Berkeley Audio Design Alpha DAC Series 3 Digital-to-Analog Converter

Distillation

Robert Harley

Founded by Pacific Microsonics alumni Michael Ritter and Michael "Pflash" Pflaumer, Berkeley Audio Design entered the market in 2008 with the excellent $4995 Alpha DAC—a component that I used and enjoyed for many years at the front of some very high-end electronics and loudspeakers. Although I had much more expensive DACs available to me, the original Alpha DAC had a certain sound quality that I didn't want to give up. Later, Berkeley Audio launched the significantly more ambitious Reference DAC. The Reference delivered performance far above that of the Alpha, establishing a benchmark against which all other DACs could be compared, regardless of price. That's not hyperbole: The Reference DAC (now $25,000 in Series 3 configuration) remained undefeated for many years despite facing a veritable parade of expensive competition. It took the $145k Wadax Reference DAC [Issue 312] to dethrone it, but we're talking about a DAC that's six times the Berkeley's price.

Both Berkeley DACs were upgraded over the years, but, overshadowed by the Reference, the Alpha DAC was eventually dropped from the line. Now, the Alpha DAC is back—not so much as an updated Alpha platform, but rather as an attempt to bring near-Reference-level performance to a lower price. The challenge Berkeley set for itself was this: "How close can we get to the Reference 3 DAC for roughly half the money?" The new Alpha DAC 3 is priced at $10,995, less than half the price of the current Reference 3. Nonetheless, the Alpha incorporates many circuits and techniques developed for the Reference. How close are they in sound quality? I had both in my system for some head-to-head comparisons.

First, let's look at the physical and functional differences between the two products. The Alpha is housed in a solid chassis, but it's not the ultra-expensive chassis of the Reference, which is machined from a block of aluminum. In features, the two DACs are identical; two SPDIF inputs on BNC jacks, one TosLink optical input, and one AES/EBU input. Note that no Berkeley DAC offers a USB input. The company believes that connecting a DAC directly to a USB source injects an unacceptable level of noise into the delicate conversion circuitry. To use a Berkeley DAC with a USB source, you'll need Berkeley's Alpha USB ($1995), which takes in USB and outputs SPDIF (on a BNC jack) or AES/EBU. The Alpha USB is a small box that has a "dirty" side that connects to the USB source, and a "clean" side that outputs SPDIF or AES/EBU to the DAC. The device isolates the output from noise at the input and reclocks the signal. It is an absolutely amazing component. I've used it with many, many DACs and USB sources over the years, and it has improved every one of them, some dramatically. (A recording engineer I know who travels with high-res files on his computer heard the effect of the Alpha USB in my system many years ago and since hasn't traveled without one.) I routinely judged the quality of a DAC's USB implementation by comparing the DAC's sound with and without the Alpha USB; the more the Alpha USB improved the sound, the worse the DAC's USB. It's a bit of a pain to have a small box behind your rack, with the additional cabling and AC cord required, but the device not only adds USB capability to the Berkeley DACs, it also renders a significant improvement in sound quality no matter what DAC you have. I even use it with music servers that offer AES/EBU or SPIDF outputs along with USB, feeding USB to the Alpha USB and then AES/EBU from the Berkeley USB box to the DAC.

The Alpha DAC 3's front-panel LEDs indicate if the unit is locked to a source, if the HDCD code is detected, and if absolute polarity is inverted. These LEDs on

Specs & Pricing

Input sampling rate: 32kHz–192kHz
Input word length: 24-bit
Inputs: AES/EBU, SPDIF on BNC (x2), TosLink
Outputs: Balanced on XLR jacks, unbalanced on RCA jacks
Output level: Variable: 6.15Vrms at 0dBFS (balanced); 3.25Vrms at 0dBFS (unbalanced)
Digital volume control and balance: 0.1dB steps, 0.05dB L/R balance, 60dB range
Remote control: Volume, balance, input selection, absolute polarity reversal
Digital filter: Custom, user-selectable
THD+N: <-110dBFS at maximum output
Firmware: Upgradeable through signal inputs
Dimensions: 16.7" x 2.3" x 10.6"
Weight: 11.5 lbs.
Price: $10,995

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Associated Equipment
Loudspeakers: Wilson Audio Chronosonic XVX, Wilson Subsonic subwoofers (x2), Wilson ActivXO crossover
Analog source: Basis Audio A.J. Conti Transcendence turntable with SuperArm 12.5 tonearm, Air Tight Opus cartridge, Moon 810LP phonostage, DS Audio ST-50 stylus cleaner
Digital source: Aurender W20SE, Berkeley Alpha USB USB-to-AES/EBU converter, Shunyata Sigma USB cable, AudioQuest Wild Digital AES/EBU cable
Amplification: Constellation Altair 2 preamplifier, Constellation Hercules 2 monoblock power amplifiers, Constellation Centaur 2 stereo (driving subwoofers)
AC Power: Five dedicated 20A lines terminated with Shunyata AC outlets
Support: Critical Mass Systems Olympus equipment racks and Olympus amplifier stands, CenterStage2 isolation
Cables: AudioQuest WEL Signature interconnects, AudioQuest Dragon Zero and Dragon Bass loudspeaker cables
Acoustics: Acoustic Geometry Pro Room Pack 12
Room: Purpose-built; Acoustic Sciences Corporation Iso-Wall System
LP cleaning: Degritter ultrasonic, Levin Design record brush

