

Antelope Audio Zodiac Platinum DSD/Voltikus PSU/10M Rubidium Atomic Clock

Antelope Audio has tapped into its bespoke digital clocking and pro-audio heritage to offer a three-box USB DAC/preamp solution for discerning domestic audiophiles
 Review: **John Bamford** Lab: **Paul Miller**

Antelope Audio's latest product for high-end hi-fi systems, its Audiophile 10M atomic clock, was launched in the latter part of 2014, and has been designed to complement the company's top-of-the-range Zodiac Platinum DSD DAC introduced earlier that same year: a two-box combo priced at £4249 with its accompanying Voltikus power supply unit. Adding the Audiophile 10M clock turns the Zodiac Platinum into an ambitious three-box system priced at a heady £8595, but promising state-of-the-art playback of PCM and DSD digital media.

FINE-TUNING OPTIONS

It's considerably more than just a D-to-A converter, as the centrally positioned volume control dominating its fascia might suggest. As well as being a headphone amplifier – with two headphone sockets on the front panel – it's also a preamplifier with two analogue inputs alongside its USB, AES/EBU and four S/PDIF (two RCA and two Toslink) digital inputs. Active inputs are auto-detected. One of the analogue inputs is single-ended (RCA), while the other is balanced – via ¼in TRS jack sockets, which are commonly used for balanced audio connections in professional gear.

Volume control is analogue, the rotary knob governing an encoder for the unit's relay-switched precision resistor ladder attenuators (separated for left and right channels) to adjust gain in 1dB increments. Both single-ended (RCA) and balanced (XLR)

analogue outputs are provided; these can be trimmed in ranges from +14dBu to +26dBu (XLR) and 0dBV to 12dBV (RCA). Headphone output impedance can also be switched between '0' and 120ohm and the headphone amplifier's output attenuated by 12dB if required. Finally there are three 'de-jittered' digital outputs on the unit's busy rear panel: two S/PDIF (RCA) and one AES/EBU (XLR).

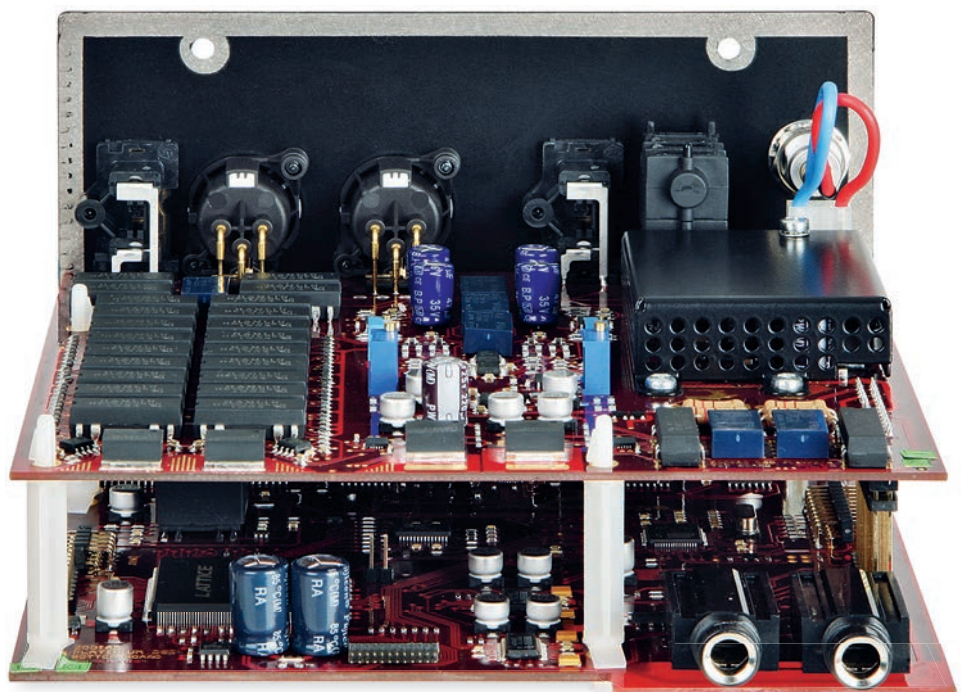
Digital-to-analogue conversion is courtesy of TI/Burr-Brown quad DACs – two DACs working in parallel per channel – while a major feature of the Zodiac Platinum is its custom designed upsampling employed by FPGAs running at 64-bit. Antelope Audio's USB implementation is also bespoke, with ASIO drivers provided

