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MUSIC ISSUE
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FEBRUARY 2014

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JOHN ATKINSON

AURALiC VEGA

D/A PROCESSOR

I was alerted to the new VEGA D/A processor from Chinese manufacturer AURALiC by Michael Lavorgna's rave review for our sister site AudioStream.com in April 2013: "Everything I played through the Auralic Vega was equally wow-inducing. Everything. . . . Music I've heard hundreds of times was presented with a crisp, clean, and delicate clarity that was simply uncanny and made things old, new again. . . . Its ability to turn music reproduction into an engaging and thrilling musical experience is simply stunning."[1]

That sounded like a DAC I needed to review, but it wasn't until July that AURALiC co-founder Xuanqian Wang hand-delivered a review sample of the VEGA. And it wasn't until October 2013 that I was able to embark on this review.

AURALiC . . .

. . . was founded in Beijing, in 2008, by Xuanqian Wang and Yuan Wang. Xuanqian Wang trained as a professional engineer in both electronics and recording engineering, and also started playing piano at age four, while Yuan Wang studied sociology and management science in the US, before returning to China to start a company that manufactured precision instruments. The two met at a music festival in Berlin; their shared love of music and the "relentless pursuit of superior sound quality" inspired them to design and manufacture audiophile products. (From here on, I refer to the company and its product as Auralic and Vega—*Stereophile*'s style is to reserve the all-caps treatment for actual acronyms and initialisms, and the capitalization and inverted camel-capping usage that Auralic has adopted looks too much like shouting in print.)

1 www.audiostream.com/content/auralic-vega-digital-audio-processor-0

The Vega

The elegant-looking Vega ($3499) is housed in a slim, brushed-aluminum enclosure. The front panel is dominated by a wide, rectangular, yellow-on-black OLED display, to its right a domed knob and a red LED. The rear panel offers single-ended and balanced outputs, respectively on RCAs and XLRs, and five digital inputs: transformer-coupled AES/EBU on an XLR (the default), two transformer-coupled coaxial S/PDIF on RCAs, one optical S/PDIF on TosLink, and a high-speed USB2.0 port. The AES/EBU and S/PDIF inputs handle 16- and 24-bit data with sample rates up to 192kHz; the USB port also operates with sample rates of 352.8 and 384kHz, and will accept DSD64 (2.8224MHz) and DSD128 (5.6448MHz) data using the DoP v1.1 protocol. No driver is required for correct operation with Mac OS10.6.4 onward; Windows users need to install the supplied driver (detailed instructions are included in the excellent manual).

While there is an on/off switch next to the IEC AC receptacle on the rear panel, the Vega is disturbed from its Sleep or Standby modes by pushing the front-panel knob. A second push brings up a menu, permitting selection of Input, Balance, Phase (polarity) Filter Mode (see later), and System parameters; otherwise, the knob controls the output level, allowing the Vega to be used as a digital-input control pre-

SPECIFICATIONS

Description Remote-controlled, upsampling, stereo D/A processor with volume control. Digital inputs: 1 AES/EBU on XLR, 2 S/PDIF on coax, 1 S/PDIF on TosLink, 1 USB 2.0 on USB type B connector. Analog outputs: 1 pair balanced on XLRs, 1 pair unbalanced on RCAs. Compatible sample rates: 44.1–192kHz, AES/EBU, S/PDIF coaxial and TosLink; 44.1–384kHz, DSD64 (2.8224MHz), DSD128 (5.6448MHz), USB. Frequency response: 20Hz–20kHz, ±0.1dB. Channel separation: not specified. Dynamic range: 130dB ref. 0dBFS, 20Hz–20kHz, A-weighted. THD+noise: <0.00015%, 20Hz–20kHz at 0dBFS. Jitter: not specified. Maximum output level: 4V single-ended, 4V balanced. Output impedance: 4.7 ohms balanced, 50 ohms unbalanced. Power consumption: 15W max. (<10W sleep, <2W standby).
Dimensions 11" (280mm) W by 2.6" (66mm) H by 9" (229mm) D. Weight: 7.5 lbs (3.4kg).
Serial number of unit reviewed 1694.
Price $3499. Approximate number of dealers: 15.

Manufacturer
Auralic (Beijing) Limited,
1F, Building No.7, 1A Chaoqian Road, Beijing, 102200, China.
Tel: (86) (0)10-57325784.
US distributor:
Auralic Americas, Inc.,
12208 NE 104th Street,
Vancouver, WA 98682.
Tel: (360) 326-8879.
www.auralic.com/en/

Текст

ERIC SWANSON

amplifier. Pressing the knob to bring up the System submenu allows the user to set the Display brightness, Sleep mode enable/disable, internal clock mode (see later), and Volume mode: each input can be set to default to a different volume level, or all can be set to default to the same value.

The Vega can also be operated by remote control, a plastic controller being supplied as standard.

Technology

Inside, the Vega's digital and audio circuits are carried on a large printed circuit board that occupies the full depth of the chassis and most of its width. The toroidal power transformer sits behind the front panel and in front of a yellow shielded section that carries the AC input and filtering. A small daughterboard behind the USB jack is marked "AURALiC DSD over USB" and carries an XMOS USB receiver chip. Three surface-mount LSI chips live behind this board, the largest of which is marked "AURALiC Sanctuary Audio Processor powered by Archwave." Archwave AG is a Swiss company; their multi-core, ARM 9–based Sanctuary processor runs at 500Mips and is used in the Vega to upsample PCM input data to approximately 1.5MHz and 32-bit depth, to provide what Auralic calls the ActiveUSB buffer stage, and to implement four reconstruction filters for PCM data and two choices of low-pass filter for DSD data. The filter options are referred to by Auralic as Flexible Filter Mode—the PCM filters include linear-phase and minimum-phase options, as well as two slow-rolloff types; the two DSD options offer different degrees of ultrasonic rolloff, to prevent the format's noiseshaping from contaminating the downstream amplification.

