



# ANTELOPE AUDIO ZODIAC GOLD

**Reviewer:** Srajan Ebaen

**Financial Interests:** click [here](#)

**Source:** Apple iMac 1TB running OSX 10.6.6 with AIFF files up to 24/192, PureMusic 1.74 in hybrid memory play with pre-allocated RAM, Burson Audio HA160D, Weiss DAC2, iPod Classic 160GB, Onkyo NS-D1 digital-direct iPod dock, Pure i-20 digital direct iPod dock, *Antelope Zodiac+* [on loan], *Red Wine Audio Black Lightning 18V DC* [on review]

**Preamps:** Esoteric C-03, ModWright LS100, Bent Audio Tap X

**Amplifiers:** ModWright KWA-100 SE, FirstWatt F5 & J2

**Speakers:** Mark+Daniel Fantasia S

**Headphones:** ALO-recabled Audez'e LCD-2, beyerdynamic T1 and Sennheiser HD800

**Cables:** Complete loom of ASI Liveline, Crystal Cable Ultra, Zu Event; Entreq USB and Firewire, Wireworld Starlight

**Stands:** 2 x ASI HeartSong 3-tier, 2 x ASI HeartSong amp stand

**Powerline conditioning:** 1 x GigaWatt PF-2, 1 x Furutech RTP-6

**Sundry accessories:** Extensive use of Acoustic System Resonators, noise filters and phase inverters

**Room size:** 5m x 11.5m W x D, 2.6m ceiling with exposed wooden cross beams every 60cm, plaster over brick walls, suspended wood floor with Tatami-type throw rugs. The listening space opens into the second storey via a staircase and the kitchen/dining room are behind the main listening chair. The latter is thus positioned in the middle of this open floor plan without the usual nearby back wall.

**Review Component Retail:** €2.995, €795 for optional power supply, €3.495



Antelope Audio's Zodiac Gold slots above the previously reviewed [Zodiac+](#) as Igor Levin's top current DAC. As a digital pro-audio company, Antelope joins Benchmark, dCS, Meitner and Weiss with models aimed at the audiophile community. While Firewire has been the definitive standard to connect pro processors to studio computer workstations, Antelope's Zodiac range of three models has instead boarded the universal serial bus called USB. The associated and proudly displayed figure 384 in the press photos of the Gold currently has little relevance. One, should 32-bit/384kHz source material get issued, this DAC is future-proof. Currently of course 24/192 files from high-resolution download sites like Linn Records represent the max data density at which commercial music recordings are released. Two, Igor Levin's team seems to be one of the few capable of—or bothering with—writing the necessary firmware code and drivers to exceed today's 24/192 ceiling for PC audio (two others at present are MSB Tech from the US and M2Tech from Italy). Besides anticipating the foreseeable future for streaming audio, the 480Mbits hi-speed USB 2.0 spec of 384kHz *isbraggadocio* for Antelope's engineering chops. But it ain't bragging if true.

We can probably agree that if the 384 figure was all that separated Gold from Plus, nobody would go Gold for now. Core differentiators thus include a clicking remote-controlled analog domain relay-switched resistor volume control for 0.05dB precision attenuation over 60dB in preamp mode; and a standard rather than mini USB port for those wishing to experiment with audiophile cables. The €795 optional Voltikus outboard power supply with triple-cascaded voltage regulation, [LT1021](#) voltage reference and 90-250V input acceptance can also upgrade the switching wall wart of the Zodiac+. The Gold then inherits the proprietary 64-bit Antelope Trinity clocking and jitter management, oven-controlled clock and BurrBrown 1792-A chip-based digital circuitry from the Plus. So shoppers will wonder. How would a Plus + Voltikus compare to a solo Gold?

On exactly *how* the Gold's all-important output stage might better that of the Plus, I asked the company's Leizer Benvenishty to fill in the gaps. But first, let's run down the basic features which determine how the Gold can interface with even complex hifi systems:



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Source switching accommodates 2 x optical, 2 x S/PDIF coax, 1 x S/PDIF AES/EBU and 2 x *analog* on RCA and TRS balanced respectively. The analog inputs bypass the digital circuitry of course to directly encounter the volume control. Smart recognition only shows inputs with valid signal as selectable. For outputs there are digital and analog options. De-jittered by Antelope's proprietary protocol, digital includes 2 x coaxial and 1 x XLR. For analog there are paralleled RCA and XLR, the latter accompanied by miniature trim pots accessible by screw driver. Lastly a BNC socket is primed for an external word clock.

