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Shunyata Denali AC Power Conditioning System

by Robert Harley



Inspiration sometimes comes from unexpected places. Who would have thought that a cardiologist trying to improve his medical diagnostic system would inspire Shunyata founder Caelin Gabriel to push forward the state of the art in AC power conditioning for audio systems?

That doctor, whose days were filled with analyzing and interpreting the tiny electrical signals emitted by the heart, spent his evenings enjoying music through a high-end system. Discovering that Shunyata's Triton AC conditioner improved the low-level resolution of his audio system, he surmised that the Triton may allow him to more clearly see the heart's tiny electrical signals in a clinical setting.

When the doctor plugged his heart-monitoring equipment into the Triton he immediately saw a reduction in background noise, which made the heart signals clearer and easier to interpret. Shunyata learned of this discovery and visited the doctor to see firsthand this unexpected new application of its technology. Gabriel returned to the lab with a mission to develop new techniques that would push the noise floor down even further than was realized in the Triton.

Gabriel succeeded, with this research path leading him to develop AC power-conditioning systems specifically for the medical field. With more than 30 demonstration systems installed in hospitals around the world, Shunyata finds itself in a new business. In December the products received medical-grade certification, which will allow Shunyata to commercialize the technology through a newly formed subsidiary, Clear Image Scientific. Shunyata's website offers more details on the medical-grade conditioner, along with a video showing the effect of the power conditioner on the equipment used to look at heart signals ("Reducing Noise Levels in Electrophysiology Medical Procedures").

The technology developed for the medical-grade AC conditioners was soon applied to audio conditioners, specifically the new Denali series reviewed here. There are three models in the Denali line. The D6000T is a tall and narrow floor-mounted conditioner with six outlets in a vertical array (the "T" signifies "tower"). The D6000S offers identical features and performance, but is designed for conventional horizontal shelf mounting (the "S" denotes "shelf"). The D2000T is a floor-mounted device with two outlets designed exclusively for power amplifiers. All have aluminum chassis, with the



“T” models featuring an aluminum base-plate and heavy-duty vibration-resistant footers. Prices are \$4995 (D6000T), \$3995 (D6000S), and \$3495 (D2000T). The D6000T and D6000S offer identical internal parts and performance. The D2000T’s noise isolation is less elaborate than that in the six-outlet models, and is based on a Shunyata technology designed specifically for powering components with high-current draw, such as power amplifiers.

How is the Denali series different from Shunyata’s previous flagship conditioner, the Hydra Triton? At the heart of the Denali series are new “CCI (Component to Component Interference) Filters” that Gabriel developed for the medical industry. These new filters

trap noise, preventing it from appearing on your system’s AC power line or from getting into your components. The new CCI filters are not only smaller, but also reportedly significantly more effective than the Noise Isolation Chambers used in the Triton. Shunyata claims (and has the measurements to prove it) that the Denali series has 36dB greater noise reduction than the Triton (for a total of 60dB at 1MHz). This additional 36dB of noise reduction turns out to be crucial in medical imaging, lowering the noise floor and allowing cardiologists to more clearly see the heart’s electrical impulses.

