OLDHAM AMATEUR RADIO CLUB

G1ORC **G4ORC**

OLD HAMS NEWS

The Journal of the Oldham Amateur Radio Club

January 2007

RSGB Affiliated Society

JOTA 2006

The 2006 Jamboree on the Air for the Nations Scouts was scheduled for the weekend of 14th/15th October. Once again we were invited to take part by the Greater Manchester Scout Association.

Like last year we set up the antenna arrays on the Friday evening of the 16th in the cold and dark, but at least it was not raining. A G5RV for HF and the Watson 2/70 colinear for VHF/UHF operation were quickly erected. Ian Firby G7VCG had recently repaired our GP5 HF vertical and this was assembled and erected the following day for HF data use by Mike Capper M0MSC from RADARS who is extremely expert in this mode of communication.

Operation began at 10:00 on the Saturday and continued through to 16:00. The timings were duplicated on the Sunday but stripping down and packing up the station was included in this.

Although we worked plenty of JOTA and other stations throughout the weekend it was fairly quiet from the scout's point of view. Fewer scouts attended compared with last year but those who did come enjoyed the occasion and were successful in gaining their communications badges.

Bertie Whitcher G7JUL was kept busy showing scouts how to tune a receiver. This helped towards fulfilling the requirements for the badge of logging 25 stations heard. Other numbers were built up from actually talking to other scouts on the air. Morse code demonstrations, packet radio and SSTV were also available to scouts.

The following members are due considerable thanks for giving their time, help and expertise at this event.

Chris Cunliffe G7OOD	Ian Moth G8ZHC	Mike Crossley M1CVL
Alan Burgess G4GLV	Sue Burgess G0RKE	Chris Mackay M0TVL
Bertie Whitcher G7JUL	Phil Ellis 2E0PUS	Paul Riddle M3MUO
Keith Graham M0KGM	Geoff Ashton M0AUG	Geoff Oliver G0BJR
Peter Rushton G7PMZ	Ian Firby G7VCG	Steve Brown M0SGB
Tony Kennedy M3TGG	Mike Capper M0MSC (RADARS	

Photographs were taken and supplied by Chris Mackay M0TVL

CONGRATULATIONS

As reported in the October edition of Old Hams News Philip Ellis passed the Intermediate course and exam. He now has his new callsign which is 2E0PUS.

Also on 7th December Paul Riddle M3MUO took and passed the Radio Amateurs Intermediate Exam. Details of his new callsign to follow.

CONTEST NEWS

Throughout the year our contest group have been gaining good publicity for our club by entering various contests. What follows is a report of their activities and successes through 2006.

On the first and second Tuesdays of every month they have been active in the 144MHz (First Tuesday) and 432MHz (Second Tuesday) RSGB Cumulative Contest. Results for this event are not due until February 2007 so watch this space.

On 6th May they entered the QRP section of the RSGB 432MHz Trophy Contest and achieved a magnificent 2nd place.

In June they took part in the Practical Wireless Magazine VHF QRP Contest and were rewarded by winning the Fixed Station section. Rumour has it that a team is being assembled to enter the 2007 PW contest from our usual location of Kinder Low. If you are interested in taking part please see Chris Cunliffe G7OOD or Ian Moth G8ZHC

Results are now in for the Worked All Britain 144MHz QRO Contest and the Worked All Britain 432MHz QRP Contest where we won the contests in both cases. We still await the results of the Worked All Britain 432MHz QRO Contest in which we also took part.

Congratulations to all those who took part in these events. It has been a very successful contesting year.

CABIN MAINTENANCE

As most of you are aware for some time we had problems with our cabin roof leaking. Last year a team of members headed by Steve Crane G0KUY fitted a new metal roof which solved many of the problems. However it was noticed through this year that water was leaking into the cabin once again. This was found to be caused by cracked seals around the window frames at the rear of the cabin. The frames were resealed but the problems continued.

