Equipment Report

432 EVO Aeon Music Server
Freedom of Choice

Andrew Quint

Just this once, let's do the whole review thing upside down and begin with the conclusion. The 432 EVO Aeon is the best sounding music server I've listened to at length, a product that deserves the highest recommendation. It also features a DSP alternative that I find to be completely wrongheaded, one that places front-and-center a key question regarding the audiophile pursuit: How much is this hobby of ours about leveraging technology to realize, as much as possible, the artistic intent of composers, performers, and recording engineers and how much manipulation of musically relevant parameters should be left to the end-user? That's where the "432" part—a reference to a playback option that can either be embraced or declined—of this Belgian company's name comes in. I'll have plenty more to say about music converted to 432Hz if you choose to read on. Which I hope you will, as choice is very much what the Aeon is about.

Frederic Vanden Poel, the designer of the 432 EVO servers and owner of the company, knows a thing or two about computers. After earning a degree in Applied Information Technology from University College Ghent, Vanden Poel worked as a software engineer, system administrator, and network-security expert for several large companies, as well as in a freelance capacity. Along the way, he founded the Klinkt Beter ("Sounds Better") enterprise that functioned as a reseller of audiophile gear. In 2013, from Klinkt Beter, Vanden Poel launched 432 EVO, to a great degree because of his dissatisfaction with available "renderers"—devices that take a music file, either streamed or stored locally, and send it on to a DAC. On the manufacturer's website,

Vanden Poel comments: "We were not too happy with music servers and streamers on the market at the time. Most of them were difficult to service through bad design and often lacked support from the manufacturers. They were not extensible, generally slow, and invariably based on outdated or outsourced OEM software. We therefore decided to do something about it." While developing his line of servers, Frederic Vanden Poel was influenced by the burgeoning movement to experience music tuned to A=432Hz, rather than the customary 440Hz, and named his business accordingly.

There are currently four models of 432 EVO servers of which the Aeon ($7500) is second from the top; the others are the Standard ($3500), the High End ($5500) and the Master ($16,000). All models have the same chassis, and the Standard, High End, and Aeon are upgradeable. Like the flagship Master, the Aeon employs an SOtM USB card that's directly clocked from a dedicated low-jitter clock board. The Aeon comes with two external linear power supplies (LPS) manufactured by a Dutch company, Sbooster—one outputs 9V to the SOtM board and the other provides 12V for the rest of the machine. (The flagship Master is a two-box affair that employs three discreet linear power supplies.) Inside the enclosure is 2TB of SSD storage mounted on a spring suspension. (4TB and 8TB drives can be ordered at an additional cost.) On the front panel is the power button and a slot to feed discs to a TEAC bit-perfect rip drive. Behind, in addition to the power-plug receptacles for the two LPS units and the USB port associated with the SOtM card, there's an RJ45 Ethernet port, four additional standard USB ports (two 2.0 and two 3.0), an HDMI output, and a couple of video outputs (VGA and DVI) that typically won't see service, as the device is VPN supported.

Vanden Poel's servers are Linux-based, which isn't unusual for the most capable music-computer developers, who want to avoid the strictures (and licensing fees) that a Windows or Apple platform might entail. The use of open-source software allows a designer more latitude and more choices, which he can ultimately translate into more choices for the end-user. In terms of the software with which a user organizes and plays digital files, 432 EVO servers offer two alternatives, the Logitech Media Server (LMS) and Roon—the full

Specs & Pricing

Formats supported: Roon: MP3, WAV, WAV64, AIFF, FLAC, Apple lossless, OGG, and AAC at resolutions up to 32-bit/768kHz. DSD64, DSD128, DSD256, DSD512. Logitech Media Server: All common formats including DSD, WAV, FLAC, MP3, ogg vorbis, AAC, MQA pass-through
Inputs/outputs: One SOtM USB, 4 standard USB, one HDMI
Connectivity: One RJ45 Ethernet, DVI video, VGA video
Drive capacity: 2TB standard (4TB, 8TB optional)
Streaming services: Tidal, Qobuz, Spotify
Dimensions: Server: 16.7" x 2.7" x 12.8"
Power supply 5.1" x 3.0" x 9.4" (x2)
Weight: Server, 11 lbs.; power supply, 4 lbs. (x 2)
Price: $7500 (black or silver)

