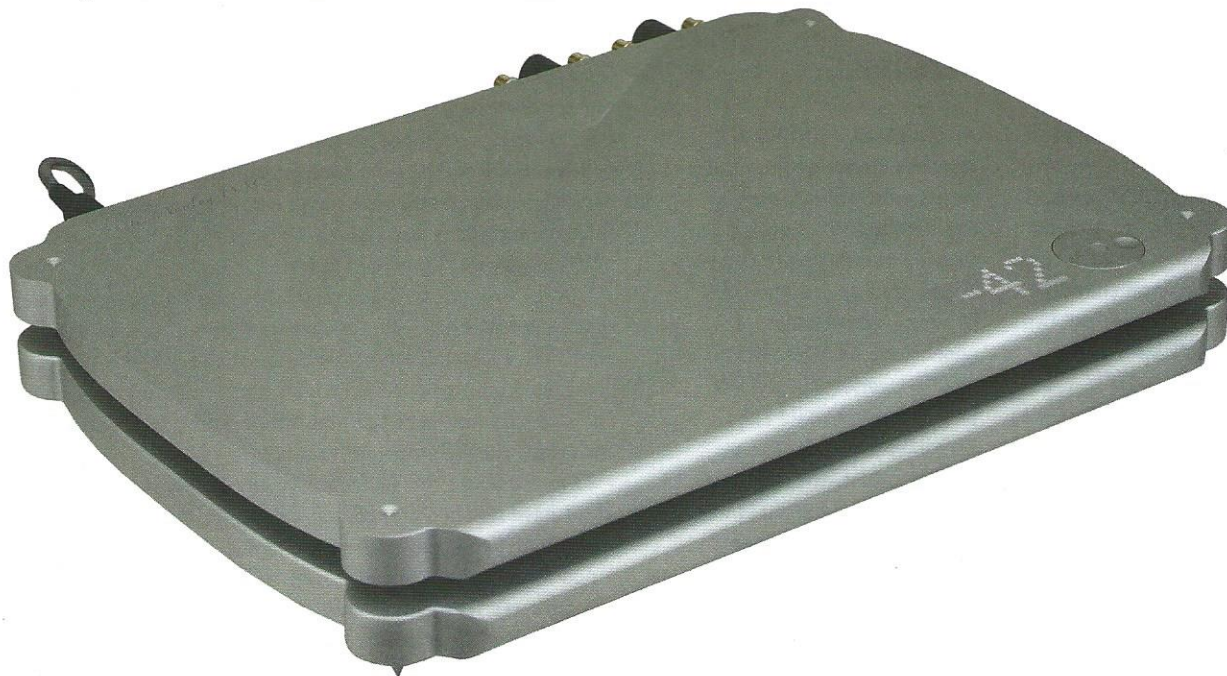


# EQUIPMENT REPORT



## MSB Technology Analog DAC

Just Like an LP?

Vade Forrester

**A**nalog DAC? What the heck is that? Doesn't the "D" in DAC stand for *digital*? Yes, but what do all DACs try their best to sound like? Right: analog. Manufacturer MSB Technology went all-out to assure its new DAC sounded as much as possible like the fabled analog source. When I auditioned MSB's top-of-the-line DAC IV, I thought it was possibly the best source I had heard, analog or digital. But its lofty price might have spooked some audiophiles. I appreciate it when technological developments advance the state of the art in playback quality, even if they carry high price tags. That's because the technology used in high-priced gear often trickles down to equipment within my financial means. That's what's happened with the Analog DAC, which MSB bills as "The Most Technologically Advanced DAC in the World!" And even though the price couldn't be described as *low*, it's a *lot* lower than MSB's DAC IV.