Spread across two weekends a team of members headed by Stuart Wilson G7MFK set to work to solve the problem permanently. Some UV plastic soffet boards had been purchased and these were cut, shaped and fitted around the cabin sealing up the gap between the walls and the new tin roof. Then a gutter and downspout was fitted at the rear of the cabin to prevent the draining rainwater from falling onto the rear window frames.

Hopefully this work will now completely resolve the problem of leaks and our cabin will be cosy and warm through this winter .

Many thanks to the following members who were involved with the repairs.

Stuart Wilson G7MFK	Mike Crossley M1CVL	Peter Rushton G7PMZ
Ian Firby G7VCG	Phil Ellis 2E0PUS	Geoff Oliver G0BJR

SOMETHING FOR THE HOLIDAY

Having looked over our collection of rigs and assorted accessories it was found to be sadly lacking. We were on the hunt for the makings of a portable station to take on holiday to a self catering cottage on the Northumberland coast.

Size and weight would have to be an important consideration as I would end up being the one carrying it around in my rucksack whilst out walking. By pure good luck the answer dropped on the door mat. Keynote, the news letter from the Fists CW Club arrived. On offer, as a club construction project was a kit from the Small Wonder Labs company in America.

The kits being made available were from the SW series, an SW80 for eighty metres or SW40 for 40 metres. The SW range gives a single band CW transceiver up to two watts output and about 40kHz coverage with a superhet receiver stage. The audio output driving Walkman style headphones/earbuds . The rig has been designed with portable operation in mind, the circuit board measures only three inches by four inches. The designer has been very mindful of current consumption, on transmit at 13.8vdc it draws about 300mA, on receive at maximum volume and a very strong signal nearly 30mA. This being the case 8 AA alkaline batteries or 10 AA recharable batteries should give approximately two hours operation.

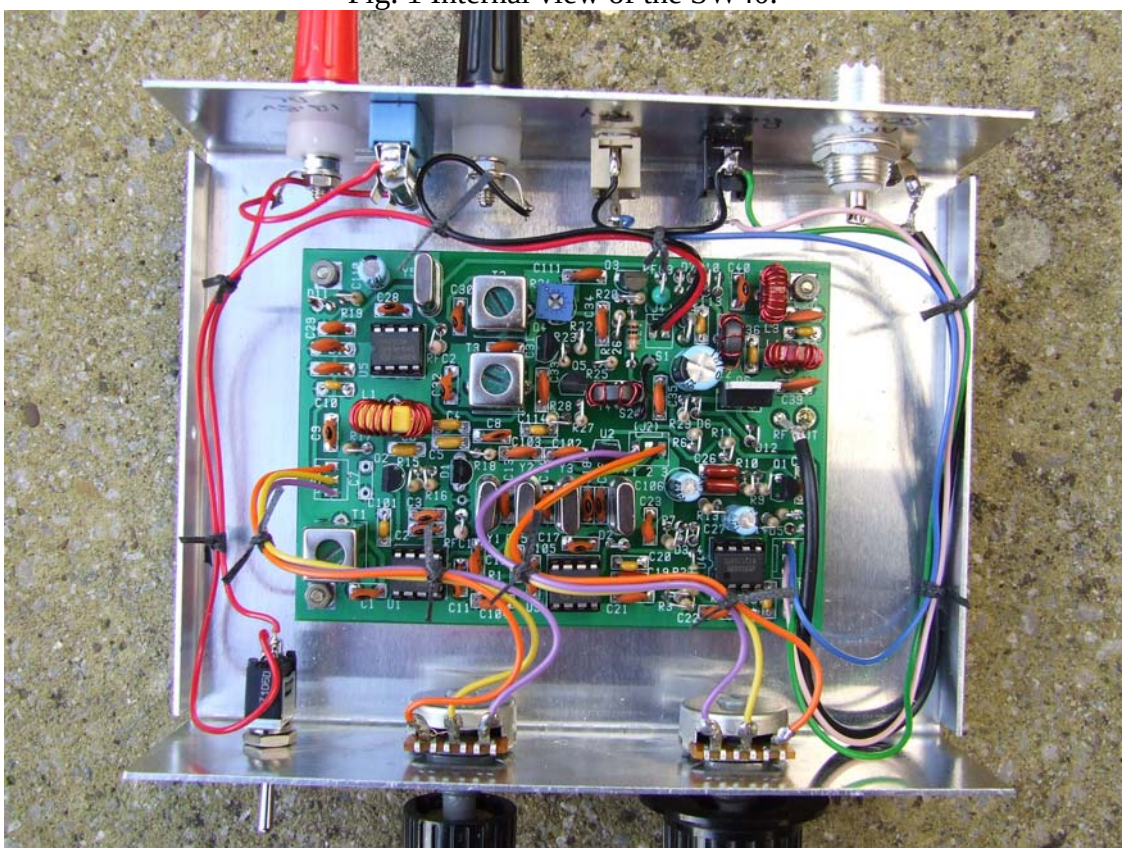
A glance at back issues of Sojourner, the magazine produced by the Adventure Radio Society gives a good indication of a well established pedigree for the SW range. They regularly appear in the results of the ARS monthly 2 hour Sparton Sprint contest.

