

Bryston BDA-2 Digital-to-Analog Converter

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Located in Peterborough, Ontario, is Bryston Limited, long a staple of the Canadian audio industry. The company got its start in the mid-1970s, building amplifiers that were primarily used in recording studios. While Bryston's role in professional audio continues today, their business has shifted significantly toward the consumer market, where their presence has grown steadily over the years.

Now known primarily as a maker of robust amplifiers and preamplifiers accompanied by 20-year warranties, Bryston entered digital audio only in the past decade, when they began offering onboard digital-to-analog converters in their preamps and integrated amps. In 2007 they introduced their first CD player, the BCD-1, and in 2008 their first outboard DAC, the BDA-1, which (along with the fact that the CD drives were discontinued by Philips) rang the BCD-1's death knell, outselling it by a large margin. Bryston then discontinued the BCD-1 to focus on selling DACs, which, as most readers are aware, are ubiquitous in audio today. Last year, Bryston expanded their line of DACs with the subject of this review, the BDA-2.

Description

The BDA-2 DAC (\$2395 USD) weighs 12.5 pounds and measures 17" or 19"W x 2.75"H x 11.5"D. The buyer chooses the width of the faceplate, which is made of thick, anodized aluminum and is available in silver or black. With its straightforward appearance, the BDA-2 looks sharp in an understated way, something only further enhanced by its solid construction and sturdy feel. The front panel, relatively simple in layout, has buttons for input selection, upsampling, and on/off. A small array of LEDs indicates the sample rate of the selected input.

The BDA-2 can accept multiple components through the many inputs on its rear panel: four S/PDIF coaxial (two RCA, two BNC), two optical, one USB Audio Class 2, and one AES/EBU balanced. After the incoming digital signal has been converted to analog, it can be sent to drive an external analog input via single-ended RCA or fully differential, balanced XLR outputs. There is also the option of bypassing the DAC and sending the signal out in the same form it entered in, via the digital coaxial (RCA) output. Also on the rear panel are an RS-232 port for uploading new software,

a 12V trigger for remotely powering the unit on or off in conjunction with the rest of a system, and an IEC inlet for the detachable power cord.



One of Bryston's objectives in designing all of their DACs is to reduce jitter, which can be loosely defined as the mistiming of data in a synchronous digital system. This is achieved in the BDA-2 by resampling and reclocking all incoming data before they're sent to the sample-rate converter (SRC).

At the SRC, incoming sample rates of 32, 48, or 96kHz are upsampled to 192kHz; 44.1 and 88.2kHz rates are upsampled to 176.4kHz. The SRC also increases the bit depth from 16 to 24 bits. These conversions make possible the improved processing of the upsampled signal by the downstream DAC, which has been specifically designed for these sample rates and bit depths. If the listener chooses not to use this feature, it can be disengaged by pressing the Upsample button on the front panel.

As with every Bryston product, careful attention has been paid to the BDA-2's power supply. Separate power transformers are used for the DAC's digital and analog sections, to allow the input receiver, SRC, and DAC to be independently regulated. Voltage regulation and filtering for both power supplies is applied at multiple stages to ensure clean, stable power.

Whereas the BDA-1 used dual 24/192 Crystal DACs, the BDA-2 has a pair of 32/192 DACs made by AKM, which Bryston claims are some of highest-resolution chips on the market today. These chips' analog outputs are connected directly to a pair of Bryston's proprietary, discrete, class-A operational amplifiers rather than an integrated circuit. According to the company, the use of discrete class-A op-amps is a major factor in achieving the BDA-2's sound.

While the BDA-1 won positive reviews, it was soon a bit outdated for those interested in playing hi-rez files from their computers. While the BDA-1 used those 24/192 Crystal DACs, its USB input could accept only a 16-bit word length and sampling frequencies of 32, 44.1, or 48kHz; in contrast, many of Bryston's competitors had already released DACs with asynchronous USB inputs capable of accepting higher-rez data.

The BDA-2 remedies the limitations of its predecessor by including an asynchronous USB input capable of handling 24/192 resolution, putting it in the same league as other top-flight DACs on the market. Any Mac operating system of 10.6.4 or higher natively supports USB Audio Class 2 and does not require the installation of

additional drivers. Users of Windows will need to install drivers to support the USB interface, but these are included with a Bryston USB key that ships with the DAC.

Each BDA-2 is hand-assembled at Bryston's factory in Peterborough and comes with a five-year warranty.

