

## Audio Research DAC8 Digital-to-Analog Converter

What's so great about high-resolution computer audio files?

Master recordist and composer David Chesky, cofounder of Chesky Records and of HDTracks.com, the latter the world's largest download site for high-resolution computer music files, succinctly answered that question in an interview in *Ultra Audio*, September 1, 2010:

Jeff Fritz: What do you hear with 24/96 that you don't hear on 16/44.1?

David Chesky: More air, extension, low-level detail.

What do you need to play those high-resolution files? A digital music player, and a digital-to-analog converter (DAC) capable of rendering the files into something speakers can play. And nowadays, the music player of many audiophiles is a laptop or desktop computer, Mac or PC, running some brand of music-player software.

How do you connect your computer to a DAC to turn those ones and zeros into music? There are several ways, but for most computing audiophiles the answer is one of the computer's USB jacks. Some computers have FireWire or a Sony/Philips Digital Interface (S/PDIF), but for most, it's USB or nothing. And if you want to play computer audio files at *all* popular sampling rates, you'd better have a DAC whose USB input accepts every sampling rate clear up to 24-bit/192kHz, the maximum sampling rate and word size now used for commercially available recordings.

Until recently, very few DACs have had USB inputs that could handle files with sampling rates higher than 96kHz, but that's changing fast. Manufacturers have been working 24/7 to build DACs that will play all popular rates through the USB port. In addition to new hardware, they must develop high-speed USB 2.0 drivers, which must be installed on your computer.

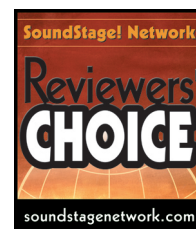
That's how the DAC8, from Audio Research Corporation (\$4995 USD), handles it. The DAC8 ships with drivers for both PC (Windows-based) and Apple computers. The drivers, which are claimed to work with a wide variety of software, guarantee low-jitter, bit-perfect playback. The DAC8 will play *all* standard sampling frequencies: 44.1, 48, 88.2, 96, 176.4, and 192kHz.

ARC has produced several DACs over the years, the most recent being the DAC7, released in 2008. While the DAC7 had a USB input, it supported sampling rates up to only 48kHz — not much use to computing audiophiles who want to play hi-rez files. Seeing the explosion of interest in using computers in audio systems, ARC then set out to create the ideal DAC for a computer-based server, with a USB input that accepted files up to 192kHz and, even more radically, sounded *better* than the S/PDIF input ARC uses. The result is the DAC8, the second full-capability USB DAC I've used.

The DAC8's front panel is available in silver or, like the review sample, black. I particularly welcomed the four aluminum buttons, which operated much more positively than previous ARC models' black plastic buttons, which were set, virtually invisibly, into a recessed black strip. Aside from the new color scheme, the DAC8 pretty much follows the styling of the latest ARC models. It's 19"W by 5.25"H by 10"D, with handles the same color as the front panel and those four aluminum buttons, and plenty of room inside for a spacious circuit layout. Like many ARC components, the DAC8 is rather light, at only 11.5 pounds — something you'll appreciate when sliding it into your rack.

ARC is renowned for its use of tubes, but you'll find none in the DAC8; the output stage is fully solid-state. Like most ARC circuits, the DAC8's are fully balanced, but both balanced and unbalanced output jacks are provided. Each channel has two DAC chips to increase dynamic range and keep noise low.

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A question that's bound to be on the tip of the computing audiophile's tongue is: Does the DAC8 use an asynchronous USB input? We checked with Audio Research's Dave Gordon, who stated, "The DAC8 unequivocally uses an asynchronous USB input." We were not able to independently confirm this, but we were told that this technical detail was verified with ARC engineers. An asynchronous USB input circuit means that the DAC's clock, not the computer's clock, controls the data transmission, which reduces the amount of digital timing errors, aka jitter.

The DAC8's front-panel controls are just those four silver buttons: Power, which turns the DAC8 on and off; Invert, which reverses the phase of the output signal; Input, which selects which digital input you want to use; and Mute, which shuts off the DAC8's output. Above the buttons is a display window with indicator lights for the Power, Mute, and Invert functions. To the right of the indicator lights, more lights show which input is selected and the sampling frequency being received through that input. While the information presented on the front panel is very useful, I had to use a flashlight to read the small, low-contrast labels, even when the DAC8 was sitting on a table only a few feet away. Considering how easy it is to read the displays on other ARC gear, the DAC8's display was particularly disappointing. Perhaps the display is more legible with the silver faceplate. Other DACs I've recently reviewed (e.g., the Esoteric D-07 and the Wyred 4 Sound DAC-2) have alphanumeric displays that are much easier to read.

