrunkSniffer* going about its business identifying the channel numbers used for each frequency and when it had found the allocated channel numbers it stored these. Now all I had to do was save the profile. Once saved, the profile can then be edited at any time by clicking on properties from the drop down menu.

The next thing to do, is monitor the trunked network for a while to establish the identify of the radios used by the system subscribers (users) to be monitored. As with just about all trunked networks, there are many different users on the system. Once I had this information I was able to create a 'Fleet'.

Then with the 'Fleet' created, I could then filter out all other users and monitor only the fleet members' conversations. Or with the click of a mouse, I could again monitor all users. This facility allows you to check if anyone new has popped up on the network. It operates via the list of available fleets that have been created.

This is a feature I grew to really like. If you uncheck a fleet then it's activity will not be displayed. So, say if you deselected them all and select 'All Others', you can monitor for any new (i.e. undefined) users on the network. Or, if you wish to monitor just one user, then you can easily just check the fleet of interest and all others would be ignored. Brilliant! What's more, you can at any time edit any of the 'Feets' by clicking on their respective entries in the 'Fleets List' and then right clicking and select Edit (or Delete if you want).

On occasions this feature appeared unstable, sometimes it would work when a track was in progress, sometimes it wouldn't, requiring me to stop *TrunkSniffer* from tracking the network. Sometimes this would not work either and I would have to completely close the program down and restart it, only then would it work faultlessly - Mike will no doubt be investigating.

The only problem I see here is each frequency used is allocated a channel number by the network and

The TrunkSniffer main monitoring window with traffic displayed.

TRUNKSNIFFER2

TrunkSniffer requires this information for it to work. To get up and running you will need a base frequency e.g. a trunked system in the UK operating on the 440-445MHz band would require a base frequency entered manually by the *TrunkSniffer* user. The problem being, for me at least, is knowing the base frequency, eg. a UK 440MHz system at 12.5kHz steps runs like this 440.0125 = Ch1, 440.025 = Ch2, 440.0375 = Ch3 on so on. Therefore, your base frequency would be 440.0125 as that is Ch1. If you get stuck at this point, then you can quite easily ask on the *TrunkSniffer* Yahoo group.

Some trunked networks use a custom band plan, which means the channel numbers are not allocated in any logical format. Fortuitously, *TrunkSniffer* caters for this, with a feature called 'AutoIdent'. With this function activated, all frequencies used are scanned and identified and automatically stored. It's when using this feature you can see where the name *TrunkSniffer* originates.

As I mentioned at the beginning, initially I found the use of *TrunkSniffer* quite daunting. I struggled with it and it took a lot of hounding the author to get it right. However, once I had it set up and running I didn't look back and went off searching for new systems and users, creating fleets to my heart's content!

Incidentally, any profiles that you create can be uploaded to the *TrunkSniffer* Yahoo group. In turn, you can download profiles that have already been submitted by other group members. One thing, I found a slight inconvenience is that the control channel frequency has to be reset every time you open a profile. This is no great task and can easily be done with a mouse click and the TSC menu.

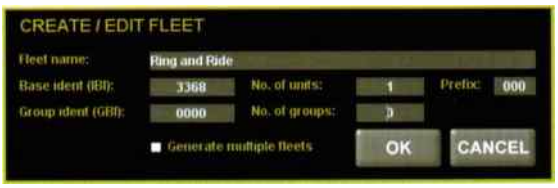
Mike tells me this will be changed in the next release of *TrunkSniffer*. As will adding user names to individual radios operating on the network rather than just numeral identifiers decoded by *TrunkSniffer*.

With all your different network profiles set up and saved, you can monitor any of them in an instant by using the drop-down menu provided.

Network Hunt

Some trunked systems change their control channel from time-to-time or indeed continuously on some systems. No problem! *TrunkSniffer* caters for this by doing an automatic 'network hunt' when a control channel is dropped *TrunkSniffer* whizzes off searching for the new control channel and, when found, monitors the radio network again with little or no interruptions of transmissions. Lovely! You can decide what you want displaying by either checking or unchecking certain options from the fourth menu on the top tool bar. On the subject of the top 'menu' bar, I'm not sure that I like its appearance. You see it has icons and not text as is more usual. Some of the images used for the menu don't really mean a lot to me. For instance one of the menu's icons comprises of three building blocks which does not mean a lot to me, I would have preferred text to the images used - a small gripe.

Getting back to what is displayed by clicking on the magnifying glass, See what I mean, I think text such as 'Display' for instance, would be much better, you are presented with a drop down menu from which you can select which information you require displaying in the *TrunkSniffer* main window



● *Here is where Fleet data lives.*

such as users registering with the network, (Turning radios on). I run with this option selected, as I find the feature rather brilliant. Status, short data messages and other items can also be displayed if you wish.

Recording

Another nice feature provided by *TrunkSniffer* is the ability to record the off-air audio on the PC's hard disk. This can be done by saving the captured audio as either an MP3 or a PCM file. I tried this out and found it worked faultlessly. The only thing I would like to see here, is the option to leave it recording and the recording to continue until you stop it. Perhaps I should explain a little better. As it stands now, the recording feature will record one conversation at a time so if you leave it running all day when you come to view the recordings in the folder you specified for saving them to you will see lots and lots of MP3 format files for each conversation as opposed to one file that has recorded continuously. Of course this feature would have to be VOX activated otherwise there would be a lot of dead air between transmissions. I don't know if this is possible but I would prefer it that way.

Receiver Display

The receiver I use in conjunction with *TrunkSniffer* is a Uniden UBC780XLT. The display on this radio when tracking with *TrunkSniffer* showed the frequency of the control channel when no voice was active. The alpha tags defaulted to 'Trunksniffer.com'. When the '780 was switched to a voice channel, the frequency would be displayed along with the radio ID's or/and the fleet name. I found this to be an excellent combination. By using one of the other compatible radios you'll not enjoy this additional functionality which is provided by the UBC780XLT radio's extended display.

Who Uses Trunked Radio?

Apart from law enforcement agencies in the USA and two in the United Kingdom, who use a different protocol. The main users of trunked systems utilise the MPT1327 standard. Here in the UK, MPT1327 trunked radio networks are used by all Rail companies as well as all Water, Gas and Electricity utilities. Security firms, taxis, plumbers, they all use them for effective communications. Also, at the time of writing, news comes in that in the UK, Dolphin TETRA is due breath its last breath at the end of July 2004.

Most Dolphin users are expected to switch to Fleetcomm, a nation-wide provider who operating in the 170-184MHz area. MPT1327 is also used by thousands of other companies who use networks run by radio communications companies such as Zycall Ltd and National Band 3 Ltd. In Australia MPT1327 trunking is used by the State of Victoria's State Mobile Radio system. Most large UK airports now have a trunked system in the 440-445MHz area.

In the UK's midlands area, MPT1327 is being used by city centre retail networks. This is sometimes known as Shopwatch, however all the users of the trunked systems I am aware of go under the guise of Retail Radio. Another user of interest is the Scottish ambulance service.

Final Thoughts

As I mentioned this earlier, I found this *TrunkSniffer* a little daunting at first, but don't let this put you off. I'm

Receivers Compatible with *TrunkSniffer*

AOR

AR8200
AR5000
AR8600
AR8000*
*Testing with this receiver has not been extensive and therefore it's not recommended for use with *TrunkSniffer*. If registered users wish to work with this receiver then they need to contact the author.

Icom

IC-PCR1000
IC-PCR100

Kenwood

TH-F6/F7

Alinco

DJ-X2000
The Alinco DJ-X2000 features serial control, but is extremely slow. To tune a frequency requires each digit to be sent individually, with a pause of 20ms between digits. Use of this receiver with *TrunkSniffer* is supported, but neither guaranteed nor recommended, so no complaints or technical support questions regarding this receiver can be answered.)

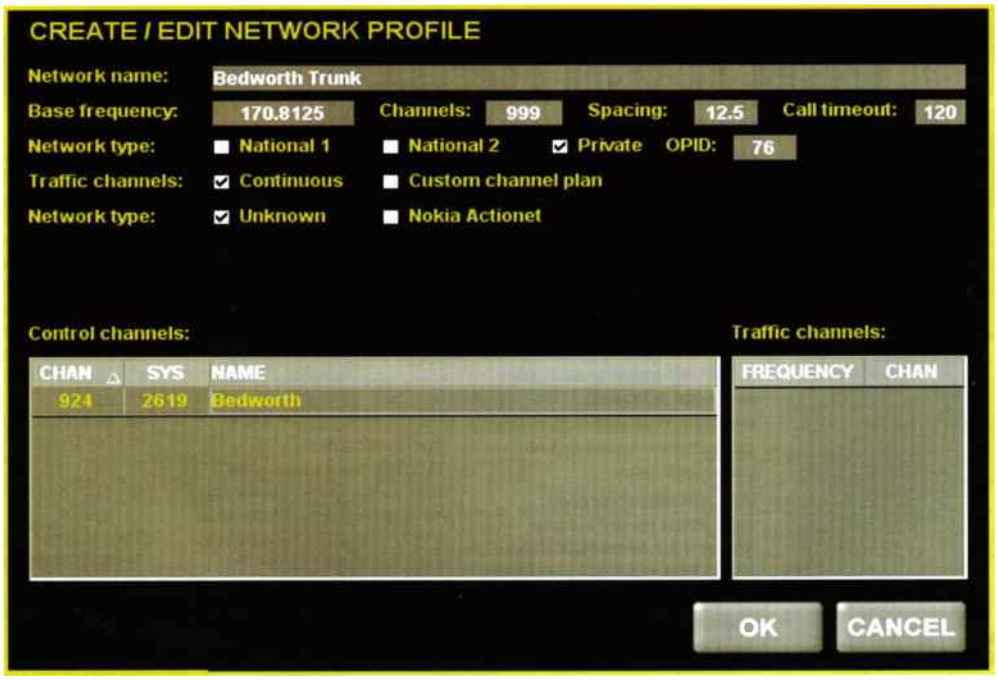
Uniden

UBC780XLT

Coming in the next version of this software:

TrunkSniffer is developing fast and its author, Mike Puchol says that the next release will provide the following:

- Support for decoding two control channels simultaneously.
- Individual unit naming and filtering within fleets. i.e. you will create a fleet, and inside the fleet the individual units - then you can choose which individual units to filter or not.
- Option to only track GTCs that go to known traffic channels, i.e. to cure system errors or bad GTCs.
- Support for Icom CI-V receivers. External script execution upon receiving certain codewords, i.e. run a script when a unit tries to register but fails, etc.



● *The Network Profile dialog box where all the key control parameters are entered.*

sure if I had to work it out myself and read the instructions properly then it would have all fitted into place but instead I opted for the easier option and kept pestering the author as to how each stage should be done and I'm sure I got up his nose a few times. I'd really like to express my thanks to Mike for his patience.

Now that I have *TrunkSniffer* running, I can't stop playing with it. Watching the screens updating as the program is busy working is great, as you can see messages being sent and even radios logging on, Pressel on, Pressel off, etc.

One thing that I found puzzling and it only happened on certain networks, is that I would get a 'Voice call' GTC 001, (go to channel 1), the software would do as it was told and go to ch001 it would then not find any transmission on ch001. Then it would sit on this channel until it timed out since the software didn't receive data from the MPT1327 signalling to go back to the control channel. This behaviour wasn't noted with most systems, but it needs mentioning. I did note that the problem only occurred when I had 'All others' selected in the list of users to monitor, so if you are interested in monitoring certain users/fleets then this problem will not arise.

Comparison

How does *TrunkSniffer* compare with the competition? The program *FTrunk* is the only other product that I am personally familiar with, therefore I can only make any comparisons between the two. Both work extremely well, but I would have to say *FTrunk* is the easier of the two to operate initially.Once you are up on your feet with *TrunkSniffer* then this will not be an issue. *FTrunk* uses a modem which is claimed to make it more stable, but to be honest I did not find *TrunkSniffer* unstable at all.

TrunkSniffer is software only, relying on a soundcard connection. Both I believe can be run off one or two receivers. Also the editing in *TrunkSniffer* is done via the software interface which I really liked whereas with *FTrunk* it is done by going into the program files and editing with *Notepad*. Also *TrunkSniffer* has two big things in its favour. One you can trial before you buy. Which brings us to the next big plus...the price!

TrunkSniffer sells for 90 Euros, which at today's exchange rate means it cost about £65 which is roughly near enough £100 cheaper than *FTrunk*. Plus you can purchase it straight away. No waiting for the postman and no surprise import taxes. Every now and again something will come along that you really get to love. This was the case for me with *TrunkSniffer*. As I used it more I grew to really look forward to using it and now I would be at a complete loss without it.

To obtain your own fully functional but timed, trial copy of *TrunkSniffer* visit **www.trunksniffer.com** For those who don't have access to the Internet, look out for the *SWM Radio Software* disk, details in the November issue of *SWM*

As is the case with many other specialist interest groups, there has been a user group for *TrunkSniffer* created by enthusiasts on the Yahoo Groups servers on the Internet. As you probably realise there is a SWM-Readers resource there too. These groups are very handy indeed as they allow interchange of views, files and more. To join the *TrunkSniffer* group visit **http://groups.yahoo.com/groups/trunksniffer/** you'll also need to acquire a Yahoo membership if you haven't already got one before you can join.

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new icom IC-R20 " dualwatch" receiver

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

Ultra wideband receiver:
The IC-R20 is the first handheld receiver which covers 150 kHz to 3304.999MHz in SSB and CW modes as well as AM, FM, WFM modes.

Dualwatch capability:
The IC-R20 is a dualwatch receiver. which allows you to receive two channels simultaneously. You can listen to a broadcast station, TV audio, ham marine, aviation or utility communications, while scanning or even monitoring another channel. With two tuning knobs on the top of the receiver, operation such as tuning a channel while listening to another channel is made easy: the large display shows both band settings.

Built-In 260 minute Digital (audio) recorder:
The IC-R20 has a built-in 32MB Digital (audio) recorder, which allows you to record received audio for up to 260 minutes. The IC recorder is useful in a variety of ways, like recording wireless microphone audio at a meeting. Recording qualities are selectable from HQ, SP and LP modes and playing speed is adjustable from 0.5 to 1.5. Used with the optional CS-R20, you can transfer the recorded contents to your PC and store them.

- Auto memory write scan.
- Total of 1250 memory channels. 26 memory banks with 8-character comment
- 11 hours of continuous receive capability (FM mode, at Max. AF audio.)
- Built-in ferrite bar antenna for AM and earphone cord antenna for FM
- VSC, CTCSS and DTCS tone squelch:

The VSC (Voice squelch control) opens the squelch only when a modulated signal is detected and ignores unmodulated, beat noise signals. The CTCSS and DTCS tones provide quiet stand-by while waiting for a matched tone signal. This is convenient for monitoring a specified repeater, station, etc. Tone scan detects a tone frequency used in a channel. The pocket beep function alerts you with a beep sound when a matched tone signal is received. Bandscope Function

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Utilising the famous DSP Module from BH Instruments, our engineers have installed this superb device into three of our most popular all band receivers. This fantastic new installation (as featured in Short Wave Magazine, Dec' 03) will drastically reduce noise on ANY MODE on any band. All the DSP functions are accessible from the top panel with a clear indication of DSP status.

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Full feature DSP audio noise reduction filtering professionally installed by ML&S

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- APF (Audio Peak Filter) function reduces interference from signals superimposed over a desired signal by adjusting the centre frequency of the audio filter
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- 1000 Memory Channels providing versatile operating possibilities
- An RS-232C serial port is located on the rear panel of the receiver for direct connection to a PC
- Versatile scanning functions allowing you to scan quickly and more effectively
- Selectable tuning steps
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- Optional voice synthesiser announces the frequency setting facility

Specifications:

Frequency Coverage :	0.100-1999.99
Mode :	SSB (USB,LSB) AM CW,FM,WFM
Dimensions :	287(W) x 112(H) x 309(D) mm
Weight :	7.0kg

Accessories:

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Maldol GDX-30 Wide Band Discone Antenna	£49.95
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APR	19 %
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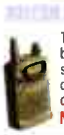

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Starting Out Part 4

Back due to reader demand, this month, we continue the rerun of the excellent beginner series from the past brought to you by the late Brian Oddy G3FEX.

In addition to noting in a log book the date, time and frequency of a broadcast station received while DXing, it is also customary to detail some of the other facts about the signal and reception at the time, so that a more complete record may be obtained. Although a listener could devise a system of his own for recording such information, it is advisable to make use of one of the standard formats which are internationally understood by other listeners and broadcasters. This is especially important if reception reports are going to be sent to broadcasters, as they need the information in a concise and accurate form for assessment with the minimum of effort.

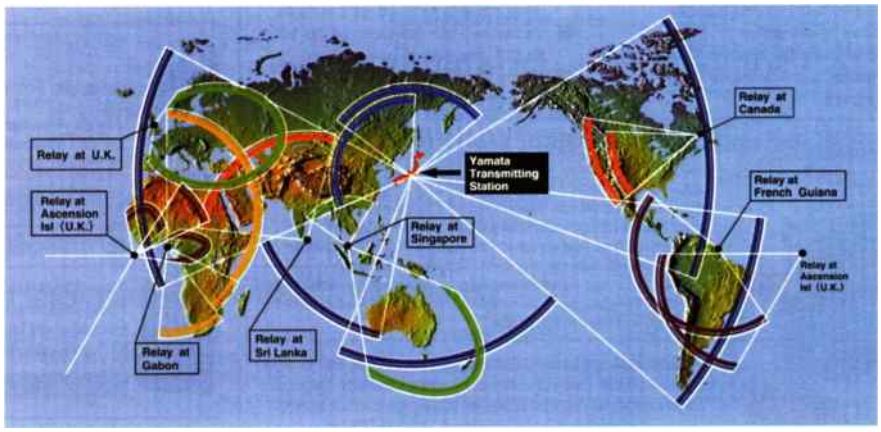
In the most widely used system, a letter signifies a particular aspect of reception followed by a rating figure. The letters used in the full system spell SINPFEMO and the meaning of each letter is (S) Signal Strength, (I) Interference, (P) Propagation disturbance, (F) Frequency of Fading, (E) Modulation quality, (M) Modulation depth, (O) Overall merit. The rating figures from 1 to 5 and their significance is indicated in **Fig. 4.1**.

The full SINPFEMO code is usually shortened by most listeners to SINPO, dispensing with the frequency of fading and modulation depth ratings. A signal which is very loud and clear and free from interference, static, noise, fading and distortion would be indicated as SINPO 55555 - it is important to note that the code is written in this format and not as S5, I5, N5, P5, O5. Apart from broadcasts via local transmitting stations, very few would actually qualify for S5 and O5 ratings, although all other ratings are possible. In order to ascertain the SINPO ratings for a particular broadcast, each aspect of the signal must be carefully analysed and enthusiasm must not be allowed to influence the value chosen!

Signal Strength

Signal strength (S) is perhaps one of the easiest ratings to determine, since the signal can be compared with others. Many receivers are fitted with an 'S' meter or employ a string of l.e.d.s or bars on an l.c.d. to indicate signal strength. Although some of them are calibrated from 1 to 5 in accordance with SINPO code 'S' values, many read 1 to 9 plus dB-over-S9 in accordance with the RST code used by amateur and commercial operators. Some meters are calibrated in 'dB above one microvolt', indicating the signal level at the antenna terminals, but these are often inaccurate and should not be taken too seriously! Regardless of the type of calibration, such meters enable the strength of all signals to be easily compare.

