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Ayre QB-9 DSD
'Super Audio' USB DAC

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AYRE

QB-9 DSD

DECEMBER 2014

USB DAC with DSD conversion
Made by: Ayre Acoustics Inc., Colorado, USA
Supplied by: Symmetry Systems, Herts
Telephone: 01727 865488
Web: www.ayre.com; www.symmetry-systems.co.uk
Price: £2495

Ayre QB-9 DSD

No jack of all trades, this DAC only does one thing: it plays audio over USB from a computer. But it makes up for that limitation by tackling its task spectacularly well
Review: **Andrew Everard** Lab: **Paul Miller**

There are some definite oddities about the £2495 Ayre QB-9 DSD DAC, not least of which is the fact that, in an age when almost every manufacturer seems to be toiling to increase the flexibility of its digital products, this is resolutely a one-trick pony. It is an asynchronous USB converter and that's all: it has just a single input – a USB Type B – plus RCA phono and XLR balanced outputs, and a display to show the sample-rate to which it's locked.

No remote control (it doesn't need one), no Bluetooth or AirPlay, not a sniff of a conventional coaxial or optical digital input, nor even a power switch… Connect USB, mains and audio cables, and after that the QB-9 DSD will simply wake up when the computer starts, and do its job.

PLAIN TO LOOK AT

The styling of the Ayre is self-effacing almost to the point of anonymity: true, the casework is beautifully finished, but it's compact at just 215mm wide and 75mm in height, so hardly the archetype of American 'heavy metal' high-end. In fact it weighs just 2.3kg, but nevertheless feels good and solid.

And while one might expect a range of controls on the front-panel, the only visible feature is the display – and that, with its blue numerals, is just a little old-fashioned. Or should that be 'retro'? Actually, perhaps that last point is forgivable, since the QB-9 was first launched almost six years ago, in April 2009. In July '10, it was upgraded to add 192kHz capability, no doubt in response to the increasing availability of 192kHz/24-bit files via services such as HDtracks; and in May '13 it hit the specification we have to hand here, with the addition of DSD compatibility.

That last step is an interesting one – and another oddity – not least because for some while Ayre resisted any move to DSD, with the company's founder and designer Charlie Hansen being pretty outspoken on why he wasn't exactly keen (to put it politely!) on DSD audio.

You can read the argument in an Ayre document available online [*http://www.ayre.com/insights_dsdvspcm.htm*]; but the upshot is that DSD takes a lot more manipulation in the recording process, requiring conversion to and from PCM for mixing (which is why we have the DXD format, designed for exactly this purpose).

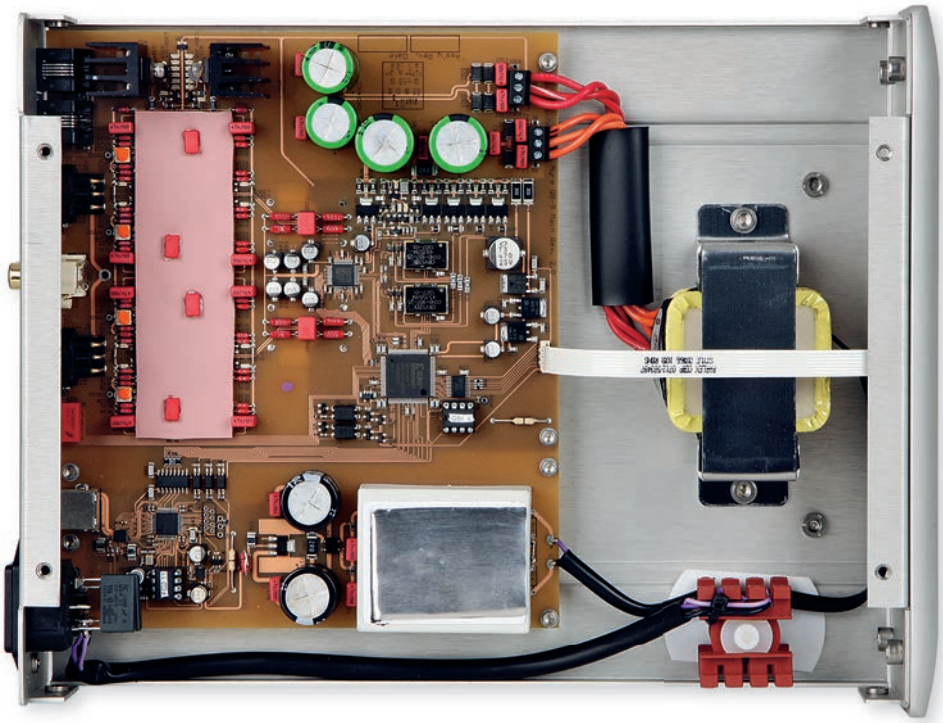
Read the document and it's clear that, in Hansen's opinion, DSD isn't quite the silver bullet its advocates would have you believe. Ayre provides some 'needle drop' comparisons between DSD and PCM to help you decide for yourself, and while it's basic tenet is 'this is what we think – make your own decision', it's clear the company retains its doubts.