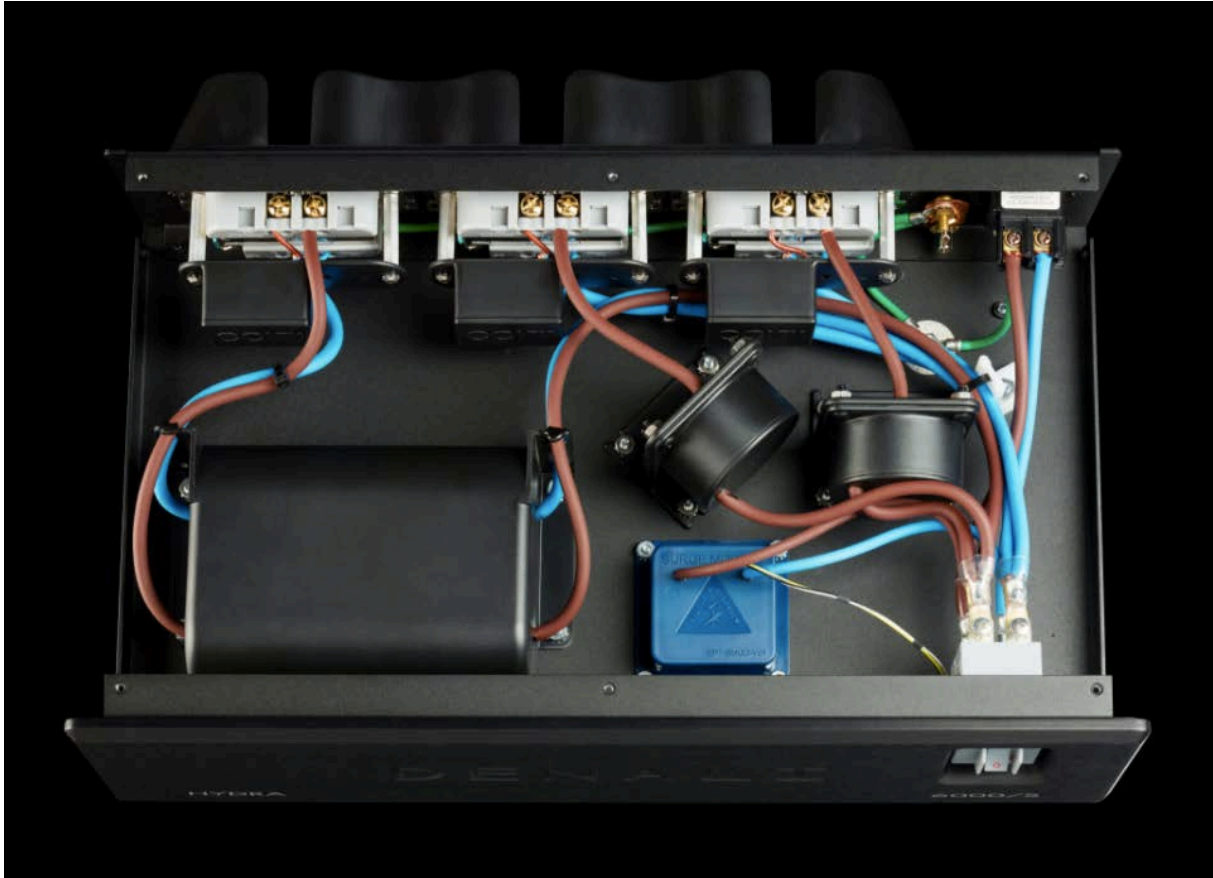
Shunyata had offered a companion product to the Triton called the Typhon, which was simply a massive bank of first-generation Noise-Isolation Chambers. The Typhon plugged into the Triton via an umbilical cord (the Typhon had no AC outlets) to increase the amount of noise filtering. Housed in the same-sized chassis as the Triton, the Typhon did indeed render an improvement in low-level resolution, finer gradations of micro-dynamics, and a greater sense of space. I even tried plugging a Typhon into the unused outlet of the duplex that powered my system; it just sat there in parallel with the AC line acting as a noise sink (no Triton or audio components connected to the Typhon). Even that made a difference in my system.

The new CCI filters developed for the medical-imaging AC conditioners and now in the Denali series render moot the need for an outboard chassis containing additional Noise Isolation Chambers (the Typhon). The CCI filters in the D6000T and D6000S are reportedly more effective than the combination of the Triton and Typhon. The CCI filters reduce the noise on the AC line, and isolate the audio components from each other. Noise generated by one component is filtered out rather than put back on the AC line where it would get into the other components in your system. Specifically, the D6000T’s (and D6000S’s) six outlets are divided into three zones. The CCI filters are arrayed to provide maximum isolation between Zones 1 and 2. The third Zone (designated “HC” for “high current,”) is designed for power amplifiers and is filtered by Shunyata’s patented “QR/BB,” circuit rather than by the CCI filters. QR/BB is a technology Shunyata developed in 2001 and has been refining since. Using no inductors or capacitors, QR/BB reportedly allows amplifiers to draw more instantaneous current from the wall outlet than is possible without QR/BB. Zones 1 and 2 are rated at 15A continuous each, with Zone 3 rated at 20A continuous.

The two-outlet D2000T is essentially the Zone 3 section of the six-outlet conditioners. The D2000T sits on the floor next to the power amplifier or equipment rack. To reiterate, the D2000T lacks the CCI filters of the other two conditioners, and is instead based on the QR/BB circuit. It offers 15dB of noise isolation between the input and output. The Denali’s AC outlets are a custom Shunyata design called

CopperCONN. The outlet is built with large solid-copper contacts and conductors rather than with the thin copper-coated brass contacts of conventional outlets. The specific copper inside the Denali, the wiring, the AC outlets, and the noise-reduction technology are all designed by Shunyata and are proprietary.