The Vega uses a high-precision master-clock circuit that the company calls the Femto Master Clock. Covered by a hefty heatsink, this uses what is claimed to be an "aerospace grade," temperature-compensated crystal oscillator with an "ultra low noise" linear power supply. The jitter is specified as an extraordinarily low 82 femtoseconds, with phase noise at –168dBc/Hz. The user can choose between four clock settings: Auto (the default), in which the Vega uses the optimal clock window for any source; Coarse, which offers the widest bandwidth of input lock, to allow the Vega to work with very jittery sources; Fine, which narrows the lock acceptance window to give the lowest jitter with high-quality streams; and Exact, which will only give lock with only very low-jitter streams but gives the highest sound quality.

The large, square chip in the center of the PCB is the Sanctuary audio processor.

Once processed by the Sanctuary chip, the oversampled 32-bit data are fed to an ESS Sabre32 9018 D/A converter chip. This is a premium-quality, 32-bit, delta-sigma part with eight individual DAC sections, these operated, I

MEASUREMENTS

I used *Stereophile*'s loan sample of the top-of-the-line Audio Precision SYS2722 system (see www.ap.com and the January 2008 "As We See It," http://tinyurl.com/4ffpve4) to examine the Auralic Vega's measured behavior. I used my 2012-vintage Apple MacBook Pro to examine the processor's performance via its USB port. All measurements were taken with the Vega's volume control, which operates in accurate 0.5dB steps, set to its maximum of "100."

Apple's USB Prober utility identified the Vega as having the Product String "AURALiC USB Audio 2.0" and the Manufacturer String "AURALiC," and confirmed that the Vega operates in the optimal isochronous asynchronous mode. The Vega's AES/EBU and S/PDIF inputs successfully locked to datastreams with sample rates up to 192kHz, including TosLink, which is usually restricted to 96kHz. The maximum output voltage was the same from both balanced and unbalanced outputs, at 4.37V, this 6.8dB higher than the CD standard's 2.0V. With the Phase control set to Normal, both sets of outputs preserved absolute polarity (*ie*, were non-inverting). The output impedance from the balanced jacks was an extraordinarily low 0.6 ohm at all audio frequencies. It was the specified 50 ohms from the unbalanced jacks, which is still usefully low.

The four filters offered by the Vega for playback of PCM recordings differed in behavior in both the time and frequency domains. Fig.1 shows the impulse response with 44.1kHz data of Filter Mode 1. It is a conventional time-symmetrical, finite-impulse-response type, with the "ringing" mapping the filter's coefficients. Modes 2 and 3 feature successively shorter amounts of pre- and post-ringing (not shown), while Mode 4, which I preferred overall, is a minimum-phase type, with all the ringing following the main pulse (fig.2).

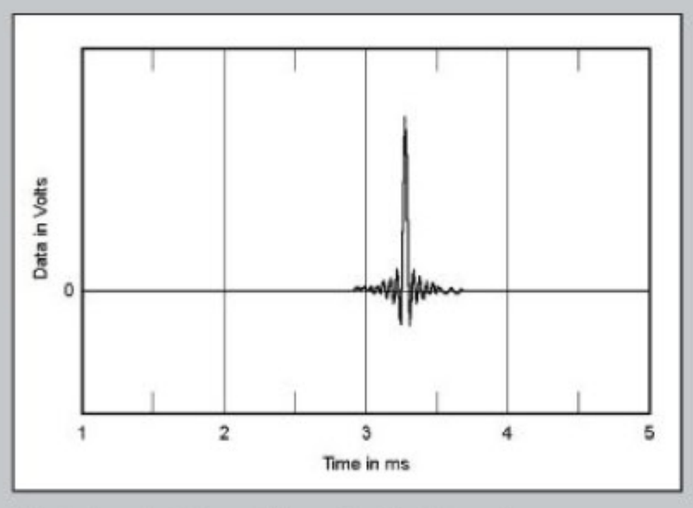

Fig.1 Auralic Vega, Filter Mode 1, impulse response (4ms time window).

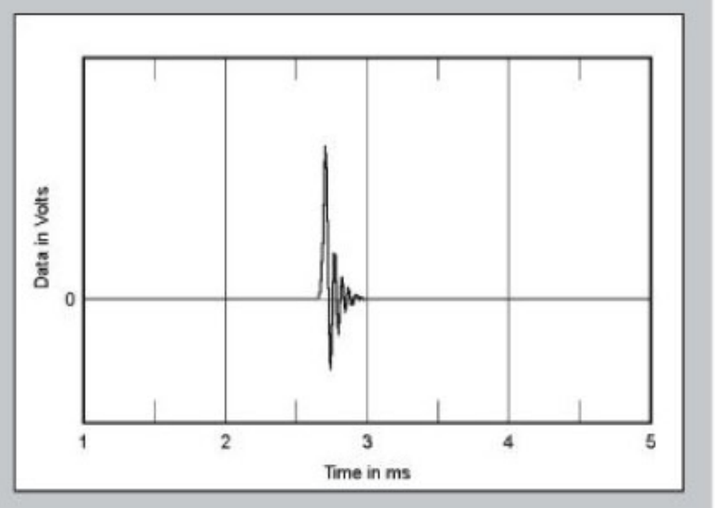

Fig.2 Auralic Vega, Filter Mode 4, impulse response (4ms time window).

believe, in two sets of four in push-pull parallel to get the lowest possible noise and the highest linearity, even at very low signal levels. Though this chip offers upsampling, this can be bypassed, in which case it will accept data of sample rates up to 1.536MHz, as in the Vega. It offers volume control for both DSD and PCM data. This chip is covered by a plate labeled "AURALiC DSD Direct Stream Digital DXD Digital eXtreme Definition." (DXD is the 24-bit/352.8kHz PCM format introduced by the Swiss company Merging Technologies for its Pyramix DSD workstation some years ago, to allow editing of DSD data without losing resolution.)