Transmissions by NHK WORLD · RADIO JAPAN



RADIO JAPAN

Interference

The rating for interference (I) refers to the subjective effect of an unwanted signal on or close to the frequency of the desired one. Generally speaking a weak background from another broadcaster sharing the same frequency will be less objectionable than a whistle (heterodyne) caused by a nearby carrier beating with the desired signal - this is especially true if the resulting beat note is around 1 or 2kHz since the human ear is more sensitive to low frequencies.

Noise

The noise rating (N) is largely determined by the prevailing atmospheric noise and bears no relation to the noise introduced by a receiver, which can be ignored. Except during periods of ionospheric disturbances, summer static and electrified rain the rating is seldom worse than N3 and even during good conditions when the higher frequencies may be employed, it is unlikely to be better than N4.

Symbol & Meaning		Rating 1	2	3	4	5
S	Signal Strength	Just Audible	Poor	Fair	Good	Excellent
I	Interference	Extreme	Severe	Moderate	Slight	None
N	Noise	Extreme	Severe	Moderate	Slight	None
P	Propagation Disturbance	Extreme	Severe	Moderate	Slight	None
F	Type of Fading	Very Rapid	Fast	Moderate	Slow	None
E	Modulation Quality	Very Poor	Poor	Fair	Good	Excellent
M	Modulation Depth	Over Modulated	Low Level	Fair	Good	Medium
O	Overall Merit	Unusable	Poor	Fair	Good	Excellent

Fig. 4.1.

Fig. 4.2: A typical log book.

Date	Time	Frequency	Station	Location	SINPO	Remarks
3/10/87	*1500*	*21.590*	*Radio RSA*	*Johannesburg*	*44444*	*'Mailbag' Programme*
5/10/87	*1900*	*17/790*	*HCJB*	*Quito*	*33333*	*Sent QSL 6/10/87*
5/10/87	*2248*	*15.145*	*WINB*	*Red Lion, USA*	*32233*	

Propagation

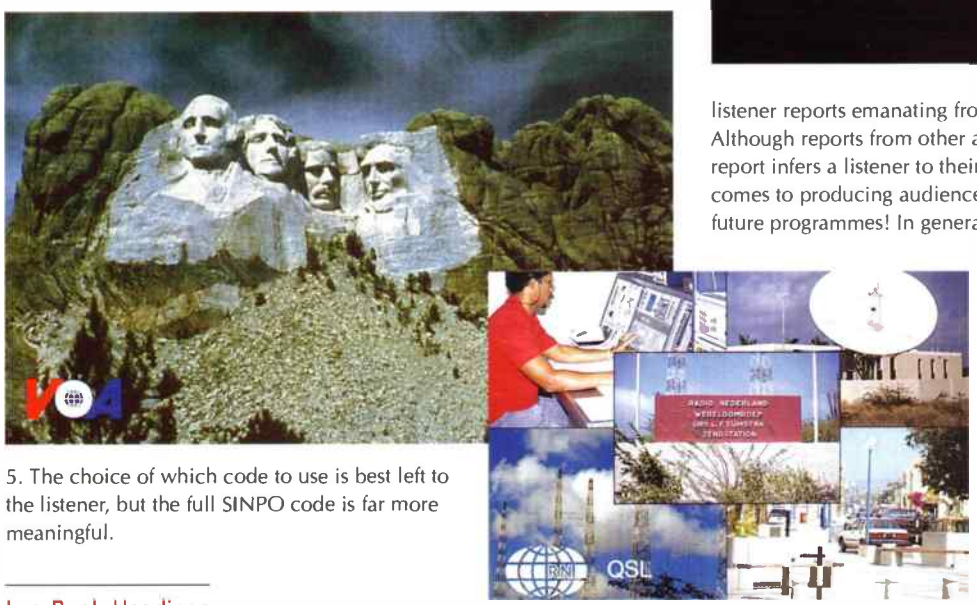
Propagation disturbance (P) is related to the intensity of atmospheric noise and the degree of fading present. A high noise level and rapid fading mutilating the programme would rate as P1, but similar conditions with the programme acceptable might rate P3. Shallow fades with little or no noise would rate as P4 or P5.

Overall Merit

To obtain the figure for overall merit (O), simply add together all of the individual ratings and then divide the total by the number of ratings to arrive at the average figure, to the nearest whole number.

Propagation

Some listeners find it difficult to tell the difference between man made interference (I) and the atmospheric noises (N) or to appreciate what is meant by propagation disturbances (P) and so decide to drop them from the SINPO code and use the much simpler SIO code. Since very few signals qualify for a rating of S5 or O5 and the ratings at the other end of the scale indicate an unusable signal the SIO code ignores ratings 1 and



5. The choice of which code to use is best left to the listener, but the full SINPO code is far more meaningful.

Log Book Headings

The typical headings for each page of a log book are depicted in **Fig. 4.2**. Note that a remarks section has been included so that the programme details and other points in connection with a broadcast may be noted for future use. All entries in the log book should be made at the time of reception, but before noting down the SINPO/SIO ratings, it is advisable to listen carefully to the signal for about 15 minutes to make quite sure that they are accurate as they may be used to form the basis of a reception report.

QSL Cards

Listeners have been sending reception reports to broadcasters since the earliest days of radio and as a mark of their appreciation, they either confirm the report by letter, or more often send a colourful verification card, known as a QSL card. The term QSL is part of the international Q code used by commercial and amateur c.w. operators and means "I give you confirmation of receipt". Collecting these colourful QSL cards is an enjoyable offshoot of DXing and many listeners have hundreds of cards in their collection!

A considerable amount of engineering expertise will have gone into choosing the most suitable operating frequency and time to ensure that a broadcast will reach listeners in a chosen target area, consequently the

listener reports emanating from the area of primary interest to them. Although reports from other areas are only of academic interest, every report infers a listener to their programmes - an important aspect when it comes to producing audience research figures and obtaining budgets for future programmes! In general anyone who cares to send along a meaningful reception report to a broadcaster can expect to receive their QSL by return. However, some take many months to reply and a few do not QSL at all, so do not expect a one hundred percent return rate.

Honesty

It is important to be honest about all aspects in a reception report and to bear in mind that poor SINPO ratings and adverse comments about a programme will not affect the QSL response. It is also worth remembering that a detailed reception report compiled during several days will be of far more use than one covering a single broadcast.

Reports

The report could be sent in the form of a letter, but since it would be unlikely to stand out in a pile of mail, a much better idea would be to design an eye catching personalised form and then get it photocopied, having one specially printed could prove expensive, but the use of cheap colour ink jet printers can produce very successful results. Some broadcasters and certain DX Clubs can provide suitable printed forms.

Before filling in the details on the form, it is advisable to ascertain

Starting Out

Part 4

the intended target area, the frequency of transmission ands the duration of the broadcasts by referring to either a current broadcast schedule for the station concerned or to an up-to-date station guide, such as the *International Listening Guide* from Germany.

The report should contain the following information:

(1) Your **name** and **address** on each sheet, printed in block capitals - be sure to include your country!
(2) The **date** written in full - not as 10/06/06 - since this can mean 6 October 2004 in some countries!
(3) Quote **time** in UTC (=GMT).
(4) The frequency in MHz - if unknown quote the wave band involved in metres.
(5) The **SINPO** or **SIO** ratings.
(6) Detail **stations adjacent** to the frequency.
(7) Give at least five minutes of **detailed programme information**.
(8) Detail your **receiver** - quote manufacturer and model number, also describe it, e.g. domestic portable or a communications receiver.
(9) Give details of the **antenna** in use. If possible, send your report by airmail, as soon as it is completed. Out-of-date reports are of little use form the technical viewpoint, although your comments about their programmes will still be valid.

Proceed With Caution

The unwary newcomer to short wave listening should proceed with caution when logging a far flung s.w. broadcast station for the first time, as some broadcasters make use of modern technology to ensure that their signals reach the chosen target area, which may deceive the listener!

Direct Transmissions

The majority of broadcasts heard on the s.w. bands reach the listener by means of a direct transmission from the country concerned. The output of a broadcasting centre, often located in the heart of a majority city, is frequently linked by specially equalised land-line, ISDN or satellite to the transmitting station, which can be located several hundred kilometres away at a suitable site in open country.

The final link in the chain between broadcaster and listener is, however, unpredictable since it depends on propagation conditions prevailing on the normally optimum higher frequency s.w. bands, which are used for long distance direct broadcasting, these tend to be generally unstable due to a number of continuously changing factors (see 'Starting Out' *SWM* June & July 2004).

In an attempt to ensure that a programme reaches a chosen target area a broadcast may often back up with a transmission on a less effective lower frequency, in case the m.u.f. falls. However, this does not always work, indeed the provision of a reliable long distance service may prove to be very difficult, if not impossible.

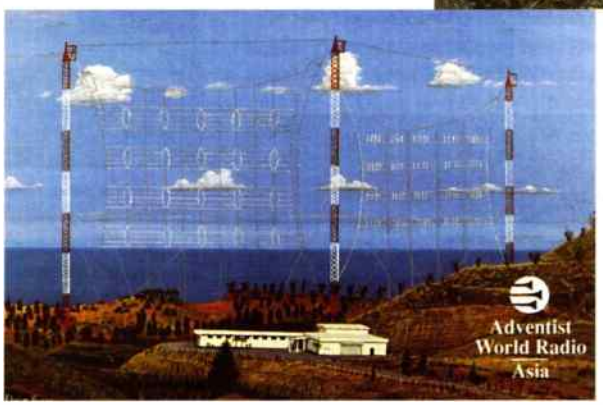
Relays

One way of tackling the problem is to employ a relay station located in a more suitable site to broadcast the programme to the chosen area. The programmes can be fed to these relay stations by means of a single sideband (s.s.b.) or independent sideband (i.s.b.) s.w. transmitters, called feeders, which develop high peak powers and use directional beam antennas. However, more often another form of relay system is used - microwave satellite links.

The use of these relay stations can be very confusing, even to the more experienced listener, since there is no way of distinguishing a relay transmitter from one located in the originating country. For example, the famous words broadcast by the BBC World Service, "This is London..." could be coming from one or more of its UK-based transmitters are Woofferton, Orfordness, Rampisham or Skelton - but they could also be coming from relay transmitters located on Ascension Is., Misarah Is. or via Canada, Cyprus, Lesotho, USA, West Indies or even Singapore!

Some of the relay stations used by the major broadcasters are owned and used exclusively by particular BC stations, but many are operated on a shared basis. Some of the BBC transmitters located in the UK also relay broadcasts from Voice of America (VoA) in Washington and RCI in Montreal, Canada, Voice of Free China and WYFR in Oakland, USA, share the use of transmitter are Taipei, Taiwan and Okeechobee in Florida - all very confusing - unless you know the facts!

Before making an entry in the log or senfding a report to any of the stations, it is advisable to check if the broadcast was a direct transmission or via relay. But how do you check? The only simple way is to obtain a copy of the station's latest broadcast schedule, alternatively, refer to a guidebook such as the *International Listening Guide*.



Some broadcasts to a chosen target area are made on two frequencies within the same band at the same time, but via different routes - one by direct transmission and the other through a relay, with the choice for best reception left to the listener. A typical example of this technique is the early morning broadcast from Radio Japan to Europe, which takes place on two frequencies in the 19m band - one direct from Tokyo - the other via a relay in Moyabi, Gabon.

Several new relay stations are presently under construction, though many dedicated listeners hope this trend will not continue because their main interest is inn direct-transmission DXing, no matter how weak the signal may be! Perhaps it is worth remembering that many of these relay stations are themselves located in some of the world's DX spots and that they make good pointers to reception conditions.

Starting Out

Next time...

In the next instalment of Starting Out we get a little more technical, looking at some theory behind transmitters.

SSB Utilities

Ben Hogan, *do SWM Editorial Offices*
E-mail *ssb.utils@pwpublishing.ltd.uk*

Strange things have been happening on h.f. over the last few weeks. Two frequencies fired up in mid-May. Audible throughout much of the world on 10.512 and 11.363MHz and transmitting the weirdest noises that have been likened to the sounds that whales make. Although very different from whales, that is probably the easiest short term to describe the noise. It made no difference whether you listened on upper or lower sideband, the sound was the same although it didn't appear that the transmissions were simulcasts of the same source. The Engima 2000 staff have, in the past, given a similar sounding set of stations the designation 'XM'.

As to their purpose, if any, little is known. Likewise, there is barely any information as to the source of the transmissions although the strength in Europe may indicate that they emanate from the Mediterranean area. A NATO signals base at Palermo, Sicily has been suggested, although other monitors believe that the source may be two naval bases in Florida, USA. Often these transmissions are heard on two or more frequencies with different signals. Frequencies in the past have included 4.376, 4.410, 4.420, 4.706, 4.740, 4.552, 5.178, 5.180, 5.435, 6.584, 6.695, 6.752, 7.631 and 8.984MHz.

It's by no means certain that the strange signals are indeed any form of communication at all. It could be that they are a form of jamming, or a means of 'hogging' a frequency to dissuade other users from 'parking' on it. Or it just may be faulty equipment or sloppy transmitter installation causing feedback to be transmitted.

Similar sounds were evident on 8.776 and 13.155MHz u.s.b. in the late 1990s and at that time it was thought that they were caused by some feedback circuit noise inadvertently being transmitted from US Navy remote transmitters. At the time of writing they have disappeared but I have no doubt that they'll be back!

North Korea

North Korea is quite often in the news these days. The country is seen as a secretive and sinister presence in Asia. The North Koreans, like any other nation, have diplomatic representation in other countries. Their embassy in Havana seems to have occasional skeds with a station thought to be connected with the Argentine Communist Party.

The latest frequencies have swung between 6.700 and 7.000MHz c.w. mode. Sometimes the messages have been headed

BAS Red Twin Otter.

ZM79 and MF29/65. Other possible frequencies are in the 10MHz range, notably 10.776.5, 10.784, 10.880, 10.888 and 10.889.5MHz. SSB has been heard on 10.888 with RTTY and c.w. being monitored on all frequencies but it seems that almost any mode can appear on any of them.

Transmission times, I'm afraid are as indeterminate as the frequencies but signals between 6.700-7.000 have been heard from 0400 and 0500 and the 10MHz frequencies between 0200 and 0300.

Comms Options

These days with so many options for communications available it seems rather incongruous that modes such as c.w. over h.f. radio are still in use. The continued existence of communications in this medium is evidence not that nations and organisations are unable or unwilling to embrace new technology but of the fact that these users see the h.f. bands as a crowded noisy environment where their signals can be hidden amongst the mass of noise, broadcast, amateur, commercial and lunacy radio traffic that fills the bands. Clearly h.f. radio is still viable as a means of communication for regimes and groups who are aware that every satellite, landline and mobile telephone is closely monitored by powerful countries and entities.

I am sometimes asked where monitors should be listening for communications from criminals/terrorists. It's quite possible that these sort of people will use radio, whether at v.h.f/.u.h.f. for local communications or h.f. for more distant contacts.

Many amateur radio sets on the market would be the cheapest option for these types of operations, as well as being the easiest to acquire without attracting attention. The segments of the spectrum just outside or on the fringes of the amateur bands would be the first place to begin a search for this kind of activity.

There are some Arabic voice nets on the following frequencies and as I don't speak the language I am unable to comment on the content. Try 7.000, 14.000, 14.090, 14.100,14.186, 14.275, 14.340, 18.075, 21.000, 21.040, 21.050, 21.120 and 21.212MHz. Either u.s.b. or l.s.b. is in use and the operators generally just refer to each other by their names (whether true or false). Likewise there seems to be some more innocuous nets in Arabic on 14.350 and 21.355MHz where the radio traffic seems to be of a more domestic nature.

One excellent broadcaster fluent in Arabic is the BBC's security correspondent, **Frank Gardner**. Frank was shot and very seriously injured on 6 June while filming in a Riyadh suburb. No passers-by came to his aid. Cameraman/Journalist **Simon Cumbers** was killed in the same attack. Frank has extensive experience in the area having been in the army and then banking in the country prior to his successful BBC career. Hopefully, Frank will be back at work soon, fully recovered.

The presence of independent reporters in troubled areas is to the advantage of all protagonists in any conflict. Unbiased reportage, hopefully, curbs excesses of regimes and up until now had a similar effect on revolutionary groups and organisations. All this has now changed commencing with the medieval-style murder of **Nick Berg** on 11 May where the killers involved actually videoed their crime.

Down South

I've received a very interesting letter from **Geoffrey Powell** in Staffordshire in response to the article 'Down South', featured in June *SWM*, which was concerned with monitoring radio traffic from the far south. Although Geoffrey possesses an amateur radio licence, his main interest remains listening for long-range radio traffic from Air Traffic Controls and aircraft. He has QSL letters from about 200 such stations including NASA.

Geoffrey included a copy of a confirmation letter that he received from the Director of the British Antarctic Survey in 1995 confirming his reception report of radio traffic that he received from the BAS Twin Otter aircraft in March of that year. The informative letter includes the ferry flight schedule of the aircraft that Geoffrey heard with the four Otters leaving Rothera Base and travelling via Montevideo, Sao Paulo, Recife and thereafter via Sal Island, Tenerife and Porto, to Fairoaks, the journey taking nine days. I expect the pilots enjoy their trip very much indeed.

Apparently the BAS Otters fly back to the UK in March (or at least they did in 1995) and return to the Antarctic in October. The letter confirms that the aircraft's destination was Fairoaks airfield in the UK. This is of particular interest to me as towards the end of March that year I had occasion to fly out of that airfield on a private flight into Europe. I was travelling with a chap from Iceland and as we walked to the waiting aircraft we both noticed the red Twin Otters.

I don't recall how many there were but they were carrying VP identification. He wondered just whose craft they were and I was able to inform him that they were BAS airplanes. Until now, some nine years later, I had no idea why they were there.

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E-mail roger.bunney@pwpublishing.ltd.uk

Last month I mentioned that the 'CNN NEWSOURCE' Atlantic feeder on *NSS-7*, 21.5°W (11.565GHz-H, SR 6109 + FEC 3/4) had disappeared resulting from a change in PIDS. On 14 May CNN transmissions included a caption advising that encryption would commence on 17 May 1200 - an excellent source of breaking USA news, NASA space activity and international news has gone dark. The Globecast North Atlantic feeder bouquet on *Atlantic Bird 1*, 12.5°W (11.016GHz-H, 20145+3/4) though sometimes providing news, NASA content and USA sporting action is mainly for occasional use and isn't a true substitute for the dedicated news carrier of CNN and the earlier WNS which also encrypted!

Another disappearance in May resulted in a degree of frequency hunting. GranadaMedia sat trucks have for some years used several frequencies (H) on *Telecom 2D* - 8°W at the lower end of the Telecom band whereas the French regionals are at the high-end of Telecom. First was *Intelsat 801* (V), 31.5°W, which had previously been used by ITV regionals both for the early evening news programmes and UK football. Granada were eventually re-located using new frequencies vertically polarised in the *Telecom 2D* Telecom band, this polarity rarely being used on this satellite. For the record, the Granada sat trucks are BT leased downlinking into the London Teleport and a terrestrial microwave link back to the studio. The new vertical frequencies are; Meridian TV - 'BT TES-43' - 12.562GHz-V (usually central South); Meridian TV - 'MERIDIAN 8MBI' 12.574GHz-V [usually S. East]; Anglia TV - 'ANGLIA TES-42' - 12.583GHz-V; Harlech Wales - 'BT TES-41 4' 12.554GHz-V. All use SR5632 + FEC 3/4. The trucks are usually on-air weekdays between about 1640-1715.

