

Cambridge Audio Azur 851N

The London-based company's latest network music player is its most ambitious yet, doubling as a DAC and digital preamp. But just how good is it at multitasking?

Review: **Andrew Everard** Lab: **Paul Miller**

Cambridge Audio has been involved in digital audio as long as almost any manufacturer, having launched the Stan Curtis-designed CD1, a multi-box CD player, back in 1984 [see *Vintage Review*, *HFN* May '14]. Over the years, with a change of ownership along the way, it built a strong following for its DacMagic digital-to-analogue converters, from the early designs through to the current range, which encompasses models down to the pocketable DacMagic XS. It's also brought affordable streaming/network audio products to the market, starting with the NP30 and StreamMagic models. Now it has launched its most ambitious network music player to date, the **€1699** Azur 851N.

COMPREHENSIVE FRONT END

The Azur 851 range runs from the 851A integrated amplifier [*HFN* Aug '12] to the all-analogue 851E preamp and 200W 851W stereo power amplifier [*HFN* Jun '14]. The only CD player, the 851C, is actually a player/upsampling DAC/preamp, while there's also a dedicated DAC/preamp, the 851D. So, it's to be expected that the 851N should be something beyond 'just' a network audio source component.

And so it proves, for though described by the company as a network audio player, it's also a DAC, complete with USB and S/PDIF digital inputs, and a preamplifier, usable straight into a power amplifier via its variable outputs. As well as wired Ethernet connectivity and built-in Wi-Fi (with a USB antenna provided), it supports Apple AirPlay for direct connection of iOS devices and computers running iTunes, and can also accept an optional BT100 Bluetooth 'dongle', selling for **€99** and compatible with aptX, to allow a wider range of computers and Android devices to be connected.

RIGHT: A SHARC DSP handles all digital processing (including the 2nd-gen ATF2 384kHz upsampling and switchable digital filter modes) while twin AD1955 DACs feed a balanced analogue audio and preamp output stage

Digital inputs are provided on two RCA phono coaxial sockets, one AES/EBU input and two optical, the former supporting file formats up to 192kHz/24-bit, as does the Ethernet/Wi-Fi streaming capability, while the asynchronous USB 2.0 Type-B connection also allows DSD64 files to be played from a connected computer.

The three USB Type-A sockets to the rear can be used for the connection of storage media, with one also being enabled for the charging of connected smartphones and laptops, and there's a further USB on the front panel. Add internet radio and Spotify Connect, and you have a pretty comprehensive digital front end for any system, and just for once all this flexibility isn't achieved at the expense of usability.

Thanks to a large, clear display – the visible face of a new streaming module, internally known as Zander, and running the in-house StreamMagic software stack – it's possible to operate the 851N either

from its front panel or across the room with no additional equipment, the main control providing simple scroll and click operation when using it 'hands on'.

CAMBRIDGE'S CONNECT APP

There's a perfectly functional remote control handset supplied, but for the smoothest experience it's best to use an Android or iOS tablet or smartphone running the redesigned Cambridge Audio Connect app, available free from the Google Play and iTunes stores. This is one of the best-designed network player control apps I have yet encountered, combining clarity with flexibility, and it works pleasingly with that display, showing both what's playing together with sleeve/radio station artwork.

An interesting aspect of the app's design is the way it interacts with both the 851N and the music stored on the user's network. Usually in such systems





the app merely controls the player, which browses the network music store(s), but not here. As Cambridge Audio's Dominic Baker explains, 'Although Zander is one of the fastest modules available, it's no match for a modern smartphone when it comes to network browsing. So we now use that power that you have in a smartphone to do all of the browsing, select tracks, etc. Only when you press Play does the app point the product at the correct file. This makes for a faster and slicker experience.'

Under the lid, the 851N draws on digital design already familiar from the flagship range's 851C CD player and 851D DAC/preamp, using twin Analog Devices AD1955 DACs in dual differential mode, one DAC dedicated to each channel.

Ahead of this conversion, there's the ATF2 upsampling also found in the 851C and 851D: this second-generation 'Adaptive Time Filtering' system provides flexible upconversion to 384kHz/24-bit before the digital data hits the DACs, and is used to reduce jitter as well as shifting digital noise far beyond the audible band.

'Immediately apparent was the 851N's low-end clarity'

In addition, there's a choice of digital filter settings, also as seen on the player and DAC. Linear and minimum phase filters are available, as well as a steep filter setting, all selected using a front-panel button, which also reverses absolute phase if held for a couple of seconds. Cambridge Audio suggests a 'suck it and see' approach – there's no 'right' setting, but rather only the one best suited to source, system and personal taste. The player memorises the setting chosen for each input, so it's possible to employ different filters

dependent on the source, internal or external, you're using [see PM's boxout].