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Roon core, not just an endpoint. Though LMS is free, most will choose the latter. Roon has established itself as the favorite file-management program among audiophiles, and with good reason. Its functionality has been steadily improving (even with classical music, a sore spot in the past), and the integration of local files with those available to stream is impressively seamless. There may be, as well, a growing consensus that Roon sounds better than the competition. Roon isn't cheap—a year's subscription purchased in advance is $119 and, if you're in a 'til-death-do-us-part sort of mood, a lifetime membership runs $699. And remember, this is in addition to what you're paying for a streaming service such as Qobuz or Tidal, both of which are readily welcomed by Roon as installed on the Aeon server.

Whichever management software is chosen, a local player is needed to access Roon or LMS, and to set the 432 EVO's operating parameters. This "webinterface" is provided with a third-party application, Vortexbox. Once that software has been installed on the device that will be used to operate the server—laptop, tablet, or phone—the user navigates to the Configure Player page. Without much fuss, one has arrived at the user interface that provides all the Aeon's functional versatility.

From that menu, one makes choices regarding upsampling, depending upon his philosophical standpoint and the capabilities of the DAC that the Aeon will be sending data to. Purists can decide to fully disable the plug-in that accomplishes upsampling, with or without the filter options detailed below. Exactly why anyone would eschew upsampling is a mystery to me; for the rest of us, there are choices ranging from 16/44.1 up to 32/768. The 432 EVO advises choosing the highest resolution your DAC can handle. Noting that the sampling rates are multiples of 44.1kHz

and 48kHz, those who listen largely to 44.1 Red Book files are counseled to first try an upsample frequency just below the DAC's maximum. The factory default setting is 32/192, which I mostly used although my reference DAC can manage 32/384.

Another parameter related to the computing power of the DAC in service is buffer size—how much data is being delivered to the DAC from the server at one time. With a more robust converter, one that can support 24/352.8 or 24/384, the buffer size can be set at 256Kib, rather than the default of 129Kib. (The options range from 16Kib all the way up to a mebibyte.) The advantage of choosing a large asynchronous buffer size is that less "context switching"—computerese for beginning a process, leaving, and then returning to it—will result in less software jitter. [The suffix "Kib" has become the EIC standard to denote 1024 bytes and differentiate it from Kb, which denotes 1000 bytes. Similarly, a mebibyte is 1.024 megabytes.—RH]

Those who upsample with a 432 EVO server can activate the SQI (Sound Quality Improved) plug-in and choose among 10 digital filters that address aliasing, ringing, and time-domain issues—problems inherent to digital encoding. Seven are variants of the two major types of filters, linear phase and minimum phase, which have their own well-known advantages and disadvantages. Three are based on the work of a pseudonymous Vancouver-area blogger, Archimago, who developed a compromise intermediate phase filter he dubbed "Goldilocks" because, in the spirit of that fa-

bled judge of ursine porridge, it sounded "just right" to him. Frederic Vanden Poel agreed and offers Goldilocks as freeware (just as the mysterious Canadian did), plus with two modifications, "Archimago's intermediate phase + evo 1" and "Archimago's intermediate phase + evo 2." The latter is the factory default; I settled on the first of Vanden Poel's Archimago variants. Other critical listeners may make a different choice—it's possible to undertake comparisons of the filters pretty much on the fly.

An additional plug-in offered to Aeon and Master model owners is the Bass Authority mode, Vanden Poel's response to the subjective impression of some listeners that his servers' low end lacked…well, authority. The designer developed a software patch that operates independently of any filter to improve bass dynamics and control. It will function even when the Aeon is operated in its "bit-perfect" mode, with SQI disabled.

For the review period, I used two DACs, a Bricasti Design M1 and the Ideon Absolute Epsilon [*see RH's full review in this issue*]. A Transparent USB Premium cable connected server and DAC. Analog electronics included a Pass Labs XP-22 linestage and Pass XA 60.8 monoblock amplifiers; loudspeakers were either Magico M1s or the TAD E1-TX system [*review pending*]. Local files were stored on a Synology NAS and reached the Aeon via a Fidelizer Etherstream switch connected to my router.