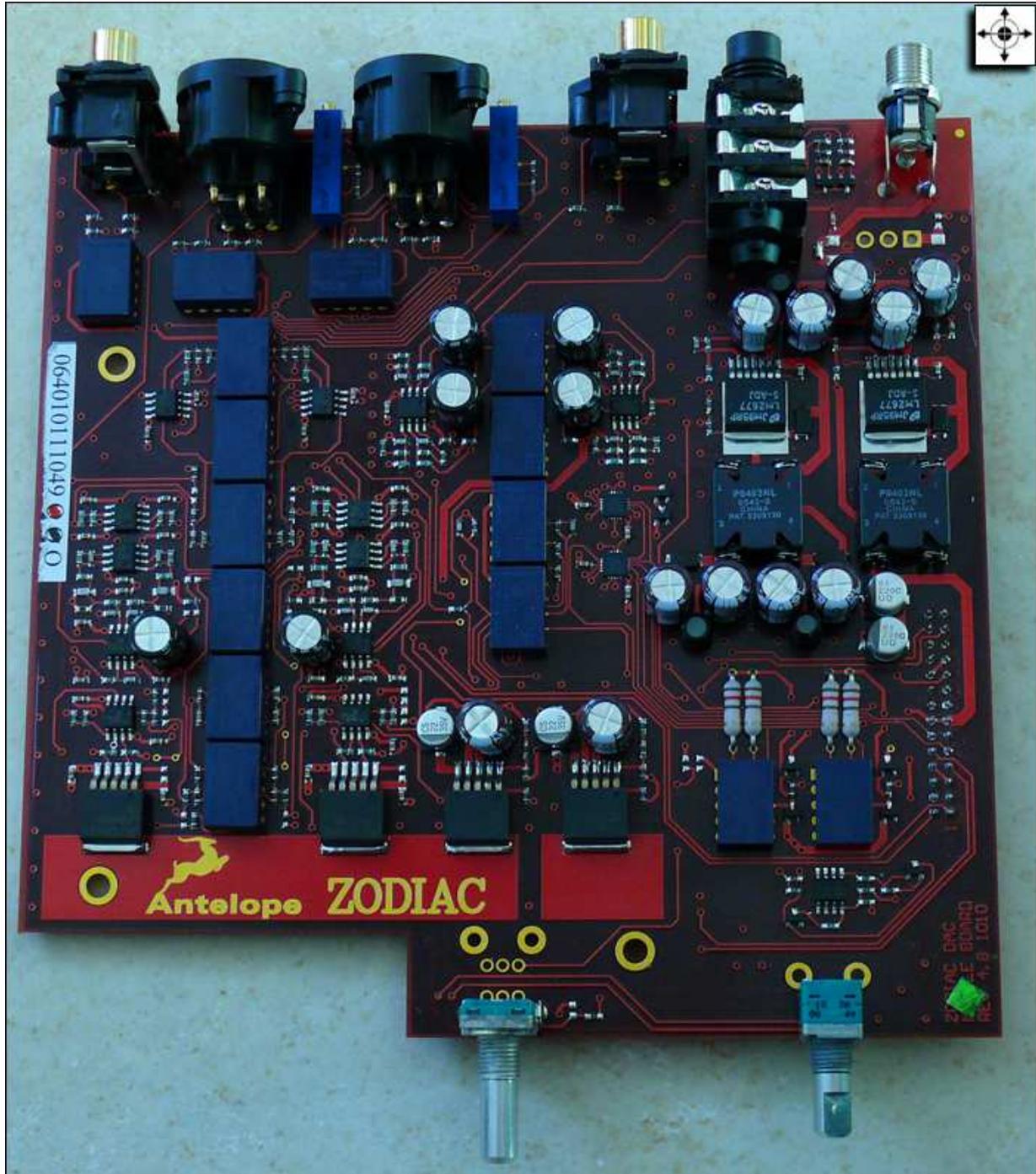
There are also two paralleled headphone outputs with switchable 0 or 120-ohm output impedance and dedicated volume control; a multi-function display for sample rate, main volume, source input, headphone amp impedance and USB modes\*; a mono summing function exclusive to the digital inputs; soft mute (-20dB only on digital sources) and full mute; and a Windows/OSX software control panel. Digital and analog circuitry occupies separate boards with gold-plated traces and large internal ground planes. A functional summary calls the Zodiac Gold an 8-input headphone/preamp/DAC with remote control. Unusual in the current climate and different for example from certain Esoteric machines which allow PCM conversion to DSD is that the Gold always processes incoming data at its native resolution *without* internal upsampling. What goes in is what comes out. Included in the shipping box is the standard SMPS DC power supply; an IEC power cable for it; USB and Toslink cables; the remote control; and an owner's manual that can be previewed [online](#).

Technical specifications for the Zodiac Gold are 129dB of dynamic range; 0.0004% of THD+N; better than  $\pm 0.003$ ppm clock stability with an oven temperature fixed at 64.5°C; less than 1ppm/year clock aging; sample rate support for 44.1, 48, 88.2, 96, 176.4 and 192kHz (352.8 and 384kHz are exclusive to the USB and word-clock inputs); 2.4kg/5.3lb



Igor Levin reiterates for us what distinguishes a Zodiac Gold from a Zodiac+: "As you already stated correctly there is the full-size USB port, the 384kHz future-proofing and the stepped versus continuous attenuator for added accuracy of the stereo presentation over the full range of possible attenuation. The remote is an important issue for heavy listeners with long play lists.

"The main differences in the analog output stage relate to the altered PCB architecture necessary to implement the stepped relay attenuator with its 0.1% accurate thin-film resistors. The Voltikus power supply is optional for either machine. We will have an on-demand custom bundle for a Zodiac+ with matching black power supply.