From left to right on the rear panel are the digital input jacks, balanced and unbalanced output jacks, and an IEC inlet for the power cord. I found it a bit odd that the input connectors were labeled by the type of connector (RCA, BNC, XLR, optical, USB) rather than the type of digital input they support (S/PDIF, AES/EBU), but that may be easier for the novice user.

The DAC8's remote control duplicates all the front-panel functions and lets you select any digital input directly, which is far more convenient than having to cycle through all the inputs to reach the one you want, as with some other DACs. The remote also has a section labeled USB Interface. With this, you can remotely control playback of music by your computer server as if it were a CD player by using the remote's CD-type controls: Play, Pause, Stop, Next Track, Previous Track. Most computer-based servers don't have a remote, so this feature is very useful, even if it works *only* with USB. ARC claims it works with most music-player software, and it certainly did with foobar2000. I didn't have to make any adjustments, and suddenly I had remote control. That's übercool.

Some DACs have built-in volume controls. This means that if the DAC and whatever digital sources are attached to it are your only sources, you can connect the DAC directly to a power amp, thus avoiding the expense of a separate preamp. Not so the ARC. Hold on to your preamp.

### Setup and use

I installed the DAC8 on my music-server (aka coffee) table, within reach of my laptop computer and my Auraliti PK100-based music server. And because I have no intention of ever ripping my entire 2000+ CD collection to my hard drive and so need a way to play CDs in real time, I took advantage of the DAC8's ability to serve as the digital hub of an audio system by connecting a Meridian 500 CD transport via the ARC's balanced AES/EBU connection. I used Wireworld digital cables: Starlight 52 USB, Gold Starlight 6 S/PDIF, and Gold Starlight 5 AES/EBU. The DAC8's AC cord looked pretty heavy-duty, so I used it for this review. Audience Au24 e unbalanced interconnects connected the DAC8 to my line stage.

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There was no way to miss or ignore the warning notice stuck to the top of the DAC8: To sound its best, it requires *600 hours* of break-in. That's 25 days of running nonstop! And, of course, each input you use needs break-in — although, hopefully, *not* 600 hours for each. I used both USB and S/PDIF inputs, so I broke in the USB input for the specified 600 hours, and the S/PDIF input for another 300. Fortunately, the DAC8 sounded pretty good right out of the box; if it didn't, I imagine many units would be returned. As usual, I did little listening to the DAC8 until those 900 hours were past.

To use the DAC8 with my computer, which runs Windows 7, I had to install the Windows USB drivers. For experienced computer users, installing drivers is no big deal: just insert the driver CD, find the folder that contains drivers for your operating system, and start the installation program. The installer copies driver software to the appropriate location; when it's finished, open your playback software and select the DAC8 as the output device. You have to install the drivers only once. If you're not familiar with driver installation, hopefully your dealer will do that for you, or walk you through it. The instruction manual, the first one in color I've seen from Audio Research, has a lengthy section on driver installation.

The drivers work with these softwares: Windows Media Player, Media Monkey, foobar2000, iTunes, J. River Media Center, and possibly others. After the DAC8 driver was installed, an "ARC" icon appeared on the Windows 7 system tray and taskbar. If you click on this icon, you'll see a rather confusing screen from which you can adjust the DAC8's operation. This is quite different from other DACs I've used, which control all operations from their front panels. Although the ARC's manual doesn't explicitly say so, if you want to upsample a music file, you set the desired sampling rate on your computer screen, and then the software in the computer, not the DAC8, does the upsampling. You can also use upsampling algorithms in your server software, if you prefer those. The DAC8 has no user-adjustable digital filter; ARC picked the filter they thought sounded best and hardwired it into the circuit.

The DAC8's custom USB 2.0 high-speed driver is an Audio Stream Input/Output (ASIO), so you'll need to adjust your server/player software to support ASIO. If you're not comfortable doing that, your ARC dealer should be able to help, if not do it for you. Of course, if you're not using the USB input, you don't need to install the USB drivers; the other inputs don't need drivers. Sorry, Apple users: there's no FireWire input, but of course you can use your Mac's USB output.

## Sound

I assume most readers' primary interest will be the DAC8's USB input, so that's where I'll start. One of the first recordings I played was of Grieg's Piano Concerto (24/192 FLAC, 2L/2L). The recording is unusual; the solo part was recorded by Percy Grainger in 1921 on a Duo-Art piano roll, then played back on a modern Steinway accompanied by Rolf Gupta conducting the Kristiansand Symphony Orchestra, all recorded in hi-rez sound. My first reaction to the recording had been disappointment — it didn't sound any better to me than a CD. Then I played it through the DAC8. It blossomed into a gorgeous-sounding recording with lush tonality, energetic dynamics, and, well, attitude. Grainger, a well-known composer, was obviously a crackerjack pianist, and it's exciting to have this 90-year-old documentation of his talent in 21st-century sound.