The kit comprises all the board mounted parts, which amounts to approximately 95% of the finished rig and a very comprehensive manual, giving all the information need to complete the job. You need to supply as extras, a case, two variable resistors, antenna, power, key and headphone connectors. The circuit board has silk screen printed component markings make assembly easy, it's like painting by numbers. Setting the transceiver up took less than half an hour. Total construction time including the metal work, a weekend, started early Saturday morning on the air Sunday evening. Fifty pounds covered the all in cost. I couldn't resist I bought one of each.

Performance on 40M - to date 15 countries worked, including 3 contacts in the USA during a two hour operating stint on the CQ WW CW contest weekend. On 80M up and down the UK. My antenna is only a Forty Metre Doublet at 15 feet.

For portable use, I intend to use a 66 foot long wire, matched to the rig via an ultra bright LED swr indicator and L match ATU. As power source in the cottage a 12v 7ampere hour gel cell battery, out in the field a pack of AA batteries.

Fig. 1 Internal view of the SW40.



If any club members are interested, I will bring the rig and manual to a club night for closer inspection, and give any advice I can. The key to a successful project is to be methodical during construction and double check your soldered joints. Poor soldering is the most likely reason for failure.

Alan (G4GLV) & Sue (G0RKE) Burgess

DAB UPDATE

In previous editions of Old Hams News there have been a few articles about Broadcast Digital Audio Broadcasting (DAB) and the various merits or otherwise of the system. To further advance our knowledge on the subject is an article found on t'internet by Ian Moth G8ZHC which will raise eyebrows even higher than before. It is shown below.

All DAB receivers will be obsolete in a few years' time

The DAB system has recently adopted the new AAC+ audio codec, and existing stations that use the old MP2 format will probably be switched off completely in the UK in around 7-8 years' time. More to the point, however, DAB radios being sold in the shops today will not be able to receive any of the many new stations that will launch using the new AAC+ format in the coming years; some of which will probably launch as soon as 3 years from now. However, DAB receivers that will support the new AAC+ codec will be available from next spring, so if you want to buy a DAB receiver that will be able to receive these new stations you would be best off waiting until then.

Frontier-Silicon's new DAB/DAB+ modules

The new receivers that will be available from next spring will use new DAB receiver modules produced by Frontier-Silicon, which produces the modules for 80% of all DAB receivers. Frontier-Silicon has already announced two new modules based on its new Kino2 DAB processor chip (the Venice 5 module, which is meant for portable radios and hi-fi system products, and the Capri module, which is aimed at MP3 players and similar portable products) and Frontier-Silicon has told me that its new modules will be fully software upgradeable to support the new DAB+ standard via USB. So receivers containing the new modules from manufacturers that put USB sockets on the back of the receivers — such as those from the market leaders Pure Digital — will be able to receive the new stations that use AAC+ once a software upgrade has been made available for them. Then by autumn/winter 2007, Frontier-Silicon's new modules will support AAC+ as standard.