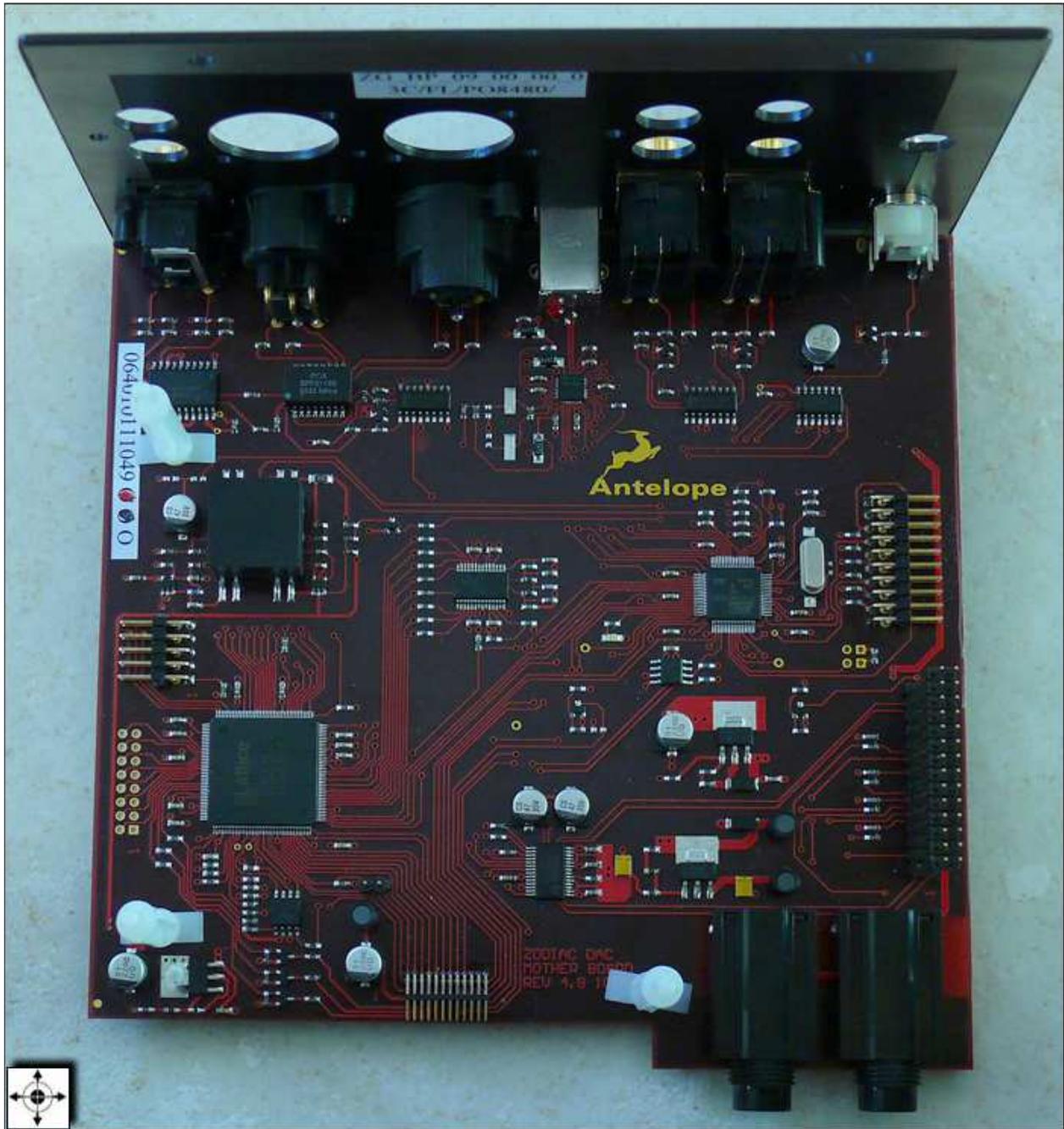


"These differences between models provide sufficient justification for the price differential. Aesthetic issues factor as well. Improved cosmetics add value. This is strongly suggested by our increased sales for the Gold. Customers seem to prefer the Gold for its price/value ratio and broader feature set. As to connecting one of our Trinity clocks, one ought to consider three different issues. From basic to top these are:

- synchronisation between components
- timing correction or jitter manipulation/reduction/elimination (Antelope AFC)
- stability achieved by a solid signal reference

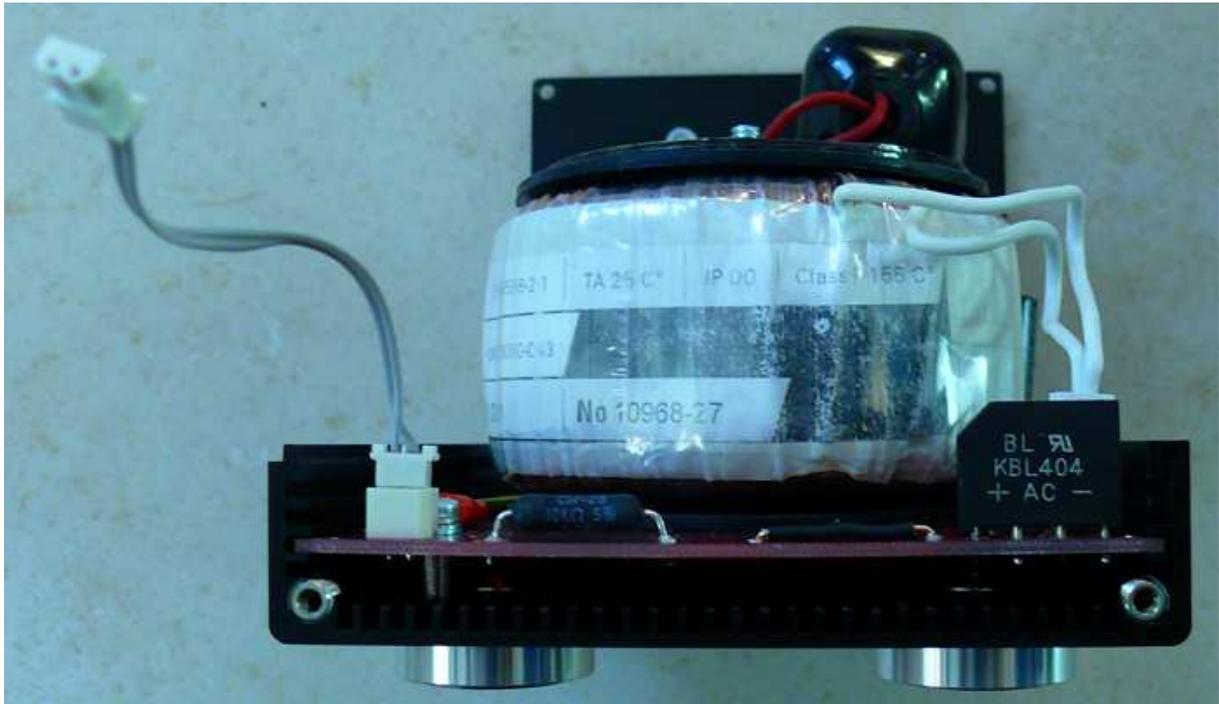
"The option to connect an external clock should be considered when the target in any given system is achieving a higher representation of the digital audio data thru-put from source to destination. There are many components which transmit and receive digital audio. It's the job of the installers (professional or otherwise) to investigate the options for a given system.