I then cued up a fave high-frequency evaluation track ripped from Argento's *For the Angel, Israfel*, performed by Eiji Oue and the Minnesota Orchestra and included on Reference Recordings' *30th Anniversary Sampler* (CD, Reference RR-908). The high opening chimes sounded a smidgen less extended than through several other

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DACs, but the flutes sounded more tonally complete and expressive. With "Folia Rodrigo Martinez," performed by Jordi Savall and his band and ripped from their *La Folia 1490-1701* (CD, Alia Vox AFA 9805), the deep bass drum was reproduced with plenty of impact and weight, but with more depth and detail than I sometimes hear. The cascabels (sleigh bells) were clearly audible throughout this piece, as were the castanets. Often these percussion instruments blur together into background mush, but not through the DAC8.

I love guitar music, and an album in recent heavy rotation has been Ottmar Liebert's *One Guitar* (24/96, Spiral Subwave/HDtracks). Liebert's guitar sounds exceptionally realistic and extremely dynamic. In several places, the forcefulness of the dynamics through the DAC8 startled me. Other DACs haven't startled me nearly as much.

The DAC8 had the typical ARC way with a soundstage: wide open and spacious. The Tallis Scholars' recording of Allegri's *Miserere* (24/96 FLAC, Gimell/Gimell) has a humongous soundstage; the DAC8 fleshed out both the lateral and depth dimensions with unusual precision. Further, not only did the DAC8 let me easily distinguish between the two groups of singers – one up front, one farther back – that make this recording so useful for distinguishing the depth of soundstage, it also portrayed depth *within* the main choral group at the front of the soundstage. Previously, this group had sounded rather flat, as if the singers were arrayed in a single line across the front of the stage.

Details of all sorts – harmonic, dynamic, vocal – abounded. Further, the DAC8 exhibited an ability to capture the complete harmonic envelope of each instrument, so they sounded more real than usual. Although the DAC8 handled musical climaxes with ease, it also vividly portrayed small changes in volume, aka microdynamics – singers' phrasings were easier to follow than with some other DACs. Here I've resorted to typical audiospeak and treated these characteristics of the DAC8's sound as if each stood alone, but in real music, of course, all of them occur at once; the DAC8 fused them together to sound more like real music than I have heretofore heard from *any* digital sound.

My laptop computer doesn't have S/PDIF output, so I switched to the Auraliti music server to evaluate the DAC8's S/PDIF input. That allowed me to play the same music files through the Auraliti and the computer almost simultaneously, which facilitated A/B switching. I cued up *For the Angel, Israfel* on both computer and Auraliti and listened closely. I heard little difference between the two inputs; both the high- and low-frequency extensions were the same, as were instrumental harmonics. I fancied that the USB input may have sounded a smidgen cleaner and more open, but that was right at the threshold of perception. I could distinguish no difference in how the two inputs handled dynamics; both were excellent. Switching to Allegri's *Miserere*, I couldn't reliably distinguish between the two inputs. Soundstaging, vocal harmonics, dynamics – if there was any difference between the DAC8's USB and S/PDIF inputs, it was below my threshold of perception. The USB input *may* have sounded *slightly* more open, but I'd say that if there was any difference between the DAC8's USB and S/PDIF inputs, it was too small to *make* a difference. Both sounded divine.

### Comparison

The Benchmark DAC1 Pre (\$1595) had one of the first USB sections capable of playing files up to 96kHz. Still, the DAC1 boasts an assortment of digital inputs: USB, optical S/PDIF, three coaxial S/PDIF, and AES/EBU. It also has an analog input for tuners or phono preamps, and an analog volume control. Its analog outputs comprise RCA and XLR jacks and a spiffy headphone amplifier. All of this

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comes in a package that measures only 9.5"W x 1.725"H x 9.33"D. It can be used as a system preamp or, for \$300 more, you can get the DAC1 HDR, which includes some parts upgrades and a remote control.

Via the Benchmark's USB input and foobar2000's WASAPI audio engine, Allegri's *Miserere* sounded very enjoyable, but with less detail than I heard from the DAC8's USB input. Voices were a bit more smeared together in the soundstage, with less depth than the DAC8. The smaller choir behind the main group sounded more distant, but with less harmonic detail, which made the voices less realistic. With *For the Angel, Israfel*, the DAC1 Pre was easily the equal of the DAC8 in frequency extension, and its very punchy bass may have surpassed the DAC8's. But the ARC's instrumental detail surpassed the Benchmark's, so that instruments sounded more lifelike.