As well as being future-proof, Frontier-Silicon says that their new Venice 5 module will consume seven-times less power than current DAB modules do, which equates to an approximate tripling of the battery-life compared to current DAB portable radios. The short battery-life of current DAB portable radios has been another of DAB's problems, so a three-fold increase is a huge leap forward. The reduction in power consumption has been achieved by moving external memory onto the chip itself in order to eliminate power-hungry bus transfers between the processor and external memory.

The new modules will also be cheaper and smaller than previous DAB modules, and Frontier-Silicon has said that it expects the receiver manufacturers that use its modules to quickly migrate their products to using the new modules — the fact that the new modules are cheaper would be enough motivation alone for receiver manufacturers to switch to using them, but with them offering a tripling of the battery-life then it's hard to imagine any manufacturers that use Frontier-Silicon modules wouldn't switch. Indeed, I wouldn't be surprised if some receiver manufacturers that currently use Radioscape modules switch to using Frontier-Silicon's because of this huge improvement in battery-life, as Radioscape won't be able to come close to matching the power consumption, because Radioscape uses off-the-shelf Texas

Instruments DSP chips to run its software, so it cannot move external memory onto the chip itself. Furthermore, because the new Venice 5 module is 50% smaller than previous modules, existing receivers will only require slight internal modifications to incorporate the new module, and Frontier-Silicon has produced reference designs to allow this to happen.

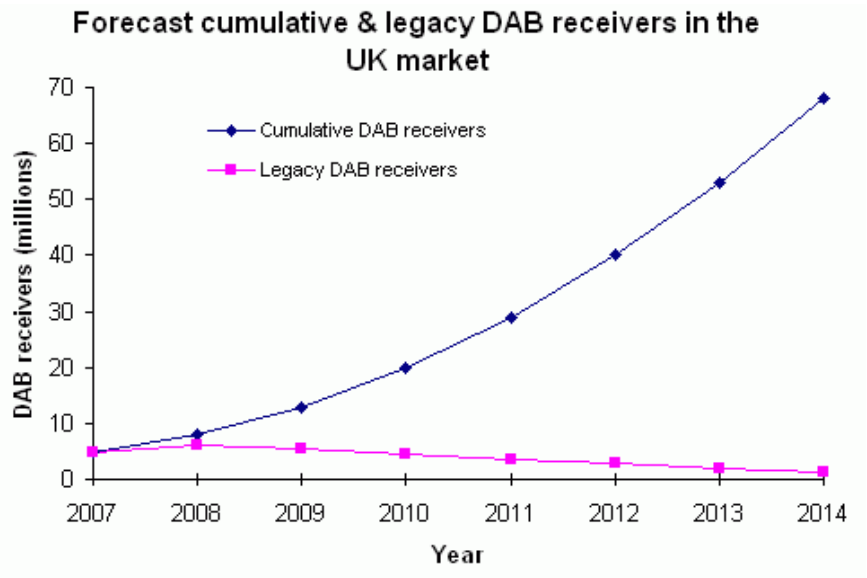
The second biggest DAB module producer is Radioscape, and it also plans to bring out a new module to support DAB+ next year, in time for when countries plan to start using the new DAB+ standard — Switzerland is in the process of advertising slots on a new DAB multiplex for the German-speaking area of the country; New Zealand plans to launch using DAB+ next year; Australia has committed to using DAB+; and France wants to launch digital radio as soon as possible using AAC+ on DAB+ or DMB, although the decision about which system will be used hasn't been taken yet.
The overall picture is that it is expected that the vast majority of DAB receivers being sold in the UK will support the new DAB+ standard within a short period of time — either via a software upgrade or natively supporting it.

The road to AAC+ on DAB in the UK
The decline of DAB and the rise of DAB+

How quickly it will be before AAC+ is used on DAB is dependent on the proportion of DAB receivers in the UK market that support the new DAB standard. The good news is that DAB is still in the relatively early stages of growth, and sales are forecast to really take off over the next few years.