the left-hand side of the front panel are accompanied by two buttons—source selection and polarity inversion. The center of the front panel contains an alpha-numeric display that selectively indicates the incoming sample frequency, output level (60 is maximum), left/right gain (balance control), the filter selected, and when the unit is decoding an MQA file. You select which of these parameters is shown in the display via the "Mode" button. A pair of buttons next to the display adjusts the output level. Finally, the "Dim" button selects one of four display-brightness settings. This functionality is identical to that of the Reference. I've spent a lot of time with this user interface and found it to be extremely simple and intuitive. The Alpha DAC 3 is supplied with a nice remote that duplicates all the front-panel controls and also adds a mute button. Incidentally, Berkeley recommends operating its DACs at an output level of 54 in the display, which is 6dB below the maximum.

The variable output level allows the Alpha DAC to drive a power amplifier directly, without the need for a preamplifier in the signal path. I've operated the original Alpha and Reference DACs this way and experienced no sonic penalty (indeed, a sonic gain compared to some preamplifiers), but I need the functionality of a preamplifier with its analog inputs for other sources.

The Alpha DAC 3 shares much of the Reference 3's technology, developed over three generations of that product's lifespan. Starting with the power supply, the Alpha DAC 3 features the same dual transformers as the Reference 3. These transformers are specially designed not to capacitively couple noise on the incoming AC line to the transformers' secondary windings. Along with the first regulation stages, the transformers are on a separate board within the chassis. (This power-supply board is isolated in the Reference chassis by an aluminum "septum" machined into the enclosure.) The main circuit board is populated with many shunt regulators next to the circuits they supply. Shunt regulation provides greater isolation between power-supply stages than conventional series-pass regulators. Berkeley spent a lot of time researching methods to limit power-supply noise paths, as well as the phenomena that cause noise coupling, for the Reference DAC—methods that are employed in the Alpha DAC 3. In fact, the two power supplies are nearly identical.

With the Alpha DAC 3 and Reference 3 in my rack, I noticed that the location and spacing of the input and output connectors is identical in the two products. That's because the two DACs share essentially the same circuit board. Some of the circuit elements in the Alpha DAC are realized with less exotic implementations, but the fundamental concepts on which the Reference 3 are based are found in the Alpha. Significantly, the two DACs share the identical (and expensive) clocking circuit, an important element that greatly contributes to the DACs' performance. The clock circuit, and how that clock signal is protected from noise on its way to the DAC, is truly heroic. As with all Berkeley products, the Alpha's digital filter is a custom design written in-house by Pflash Pflaumer.

When I removed the Alpha 3's top panel, I noticed a square of material above the digital-to-analog conversion section, just as in the Reference. This ultra-expensive material absorbs and diffuses RF energy. Noise radiated by circuits is absorbed rather than

being reflected from the top panel back into the circuit board. The Alpha DAC abounds in such sophisticated, "outside-the-box" engineering touches. Michael "Pflash" Pflaumer, designer of all the Berkeley products, is a brilliant thinker, who is equally adept at hardware design and writing software. Pflaumer is the co-inventor of HDCD, and also wrote all the DSP code to realize that technology. In addition, he developed the Pacific Microsonics Model One and Model Two A/D and D/A converters, which greatly advanced the state of the art and are still prized today.

Each Alpha DAC 3 is built in Northern California, hand-calibrated, and individually auditioned before being placed in a shipping carton.

Listening

All the Berkeley DACs, from the original Alpha DAC to the latest Reference 3, share some common traits. The differences between the models have been in the degree those traits are present, rather than in fundamental sonic character. One of these qualities is the resolution of very-low-level detail, which confers a wealth of sonic benefits. As with other Berkeley DACs, this new Alpha DAC Series 3 reaches down deep and extracts extremely fine information, presenting it in a natural and musical way. You hear this resolution, in part, as tremendous soundstage depth and width, precise image placement, and three-dimensional separation of individual instruments. The resolution of fine spatial cues—cues that are obscured by most other DACs—conveys the music with a believable feeling of space, size, dimensionality, and "air." This presentation is the antithesis of flat and congested. Very fine sounds created by instruments played quietly at the back of the hall are rendered with clarity and precision rather than simply being hinted at or buried within the overall sonic fabric. This quality imbues the music with a density and richness of information that sounds closer to live music. You hear this most clearly on orchestral music, particularly those recordings that have captured a natural acoustic. Listen, for example, to the tambourine at the back of the orchestra on Rachmaninoff's Symphonic Dances, the low brass in *John Williams: At the Movies*, or the nearly unaccompanied contrabassoon passage from *The Rite of Spring* [all Reference Recordings].

