

Cambridge Audio Azur 851C/851A (£1195/£1195)

Now six years in service, Cambridge Audio's innovative Class XD technology is refined and re-housed in a new amp and partnered by a giant-killing DAC-plus-CD player
Review: **John Bamford** Lab: **Paul Miller**

When is a CD player *more* than a CD player? When it has inputs. Then it's a standalone DAC – with an in-built CD drive for added convenience. No separate disc transport and connecting cable required!

Enter Cambridge Audio's new 851C disc spinner, replacing the EISA Award-winning 840C in the company's prestigious Azur component line-up. As in the outgoing model, the 851C uses on-board DSP for 24-bit/384kHz upsampling, employing a customised version of Anagram Technologies' Q5 and Adaptive Time Filter (ATF) systems, licenced by Cambridge from the Swiss firm.

This has been refined over the years, the 851C now featuring the latest ATF2 upsampling and de-jittering technology. The machine has full dual-differential architecture, using twin Analog Devices AD1955 DACs, and offers a choice of steep roll-off, linear phase and minimum phase filters that can be selected via a button on the fascia or the remote handset. And, as before, it has digital inputs for hooking up external sources. But where the 840C had only RCA and Toslink S/PDIF inputs this new 851C adds an AES/EBU (XLR) and an XMOS-based asynchronous USB input. Cambridge supplies driver software for PC users, enabling the USB port to accept media files up to 24-bit/192kHz.

I can't recall the first CD player that came with a digital input, but I suggest such a feature was of only minor interest at the time. Wind the clock forward to today and, due to the ubiquity of computer audio and increasing availability of hi-res downloads, standalone DACs are *the* hot ticket item in the specialist hi-fi industry. This year we've witnessed Cambridge

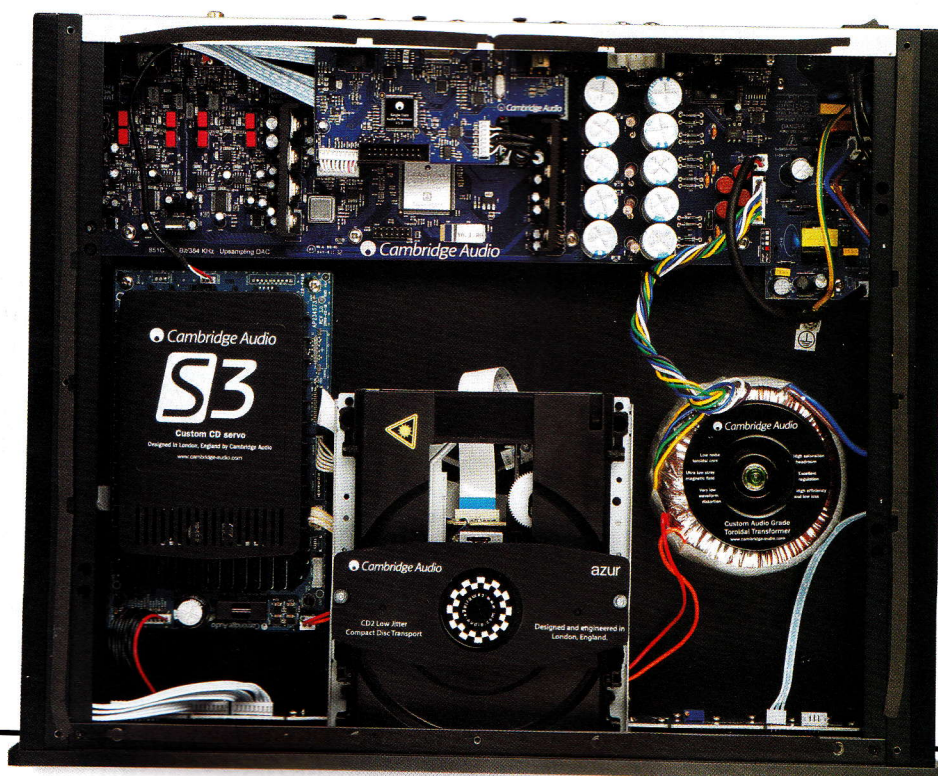
replace its bargain-priced DacMagic D/A converter with *two* affordable models, the DacMagic 100 and DacMagic Plus. But make no mistake, it's this 851C that represents Cambridge's top-of-the-line, most sophisticated digital-to-analogue converter. Where the DacMagic models are powered by plug-top power supplies, under the bonnet of the 851C is a custom toroidal transformer feeding a substantial power supply with independent regulation for the transport, digital and analogue sections. So I'll say it once more: it's a standalone DAC with a CD transport built-in as a bonus...

