NAD C 658 BluOS Streaming DAC

A DIFFERENT KIND OF AUDIO COMPONENT

The C 658 is a unique kind of component. In fact, we had a difficult time coming up with a description for a product that includes functions previously requiring a CD player, a tuner, a DAC, an electronic crossover, and a preamp. In the end we decided to focus attention on the BluOS streaming and the high-quality DAC. But that's only the beginning of the story. How did we fit so many different functions into one compact unit and yet make it easy to access and control? The simple answer is 'software,' but the required software is amazingly complex and the result of many years of development combined with a high level of integration and cooperation with many different technology providers. At its core is a very powerful iMX 6DL 1GHz ARM processor that can be programmed to perform many functions, which includes both a wired (Gigabit Ethernet) and wireless (Wi-Fi 5) interface to the internet. This is integrated with both analogue and digital hardware to allow the broad array of capabilities so neatly combined in a single component.

WHY WE MADE IT

We made the C 658 for serious music lovers that want access to all the various music sources available today while still honoring the legacy sources that are important to so many people. High-Res music streamed from the internet or stored on local memory media is the cutting edge of audio technology, but it is not the only way people consume music. LP records, CDs, MP3 files stored on phones, radio streams, and even music videos are all part of the mix for music lovers. We wanted a simple affordable component that could be as universal as possible while extracting every last ounce of musical goodness from each of these sources.

BluOS™ HIGH-RES STREAMING

BluOS is the most complete High-Res music streaming platform available today. With support for Tidal, Qobuz, and Deezer we have High-Res covered with full integration of MQA and support for 24/192 PCM. We also support local libraries, whether stored on a network NAS drive or an attached USB HDD, and can index over 250,000 titles (more than any similar system). BluOS also supports many of the most popular services like Apple Music (via AirPlay 2), Amazon Music, Napster, and Spotify. TuneIn offers thousands of radio feeds from all over the world, and we have direct access to Calm Radio and iHeart. In addition, we support many special interest services like Radio Paradise (uncompressed), Slacker, Murfie, and others in development. And that is the really cool thing about BluOS; three or four times a year BluOS pushes out software updates that add new service options and features – free of charge. This also allows quick updates as all these services are constantly evolving and changing. BluOS also brings unparalleled access and control with sophisticated apps for iOS and Android, as well as Mac OS and Windows and every major Smart Home Control system including Alexa and Siri voice control (with others in development).

STATE-OF-THE-ART DAC

All this digital goodness must become analogue before it gets to our ears, and the C 658 is using the advanced ESS9028PRO 32 bit Hyperstream™ codec as the foundation of the DAC section. We also employ a Burr Brown Asynchronous Sample Rate Converter to buffer the incoming digital source signals to reduce jitter to an absolute minimum. Add to this the Sabre DACs latest generation of jitter reduction circuitry and the C 658 is amazingly precise and musical. The codec is followed by a filter stage based around an instrument grade OPAmp with a 15MHz bandwidth offering an extremely high slew rate (13V/uS) and super low noise and distortion. While using great parts is important, the circuit layout is even more important. With high speed digital circuits keeping signal paths as short and symmetrical as possible is crucial to good performance. This is where NAD's many years of digital engineering come into play, extracting the maximum performance possible from the chosen parts by using multi-layer circuit boards with extended ground planes and local power supply decoupling.

FULL FEATURED PREAMPLIFIER

The analogue stages of the C 658 are no less advanced than the digital stages. Inputs are switched using precision relays rather than CMOS switches to keep impedance – and thus noise - as low as possible. There is an analogue bypass circuit to allow direct analogue throughput of the phono and line stages. Of special note is the outstanding phono stage based on NAD's classic circuit and using today's super OPAmps that offer ultra-wide bandwidth and low (0.0005%) distortion along with vanishingly low noise. Precision passive components are used to create an RIAA response that is textbook perfect (+/- 0.5dB) along with high overload margins to extract the very best from your vinyl collection, even newer higher fidelity pressings. The line inputs are buffered to isolate the preamp and create the ideal gain structure with very low noise. A high precision software controlled analogue volume control offers 0.5dB volume steps with a 110dB range and keeps distortion and noise very low in this critical area. The old fashion variable potentiometer (still used by many) suffers from channel imbalance and crosstalk and creates a variable in the circuit that can affect performance if not properly buffered. After the volume control the signal is sent to the fully balanced XLR outputs or to the single ended outputs and the separate headphone amplifier. There is also a crossover function with High Pass filter (80Hz) and two unfiltered subwoofer outputs. This keeps the circuit simple and leaves the low pass filter function where it belongs; in the subwoofer amplifier.

If you plan to use Dirac Live room correction or send your analogue sources over the network to other BluOS players, the analogue sources much first be converted to digital PCM. Here we are using a new generation of software-controlled ADC from BurrBrown running at 192kHz and capable of bit depths of 24. This is a very clean and transparent circuit that does not degrade the analogue signal.

DIRAC LIVE ROOM CORRECTION

This is our first stereo component featuring room correction, and we have chosen Dirac Live LE for its highly sophisticated approach to solving the problems of room acoustics. Rather than just adjusting frequency response, like a fancy parametric tone control, Dirac Live actually time aligns the signal to create amazingly realistic transients with impact and clarity that must be heard to be believed. We include the LE version which limits frequency response correction to the room mode frequencies below about 500 Hz. This is the frequency range that is very difficult to tune physically with speaker placement and room treatments. Only a properly implemented electronic program can effectively deal with

low frequency standing waves in the room. The included calibrated microphone and USB adaptor are connected to a PC and the internet to analyze your room and download a custom filter set directly into the C 658 over your local network. This is a one-time calibration process, although up to three response target curves can be stored. A full range version of Dirac Live is also available for purchase from Dirac along with future enhancements like support for multiple subwoofers. Unlike cable upgrades and other accessory 'tweaks,' you won't have to listen hard for the difference Dirac Live makes to the sound. In many systems it is a night and day difference in sonic performance and accuracy.

MULTI-ROOM CAPABILITY

Multi-room audio and smart home integration are made possible by the BluOS network streaming capability built into the C 658. This allows music to be available anywhere in the home by adding BluOS enabled speakers, either wired (64 rooms) or wireless (8 rooms) which can be grouped to play in unison or can be individually controlled to access network content. BluOS is the best sounding High-Res multi-room system available and is supported by several premium brands including Bluesound, Dali Loudspeakers, Roksan, and others to be announced.

REDEFINING AUDIO ARCHITECTURE

By combining High-Res streaming, analogue audio, and advanced room correction in one compact and affordable component, NAD has redefined the way we can enjoy music in the home today. Just add amplification and speakers, or self-powered speakers, to enjoy all your music from any source, and with BluOS, in every room of your home. The C 658 supports Wi-Fi 5, Gigabit Ethernet, and Bluetooth aptX™ HD and can both receive Bluetooth from a phone or computer and also send any source via Bluetooth to wireless headphones. And if something new comes along (and we know it will) the C 658 is ready to be upgraded, either via software or by adding a new MDC Module thanks to NAD's Modular Design Construction. With the NAD C 658, advanced technology and human engineering are combined to make the home listening experience better than ever.