Texas Instruments' high-performance SoundPlus OPA1612 dual–op-amp chips are used for the Vega's I/V and analog low-pass filter stages. The balanced analog output stage, based on what Auralic calls the Orfeo module, is said to be "inspired by the Neve 8078 analog console's circuit design." (Orfeo is not used for the single-ended outputs.) The components in this module are claimed to operate in thermal equilibrium with very low open-loop distortion, the output transistors in class-A. Auralic says that the Vega's output stage will have no problem driving loads as low as 600 ohms from both its balanced and unbalanced outputs, which my measurements confirm (see sidebar).

Sound Quality

Xuanqian Wang told me that he doesn't believe in burn-in. However, I found that the Vega took several hours from cold before its sound quality reached a plateau. This is apparently because both the Femto Master Clock and Orfeo output-stage components need at least an hour to establish thermal equilibrium before reaching their specified performance conditions. When I put the review sample in Sleep mode, the clock and output stage remain powered, eliminating the need for any further warm-up when the Vega is switched back into operational mode.

Prior to the Vega's arrival, my listening room saw some superb-sounding D/A processors in 2013. In order of rising price: the NAD M51 ($2000, reviewed in July 2012), the Musical Fidelity M6DAC ($2999, June 2013), the Electrocompaniet ECD2 ($3100, December 2013), the Arcam FMJ D33 ($3200, February 2013), the Marantz NA-11S1 ($3499, October 2012), the MSB Diamond DAC IV with Diamond Power Base ($43,325, October 2012), and the dCS Vivaldi system ($68,497 without its SACD transport, January 2014). But the $3499 Vega was in no way embarrassed by having to follow this company. In fact, though I felt a twinge of loss when the Vivaldi system went back to the distributor, the Auralic Vega proved a very satisfying replacement.

I found that the Vega took several hours from cold before its sound quality reached a plateau.

The English composer John Tavener passed away as I was installing the Vega in my system. One of the first recordings I played, therefore, was cellist Raphael Wallfisch's performance of Tavener's *The Protecting Veil*, accompanied by the Royal Philharmonic Orchestra conducted by Justin Brown (CD, Intersound 2847), feeding data to the Vega's AES/EBU port from my Ayre Acoustics C-5xe^{MP} universal player. Like Michael Lavorgna, I found that Mode 4 was overall my favorite filter. It allowed the spaces between the notes on this hauntingly beautiful recording to be fully developed.

I was going to follow the Tavener with a needle drop of Joni Mitchell's 1978 album, *Don Juan's Reckless Daughter* (LP, Reprise

measurements, continued

This ringing, however, neither lasts as long nor is as well developed as with other minimum-phase reconstruction filters (see, for example, fig.2 at http://tinyurl.com/kwhx3jp).

To highlight the differences between these filters in the frequency domain, I use a representation suggested to me by Jürgen Reis of MBL, in which the device under test decodes first 44.1kHz data representing white noise, then 44.1kHz data representing a full-scale tone at 19.1kHz. Fig.3, for example, shows the resulting spectrum with these signals with the Vega's Mode 1 filter. The white-noise spectrum reveals that the Vega's output rolls off rapidly above 21kHz; as a result, the sampling image of the 19.1kHz tone at 25kHz (blue and magenta traces) is completely suppressed. Note also the very low levels of the distortion components of the 19.1kHz tone in this graph. Filter Mode 2 is almost identical (not shown), but Mode 3 (fig.4) has a much slower rate of ultrasonic rolloff. Consequently, the 25kHz image of the high-level tone is reduced by just 24dB. Mode 4 offered another 6dB of image rejection (fig.5), but the still-slow rolloff correlated with the smaller amount of ringing in seen in fig.2.

Fig.6 is a conventional frequency-response plot, taken with Filter Mode 1 and sample rates of 44.1, 96, and 384kHz. The channel levels match to within 0.05dB, and the shape of the response is the same with all three sample rates: flat almost to 20kHz, with then a gentle rolloff above the audioband broken by a sharp cutoff just below each of the three lower Nyquist frequencies (*ie*, half of each sample rate). With 384kHz data, the output was down by 16.5dB at 190kHz. Filter 2 was similar to Filter 1, though Filter 3 began to roll off above 16kHz with 44.1kHz data, reaching –3dB at 20kHz (not shown). Filter 4 had the same premature rolloff above 16kHz with 44.1kHz data (fig.7, green and gray

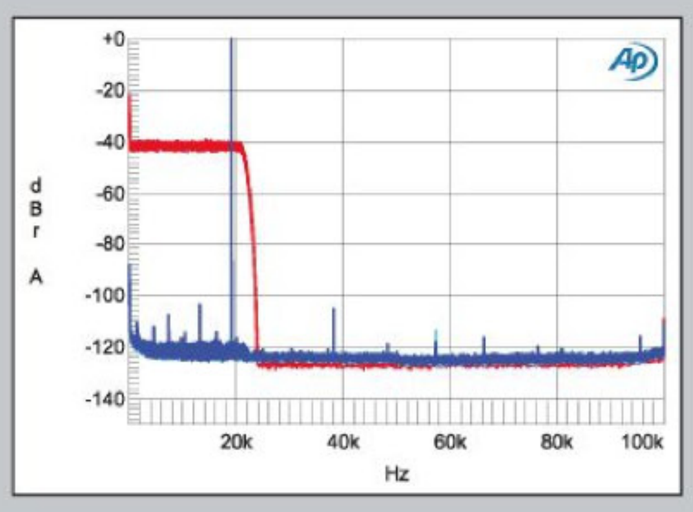

Fig.3 Auralic Vega, Filter Mode 1, wideband spectrum of white noise at –4dBFS (left channel blue, right magenta) and 19.1kHz tone at 0dBFS (left cyan, right red), with data sampled at 44.1kHz (20dB/vertical div.).