"Regarding a Bulgarian connection, our Antelope Audio EU sales and support center is indeed located in Sofia, Bulgaria but manufacture and assembly occur in various places including China, Germany and Bulgaria. A Gold without Voltikus compares to a Plus with Voltikus with more accurate stereo imaging, higher sample rate, remote control and the bundle price for an optional Voltikus.

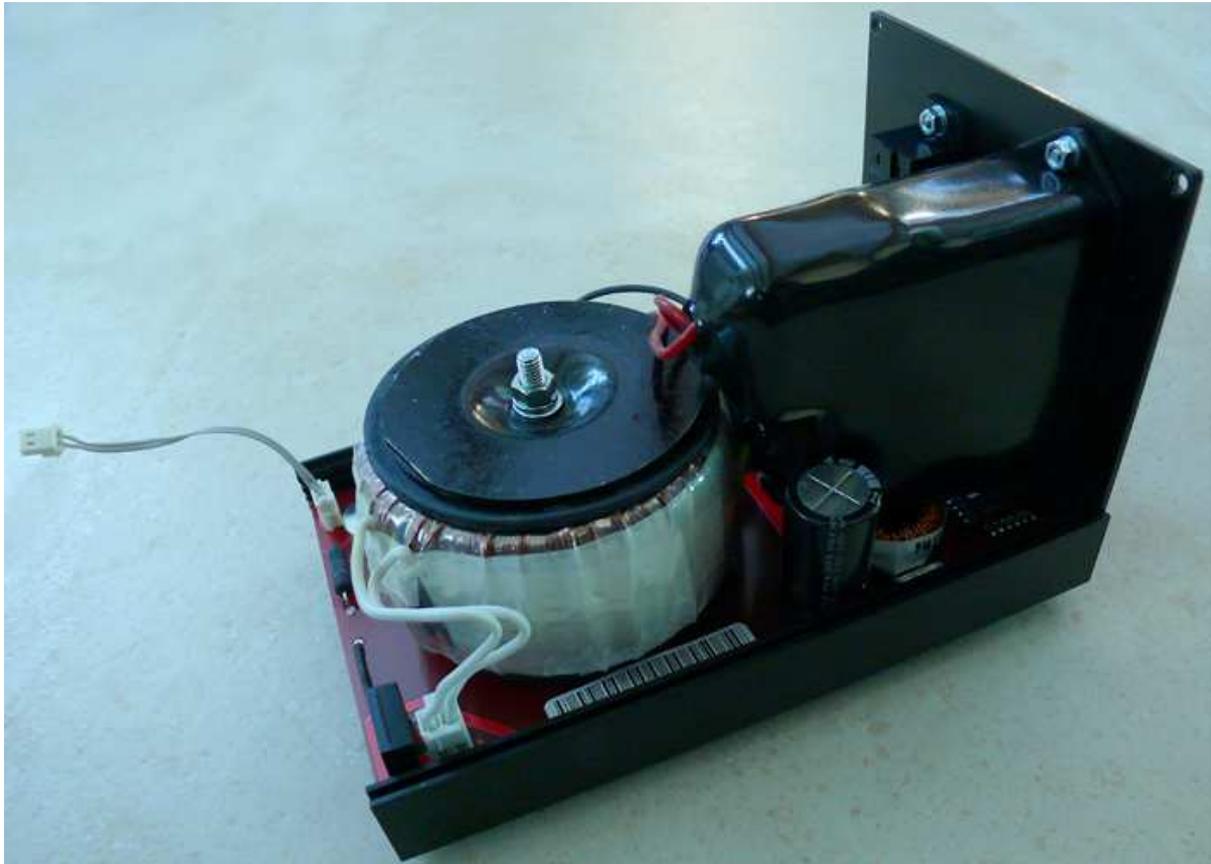


"About the status for the announced Windows/OSX software panel, we are working constantly on this utility to provide a very efficient user experience for controlling, updating and supporting our product from afar via the web. My assumption for the availability of the first release is April 2011. You also asked that if the Voltikus is a linear supply, how can it offer a 90-250V input acceptance. The Voltikus runs a composite architecture consisting of a linear first stage utilizing a custom toroidal transformer with an electrostatic shield between the windings followed by a switching preregulator that provides the ability to handle an extremely wide input range. The output of the preregulator goes through two linear cascaded power supplies which result in extremely low noise, the same or lower than a typical microphone phantom power supply. The linear regulators are implemented with a discrete laser-trimmed voltage reference to give much higher stability and far better noise performance that would be possible with a typical linear power supply."

