NEWS

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BRYSTON

WHY AN ‘ALL-IN-ONE’ CD PLAYER ?

The Bryston BCD-3 is a state-of-the-art REDBOOK CD player using fully discrete analog Class-A proprietary Bryston circuits, a quality Drive, hefty power supplies and AKM 4493 SEQ 384/32Bit DAC’s.

The DRIVE and DAC must use the same MASTER CLOCK

ADVANTAGE:

The advantage of an all-in-one box solution for a CD Player (as opposed to separate outboard DAC and Drive) is the elimination of jitter. For optimum performance the Drive and DAC must use the same MASTER CLOCK. If the clock signal of the drive is not being synchronized with the clock signal from the DAC then jitter develops.

In external DAC’s you must re-clock the digital input in order to reduce the jitter. Jitter is defined as a mistiming of the digital signal.

50 ANNIVERSARY

Bryston is not offering SACD because it requires a Blueray or video capable drive.

The Bryston CD Player is dedicated to CD REDBOOK NATIVE playback first and foremost. We wanted a drive that was natively clocked to 44.1/16BIT so no conversion is necessary like in DVD drives that sample at much higher rates.

THE BCD-3 is as pure a native CD signal as you can get.

The timing of all those ones and zeros is of extreme importance. It isn't enough to get the bits right; those bits have to be converted back into music with the same timing reference as when the music was first digitized. These timing errors - called jitter are the bane of quality audio. With the Bryston CD player the master clock and the drive are synchronized perfectly to eliminate any possibility of jitter affecting the sound quality of the player. Also in a two box solution (player and external DAC) you are dealing with two extra conversions. The I2S signal must be converted to SPDIF first then in the DAC the SPDIF must be converted back to I2S. The regeneration of the Master clock from the SPDIF signal produces more jitter. Whereas a single box solution does not require these extra conversions.

BRYSTON DAC

The DAC integrated circuit (chips) provide the conversion of the digital signal to the analog domain. The chip used in the BCD-3 is the AKM 4493 SEQ 384/32Bit DAC. Due to the requirements of the conversion process, this chip and every other DAC chip, applies a digital filter to the signal before the conversion to analog and an analog filter after the conversion process. The AKM DAC is a hybrid multi-bit delta-sigma DAC.

This is a rather tongue-twisting description that essentially means it is an advanced generation chip which uses several methods to optimize the conversion process. This DAC uses a process similar to the previous up-sampling process where it over-samples 8 times. This again allows for filters which are out of the audible range. The output of this process is a sensitive analog signal. It is critical that the timing of this process is very closely controlled by a low jitter clock.

SEPARATE DIGITAL & ANALOG POWER SUPPLIES

The DAC chip requires a very clean digital power supply if it is to function at its optimum. Noise on the digital supply may cause added jitter, noise and distortion. Incorrect board routing of the digital power supply or ground may introduce digital noise into the analog circuits. This digital power supply is provided from a separate closely regulated and filtered source. The DAC also requires a high quality analog power source. The analog signal is at its lowest magnitude in and coming out of the DAC so any added noise or distortion will be greatly amplified by later stages. Again a separate, heavily regulated and filtered power supply with carefully routed grounds is provided. This sort of care with the power supplies is one of the reasons for the superior sound of BCD-3 Bryston CD Player.

DISCRETE CLASS-A ANALOG STAGE

Getting the Digital side of the equation is only the start. Once the signal leaves the DAC it is buffered and increased in strength by operational amplifiers. These are constructed from discrete devices (transistors, resistors and capacitors) instead of integrated circuits. The use of discrete devices allows the design of a circuit that exactly matches the needs of the DAC. Use of integrated circuits always involves compromises since they are designed as general-purpose devices. Discrete devices also allow for more powerful outputs from operational amplifiers since heat from the output driver transistors is separated from other devices. In an integrated circuit operational amp this heat can affect the rest of the circuitry since it is all on one chip.

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DISCRETE DEVICES

Discrete devices also allow specific matching of important characteristics such as input and output impedances based on the specific in-circuit requirements. Discrete operational amps can also be designed to more closely match their power source that again leads to reduced distortion and noise. Discrete devices can be tested very closely to meet specific tolerances and be matched against each other when a desired performance design is critical. Circuits can and are designed to require closely matched devices for optimum performance. Integrated circuits have large numbers of components on one chip and it is not practical to do more than high-level sorting of device characteristics. Bryston does sorting and grading with its DAC chips but can do a much finer level with the discrete devices, which leads to better sound quality.

BCD-3 FEATURES:

- Redbook CD and CDR playback
- Two AKM 4493 SEQ 384/32Bit DAC's
- 8 times over-sampling
- Discrete Bryston Class A analog output stage
- Independent Analog and Digital power supplies
- Balanced XLR & Unbalanced RCA Stereo outputs.
- Transformer coupled SPDIF & AES EBU Digital outputs.
- Ethernet software upgrade
- Network connectivity
- Remote 12 Volt Trigger
- Full function IR remote control

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