System and sound

I connected Bryston's newest DAC to their B100 SST integrated amplifier with Kimber Kable Tonik interconnects. An NAD C 565BEE CD player was linked to the BDA-2 via an i2Digital X-60 digital coaxial cable, while a MacBook computer running Audirvana software provided the BDA-2 with digital content via an AudioQuest Forest USB cable. The B100 powered Amphion Argon3L floorstanding speakers through AudioQuest Type 4 speaker cables terminated in banana plugs. All electronics were plugged into an ExactPower EP15A power conditioner/regenerator.

I never got a chance to hear the BDA-1, but I've had plenty of experience with Bryston's digital offerings: I reviewed the BCD-1 CD player, and their DAC is installed in my B100 SST integrated amplifier. While Bryston has made some changes in the BDA-2, most notably switching from 24/192 Crystal to 32/192 AKM DACs, the BDA-2 was sonically very similar to its digital predecessors, and embodies the Bryston sound. This would seem to illustrate the importance of the DAC's architecture (power supply, gain stages, etc.) over the chip itself in determining the overall sonic character.

What *is* the Bryston sound? On first hearing a Bryston product, the first things that would likely strike someone unfamiliar with the brand would be transparency and clarity. The BDA-2 was no exception. If you want to understand what reviewers mean when they say that a component produces "an ink-black background," listen to this DAC. Its noise floor was dead quiet; as a result, it resolved detail impeccably, letting me hear subtleties that less revealing converters gloss over. "Your Rocky Spine," from Great Lake Swimmers' *Ongiara* (CD, Nettwerk, 6700 30691 2), begins with the sound of a banjo behind the baffle of the left speaker, before panning coherently across the soundstage as the rest of the band joins in. The various stringed instruments were rendered with excellent precision. So clean was the BDA-2's delivery that the positions of the musicians and the spaces between them were easy to discern; the overall effect was of a very genuine, believable sound.

As I read through my listening notes before sitting down to write this review, one adjective frequently popped out: *natural*, which, as a description, is pretty vague. When I say that the BDA-2 "sounded natural," I mean there was nothing forced in its delivery of music, and this was related to its reproduction of space. While some DACs are more upfront in their delivery, making the music jump out and seem closer, the Bryston was a touch more recessed. If anything, it sounded slightly more distant than the DAC aboard my B100 (a point I'll come back to), yet it was no less involving. "Take It With Me," from Tom Waits's *Mule Variations* (CD, Epitaph/Anti-86547-2), played through the Bryston electronics and Amphion speakers, had a lifelike sound that convincingly reproduced Waits's "bourbon-soaked" baritone with perfect clarity. Although this is an intimate-sounding recording of only Waits's voice and upright piano, the BDA-2 didn't add an extra dose of presence by moving him in

closer. Rather, it positioned Waits so that it was easy to imagine him sitting at the piano and performing in front of me, bringing me about as close to the man as I may ever get (he rarely tours).



Another strength of the BDA-2 was its ability to easily handle a wide dynamic range. I suspect this may have been due in part to its low noise floor, which served to emphasize the difference between the most quiet and most explosive moments in a recording. An example of this was *War Dance*, from Respighi's *Belkis, Queen of Sheba: Suite*(CD, Reference RR-95 CD): The BDA-2 had no problem capturing the ferocity, power, and intensity of this performance by Eiji Oue and the Minnesota Orchestra. As solo flute handed off to pounding percussion, the music was forceful and authoritative, and the BDA-2 elucidated it with ease.

While the BDA-2 offered exceptional transparency and squeaky-clean, highly resolved sound, it lacked any signature of its own. It didn't color the music passing through it in any way. The BDA-2 sounded neutral, taking on the character of whatever recording it was playing. Of course, this could be considered a disadvantage with poor recordings -- such things as compressed dynamics, hot highs, or woolly bass were laid bare. That's not to say you won't want to keep listening to your not-so-stellar-sounding recordings, but that the BDA-2 will let you hear just how shoddy they sound.

I've finally decided to get more seriously involved with computer audio, and the arrival of the BDA-2 coincided with my purchase of the Audirvana software for my laptop. Until now, a great deal of my listening involved streaming music wirelessly through iTunes from an iMac to an Apple Airport Express router that connects via TosLink to the DAC aboard the Bryston B100. As convenient as this setup is for listening to good-quality music at home, it has never been able to match the sound I get from CDs. I'd been told that this may have something to do with using iTunes as the audio engine, hence my switch to Audirvana. Combined with using the BDA-2, this change has allowed me to enjoy sound from a computer that has matched, and in some cases exceeded, what I hear from CD.