for Macintosh, Windows and Linux operating systems. Supporting PCM up to 384kHz and DSD up to 128Fs via DoP, the Platinum's synchronous upsampler can convert 44.1/48kHz to 352.8/384kHz and single-rate DSD [DSD64/2.8MHz] to quad-rate DSD256. I say 'can' because this feature can be disabled if you prefer to play out files at their native sampling rates – or perform strategic upsampling in player software in your computer.

THE VOLTIKUS PSU

There are no user-selectable filter options in the Zodiac Platinum, Antelope's designers choosing to employ a fixed linear-phase filter. While most functions can be addressed in set-up menus accessed by

RIGHT: Antelope's reed relay-stepped volume control, output stage and power supply sits on the Zodiac's uppermost PCB while the LatticeXP2 FPGA (the host processor) and dual PCM1792 DACs are located on the lower board





variously pressing and holding the power and source buttons on the fascia, computer audiophiles will be delighted by Antelope's provision of a comprehensive software control panel which allows remote control of the DAC directly from the screen of your computer. It provides convenient access to all essential controls – source selection, volume, upsampling on/off, etc – and provides a number of additional features such as a peak level meter, adjustment of the front panel LEDs' intensity, product registration and feedback to the manufacturer, and firmware updates. A nicely-formed metal infra-red handset [see p51] is also included in the package.

Antelope's cutely-named Voltikus power supply is priced around £800 as an upgrade option for the company's Zodiac Gold DAC/preamp/headphone amplifier introduced three years ago. But with the firm's latest DSD-capable (and better spec'd) Zodiac Platinum the Voltikus PSU is mandatory as the Platinum has no on-board supply. A discrete linear supply employing a shielded

'Detailed and vivid, it packs a powerful low-end punch'

toroidal transformer, Linear Technology LT1021 voltage reference and multi-stage regulation, the Voltikus design has been tweaked for accompanying the Platinum and hooks up via a supplied cable terminated with mini XLR connectors. Power on/off is governed by a rocker switch on the rear panel where there is also a ground/lift switch to eliminate hum caused by ground loops.

And finally we have Antelope Audio's brand new Audiophile 10M outboard atomic clock, an ultra-accurate 10MHz rubidium reference generator designed to 'get ultimate sonic performance from your system' [see boxout]. It has two outputs and can be used with two devices that support 10MHz input clocks – typically studio components – simultaneously.

Connection to the Zodiac Platinum is via a supplied BNC cable. It increases the price of ownership substantially, and it only references USB audio signals.

Considering the elaborate three-box component rig and the need to install the

ABOVE: Buttons for power, input, mono and mute are duplicated on Antelope's nifty software control panel (see text) and IR handset. Display shows volume, input or sample rate

ASIO driver and desktop utility, it might sound like something of a palaver to get this top-of-the-range Zodiac Platinum up and running. Don't be put off. Installation was a breeze and everything worked without a hitch.

DEEP IMAGES CREATED

From the outset I could hear that the performance was straight out of the top hi-fi drawer. It sounds detailed and vivid, delivers a beautifully 'open' and three-dimensional soundstage, packs a powerful low-end punch, and has a mellifluous easy-on-the-ear quality. I settled in to several days' enjoyable auditioning...

Recent months have found me exploring the musical subtleties of several modern jazz offerings released on the Norwegian independent Hubro imprint. One of my favourite ensembles is the innovative trio Splashgirl, whose 2012 album *Field Day Rituals* [Hubro CD2520] showcases piano, double-bass and drums, artfully crafting sparse sonic landscapes in which the spaces around their instruments play as important a part of their compositions as the notes themselves.

The Zodiac Platinum's strikingly clear and deep imaging capability helped make inventive tracks such as 'Dulcimer' and 'Mass' utterly captivating, the latter's immense low frequency rumblings resolved exquisitely by the Platinum to help describe the music's dark and spooky underbelly. The piano and drum kit sounded highly authentic, with realistic splash and crash to the cymbals, together with naturally decaying reverberation tails.