Running the show is a 32-bit SHARC processor, responsible for not just the upsampling but also the volume level when the 851N is used straight into

a power amp. This processor is designed to maintain full digital resolution even as the volume is reduced, by resampling the signal at every level-step – rather than resorting to the bit-reduction used in some digital preamps.

The other 851-series digital products use a Blackfin processor, but the more

ABOVE: Big, clear display provides track/album/artist info and album/station artwork. Main rotary control offers turn-to-scroll/press-to-enter operation for simple 'hands on' navigation

powerful SHARC was chosen here in order to support DSD64 over USB (DoP). Baker explains that the choice of DoP, and thus the SHARC, was a prosaic one: 'At the time we were developing the 851N we couldn't find any DACs that supported DSD natively that would outperform the AD1955s.'

A WIDE OPEN SOUND

As the Lab Report suggests [p59], the Azur 851N turns in a fairly remarkable performance across a range of sources and bit/sample rates, but what immediately impresses is the fresh, clear and wide-open sound of which it's capable. This is as true when used as a source component into conventional amplification as it is making use of the variable output facility straight into a power amplifier.

I had some initial teething problems when playing files from my NAS drives using my preferred MinimServer streaming software, as the 851N had an annoying habit of skipping midway through a track and playing the next selection. The problem seemed linked to my preference for FLAC-to-WAV transcoding in MinimStreamer – it was less prevalent, but no more predictable, when transcoding was turned off. However, when using TwonkyMedia Server to dish up the data in straight FLAC there were no such problems.

As well as trying out the admirably well-sorted internet radio implementation and even Spotify Connect (the sound of which I still find rather bland and anonymous), I used music files from CD quality all the way up to 192kHz/24-bit over the network: CDs via Metronome's Le Player [see p46], and some DSD files played over USB via Audirvana Plus software.

While the S/PDIF inputs perhaps have a slight edge over the USB when all things are equal, with just a hint more ☺

FILTER-FEST

Not only does the Azur 851N employ a SHARC DSP to upsample all internally decoded media to 384kHz/24-bit (and process DSD64 streams via USB and network connections) but there's plenty of spare overhead to accommodate three different digital filter algorithms prior to the Analog Devices DACs. (These replace the 192kHz Wolfson DACs used in its earlier USB DACs and players.) The Linear Phase filter offers a constant group delay, yielding a time-coherent output with limited pre/post ringing and is most listener's preferred option when streaming 44.1/48kHz media. The Minimum Phase option behaves rather like an apodising filter, freeing the impulse response of any unnatural, acausal pre-ringing but increasing the energy of its post-ringing and incurring a non-linear group delay. The final, Steep filter option is the classical brickwall approach that offers little damping of any pre/post ringing but provides a linear phase output with excellent attenuation of any digital images immediately outside of the audio range. Also, perhaps courtesy of higher-rate upsampling, the 851N offers a more extended and flatter response than its forebears. PM

NETWORK AUDIO PLAYER



ABOVE: Four S/PDIF inputs and two outputs, one AES/EBU in and out, asynchronous USB-B, four USB-A (including an iDevice-compatible USB-A on the fascia), trigger, external IR and RS232. Analogue outs (fixed and variable) via RCA and balanced XLRs

information, the balance is redressed when playing DSD files when the 851N offers just the right combination of smoothness and captivating detail.

This isn't really a 'kick back and relax' kind of player, as the sound is much too interesting and attention-grabbing for that – although using the 'Steep' filter setting did smooth things down a shade. It's never rough or unruly but manages to deliver a sound that's both musically satisfying and impressive in all those hi-fi ways, from soundstage depth and focus to power and definition.

THE BLARE OF BRASS

Starting off with some classic prog in the form of Rick Wakeman's *The Six Wives Of Henry VIII*, in a 96kHz/24-bit rip from vinyl [A&M AMLH 6436], what was immediately apparent was the low-end clarity of which the 851N is capable. Add to this its ability to drive even complex rhythms and present a stinging, but never tortured view of cymbals, plus those characteristically 'period' synth sounds – now revealed in all their edginess.

This view was reinforced with Kyle Eastwood's *Timepieces* [Jazz Village JV 570034 – see *HFN* Jun '15] which makes clear the bass extension and definition on offer here as Eastwood and drummer Ernesto Simpson bounce off each other while, above, the piano of Andrew McCormack sounds deliciously full-bodied and the brass of Quentin Collins and Brandon Allen has beautiful breathiness and blare.

It's hard not to like the way the music explodes out of the speakers in all its three-dimensional glory, with performers reliably placed in an

unforced soundstage, and complete with real ambience and lovely instrumental textures.

Switch to 'Pyongyang', from Blur's comeback album *The Magic Whip* [Parlophone 0825646141692], and again there's that sense of the music breaking free from the speakers and filling the room. The sound is instantly attractive, and yet rewards close attention with the information it contains about the tonality of voices and instruments.