The graph below uses figures from the DRDB's (Digital Radio Development Bureau) Five-Year Sales Forecast, and I've projected sales a further few years into the future. The DRDB forecast that there will be 4.6m DAB receivers sold by the end of this year; 13m by the end of 2008, and 20m by the end of 2009. The only assumption I've used for sales following 2009 are that the rate of acceleration of sales is the same after 2009 as it is before.

The acceleration in DAB sales is due to the combination of lower receiver prices and more products being available for areas where DAB hasn't sold well to date, such as micro systems, car stereos and MP3 players.



If you think these cumulative sales figures look high, remember that the broadcasters would like to switch off FM as soon as possible, and there are estimated to be around 120m FM receivers of one sort or another (such as portable radios, hi-fi systems, car stereos, portable CD stereos, radio alarm clocks etc.), so if they haven't managed to reach 70m cumulative sales by 2014 then you have

to ask yourself when they will be able to switch off FM. Also, Ofcom has recently suggested that it thinks that 90% of all radio listening will be via digital in 10 years' time, so the graph above would seem to be in keeping with Ofcom's forecast.

With regards to the decline in the number of legacy DAB receivers, I actually think I've been relatively conservative in the rate of decline.

For example, according to Ofcom, the number of legacy OnDigital/ITV Digital set-top boxes in the UK market in October 2002 when Freeview launched stood at over 1m, but by September 2005 there were only estimated to be 300,000 such receivers left in-use — a drop of 70% in just 3 years! These receivers were still capable of receiving the TV channels on Freeview, and the rapid decline was simply due to newer receivers functioning better (e.g. faster channel change) than the old ones did and offering features that the old receivers didn't support, such as the electronic programme guide (EPG) and better support for digital teletext.

On DAB, the prospect for better functionality and more advanced features being provided by newer receivers in comparison with legacy receivers is arguably far more attractive than with the case of Freeview receivers. The following is a list of improved functionality and features that will become much more commonplace that either aren't provided at all yet or are only provided on the higher-end DAB receivers:

- three-times the battery-life of existing DAB receivers
- Electronic programme guide
- Record/playback to/from SD card
- Pause and rewind
- DRM reception

Displaying pictures? (France and Australia want to do this, so I wouldn't be surprised if they do this in the UK as well)
Combined DAB/FM/DRM/Wi-Fi Internet radio in the future?
And the above list doesn't even include the new stations that will launch using AAC+ nor the addition of the MPEG Surround format that has been adopted for the new DAB+ system...

New stations using AAC+

The main thing the graph above shows is that 3-4 years from now the vast majority of DAB receivers will support the new DAB+ standard, so the business case for launching new commercial radio stations (that wouldn't be able to launch using the old MP2 format) using the AAC+ format will become overwhelming. And with Ofcom being, in their own words, "biased towards non-intervention", they won't stand in the way of the commercial radio groups launching new stations, and I have no doubt that we will see new commercial stations launching using AAC+ within this timeframe.

To see why this is so likely to happen, you just have to look at how much the commercial radio groups want to launch new stations. For example, the ex-head of digital radio at Emap, which is the second-biggest commercial radio group, once told me that Emap wanted the minimum bit rate for stereo stations to be reduced to 96 kbps! 96 kbps MP2 would provide ridiculously low audio quality, and the only reason he wanted Ofcom to allow this was so that they could launch new stations. And GCap/Digital One have also been lobbying Ofcom to allow them to use 112 kbps instead of the usual 128 kbps for stereo stations, and yet you

would have to reduce 7 stations from 128 kbps to 112 kbps in order to allow just one measly 112 kbps station to launch in the freed-up space!

Basically, once it becomes financially attractive to launch new stations using AAC+, and once sufficient time has past to allow them to do so without consumers kicking up a fuss, they will launch new stations.