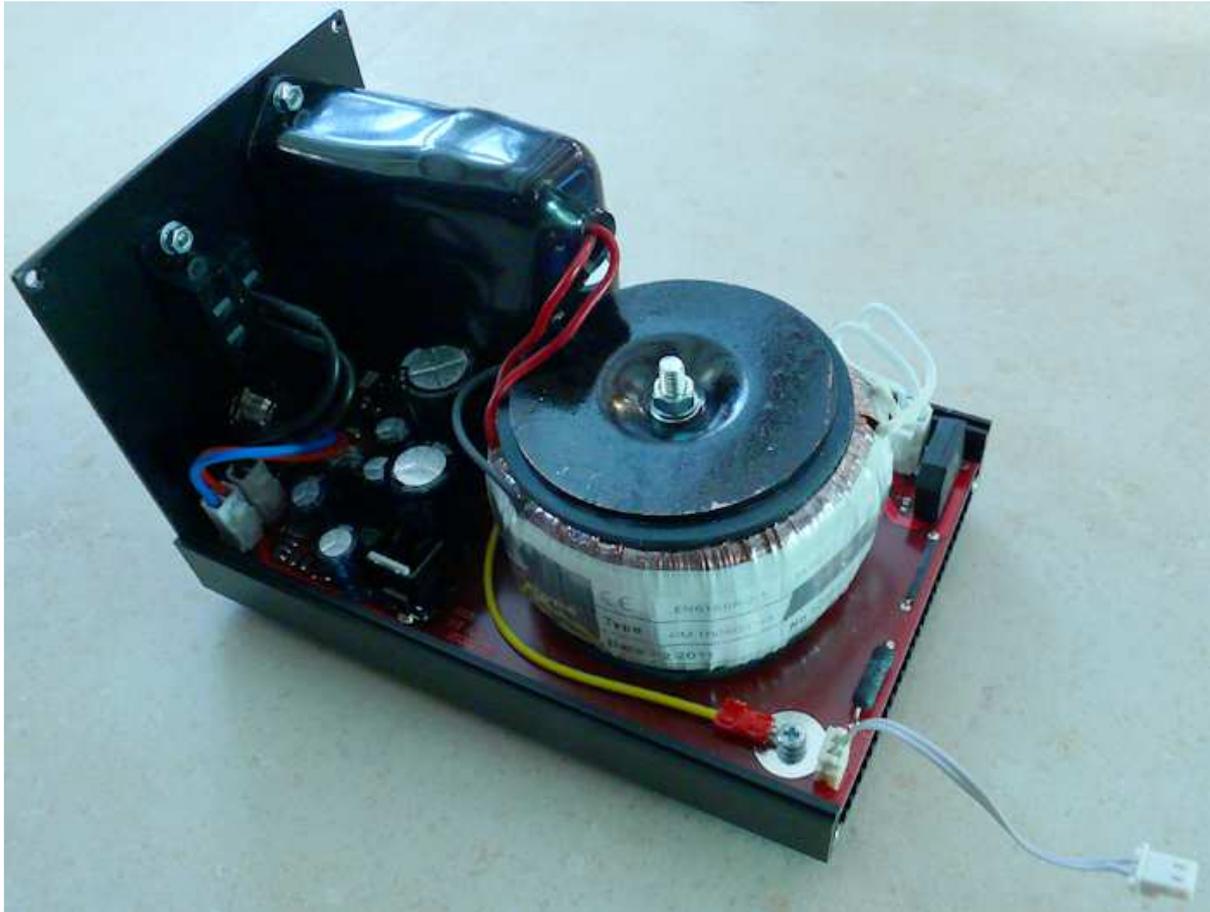
Even though owners of the Zodiac+ were vocal on the forums that proper break-in meant upward of 500 hours, Antelope had again dispatched a virgin review loaner. *Argh.* Given the designer's explanations above, the promise of reissuing the already returned Zodiac+ loaner for a comparison seemed ill timed. Why should the Gold eclipse the Plus when the machines share the same digital and analog stages? The Gold's attenuator is the more accurate but will be irrelevant for those with preamps. Preamps also eliminate the remote as a feature. The appeal of Gold-direct drive into an amplifier had to be tested then. Beyond that it only leaves the USB cable (upscale variants with the mini connector of the Zodiac+ are still rare). Used purely as a fixed-output converter and disregarding the Voltikus which can enhance both models equally, the Gold iteration seemed to me mostly a luxu add-on of power windows and heated seats with the same engine and suspension. Why should it go any faster until 384kHz files come around? Protracted break-in initially on the bedside table with iPod, Pure's i-20 digital-direct dock, Schiit's Lyr and HifiMan's HE-6 was called for to report on properly matured results.



On *protracted* break-in, reader Carsten Schmidt Christensen of Schmidt Audio introduced himself as the Danish Antelope distributor. "Having had the Gold for already 2.5 months I know both Zodiac+ and Gold very well. As you know the Plus needs a lot of burn-in to show its best. I would say more than 800 hours and yes, burn-in makes a huge difference. The Gold is a lot more extreme in every respect and therefore needs a lot more burn-in than the Plus. My unit has passed the 1.400-hour mark and still gets better every day. My guess is that 2.000 hours are needed for full burn-in. Please be aware that every input and output needs to be burned in separately. If you make the main burn-in via S/PDIF, the USB input still needs its own burn-in—I guess 300 hours will do—and again the differences are huge."