Unsurprisingly, this sonic ability means the Cambridge Audio also makes a fine fist of classical music, and I greatly enjoyed the Kansas City SO/Michael Stern recording of Britten's *Young Person's Guide To The Orchestra*. This music could almost have been written as a system-tester, and in DSD64 [from Reference Recordings RR-120 SACD] every instrumental timbre was crystal-clear, even in the relentlessly building final fugue. Hugely exciting.

It's hard not to conclude that this is a major league contender, and from a brand still (wrongly) associated with budget separates in the mind of many an audiophile. Which is their loss... ☹

HI-FI NEWS VERDICT

Combining solid build (what Cambridge cheekily calls 'Full Metal Jacket') with flexible, intuitive operation and a glorious sound, fully capable of slamming home rock or drawing out the scale of classical music, this is a fine addition to the flagship Azur range. Network DSD streaming would have made it perfect, but whether as a source or keystone of a complete system, the 851N is excellent value for money.

Sound Quality: 87%

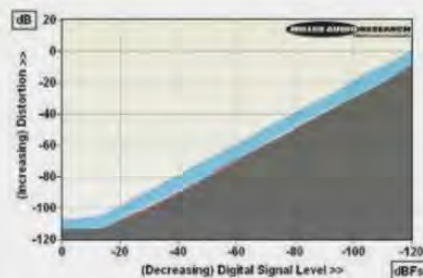


LAB REPORT

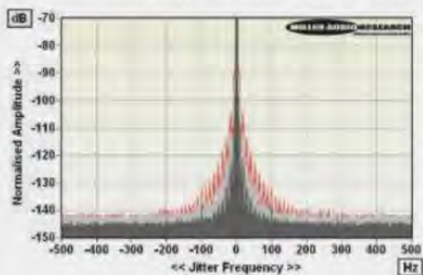
CAMBRIDGE AUDIO AZUR 851N

Tested in its fixed analogue output setting (and USB configured for 192kHz-ready 2.0 mode), the 851N offered a near-flawless set of numbers. The by-now-familiar Linear, Minimum Phase and Steep roll-off filter options offer responses of –1.4dB, –1.3dB and –9.7dB at 45kHz, respectively, with 96kHz media and –3.3dB, –3.2dB and –11.5dB at 90kHz with 192kHz files. Maximum output is a heady 4.27V (balanced) via a 45ohm source impedance while the A-wtd S/N ratio is impressively wide at 112.2dB, 112.1dB and 111.3dB via S/PDIF, network and USB digital inputs. Distortion and low-level linearity are first-rate via all inputs but, if minuscule differences are analysed, the rank order is as above. Unlike with most DACs there's no peak-level compression here, so distortion remains incredibly low at ~0.0002% over the top 15dB of its dynamic range through bass and midrange, increasing to just ~0.0004% at 20kHz and ~0.0006% at 40kHz with 96kHz inputs [see Graph 1, below].

Jitter is also lowest at 50psec (48kHz) falling to 10psec (96kHz) via S/PDIF, increasing marginally to 60psec (48kHz) via USB and then to 385psec (48kHz) via the wired network connection. These are all low-rate jitter sidebands [see Graph 2, below] and decrease further to 125psec (96kHz) and 50psec (192kHz) via the network input. The latter does not handle 32-bit floating-point WAV files, by the way. The remaining, analogue, parameters including separation (130dB) and channel balance (0.04dB) are all superb. Readers may view comprehensive QC Suite test reports for the S/PDIF, USB and network audio performance of Cambridge Audio's Azur 851N by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM



ABOVE: Distortion versus 24-bit/48kHz digital signal level over a 120dB range at 1kHz (S/PDIF, black; Network, red; USB, grey) and 20kHz (USB, blue)



ABOVE: ±500Hz zoomed, low-rate jitter spectra comparing S/PDIF, black; USB, grey and Network, red

HI-FI NEWS SPECIFICATIONS

Maximum output level [Balanced]	4.27Vrms at 45ohm
A-wtd S/N ratio (S/PDIF / USB / Net.)	112.2dB / 111.3dB / 112.1dB
Distortion (1kHz, 0dBFS/–30dBFS)	0.00020% / 0.00022%
Dist. & Noise (20kHz, 0dBFS/–30dBFS)	0.00024% / 0.00045%
Freq. resp. (20Hz–20kHz/45kHz/90kHz)	+0.0dB to +0.08dB/–1.4dB/–3.3dB
Digital jitter (S/PDIF / USB / Network)	50psec / 55psec / 385psec
Resolution @ –100dB	±0.1dB
Power consumption	22W (<1W standby)
Dimensions (WHD) / Weight	430x115x360mm / 8.1kg