So what makes the Analog DAC special? For one thing, its physical construction is unique. Instead of building a typical chassis—you know, a metal box to house the electronic components—MSB has made the Analog DAC modular. It's basically a machined aircraft-grade aluminum slab under which are attached removable input modules that give the Analog DAC its functionality. You start off with a basic unit with one input module (your choice) and a basic power supply for \$6995, then add additional modules to suit your needs. Want another digital input? \$995. Want a stepped-attenuator volume control, with 78 1dB steps? \$995. The volume control is one option that's not

modular, since it requires a hole in the top of the chassis for the volume control knob. It's \$995. Want a better power supply than the stock unit (which is a very respectable linear model)? \$2995. Want a different color than the stock matte-white or matte-black? That's \$700 for satin black, \$350 for custom colors (I think a red one would be neat; black and silver are boring). And there are quite a few other options like remote control, iPad control, Wi-Fi, and so forth. The review unit (\$6995) had a volume control (\$995), a USB input (included in the base price), a SPDIF input (\$995), and an Inter-IC Sound (I<sup>2</sup>S) input (\$995). An aluminum remote control was also included, which is an \$85 option; so if I add up all the options correctly, the total price of the review unit was \$10,065. See the MSB Web site at for a complete list of options and prices.

The different input modules connect to an internal I<sup>2</sup>S buss. If a need for a new input develops (maybe USB 3.0?), a module for that will be developed and can be installed with a screwdriver. After it's installed, it becomes totally plug and play. The I<sup>2</sup>S buss connects to the DAC module, which is not an off-the-shelf chip; rather, it's a 384kHz discrete-ladder DAC constructed from *extremely* precise resistors. The firmware that controls the internal operation of the DAC is easily upgraded (see the Setting Up section below). That makes it easy and fast to make changes. The firmware-update files are in WAV format, making firmware changes just like playing a song. That's very clever. The Analog DAC's output impedance through the RCA outputs is 53 ohms without a volume control; 38 ohms with the control. That's low



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enough to drive any amplifier or cable.

MSB Technology uses its precision "Femto Clock" technology to minimize jitter, and includes a large internal memory where you can set filters, upsamplers, and other DSP instructions. This is *not* an off-the-shelf DAC design using conventional parts and circuits.

The Analog DAC's optional power supply has exactly the same form as the DAC, and is usually pictured with the DAC stacked on top of it. The stock power supply is a linear power unit with two transformers.

The Analog DAC can play Direct Stream Digital (DSD) files in their native format without converting the files to PCM. These are the files used to make SACDs. DACs capable of playing DSD files in their native format may be the hot item in the hi-fi industry right now. We speak of DSD sampling rates as "DSD64" and "DSD128," where the numbers "64" and "128" denote multiples of CD's 44.1kHz sampling rate. DSD recordings created as masters for SACDs are DSD64, but it's possible to record DSDs at twice that rate. The Analog DAC plays both DSD64 and DSD128 recordings. And as I was pleasantly surprised to learn, it plays DSD files through both USB and SPDIF inputs. The capability to play DSD was added by a firmware update—no hardware changes were necessary. The Analog DAC also plays PCM files up to 384kHz/32-bits. That allows it to play the 352.8/24 Digital eXtreme Definition (DXD) files used for high-resolution mastering by several recording companies. A few companies now sell DXD files, should you want to hear super-high-resolution recordings. Be sure your music player can handle them before you pull the switch to download DXD files.

A Windows driver came on a CD, and can also be downloaded from the MSB Web site. Also on the CD were some set-up instructions. A manual can be downloaded from the MSB Technology web site.

### Setting Up

I used a WireWorld Platinum Starlight USB cable to connect my laptop server to the Analog DAC. MSB Technology advised that since the internal circuit of the Analog DAC was unbalanced, the unbalanced connectors should sound better, so that's what I opted for. If you have the volume control installed, the Analog DAC is designed to be used as your system controller in lieu of a preamp, so it should be connected directly to the power amplifier's inputs and the very fine volume control operated by the MSB remote control. Since my Berning ZH-230 amplifier has unbalanced inputs only, the unbalanced connection from the Analog DAC was ideal. If you have other analog sources, such as a phono preamp, you can plug it into the Analog DAC's analog inputs and select it from the MSB remote. I must say it would seem a little weird to plug a phono preamp into a DAC, but, hey, welcome to the digital age. I connected my tuner to the analog input just to see if it worked. It did, and I could select the tuner using the remote control.

