

Separate Components

Bryston B100-DA Integrated Amplifier/DAC
Sugg. Retail: \$3895 (\$2995US), DAC \$1200 (\$1000US), MM Phono, Remote \$500 ea (\$400US)
Manufacturer: Bryston Limited, PO Box 2170, 677 Neal Drive, Peterborough, ON K9J 6X7 (705) 742-5325 FAX 742-0882 www.bryston.ca



The *Bryston B100* sits in a line of revered preamplifiers and integrated amplifiers, outstanding for their sonic performance and operational flexibility, and the latest DA2 version provides 6 analog inputs (TV, CD, AUX/PHONO, AUX- 2/SPDIF [A/D or ANALOG/DIGITAL on DA remote and faceplate, respectively] VIDEO, and TUNER), with RECORD IN and POWER AMP IN complementing the RECORD OUT and PREAMP OUT RCAs. A slide switch on the rear panel allows disconnecting of the normally direct preamp/amp path. The DA model, as reviewed here, offers 4 digital inputs, 2 SPDIF, 2 TOSLINK (if you're wondering, I'm following *Bryston's* convention of capitalizing all in/out), taking away the AUX-2 input to select them, with a separate button array near the remote's bottom or back, these labeled, CD, TUNER, TV, and VIDEO (whatever happened to DAT, DVD, or SACD?).

By the way, the PHONO option (*B100-P*), can be simultaneously included with the digital (taking over AUX-1), but only with MM gain stage. Without the DAC option, *Bryston's* excellent MC transformer can be included. Lest I forget, the *B100* in all its versions includes a headphone jack, something I've been missing on high end components in recent years.

But let's talk about the DAC. It's much more than just a DAC, with more and better engineering effort than most high end outboard DACs (an outboard version is imminent). It's best described in the literature for the *B-26DA* preamp) online: "The Bryston DAC chip we use is a hybrid multi-bit delta sigma DAC (digital to analogue converter) device. Before the digital data reaches the delta-sigma modulator, it is run through an 8x over-sampling process and digital

interpolation filter. Due to the inherent over-sampling process of a delta-sigma modulator architecture, the overall interpolation ratio of the device is 128 times. Over-sampling and up-sampling have some great benefits when implemented correctly."

"There is a significant difference between up-sampling and oversampling. Over-sampling is when the the samples are repeated (2x, 4x, 8x, etc.) to create a new sampling frequency. The new samples are then generally run through an interpolation filter to create a more analog-like waveform."

"Up-sampling usually refers to a mathematical process in which the new sampling rate is not a multiple of the old sample rate, and the numbers have to be calculated in real-time. This is what is happening when a sample rate converter chip is in an up-convert mode. So in the BP-26DA, if a 44.1 kHz signal is present: we upsample to 96 kHz (with the Sample Rate Converter) and then the DAC and then the DAC will internally 8x oversample that signal. The great benefit of both of these methods is that it relaxes the requirements of the analog filter after the DAC. This is important because it allows designers to



implement higher cutoff frequencies with slower roll-offs, which result in a phase linear circuit in the audio band."

"The up-sampling method, when implemented correctly, also has the side effect of jitter reduction, since the output clock is unusually asynchronous from the input clock."

"All of this being said the most critical part of the DAC circuit in the Bryston Preamplifiers and Integrated Amplifiers is that the output from the D to A is directly connected to a pair of Bryston proprietary Class A Discrete Operational Amplifiers rather than the typical IC chips employed in most other products. This makes a huge difference in resolution and dynamic headroom performance."

Regular readers will notice some food for thought for the *Simaudio* engineering staff, who at last contact claimed that oversampling and upsampling were identical. It's nice to have a clear and valid engineering explanation and sonic evaluation of this



technology, one that I have used in recording, mastering, and music reproduction for several years. Digital resolution is in the samples, and multiplying them is not nearly as effective as reclocking and enhancing them by interpolation and other digital processing, such as noise shaping. These days, I even make analog recordings of digital media *after* upsampling to maximize resolution and minimize high-frequency distortion (see **G, G & G** for how). Digital recordings of analog sources will always benefit from higher sampling rates, this especially the case, obviously, with live music. Even our 44.1 and 48 kHz masters benefit from being upsampled and reclocked, and we are currently considering such re-releases in either DVD or SACD versions. With this preamp/DAC, of course, you can get such benefits from simple CD playback. And *that's* the bottom line about what's important about this component's digital performance.

Getting back to the *100B-DA* and its facilities, a balance control is also included, with 1 dB increments up to 6 dB in either direction. There are 12V triggers for screens, etc., and a 3.5mm jack for system interface with other components' control systems. The remote control can be programmed for motion-sensing backlight operation, so that when you pick it up the legends for each button light up. Obviously, this will tend to shorten battery life (a pair of AAs, accessible only by removing 4 screws on the bottom; the remote itself is a minor work of art, beautifully milled from an aluminum block with 2 internal circuit boards).

RS232 operation is also possible through the provided jack. There is also a Pass-Through Mode that "sets the preamp to (1) unity gain and locks out the volume and balance controls for any single analog source." This leaves control of these by the source component, good for home theatre interface.