NO MERE AFTERTHOUGHT

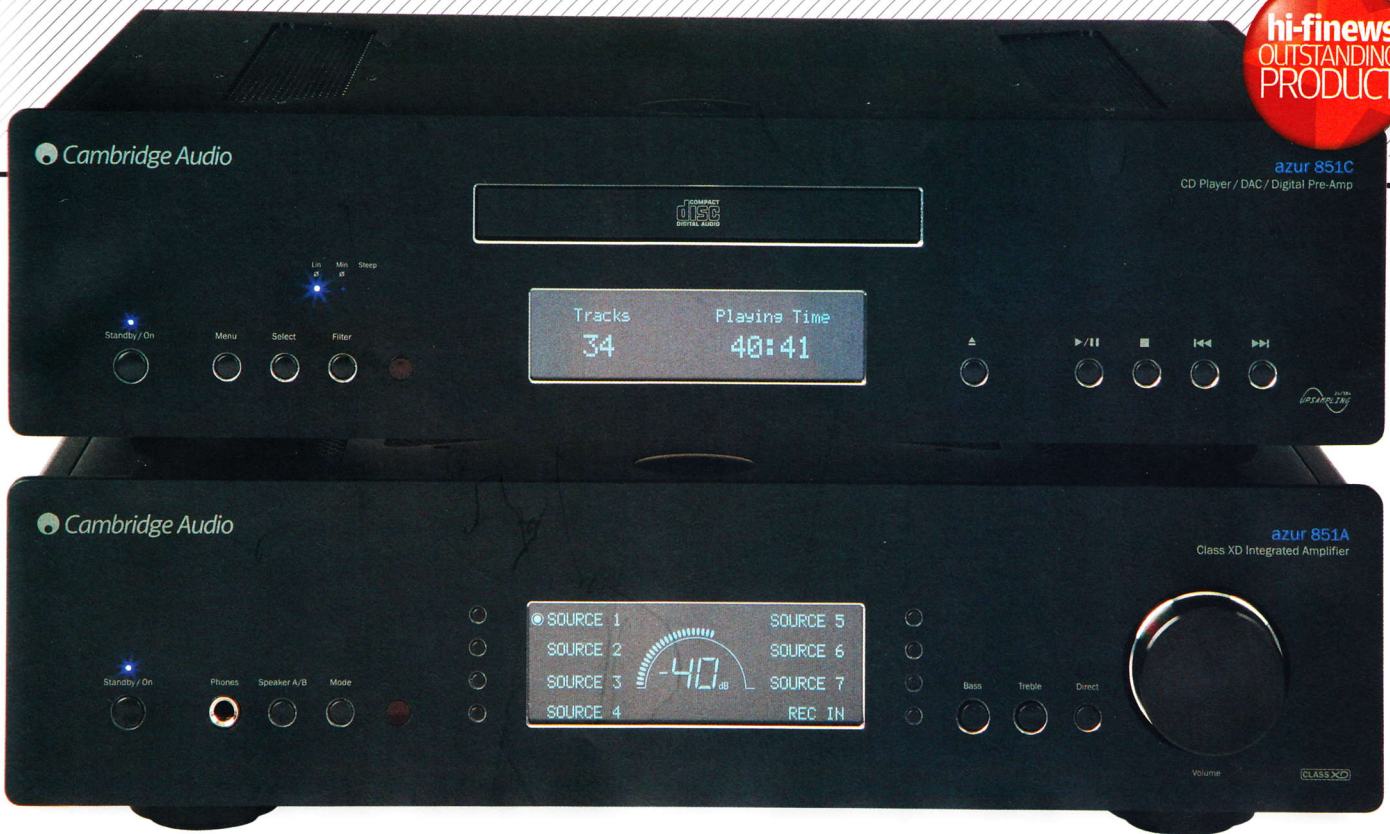
Mind you, CD replay isn't just an afterthought. Cambridge's engineers have specified a CD-only transport mechanism employing a rubber-damped laser block