However, what is beyond a doubt is that there is a demand, from those describing themselves as 'computer audiophiles', for DSD-capable digital hardware, and so we have this version of the QB-9, which currently only supports 'single' DSD, aka DSD64 or DSD2.8. Ayre promises that a DSD128 upgrade will follow in time and this will also add 352.8kHz and 384kHz PCM capability. A free upgrade will be offered to owners of the QB-9 DSD when that 'double' option becomes available.

KEEPING THE BASICS

The upgrades involved in creating this DSD-capable version of the DAC were a little more extensive, however. The Burr-Brown DSD1796 DAC of the original QB-9 was replaced with the ES9016S 'Sabre Ultra' 32-bit converter from ESS, and the audio master clocks upgraded to devices running at twice the speed to get more from the new DAC. Changes were also made to the analogue audio circuitry, and the power supplies for the analogue and USB sections.

Retained, however, were the basics of the QB-9, including its use of Wavelength Audio's Asynchronous USB Streamlength



RIGHT: A Xilinx Spartan FPGA handles all input processing and 16x upsampling while an ESS Sabre 'Ultra' 9016S 32-bit DAC feeds the balanced analogue output stage (masked here under a pink blanket of damping material)

technology, which was developed by asynchronous USB audio pioneer Gordon Rankin. Ayre was the first licensee for this codec, which is now found in products from a number of other manufacturers, not least Wavelength Audio itself. Oh, and in the AudioQuest DragonFly pocket DAC.

I mentioned before the lack of controls on the QB-9 DSD: well, there are some, but they're on little dip-switches to the rear of the product, and these cover: 1) digital filtering – 'Listen' to improve time-domain performance, or 'Measure' to tidy up the frequency-domain [PM measured in 'Listen' mode, p49]; 2) power mode – on when computer is on, or only on when an audio application is sending data; and 3) display on/off.

There's also a USB mode selector, allowing for standard or high-speed working: the 'Rsrv B' position is required for anything above 96kHz audio, and will work fine with Mac OS X computers, while requiring an Ayre driver available as a free download for Windows.

It's also possible for the QB-9 DSD to control, and be controlled by, other Ayre components, using the AyreLink connections provided over simple 'phone cables' terminated in RJ-11 plugs.

This allows niceties such as display dimming, and system wake-up/source selection as soon as your computer starts sending music. Beyond that, however, this is perhaps the most 'plug and play' product I have encountered since – well, since perhaps the likes of the little M2Tech HiFace DAC and a number of other products of the same kind. Even setting it up with Windows computers won't be onerous once the correct drivers are in place, while using it with OS X is a snap.

> 'I can describe the sound of the QB-9 in one word: "Wow!"'

Anyone who believes this whole high-end audio lark is fiddly, tweaky and complicated really needs to start here: with this DAC, virtually any computer can be used. I tested it with my usual MacBook Air and Mac mini computers, but also found it worked well with an Asus 'netbook' of a couple of years back which – if memory serves – was bought for less than £200.

ABOVE: From left to right, the Ayre front panel contains – nothing, actually! No controls, and the display simply lights up when a signal is locked to show the sample rate in use

INSTINCTIVELY RIGHT

Usually we begin the sound quality section of our tests with a paragraph describing how the component in question sounds overall. But for once I must break with tradition as I can describe the sound of the Ayre QB-9 in one word: 'Wow!'.

I can safely say I have never encountered a product with a presentation that seems so instinctively right from the get-go, while absolutely making the most of the system with which it's used. Of course it's an illusion that a big, powerful sound requires a big, impressive-looking hi-fi component (after all, a DAC chipset is tiny), but for anyone still labouring under that misconception the Ayre has everything required to set the record straight.