In a completely different vein, Lorde's hit song 'Royals' from *Pure Heroine* [Universal Music NZ 602537519002] sounded equally splendid, the Platinum combo depicting most faithfully the

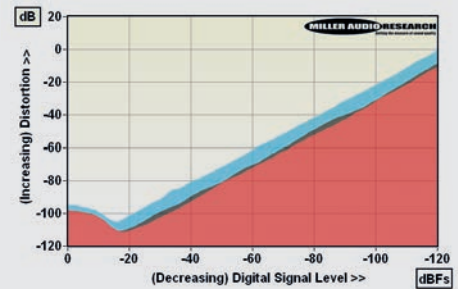
RUBIDIUM BEAT

When Igor Levin founded Antelope Audio in 2005 he already had 15 years' experience in professional audio, his US-based AardSync brand providing high-precision audio and video clocking systems for recording and mastering studios, and large-scale pro-sound rigs for live concerts. Antelope Audio continues to design and manufacture a plethora of professional studio gear alongside its range of specialist hi-fi DAC/preamps, built in its factory in Bulgaria. Precision clocking remains at the company's very core, its proprietary 'oven controlled clocks' and 64-bit 'Acoustically Focused Clocking' (AFC) algorithm featuring in all its current hi-fi DACs. Says the firm of its Audiophile 10M rubidium atomic clock: '100,000x more stable than a typical crystal oscillator, the hyperfine energy levels of the non-radioactive rubidium core enable high-precision timing to 0.03 parts per billion, which equates to a loss of just one second per 1000 years!' Introduced for the first time as a hi-fi component by Antelope, to ensure *ultimate* performance from its Zodiac Platinum DAC/preamp, its design is based on the brand's Isochrone 10M studio master clock which, we're told, many engineers believe to be 'the best sounding clock' ever produced.

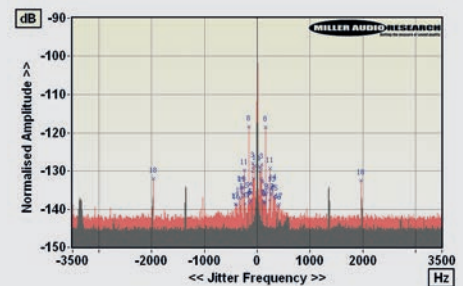
ANTELOPE ZODIAC PLATINUM

This is a very solid performer although much of its subjective 'character' is as likely due to the analogue output stage as the proprietary digital housekeeping. As supplied, the DAC is configured to offer a maximum 3.9V output through its (balanced) 55ohm XLRs where distortion rises slightly from a minimum of 0.0002-0.0004% (20Hz-20kHz) at -20dBfs to 0.0013-0.0018% at 0dBfs [see Graph 1, below] irrespective of choice of digital input or use of the 10M clock. Similarly, the A-wtd S/N ratio remains impressively wide at 114.5dB, low-level resolution good to ± 0.1 dB over a full 100dB dynamic range and the frequency responses very extended at -0.13dB/20kHz (44.1/48kHz media), -0.7dB/45kHz (96kHz files) and -3.1dB/90kHz (high-res 192kHz files).

Antelope's 10M external clock only services the proprietary asynchronous USB input, *not* the S/PDIF or AES/EBU inputs. However, while there is no significant difference in the general performance of the Zodiac's S/PDIF and USB options there is a distinction in cumulative jitter with the 'unlocked' S/PDIF emerging the superior at just 18psec [black spectrum, Graph 2 below] and the 10M-clocked USB at 78psec [red spectrum, Graph 2]. Clearly the most thermally stable master clock cannot guarantee that jitter won't 'sneak in' at some other point across the digital audio path up to, and including, the DAC chip itself. However the sharp delineation of these spectral lines indicates little or no noise-like jitter which bodes well for fine, sharply-focused stereo imaging. Readers may view comprehensive QC Suite test reports for the Antelope Audio Zodiac Platinum DAC's S/PDIF and USB inputs by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: Distortion vs. 48kHz/24-bit digital signal level over a 120dB dynamic range. S/PDIF input (1kHz, red) and USB input (1kHz, black; 20kHz, blue)