sourced from Japan, along with a new ARM-controlled CD servo of custom design dedicated to getting the best possible performance from Red Book media. It proved pleasingly slick in operation. The 851C also displays CD Text information. A selectable volume control is included (with channel balance too) so you can even use it as a preamp in a digital-source-only system – although there's no volume knob or up/down buttons on the fascia itself.

Meanwhile, the 851A amplifier replaces Cambridge's 840A v2. As before, it's a powerhouse integrated rated at 120W/8ohm featuring refinements to its proprietary Class XD technology [see boxout]. The 851A has a new volume control, the resistor ladder and relay design previously used replaced with a balanced silicon gate control. Seven line inputs are provided. Those labelled Input 1 and



RIGHT: More DAC than CD player, the 851C features a USB2.0 receiver, custom (Anagram) upsampling/switchable digital filters and twin Analog Devices AD1955 converters



ABOVE: Soft-touch controls and a wealth of other functions added by the matching remote handset [see p31], but the back-lit displays do not quite match in style, brightness or colour

Input 2 have both single-ended (RCA) and balanced (XLR) connections. There's a tape in/out as well. Selecting Input 1 (or Input 2) chooses its RCA input, while selecting it a second time switches to its XLR input. Consequently you could

connect *ten* sources to the 851A – enough for most of us, surely!

The 851A's second balanced input has replaced the multi-room connectivity of the outgoing 840A, although custom installations are still catered for by RS232 and IR ports, while two sets of speaker terminals provide A/B/A+B switching. Other niceties include input gain trim and selectable bass and

treble controls that can be set individually for each input via a configuration menu. A preamp output (single-ended only) is included; moreover, any of the inputs can be configured as a power amp input and its

fixed level custom-set. Inputs can be named on both the amplifier and the 851C DAC/player.

Frankly, the feature-set of the 851C and 851A is the stuff of high-end audio dreams, but packaged in sensibly

priced components thanks to economies of scale in Cambridge's Far Eastern manufacturing. They're more expensive than the products they replace, but chassis and bonnet construction is a little sturdier

'This Azur combo took me to places I haven't been for a long time!'

CROSSOVER DISPLACEMENT

Class A is the sledgehammer approach to eliminating crossover distortion – caused by the music signal crossing from positive to negative-going (or vice-versa) and one or more transistors momentarily switching off. In Class A the complementary pairs of output transistors always have sufficient standing current to ensure they remain conducting at all times, but the devices run hot and the implementation is very costly. Cambridge's elegant Class XD alternative doesn't eliminate crossover distortion, it simply shifts it away from the zero-crossing point of the waveform – hence the name 'Crossover Displacement' or XD. Class XD tracks the audio signal and applies a negative bias current, offsetting the position of the crossover point without creating a DC offset.


At low signal levels the crossover point is shifted below the maximum negative swing of the audio waveform, yielding all the benefits of pure Class A. At higher signal levels the offset crossover point falls within the negative cycle of the music waveform – there's the same number of 'transitions' but the nature of the distortion is more easily accommodated by negative feedback. Finally, if Class XD sounds rather like the sliding bias regimes popular with Japanese amps of yore, it's not, for where the latter applied a *symmetrical* shift in bias Class XD applies an *asymmetrical* (negative) shift. PM

than before and they have improved LCD displays that provide better contrast and a wider viewing angle for improved legibility.