I discovered the Analog DAC was sensitive to the cables used to connect it to the power amplifier. A Clarity Cable Organic interconnect sounded a bit bright and lean—not the way it usually sounds in my system. Purist Audio Design Venustas interconnects sounded a bit fatter with more bass, but the best sound I found came when I used High Fidelity Cables' CT-1 interconnects.

Operating via magnetic conduction instead of normal voltage conduction, the High Fidelity Cables interconnects are probably the best I've heard to date. I don't really understand how they work, but their sonic advantages are audible. With them, the Analog DAC sounded more balanced, with deeper bass.

When I used an Audience powerChord e power cord, the Wattgate IEC connector that plugged into the power supply almost completely blocked the on/off switch, so to turn the Analog DAC on and off, I had to plug/unplug the power cable. Wattgate IEC connectors are pretty average in size for aftermarket connectors, so I would expect the same problem with other aftermarket power cords. The molded IEC power connector that comes with the power cord included with most components wouldn't have this problem.

I placed the Analog DAC on a middle shelf on my Billy Bags equipment rack and adjusted the cone feet until the DAC was

## SPECS & PRICING

**Inputs:** One digital input included in base price, additional inputs optional; one analog input on RCA jacks  
**Sample rates supported:** PCM-44.1k, 48k, 88.2k, 96k, 176.4k, 192k, 352.8k, 384k up to 32 bits; DSD at 2.82M and 5.64M (DSD64 and DSD128)  
**Line output level:** 2.62V RMS, balanced or unbalanced output  
**Output impedance:** 53 ohms without volume control, 38 ohms with volume control (unbalanced); 106 ohms without volume control, 76 ohms with volume control (balanced)  
**Dimensions:** DAC, 17.63" x 1.5" x 12.5" plus connectors; power supply, 6.7" x 2.25" x 8.9"  
**Weight:** DAC, 12 lbs.; power supply, 7 lbs.  
**Price:** \$6995, \$10,065 as reviewed

**Manufacturer Information**  
**MSB TECHNOLOGY CORPORATION**  
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(831) 662-2800  
msbtech.com

**REFERENCE EQUIPMENT**  
**Speakers:** Affirm Audio Lumination speakers  
**Amplifiers:** Berning ZH-230 stereo amplifier  
**Preamplifier:** Audio Research LS27 linestage  
**Digital sources:** Hewlett Packard dv7-3188cl laptop computer running 64-bit Windows 7 Home Premium and J. River Media Center version 19; Auraliti PK100 music player; Audio Research DAC8  
**Interconnects:** High Fidelity Cables CT-1  
**Speaker cables:** Clarity Cables Organic  
**Power cords:** Purist Audio Design Venustas, Blue Marble Audio Blue Lightning, Clarity Cables Vortex, Audience powerChord e  
**Digital:** Wireworld Platinum Starlight USB cable, Gold Starlight 6 SPDIF cable, and Gold Starlight 5 AES/EBU cable  
**Power conditioner and distribution:** IsoTek EVO3 Sirius



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perfectly stable. There wasn't room on a single shelf for both the power supply and DAC, so I placed the power supply, which is about the size of a hardback novel, two shelves above the DAC. That's about as far as the connecting power cord would reach. The Analog DAC has a huge display, the largest I've ever seen in a DAC, and it shows both the volume control setting and the input source; however, since it's only visible from the top, it can't be seen if you're sitting across the room, unless the Analog DAC is on a low shelf in your rack.

To use my Windows-based laptop server, I had to install a driver so Windows 7 would play Class 2 USB Audio, which enabled playback of high-resolution PCM and DSD input. After checking to be sure it was the current version, I installed the driver that was on the included CD. Installation was straightforward, i.e., not tricky.