You see, what pours forth from this little box is a sound with striking bass weight and definition allied to all the vibrancy and attention-grabbing detail one could want. It's the kind of audio experience that just leaps out of the speakers and sits there in the room, lasciviously suggesting that 'perhaps Sir would like to crank the amplifier up just *a leetle beet* more, just so we can show you what we can *really* do?' – and that temptation proves hard to resist.

The Ayre just 'does it', and it does it with any music you throw at it, be it DSD, 'hi-res' PCM or CD rips, making even the most unlikely candidate come shining through. On the deluxe edition of Wings' *At The Speed Of Sound* album [Concord HRM 35671-02] there's a 'John Bonham version' of 'Beware My Love', which is a very long way from the slightly limp-rocking original, underpinned as it is with some serious

HIGH ALTITUDE HI-FI

Founded in 1993 and still based in Boulder, Colorado, Ayre was started by Charlie Hansen in order to offer the kind of performance available from the products he'd been making at Avalon, but at more affordable prices. One major aspect of Ayre's products is the fact that they are designed and built in the USA, both in-house and using trusted US-based subcontractors. That's no longer a given even in high-end audio, where more than a few companies have turned to external manufacturing to keep costs in check. But at Ayre things go even further: each component is hand-assembled by a single technician in the company's Colorado facility, and extensively tested before despatch. At the heart of the company's design philosophy is fully-balanced, zero feedback circuit design, and since its foundation Ayre has been leading digital innovation, not least with the original version of the QB-9, the world's first solid-state DAC with asynchronous USB transfer. The latest arrivals from Ayre via UK distributor Symmetry are 'Twenty' versions of the flagship KX-R preamplifier and MX-R monoblock power amps, selling for £20,995 and £11,795 apiece respectively.

ABOVE: Rather than the usual host of digital inputs, the QB-9 offers USB Type B only alongside single-ended (RCA) and balanced (XLR) analogue outs and AyreLink ports

Bonzo tub-thumping. It kicks off with fast-paced cymbal work, and then the drums crash in, the Ayre giving them full weight and slam, to the extent that I found myself listening to the drumming and more or less dialling out what else was going on in the mix.

Similarly with Bowie's 'Fashion', from the recent *Nothing Has Changed* retrospective [Parlophone 825646205745], the Ayre lays down a tight, funky, wall-shaking groove with metronomic precision, driving the track on relentlessly.

SPOT THE DIFFERENCE

It's a thrilling, addictive sound, and it gets better as you explore higher resolution musical formats. When reviewing the Ayre I'd just downloaded Joe Stilgoe's witty *Songs On Film Live* set [Linn Records AKD 498], recorded at the 2013 London Jazz festival. Starting with the 'spot the reference' opener, 'Cartooning Up', the Ayre just hit me with a great 'whoomph' of live ambience, and some of the most realistic piano, bass and drums I'd heard for a very long time.

Chris Hill's stand-up bass instantly grabbed me with its extension and the way the notes were clearly struck, then decayed, while Ben Reynolds' taut, bang on the money drumming kept the rhythms honest, aided by the Ayre's extension and speed. It's a real 'it's doing *what*???' presentation, daring your attention to drift for a moment, lest it snaps you back into focus with the sheer – well, the sheer *everything* of what it does. This isn't a 'you had to be there' recording when heard through the Ayre: instead it sounds just like *being there*, so well is the atmosphere conveyed.

In fact, I was enjoying myself so much with what was still CD-quality material (or just above: the Stilgoe is in 48kHz/24-bit) by this point that I almost overlooked the need to address the question of whether the QB-9 DSD sounds better when playing high bit- or sample-rate PCM or DSD files.

The answer to that would have to be 'yes': it plays both kinds of files splendidly, thank you very much, with even greater clarity, dynamic range and presence; and even doing some direct comparisons between DSD files and downsamples to PCM (to eliminate any mastering differences) revealed little to tell between DSD64 and 176.4kHz/24-bit PCM. Indeed, some recordings sounded better in their DSD form, with better vitality and dynamics, while others had just an edge of sparkle in 'hi-res' PCM.

Both showed clear benefits in detail and dynamic range over CD quality files, superbly though the Ayre does play 44.1kHz/16-bit.

