



# BERKELEY AUDIO DESIGN ALPHA DAC

The audiophile digital to analog converter (DAC) has had a turbulent life span since the first of its kind—which I reckon was Arcam's Black Box—hit the market what seems like millennia ago in the mid-1980s. It was considered a significant upgrade to the mediocrity of most CD players, way-back-then, only to become almost extinct when the internal DACs and general sophistication of CD players' circuitry came of age in the late 1990s to mid 2000s. So the DAC has been both a darling and an ogre. Now, in the present that is the second decade of the 21<sup>st</sup> century, the onset of computer audio and high-resolution downloads have once again revived the concept of the outboard DAC, but this time around, it's come back stronger than ever and shows absolutely no signs of going away.

## THE EQUIPMENT

The Berkeley Audio Designs Alpha DAC is a state-of-the-art converter with a whole variety of connecting and configuration options. For starters, the Alpha DAC presents the user with the usual analog outputs in both RCA single-ended and XLR balanced options. Digital inputs include Toslink optical, a proprietary BADA input via RJ-45-type connection (to allow future HDMI and other DRM digital formats), S/PDIF via a proper 75Ω BNC connection and 100Ω AES/EBU with the mandatory XLR connection. Take from that the Berkeley Audio Designs does not belong to the digital data transmission via USB school of thought. An IEC input rounds out the rear panel socketry.

The front panel presents a host of but-

tonry and LEDs that, at first glance, may even seem excessive. Familiarisation and frequent operation will soon dispel any trepidation of unnecessary complexity—that is, it all makes sense! A bank of four LEDs, in a horizontal array, switches between each digital input so you always know what you're connected to. An input button physically switches between them and an adjacent 'Lock' LED confirms the handshake between source and DAC. A blue LED confirms HDCD playback, a commendable feature that I wish more DACs possessed, because there are far more HDCD-encoded CDs out there than most people realise and the often-underrated format does present worthwhile sonic benefits in high quality audio systems. The presence of HDCD on the Alpha DAC isn't at all surprising, be-

cause Berkeley Audio Design was founded by the two of the co-founders of Pacific Microsonics, Inc., the developer of the HDCD process and the Pacific Microsonics Model One and Model Two, widely considered to be the highest quality professional ADC and DAC ever produced. The two are Michael "Pflash" Pflaumer and Michael Ritter. The other co-founder of Berkeley Audio Design is René Jaeger, well-known for his work at Lexicon, dBx and Grass Valley Group.

Moving along the fascia we find an invert LED (with its own circular button) for switching absolute phase. Again, system and recording permitting, you may or may not hear its effect, but those of you who use a subwoofer might find it incredibly useful. The centre section of the fascia is dominated by a reasonably-sized display





with large, legible-from-a-distance information about all the major functions. Onwards, there are two small circular buttons with plus (+) and minus (-) symbols for the adjustment of volume (more on this later), left and right channel balance, sample rate and filter switching (more on this later also), each with its own LED. A mode button also selects between these modes. Finally, a 'Dim' button can be used to adjust the brightness of the display.

The Alpha DAC is also able to act as a preamplifier in terms of switching between digital sources and controlling volume levels when directly connected to a power amplifier. If levels are kept high (numerically, at around the 48–50 mark) the company claims there is no resolution shortfall by way of bit-losses.

The selection of digital filters is extensive although Berkeley recommends using the 1.16 or 1.24 interpolation filters that are provided as the standard defaults. Other filter choices are stated as being 'for studio use only' and said to be tools for determining the sonics of commercial equipment: a curio, in a domestic context, that reveals the Berkeley's professional DNA.

The Alpha DAC comes with a small remote that can control all of the features on the main unit. It also adds a 'mute' function that is not available from the front panel. I found this remote felt rather 'plasticky' but it was certainly well-designed and fitted comfortably into my hand. It also operated the DAC reliably, even from extreme distances and angles. Overall, I think it would be fair to say that the Alpha DAC is one of the most feature-packed DACs I've ever reviewed.

The Alpha DAC's specifications are equally impressive. The Alpha DAC has an input sampling rate of 32kHz to 192kHz with a 24-bit input word length.