The *Telecom* 2D, 8°W satellite has been very busy recently, 5-6 June provided pictures of the Normandy region, beaches, local towns and the religious ceremonies at the war cemeteries, for the 60th anniversary of the D-Day invasion. The French regional sat trucks tend to use from 12.680 to 12.740GHz-H for downlinks, they're usually profuse with test patterns showing origination point - so there'd be no problem resolving signals with a 800mm dish. A band scan around 1800 should resolve several signals. Weekends often result in regional news and sport daytime.

French TV haven't deserted *801* @ 31.5°W so a vertical polarity check over 10.950-11.300GHz might reveal additional activity.

Several heads of state appeared on the D-Day feeds. One was USA President Bush who read a sermon and met with veterans at the American cemetery on 6 June. The 'APTN' feed 'UP4' 10.972GHz-V (4167+5/6) over Eutelsat *W1*, 10°E carried an OB covering the arrival at an Italian airfield from 2200.

Lamenting the loss of the 'CNN NEWSOURCE' feeder, **Alan Richards** (Skegness) comments of life elsewhere on the *NSS-7*. 'BTNA WASHINGTON STREAM' is often linking content from North America into Europe and further east using 11.565 and 11.665GHz-H (5632+3/4). Recently a Colin Powell interview was sent to 'NEW DELHI TV' and part of the *Viewpoint* programme was despatched east into Abu Dhabi . The moral - check the whole Ku-band for sigs.

Telstar-12 15°W revealed a very high strength signal appeared which produced on the Coship scan some 11 TV channels + 16 radio channels, well worth any reader spending an hour checking out the programming. Content appeared to be for the Middle East and SE Asia with channels such as 'MID IRAN'; 'VOA PERSIAN TV'; 'TAMASHA' and 'TZUCHI'. Many have oriental script, others Arabic - 15°W, 12.610GHz-H (19625+2/3).

With the new upmarket *Eutelsat W3A* now at 7°E, it in-the-clear may well be worth checking. There are many EBU distribution feeds, unilaterals, etc., carried over this slot using MPEG 4:2:2 which will not produce any pictures on standard MPEG-2/MPEG-4:2:0 enthusiasts' receivers. A scan early June produced several interesting finds. The BFBS (British Forces Broadcasting Service) carry encrypted TV programme feeds to far flung military outposts. Check 11.327GHz-V, 27500+3/4 for BFBS, also have a look at 11.285GHz-V (27500+3/4).

A little lower a block of EBU feeder channels ex Baghdad are used during the whole day, though not all transmit continuously. These are marked as 'Path 1' (or 2 or 3) and ascend as 11.098; 11.104 and 11.110GHz respectively - all horizontal and running SR4433 + FEC 7/8. Whilst checking the EBU slot one night I caught - 'YSM 001 RTV Serbia DSNG 1' at 11.091GHz-H (6664+7/8). A short news report for 10 minutes and gone. Incidentally the regular ABC NEWS feed up on *Intelsat 707*, 1°W identification 'ABC SCOPUS' still maintains almost 24 hour transmissions in 525-lines feeding via the ABC London office, check out 11.659GHz-V (5632+3/4), when not carrying reports a picture is shown from the ABC Baghdad office.

Long serving readers will recall the excitement of surveillance feeds over the Balkans, originating from American 'spy' aircraft and drogues. The aircraft downlinked output to a security base in the Balkans, it was then uplinked to *Telstar 11*, 37.5°W, which was received unscrambled across Europe and most likely forward hopped into Norad's Command and Control Centre. Pictures seen were of drug, arms and people smugglers and other no-gooders - eventually the 'Balkans multiplex' was scrambled. Included in the 'Balkans multiplex' were CNN (American) programme feeds. **Roy Carman** (Dorking) now reports the 'Balkans multiplex' has moved *en-bloc* to *Telstar 12*, 15°W, 12.546GHz-H (19500+2/3) - still encrypted.

On 5 June the Pope took a day trip to Berne in Switzerland meeting locals at a sports hall. Mid-afternoon and three channels appeared as 'POPE 1 EUROVISION SUI-19' and variations on the same ident theme for 'POPE 2' and 'POPE 3' over *W3A*. A 6MHz channel split showed up as 'Pope 1' 10.961GHz; 'Pope 2' 10.967GHz and 'Pope 3' 10.973GHz - all H 4433 + 7/8. The 'SUI-19' indicates a Swiss sat truck though the Italians provided their own truck 'VIDEOPUI' for coverage at 11.192GHz-H, 5632+3/4.

SESAT, 36°E has come to life. Noting several spikes on the 'Spectralook' a scan followed and revealed signals. An odd clutch of channels originating from the Azerbaijan/Caspian Sea region. All TV channels appear to be free-to-air (FTA). We have - 'CASPIONET' 12.513GHz; 'LIDER TV' (possibly from from Baku as the 'hidden id' says 'Lider TV Aze-Bak-004') 12.522GHz; 'AZTV AZERBAIJAN' 12.533GHz - all H running 4339+ 1/2. An odd 'JSC CONTRIBUTION' (reveals as 'Al Jazeera') with no programming and likely a news feed frequency 12.541GHz-H (5789+3/4); 'OBN BiH 387 3' is next at 12.699GHz-H (4339+2/3). A sweep using vertical polarisation found '2MNAT' TV and radio channel 'RADIO 2M MAROC' encrypted 12.686GHz; finally 'LEONARDO INT' 12.709GHz both V, 4339+1/2.

Sunday, 23 May an emergency at Charles de Gaulle airport, Paris. It was 1030 when pictures became available over 'FRANCE 3 420 6mB' on *Telecom 2D*, 8°W - 12.733GHz-H (4214+7/8). A structure in the Terminal E-2 building had collapsed. Rescue work continued all day as did the 'France 3' truck with updates until the early evening.

The path 1 EBU feed ex Baghdad over *Eutelsat 3A*, 7°E.

VTR countdown into feed for CTV Canada via the ABC feeder 1°W.

Serbian TV news link test card 7°E.


Indian reporter listens to the New Delhi local radio news before his report into the USA networks - re. Sonia Ghandi (*Europe*Star* 45°E).

VTR countdown 'clock' for the French FR3 regional Nantes studio -

CNN NEWSOURCE hits encryption over *NSS-7*.


Heavy pixellation as *Eutelsat 2F3*, 21.5°E moves out into inclined orbit and the signal falls away.


A televised bullfight in Spain, the bulls take over and sorts out the Matadors via *Hispasat* 30°W

DX Television

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

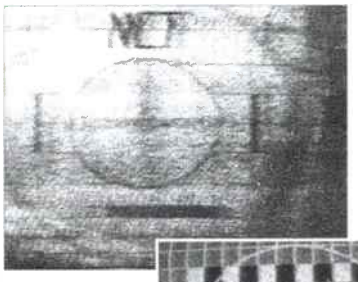

Fig. 1: The Italian NCT test card radiated in the 1980s. It was seen only once!

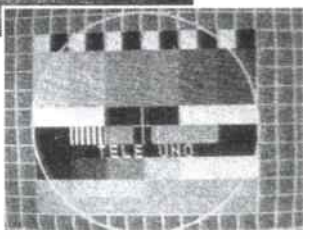

Fig. 2: This test card design was commonly used by Italian private stations during the 1980s.

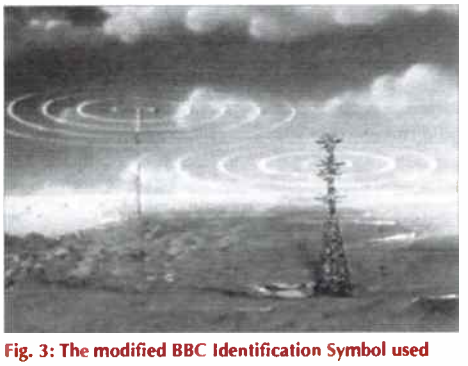

Fig. 3: The modified BBC Identification Symbol used from December 17th, 1949 showing the original 1936 Alexandra Palace tower and the new Sutton Coldfield transmitter when coverage was extended to the Midlands.

The long-awaited Sporadic-E season finally arrived and May's reception was quite eventful with signals arriving from most European countries. So far, openings into Italy have been frequent. Reception from the Middle East was also evident on more than one occasion.

Sporadic-E Reception Reports

On 10 May, a sustained Sporadic-E opening occurred lasting from mid-morning until late evening with a predominance of Spanish and Portuguese signals on Channels E2 and E3. From 1300, **Stephen Michie** (Bristol) and **Peter Barber** (Coventry) identified TVA, an Italian private station just above Channel A; by 1620, TELE A+, another Italian private station devoted to home shopping, was spotted by **Tony Jones** (Basildon).

An all-day opening on the 15th produced signals from Italy, Estonia, Lithuania, Ukraine, Slovenia, Croatia, Switzerland, Norway, Sweden, Spain and Portugal. **Tom Crane** (Hawkwell) first became aware of a strong video carrier on 49.741MHz (Channel R1) at 0550. Shortly after, Estonia (ETV) was identified on R2 co-channelling with Latvia (LTV7). At 0925, Tony Jones discovered Croatia (HRT) E4 and Estonia (ETV) on R1 and R2. At 1055, **Vince Richardson** (Dolgarrog) saw a cookery item followed by the 'tg1' (Telegionale) news from RAI UNO (Italy) on Channel A. Shortly after, SF-1 (Switzerland) E2 and an unidentified shopping channel on E3 emerged. **Simon Hockenhull** (Bristol) logged Sweden, Norway, Portugal and Spain throughout the afternoon. Between 1749 and 1812 **Peter Barclay** (Sunderland) identified YT-1 (Ukraine) on R2 from the lottery results, programme trailers and a news bulletin.

Middle East Openings

Unidentified Arabic pictures on E2 were encountered here in Derby on the 16th. At 0710 the following morning, Peter Barber encountered IRIB-1 (Iran), with its logo in the top-left. By 0817, a second Arabic signal, possibly IRIB-2 or Syria, had emerged. Later on the 17th, Simon Hockenhull noticed NRK-1 covering a large march past the royal palace. An E-mail to NRK was answered explaining that 17 May is a big holiday event to celebrate the Norwegian constitution.

By late morning on the 23rd, an opening was established to the Baltic region with activity affecting Band II TV channels. Peter Barber spotted the LTV7 logo of Latvian Television on R3 at 1150 while Peter Barclay resolved signals higher up the band on R4 which, unfortunately, could not be identified. Around the same time, Tom Crane noted Estonia battling with Belarus on R2 but over in Bristol, Simon Hockenhull identified TVR-1 Rumania on this channel.

Peter Barclay witnessed a couple of goodies on the 29th: RTP-1 (Portugal) on E4 from the Valenca do Douro 50W relay and reasonably clear pictures from Belarus on R4 (85.25MHz), despite its closeness to the f.m. band.

Mystery Test Card

On 26 May at 1840, **Cyril Willis** (Kings Lynn) spotted an old-type test card on E3 (measured at 55.249956MHz) peaking to the south-east. Cyril described it as a 'US-style' test card dating from the 50s or 60s with the colour bars commencing outside the circle. A black oblong was situated at the top bearing white lettering; part of the identification was 'Canale 3', which suggests that it was Italian in origin. We cannot think of a particular test card that fits Cyril's description so possibly a new electronic one is in use.

Many years ago, the Italian NCT (Nord Centre Television) service on this channel used one resembling a drawing of the USA Indian Head test card. NCT was later replaced by Tele Uno, which eventually became TVA. TVA has already been identified with its large offset just above Channel A, suggesting that a new station was testing.

No Spanish Retune Caption

Simon Hockenhull comments that despite the imminent closure of the Spanish Band I transmitters, there have been no warning subtitles advising viewers to retune to u.h.f.

New Offsets

Tom Crane has measured an Italian home-shopping channel on 47.723MHz, just below Channel E2. This might be a new offset for an existing Italian private station such as TeleA+ or it could be a new station entirely? Tom has found RAI UNO twice on Channel A with zero video carrier offset. Usually, the three main RAI UNO outlets have been Monte Nerone on 53.7396MHz and Monte Caccia and Monte Cammarata, both on 53.7604MHz. Val Venosta is the highest power zero-offset transmitter at only 2kW.

Col. Rana Roy (Northern India) reports Chinese signals from CCTV3 on Channel C1 on the 15th between 1755 and 1815. On the 17th, between 0900 and 1015, Kazaghistan TV on R1 was displaying a Cyrillic logo, possibly 'YABAP'. Rana has noticed Dubai TV on E2 using a new logo resembling a letter D with a nine superimposed over it.

Finnish FM

While driving in the Herne Bay area at around 1915 on 29 May, a fading signal from VRT-2 on 98.6MHz f.m. (Egem, Belgium) prompted **Kjeld Spillett** (Gillingham) to retune his car radio. While doing so, he stumbled across YLE-1 or YLE-2 (Finland) on 93.2MHz f.m. which was strong enough to display an RDS text of "YLE YKM". The *FM Handbook* lists YLE-1 from Lahti (50kW) and YLE-2 from Oulu (50kW) on this frequency.

Finally, **George Garden** (Edinburgh) is off to Iceland armed with a v.h.f./short wave radio and a v.h.f./u.h.f. pocket l.c.d. TV to sample the broadcasts first hand.

Write In!

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

Our DXTV and archive TV website can be found on the Internet at: **www.test-cards.fsnet.co.uk**

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

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

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

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

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

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This time round we'll give a very brief summary of recent activity - excluding the increasingly active polytone transmissions (**XP**). This only covers the habits of main schedules, as many stations run schedules, which don't conform to their standard patterns. Note that it is only intended to give a rough indication of the current Numbers station scene. Starting off with the more common Morse stations:-

M1 (from Kaliningrad, live, hand-keyed) 'A' network always uses SNs 025, 197 and 463 according to month. 025 at present: Sun 0700 6.780, Tue 1800 5.280, Tue 2000 4.905, Thu 1800 5.280, Thu 2000 4.905, Sat 1500 6.434.

M3 Most transmissions Mon-Fri 0500-1300 on the hour or half hour (a few h+15 or h+45). Current schedules include 010 011 012 040 044 182 183 211 214 284 503 508 522 971. Frequencies include 4.990, 5.100, 5.385, 5.500, 6.252, 6.815, 6.890, 7.377, 7.772, 7.985, 8.195, 8.545, 8.760, 9.030, 10.520 and 10.728, etc. (Special scheduled 121 is unpredictable).

M8 (Cuban intelligence). Many regular schedules, but as with all stations, subject to sudden change. Best times 0200-0900 on the hour. Frequencies range from 3.265 to 12.120MHz. A 1300 schedule runs: Mon, Wed, Fri 10.566; Tue, Thu, Sat 12.093.

M10 (Czech intelligence) Many regular schedules all using two parallel frequencies. Has used 4.782, 5.078, 6.758, 7.745, 8.190, 9.165, etc. for many years. SNs include (with 555 preamble nearly always): 269 388 475 508 643 832.

M10E (uses 5-figure random headers rather than SNs; (111 preamble) ENIGMA 2000 report for 10 March 0800 on 7.891.

M12 (Russian) Very active with numerous schedules, SNs and frequencies - too many to list.

M13 Many schedules. Frequencies for each schedule change monthly (usually repeating each year) along with messages and serial numbers.

M13A (000 preamble) SN changes throughout the year, but message serial numbers continue consecutively.

M14 (Russian) Activity quite high at present. A long-term regular is SN 263 (1st and 3rd Fri 2000) m.c.w. (most are very fast i.c.w.). Like most numbers stations, frequencies vary seasonally.

M16 ('8BY' French intelligence) Every hour h+40 to h+00, on three parallel frequencies.

M23 Activity low at present. Recent schedules include 246 (2000 7.800) and 555 (2030 7.795). Often uses two parallel frequencies. Some transmissions are daily.

M39 (Czech/Slovak) Totally unpredictable, but when active may continue for hours or a few days. Uses two parallel frequencies between 3 and 8MHz.

M51 (French, Mont Valerien) sends messages of 100 five-**letter** groups on two parallel frequencies. Below 7MHz. Entirely unpredictable. No schedules ever identified.

Now on to some more common voice stations (mostly a.m.):-

E3/E3A (MI6, 'Lincolnshire Poacher' and 'Cherry Ripe' - both u.s.b.). Both have been operating the same busy schedules unchanged for several years now - see previous articles. E3 (Cyprus) - three parallel frequencies; E3A (Far East) two parallels.

E6, G6, S6, V6 (all Russian) E6 active but less so than formerly: G6 1st Mon 1900 and 1st Thu 2030; S6 very active with many schedules running; S6C occasional and unpredictable as always; V6 no recent reports.

E7, G7, S7, V7 (all Russian) E7 quite busy - Sun & Wed 1800, Mon & Wed 2000, Thu 0610 & 2110; G7 & S7 no recent reports; V7 304's 0600 schedule only.

E10 (Israeli, Mossad) Same as always, high level of activity. Networks: CIO EZI FDU FTJ JSR KPA MIW PCD SYN ULX VLB YHF

E11, S11A English - busier than usual, SNs 182, 183, 189, 232, 235, 312 and 314; Tue 0830 1030 1230 & 1300, Thu & Fri 0800 & 1030. Slavic - 971 only, 1st & 3rd Wed at 2100.

E15 (Egyptian) still active but erratic of late. Try 4.130, 11.000, 11.170, 14.000, 17.503 and 18.000MHz.

E17Y (Ukraine?) Schedule 274 still active but erratic. Best time 1300-1500 at between 10 and 12MHz.

E23 Same monthly schedule as always, still on old Swedish Rhapsody frequencies.
1st week (u.s.b.) 0957 6.507; 1157 8.188; 1257 5.340
2nd week (u.s.b.) 0957 7.250; 1157 8.188; 1257 5.748
3rd week (u.s.b.) 0757 4.832; 0957 6.200; 1157 8.188; 1257 6.507
4th week (a.m.) 0757 5.340; 0957 8.188; 1157 7.250
Now that E5 has left us, this is the last chance to hear the CynthIA's droning voice!

G22, S4 (l.s.b.) German 1st Tue and Thu at 2300, SN 186; Slavic 2nd Mon & Wed at 2245, SN342 Both in 3/4MHz region.

S10D (Czech/Slovak) e.g. Sun and Tue 2050; Sat 1520. Uses two parallel frequencies.

S17C (Czech) Daily 1250 on 6.758 and possibly a parallel.

S21 (Russian, Kaliningrad) always Tue and Thu 1842 (SN 454 on 4.454//4.854.

V2A (Cuba) Usual high activity on long standing schedules.

Amateur Bands

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

There's certain to be plenty of special event stations on the air to celebrate the Olympic games. Since early May there have been nine special event stations with callsigns that indicate the days left until the games, one in each of the Greek regions. Listen out for these 'Countdown on the Air' stations which have callsigns **SX** *r* **A** *n* where *r* = the number of the region and *n* = days to go. Each station is on the air one day at a time on all bands and modes.