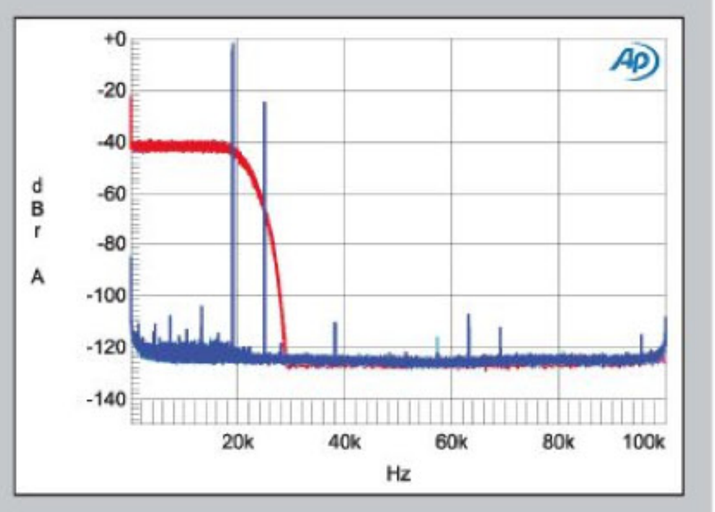

Fig.4 Auralic Vega, Filter Mode 3, wideband --spectrum of white noise at –4dBFS (left channel blue, right magenta) and 19.1kHz tone at 0dBFS (left cyan, right red), with data sampled at 44.1kHz (20dB/vertical div.).

K63003)—but I couldn't wait for the transfer to digital, which of course can be done only in real time. So I fed the AES/EBU output of my Ayre QA-9 A/D converter, set to 24/96, straight to the Auralic Vega. OMG! The low F and C that Jaco Pastorius strikes from his Jazz Bass at the start of "Cotton Avenue" were projected with almighty weight by the Vega, but without losing any of the definition to the notes' leading edges. Similarly, when Pastorius swoops down to the open D string at the start of "Jericho," which ends side 1 of this album, the combination of low-frequency weight and higher-frequency definition made it difficult to remember that I was listening to back-to-back A/D and D/A converters in the playback chain. I knew, from my review in November 2012, that the Ayre has superb sound quality, but it was obvious that the Auralic Vega was equaling that quality.

Returning to "pure" digital, I changed to the Vega's USB input and selected the live version of "Fat Man in the Bathtub" on *Hotcakes & Outtakes: 30 Years of Little Feat* (16/44.1 ALAC ripped from CD, Warner Archives/Rhino R2 79912). Some Internet know-everythings have opined that a delta-sigma DAC can't get close to the sense of musical pace you get from a resistor-ladder DAC. Well, I wish those people had been in my listening room as the late Richie Hayward's loose-limbed drum intro to "Fat Man," as reconstructed by the Vega, had me up from my listening chair dancing around the room. Even when the recording was compromised, such as a 224kbps MP3 of Little Feat performing Allen Toussaint's "On Your Way Down," from a bootlegged 1975 concert in Boston, the Vega allowed the technical shortcomings to step out of the music's way.

So far, everything I have mentioned has been a PCM recording of some kind. But a major benefit offered by the Auralic Vega is that it will decode both DSD64 and DSD128 datastreams via its USB input. (DSD64 is so called because it operates at a sample rate of 2.8224MHz, or 64*x*44,100Hz, and is the format offered on SACD discs; as its name suggests, DSD128 features twice the sample rate, or 5.6448MHz, moving the format's intrinsic ultrasonic noise an octave further away from the audioband.) The increasing availability of DSD files was one of last fall's big news stories—a full list of sites offering DSD downloads can be found at www.audiostream.com/content/dsd-resources-dsd-download-sites, while free samples of DSD64, DSD128, and DXD recordings can be downloaded from www.2l.no/hires/index.html.

The first DSD file I played was "Vaquero," from Tiny Island's eponymous 1999 album (and, in this case, an Opus 3 DSD64 sampler). What sounds like a National steel guitar is accompanied by accordion, acoustic guitar, double bass, shaker, and bass drum, all played in a beautifully resonant space. The Vega allowed the system to throw a huge space between and behind the Vivid speakers. At the end of the track, a small bell is quietly struck deep in the soundstage—it sounded deliciously palpable.

Next up was a DSD128 file: a movement from Britten's *Simple Symphony*, from Øyvind Gimse and the Trondheim Soloists' *Divertimenti* (2L 050). This is a drier recording than the Tiny Island track, but again, a stable, believable performing space appeared between and behind my speakers. The original master for this track is DXD, or 24/352.8, and 2L also offers that resolution for download. The DSD128 file is 256.5MB in size, the DXD 387.4MB, each for just over 3 minutes of music. When I selected the DXD version for playback, "352.8KS" appeared on the Vega's screen. Was there a difference between the original DXD files and a DSD128 version derived from it? I repeated the comparison several times on different days. Sometimes I thought the DXD had slightly more space, the DSD128 a slightly softer top end. Other times, they were indistinguishable. But the Vega handled both file formats equally well—in fact, it handled with aplomb everything I asked it to play.

measurements, continued

traces), but also rolled off earlier than Filter 1 with the higher sample rates. With 384kHz data, the output was down by 3dB at 85kHz and by 34.5dB at 140kHz.