The frequency response at 88.2kHz sampling rate is specified at 0.1Hz to 35kHz  $\pm 0.1$ dB and at both 176.4kHz and 192kHz it's said to be just 3dB down at 59kHz. THD+N is rated at less than 110dBFS.

## PERFORMANCE

I used the Alpha DAC both as a regular DAC, feeding into my reference Supratek preamplifier and then via its in-built volume control directly into a number of different power amplifiers (all of which had a high input impedance so as to avoid compatibility issues and early bass roll-off).

The volume control option showed a marginal gain in transparency and low level detail—subtle as it was—so I carried out the rest of my reviewing process with it in that configuration.

What struck me first was the Alpha DAC's absolute and utter refinement. Play any brash or even harsh recording and the Alpha tames the beast—it doesn't kill it entirely—and makes such recording or mastering blunders a lot more bearable. And another gain from such a sophisticated presentation was a sense that the Berkeley presented the finer harmonic nuances and micro-detail in a way that became more palpable and simultaneously more natural. It was as if minute detail, transparency and timbral information enhanced the subtler colours of the overall musical fabric. Soloists, no matter the instrument, and lone vocalists projected into the listening space with extraordinary realism.

When listening to chamber or classical pieces the Alpha DAC was truly glorious. The separation and the tonal palette painted an intricate, realistic and detailed picture that brought out the timbre of instruments in a way that became, indeed, addictive. And the soundfield spread wide and deep... immersively so.

## BERKELEY AUDIO DESIGN ALPHA DAC

**Brand:** Berkeley Audio Design

**Model:** Alpha

**Category:** DAC

**RRP:** \$5,999

**Warranty:** Two Years

**Distributor:** Audio Marketing Pty Ltd

**Address:** Unit 14L, 175 Lower Gibbes Street  
Chatswood NSW 2067

**T:** (02) 9882 3877

**F:** (00) 9882 3944

**E:** info@audiomarketing.com.au

**W:** www.audiomarketing.com.au



Comprehensive features  
Superb engineering  
Refined and nuanced sound




Can be a tad too polite in  
some systems

Put on a bit of Perfect Circle or Porcupine Tree and the Alpha DAC hits you with a massive soundscape and vivid textures highlighted by surgical separation. Dynamically the Berkeley was a tad polite and its utterly refined signature took the edge off and slightly slowed the attack of this aggressive and hard-hitting musical genre—even if its bass reproduction was tight and evenly balanced between the upper, mid and lower registers.

But ultimately the Berkeley Alpha DAC is about the finer details, the essence and purity of musical information. It's about the minutiae that in conjunction with tonal fidelity and spatial expansiveness translate to a captivating and compelling interpretation.

## CONCLUSION

The Berkeley Alpha DAC is a comprehensively-featured DAC that is ready for the 21st century's musical format challenges while providing a superb upgrade path for any ageing CD player. It manages to involve and emote by producing not just coherent sounds but transcendent and magnificent music.  **Edgar Kramer**



## TEST RESULTS

The most unusual aspect of the Alpha DAC's operation is that the output level varies very dramatically depending on what interpolation filter you select. If you select any which ends in '.16' the maximum output level at the analogue outputs is 1.6334 volts (right channel, the left channel clocks in at 1.6635 volts). However, if you switch to any of the interpolation filters that ends in '.24' output level increases by a massive 6dB to become 3.2668 volts (right channel, or 3.2770 volts left channel). So, when you remember that any study of psychoacoustics will demonstrate that a louder sound will always appear to be 'better' than a softer one, it will make it very difficult to do any type of 'A-B' comparison between two interpolation filter types, because the level will jump by 6dB whenever you switch between the two.