In addition, Shunyata treats the components in the Denali with a process it calls the “Kinetic Phase Inversion Process.” It is secretive about how this works, but claims that the process enables components and wiring to break in immediately, and more fully, than during normal use. Cryptic names for secret processes usually arouse suspicion, but Caelin Gabriel has earned the benefit of the doubt by virtue of his long track record of inventive technologies and outside-the-box thinking, and his scientific-minded approach, not to mention his products’ sonic performance over the years.



I must commend Shunyata for its creativity in making the Denali products easier to integrate into a system than previous designs. The D6000T, with its tall and slim tower chassis, doesn’t require a rack shelf. Before switching to the Denali, I positioned the Triton facedown on the floor behind my full rack, an inelegant and ignoble placement that wasn’t ideal visually, ergonomically, or sonically. The D6000T, by contrast, sits next to my rack, consumes very little floor space, and allows me to run all the AC cords to the rack’s side, away from signal-carrying interconnects. The sloping front panel and graceful lines turn what is essentially a black box into an elegant-looking component. These comments also apply to the low-profile D2000T; one sat unobtrusively on each side of the Critical Mass Systems Maxxum amplifier stand.

Another welcome innovation is the “cradle support system,” a simple yet highly effective way to secure the AC plugs in the Denali’s AC outlets. A semicircle above and beneath each duplex outlet, extending a few inches behind the rear panel, cradles the AC plug so that there’s virtually no weight pulling on the cable. The combination of Shunyata’s custom AC plug, the CopperCONN AC socket, and the cradle support system produces a very firm and secure connection. Although the Denali series is better technically, sonically (as we’ll soon see), and ergonomically than the Triton/Typhon, the new products cost no more than their predecessors. The only misstep in the new design is the retina-searing blue

LED on the front panel; I covered it with a tiny circle of black electrical tape. Shunyata says that this problem has been corrected.



Listening

I installed a Denali D6000T next to my rack, a D6000S behind my rack, and a pair of D2000Ts (one for each amplifier) along with Shunyata's Sigma AC cords. This setup replaced a Triton, Shunyata's DPC8 conditioner (the DPC8 is designed specifically for digital sources), and three Typhons (one connected to the Triton, the other two hanging on unused AC outlets). The replacement Denali system is about half the cost and half the weight and bulk of the previous Triton/Typhon setup.

My listening room is supplied by four dedicated 20A circuits. One circuit powers the analog rack, one supplies the main rack housing the preamp and digital components, and each monoblock is on its own circuit. The AC wiring from the electrical sub-panel to the Shunyata-made wall outlets is a cryogenically treated in-wall wire developed by Audience. All the AC power cords are Shunyata Sigma, which contain miniature noise filters built right into the large carbon-fiber plug housing. Incidentally, when I had the dedicated lines installed I left in place the stock AC power to the listening room to allow A/B comparisons.

Before describing how the Denali sounds in my system and the ways in which it differs from the Triton/Typhon, I'd like to dispel a common myth about AC power conditioning. It is widely assumed that an AC conditioner for an audio system is primarily focused on cleaning up the "dirty" incoming AC power. Although a good conditioner does remove noise on the incoming AC line, an equally important job is to isolate the components within your audio system from each other. This is especially important with today's products that incorporate digital circuitry. It's not just DACs, music servers, and other digital sources that generate digital noise; most modern preamplifiers, for example, are microprocessor-controlled. Any component with digital switching circuits puts noise back onto the AC line, which gets into the audio circuitry of other components plugged into the common AC line. A good AC conditioner isolates each component from every other component in your system.

The qualities that have made me a Shunyata user for the past ten years were taken to new heights by the Denali system. I didn't need to listen carefully and pick out small differences between the new and old conditioners; the Denali rendered an immediately apparent wholesale improvement to my system.

The best single word to describe Shunyata's technology in general, and the Denali system in particular, is "organic." That is, the music has a natural ease that makes it easier to forget I'm listening to electronics and speakers. The Denali removes a fine scrim of grain, etch, and metallic hardness that overlays timbres, washing them clean. If you're used to the sound of your system without good AC conditioning, you may not identify this whitish grain specifically, but it nonetheless diminishes the natural tonal colors of instruments, and fosters that familiar feeling of listening to the music as filtered through electronics.