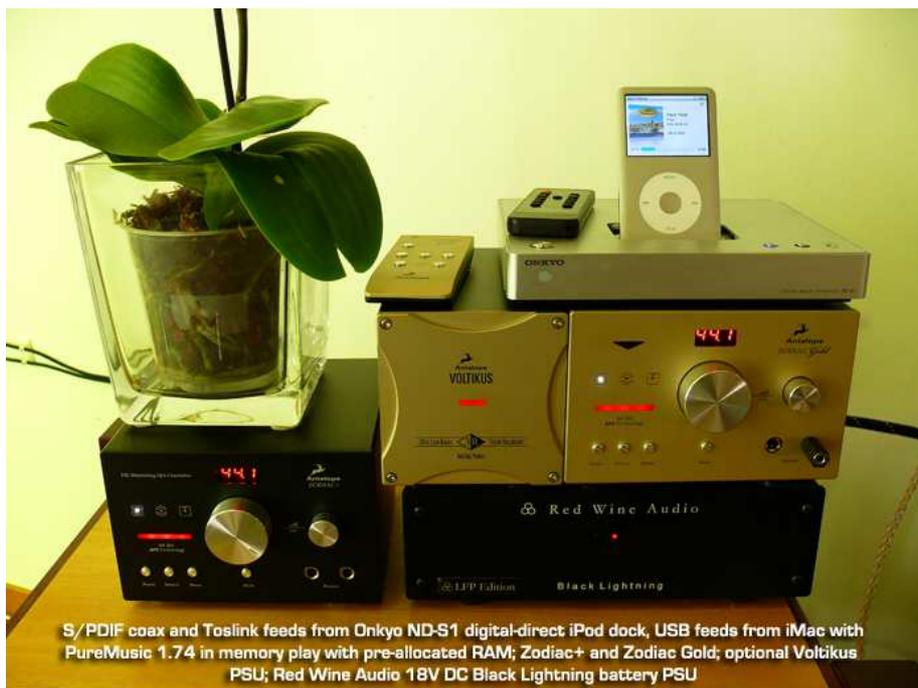


Given Igor's explanations I questioned just *why* Carsten believed the Zodiac Gold to be 'a lot more extreme in every respect'. The imagination is a powerful thing. Assurances of 'huge' in upscale hifi are nearly always suspect. Never mind that tracking break-in changes over 2,000 hours requires that one maintain a virgin unit *and* others with various degrees of time on them to conduct actual side-by-side comparisons. Anything less could be construed as a cheap trick to appease buyers who aren't completely thrilled with their purchase after the first week.



Checking with Antelope for *their* take on required break-in I was given 500 hours. That's 21 days non-stop. While a DAC needn't make sound to break in, it does hog a source/transport for a constant three weeks. This I confess caused me some irritation with the sender.

With the Zodiac+ loaner returned from Luzern and two stock SMPS on hand plus a Voltikus and matching after-market battery supply from Vinnie Rossi, I had all manner of musical chairs to play out.



S/PDIF coax and Toslink feeds from Onkyo ND-S1 digital-direct iPod dock, USB feeds from iMac with PureMusic 1.74 in memory play with pre-allocated RAM; Zodiac+ and Zodiac Gold; optional Voltikus PSU; Red Wine Audio 18V DC Black Lightning battery PSU

Anticipating hair splitting when running both versions through a preamp, it seemed opportune to assemble the most resolved system I could. To complete my front end beyond the review sources I settled on John Chapman's autoformer volume control or alternately Esoteric's superb C-03 preamp in 12dB gain mode for some body enhancements.



Front end with Bent Audio Tap-X and Esoteric C-03 preamplifiers

Speakers became the overachieving Mark+Daniel Fantasia S recently [reviewed](#), awarded and then acquired to benefit future reviews and self gratification. I leashed up the FirstWatt F5 as bass amp and matching J2 as mid/treble amp for some pre-goal cheating.

Before hitting the magic number to compare two Antelope and my resident Burson HA160D and Weiss DAC2 converters, I started swapping power supplies. Regardless of whatever subsequent sonic morphing the Gold might still undergo, the benefit of upgrading the stock Chinese switch-mode power supply had to be plain after 300 hours. It was.



Review system

As I'd learnt with the Zodiac+, Igor Levin's digital chops manifest first and foremost on high. His machines inject air, space and illumination from the top down. Think effects from the 330° dispersion CDTIII™ signature Gallo tweeter. My main criticism with the Plus had been lack of 'incarnation factor' from insufficiently developed bass weight and image density. The sound was *very* finessed on the material's tiny tendrils but not fully grounded through its roots. Versus the Burson HA160D which since its arrival has displaced my Weiss DAC2 as chief digital code breaker, the Plus had seemed a bit lightweight and pale - heavy on resolution sophistication, lighter on meaty substance and fully developed colors. I'd silently concluded that Burson's proven analog competency overpowered Antelope's proprietary digital wizardry when it came to a compelling musical experience. For €2.395 in Europe the stock 'laptop brick' of the Plus had frankly seemed well below par. The Voltikus now suggested that it was.

Imagine that you carefully enhanced the black levels in an over-exposed image. What had seemed washed out from too much light deepens and solidifies. Contrast increases and with it comes a better sense of articulation. Half and lesser shadows begin to accompany the primary values of high noon. As a result grittiness and gumption move up. That's what Antelope's Voltikus and RWA's Black Lightning supplies accomplished. The sound grew in gravitas. Equals in their degree of improvement—far from subtle and at this juncture seemingly mandatory—they had dissimilar flavors. A [feature review](#) on the Red Wine option goes into details. For here it'll suffice that the battery played it warmer, rounder, softer, more 'analogue' and weightier in the bass.