With the 432 EVO Aeon in my system, the playback of digital files—retrieved from the NAS, ripped to the

server's hard drive, or streamed from Tidal—was more musically engaging than anything I'd experienced previously in my room. What was I hearing? Above all else, there was an immediacy to the presentation that let me buy into the fantasy that all audiophiles have at least occasionally—that they're not listening to canned sound but to flesh-and-blood musicians. The ferocity of the solo violin on Paavo Järvi's recording of *L'histoire du soldat* (PentaTone) was a stunning example, even though the source material was "only" 16/44.1. Tonal accuracy was unassailable. With that same Stravinsky performance, there was no doubt that it was a cornet being played and not a trumpet. The retrieval of low-level detail was outstanding—the decay of a struck cymbal, for instance. It was obvious to me that the guitarist on Wayne Horvitz's *Sweeter Than The Day* album was playing through a tube amplifier that was then mic'd in the studio.

Upsampling, to the extent acceptable to the DAC in use and as implemented by the Aeon, made a substantial difference, especially with Red Book files. My favorite version of Handel's *Messiah* is Trevor Pinnock's, the recording that, 30 years ago, convinced me of the desirability of historically informed performance practice with Baroque and early Classical repertoire. The emotional center of *Messiah* is the alto aria "He was Despised," and upsampled to 32/192 the luxuriance of Anne Sofie von Otter's vocal instrument is gloriously represented, the subtlety of her dynamic contouring and phrasing as fully revealed as it would be from a higher-resolution master. Similarly, setting the buffer size at 256Kib brought out the rich complexity of a well-recorded string quartet's ensemble sonority (the Hagen Quartet playing Beethoven's Op. 18, No.3, as ripped from a Myrios Classics SACD).

The Bass Authority option performed as promised. The bass drum thuds beginning at 3:51 in the opening movement of Bernard Haitink's 2010 recording of Shostakovich's Symphony No. 15 didn't necessarily have more low-frequency extension than usual, but they discreetly acquired more weight and restrained power. Electric bass on Kevyn Lettau's *Songs of the Police* had more heft when the feature was turned on. On acoustic bass, the sonic representation of Christian McBride's instrument on Diana Krall's "I Don't Know Enough About You" is fuller, more dimensional, and more believable as a large, hollow box. The Bass Authority mode—along with upsampling, the largest possible buffer size, and one of the filter choices—clearly should be in play for the Aeon to generate an optimized stream of ones and zeros for your DAC to process. But there's one software function that, I feel, ought to be left on the sidelines.   `

432 Playback

We now get to the aspect of the Aeon's design that's as controversial as it is interesting, the conversion of recordings originally produced with the A=440Hz standard to 432Hz. It can't just be glossed over, as the manufacturer obviously believes in it. One element of the 432Hz debate isn't at all controversial, namely the historical fact of "pitch inflation," which has been going on for hundreds of years. If you attend a symphony orchestra anywhere on earth, chances are you'll witness a time-honored ritual that begins every performance. The lights go down, the concertmaster comes out on stage, and he or she nods in the direction of the

principal oboist who sounds the "A" above middle C, aka A4. The musicians—first the winds and then the strings—tune their instruments to this pitch that has been specified internationally since 1939 as 440Hz.

It hasn't always been that way. Over the course of several centuries, there's been a steady rise in the pitch of A, progressing from approximately 415Hz during the Baroque era, to the 420s in Mozart's day, to the mid-430s of the late nineteenth century, and to 440Hz (and higher) in the twentieth. The motivation for this evolution was a desire on the part of composers, instrumentalists, and conductors for the sound produced to be louder and more brilliant—kind of the equivalent of today's "loudness wars." This trend wasn't popular with singers who were required to vocalize in an ever-more strenuous range. Verdi lobbied for an A=432Hz standard in the mid-1880s, and a hundred years later, Luciano Pavarotti, Plácido Domingo, and Birgit Nilsson were among the signatories to a petition demanding that the Italian government establish that frequency as law.