Channel separation was superb, at >120dB in both directions below 4kHz (not shown). Fed dithered 16-bit data representing a 1kHz tone at –90dBFS via TosLink, the resultant spectrum of the Vega's output showed only the dither noise (fig.8, cyan and magenta traces). Increasing the bit depth to 24 (blue and red traces) dropped the noise floor by an astonishing 28dB, which suggests that the Vega's resolution is commendably close to 21 bits. Some spurious AC-supply components are visible in this graph, particularly in the left channel (blue trace), but as even the highest in level of these spuriae lies well below –130dB, these are inconsequential. When I repeated the test with 24-bit data via the Vega's USB port, I got the same spectrum, confirming that the processor handles 24-bit data via USB. Peculiarly, some very low-level, odd-order harmonics were visible in this spectrum (not shown) that are absent from fig.8. Although these all lay at or below –146dB, I did wonder if they

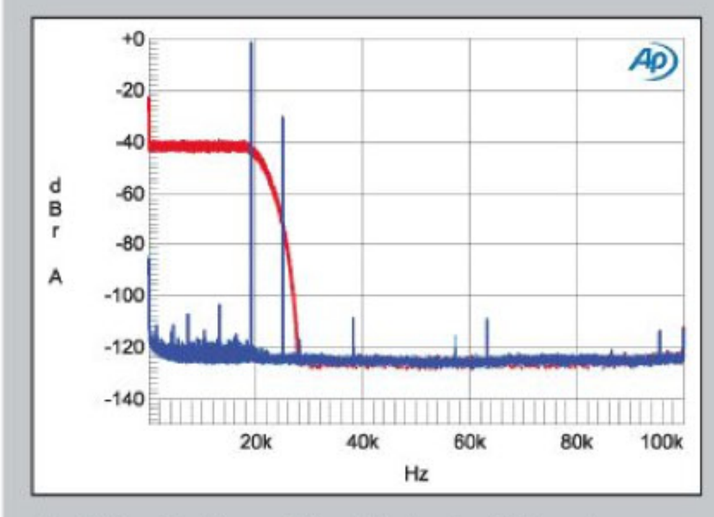

Fig.5 Auralic Vega, Filter Mode 4, wideband spectrum of white noise at –4dBFS (left channel blue, right magenta) and 19.1kHz tone at 0dBFS (left cyan, right red), with data sampled at 44.1kHz (20dB/vertical div.).

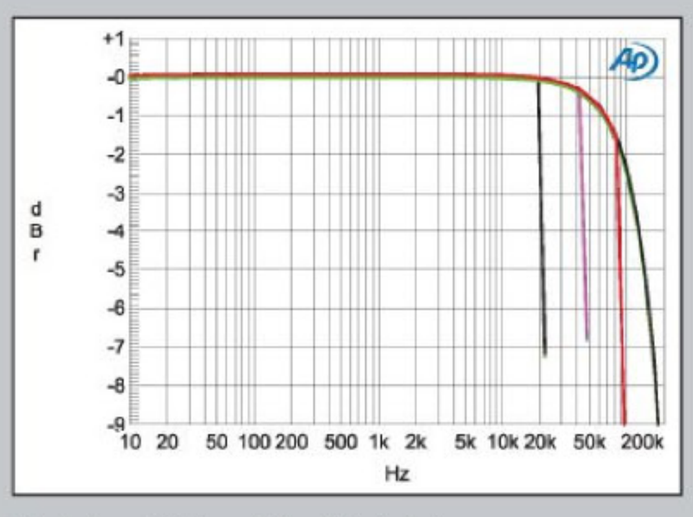

Fig.6 Auralic Vega, Filter Mode 1, frequency response at –12dBFS into 100k ohms with data sampled at: 44.1kHz (left channel green, right gray), 96kHz (left cyan, right magenta), 192kHz (left blue, right red), 384kHz (left green, right gray) (1dB/vertical div.).

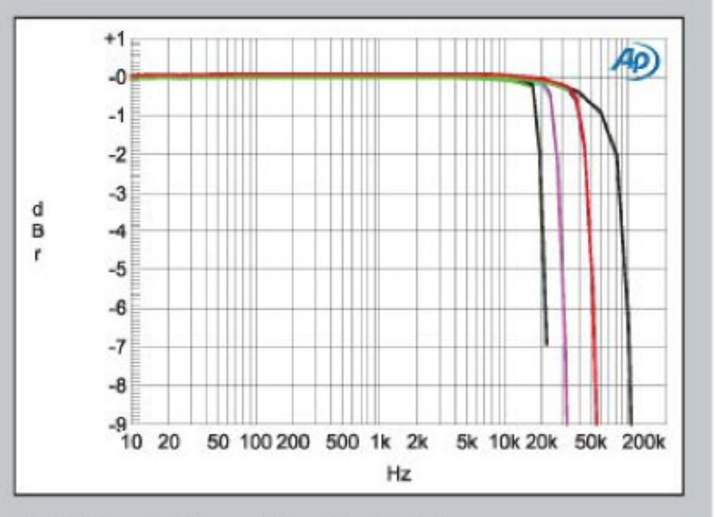

Fig.7 Auralic Vega, Filter Mode 4, frequency response at –12dBFS into 100k ohms with data sampled at: 44.1kHz (left channel green, right gray), 96kHz (left cyan, right magenta), 192kHz (left blue, right red), 384kHz (left green, right gray) (1dB/vertical div.).

Now that Acoustic Sounds is offering DSD files for download,[2] at Thanksgiving I treated myself to two recordings I already have on CD and LP, one old and one new, both from analog masters: the Dave Brubeck Quartet's *Time Out* (DSD64, Columbia) and Shelby Lynne's *Just a Little Lovin'* (DSD64, Lost Highway). Through the Auralic Vega, the familiar—even the over-familiar—became new again.