Checking in with the \$1.150 Burson at 300 Zodiac hours showed that these same goods still came in second over the Gold/Voltikus combo. It appeared that where Antelope had to add a surcharge optional power supply to do right by analog and compete against the far cheaper challenger from Oz, Burson had properly included a superior built-in twin-trafo PSU with discretely built-up voltage regulators in their base price already. This did righter yet at this stage of the game (their I/V conversion is discrete as well). I began to wonder whether another part of the Down Under advantage involved gain. Burson's output stage pumps out 10V max with their stepped resistor control bypassed. Despite otherwise matched levels such a robust output might have better control/drive into whatever input stage follows it (preamp or amp direct)? Be that as may, the Burson's lower octaves were more substantial, its tone colors richer. The sense of bodies rather than spectres in the room was higher as was rhythmic urgency. Back on the burner it was for the Antelope gear.

**Between 300 and 500 hours something rather *unsubtle* happened.** Suddenly I had too much bass. That and a concomitant fleshing out all around signaled that the Gold had finally arrived. Having really cheated with my biamp scenario to sweeten the *Break-in Blues*—though making the same power into 8 ohms, the bass amp delivers thrice the power of the treble amp into 4 ohms whilst having 5dB lower overall circuit gain—it was time to get serious and single. Out with the FirstWatt duo, in with the ModWright KWA 100SE.



**Zodiac+ vs. Zodiac Gold, both with stock SMPS:** Preventing a completely even comparison was the mini USB port on the Plus. I didn't have an exact equivalent for that to my usual Entreq Challenger 2010 leash. Here I used an upscale red WireWorld Starlight flat cable instead. Despite the deliberate psych setup of the preceding pages, the two Antelope converters did *not* sound identical (and the nature of these differences suggested that they went beyond USB cable offsets).

Take Javier Limón's *Mujeres de Agua* album to stand in for many others. Its twelve Flamenco tracks generously list a who's who of incendiary leading ladies from inside and outside the genre. Think Aynur, La Susi, Estrella Morente, Mariza, Carmen Linares, Buika, Montse Cortés, Sandra Carrasca, La Shica, Yasmin Levy, Eleftheria Arvanitaki and Genara Cortés. Then add surprise appearances by Turkish clarinet sensation Hüsnü Senlendirici and singer/oudist Dhafer Youssef. Cante jondo (deep Flamenco song) is about transmitting *duende* as though it were a descending Voudoun Lwa deity. Voices come unglued. They warble, break up, get hoarse, raspy and guttural. With the ladies this obviously happens in the higher registers. Put 1 + 1 together—i.e. account for typical hifi limitations—and you'll appreciate here the narrowness of walking the path of righteousness.

You want the wild rawness uncut. The emotional contact high shouldn't diminish. But you don't want reminders of artifice. Those come by way of stridency, hash and grain. If components play it safe and gloss over recorded edge, it creates a center fold photoshopped to *death by plastic*. If components mix in artificial grit, it creates fake pain or playback rust. Deciding on what's real vs artificial edge can be tricky. Here the Zodiac+ was clearly the edgier operator. At

first glance this could have suggested truthier rawness. But it was also thinner and leaner. This wasn't by way of tonal balance shifts. It came from the inside out, from the domain of tone density. The Gold was smoother. But instead of rounding over edges it achieved this agreeable smoothness with greater harmonic fullness of tone. Recorded angularity, that fire/metal in the throat which gypsy singers prize over prettiness, wasn't impacted. There simply was more body fill. This observation was consistent across different genres and recordings. Could this be duplicated by adding Voltikus to Zodiac+?



Yes and no. The Voltikus-fitted Plus did gain in smoothness but simultaneously suffered reductions in bass slam/impact and general transient sharpness. I viewed it as an injection of warmth at the expense of grittiness. It thus became a matter of preference rather than clear-cut upgrade. Comparing Zodiac+/SMPS vs. Gold/Voltikus showed echoes thereof in the latter but more faintly so. Here the progress on density and mass outweighed the small backward step on bass striatedness and general wiriness. The upshot is a very *significant* maturation process from break-in. Its effects are larger in scope than the power supply upgrade. A break-in preview of sorts can be had by leashing the Voltikus to a virgin Gold. Yet a cooked Gold with SMPS outperforms the former in no uncertain terms.

The Voltikus contributions point at the bathroom scale. Put plainly, things gain weight. The side effect is a subjective reduction in speed or edge. That's exactly what's usually equated with tube-derived warmth aka analogue. Think of the SMPS as 'digital' then and the Voltikus as 'analogue'. Though it deals in deplorable generalities and preconceptions, it'll have your expectations properly calibrated. The more important issue is, don't judge the converter prematurely. Decide on your power supply of choice *only after* the machine has settled in. The 500 hours are no myth but frustrating and rewarding reality. Also true is that beyond its leathered-up feature set the Gold is sonically slightly superior to the Plus. I didn't expect it nor do I understand what makes it so but there it was to be noted and acknowledged.

**Burson Audio HA160D vs. Gold/Voltikus:** Now the Antelope converter was the Aussie's equal on low-down grunt, mass and welly. This also meant that black levels and tone density were matched. Juan Manuel Cañizares' *Puerto de Encuentro* made that point. Though Cañizares is a very formidable flamenco guitarist who played for years with Paco de Lucia, this is a successful crossover effort into Jazz full of pluckily popped bass, muted trumpet, tight grooves, hooks, real Earl Klugh cool and only the very occasional flamenco-reminiscent riff or arpeggio run. Where the converters differed was on top-down illumination. The Zodiac Gold enjoyed more visibility down into the lower midrange below which the two presentations became mostly a draw.