The amplifier section is rated at 100 watts rms per channel (180 at 4 ohms), and comes out of the *2B* heritage, with finned heat sinks enclosing the power output transistors on either side of the chassis. It is, as usual, conservatively rated, though unusual with *Bryston*, no measured performance stats are provided. The manual, however, is very complete, with explanations of all the functions I've only touched on here. There are a single pair of 5-way binding posts, gold plated, with clear hard plastic nuts. Warranty is still 20 years, no questions asked (even the age).

As I hooked up the *B100-DA* to my reference system, there was one thing I immediately missed: balanced inputs. I resorted to adaptors for my pair of *Ultralink Ultima* balanced cables that normally drive guest amplification components. Hooking up the digital side of things was more straightforward: I set up my *Pioneer PDV-LC20* portable DVD player via its Toslink output, which carries 96 kHz PCM signals as well as Dolby Digital and 44.1 CD, one of the few portables to output 96 kHz 2-channel DVD recordings at full resolution (my *Samsung DVD-L300* downsamples to 48 kHz, though it plays DVD-As in stereo to a DAC). I have quite a few of these interim format DVDs, which play on all DVD machines, mostly from Chesky and Classic record labels. This would also allow me to test the *Bryston* DAC's response to Dolby 5.1 or DTS signals, to encourage (or

warn) those who may put this amp in an HT system.

The *B100-DA* was connected to a pair of *QUAD 22L* dynamic loudspeakers (see review elsewhere) using several cables, starting with a single run of *Audioquest Gibraltar*, which proved a very good match for bright, clean, dynamic sound. I then tried the more recent *Audioquest Pikes Peak*, also single wired, but with the company's bias battery current system (speaker cable reviews are in the works for our Fall issue).

As other reviewers have found, there's a lot to like about this amplifier/DAC: stupendous power for an integrated, plenty of inputs for both analog and digital, and close to the best CD and other digital reproduction I've

The Ray Montford Legacy Grows...



Many Roads is an exploration of guitar virtuosity, textures, and colours, and is Ray's newest CD collection of totally original compositions. **One Step Closer** is more acoustic, but also offers a range of guitar playing that is simply breathtaking. Andrew Marshall thinks that Ray is Canada's finest folk guitarist and composer since Bruce Cockburn, and his recordings, all self-produced are audiophile gems. Order these, and his new album, **The Early Sessions** at www.audio-ideas.com.

ever heard. If it seems a bit pricey at first glance, when you total up the cost of comparable components that will provide this level of function, flexibility, and outright excellence you find yourself looking easily into the \$5000 range. It's also one of the most stylish components to come from the *Bryston* stable.

But what kind of a horse is it sonically? Well, there are horses for courses, digital or analog, but this one does both steeplechase and quarter-mile with flying colours, speed and power distinguishing its pedigree along with audiophile finesse. I got out several 96K audio DVDs (not DVD-As, as already noted), starting listening with a wonderful collection of *Gershwin's* music produced and engineered by Mark J. Aubort and Joanna Nickrenz, *All the Works for Orchestra & for Piano & Orchestra*, with the St. Louis Symphony under Leonard Slatkin, with Jeffrey Siegel, piano. Some favourites included *Lullaby*, and *Catfish Row* (from *Porgy and Bess*), and, of course, *An American in Paris*. The sound of these recordings, long highly regarded, came alive, with lots of depth and power, as well as abundant inner detail. With piano, we had an extra wide *Steinway* in the *Concerto in F* and *Rhapsody in Blue*, closely surrounded by a very live sounding orchestra, with very individual players, but a nice cohesive overall sound. The recording retained and showed its true analog glory through the *Bryston/Quad* combination.

Getting a little more analytical, I threw on my *Test & Reference* CD, checking out the deep bass (flat to 30 Hz in my long room), a very natural, uncoloured sound on pink noise, and a very smooth, sweet character, with just a little extra energy at the very top of the audible range.

The bass character was especially notable, very deep and tuneful, as well as powerful and effortless, typical *Bryston*, and something I know of from my years with *3Bs*, the current also being of *SST* vintage. In my own recordings I know so well, this system shone, allowing me to hear things as I would expect, with all the detail, nuance, and tonal balance I heard at the original sessions or concerts.

This confirms, of course, the excellence of the DAC and its ability to draw all of the music out of both 96 kHz and 44.1 recordings. I also tried some movie soundtracks, and a favourite DVD-A disc. I won't say much about the former, except that the *B100-DA* decodes them nicely in stereo, so you needn't worry about running your video system through it, and the special features described earlier in integrating HT and audio systems could be very useful.

The latter, *The Bluegrass Sessions, Tales From The Acoustic Planet, Volume 2*, by Bela Fleck and friends, was very cleanly reproduced in stereo, with Fleck's banjo ringing free, the overall mix rather denser than that heard in multichannel, but very engaging none the less. And, if you've looked at **SuperSounds** in this issue, you know that anything with Jerry Douglas is OK by me.

I could go on, but I think the case is proven. The *Bryston B100-DA* is one of the best and most versatile integrated amplifiers ever designed and produced, one with no flaws, no quirks, and no temperament, but pure high end all the way home. I can't think of a better way to start and complete a true high fidelity system. Can you?