To add some further interest, visiting radio amateurs to Greece can use the special prefix of **J42004** followed by their own call from the 1 August through to the 15 September. Greek radio amateurs may use either **SX2004** or **SY2004** as their callsign prefix from 1 June until 15 November 2004 to commemorate the Olympic and Paralympic Games.

There's also a special Olympic Award that has been running from mid-May and finishes at the end of September. Issued by RAAG, the Greek national society, there are gold, silver and bronze diplomas depicting early Olympians, which are available for amateurs and listeners. For more details visit **www.raag.org** or to apply contact **RAAG, Award Manager PO Box 3564, 102 10 Athens, Greece**

Rare Calls

Still in Greece, the *425DX News* lists Mount Athos as the DXCC country most wanted by European amateurs. Although part of mainland Greece, the Athonite peninsula on which the mountain is located has been the spiritual retreat of Orthodox Christian monks for over a thousand years. Access is subject to stringent conditions (being male is one) and very strictly limited.

Operating an amateur station requires special permission beyond that, which no one seems to have obtained for some time. A radio amateur monk from one of the area's 20 monasteries was occasionally heard on the air a couple of years ago but not, I gather, for a while. It's no surprise then that the place tops the list. But the country in second place technically doesn't even exist!

Although allocated the call prefix 1A0, the Sovereign Military Order of Malta isn't a country within the usual definition of the word, as it doesn't have any territory or citizens. It does, however, have a couple of offices in Rome, so at least there are places from which visiting amateurs can operate.

Out of Africa

Towards the end of July and into August **Dave Anderson K4SV** and **Neil King VA7DX** will be operating from three different southern African countries. Initially, they will operate from Lesotho as **7PBDA** and **7PBN** from 29 July to 6 August. Then from slightly north of there in Swaziland as **3DA0SV** and **3DA0WC** from 7 - 11 August. Finally, to Mozambique for five days from the 12th, callsigns for this final destination are presently unknown. Activity is expected on all h.f. bands using s.s.b. and some digital modes, with the focus on the lower bands at night.

Light Relief

There should be plenty of special event activity over the weekend of the 21/22 August when the International Lighthouse/Lightship weekend takes place. The UK had almost 30 entrants as we went to print, but that's likely to increase as the weekend approaches.

Here's a very small selection of the callsigns being used:- **GB0ML** – Mumbles Lighthouse; **GB2LBN** – Barns Ness Lighthouse; **GB0REL** – Rathlin East Lighthouse; **GB4HCL** - Hurst Castle Lighthouse. Early readers may also catch **Chris G1VDP** operating from the Lizard Lighthouse on the Monday 26 July and from Trevose Head Lighthouse on the following Monday 2 August. The most likely frequencies to find him on are 7.064MHz in the mornings and 21.265MHz in the afternoons, plus 14.263MHz if he can erect a suitable antenna!

Little Feet

Talking of antennas, **Tex Swann G1TEX**, our Technical Editor, is doing some experiments with a vertical antenna supported on a fibreglass roach pole (a kind of fishing rod I'm told) fed via the transformer used with the G5IJ antenna mentioned in my October and December 2003 'Amateur Bands' column.

The ideal result will be an economical multi-band h.f. antenna with a very small footprint, something owners of small gardens could find very helpful. I always wonder at most published designs of many vertical h.f. antennas because they invariably require long radials stretching out in all directions.

It strikes me that the majority of people who want to build a vertical antenna are motivated by lack of space. If they had the room for the radials that many designs require they would have erected a horizontal antenna in the first place, and not bothered to consider a vertical. It's early days yet, but let's hope Tex's experiments produce the desired result. If so, you'll read it here first!

The Master's Touch

Italy's Ancona Radio Club will be operating with the callsign **IY6GM** from Monte Cappuccini, near Turin for the period 6-10th August. This is to celebrate the 100th anniversary of experiments carried out from that location by the master himself, Guglielmo Marconi.

Wonderful Wales

I've made a few comments in the past about the low take up of the Intermediate and Full licences compared to that of the Foundation licence and have suggested that it may in part be due to the difficulty in finding out where courses are being run. Well from now on, no one in the south of Wales can use that excuse. **Blackwood Amateur Radio Society**, which meets every Friday evening at 1900 during school term time at the Oakdale Community College near Blackwood in Caerphilly, runs courses for all three levels of licence.

Membership of the club is the only condition to receiving the free tuition. Look at **www.qsl.net/gw6gw** for more details of the club, or just turn up on any club night. Incidentally, July's *PW* has an extremely interesting article about the life of a local radio pioneer, Arthur Moore. In 1912, at nearby Gelligroes Mill, and using only basic receiving apparatus, Moore heard the morse code distress signals from RMS *Titanic*. His original spark gap transmitter, which he had built a couple of years earlier, is in the care of Blackwood ARS.

Scanning Scene

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

A mate of mine received a E-mail offering him a job in Iraq. It wasn't one of the stay in the armoured HQ type jobs either. It was a 'pick up your gun and get back to work' type job. My only contribution to his decision making process was to let him know that I believed that there was plenty of stuff to scan on the radio. He didn't look interested but I pressed on.

On the lower frequencies, traffic from the US military staff has been heard in the UK on 31.700 and 32.000 f.m. and if you happen to be in the Baghdad area, there's a mass of stuff to listen to. The Americans are using a tremendous number of the Family Radio Service (FRS) radios. Yes, FRS not the military version! Officially this is frowned upon but as there aren't enough mil radios to go around, well.... the boys improvise.

The FRS sets are used at squad level and one squad won't use another's channel unless in emergency. They even have a radio show on FRS channel 6 (CTCSS code 9) in the late evenings. They call it Radio 69. It's been described as 'a cross between Howard Stern and Doctor Ruth on steroids'.

"Sounds fun", I said, my mate still showed a marked lack of interest and quaffed his pint. I pointed out to him that both European and US CB radios are in use there and that there's much to monitor including some interesting 'broadcasts' on the CB allocations.

There's plenty of military traffic in the clear between 138-144MHz and base facilities contractors are using channels in the 150-158MHz range as well. My mate ordered a round and sighed, "I've taken a job at a hair salon near Amersham" he said.

An Arresting Text

An item from the *London Evening Standard* on the 3 June mentioned that a mobile 'phone user had been arrested and questioned over a text message that he had sent to a mate that included the words 'gun' and 'jet airliner'. He was later released when he explained that the offending words were from the lyrics of a song by a new wave group from the late 1970s called The Clash, that he was sending to his pal via the SMS. Think about it!

Switching Device

In my June column I wrote about a remote controlled switch device that the *Daily Telegraph* were knocking out to punters at about thirty quid. **Roy Killick** from Sussex wrote with details of a seemingly identical unit that he had purchased in October last year from an outfit in Belvedere, Kent, called LIDL UK GMBH. Roy paid just under £17 for it and is pleased with the item.

Roy copied the specification sheet for me revealing that his unit transmits on 433.920MHz. This frequency may seem familiar, as it's the one in use for most of the remote car locking/immobiliser systems in Europe.

Roy says that LIDL UK is primarily a vendor of foodstuffs but also often sells interesting electronic bits and bobs are offered. Thanks for the info Roy.

Paul from Kent has been busy with his computer and PDW software and has concentrated on fire brigade text pagers on 153.050MHz. Thanks for your logs Paul.

It seems that the pager transmitter that you have been monitoring is specifically for fire use in the south east of England and that messages relevant to the brigade in that corner of the country are only being sent to transmitters in that area. It's a great way to target paging at emergency responders for if the transmissions are area specific then those fire service staff that are not in the area, and therefore unavailable to respond to the call, wouldn't receive it in any case.

UK Frequency Allocation

My attention's been drawn to the UK Frequency Allocation Table issued by the now deceased RadioCommunications Agency. The RA has now been superseded by Ofcom whose website is not for the faint hearted! Anyway should you muster the courage to wade through the corporate information, one or two interesting facts emerge.

There are, for example, some frequencies at which civil land mobile operation is not permitted in certain areas. For instance should you happen to be within 32km (just under 20 miles) of Leicester or Worcester then you are not permitted to use 425.025 and 443.500MHz, while 447.700 ±6.25kHz), 447.750, 448.250, 448.750MHz (all ±12.5kHz) are not to be used within 32km of the centres of Aberdeen, Bradford, Derby, Edinburgh, Halifax, Leeds, Leicester, Middlesbrough, Nottingham, Preston, Sheffield and (somewhat non specifically) Tyneside.

If I lived in any of the above areas you can be sure that I'd have those very frequencies programmed into every scanner in my possession in an attempt to find out who is using them and for what purpose. Should you feel the need to examine the document yourself and are afflicted with a computer and Internet access then the page to peek at is **www.ofcom.org.uk/static/archive/ra/topics/spectrum-strat/uk-fat/uk-fat2002.htm** Check out Annex C - and the very best of luck!

Radio Traffic Monitoring

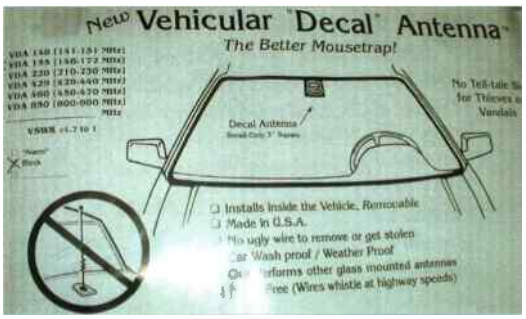
Seeking out and monitoring other people's radio traffic is bound to be unpopular with some groups - it's an ignorance thing. There are cordless 'phones on sale that transmit pure f.m. signals of distances of more than a couple of km. Many police forces and other safety agencies are still transmitting 'in the clear', but inadvertently listen into any of this traffic and you are categorised as some sort of pervert by a gutter press hungry for a non-story to fill a column between pictures of the near naked and salacious gossip about so called 'celebrities' of whom most of us have never heard, or care.

You can secrete a radio set fairly easily these days but antennas are a different matter. There will always be a compromise between an antenna that is efficient but often very visible and one that is nearly impossible to detect but suffers accordingly in the efficiency department.

Mobile monitoring is a particular problem as any extra antennas mounted on a car can draw unwanted attention. What this is all leading up to, is that I've bought another covert antenna!

The 'Decal' antenna, as it's called is made by company called Antennas America Inc. and consists of a length of coaxial cable terminated in a small three pin plug that fits into a tiny socket on what looks like a small black piece of plastic about 90mm across but shaped like an id card holder that would clip to a shirt. Imagine something about the size of a vehicle tax disc but squarish and you've got it.

Closer examination of the Decal reveals that it has metallic elements beneath the plastic. The elements' shape is reminiscent of a fractal antenna. The plastic has a self adhesive side, the idea being that you stick the antenna to the inside of some glass on your car (the illustration on the pack shows it glued to the windscreen), plug it into the radio and you have a discrete antenna. I bought mine from a small company in Wales and it is clearly 'new - old stock'.



From the packaging it seems that the company made the antenna in six frequency ranges from 141 to 900MHz. The one that I have is alleged to cover from 148-172MHz and should allow transmission power of 150W, although I wouldn't want to try that much power. If you possess a tax disc holder with a wallet arrangement that allows you to slide the disc in the back of the holder without removing the holder from the screen, then you'll find the Decal antenna fits nicely in the back of the holder.

Performance of the Decal antenna is not sparkling but is more than adequate for higher v.h.f. and u.h.f. signals transmitted from base installations and for simplex signals from a few kilometres away. It is also very covert!

Sky High

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I am grateful to **Dave L**, **Mike**, **Steve F** and **Adrian** who have all sent me information regarding the aircraft participating in the Queens Birthday Flypast. Most aircraft used 300.1 for the primary air-to-air frequency. The 56 (R) Sqn aircraft used the Leuchars Air-to-Air frequency 242.05 to contact WINDSOR LEAD. The 6 Squadron Jaguars used their Coltishall Air-to-Air frequency 233.7 to contact MADRAS and WINDSOR.

BOXER 1 had a special blue colour scheme on the tail but the reason for it was not noted by my correspondents. However, as 6 Sqn were formed in January 1914 I suspect it might well be a squadron 90th Anniversary scheme. The other Jaguar, BOXER 2 has the usual 'Saint' special marks on the tail, (white on black).

I had several conflicting reports for some of the information, especially for WARLORD 2/3. One radio log reports that WARLORD 3 returned to Marham with a technical problem and another source suggests that the aircraft may have been switched in the formation because of the problem, (so the spare aircraft became WARLORD 2 and took part in the flypast). The 4 FTS Hawk callsign WHIP is a new one to me, I am not sure if it is a one-off for the flypast or new to the squadron.

Tail	Aircraft	SQN	Callsign
ZZ171	C-17A Globemaster	99 Sqn	WINDSOR LEAD
ZD949	Tristar K.1	216 Sqn	FAGIN (COMBINE)
ZA613/AN	Tornado GR.4	9 Sqn	ROCKET 1
ZG771/AZ	Tornado GR.4	9 Sqn	ROCKET 2
ZA546/AG	Tornado GR.4	9 Sqn	ROCKET 3 (spare aircraft)
ZH107/07	Sentry AEW.1	8/23 Sqn	SENTRY (COMBINE)
ZE837/TD	Tornado F.3	56 (R) Sqn	WARLORD 1
ZE160/TX	Tornado F.3	56 (R) Sqn	WARLORD 2
ZE908/TB	Tornado F.3	56 (R) Sqn	WARLORD 3 (spare aircraft?)
XV105	VC-10 C.1K	10 Sqn	MADRAS (COMBINE)
XX112/EA	Jaguar GR.3	6 Sqn	BOXER 1
XX766/PE	Jaguar GR.3	16 (R) Sqn	BOXER 2
XZ106/FR	Jaguar GR.3	41 Sqn	BOXER 3 (spare aircraft)
XV240/40	Nimrod MR.2	Kinloss Wing	NIMROD
XX280/280	Hawk T.1	4 FTS	WHIP 1
XX339/339	Hawk T.1	4 FTS	WHIP 2

Airband Analysis

For those of us who have an interest in monitoring the airbands, I am sure that the Editor's report on the AOR SDU5600 in the March *SWM* must have raised a question mark over a number of exciting possibilities. I have said many times in this column that the search for new frequencies, (especially on the military airband), can be a rewarding and sometimes frustrating experience.

Consequently, anything that raises the odds in that hunt for information is a bonus. I was therefore fortunate to get my hands on an SDU5600 in early June and its abilities to interrogate the airbands was very swiftly put into action. I will try not to repeat too much of the information included in the Editor's report, but I feel that the relevance of this piece of equipment to the airband listener was well worth a second mention here in the 'Sky High' column.

Some 10 years ago I owned its forerunner - the SDU5000 - (this later developed into the SDU5500 in 1999), but with the introduction of new technology such as Digital Signal Processing (DSP) and Fast Fourier Analysis (FFT), the new '5600 is a very different beast. Aided by the new technology, one of the main differences is that the screen update rate is significantly faster than my old SDU5000, (up to six times per second).

Basically, this means that the '5600 is a Spectrum Analyser, which can monitor a chunk of the airband spectrum in almost real time, the delay only being small fractions of a second. I am sure that the reader will have already realised the possibilities that this piece of equipment can have for airband monitoring.

The SDU5600 operates in three primary modes: Spectrum, Step and Channel. The Spectrum mode is ideal for general monitoring and can sweep a 10MHz piece of the airband, but as the screen is set-up to 320 dots/pixels from edge to edge this allows for a sweep of 320 channels at a time. Consequently, for the maximum 10MHz search the spacing will default to 31.250kHz, (10MHz divided by 320), whilst it will work, this spacing is obviously not ideal for the airband.

By using the Step mode with it set to the current airband 25kHz spacing this gives a maximum sweep of 8MHz of either of the airbands, (8MHz divided by 320 = 25kHz). This therefore means that the entire civil airband can be covered by just three sweeps.

Alternatively, you can set it to Channel mode if you wish to sweep a smaller segment such as 1-4MHz. With this in mind I set it to sweep the top of the civil airband, 136-137MHz in step mode as I know that there can be some items of interest in this area including a number of company frequencies. Channel Mode is very useful as you can set the start and a finish frequency, in this case 136 and 137MHz with a 25kHz step and when a peak appears on the screen you can select it with the cursor and press MKR (Marker) and the radio will tune to that frequency without changing the centre frequency.

Some of the expected frequencies were quickly identified, Bristol Approach on 136.075, ACARS on 136.925 and Monarch Operations on 136.875. I left it to sweep on its own for an hour or two with the Maximum (Max) facility selected, normally a peak will only show whilst the transmission takes place but with MAX selected this enables the trace to be retained on the screen so that you build up a picture of the recent activity.

Whilst commenting that us radio enthusiasts are never satisfied, the Editor in his March review identified an extra feature he would have liked on the SDU5600. Well I'm going to do the same - when using the Max hold facility it would be nice if there were a numerical readout so that you could see how many hits were made on each peak on the screen, this would therefore indicate how busy each frequency had been. I realise that this would not be easy on a 75mm screen when you are analysing a span of 8MHz, (perhaps when the software is finished?).

Anyway back to the civil airband. The first thing of interest that I noted was some hits on 136.75, further investigation showed that this was a new (to me), UK ACARS frequency, I knew that this frequency was used for ACARS in the USA, but when was it introduced here? (I have to admit I'm not a regular ACARS listener). So the SDU5600 had immediately come up trumps and it wasn't long before it struck again.

The frequency 136.25 was noted a couple of times and having tuned it into the number two box it soon emerged that this was a Shannon Control frequency which as far as I am aware is not used very often, so I guess it may be a standby frequency, it is certainly not listed in

some official documents. I assume that it is utilised for the southern part of the airspace as aircraft were being handed off to the Berry Head/Lands End sector on 132.95.

Next month I will conclude my look at the SDU5600 and will report on the fun I've had scouting around the military airband. I will also include an early look at the new software for the SDU5600 which is still currently under development.

France UAC

A letter from **Ron** in Worthing asks if I could let him know the French Area Control frequencies that are used by the two northern French Upper Airspace sectors that are adjacent to the UK's southern airspace boundary. It's been a few years since I included the French frequencies, so for those of you who live in the south/west of the UK and can monitor flights across France I have included a complete list of the Brest and Paris frequencies.

It can be seen that Brest Control has converted most of its sectors to 8.33kHz spacing and this may give you a clue as to what London Control might look like in the future. It is interesting to note that Paris Control now has only one 8.33kHz converted frequency whereas a couple of years back they had three or four.

As a guide to which frequencies you might hear, from my home in Devon I did a quick check around the frequencies and those marked with a * were those heard in about an hour and a half's listening. (Some signals were quite faint). This was just a quick overview and does not necessarily represent all the frequencies you may be able to hear, (which of course is also affected by your monitoring location in the UK).