The Alpha 3's high resolution also more accurately renders timbre. Instrumental textures and tone colors are simply sensational, with a palpable realism and life. It sounds as though timbre is denser and richer in inner detail, infused with the kind of micro-information that vividly conveys the instrument's mechanism for producing sound. Vocals are wonderfully natural, with human-like body and character. Very fine treble detail—the delicate, filigreed structure of cymbals, for example—is beautifully portrayed. For example, the subtle cymbal taps and decays in the instrumental section of "Harpo's Blues" from Phoebe Snow's first album have a refinement and inner detailing that bring the sound of digital playback closer to what I hear from the Acoustic Sounds 45rpm LP played back on the Basis Transcendence turntable.

The bass is also well defined, tending toward the lean and tight rather than the big and bloomy. The Berkeley DACs don't quite have that center-of-the-earth solidity in the lowermost octave, but the bottom end is nonetheless satisfying in weight and dynamic impact. The Alpha DAC 3 excels at revealing dynamic shadings and pitch definition in acoustic bass playing, such as Christian McBride's nimble touch in the outstanding Chick Corea live album *Trilogy 2*.

I also like the way the Alpha 3 (and other Berkeley DACs) portray dynamics. The leading edges of attacks are quick and sharp without sounding etched or fatiguing. The Alpha 3's low-level resolution contributes to the sense of extremely wide dynamic contrasts, from the gentlest cymbal taps to a big-band at full tilt. The dynamic range is also reproduced along a continuum rather than in discrete steps, another factor that adds to the lifelike rendering.

As great a DAC as the Alpha Series 3 is, it's not quite at the same level as Berkeley's Reference 3 DAC, which isn't surprising considering the cost differential. At first listen, the Alpha DAC sounds a bit more forward in the mids than the Reference 3, is more open in the treble, and overall more lively sounding. In fact, there was something appealing about this presence and energy. But more careful auditioning reveals that the Reference 3 DAC is more subtle, sophisticated, and refined through the mids and treble, which makes it sound a bit more subdued by comparison with the Alpha. The Reference 3 DAC is cleaner and purer in timbre, particularly in the treble. Cymbals have greater delicacy, inner detail, and refinement. The Alpha doesn't quite have the pristine crystalline quality of the Reference 3. The Reference 3 DAC also throws a larger soundstage, with greater depth and more air between instrumental outlines. Finally, the Reference has slightly deeper bass extension and a bit more definition.

I urge you not to read this as a criticism of the Alpha DAC 3. I'm comparing a $10,995 DAC with a world-class reference product; I doubt that any

other DAC near the Alpha 3's price would come anywhere near as close to the Reference 3 as the Alpha 3 does. Moreover, I listened to the Alpha 3 for some time before making the comparisons with the Reference 3 and didn't find it wanting. Only in the context of a head-to-head comparison, at the front of a massively resolving reference-quality system (Constellation's top electronics, Wilson Chronosonic XVX loudspeakers, state-of-the-art Shunyata AC, and AudioQuest's best cabling in a purpose-built room) was I able to distinguish the differences between the two DACs.

Finally, there's another important characteristic of Berkeley DACs that the Alpha exhibits: It narrows the sound-quality gap between standard-resolution and high-resolution sources. Although high-res files have greater ease and detail in general, CD and standard-resolution streaming files sound better than they should through the Alpha DAC 3. You can listen to CD-quality files without the characteristic hardness and glare—a big benefit. An added bonus: If you have HDCD-encoded discs or files, the Berkeley will render them with near-high-res quality.

I could easily live with the Alpha Series 3 and never look back. The Alpha DAC Series 3 is a terrific bargain and an unqualified triumph.

Conclusion

With the brand-new Alpha Series 3, Berkeley Audio Design has brought near-reference-level performance to a significantly lower price. In fact, you can think of the Alpha Series 3 as a distillation of the $25,000 Reference in a less expensive implementation. By keeping some of the essential elements of the Reference (including the state-of-the-art clocking circuitry) and forgoing the expensive chassis machined from a solid block of aluminum, the price of entry to Berkeley's unique technologies is substantially reduced.

The Alpha DAC exhibits the characteristic Berkeley DNA—superb resolution of low-level detail, three-dimensional soundstaging with the ability to hear very fine timbral and spatial information at the back of the hall, dense tone color, and outstanding clarity that allows you to hear individual instruments within the whole. With a Reference 3 DAC and the new Alpha in my rack for comparison, I found that the Alpha doesn't have quite the last measure of world-class performance, but it comes closer than you'd expect for less than half the price. I could easily live with the Alpha Series 3 and never look back. The Alpha DAC Series 3 is a terrific bargain and an unqualified triumph. tas

The Alpha DAC Series 3

Reference Level Performance Never Available Before At This Price

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