It's only after hearing the system with this distortion removed that you recognize this distortion for what it is. More important, however, is the effect on the listening experience. The cleaner rendering of timbre confers many benefits, including richer and denser tone color by virtue of absence of the electronic patina. The Denali allows the instruments' natural beauty to shine through, unencumbered by a tincture of sterile artificiality. Instrumental and vocal textures become more like music and less like electronics. The sound is richer, more deeply saturated, and timbrally vivid.



This impression is amplified by the another salubrious effect, the dramatic lowering of the noise floor, and with it the threshold for hearing musical detail. To use a visual analogy, compare looking at the night sky from a major city with that same view from a pitch-black wilderness. The city's light pollution obscures the faintest stars, and reduces the contrast between the still-visible stars and the blackness of space. The night sky from, say, Death Valley, is awe-inspiring. From Manhattan, not so much. Similarly, the Denali's

reduction in background noise allows a wealth of fine detail to emerge. This detail may be the micro-texture of tone colors that imbues the sound with a more vivid sense of the instrument and the mechanism by which it creates music. This micro-texture, when resolved, makes it easier to cross the threshold into that zone of forgetting that you're listening to a reproduction. Moreover, resolving this tiny component of the sound not only provides greater richness of timbre; it also allows you to better differentiate individual instruments in an ensemble. On Dick Hyman's *From the Age of Swing* on Reference Recordings the unison phrases by the brass and woodwinds sounded like many differentiated instruments playing together rather than a synthetic continuum.

It's not just very low-level timbral detail that makes instruments sound more lifelike, but also the resolution of very fine transient information. I'm talking about the finest micro-transients, components of the signal that you may not think of as transients but that, nonetheless, provide the brain with richer cues about the sound's origin. A reed moving back and forth, for example, or the series of very fine, closely spaced dynamic impulses created by a bow moving across a string. Without any AC conditioning, these extremely fine but vitally important signal components are simply buried. The delicate brushwork on Jimmy Cobb's snare drum on *Jazz in the Key of Blue* was much better articulated, with a more vivid and realistic rendering of brushes moving across the drumhead. The Triton was for me revelatory in how it unearthed fine details, but the Denali is, surprisingly, significantly better at resolving these low-level cues. The more experience I have with cutting-edge audio, the more I'm convinced that it's the resolution of the very finest musical information that vaults a system from outstanding to musically transcendental.

Another manifestation of the reduction in the noise floor is the ability to hear the fragile spatial cues that, together, allow our minds to create a believable soundstage. Soundstage depth, width, the sense of hearing back into the hall, and of individual instruments separated by space is staggeringly better with the Denali. To borrow one of Jonathan Valin's wonderful visualizations, it's like looking at a diorama compared to looking at a painting. Early in *The Rite of Spring* [Reference Recordings] the contrabassoon in the back row plays a prominent, almost solo, passage that lights up the surrounding acoustic and reveals the orchestra's depth and the hall's size. The Denali brings these spatial details to vivid life. The more realistic portrayal of spatial cues also has the effect of making the loudspeakers more fully disappear. Without Shunyata's conditioning, the speakers do a good job of floating images and fostering

the impression that the sound isn't coming from two transducers. But the Denali takes that impression to another level, and in a way that's hard to describe. The soundstage and the instrumental images within it are more tangible, solid, immersive, and detached from the speakers. The Denali's combination of deeper background blackness, resolution of the finest spatial and textural detail, utter liquidity of timbre, and powerful impression of immersing you in the recording venue's acoustic presents the music with a heightened sense of occasion and drama. When a piece of music starts, it feels as though I'm about to experience a momentous event that deserves and demands my full attention. Any component that fosters this feeling is special, indeed.

Conclusion

Shunyata's new Denali AC conditioning system significantly improves upon the sound quality of its stellar predecessor, the Triton. In every sonic criterion, the Denali establishes a new benchmark of performance. In addition to cleaner timbres, lower noise, greater resolution of low-level detail, and a more expansive and dimensional soundstage, the Denali system goes a step further in recreating the illusion of musical realism. In addition, the D6000T's new vertical orientation and cable support system make it fit more easily into any system. And if you have shelf space, you can save \$1000 with the D6000S and still get the same performance as the D6000T. Although \$4k or \$5k for power conditioning isn't inexpensive, I consider the Denali products a tremendous value not just in relation to competing conditioners, but also in the context of your entire system investment. Before you "trade up" to a different power amplifier, for example, you should hear what state-of-the-art AC conditioning can do.