Paris Control (Upper)
118.225 Sector UP
118.725 Sector OT
120.950 Sector TL
122.575 Sector RT
124.000 Sector TS
124.850 Sector TH
125.075 Sector AO
127.300 Sector OG
128.100 Sector TE
128.275 Sector TB *
129.000 Sector TP *
131.175 Sector TM
131.250 Sector UZ *
132.100 Sector AR
132.375 Sector TU
132.675 Sector UJ
132.740 Sector PU
133.500 Sector UT
133.925 Sector UK *
134.875 Sector OY
135.305 Sector SU (8.33)
136.375 Sector TN

Brest Control (Upper)
118.350 Sector IN
118.885 Sector ZI (8.33) *
119.025 Sector GS
124.675 Sector AS
124.775 Sector Common
125.500 Sector ID *
125.965 Sector XS (8.33) *
127.860 Sector NS (8.33)
129.500 Sector OS *
131.280 Sector GU (8.33)
132.025 Sector AU
132.190 Sector NU (8.33)
132.210 Sector ZS (8.33) *
132.510 Sector JU (8.33)
132.765 Sector JS (8.33) *
132.830 Sector ZU (8.33) *
133.005 Sector OU (8.33)
133.240 Sector XU (8.33)
133.480 Sector QS (8.33)
133.615 Sector QU (8.33) *
133.635 Sector XI (8.33) *
134.240 Sector NI (8.33)
134.335 Sector Common (8.33)
136.000 Sector Common

Abbreviations

ACC	Air Combat Command
ACMI	Air Combat Manoeuvring Instrumentation
ADR	Air Defence Region/Radar
AEW	Airborne Early Warning
AIRCENT	Airforces Central Europe
AIRSOUTH	Airforces Southern Europe
AUX	Auxiliary Radio
AFIS	Aerodrome Flight Information Service
AFRC	Air Force Reserve Command
AMC	Air Mobility Command
ANG	Air National Guard
APCH	Approach
ASACS	Air Surveillance And Control System
ATC	Air Traffic Control
ATIS	Automatic Terminal Information Service
AWACS	Airborne Warning And Control System
C/POST	Command Post
C/S	Callsign
CAC	Centralised Approach Control
CFS	Central Flying School
CH	Channel
CRC	Control And Reporting Centre
CRP	Control And Reporting Post
DATIS	Digital ATIS
ETPS	Empire Test Pilots School
FAC	Forward Air Control
FIR	Flight Information Region
FIS	Flight Information Service
FOST	Fleet Officer Sea Training
FRADU	Fleet Requirements & Distribution Unit
FS	Flight Squadron
FSATO	Fleet Support Air Tasking Organisation
FTS	Fighter Training Squadron
FW	Fighter Wing
GCI	Ground Controlled Interception
H24	Operational 24 Hours A Day
ICAO	International Civil Aviation Organisation
ICF	Initial Contact Frequency
JAAWSC	Joint Anti War Warfare Shore Co-Ord
LACC	London Area Control Centre
LDOC	Long Distance Operational Control (HF)
LJAO	Local Joint Area Organisation
LMS	London Middle Sector
OTA	Operational Training Area
LUS	London Upper Sector
MAS	Middle Airspace Service
MATZ	Military Air Traffic Zone
NATO	North Atlantic Treaty Organisation
NDB	Non Directional Beacon
OPS	Operations
PETF	Practice Emergency Test Frequency
PRI	Primary (Frequency)
RAF	Royal Air Force
RAPCON	Radar Approach Control
RTTY	Radio Teletype (also noted as RATT)
RWY	Runway
S/B	Standby (Frequency)
SAR / S&R	Search And Rescue
SEC	Secondary (Frequency)
SHF	Support Helicopter Force
SOF	Safety Officer Flying (Squadron)
SOG	Special Operational Group
SSR	Secondary Surveillance Radar
ST	Stud
STC	Special Tasks Cell
SVFR	Special Visual Flight Rules
TAD	Tactical Air Designator
TC	Terminal Control
TCA	Terminal Control Area
UAS	Upper Airspace
UAS	University Air Squadron
UK ASACS	United Kingdom Air Surveillance And Control System
USAF	United States Air Force
USCG	United States Coast Guard
USN	United States Navy
WFU	Withdrawn From Use
VOR	VHF Omni-Directional Range Beacon

Our image this month shows the SDU5600 set to analyse 8MHz of the civil airband in 25kHz steps from 128.975 to 136.975. The MAX hold is selected and it can be seen how many active frequencies, (peaks), were captured in just 45 minutes.

Next month, hopefully a first report on RIAT 2004 at Fairford.

Decode

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Following on from last month's brief introduction to Automatic Link Establishment (ALE), this time I'll give you a more complete background to ALE with some examples of how it's used. I've also got some interesting news on some new signals from the German weather service.

Let's start with a quick reminder about ALE and its role in the world of radio communications. In simple terms ALE is an automatic radio operator, i.e. it looks after your radio links, keeps an eye on propagation conditions and always 'knows' the best frequency to contact any station in the network. These are all things you would expect a good radio operator to be able to do! This level of automation is achieved by ALE through the use of processor controlled radio links that constantly monitor the link quality between all stations in the network. Whenever a request comes in to send a signal across the network, the ALE system always knows the most reliable link to use. The development of ALE has breathed a new lease of life into what was previously considered a dying medium, so we should be grateful!

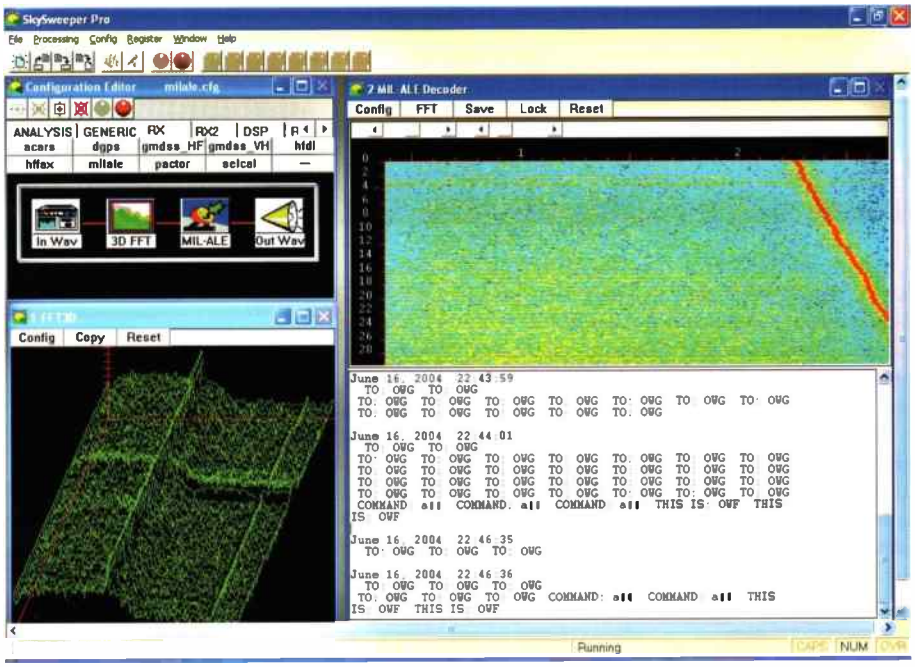
Before you can make any sense of ALE (MIL-STD 188-141) transmissions you need some software that can decode the raw signals. There are various choices available including commercial packages from suppliers like **Skysweeper**, **Hoka** and **Wavecom**. However, these excellent packages deliver a host of sophisticated decoding modes, so do not generally come cheap. If you just want to dabble, the most popular route is to use *PC-ALE* which is freely available for download from the Web. The program has been generously provided by **Charles Brain** and has proven to be an excellent ALE decoding system. However, like many enthusiast inspired developments, a certain amount of technical knowledge is assumed, so it's not necessarily the friendliest software. I can help out a bit by providing an introduction to ALE and the type of messages you may encounter. Here's the location where you can get your copy of *PC-ALE*:
www.chbrain.dircon.co.uk/pcale.html

Inside ALE

Before I get you receiving your first signals, I ought to start by explaining what you're likely to see and give you a few tips on how to interpret the data. Because ALE is essentially a computerised control system for radio networks, most of the raw signals you receive will appear as gibberish. Remember, ALE is just computers 'talking' to each other, so they just need to exchange data in the most efficient format available. In addition to resolving the modulation system, the decoding software has to interpret the communication code and present the output in a form that you and I can make some sense of! The most common messages that you will come across are what are known as soundings. This is where the transmitting station sends out a burst of information that the other stations in the network use to check the quality of the link. These are very common - here's a sample message for you to see:

TO: OWG TO: OWG TO: OWG TO: OWG
TO: OWG TO: OWG TO: OWG TO: OWG
TO: OWG TO: OWG TO: OWG TO: OWG
TO: OWG TO: OWG TO: OWG TO: OWG
TO: OWG TO: OWG TO: OWG TO: OWG
TO: OWG TO: OWG TO: OWG TO: OWG
TO: OWG TO: OWG TO: OWG TO: OWG
COMMAND: a
COMMAND: a
COMMAND: a
THIS IS: OWF THIS IS: OWF

This sequence shows a series of calls to station callsign OWG originating from station OWF. You will see that the decoding software has conveniently added the TO and THIS IS to help give the message some logic. The ALE system uses a pretty simple command set for its messages so there are only a few key words to deal with - they are: TO, THIS IS, THIS WAS, DATA, REPEAT, THRU, COMMAND and FROM. The modulation system that supports the ALE messages has been designed to pass through conventional s.s.b. h.f. radio equipment. The format uses frequency shift keying with eight orthogonal tones. Each of these tones has a duration of 8ms and is spread across 750Hz to 2500Hz with a separation of 250Hz between each tone. This system is very effective and delivers a reliable data rate of 375 bits per second.



***Skysweeper Pro* decoding MIL-STD 188-141 ALE.**

Layers of ALE!

Whilst ALE is a pretty clever and important system, it is just one of the components in today's sophisticated h.f. radio networks. Adaptability is the key word and the use of smart adaptation techniques have revolutionised h.f. data systems. A good example of this is the Battle Force E-mail system (BFEM) used by the USA Navy. This started life as a basic E-mail system for admin messages that could link an aircraft carrier or other large ship with up to 20 other ships in the local area. The system was so

successful that it has since been significantly enhanced and provides world-wide E-mail access for operational messages and a much welcomed E-mail service for troops to send messages back home.

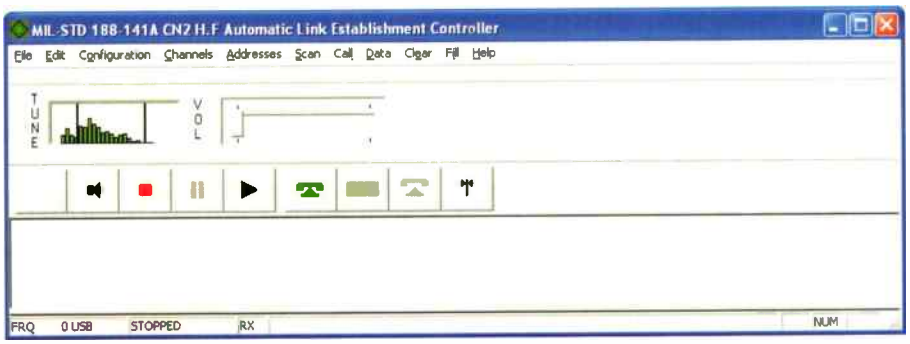
To understand how a system such as BFEM works you need to think of the system as existing in several communication layers - a bit like jam sponge! The lowest level is called the physical layer and comprises the basic radio transmitter and receiver complete with antenna and a basic modem - just enough to communicate, but no frills. Sitting above the physical layer is the Data Link Layer - this is where error correction is added. If you imagine a more familiar system like SITOR or AMTOR the physical layer is the transmitter and receiver plus the modem, but the encoding and decoding software on your PC is the Data Link Layer.

Also included in the Data Link layer is the ALE control system. If you think about it, the Data Link layer has all the components required to create a reliable data link. The rest of the layers can use the Data Link layer with confidence knowing that the message will get through. Above the Data Link layer is the Network layer. This contains all the technology required to create a network by linking together a host of reliable links. The main components in a Network layer are routers. These are systems that can read address information from messages and route the data to the correct destination - hence the name router.

The final layer (Phew!) is the Application layer. This is the icing on the cake that makes the whole system come to life. Within this layer are E-mail programs and web browsers - all the software that we know and love that provide the human interface to sophisticated networks like the Internet. Commercial and Military systems such as Battle Force E-mail use this multi-layered structure for their communications systems.

Security Vulnerability

Although ALE is an excellent system for automatically managing sophisticated h.f. radio networks, the basic ALE system does have a potential security problem. In addition to looking after a radio network and finding the best circuits to support a particular route, the ALE software handles the connection and will link stations together. This is great for the network operator, but can leave the system open for a bogus or foreign ALE network to make a connection. If the ALE system is managing a military network this would be an intolerable risk. The solution comes through the inclusion of what's known as Linking Protection. The protection can take various forms, but the 'scrambling' software sits in the Data Link Layer between the ALE controller and the error correction system. By putting the scrambler at this point it is in a clear, error corrected part of the data path, but before the ALE controller. Systems that are running with linking protection cannot be monitored using the type of decoders available to you or I as the ALE information is encrypted. If you hear what sounds like a good ALE signal, but you can't resolve it, you're probably listening to a station with linking protection.



Charles Brain's *PC-ALE* Controller.

The RF Noise Identification Website
Identify the RFI that interferes with your reception

Ken Alexander's excellent r.f. noise page.

German Weather Service

Whilst browsing for news stories I came across an interesting feature in the latest Worldwide Utility News *Newsletter*. It seems the German Weather Service are conducting some tests with their radio services. The tests appear to have started on 11 May with DWD64 transmitting 100baud 170Hz shift signals on 5.8325MHz. This signal was noted between 0900 and 1015. Other stations in the weather net then responded with either German 'Quick Brown Fox' messages or dummy weather messages. Other stations that have been identified so far include the following: DDA64 DWD Offenbach, DDA03 Schleswig, DDA14 Hamburg-Fuhlksbuettel, DDA20 Emden, DDA22 Bremen, DDA31 Muenster/Osnabrueck, DDA33 Hannover, DDA42 Kahler Asten, DDA50 Aachen, DDA54 Wasserkuppe, DDA60 Trier, DDA65, DDA70 Saarbruecken, DDA72 Mannheim, DDA73 Stuttgart-Echterdingen, DDA77 Regensburg, DDA80 Freiburg, DDA91 Donaueschingen, DDA92 Konstanz, DDA96 Garmish 10963 Other frequencies listed for DWD are: 4.8775, 4.960, 5.2525, 5.3576, 5.832 5.859 and 5.876MHz.

In addition to the 100baud signals, PACTOR like transmissions have been noted on 5.876 and 5.2525MHz - these are probably RS-ARQ/ALIS transmissions. As far as further tests go, there was an announcement on 5.8325MHz to say the next test would be on 8 June. Hopefully, this means that the tests are running on the 2nd Tuesday of each month. If you want to find out more on this, keep an eye on the 'WUN' site at: **www.wunclub.com** My thanks to Day Watson's May Digital Review for the information.

Noise Identification

Are you plagued by a interference you just can't pin down? If so, I might have found a website to help. **Ken Alexander VE3HLS** had a great idea to collate and identify as many interference sources as possible. He's done this via his website that's jam packed with a huge number of interference sources. Each noise source is presented with a description plus an audio recording (MP3 format) of the offending signal and a waveform. If you have a problem signal you just have to visit Ken's site and see if it's listed. If it is, you will normally find the identification details set out in the panel next to the sound. Finding the cure is up to you, but knowing the signal source is a significant help. Even if your signal is listed but with no identification - at least you know you're not on your own! If you'd like to take a look, Ken's site can be found at: **http://ve3hls.tripod.com/noise/rfihome.html**

Info in Orbit

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E-mail info.orbit@pwpublishing.ltd.uk **Web Site** www.astronomer.plus.com

My initial interest in weather satellite (WXSAT) monitoring was sparked by not only an interest in monitoring satellites from home, but also by the possibility of using weather satellite images to indicate when clear skies were likely overnight for my other hobby - astronomy. For the recent transit event, we wanted clear skies from sunrise until mid-day in order to observe the planet Venus crossing the disc of the sun. Meteorological forecasts are one thing, having access to the finest quality satellite imagery every 15 minutes from *METEOSAT-8* (received via *HotBird-6*) means that the true weather situation can be monitored all the time.

On Tuesday morning, 8 June, I arose at quarter to six local time, after just a few hours sleep, having been at the telescope for some hours the previous night! To my great relief the sun was shining, and to my increased delight, the sun was rising between the two large trees. I had feared that I would not see the sun until half-way through the transit.

Planets Mercury and Venus are the only planets that can ever cross the face of the sun, as seen from earth. Their orbits are not in the same plane as that of earth, so we don't have a transit every time they pass between us and the sun. They normally pass either below or above the sun. Venus' orbit is tilted by just a few degrees, and is of such a size that it only crosses every 120 years, with a further transit eight years later, followed by the long gap. Consequently, no-one alive had seen a transit until 8 June. Of great significance was the development of telescopes, digital cameras and computers since the last transit!

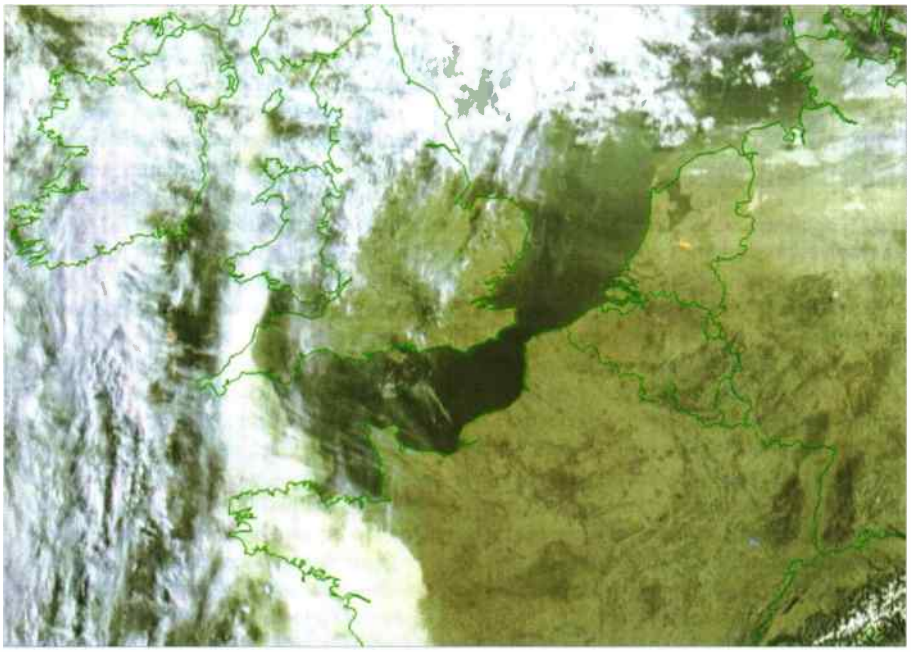


Fig. 1: *METEOSAT*-8 channel-12 0600 8 June 2004 for Venus transit (© EUMETSAT 2004).

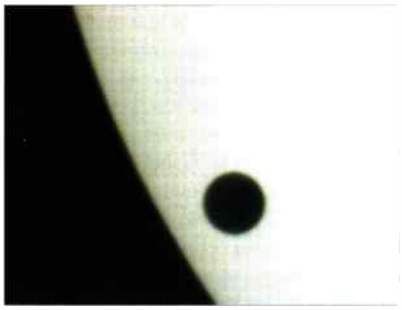


Fig. 2: Venus near start of transit across the sun at 0552 8 June 2004.