And it is hardly apocalyptic if they do launch new stations using AAC+, because legacy receivers will continue to work merrily away as if nothing had happened. Yet if you believed the doom-mongers, if stations were launched using AAC+ there would be mass public revolts, probably leading to the decapitation of Terry Wogan. My simple response to this is that the vast majority of people with legacy receivers will simply be blissfully unaware that they're missing out on anything whatsoever, because their legacy receivers won't explode when the first AAC+ stations started transmitting. And using past broadcaster performance as a good guide to the future: if they're willing to broadcast 98% of stereo stations at low audio quality, as they do at the moment, and they're more than happy to transmit a large number of music stations in mono, why on earth do people think that they'll become all conscientious all of a sudden?

They won't, it's as simple as that. And the commercial radio industry is struggling financially at the moment with 16-24 year olds abandoning radio in droves and advertising money shifting towards the Internet, and it's only likely to get worse in future.

There is also the future threat posed by the Ondas Media subscription satellite radio service that is planned to launch by 2009/10, and as this subscription service will offer a wide range of stations, and as it is subscription-based they will likely cover niche genres that advertising-funded stations don't cover (at least at the moment on the inefficient old DAB system), the broadcasters will want to make DAB as attractive to consumers as possible in order to minimise the number of people deciding to subscribe to the new satellite service, because I dare say that most of those that do subscribe will stop listening to commercial radio for good.

Phased introduction of AAC+ stations

As already mentioned, the legacy MP2 services will not be switched off for quite a few years yet, but that doesn't stop them from introducing new stations using AAC+.

New stations in unused capacity

Firstly, with only a couple of exceptions, the only local DAB multiplexes that are full at the moment are those that cover the biggest cities in the UK. And there will also be new multiplexes launching as a result of the UK obtaining additional spectrum for DAB from the Regional Radio Conference in the summer. A new national DAB multiplex, new regional multiplexes for the North West and North East of England, new local multiplex for Edinburgh and new local multiplexes for areas that don't already have one So there is already scope to launch AAC+ stations using capacity that is either currently unused or on multiplexes that will launch in future.

Reducing the quality of exiting MP2 stations

But even on multiplexes that are full, it is possible to launch stations using AAC+ without withdrawing any stations by simply reducing the bit rates of the existing stations. I would expect this to happen as follows:

1. Reducing 128 kbps stereo stations to 112 kbps

Reducing the bit rates of stereo stations from 128 kbps to 112 kbps and mono stations from 64 kbps to 56 kbps would allow the following number of new AAC+ stations to launch (assuming the whole multiplex is used for radio stations):

Change to existing MP2 stations
New AAC+ stations that could launch
Reduce 128 kbps stereo stations to 112 kbps and 64 kbps mono stations to 56 kbps4 x 48 kbps AAC+ stations per multiplex

1 - 48 kbps AAC+ provides equivalent audio quality to 160 kbps MP2, so the audio quality would be a lot better than the 98% of 128 kbps stations that are transmitting at present (if the implementation of AAC+ is as used on the DRM system then bit rates don't need to be a multiple of 8 kbps as they are usually)

This alone would allow an increase of around 44% in the number of stations on DAB — but this is nothing compared to what will follow.

Ofcom has already agreed to allow the commercial radio groups to reduce their bit rates from 128 kbps to 112 kbps, and yet strangely no stations have yet been reduced to 112 kbps — as they haven't reduced the bit rates when they're allowed to and they've been lobbying for this to happen, are they planning ahead for the introduction of AAC+, or am I giving them too much credit?

As already mentioned, the benefit is very small if MP2 is used, because 7 stations would have to have their bit rates reduced to allow one new 112 kbps station to launch, but because AAC+ is vastly more efficient than MP2 then 4 stations will be able to launch if the bit rates are reduced, and the audio quality of these new stations at 48 kbps would be a lot better than the 128 kbps MP2 used at present.