Against my benchmarks

When a product sounds as good as the Auralic Vega did, it's no problem to wax poetic about it in absolute terms. But how did it compare with the two $2000 D/A processors I was listening to during the same period: the NAD M51 and the Benchmark DAC2 HGC, the latter reviewed by Erick Lichte elsewhere in this issue?

Jon Iverson had enthused about the M51 in his July 2012 review, concluding that he preferred DACs "that reveal as much as possible about what was captured on the tape or in the digits, and couldn't care less about adding a rose-colored tint to dodgy digital sound. In this regard, the NAD M51 succeeds with a wonderfully detailed and revealing sound best described as honest, with a friendly smile." I have been using the M51 while working on a review, to appear in a couple of issues' time, of NAD's M50 media server, and have gotten to love its revealing ways.

With the 24/96 version of Joni Mitchell's "Cotton Avenue," the NAD processor focused more on Mitchell's open-strung acoustic guitar than had the Auralic, and Jaco Pastorius's subterranean bass-guitar notes didn't have quite the weight I'd heard with the Vega. But the overall sound was a little more airy via the M51, as it was with Little Feat's live "Fat Man in the Bathtub." The Vega's reconstruction of Richie Hayward's drums emphasized a bit less the cymbals and snare wires. By contrast, the M51 was less kind to the compromised sound quality of the bootlegged "On Your Way Down." Both DACs boogied hard, however, though the NAD had slightly more definition with kick drum. The M51's cleaner if leaner balance worked better with "Even the Clock," from Steamhammer's 1969 album *Reflection* (24/192 ALAC needle drop from UK LP, CBS 63611).

The M51 decodes only PCM files, which puts it at somewhat of a disadvantage for DSD playback. The Audirvana Plus program downsampled DXD to 24/192 and DSD64 and DSD128 to 24/176.4kHz, in order to play the files via the M51 via USB. There wasn't then quite the sense of space in "Vaquero," though the definition of the individual sounds of the instruments was superb; the initial "flap" of the skin on the bass-drum strokes was slightly clearer through the M51 than it had been through the Vega. But overall, I preferred Auralic's converter; the individual aspects of the sound were better integrated into the whole, but without becoming smeared or diffuse—in a word, it was more organic.

The Benchmark DAC2 uses the same ESS Sabre[32] 9018 DAC chip as the Vega. To get familiar with the DAC2's sound, I used it for two days of intense listening, mainly feeding it hi-rez PCM, such as HDtracks' 24/192 remastering of Miles Davis's *Kind of Blue*, via USB. EL called it correctly: It may cost just $1995, but the DAC2 is a superb-sounding processor with authoritative lows, smooth yet detailed highs, and accurate, stable stereo imaging. I have forgotten how many reissues of *Kind of Blue* (including two different vinyl transfers) I have—I have even handled the master tapes and listened to them in Sony's mastering studio—but decoded by the Benchmark, this new HDtracks release was the best I had heard.

Until I played it through the Auralic Vega. Miles Davis is supposed to have said that music "lies in the spaces between the notes." The Auralic and Benchmark DACs both got the

2 See www.stereophile.com/content/new-audiophile-download-service.

measurements, continued

indicated some problem at the 24th-bit level with USB data. Again, however, these spuriae will be inconsequential.

The spectral peaks at 1kHz in fig.8 kiss the –90dBFS line, suggesting that the DAC has minimal linearity error. In conjunction with the very low level of analog noise, this allowed the Vega's reproduction of an undithered sinewave at exactly –90.31dBFS (fig.9) to be perfect. The waveform is beautifully symmetrical about the time axis, and the three DC voltage levels defined by these data are superbly well resolved. I was using Filter Mode 4 for this measurement, and you can clearly see this filter's asymmetrical ringing on the waveform tops and bottoms; changing to Filter 1 gave the usual symmetrical Gibbs Phenomenon ringing (not shown), while increasing the data's bit depth to 24 gave a well-defined sinewave, even at this very low level (not shown).

Auralic's Vega offered very low levels of harmonic distortion, even when driving a full-scale signal into the very demanding 600 ohm load. Fig.10 reveals that the highest-level harmonic under those circumstances is the third, but that it lies at –116dB, or just 0.0002%! The Vega's performance with the high-frequency intermodulation test depended

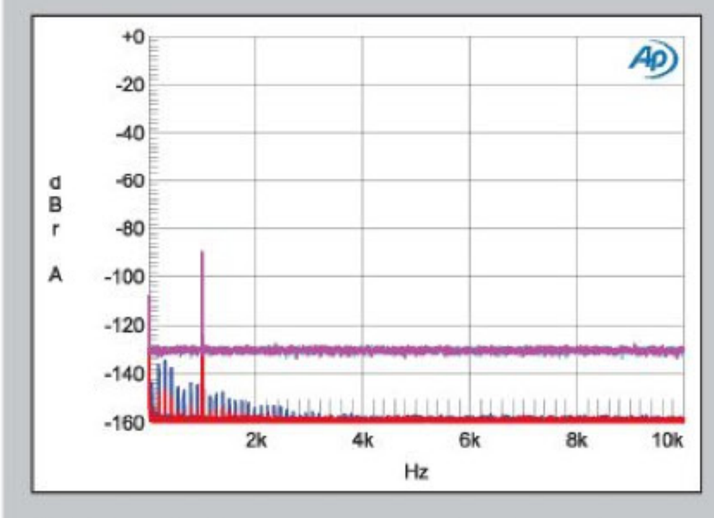

Fig.8 Auralic Vega, spectrum with noise and spuriae of dithered 1kHz tone at –90dBFS with: 16-bit data (left channel cyan, right magenta), 24-bit data (left blue, right red) (20dB/vertical div.).