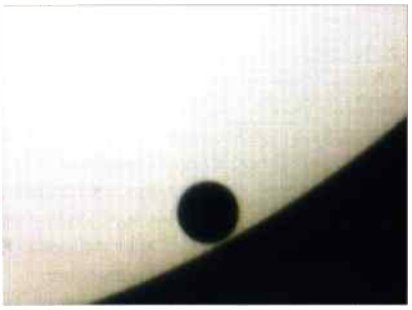


Fig. 3: Venus near end of transit across the sun at 1103 8 June 2004.

After opening up the observatory and powering up the computer, I placed the solar filter on with due ceremony. This device is essential for safe viewing of the sun, so I fit it with great care. It comprises a highly accurately deposited film of material on a high quality glass surface that reflects almost all incoming radiation, particularly that beyond the normal visible spectrum that can cause blindness when casual filters are used in ignorance.

I had been horrified earlier in the week to see someone suggest via a WXSAT forum that it was safe to use a couple of CDs as a filter! Our eyes cannot currently be repaired if we abuse them in that manner. One perfectly safe alternative method of studying the sun is to project the solar image from a small refractor onto a piece of white card.

My telescope is a 300mm Meade LX200 (stopped down to about 120mm, and then filtered for solar work), used with an f6.3 focal reducer. For the transit I used a Toucam Pro web camera and a freeware program called *K3CCD* (at least my version is freeware). After locating the sun using the 'shadow' method, I visually watched the planet's dark black disc slowly entering the sun's disc.

Sunspot maximum has long since passed, though there have been many instances of solar activity, but on the 8th, there were no sunspots of significance and none near the predicted track of Venus. I took a series of 30 second webcam sequences at approximately 5 to 10 minute intervals. Apart from a few minutes during which some cloud intervened, and another period when the sun past behind the top of one of those naughty trees, I had an almost uninterrupted view of the transit.

As the end of the transit approached, I took continuous sequences because I was hoping to capture the effect known as the 'black drop', recorded on historical manuscripts from 1882 and before. This is reported as a short-lived extension between the planet's black disc and the sun's limb, during ingress and egress times when the two limbs merge or separate. I saw a very brief extension during both periods, the latter not easy to see even on the video recordings.

From around Britain, I was receiving reports, with requests for weather information from friends in Plymouth where I used to live. The southwest had started with some clear patches but *METEOSAT-8* images were showing mist and cloud rapidly approaching - see **Fig. 1**. Unfortunately, Scotland also had cloud problems. I produced some transit images during the event itself and E-mailed them to friends and our local BBC television station, on which one was shown that evening. The next transit of Venus is in eight years time, but won't be visible from Britain - so this remains a unique event for our lifetime.

D-Day Remembered

They did not have weather satellites on 6 June 1944. Sixty years later, a gloriously sunny day was experienced by the veterans attending the anniversary of the beach landings. D-Day was

Fig. 4: *METEOSAT-8* ch-12 visible 1015 6 June 2004 (60th anniversary D-Day).

all before my time, but the anniversary was none the less moving.

New Additions To *METEOSAT-8*

Officially, there were images available from five geostationary WXSATs via the EUMETCast data stream from *HotBird-6* - until recently. *METEOSAT-8*, *METEOSAT-5*, *GOES-9*, *GOES-10* and *GOES-12* have been included for several months.

During late May, images from *METEOSAT-7* and *METEOSAT-6* became available to those who successfully applied for HRI data from the latter satellites, together with an increased image rate from *METEOSAT-5*. So far, I have not seen *METEOSAT-6* data.

The new image flow increases the number of images from *METEOSAT-5* and *METEOSAT-7* to the full rate available, requiring regular hard drive free space monitoring, or alternatively, setting the software to automatically delete files more regularly! **Figure 5** shows clear skies over much of the middle-east in this image from 0630, previously not available from the EUMETCast data stream.

WEFAX Usage Continues

If you monitor *METEOSAT-7* WEFAX (the almost continuous stream of low resolution images), you are not alone! Although many WXSAT enthusiasts in Britain and Europe are setting-up *METEOSAT-8* (*HotBird-6*) reception systems, my recent enquiry on the WXSAT forums produced many responses, suggesting that a large number of users continue to monitor WEFAX. This service is scheduled to terminate at the end of 2005, though subject to possible extension.

EUMETSAT Conference

EUMETSAT recently held a Meteorological Satellite Conference in Prague, comprising ive days of talks, discussions, presentations, software demonstrations and poster displays. **Ferdinand Valk** attended the Conference and kindly explained about a special presentation. Ferdinand described the event as well organised, instructive and most interesting. **David Taylor** participated with a demonstration of the *MSG Toolset Plus* Suite. Ferdinand added supportive visual samples of his results obtained with David's programs.

At the end of the event David was called to the front to receive a reward for the best Software Display/ Demonstration of the Conference. This honour was bestowed on him via a majority vote of the approximately 200 participants. Congratulations are therefore appropriate for David. As Ferdinand points out: "It is, amongst others, this type of contribution that makes EUMETSAT take the private and hobby user community very seriously". My thanks to Ferdinand for his notes.

The polar WXSATs give us better, more detailed coverage of northerly latitudes than can geostationary satellites because the former not only have much lower orbits, but they also pass directly over the land itself. The best resolution a.p.t. used to be transmitted by *METEOR 3-5*, the Russian WXSAT that failed a few years ago. It orbited at some 1200km altitude - considerably closer than our *METEOSAT-8* and similar satellites! It transmitted just one spectral band - visible - and so had a higher resolution than the NOAAs.

Nick Hewgill was checking the images from his polar WXSAT recordings when he noticed what appeared to be a large hole in the Greenland ice along the eastern coast. Nick lives not far from Ipswich and uses a crossed-dipole antenna mounted about 8m above the ground, feeding his Timestep Proscan receiver. He commented: "I do get very good signals to the west; I've had a couple of passes where the whole of Greenland is visible (just), and also the furthest west I have seen is Baffin island and Newfoundland! I haven't had a station for all that long so I don't know if my coverage is just average or good".

Nick's comment was very interesting because from my previous location part-way up a hill in Plymouth, I was able to receive satellite transmissions having a westerly preference because that horizon was extremely good. Like Nick, I could occasionally monitor NOAA satellites passing deep into Greenland, and rarely, could just image the whole land.

The hole is indicated by the arrow in **Fig. 6**, and despite its small size, it stands out due to its unusual appearance. I believe that I can remember noticing this hole on those Plymouth images. I have not seen it recently due to the relatively poor horizon seen by my h.r.p.t. dish.

Ferdinand Valk kindly provided the explanation for the effect. He explained: "With around 600 inhabitants for the whole region, the area is the northernmost permanently settled place on Greenland's east coast. Usually around the end of July or in August supplies are brought in by boat (once per year). The region is becoming a bit more accessible these days by air and some form of tourism is becoming possible. The hole is not induced by icebreakers. The southward ice flow along the Eastern coast of Greenland takes a turn into the Denmark strait. This causes a natural region of instability around

Fig. 5: *METEOSAT-5* visible-light 12 June 0630.

Fig. 6: *NOAA-17* 19 May a.p.t. Greenland from Nick Hewgill.

the bend at Ittoqqortoormiit (Scoresbysund). The tide-dependent level of the sea-ice and the fixed level shore-ice (the icefoot) provide for a natural breaking point once the ice thins. Huge floes can then break loose, most prominently at places such as the one under discussion".

To illustrate this, Ferdinand provided a post-processed *Terra* image to bring out a bit

Fig. 7: *Terra* (Modis) image of eastern coast of Greenland - courtesy NASA.

Fig. 8: *NOAA-12* 25 May 1551 from Mike Worsley.

more detail of the area being discussed - see **Fig.** 7.

The *Terra* spacecraft carries a number of instruments, one of which is the Moderate-resolution Imaging Spectro-radiometer (MODIS). The instrument covers 36 discrete spectral bands that should help scientists to understand the effect of humans on the environment.

Repairs Underway

For at least a few weeks, I have reverted to a.p.t.-only reception from the polar orbiters! My tracking dish system has been showing occasional signs of a sticking elevation motor for some weeks and it finally failed in early June. After some discussions with **Arne van Belle**, a Dutch expert on WXSAT hardware maintenance, I decided to try to effect repairs.

After close examination, it became evident that my Yaesu elevation rotator is a sealed unit that cannot be lubricated from the outside. The bolts holding the two sides together have resisted my attempts to unscrew them. My next plan, after completing this article, is to visit the local garage to get them to loosen off the screws. Replacement of the unit is not an option, so my attempts at repair have nothing to lose. More news next month about what happened!

An Oldie But Goody

Mike Worsley sent **Fig. 8**, received at his home in Fareham on 24 May 2004. Apart from being a clear picture that showed some interesting features, nothing else struck me about it until I read Mike's notes. He uses a Maplin WXSAT receiver! Those familiar with the earlier hardware that we used back in the mid-1980s may recall that Maplin supplied components and kits offering a selection of WXSAT hardware, including antennas and ready-built modules.

Mike has a turnstile antenna and decodes the receiver output using the freeware version of *WXtoImg*. Mike cropped out some noise at the low elevation ends of the pass, but otherwise made little enhancement. He noted: "The sun's reflection shows how calm the seas were off the west coast of Ireland - a bit of a difference from the time I was out there on exercise with the Royal Navy!".

Mike originally bought the kit to make the receiver and decoder back in 1985, and had it connected to an Amstrad 6128 home computer. "I had to write the software to get it to work and the display was only 16 colours with a resolution of 162 x 200 pixels. A bit of a difference from what is available today", he commented. I recall buying my third computer - an Amstrad-6128 - and writing software to predict satellite passes.

Mike told me that the receiver still gets used regularly in spring and summer, and for monitoring "any decent snow in the winter". The unit is apparently behaving well after all these years! Mike says: "Pager transmissions are the only real problem. I have also picked up the occasional Air Traffic broadcast and a request for another pick up in the North Fareham area from a passing taxi!".

His decoder has been consigned to the loft, having been replaced with a PC soundcard. Mike's antenna is currently mounted in the loft, but he plans to move it. He has good reception from satellite elevations above 25°, but still has bands of noise across Spain and Scandinavia even on overhead passes.

On-shore Breezes

You cannot help noticing weather features in the close-up images from *METEOSAT-8*. **Professor Robert Moore** of the university of Liverpool sent **Fig. 9** showing the result of onshore breezes around Britain in mid-May. Breezes coming off the sea and onto the land during the day may produce clouds that highlight the coast. Robert's picture shows the whole country covered in this way.

The RIG Problems

The non appearance of the March edition of the Remote Imaging Group journal (as at mid-June) will not have gone unnoticed by members of RIG. For reasons perhaps beyond the scope of this column, a number of former committee members decided to leave RIG some months back. They set up their own WXSAT-monitoring organisation - the Group for Earth Observation - and held a very successful first symposium on 1 May - as I reported last month.

Indications are that GEO is rapidly gaining members, and has so far produced two quarterly journals, with number three now being compiled. I do not know what the future holds for RIG, but I am certain that GEO will succeed in building a substantial membership.

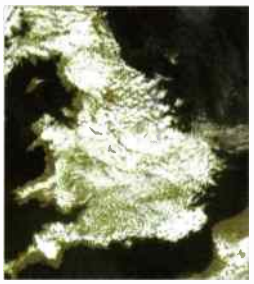


Fig. 9: *METEOSAT-8* 1325 15 May 2004 from Robert Moore (© EUMETSAT 2004).

Frequencies

a.p.t. (low resolution, low-cost imagery)
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 transmits a.p.t. on 137.62MHz.

h.r.p.t. (high resolution, research quality imagery).
NOAA-12 and *NOAA-16* transmit h.r.p.t. on 1698.0MHz.
NOAA-14 transmits on 1707MHz (failed imager).
NOAA-15 transmits on 1702.5MHz.
NOAA-17 transmits on 1707MHz.
FENGYUN-1C and *-1D* transmit on 1700.5MHz.

WEFAX: *METEOSAT-7* (geostationary) transmits WEFAX on 1691 and 1694.5MHz and Primary Data on 1691.0MHz.
EUMETCast from *HotBird-6* carrying *METEOSAT-8* data on 11.096GHz.

Propagation

Forecasts

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

How to use the Propagation Charts

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

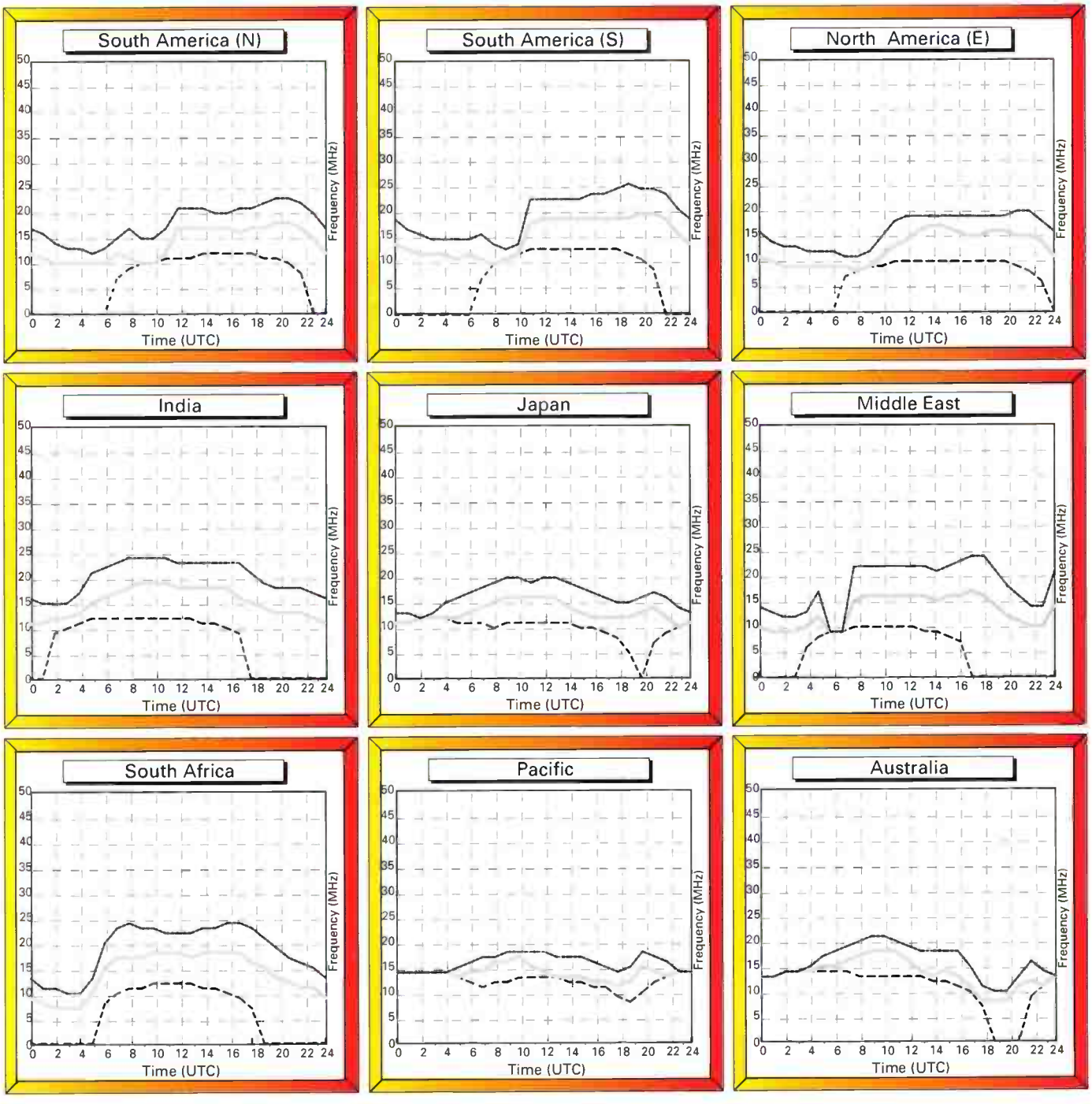
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

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

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

Good luck and happy listening.

August 2004
Circuits to London

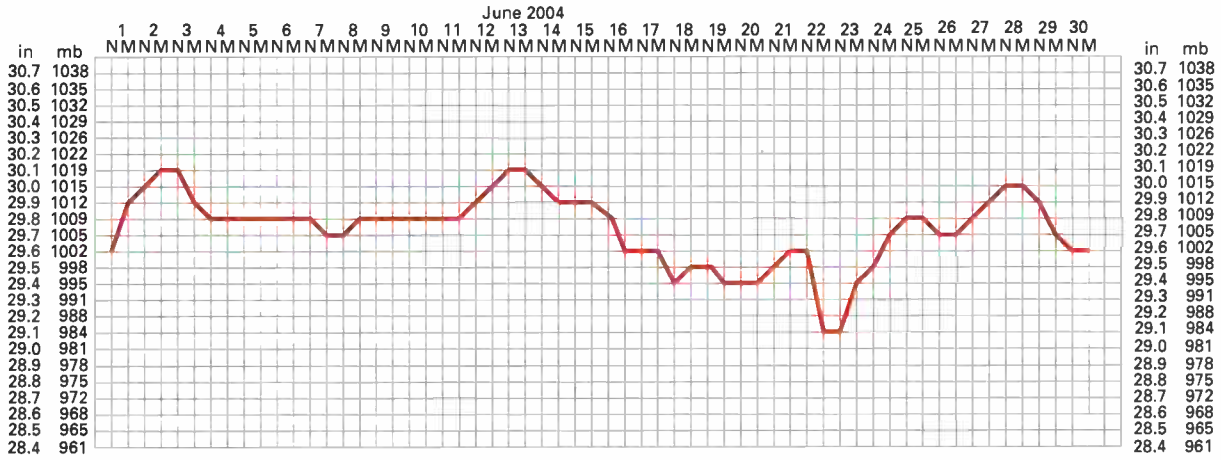


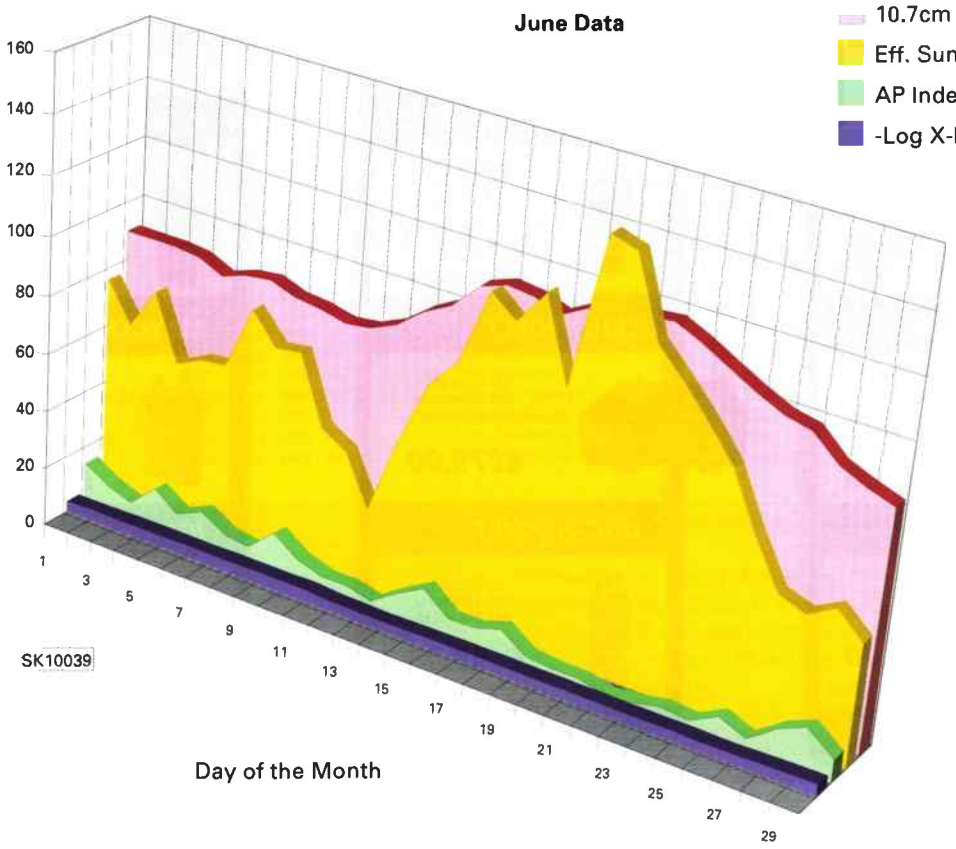
SK10038

Propagation Extra

Kevin Nice G3UNR, G7TZC
SWM Editorial Offices, Broadstone
E-mail: kevin.nice@pwpublishing.ltd.uk

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





guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity. The K and AP indices are measures of geomagnetic activity.