HARD TO FAULT

Used to drive the Monitor Audio PL100 standmounts reviewed this month [p56], the Cambridge combo sounded deliciously insightful, the 'open' and ultra-vivid PL100s showcasing the transparency of the upstream source player and amplifier. The speakers' fabulous ribbon tweeters (with almost 100kHz range) revealed the smooth refinement of the Cambridge duo, instruments and voices set against an eerily silent background and clearly differentiated even in dense sound mixes.

I threw a bunch of familiar audiophile 'reference' recordings at this combo. All the usual suspects: Diana Krall's 'My Love Is' from *Love Scenes* [Impulse IMP12342]; Dire Straits' 'Private Investigations' from *Love Over Gold* [1996 remaster, Mercury 8000882]; various tracks by Patricia Barber... you get the picture. What they proved was that these components are more than merely competent, rather they deliver truly excellent sound that challenges products costing megabucks. They seem to tell it like it is, revealing texture, 'character' and space in recordings without imparting an obvious sonic thumbprint of their own.

Imaging was tremendous, Patricia Barber's piano remaining rock-solid in its location in the soundstage with no 

LAB REPORT

CAMBRIDGE AUDIO 851C/A (£1195 ea)



ABOVE: Matching balanced (XLR) and single-ended (RCA) connections are joined by a suite of USB and S/PDIF inputs on the player with two sets of speaker outs on the amp

While the 851A amplifier is clearly a refined version of the 840A [HFN, Jun '06], the 851C CD player/DAC is a new design. Its performance as an outboard DAC is first rate, supporting inputs up to 24-bit/192kHz via S/PDIF and USB with no downsampling while maintaining a consistent 112.5dB A-wtd S/N ratio. Responses are influenced by choice of filter (the Minimum filter has the biggest impact in the *time* domain with its exclusively post-event echo) but they are typically $-0.08\text{dB}/20\text{kHz}$ ($44.1/48\text{kHz}$), $-1\text{dB}/45\text{kHz}$ (96kHz) and $-2.9\text{dB}/90\text{kHz}$ (192kHz sources). Jitter is fabulously low at 117psec (the limit of measurement with 16-bit CD) and typically $<20\text{psec}$ with 24-bit LPCM/USB inputs. Distortion is also very low indeed [see Graph 2, below], not just through the midrange at 0.0002% (S/PDIF) but also at very high frequencies – 0.0003% at 20kHz (OdBFs = 4.31V/45ohm) pays testament not only to the twin AD1955 DACs but also CA's balanced analogue output stage.

The 851A also comfortably busts its 120W/200W spec. at $2 \times 155\text{W}/8\text{ohm}$ and $2 \times 260\text{W}/4\text{ohm}$ with a dynamic capacity of 185W/385W into 8/4ohm [see Graph 1]. The A-wtd S/N is very wide indeed at 91dB (re. 0dBW) while residual hum and noise is almost invisible at -99.5dBV ($10.6\mu\text{V}$). Its frequency response stretches from -3dB at a near-subterranean 2Hz to $-0.9\text{dB}/100\text{kHz}$ while distortion is also extremely low at 0.0003-0.0005% from 1-100W, increasing to just 0.0055% at 20kHz. Readers may view comprehensive QC Suite test reports for Cambridge Audio's 851C and 851A by navigating to www.hifinews.co.uk and clicking on the red 'download' button. PM

smearing of focus during dynamic shifts in her playing. With top drawer recordings, the Cambridge combo allowed you to enjoy a great sense of depth and detail.

ENTER SIR GALAHAD

Muting the amp, I disconnected the PL100 speakers to hook up my towering Townshend Sir Galahads [see www.hifinews.co.uk/news/article.asp?a=9884]. Ridiculous? Using such 'humble' components as the 851s to drive thirty-odd grands' worth of high-end monitors? Well I kid you not, but I was taken to places I haven't been to for a long time by this Cambridge combo! Playing 'Bop' from The Brand Brauer Frick Ensemble's *Mr Machine* album [!K7 Records K7286CD] highlighted the amplifier's immense power reserves and confidence.