Cymbal work showed more overtone splashiness. Image specificity/focus lock and with it the 3D-wraparound effect of 'hearing' space behind and around the performers were higher. Visibility enhanced. A good descriptor for the effect is *iseraation*. This was not a function of an upshifted tonal center. It was built on more upper-range energy and as such a sense of greater resolution. Close-mike'd effects on vocals and fret boards were highlighted. Plosives and sibilants had more pepper. Hall sound and ambient retrieval were greater. My thinking on the causes thereof followed quite primitive lines. It seemed to me that with the 'analogue' virtues of tone, image heft and foundation weight now on par with the Burson whose team's declared focus has always been analog, Igor Levin's digital chops could finally dominate the comparison. This parlayed as deeper resolution which most benefited the upper registers.

Along these lines I decided to explore further. I wanted to override Antelope's in-equals-out sample rate thru put. What if I upsampled 44.1kHz data to 176.4kHz or 192kHz in PureMusic? This very logically would force the Gold to reset itself and process standard Redbook files at higher rates. Focusing especially on the treble of acoustic instruments—a recent acquisition of Krystian Zimerman playing Rachmaninov's *Piano Concertos 1 & 2* with the Boston Symphony under Seiji Ozawa came in handy—I quickly concluded that 176.4kHz was the most sophisticated (it's true also for my Weiss DAC2). PureMusic confirmed support for all sample rates between 44.1kHz and 192kHz (albeit nothing above it) so the user has full control to suit personal preferences.

The point is, the Zodiac Gold is astute enough to finally transform these often subtle to outright imaginary changes into something worthwhile.

**Amp direct:** One big selling feature of the Gold is its precision resistor array IR volume control to eliminate a preamp. My setup involves a lengthy 6-meter interconnect in either XLR or RCA config. I thus opted for the Gold's balanced outputs with their higher gain. Comparator in this instance was my \$10,000 Esoteric C-03 transistor preamp in zero voltage gain mode. Here I had to eat crow chowder. Prior to the magic 500 I'd instantly written off a short-lived direct attempt as far from satisfactory. I now revisited the exercise just duty-bound. Instead I was greeted by *space exploded*. To fully hear what the Antelope converter can do on walk-in soundstage immensity might have to mean ditching the preamp. Dynamics could take a small hit but in my case this wasn't a factor except for the usual symphonic bombast. Since I rarely engage that or at levels which would matter in this context, 't'was academic. I thought the gains in staging grandeur and vocal immediacy were a fair trade for giving up a tad of robustness and low-down slammage to the preamp. After all I now was perfectly content with the bass registers and overall embodiment.

Minor practical limitations in the direct scheme are Antelope's step size—depending on where in the range you listen you could come across 4dB jumps which are certainly a far cry from the consistent 0.5dB of my Esoteric—and audible relay clicks. The latter are mostly mute if done one or two at a time. Things only devolve into a sewing-machine click fest when you traverse the entire range without signal.

**Conclusion:** With designer cosmetics that are very attractively executed—some might find the white signal lock LED too bright—and truly comprehensive functionality, the Zodiac Gold sonically surpassed my affordable Burson Audio HA160D reference on magnification power in the upper half of the audible range and equalled it in the lower (by default the latter had it overtake my Weiss DAC2 too). The USB DAC category is presently hyper active to make ultimate statements more unstable than ever. But with the Weiss Minerva as benchmark and overachievers like the Burson and Wyred4Sound DAC2 in the mix, Antelope Audio's Zodiac Gold emerges as a very strong front runner for extra coin. Even Toslink with a plastic rather than glass conductor performed better than expected (though less distinct than coax or USB, i.e. more cuddly smoothness than sharp attacks). The Gold's 384kHz compatibility is still a non feature in early 2011 but given the fast pace of changes in digital entertainment, future-proofing investments for a few years down the road is a solid anti-obsolence tactic.



Exotic CD players today struggle very hard for the dubious distinction of 'the last deck you'll ever need'. The Zodiac Gold has all the earmarkings of being the only PC interface you'll need for the next five years whilst participating in streaming audio at a very high level. That's particularly apt with its excellent showing in amp-direct mode (there is one analog input too). For such applications the core mandates of analog-domain volume control, precise channel matching and remote convenience are all accounted for. This really makes one pause. Think on what else one could possibly require from such a device. From where I sit ... nothing really. Case closed, jury released. Pipe in the applause.

**Quality of packing:** Very good.

**Reusability of packing:** A few times.

**Ease of unpacking/repacking:** A cinch.

**Condition of component received:** Flawless.

**Completeness of delivery:** Perfect. Includes SMPS, USB and Toslink cable.

**Human interactions:** Sufficient.

**Pricing:** Fair but the law of diminishing returns kicks in aggressively with the \$1.150 Burson and \$1.495 Wyred4Sound units.

**Final comments & suggestions:** The fundamental weakness here is the 500-hour break-in requirement. The changes are so significant that any premature auditions will fail the mark far more than usual. Be prepared for real disappointment upon delivery. If you audition at a dealer, be firm that the unit had the requisite time. Else you'll be wasting *your* time. The Voltikus power supply is a very credible option but less of an unmitigated upgrade and more of an alternate flavor. Thicker slower denser systems and adrenaline junkies could conceivably prefer the stock SMPS. Lovers of 'analogue' sound will almost certainly prefer the Voltikus The champagne finish (think Conrad-Johnson) is understated but likely won't match *anything* in the black/silver dominated hifi scene of today.