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

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

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

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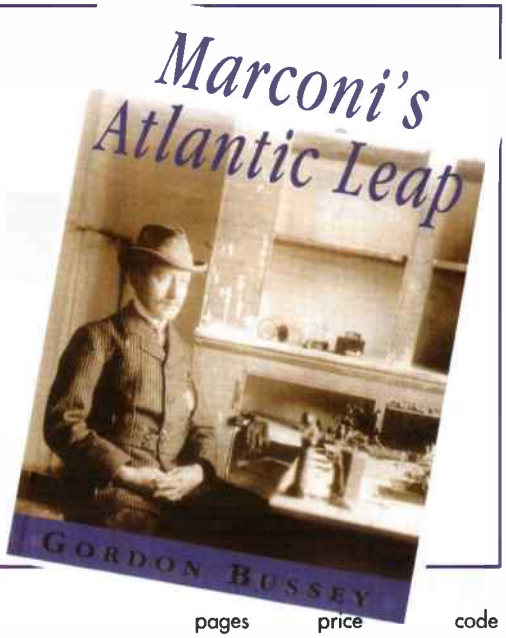

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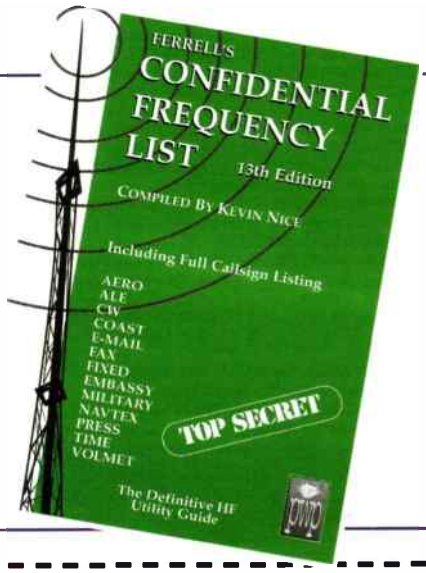

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LEICESTER RS, G3LRS. Meets at Gilroes Cottage, Groby Road, Leicester LE3 9QJ. Details from Mr S.P. Hay G3HYH. Tel: 0116-224 2598.

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 Hall, Asfordby Hill, Melton Mowbray, Leics. Details from Mr R. Winters G3NVK. Tel: (01664) 63369.

NATIONAL SPACE CENTRE ARS, M1NSC. Details from Mr J. Heath G7HIA.

TAMWORTH ARS, G8TRS. Details from Mr A.I. Dyson GOHUW. Tel: (01B27) 830437.

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

LINCOLNSHIRE

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 G4ODA.

GRANTHAM RC, GOGRC. 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 Club, Tnton Road, Lincoln. Details from Mrs Pam Rose G4STO. Tel: (01427) 788356.

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

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, Web: www.sdars.org.uk

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

NORTHANTS

KETTERING & DARS, G5KN. Meets at The Lilacs Public House, 39 Chuch Street, Isham, Kettenng, Northants NN14 1HD. Details from Fay Barwell 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, G4LJP. Details from Mr P.S. Lidsay G4CLA.

NOTTINGHAMSHIRE

ARC OF NOTTINGHAM, G3EKW. Meets at the Haywood Road Community Association, Haywood Road, Mapperley Road, Nottingham NG3 6AD. Details from Ron Hague G4XOU. Tel: 0115-919 9177.

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

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

MANSFIELD ARS, 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 G8TBF.

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, Farnborough 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

OSWESTRY & DARC, G4TTO, G1ORA. Meets at the Sweeney Hall Hotel, Sweeney, Oswestry. Details from Ant Astley GWOAJA. Tel: (01691) 860545.

SALOP ARS, G3SRT, M1AXW. Meets at the Telepost Club, Railway Lane, Abbey Forgate, Shrewsbury. Details from John Bumford GOGTN. Tel: (01743) 249943. E-mail: john.bumford@virgin.net

TELFORD & DARS, G3ZME. Meets at the Dawley Bank Community Centre, Dawley, Telford, Shropshire. Details from Mr M. Vincent G3UKV. Tel: (01952) 255416.

STAFFORDSHIRE

BURTON-ON-TRENT & DARS, G3NFC. Meets at the Stapehill Institute, Main Street, Stapehill, Burton-on-Trent, Staffs. Details from Mr M.W. Cotton G4HBY.

CANNOCK CHASE ARS, G6SW. Meets at the Four Crosses Inn, Watling Street. Hatherton, Cannock. Details from Arnold Matthews G3FZW. Tel: (01543) 262495.

CHAD RC, G4CAR. Meets at the Swinfen Officer's Club, Swinfen, Lichfield. Staffs. Details from Bernard 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, Blythe Bridge, Stoke-on-Trent, Staffs ST11 9LJ. Details from Mr B.J. Butcher G4HKG. Tel: (017B2) 395793.

NEWCASTLE-U-LYME SCOUT AR COM GR, G7UQG

STOKE-ON-TRENT ARS, G3GBU. Meets at the '45' Club, 92 Lancaster Road, Newcastle-under-Lyme, Staffs. Details from Albert Allen G4DHO. Tel: (017B2) 638801.

SUTTON COLDFIELD RS, G3RSC. Meets at the Rugby Club, Walmley 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 Humphnes 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, Brinklow Road, Coventry. Details from John Beech G8SEQ. Tel: (01203) 673999.

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

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. Nicholls. Tel: (01922) 635376.

MIDLAND ARS, G3MAR. Meets at Unit 22, 60 Regent Place, Hockley, Birmingham (jewelry quarter). Details from John A. Crane GOLAI. Tel: 0121-62B 7632.

SANDWELL AMATEUR RADIO CLUB, GOCWC. Meets at Sandwell ARC, Broadway, Oldbury, Warley, West Midlands B68 9DP. Details from Stuart Collins MOBTO. 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, Solihull, 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 Secretary.

STOURBRIDGE & DRS, G6OI, G6SRS. Meets at the Old Swnford Hospital/School, Stourbridge, West Midlands. Details from Tom Edwards.

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

WEST MIDLANDS POLICE ARC, GOCOP, G1WMP. Details from Steven Jones G6LRL.

WILLENHALL & DARS, G4ETW. Meets at The Liberal Club, Villers Street, Willenhall, West Midlands. Details from Dave Bradbury. Tel: (01902) 411252.

WOLVERHAMPTON ARS, G8TA. Meets at the Electncity Board Sports Club, St. Marks Road, Chapel Ash, Wolverhampton. Details from Mrs J. Smith. Tel: (01902) 751936.

WORDSLEY RC, G4WRA. Meets at the Brick Maker's Arms, Mount Pleasant, Bnerley 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, Bracknell, Berks. Details from John Ellerton G3NCN.

BURNHAM BEECHES RC, G3WIR. Meets at the Farnham Common Village Hall, Victona Road, Farnham Common, Bucks. Details from Mrs Eileen Chislett G6EIL. Tel: (0162B) 625720.

MAIDENHEAD & DARC, G3WKX. Meets at the Red Cross Hall, The Crescent, Maidenhead, Berkshire. Details from Neil Savin GOSVN. Tel: (0162B) 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 Marnoch Standen GOJMS. Tel: 011B-972 3504.

BUCKINGHAMSHIRE

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

CHESHAM & DARS, G3MDG. G1MDG. Meets at the White Hill Centre, Chesham, Bucks. Details from Mr T.J. Thirlwell GOVFW. 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) B74075.

MILTON KEYNES SCOUT ARS, GOSMK. Meets at The Quarries, M.K. Scout Campsite, Cosgrove. Details from Mr P.A. Orchard GORYZ. Tel: (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, RS89030. Meets at the Victory Social Club, Kechill Gardens. Hayes, Bromley. Details from Alan G. Messenger GOTLK.

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 Hill, London. Details from Bob Burns G3OOU. 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.

ECHELFORD 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, Burnt 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. Fnel G4AUF. Tel: (01895) 621310.

SILVERTHORNE RC, G3SRA, G2HR, G8CSA. Meets at the Chingford Adult Education and Community Centre, Friday Hill House, Simmons Lane, Chingford, London E4 6JH. Details from Dave Chnsty GOKHC. 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 G4OHX. Tel: 01B1-690 1274.

SURREY RADIO CONTACT CLUB, G3SRC. Meets at the T.S. Terra Nova, 34 The Waldrons, Croydon, Surrey. Details from Maunce Fagg G4DDY. Tel: 0208-669 1480.

WEST LONDON ARS, RS95599. Details from Robin Clay G0VJI.

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, G5ZG. 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, Hemel 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 G3JNJ. Tel: 0208-292 3678.

MIMRAM CONTEST GP, MOABC. Details from Alan Holdsworth G8OO. 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 SG2 0LT. Details from Peter Bell 2E1CRK. Tel: (01462) 674505.

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 Marlborough 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 G7PNF. Tel: (07973) 560649.

SURREY

BENTLEY ARC, GOVZS. Details from Derek Gilbert GONFA.

CATERHAM RG, GOSCR. Details from Mr P.N. Lewis G4APL.

COULSDON AMATEUR TRANS. SOC., 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 Greenwell G3AEZ. Tel: (01306) 631236.

FARNBOROUGH & DRS, G4FRS. Meets at The Community Centre, Meudon Avenue, Farnborough, Hants. Details from Mr M. Hearsey G8ATK. Tel: (01252) 715765.

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

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

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

SUTTON & CHEAM RS, G2XP, G7SAC. Meets at the Sutton United Football Club, Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Details from John Puttock GOBWV. Tel: 0208-644 9945.

THAMES VALLEY ARTS, G3TVS. Meets at the Thames Ditton Library, Watts Road, Giggs Hill, Thames Ditton, Surrey. Details from Cdr. J. Pegler G3ENI. Tel: (01483) 284279.

WIMBLEDON & DARS, G3WIM. Meets at St. Andrews Church Hall, Herbert Road, Wimbledon, London. Details from Mr Reg Blackwell M1EEK. Tel: 0208-696 9857.

SOUTH & SOUTH EAST EAST SUSSEX

BRIGHTON RADIO CLUB, G4GQR. Meets at Vallance Community Centre, Sackville Road, junction of Connaught Road, Hove.. Details from Hon. Sec 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.

SOUTHDOWN ARS, G3WQK. Details from Jim Harris G4DRV. Tel: (01323) 728479.

THE QRZ ARG OF SUSSEX, GB3VX. Meets at the Coach Station, Wartling Road, Eastbourne. Details from Stuart Constable MOCHW. Tel: (01435) 863020.

HAMPSHIRE

ANDOVER RAC, GOARC. Meets at the Village Hall, Wildhern, 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 MOCJJ.

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 Swan 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) B13827.

SONY BROADCAST ARC, G4SZC. Accredited C&G RAE centre. Meets at Sony Sports & Social Club, Prestley Road, Basingstoke. 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 PO14 1AS. Details from Mr W.S. Blyth GOPPH. Tel: (01329) 232386.

THREE COUNTIES ARC, G4WWR. Meets at the Bramshott Parish Inst. & Club, Headley Road, Liphook, Hants. Details from Damian Kamm G7RFV. Tel: (0142B) 724456.

WATERSIDE ARS, G4JYN. Meets at the Applemore Scout HQ, Applemore, Hythe, Southampton. Details from Tony Horton GOLKG. Tel: (01703) 841794.

ISLE OF WIGHT

BRICKFIELDS ARS, GOBAR. Meets at Brickfields Horse Country Cent, Newnham Road, Binstead, Isle of Wight. Details from Mr Pebody.

ISLE OF WIGHT RS, G3SKY. Meets at The Old Cafe, Whiteciff Bay, Holiday Park, Bembridge. Details from Alan Reeves G4ZFQ. Tel: (01983) 294309.

OXFORDSHIRE

BANBURY ARS, GOBRA. Meets at St. John's Church Social Club, South Bar, Banbury, Oxon. Details from Mr R.S. Marsden G1YSY. Tel/FAX: (01295) 253509.

HARWELL ARS, G3PIA. Meets at the Social Club, Harwell Laboratory, Didcot. Oxon. Tel: (01235) 223250.

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.

WEST SUSSEX

CHICHESTER ARC, G2NM. Meets at the St. Pancras Hall, Chichester. Details from Graham Swann GOWSO.

CRAWLEY ARC, G3WSC. Meets at the Tilgate Forest Rec. Centre, Hut 1B, 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: (01403) 253432.

MID SUSSEX ARS, G3ZMS. Meets at Marle Place, Leylands Road, Burgess Hill, West Sussex. Details from Mr C. Childs 2E1DCP. Tel: (01444) 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.

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

WILTSHIRE

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

AVON

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

GORDANO ARG, G6GRG. Meets at The Ship, Redcliffe Bay, Portshead, Avon. Details from Mr R.T. White G8SPC. Tel: (01275) B74001.

NORTH BRISTOL ARC, G4GCT. Meets at the Self Help 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) 8342B2.

THORNBURY & SOUTH GLOS ARC, G4ABC. Meets at the United Reform Church Hall, Rock Street, Thornbury, 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.

CORNWALL & SCILLY IS

CORNISH RAC, G4CRC. Meets at the Perran-ar-Worthal Village Hall, Perranwell, Nr Truro, Cornwall. 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, G8ZGM. Meets at the Club House, Poldhu Cove, Mullion, Cornwall TR12 7JB. Details from Mrs Carolyn Rule MOADA. Tel: (01326) 240144.

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

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

DEVON

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, Axminster, Devon. Details from Pat Cross GOGHH. Tel: (01297) 33756.

DARTMOOR RADIO CLUB, G1RCD, G0DRC. Meets at the Yelverton War Memorial Village Hall, Meavy Lane, Yelverton, 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, G0XRC. Meets at The Scout Hut, Marlpool Hill, Exmouth.

NORMAN LOCKYER OBSERVATORY ARG, G0AXC. Meets at the Norman Lockyer Observatory, Salcombe Hill, Sidmouth. Details from Ron Hamson G0NOC. Tel: (01395) 515349.

NTE (PAIGNTON) ARS, G0OSH. Meets at Paignton Community College, Upper School, Waterleat Road, Paignton. Details from Rod Maude G0SWM. Tel: (01803) 521066.

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, G0UOP. Details from Alan Santillo G0XAW.

DORSET

BLACKMORE VALE ARS, G4RBV. Meets at Shaftesbury Club for Young People, Coppice Street, Shaftesbury, Dorset SP7 8PF. Details from Mr A. Marriott G0GFL. Tel: (01258) 860741.

BOURNEMOUTH RS, G2BRS. Meets at the Kinson Community Centre, Kinson, Bournemouth, Dorset. Details from Chris R. Ellis M5AGG, Broken Ridge, Fir Tree Close, St. Leonards, Ringwood, Hants BH24 2QW. Tel: (01202) 893126.

CHRISTCHURCH ARS, G0MUD. Meets at the Siemens Plessey Sports & Social Club, Grange Road, Somerford, Christchurch, Dorset. Details from Mr K.P. Harris G7WSN. Tel: (01202) 484892.

FLIGHT REFUELLING ARS, G4RFR. Meets at the Flight Refuelling Social Club, Merley, Wimborne, Dorset. Details from Martin Axon 2E1DFZ. Tel: (01202) 693334.

POOLE RS, G4PRS. Meets at the Bournemouth & Poole CFE, Constitution Hill Site, Poole, Dorset. Details from Phil Mayer G0KKL. Tel: (01202) 700903.

PORTLAND ARC, G0VOP/G7VQP. Meets at Clifton Hotel, Grove Road, Portland. Details from Kerry Morris G1WIK. Tel: (01305) 788591.

SOUTH DORSET RS, G3SDS. Meets at the Church Hall, Chickerell, Weymouth, Dorset. Details from John Rose M0BQO. Tel: (01305) 832057.

SWANAGE & PURBECK ARC, M0BLJ. Meets at Kings Arms, Langton Matravers, Dorset. Details from Peter Wakefield M1WCH/M3WCH. Tel: (01929) 424413.

WESSEX AMATEUR WIRELESS CLUB, G1WAW. Details from Ken Powell 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, G0PCS. Details from Craig Douglas G0HDJ. Tel: (01935) 71131.

TAUNTON & DARS, G3XZW. Meets at The Memorial Hall, Trull, Taunton. Details from David Rosewarn M0CIF.

WEST SOMERSET ARC, G0OWX. Meets at the West Somerset Community College, Minehead, Somerset. Details from Robert Bonar G1ONV/M3ONV. Tel: (01643) 863462.

WINCANTON ARC, G0WRA. Meets at King Arthur's Community School, West Hill, Wincanton. Details from Mr G.A. Fingerhut G0ENW. Tel: (01963) 370506.

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

ESSEX

BRAINTREE & DISTRICT AMATEUR RADIO SOCIETY, G3XG. Meets at the Braintree Hockey Club, Church Street, Bocking, Braintree. Details from John M5AJB. Tel: (01787) 460947.

CHELMSFORD ARS, G0MWT. Meets at the Marconi Social Club, Beehive Lane, Chelmsford, Essex. Details from David Bradley M0BQC. Tel: (01245) 602838. E-mail: cars@g0mwt.org.uk

CLACTON RADIO CLUB, G3CRC. Details from Mr D. Fitzpatrick M0CHL.

COLCHESTER ARS, G3VCO. Meets at the Colchester Institute, Sheepen Road, Colchester. Details from Frank R. Howe G3FIJ. Tel: (01206) 851189.