ABOVE: High resolution jitter plots with 48kHz/24-bit data (S/PDIF, black; USB, red). 10M clock used for USB

HI-FI NEWS SPECIFICATIONS

Maximum output level (Balanced)	3.90Vrms at 55ohm
A-wtd S/N ratio (S/PDIF / USB)	114.8dB / 114.5dB
Distortion (1kHz, 0dBfs/-30dBfs)	0.00125% / 0.00016%
Dist. & Noise (20kHz, 0dBfs/-30dBfs)	0.0018% / 0.00045%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0dB to -0.1dB/-0.7dB/-3.1dB
Digital jitter (48kHz/96kHz/USB)	18psec / 38psec / 78psec
Resolution @ -100dB (S/PDIF / USB)	± 0.1 dB / ± 0.1 dB
Power consumption	15W (5W standby)
Dimensions (WHD) / Weight	430x100x360mm / 13.5kg



ABOVE: The DAC [centre] offers USB (with a 10MHz clock input on BNC), coaxial and Toslink S/PDIF, and AES/EBU digital ins, re-clocked S/PDIF and AES digital outs plus RCA and balanced XLR analogue outs. The 10M [right] provides two clock outputs

fragility evident in the 17-year-old New Zealander's voice. The wallop of the bass drum was exhilarating. And, once again, the clarity allowed easy observation of individual elements – and the 'sonic spaces' – in the recording, along with the multi-tracked harmonies and the didgeridoo-type droning bass effects buried in the mix.

Meanwhile densely-produced prog-rock recordings such as Squackett's infectiously melodic 'Tall Ships' from *A Life Within A Day* [Esoteric Antenna EANTCD 21002] were seemingly put under a microscope. Ex-Yes bassist Chris Squire's characteristically twangy Rickenbacker sound stood out clearly among the multiple layers of keyboards, guitars and reverberant voices as I listened all the way into the recording studio's mixing desk. Steve Hackett's acoustic guitar sounded simply heavenly.

UPSAMPLING THE FILES

Meticulously crafted high resolution audiophile recordings naturally were brought to life by the Platinum set-up. Switching between WAVs, AIFFs and FLACs of high sampling rate PCM recordings from the 2L label and native DSD recordings from Channel Classics was automatic and seamless throughout the time I spent evaluating the Antelope combo.

The best of these sounded wonderfully authentic – as indeed they do when I play them through my resident T+A DAC 8 [HFN Oct '12]. But of course this was designed at a time when 192kHz/24-bit audio was the 'state of the art' in USB interfacing. More recent designs, like this Zodiac Platinum, are mandatory if you want to play DSD recordings in

their native format and access rare 'demo' files at 352.8/384kHz.

Comparing like-with-like, listening to CD rips and hi-res PCM files up to 192kHz/24-bit, I'd describe the T+A DAC as 'faster' and more incisive-sounding, the Zodiac Platinum adding a little more subjective bass warmth and a gentler, more relaxed demeanour through mid and treble.

All the while I'd deliberately been listening to Antelope's three-box combo with its upsampling turned off, wanting to hear files in the 'raw'. Does switching-in the Zodiac Platinum's upsampling make an appreciable improvement to its sound quality? As when observing the subjective differences between various digital filters, it's impossible to determine what sounds 'best', as the results tend to vary from recording to recording, and preferences would depend on the 'character' of your system.

For the most part I couldn't determine that upsampling PCM files to 352.8kHz made a difference that would easily be heard under blind listening conditions. However, with simple recordings (the aforementioned Splashgirl a case in point) upsampling *did* appear to add a little more clarity and openness, sharpening the focus. ☺

HI-FI NEWS VERDICT

Admittedly expensive – especially with its optional Audiophile 10M rubidium clock – this is a top-flight component combo that delivers spectacular sound. But it sounds tremendous even without the 10M. £4249 for the two-box Zodiac Platinum combo isn't unreasonable if you factor in what you might otherwise spend on a latest-spec DAC, an audiophile headphone amp *and* a separate preamp for a high-end system.

Sound Quality: 87%