2. Reducing 112 kbps stereo stations to 56 kbps mono

When we reach the right-hand side of the graph above — about 2011 or 2012 onwards — the vast majority of all receivers will support AAC+, and I would then expect them to reduce their stereo stations to mono in order to allow the following number of new stations to transmit:

Change to existing MP2 stations
New AAC+ stations that could launch

Reduce 112 kbps stereo stations to 56 kbps mono13 x 48 kbps AAC+ stations per multiplex

They might do this early on, because there are already plenty of mono music stations transmitting on DAB, so if they find it acceptable now, then when only a small minority of

receivers are affected they won't think twice about doing it. And one of the advantages of the vast majority of DAB receivers sold-to-date being portable radios is the fact that owners of such devices wouldn't even notice that stations have been reduced to mono anyway.

3. Switching off all of the MP2 services

Once the UK reaches the position shown on the far-right-hand side of the graph above where the legacy DAB receivers only account for about 2% of the total number of receivers, it then becomes feasible to switch off the MP2 services altogether. People shouldn't complain, because assuming this happens in 2014, as per the graph, they would have had at least 7 years of use from their legacy DAB receiver and a replacement DAB+ receiver will cost peanuts and provide far better functionality.

This will allow the following number of stations to launch in the freed-up capacity:

Change to existing MP2 stations
New AAC+ stations that could launch
Switch them all off 13 x 48 kbps AAC+ stations per multiplex

The BBC DAB multiplex

The above description is only about the commercial radio stations, and the BBC won't be allowed to launch any new stations, or if they do launch any it will only be 1 or 2 at most.
Also, the BBC has also already said in its recent submissions to public consultations that it does want to improve the audio quality of its stations on DAB, and as the following table shows, the BBC could provide very good audio quality on all of its radio stations and provide MPEG Surround on all of the stations that would likely use it, and there would be a third of the multiplex left over!

Station	Bit Rate kb/s	Audio codec2	Audio mode	Audio quality	Capacity Units
Radio 1	1321	AAC	Stereo Surround	Almost CD-quality	72
Radio 2	1321	AAC	Stereo Surround	Almost CD-quality	72
Radio 3	1321	AAC	Stereo Surround	Almost CD-quality	72
Radio 4	1021	AAC	Stereo Surround	Almost CD-quality	56
Radio 5	64	AAC+	Stereo	Very good quality	36
Radio 5 Sports Extra	64	AAC+	Stereo	Very good quality	36
6 Music	1321	AAC	Stereo Surround	Almost CD-quality	72
BBC7	721	AAC+	Stereo Surround	Very good quality	40
1Xtra	1321	AAC	Stereo Surround	Almost CD-quality	72
Asian Network	64	AAC+	Stereo	Very good quality	36
World Service	64	AAC+	Stereo	Very good quality	36
Data services	480---264				
Total	1544864				

1 - the bit rate includes the bit rate for the MPEG Surround stream data, which is around 3 - 4 kbps
2 - AAC (LC-AAC) provides higher quality than AAC+ (HE-AAC) at bit rates above approximately 85 kbps.

Overall, if you buy a new DAB radio now, it won't stop working for many years, but you will miss out on plenty of future stations and better audio quality.

Submitted by Ian Moth G8ZHC

OLD HAMS NEWS

The editor would like to thank all contributors to this edition of Old Hams News. The next edition is due to be issued in April 2007. Any contributions for this edition should be forwarded to the editor, Geoff Oliver G0BJR on or before Thursday 22nd March 2007 to ensure inclusion.

Articles will be accepted on many formats, by email to "news@oarc.org.uk", by word of mouth, hand or type written notes, or as a .txt file on a CD ROM. Photographs, drawings, circuit diagrams and other graphics to enhance your article will also be most welcome.

An edited version of Old Hams News is available on the Internet at the following URL
www.oarc.org.uk
then click on the "Club Journal" hyperlink.

If you submit an article for inclusion in Old Hams News and you do not wish it to be included in the Internet edition you must state your wishes at the time of submission. Otherwise the editor reserves the right to include/exclude your article as he sees fit.

For reference the officers and committee members are listed below and will be happy to help with any club related enquiries you may have.

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Written, edited and produced by Geoff Oliver G0BJR