DENGIE HUNDRED ARS, G0UTT, G7SDH. Meets at the Henry Samuel Hall, Maryland, Essex. Details from Mrs Christine Wade. Tel: (01621) 772986.

HARLOW & DARS, G6UT. Meets at the Mark Hall Barn, First Avenue, Harlow, Essex. Details from Len Brackstone G7UFF. Tel: (01279) 832700. FAX: (01279) 864973.

HARWICH ARG, GOGRH. Meets at the Park Pavillion, Barrack Lane, Harwich. Details from Eugene Kraft G4FTP.

LOUGHTON & EPPING FOREST ARS, G4ONP. Details from Marc Litchman G0TOC. Tel: 0208-502 1645/(07803) 023501.

SOUTH ESSEX ARS, G4RSE. Meets at the Paddocks, Long Road, Canvey Island, Essex. Details from Mrs Betty Maynard G6LUO. Tel: (01268) 695474.

SOUTHEND & DRC, G5QK. Meets at the Alexandra Yacht Club, Clifftown Parade, Southend-on-Sea, Essex. Details from Alan Radley G0TTM. Tel: (01268) 741229.

STANFORD-LE-HOPE & DARC, G4SLH. Meets at the St Joseph Parish Rooms, Scratton Road, Stanford-le-Hope, Essex. Details from Ken Thompson G4PAD. Tel: (01375) 671238.

VANGE ARS, G3YCW. Meets at the Barnstable Community Centre, Basildon, Essex. Details from Mrs D. Thompson. Tel: (01268) 552606.

KENT

BREDHURST RX & TX SOC., G0BRC. 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, Eltham, London SE9. Details from Richard Perzyna G8ITB. Tel: (01689) 602948.

DOVER RADIO CLUB, G3YMD. Meets at the Dover Grammer School for Boys, Astor Avenue, Dover. Jim Cairns M1BKI. Tel: (01304) 852773.

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

HASTINGS ELEC. & RC, G6HH, G1HHH, G6LL. Meets at West Hill Community Centre, Croft Road, Hastings, East Sussex. Details from Mr J. Boothroyd G0MTJ. Tel: (01233) 732656.

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

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 G0VAR. 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, Bexleyheath, Kent. Details from Mr A.V. Fnobens G8MLQ. Tel: (01474) 365694.

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

THE MORSE CLUB, GX0OXE. Meets at The Five Wents Memorial 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

ANGLIA TELEVISION ARS, G0TXV. 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 G0MQL.

NORFOLK ARS, G4ARN. Meets at Norwich Aviation Centre, Norwich Airport. Details from John Wadman G0VZD. Tel: (01953) 604769.

NORTH NORFOLK ARG, GB2MC. Details from Tony Smith G4FAI. 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 Woods G3LPT.

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

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

IPSWICH RADIO CLUB, G4IRC. Meets at the Golden Hind, Nacton Road (3rd Wednesdays at The Hollies, Bucklesham Straight Road), Ipswich. Details from Keith Gaunt 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, Oulton Road, Lowestoft. Details from Phil Holden G0JSG. Tel: (01502) 585448.

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

SUDBURY & DRA, G0SWI, G7SRA. Meets at the Old School, Wells Hall Road, Great Cornard, Sudbury, Suffolk. Details from Bryan Panton G1TWY.

SUFFOLK DATA GROUP, GB7MXM. Details from Peter Pryke G8HUE. Tel: (01473) 631313.

NORTH WALES

CLWYD

CONWAY VALLEY ARC, GW6TM. Meets at the Studio, Penrhos Road, Colwyn Bay, Clwyd. Details from Mr R.W. Evans GW6PMC. Tel: (01745) 855068.

HALKYN & DARS, GW3HRG. Details from Mr D. Austin GW1XHG.

NORTH WALES RS, GW0NWR. Meets at the Old YMCA, Queen's Drive, Colwyn Bay, Clwyd. Details from Ted Shipton GW0DSJ. 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, GW0MVI. 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, Llanfaipwll, 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, GW0ARA. 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, Llangunnor, Carmarthen SA31 3BS. Details from Mr W.D. Hughes GW4ZXL. Tel: (01267) 231359.

CLEDDAU ARS, GW0SYG. Details from Trevor Perry GW4XQK. Tel: (01646) 600725.

LLANELLI ARS, GW0EZQ. Meets in the Furnace Community Hall, Furnace Square, Llanelli. Details from Roy Jones GW0KJZK. Tel: (01554) 820207.

PEMBROKESHORE RS, GW0EJE. Meets at Furzy Park Community Centre, Furzy Park, Haverfordwest, Pembrokeshire. Details from Ian M. Jones MW0CAB. Tel: (01437) 763028.

GWENT

ABERGAVENNY RS, GW4GFL. Meets at the Hill Residential College, Pen-y-Pound, Abergavenny, Gwent. Details from Glyn Hughes GW0DQY. Tel: (01633) 483186.

BLACKWOOD & DARS, GW6GW. Meets at the Oakdale Comprehensive School, Oakdale, Blackwood, Gwent. Details from John Evans GW8ITI. Tel: (01495) 225178.

EBBW VALE COLLEGE RS, GW0IW. Meets at the Gwent Tertiary College, Ebbw Vale Campus, College Road, Ebbw Vale, Gwent. Details from Mr T. Hayden GW0HCN. Tel: (01495) 305192.

NEWPORT ARS, GW4EZW. Meets at the Bryngias Community Centre, Bryngias Road, Newport, Gwent. Details from Paul Nicholls.

PONTYPOOL ARS, GW3RNH. Meets at the Settlement, Rockhill Road, Pontypool, Gwent. Details from Graham Smith GW0OLZ.

MID-GLAMORGAN

BRIDGEND & DARC, GW4LNP. Meets at the Club Brynmenyn, Brynmenyn, Bridgend. Details from Alun Hulmes. Tel: (01656) 721574.

HOOVER (MERTHYR) ARC, GW3RDB. Meets at the Hoover Sports Pavilion, Hoover Ltd., Pentrebach, Merthyr Mydfil, Mid Glamorgan. Details Robert Cummings GW0RVG.

MID GLAMORGAN ARG, MW0CNA. Meets at Aberkenfig Sports & Social Club. Details from Mervyn Carey GW4VSE. Tel: (01656) 734668.

SOUTH GLAMORGAN

BARRY ARS, GW3VKL. Meets at Sully Sports & Leisure Club, South Road, Sully, S. Glamorgan. Details from Richard Mortimore GW4BVJ. Tel: (01446) 738756.

HIGHFIELDS ARC, GW4LFO. Meets at the Highfields Physically Handicapped Centre, Allensbank Road, Cardiff. Tel: (01222) 561542.

WEST GLAMORGAN

PORT TALBOT (BS PLC) ARS, GW3EOP. Meets at the British Steel PLC Sports & Social Club, Margam, Port Talbot, West Glamorgan. Details from Mr J. Chinnock MW0AGE.

SWANSEA ARS, GW4CC. Meets at the Applied Sciences Building, Swansea University. Details from Frank Burrow GW8BME. Tel: (01792) 390233.

SCOTLAND WEST & WESTERN ISLES

CENTRAL REGION

FALKIRK & DARS, GM0FRC. Meets in the 62nd Forth Valley Scouts Hall, Denny Road, Larbert, Nr. Falkirk. Details from Brian J. Waddell GM4XQJ, QTHR or E-mail: gm4xqj@btinternet.com

STIRLING & DARS, GM6NX. Meets at Bandeath Industrial Estate, Throsk, Nr. Stirling. Details from John Sherry GM0AZC. Tel: (01324) 824709.

DUMFRIES & GALLOWAY

WIGTOWNSHIRE ARC, GM4RIV. Meets at the Aird Unit, Stranraer Academy, Stranraer, (entrance from Cairnport Road). Details from Neil Macdonald GM4LQS.

STRATHCLYDE

AYR ARG, GM0AYR. Meets at the University of Paisley, University Campus, Beech Grove, Ayr KA8 0HN. Details from John Shankland MM1JAS. Tel: (01292) 445599.

CENTRAL SCOTLAND FM GROUP, RS38728. Details from Thomas Stalker GM7TZU. Tel: (01698) 816793.

DALRY ARG, MM0ARG. Meets at The Turf, In Dalry Court, Hill Street, Dalry. Details from Alex McKeeman MM0ABM. Tel: (01294) 823295.

DUNOON & DARS, GM0COD. Meets at the Edward Street Community Centre, Edward Street, Dunoon. Details from A.B. Horton GM0BUL. Tel: (01369) 840217.

HELENSBURGH ARC, GM4HEL. Details from G. Capstick GM7OAF. Tel: (01436) 675922.

INVERCLYDE ARG, GM0GNK. Meets at the Cardwell Bar, Cardwell Road, Gourock, Strathclyde. Details from Andrew Givens GM3YOR. Tel: (01475) 638226.

KILMARNOCK & LOUDOUN ARC, GM0ADX. Meets at the Hurlford Community Centre, Cessnock Road, Hurlford. Details from Steve Campbell GM4OSS. Tel: (01560) 483800.

LARGS & DARS, GM0VKG. Details from Mr J. Clough GM0MDD. Tel: (01475) 568584.

LORN ARS, GM0LRA. Details from T. Olsen GM0EQW. 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) B22860.

MILTON OF CAMPSIE ARS, GM0MOC. Meets at The Red Cross Hall, Kirkintilloch. Details from John MacKenzie GM0HJU. Tel: (01360) 312954.

PAISLEY ARC, GM0PYM. Meets at the Paisley YMCA Hall, 5 New Street, Paisley PA1 1XU. Details from John Quigley GM0TQA. Tel: 0141-889 6860.

SCOTTISH DIGITAL COMMS. GRP, GM7VSR. Details from Stuart Clink GM1VBE. Tel: (01698) 884803.

WEST OF SCOTLAND ARS, GS4AGG. Meets at the Multi Cultural Centre, 21 Rose Street, Glasgow. Details from Hon. Sec.

SCOTLAND EAST & HIGHLANDS

BORDERS

BORDERS ARS, GM0BRS. Meets at the St. John Ambulance Hall, Berwick-upon-Tweed. Details from A.M. McCreadie GM0BPY. Tel: (01B907) 50492.

GALASHIELS & DARS, GM4YEQ. Meets at the Focus Centre, Galashiels. Details from Jim Keddie GM7LUN.

KELSO ARS, GM4KHS. Meets at the Abbey Row Community Centre, Kelso. Details from Margaret Chalmers GM0ALX. Tel: (01573) 226372.

FIFE

GLENROTHES & DARC, GM4GRC. Meets at the Football Pavillion, Station Road, Thornton, Fife. Details from Alexander Adam GM0FVD. Tel: (01592) B74374.

GRAMPIAN

ABERDEEN ARS, GM3BSQ. Meets at the Red Cross HQ, 22 Queens Road, Aberdeen. Details from Robert Duncan. Tel: (01224) B96142.

BANFF & DARC, GM0PYC. 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.

HIGHLAND REGION

FORT WILLIAM ARG, GM0FRG. 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 GM0OGZ. Tel: (01463) B11701.

LOTHIAN

COCKENZIE & PORT SETON ARC, RS177035. Meets at the Thomtree Inn, Lounge Bar, Old Cockenzie High Street, Cockenzie, E. Lothian. Details from Mr Bob Glasgow GM4UYZ. Tel: (01875) B11723.

LOTHIANS RS, GM3HAM. Meets at the Orwell Lodge Hotel, Polwarth Terrace, Edinburgh EH11 1NH. Details from Thomas G. Main, Sec.

ORKNEY

ORKNEY ARC, RS181749. Details from Mrs Terry Penna. Tel: (01856) 741233.

SHETLAND ISLANDS

LERWICK RC, GM3ZET. Meets at the Islesburgh Community Centre, King Herald Street, Lerwick, Shetland. Details from Ian C. Millar GM7RKD. Tel: (01950) 460306.

TAYSIDE REGION

DUNDEE ARC, GM4AAF. Meets at the Dundee College, Graham Street Annex, Dundee. Details from Martin Higgins MM0DUN, c/o Dundee ARC, 60 Duns Crescent, Dundee DD4 0RZ

PERTH & DARG, GM4EAF. Meets at the Perth Sports & Social Club, 18 Leonard Street, Perth. Details from Ron Harkess GM3THI. Tel: (01738) 643435.

STRATHMORE & DARC, GM3GBZ. Meets at 2231 Sqdn ATC, 1 Lochside Road, Forfar. Details from Graham Scattergood MM0BSX. Tel: (01307) 468824.

N. IRELAND

CO. ANTRIM

ANTRIM & DARS. Meets at the Clotworthy Arts Centre in the Castle Grounds in Antrim. Details from David Hutchinson GI4FUM or visit www.gn4sw.co.uk

BALLYMENA RC, GI3FFF. Meets at 70 Nursery Road, Gracehill, Ballymena, Co. Antrim. Details from Jeffery Clarke GI4HCN. Tel: (01266) 659769.

CARRICKFERGUS ARG, GI0LIX. Meets at the Downshire Community School, Downshire Road, Carrickfergus. Details from John Branagh GI3YRL. Tel: (01960) 367208.

GLENGORMLEY ELECTRONICS ARS, GN0XYZ. Meets at Knockagh Lodge, 236 Upper Road, Greenisland, Co. Antrim. Details from James Hoey GI0BJH. E-mail: g0bjh@ntlworld.com

LAGAN VALLEY ARS, GI4GTY. Meets at the Harmony Hall Arts Centre, Harmony Hill, Lisburn, Co. Antrim. Details from Ron McCaughey GI4NTO.

ROYAL NAVY (ULSTER) ARC, GI0URN. Club affiliated to the Royal Navy Amateur Radio Society. Details from Alex Miller GI4SFV.

CO ARMAGH

ARMAGH & DARC, GI0ADD. Meets at County Armagh Golf Club, 7 Newry Road, Armagh City. Details from John A. Murphy. Tel: 0283-752 2153.

CO. DOWN

BANGOR & DARS, GI3XRQ. Meets at The Stables, Groomsport, Co. Down. Details from Terry Barnes GI3USS. Tel: 0289-147 3948.

NEWRY & MOURNE ARC, GI4MBO. Meets at the Shamrock Social Club, Newry.

ULSTER DX ARG, MI0UDX. Details from Mr P.G. Mercer GI4VIV.

CO. FERMANAGH

LOUGH ERNE AMATEUR RADIO CLUB GI0LEC. Meets at the Railway Hotel, Forthill Street, Enniskillen, Co. Fermanagh. Details from Herbie Graham GI8JPO. Tel: 02866 387761.

TYRONE

THE FOYLE & DARS, MI0AKU. Meets at 159 Victoria Road, Bready, Co. Tyrone. Details from Trevor Campbell GI1XGA. Tel: 0287-134 5405.

International Radio Clubs

AMSAT-UK (G0AUK)
Information from Jim Heck G3WGM, Badgers, Letton Close, Blandford, Dorset BH11 7SS. E-mail: g3wgm@amsat.org or visit www.uk.amsat.org

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)
Enquiries to Dave Lawton G0ANO, 'Grenehurst', Pinewood Road, High Wymcombe, Bucks HP12 4DD. Tel: (01494) 528899. E-mail: memsec@batc.org.uk or visit www.batc.org.uk

British DX Club (BDXC-UK)
Enquiries to Club Secretary Colin Wright, 126 Bargery Road, London SE6 2LR. E-mail: secretary@bdxc.org.uk or visit www.bdxc.org.uk

Danish Shortwave Club
Information from Treasurer Bent Nielsen, Egekrogen 14, DK-3500 Vaerloese, Denmark or visit www.dswci.org

International Listeners' Association (RS88763)
Details from Trevor Morgan GW4OXB, 1 Jersey Street, Haford, Swansea SA1 2HF. E-mail: gw4oxb£net.ntl.com

International Short Wave League (ISWL - G4BJC)
Information from Honorary Secretary Bill Mackie G-9137/G4AIE, 23 College Park, Horncastle, Lincs LN9 6RE. E-mail: bill.mackie@zetnet.co.uk or visit www.iswl.org.uk

Military Wireless Amateur Radio Society (G0PTZ)
Further details from John Taylor-Cram, 7 Hart Plain Avenue, Cowplain, Waterlooville, Hampshire PO8 8RP. Tel: 0239-225 0463.

Radio Amateurs Invalid and Blind Club (RAIBC - G4IBC, GB0IBC, GB1IBC)
Enquiries to Honorary Treasurer/Membership Secretary Mrs Shelagh Chambers, 78 Durley Avenue, Pinner, Middlesex HA5 1JH. Tel: 0208-868 2516.

***Radio Amateur Old Timers' Association**
Enquiries to Membership Secretary Ted Rule, G3FEW,15 Norwich Road, Lenwade, Norwich NR9 5SH. Tel: (01603) 872309, E-mail: edit@raota.fsnet.co.uk or visit www.raota.supanet.com/

Remote Imaging Group (RS88803)
Further details from the Membership Secretary John Din, 59 Woodend Road, Coalpit Heath, Bristol BS36 2LH. FAX: (01454) 887880. E-mail: membership @rig.org.uk

Royal Air Force Amateur Radio Society (RAFARS - G8FC, G8RAF)
Details from the Administrator, HQ RAFARS, RAF Cosford, Wolverhampton WV7 3EX. Tel: (01902) 372722, E-mail: administrator@rafars.org

Royal Navy Amateur Radio Society (RNARS - GB3RN, G3CRS, G1BZU)
Enquiries to Secretary Philip Manning G1LKJ/M3LKJ, 1 Wavereley Gardens, Ash Vale, Surrey GU12 5JP. Tel: (01252) 334929, E-mail: g1lkj@amsat.org or visit www.rnars.org.uk

Royal Signals Amateur Radio Society (RSARS - G4RS)
More information from General Secretary, HQ RSARS, Cole Block, Blandford Camp, Dorset DT11 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

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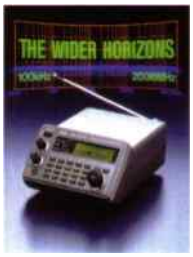

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AGL	Angola	CHL	Chile	GHA	Ghana	KWT	Kuwait	NRU	Nauru	TGO	Togo
ALB	Albania	CHN	China	GMB	Gambia	LAO	Lao P.D.R.	NZL	New Zealand	THA	Thailand
ALG	Algeria	CLM	Colombia	GNB	Guinea-Bissau	LBN	Lebanon	OMA	Oman	TJK	Tajikistan
AND	Andorra	CLN	Sri Lanka	GNE	Equatorial Guinea	LBR	Liberia	PAK	Pakistan	TKM	Turkmenistan
ARG	Argentina	CME	Cameroon			LBY	Libya	PHL	Philippines	TON	Tonga
ARM	Armenia	COG	Congo	GRC	Greece	LCA	Saint Lucia	PNG	Papua New Guinea	TRO	Trinidad and Tobago
ARS	Saudi Arabia	COM	Comoros	GRO	Grenada	LIE	Liechtenstein	PNR	Panama	TUN	Tunisia
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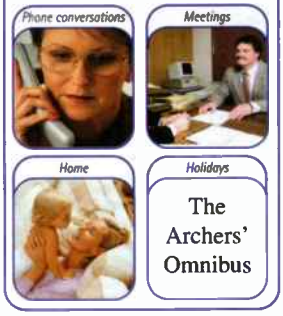

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