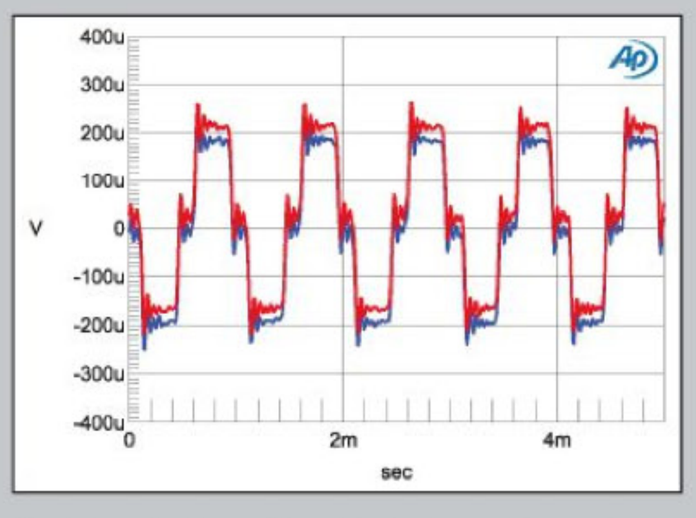

Fig.9 Auralic Vega, Filter Mode 4, waveform of undithered 1kHz sinewave at –90.31dBFS, 16-bit data (left channel blue, right red).

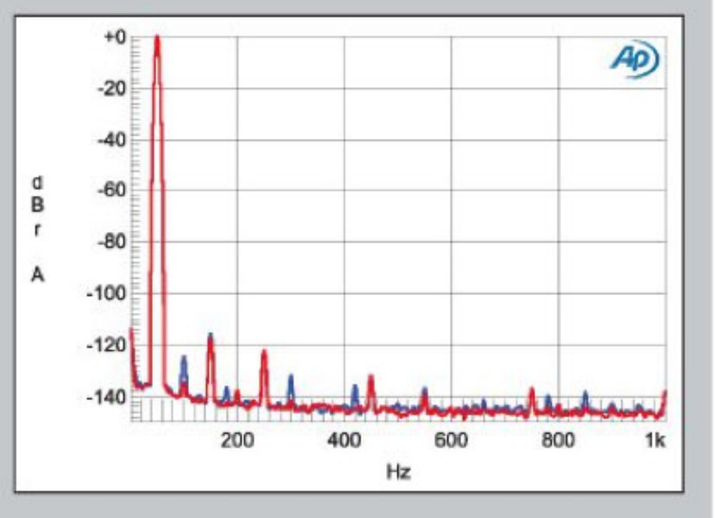

Fig.10 Auralic Vega, spectrum of 50Hz sinewave, DC–1kHz, at 0dBFS into 600 ohms (left channel blue, right red; linear frequency scale).

ASSOCIATED EQUIPMENT

Analog Source Linn Sondek LP12 turntable with Lingo power supply, Linn Ekos tonearm, Linn Arkiv B phono cartridge.
Digital Sources Marantz Reference NA-11S1 media player; Ayre Acoustics C-5xe^{MP} universal player; Apple 2.7GHz i7 Mac mini laptop running OS10.7, iTunes 10, Pure Music 1.89, Audirvana Plus 1.5.10, JRiver Media Center 19 for Mac; Benchmark DAC2 HGC, NAD M51 D/A converters; Ayre Acoustics QA-9 & Benchmark ADC1 USB A/D converters.
Preamplification Channel D Seta L phono preamplifier, Pass Labs XP-30 line preamplifier.
Power Amplifiers Pass Labs XA60.5, MBL Corona C15 (both monoblocks).
Loudspeakers Vivid Giya G3, Wilson Audio Specialties Alexia.
Cables Digital: DH Labs Silver Sonic, AES/EBU; AudioQuest Coffee, Belkin Gold USB; AudioQuest FireWire 400 (prototype); AudioQuest Diamond, Ethernet. Interconnect: AudioQuest Wild, Kubala-Sosna Elation! (balanced). Speaker: Kubala-Sosna Elation!. AC: Kubala-Sosna Elation!, XLO Reference 3, manufacturers' own.
Accessories Audio Power Industries 116 Mk.II & PE-1, APC S-15 AC line conditioners (computers, hard drive); ASC Tube Traps, RPG Abffusor panels; Target TT-5 equipment racks; Ayre Acoustics Myrtle Blocks; Shunyata Research Dark Field cable elevators. AC power comes from two dedicated 20A circuits, each just 6' from breaker box.—**John Atkinson**

notes right, and both had similarly smooth high frequencies, but the Vega was slightly better at getting right the spaces between those notes. The Benchmark's sense of the recording venue was not quite as fully fleshed out as the Auralic's, though each individual instrument was a little more detailed.

I turned to DSD files, played back using Audirvana Plus. One disadvantage the DAC2 had in these comparisons was that it appears to be limited to DSD64 playback. DSD128 files were downsampled to 24/176.4 by Audirvana if I tried to use the DAC2 with this format, while attempting to play a DXD file with the DAC2 resulted in white noise. But with a superb-sounding DSD64 recording, such as Iván Fischer and the Budapest Festival Orchestra performing Rachmaninoff's Symphony 2 (Channel Classics 21604), this was not a problem. Both DACs dug deep into Rachmaninoff's lush, lyrical score. Both DACs threw a deep, detailed, stable soundstage. Both DACs allowed me to forget the playback mechanics and lose myself in the music. But in the end, I had to concede that the Auralic's sound was a touch sweeter, a touch closer to that of real violins. But damn, this is a superb recording!