So, there are musicological reasons favoring a lower frequency. "Original instrument" groups now routinely tune to 415Hz, which is a half-step lower than 440: Play an A on a baroque violin and it sounds like a G-sharp to modern ears. There are also some less rigorously substantiated arguments that involve claims of physiologic responses in human test subjects, beneficial effects on disease, and occult philosophy. Mostly, modern proponents of 432Hz tuning just like the

way it sounds. The manufacturer's promotional literature, which reports that 90% of listeners prefer a 432Hz version of a musical selection to the 440Hz original, describes the sound as "warmer, more pleasing, more like analog, and more relaxing compared to the sharper 440Hz." Is this a good thing? Often, music needs to develop tension and release it, to operate in the realm of "stress." Whatever the musical genre, audio quality that aims to be soothing may undermine the message a composer or artist has put forth. However, if you choose to do so, you can tell the Aeon in the Configure Player menu to alter the pitch from a "Base" frequency of 440-to-445Hz (there are six options) to one of seven "Targets"—415, 426, 426.5, 430.5, 432, 440, or 444.

While it's not difficult to utilize DSP software to lower the pitch of a musical performance without altering its speed, that's not what Frederic Vanden Poel opted to do. "We use rate shift instead of pitch shift," he explained in an email. "Pitch shift as present on some digital DJ gear just lowers the pitch and keeps the tempo identical, which will result in audible loss. It probably works for EDM [Electronic Dance Music] but not for acoustic music and it just sounds fake to our ears. We tried all available methods before creating our own 432 plug-in and then perfected the best-sounding method in our own way. The only means to accomplish this is to change both pitch and tempo. The 432Hz plug-in in our product is designed to be free of audible artifacts and combines rate shift with upsampling in a very efficient way."

If you don't know the music especially well, or you're not that sensitive to classical music being performed in the wrong key—"wrong" in the sense that it's not what the composer and/or performer intended—perhaps 432Hz will sound better to you. But if it's musical material with which you're ultra-familiar, things may seem a bit off. Between audio shows, equipment reviews, and listening for pleasure, I suspect I've heard that opening movement of the Shostakovich 15th Symphony a couple of hundred times. Played back at the 432Hz setting, not only was the pitch obviously flat, the full orchestral sonority and the tone quality of individual soloists was clearly altered. And although the tempo was less than 2% slower, there was a slight loss in the tensile quality and edginess of Haitink's interpretation.

It wasn't just with classical music that the conversion methodology potentially violated the artistic intentions of composers and performers. My favorite track on Joni Mitchell's 1976 album *Hejira* is "Song for Sharon"—I never tire of the way the music hypnotically illuminates the poignant narrative, the singer contrasting her life as a solitary artist with that of a musician friend who opted for farm and family. Played back at 432Hz, Joni's voice had a few additional pack-years of roughness added on prematurely, and Max Bennett's fluent, melodic electric bass figurations lost their buoyancy. The song had become pedestrian, robbed of its wry yet wistful point of view and the perfection of Mitchell's synthesis of pop, jazz, and folk. Count me in the 10% that doesn't prefer 432 to 440.

Frederic Vanden Poel may advocate for 432Hz, but he doesn't insist on it. Conversion from 440 to 432—the factory default—is easily defeated, while still allowing adjustments to the other parameters described above, simply by setting both the Base and Target frequencies to 440Hz. If you happen to be a 432Hz partisan or just want to try it out, it's easy to enable the software. Or to disable it, which is why I'm purchasing the review sample, for everything the 432 EVO Aeon does so very, very well.

The forward progress of digital playback has been steady over the past four decades. The development of better DAC chips and their more creative implementation was critical, of course, keeping pace with advances on the encoding side of the process. The potential elimination of the physical disc with high-resolution downloads and streaming has been a big step forward. We've also seen a slow awakening to the idea that the way the zeros and one are treated at the very start of the playback sequence is of great importance.

Ironically, there are parallels here to the pre-digital era, when most of the choices available to audiophiles seemed to revolve around the record player—the cartridge employed, VTA, tracking force, the physics of the tonearm, a direct drive vs. belt-driven turntable, and a couple dozen other considerations. There are loads of factors to consider in the analog realm and, it turns out, that's also the case at the beginning of the digital audio chain. A ho-hum laptop with file-management software installed isn't going to get you to the point to which digital playback has advanced in 2022. There are a host of decisions to be made to optimize the process of turning stored or streamed data into music and the 432 EVO servers present these choices in a way that helps assure the best possible results. In short order, even the most obsessive enthusiast will stop tweaking filter settings and buffer size and just…listen. Which is always the best choice an audiophile can make. **tas**