The frequency response is very flat across the audio band (the minuscule 0.75dB rise at high frequencies is greatly exaggerated by the graph scaling), but the filter slope at 20kHz is massively steep. The square wave and impulse shots (not shown) exhibited the standard time-reverse ringing of an oversampling digital filter. Channel separation was good at low and mid frequencies without being exceptional, but the separation at 20kHz was better than average. Channel balance was sensationally good: 0.00053dB! Interchannel phase was less so, as you can see, but the group delay was excellent. Overall signal-to-noise ratios were pulled down a little by some h.f. noise breakthrough, but you could expect around 107dB. Some linearity error was evident, and unlike most DACs, didn't really improve too much at low recorded levels with dithering, so that 0.15dB error with an undithered signal at -89.46 became a 0.14dB error with a dithered signal at -90.31dB. But these are academic arguments only: such tiny errors would never be audible. It was also interesting (but similarly academic) that the 'standard' setting results in an inverted signal at the output, so that

## Berkeley Audio Design Alpha DAC - Test Results

Digital Section (44.1kHz/16-bit)	Result	Units/Comment
Output Voltage	1.6335 / 1.6334	volts (Left Ch/ Right Ch)
Frequency Response	See Graph	dB (20Hz - 20kHz)
Channel Separation	98dB / 98dB / 94dB	dB at 16Hz / 1kHz / 20kHz
THD+N	0.01%	@ 1kHz @ 0dBFS
Channel Balance	0.00053dB	@ 1kHz @ 0dBFS
Channel Phase	0.03 / 0.03 / 0.59	degrees at 16Hz / 1kHz / 20kHz
Group Delay	+5.71 / -5.43	degrees (1-20kHz / 20-1kHz)
Signal-to-Noise Ratio (No Pre-emph)	78 / 92	dB (unweighted/weighted)
De-Emphasis Error	0.007 / 0.034 / 0.003	at 1kHz / 4kHz / 16kHz
Linearity Error @ -60.00dB / -70.00dB	0.04 / 0.01	dB (Test Signal Not Dithered)
Linearity Error @ -80.59dB / -85.24dB	0.10 / 0.12	dB (Test Signal Not Dithered)
Linearity Error @ -89.46dB / -91.24dB	0.15 / 0.08	dB (Test Signal Not Dithered)
Linearity Error @ -80.70dB / -90.31dB	0.04 / 0.14	dB (Test Signal Dithered)
Power Consumption	N-A / 23.96	watts (Standby / On)
Mains Voltage During Testing	246 - 252 volts	(Minimum - Maximum)


Digital Section (AES-17 48kHz/24-Bit)	Result	Units/Comment
Out of Band Spurious Components	-109.346dB	
Suppression of Imaging Components	-109.570dB	(Worst Case)
Level Dependent Logarithmic Gain	-0.0dB	
Intermodulation Distortion (1)	-77.717dB	18kHz/20kHz 1:1 Ratio
Intermodulation Distortion (2)	-62.530dB	41Hz/7993Hz 4:1 Ratio
Low Level Noise Modulation	+4.025dB	Worst Case
Idle Channel Noise	-105.230dB	CCIR-RMS weighting
Signal-to-Noise Ratio	-107.157dB	CCIR-RMS weighting
Power Line Products	-100.753dB	50Hz
Non-Linear Interchannel Crosstalk (a)	-91.963dB	3kHz (2nd-order ref 17kHz/20kHz)
Non-Linear Interchannel Crosstalk (b)	-101.624dB	6kHz (3rd-order ref 17kHz/20kHz)
Non-Linear Interchannel Crosstalk (c)	-104.631dB	10.040kHz (2nd re 40Hz/10kHz)
Non-Linear Interchannel Crosstalk (d)	100.752dB	10.080kHz (3rd re 40Hz/10kHz)
Absolute Phase	Inverting	Normally, but is switchable

“ Overall, I judged the technical performance of the Berkeley Audio Design Alpha DAC to represent the state-of-the-art

to get the Alpha non-inverting, you have to switch the front panel switch to show that its 'inverting', when it's not. I'm not sure of the rationale behind this decision.

Distortion was very, very low, irrespective of level or frequency, and all types of intermodulation distortion were also incredibly low. The test results graphs were marred by some 'breakthrough' at around 15kHz from a near-by video monitor (which you should

ignore, because it was due to the test set-up and would not occur in a hi-fi system), so I have included only the 0dB distortion graph, and you can see there's just a 2nd harmonic at -112dB and a 3rd at -109dB and the noise floor is down around -130dB.

Overall, I judged the technical performance of the Berkeley Audio Design Alpha DAC to represent the state-of-the-art: it's a truly superior DAC.  Steve Holding