The Analog DAC manual recommends Foobar 2000 as a music-server program, and included a file on the CD describing how to set up Foobar 2000 to work with the Analog DAC. I view this type of help as essential; DACs are seldom plug and play, and each computer-based music server has to be set to use a particular DAC. Most have different settings which need some tweaking to sound best. My preferred software, J. River Media Center 19, was simple to set up—after I figured out what all the settings meant.

MSB Technology's position on burn-in is ambiguous. It begins by asking if burn-in is real or just a period of familiarization; then it says feedback (whose?) recommends 100 hours' burn-in, then it says customers recommend one month burn-in. Come on—it either needs burn-in or it doesn't; and it should be possible to specify a length of time. I burned in the review unit for about 300 hours.

Thanks to a recent software update, my Auraliti file player now plays DSD as well as PCM, and, somewhat unusually, plays DSD64 through both SPDIF and USB outputs. DSD128 is played through the USB output only; apparently, DSD128 exceeds SPDIF's limits. When I plugged the Auraliti into the Analog DAC's inputs, it worked without a hitch, providing plug-and-play DSD sound. I

could get used to that!

During the review period, I received another software update, this time from MSB Technology. The firmware update took the form of a WAV file, and all that was necessary to apply the update was to play the WAV file. If the update doesn't "take," an audible message tells you so. How cool is that? I first tried playing the WAV file with iTunes, and heard the failure message. Then I tried it with J. River Media Center, and this time, there was no error message. When I restarted the Analog DAC, the correct firmware version was displayed. Most manufacturers don't ever update their firmware, and I don't know of any that makes it this easy.

### Sound

While the Analog DAC's most advanced feature is its ability to play DSD files, it's just as important to assess how well it plays PCM files, even those ripped from CD. After all, what makes up most of your collection? So I enjoyed playing a wide variety of music through the Analog DAC.

In a word, the Analog DAC was *detailed*. I don't mean it was analytical, just that it revealed a ton of information about the music played through it. Since I had it on hand when writing the article about DSD downloads published in the previous issue, I used it to sample DSD files from various download sites. Unsurprisingly, the Analog DAC showed that not all DSD files are created equal; some were glorious, while some, well... not so much.

Dynamics were finely delineated when the music called for it. They weren't amped up, as may be the case with some components, but were fast enough to enhance the sense of musical flow. On Jordi Savall's *La Folia 1490-1701* (ripped from Alia Vox AFA 98050) the track "Folia Rodrigo Martinez" is a dynamic minefield, requiring the audio system to play at continuously varying levels of loudness. Some components artificially divide the sound into discrete steps, but the Analog DAC showed the loudness changed continuously. The Analog DAC reproduced the bass drum, which descends into the mid-30Hz range, with extension and detail. Power and slam were good overall. The amount of detail





revealed in this information-dense recording was amazing; it was not even slightly etched or bright, but very natural-sounding. I've never heard a component extract this much detail from the recording—a recurring theme in my listening notes.

On Alex de Grassi's album *Blue Coast Special Event 19* (DSD64/ DFF, Blue Coast Records), the cut "Shenandoah" exhibited exceptionally detailed guitar sound, with an unusual drone effect I had never heard before. But the picture of de Grassi's guitar revealed it to be a very unusual design, so maybe that explained the sound. The Analog DAC really showed how realistic a recording of solo guitar engineer Cookie Marenco had captured.

Piano recordings were spectacular. On Thomas Günther's performance of Schubert's Piano Sonata in A minor (DSD64/ DSF, Cybele Records), the Analog DAC reproduced the piano's complete harmonic structure with a combination of delicacy and explosive power rarely heard on recordings. The sense of the hammers striking the piano's strings was captured superbly. It's odd that I noticed this particular detail on several piano recordings. Other finer details of Günther's performance were strikingly realistic, too. I'd never mistake the recording for a real piano, but it's getting closer to the real thing. Isn't that what the hobby is about?