With the Allegri track, the Benchmark's S/PDIF input sounded a bit murky, the two choirs smeared together so that individual vocalists were hard to distinguish. Spatial cues were more difficult to make out, although I could still tell the difference between the two groups of singers. The bass in *For the Angel, Israfel* was a bit deeper and punchier through the Benchmark's S/PDIF input, while the high chimes were detailed and harmonically complete. The DAC8 sounded even more detailed, making it easier to tell when the chimes were struck, and to track the decay of each note as it vanished into silence.

Through both inputs on both models, while the Benchmark DAC1 Pre presented an enjoyable musical experience, the Audio Research DAC8 sounded less digital, with more detail and realism — which, given its price, it darned well should.

The Wyred 4 Sound DAC-2 was the first full-capability USB DAC I'd seen, and it has some advantages over the ARC DAC8: it cost only \$1499, and packs more into its smaller enclosure. It also provides a digital volume control — it can be connected directly to a power amplifier, thus saving the expense of a preamp. The DAC-2 uses Sabre's ES9018 chipset, which has eight channels, all of which are used to provide balanced and unbalanced two-channel outputs.

I reviewed the Wyred 4 Sound DAC-2 in our December 15, 2010 issue and won't repeat myself here. Generally, I thought the DAC-2's S/PDIF input sounded slightly brighter than the ARC DAC8's. Which one was right? Well, both sounded well within the bounds of reality, so basically it will be a matter of matching the DAC to your system: If the system's highs aren't terribly extended, the Wyred 4 Sound might be a good match; if your system sounds bright, the ARC could be just the thing. The Wyred 4 Sound's USB input wasn't as bright as its S/PDIF input, and so was quite close to the DAC8's.

The DAC-2 lacked a smidgen of the DAC8's detail retrieval and harmonic completeness. On the other hand, its display is much easier to read, and at \$1499 it's a huge bargain. But in my view, the Audio Research DAC8 offered enough additional realism to warrant the difference in price.

## Wrap-up

The Audio Research DAC8 goes all out to support computer-based music servers by providing a USB input that plays *all* sampling rates up to 192kHz. While some manufacturers still whine that S/PDIF inputs sound better than USB, ARC claims that their USB input sounds better. I can't provide a definitive opinion until I have a single source that plays both USB and S/PDIF, but when I played the same music files through a server with an S/PDIF output and a computer with a USB

## Associated Equipment

### Speakers —

Affirm Audio Lumination,  
JL Audio Fathom f110 subwoofers

### Amplifiers —

Art Audio PX-25,  
Atma-Sphere S-30 Mk.III,  
Audio Research VS115  
(all two-channel)

### Preamplifier —

Audio Research PH5  
phono preamp and LS26 line stage

### Sources —

Linn LP12 turntable on custom  
isolation base, Graham 2.2 tonearm,  
van den Hul Platinum Frog cartridge;  
Sony SCD-XA5400ES SACD/CD player;  
Hewlett-Packard laptop computer  
running Windows 7

and foobar2000 music server;  
iPod Touch connected to Wadia  
170iTransport digital music dock;  
Auraliti PK100 music server;  
Meridian 500 CD transport;  
all servers and digital players  
connected to Benchmark DAC1  
Pre D/A converter

### Interconnects —

Audience Au24 e,  
Clarity Cables Organic,  
Crystal Cable Piccolo,  
Purist Audio Design Venustas,  
TG Audio High Purity Revised

### Speaker cables —

Audience Au24 e, Blue Marble Audio,  
Clarity Cables Organic,  
Crystal Cables CrystalSpeak Micro,  
Purist Audio Design Venustas

### Power cords —

Audience powerChord e,  
Blue Marble Audio Blue Lightning,  
Clarity Cables Vortex,  
Purist Audio Design Venustas

### Digital cables —

Gold Starlight 6 S/PDIF and 5 AES/  
EBU, Wireworld Starlight 52 USB

### Power conditioners —

Audience aR6-T,  
IsoTek EVO3 Sirius

output, I was hard-pressed to hear a difference. Both had the ARC house sound. The DAC8 is as good as any digital source I've heard.

I suspect most of us will regard \$4995 as a hefty chunk of change to pay for a DAC, but the *real* question is always the same: Is it worth it? For me, the answer is a resounding *Yes*. ARC's DAC8 is a well-engineered, well-built machine that advances the state of the audio art and finally makes it possible to assemble a no-holds-barred, computer-based music server whose sound is competitive with just about anything – which is just what I was looking for. In the haul-out-the-checkbook sense, the Audio Research DAC8 has become this reviewer's choice.

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Converter  
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Warranty: Three years parts and labor  
to original purchaser.

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