I think it's safe to say that the Ayre doesn't favour one hi-res 'philosophy' over the other, but rather plays the two equally well, so whatever your file format of choice – or if you maintain a mixed music library bought on the basis of content rather than format – it will serve either extremely well. The QB-9 DSD is worthy of serious consideration by anyone looking for a high-end 'Macs and DACs' computer audio solution.

HI-FI NEWS VERDICT

Ayre may not be sold on the idea of DSD, but you'd never guess: the QB-9 DSD DAC excels with one-bit music and high-resolution PCM alike, to the point that choosing between the two hi-res methods becomes irrelevant. Even more striking is just how good it can make CD-quality files sound, with a rich, solid and taut bass combining with treble and midband clarity for an involving and satisfying presentation.

Sound Quality: 88%

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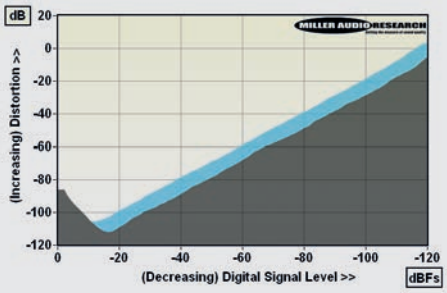
LAB REPORT

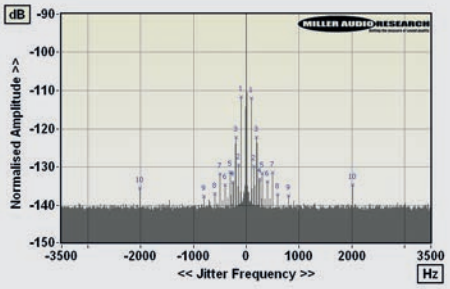
AYRE QB-9 DSD

Charlie Hansen of Ayre Acoustics has certainly 'tickled-up' the QB-9 with its new 45.1584MHz and 49.152MHz clocks and upgraded ES9016S DAC although the XMOS USB driver software is the familiar v1.26 release. Nevertheless, the generalised performance of the QB-9 over the top 15dB of its dynamic range is determined more by Ayre's balanced analogue output stage, with midband distortion increasing slightly from a minimum of 0.00018% at –16dBFs to 0.0065% at 0dBFs [see Graph 1, below]. The increase comprises 2nd and principally 3rd harmonics with higher orders usefully suppressed to <0.0001%. We have seen the ES9016S achieve a THD of <0.0001% at 0dBFs but this is of technical rather than subjective interest! The balanced outs offer a maximum 3.92V from a low 60ohm source impedance and the A-wtd S/N ratio is an impressively wide 111dB. Furthermore, the use of a dual-mono DAC (eight channels, in fact) together with very careful analogue PCB layout maintains stereo separation up to 125dB.

Ayre specifies an apodising-type minimum phase digital filter and this is reflected in the reduced time domain pre-echo/ringing but also in the very limited 6dB stopband suppression (with 48kHz media) as well as the early treble roll-off: from –0.15dB/10kHz to –2.4dB/20kHz with 48kHz media, –5.9dB/45kHz with 96kHz inputs and –10.2dB/90kHz with 192kHz media (the maximum accepted by the QB-9). Noise-like (uncorrelated) jitter is almost absent but there's a hint of PSU-related artefacts amounting to a mere 145psec [see Graph 2]. Readers may view a comprehensive QC Suite test report for Ayre's QB-9 DSD DAC by navigating to *www.hifinews.co.uk* and clicking on the red 'download' button. **PM**



ABOVE: Distortion versus 24-bit/48kHz LPCM digital signal level over a 120dB dynamic range via USB input (1kHz, black; 20kHz, blue)



ABOVE: High resolution jitter plot with 24-bit/48kHz data showing very mild PSU-related sidebands

HI-FI NEWS SPECIFICATIONS

Maximum output level (Balanced)	3.92Vrms at 61ohm
A-wtd S/N ratio	110.5dB
Distortion (1kHz, 0dBFs/–30dBFs)	0.0065% / 0.0012%
Dist. & Noise (20kHz, 0dBFs/–30dBFs)	0.0037% / 0.0032%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0 to –2.4dB/–5.9dB/–10.2dB
Digital jitter (48kHz/96kHz)	145psec / 150psec
Resolution @ –100dB	±0.1dB
Power consumption	12W (standby 11W)
Dimensions (WHD) / **Weight**	215x75x290mm / 2.3kg