Rebecca Pigeon's "Spanish Harlem" from her album *The Raven* has been an audio fave since it first appeared on LP. Remastered as a 176.4/24 FLAC album by Bob Katz for Chesky Records, it was eerily realistic through the Analog DAC. Pigeon's voice, in particular, had a "reach-out-and-touch-it" quality, creating the illusion of someone standing in front of me singing. Instrumental accompaniment was equally detailed, especially the stand-up bass.

The Tallis Scholars' *Miserere* was their signature album, and on Gimmell Record's 96/24 FLAC download of *Allegri's Miserere & Palestrina's Missa Papae Marcelli*, the Analog DAC showed off its ability to throw a large soundstage. The "Miserere" piece is an *a cappella* work which has a small choral group at the front of the soundstage and a smaller solo group some distance behind it in the large church where the recording was made. The Analog DAC showed the separation between the main group and the solo group clearly, while making the words sung by the distant solo group unusually distinct.

## DSD vs PCM

The 2L company offers several sample files in both DXD and DSD format. The company records its masters in DXD, performs whatever editing is necessary in that format, and then converts

them to DSD. I expected that the original DXD files would sound better than the converted DSD files, but to my surprise, I slightly preferred the DSD-sourced files. On Beethoven's Sonata No. 32, the piano sound was more full-bodied and detailed. Once again, DSD portrayed the sound of the piano's hammers hitting the strings much more realistically than the DXD version. On the Allegro movement from Mozart's Violin Concerto in D Major, DSD string sound was richer and less mechanical, i.e., less digital. On a vocal selection, Vivaldi's "Recitative and Aria" from Cantata RV 679, "Che giova il sospirar, povero core," my impression was similar to the one I had with the Mozart concerto—the soprano sounded more like a person singing than a recording of a person singing. The differences weren't night and day, but they established DSD as more analog-like. That doesn't mean DXD files sounded bad; they sounded good before DSD files came along, and still sound good. What's important for this review is that the Analog DAC made it easy to distinguish between the DXD and DSD versions of a recording, illustrating the MSB's transparency.

## Comparison

My Audio Research DAC8 doesn't play DSD files, but it's what I have on hand, so I'll limit my comparison to PCM files. After all, the vast majority of my collection of downloaded and ripped music files are PCM, so that's not much of a limitation. The \$4995 DAC8 is a single-chassis unit which looks very conventional compared to the Analog DAC.

On "Folia Rodrigo Martinez," the Audio Research displayed its hallmark bass, the most powerful I've heard from any DAC. I've started to wonder if it's not actually *too* powerful, as peculiar as that concept may seem to some audiophiles. Tonally, the Audio Research is similar to the Analog DAC, although the latter captures more details of the performance.

"Spanish Harlem" was a close match, but the Analog DAC's superior detail retrieval made Rebecca Pigeon sound just a smidgen more lifelike.

The "Miserere" track sounded a bit different on the two DACs. The Analog DAC's extra detail made the distant solo group more understandable, which had the effect of making them sound closer to the main group in front. The Analog DAC was squeaky clean, whereas the Audio Research sounded a little more smeared.

## Bottom line

So does the Analog DAC sound like, well, an analog DAC? Maybe it does, if you can find an analog source as free from noise and distortion as the Analog DAC and if your idea of a quality analog source excludes any coloration from tubes or solid-state gain stages. If you want a flexible, top-notch DAC capable of playing any digital source currently available, in a unique, strikingly-designed package that can function as a line source as well as a DAC, the Analog DAC may be just your ticket. It's expensive, but its sound quality and functionality are hard to beat at the price. And its ability to replace an expensive linestage, connecting cables, and power cord can save you a bundle, reducing your overall system price and increasing the amount of free shelf space on your equipment rack. Viewed from that angle, maybe the Analog DAC isn't as expensive as it first looked. **tas**