Summing Up

I am tempted to declare that, at $3499, the Auralic Vega is a bargain. For just over 5% of the price of the dCS Vivaldi three-piece DAC, the Vega got remarkably close in sound quality, at least as far as I could tell without being able to do a direct comparison. (The Vivaldi returns to my system around the time this issue of *Stereophile* drops into your mailbox; I will report on that comparison in a Follow-Up review, as well as on using both without a preamp in the system.) And can the Auralic processor really be a bargain when, for 57% of the Vega's price, the remarkable Benchmark DAC2 HGC is available—which, while being limited to DSD64, offers two pairs of analog inputs *and* two headphone outputs? And at $2000, the NAD M51 is still one of the best-value PCM-only DACs I have heard.

You know what? For its sound quality alone, the Auralic Vega—okay, Mr. Wang, AURALiC VEGA—indeed *is* a bargain. It's digital and DSD done right! ■

measurements, continued

on the Filter mode used. With Mode 1 (fig.11), not only were the intermodulation products supremely well down in level, with the difference product at 1kHz lying at –128dB (0.00005%), all the ultrasonic images of the 19 and 20kHz tones are all very well suppressed. Mode 2 (not shown) was similar to Mode 1, but with Modes 3 and 4 (fig.12), the ultrasonic images were well evident. Even so, actual intermodulation was as low as it had been in fig.11.

Tested for its rejection of word-clock jitter with the Femto Master Clock set to Auto, the Vega measured superbly well with all inputs, even TosLink. With 16-bit J-Test data (not shown), all the odd-order harmonics of the low-frequency, LSB-level squarewave were at the correct level, and there were no jitter-related sidebands. With 24-bit data—fig.13 shows the output spectrum for data input to the USB port—the spectral spike that represents the 11.025kHz tone is virtually free from the spectral "shoulders" that would suggest the presence of low-frequency random jitter, and any sidebands lie at or below –144dB!

Auralic's Vega D/A processor offers measured performance that is beyond reproach.—**John Atkinson**

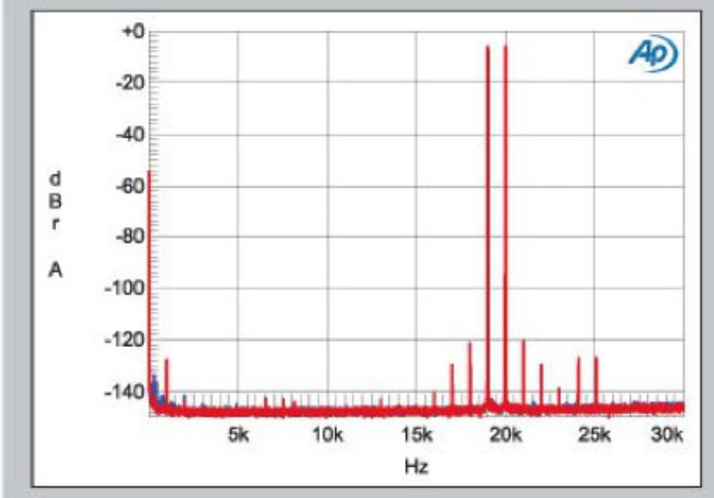

Fig.11 Auralic Vega, Filter Mode 1, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 0dBFS into 100k ohms (left channel blue, right red; linear frequency scale).

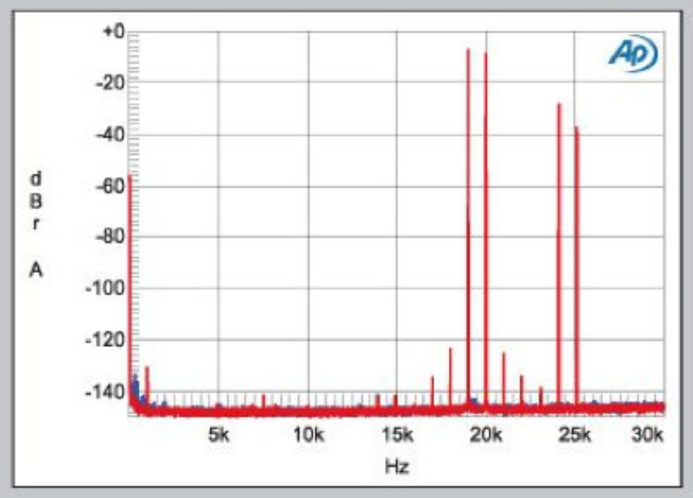

Fig.12 Auralic Vega, Filter Mode 4, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 0dBFS into 100k ohms (left channel blue, right red; linear frequency scale).

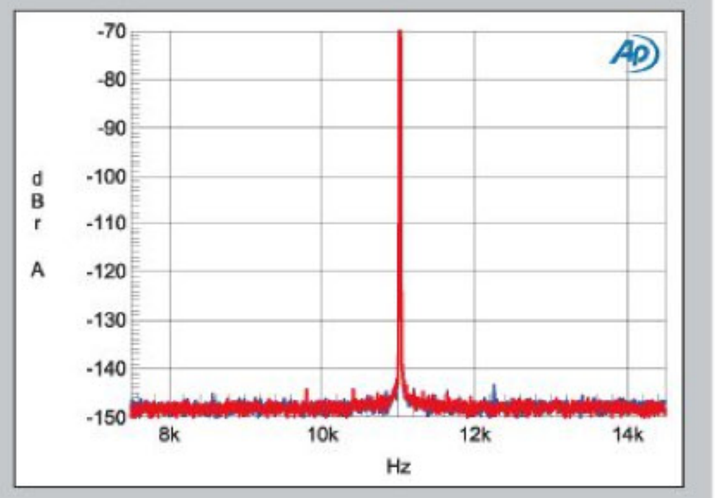

Fig.13 Auralic Vega, high-resolution jitter spectrum of analog output signal, 11.025kHz at –6dBFS, sampled at 44.1kHz with LSB toggled at 229Hz: 24-bit data via USB from MacBook Pro (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz.

Текст