Using the USB input and listening to "Pyramid Song," from Radiohead's *Amnesiac* (16-bit/44.1kHz AIFF, EMI), the music spread from speaker to speaker in a wide stage with a good sense of depth, into which the piano notes were able to bloom and decay as the random sounds underpinning the song created an eerie effect. When the drums entered, the cymbals shimmered with amazing clarity, as this recording of both acoustic and synthesized sounds was delineated by the BDA-2. Switching over to the CD, I heard something very similar, except that via USB

there was a slightly greater sense of air that helped tease further apart the synthesized sounds that contribute to this song's dark atmosphere.

Comparison

For the past six years I've been using the DAC onboard the Bryston B100 SST integrated amplifier, which made for an ideal comparison with the BDA-2. The B100's DAC came as a \$1000 option when I bought it in 2007, and features four digital inputs (two coaxial, two optical). The chip itself is made by Crystal, and in many ways is implemented in a manner similar to the BDA-2. Power is supplied by a separate transformer, and is regulated in all stages of the digital chain. Furthermore, as in the BDA-2, once the signal leaves the B100's DAC, it's amplified using discrete class-A op-amps.

The sounds of the BDA-2 and the B100 DAC had much in common. Both were uncommonly transparent, and presented music against a silent backdrop. This allowed more details to emerge -- I could hear deeper into the music. Both DACs portrayed dynamic shifts with ease in a way that brought recordings to life. The explosive sound of a symphony orchestra could be not only heard but felt, producing an engaging and tangible listening experience that more closely mirrored the sound of live music.

Bryston gear has a reputation for producing solid bass, and in this regard I wouldn't bet any money on my ability to distinguish between these two DACs. Through both, the low end of "good kid," from Kendrick Lamar's breakout album, *good kid, m.A.A.d. city* (CD, Aftermath/Interscope B001753602), was powerful and pompous, propelling the track forward with a clean, dry low end that never lacked energy or *oomph*. Although neither DAC infused low frequencies with additional weight or emphasis, both played with authority while still letting me hear details such as the decays of bass lines -- something that can be better appreciated with well-recorded jazz and classical music than the hip-hop I've cited here.

The biggest difference I noted between the BDA-2 and B100 DACs was in their overall soundstaging -- the B100 was slightly more forward. When I listened to "Muhammad My Friend," from Tori Amos's *Boys for Pele* (CD, eastwest A2 82862), the BDA-2 preserved the lucidity I heard through the B100's DAC, but the sound was slightly farther back, as though the entire performance had been nudged a bit toward the front wall. Through the BDA-2, the sound of Amos's Bösendorfer piano lacked the same forward presence it had through the B100 DAC; similarly, her voice took a step back -- she now sounded a bit farther away. Normally, I avoid a more recessed sound -- the music can be less involving, and I find that my mind wanders more easily. Not so with the BDA-2. It wasn't so laid-back that it disappeared into the background; rather, I appreciated the senses of a deeper stage and more spaciousness overall. Regardless of which DAC I used, I found the listening experience equally involving.

The two Bryston DACs shared some important sonic traits: transparency, neutrality, and clean resolution. The B100's more upfront sound will appeal to some, but I equally appreciated the BDA-2's perspective, which was a shade more relaxed but every bit as engaging.

Conclusion

At \$2395, Bryston's BDA-2 is probably at about the midpoint of what one can expect to pay for a state-of-the-art DAC -- in my experience, paying substantially more for a digital front end generally yields a different sound, but not necessarily a better one. For \$2395, the buyer of a BDA-2 will get a solidly built, high-performing DAC that can improve the sound of up to eight source components, while also accepting high-resolution digital files from a computer. Unlike its predecessor, the BDA-1, Bryston's new DAC is unlikely to become dated any time soon. If you're in the market for a flagship DAC from a reputable manufacturer that will likely raise the sound quality of your entire digital system, you'd be making a mistake if you didn't at least audition the BDA-2. Highly recommended.

. . . Philip Beaudette

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Associated Equipment

- **Speakers** -- Amphon Argon3L
- **Integrated amplifier** -- Bryston B100 SST
- **Sources** -- NAD C 565BEE CD player; Thorens TD-160HD turntable, Rega RB250 tonearm, Dynavector DV-10X5 high-output moving-coil cartridge; Apple iMac computer, Apple AirPort Extreme, Apple AirPort Express
- **Speaker cables** -- AudioQuest Type 4
- **Interconnects** -- AMX Optimum AVC 31 coaxial, AudioQuest Copperhead, Kimber Kable Tonik, XtremeMac XtremeHD TosLink
- **Power conditioner** -- ExactPower EP1 5A

Bryston BDA-2 Digital-to-Analog Converter

Price: \$2395 USD.

Warranty: Five years parts and labor.

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