This galloping, Steve Reich-esque composition lays out a hypnotic, electronica-type backdrop of piano and drums between the speakers. Against this, startling percussive elements leap out of the mix. Nothing seemed to faze the Cambridge duo: the cracking sounds of wood blocks and bells ricocheted around the listening room; leading edges of transients appeared fast and dynamic. All the while the position of the piano and drums never wavered in the image – even later on when synthesizer sound effects delivered shockwaves of bass energy in this eclectic marriage of electronic dance music with sampled classical instruments.

No matter how challenging the music, the system kept a tight grip on proceedings while appearing calm and unflustered. I mixed and matched the 851s with other components to assess individual

merit. I concluded that the amp is explicit and vivacious, sounding open-mouthed and airy while also delivering the sort of stellar bass common to solid-state muscle amps such as big Brystons and the like.

It's the 851C DAC/player that brings a quiet composure to the party, sounding subjectively 'dark' if a little dry and matter-of-fact. Although it would be churlish to criticise it, I could describe it as slightly soulless and lacking charm. But this would be in absolute terms, comparing it against cost-no-object audio esoterica. Whether unintentionally or by design, however, the 851 combination is a marriage made in heaven.

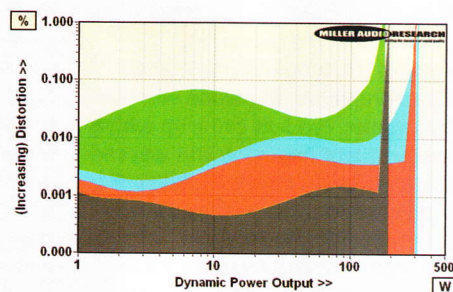
The 851A is a wolf in sheep's clothing, a muscular amp that grips the speakers and serves up tight, powerful and extended bass. Torture tracks such as Grace Jones' famous 'Slave To The Rhythm' or 'Big Wheels In Shanty Town' from David Sylvian's *Rain Tree Crow* [Virgin CDV 2659] were handled with aplomb, bass lines reproduced with gusto while midrange and high frequencies remained polished and squeaky-clean thanks to that quiet composure of the 851C source. ☺

HI-FI NEWS VERDICT

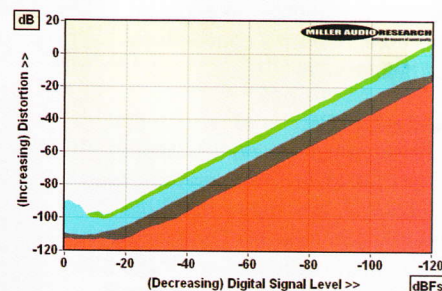
If ever there was a combo deserving of garish 'Buy Me' stickers on the fascias it's these latest Azur components. As is so often the case with products from Cambridge Audio, what you're getting in the 851C and 851A is cutting-edge technology for substantially less than high-end prices. Add the best speakers you can afford and this CD/DAC and amplifier will deliver a taste of hi-fi heaven.

Sound Quality: 86%

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ABOVE (851A): Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads



ABOVE (851C): THD vs. digital signal level over a 120dB range; 24-bit/48kHz (1kHz, red), 16-bit CD (1kHz, black/20kHz, blue) and USB (20kHz, green)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	155W / 260W
Dynamic power (<1% THD, 8/4/2/1ohm)	185W / 305W / 310W / 180W
Output impedance (20Hz–20kHz)	0.028–0.070ohm (45ohm, CD)
Freq. resp. (20Hz–20kHz, CD/amp)	+0.0 to $-0.1\text{dB}/+0.0$ to -0.05dB
A-wtd S/N ratio (CD/amp)	112.5dB (0dBFS) / 90.8dB (0dBW)
Distortion (20Hz–20kHz, CD/amp)	0.0002–0.0003% / 0.0003–0.0055%
Digital jitter (CD/LPCM/USB)	117psec / $<10\text{psec}$ / $<20\text{psec}$
Power consumption (CD/amp)	23W/45W (80W idle/1W standby)
Dimensions (WHD CD/amp)	430x115x360/430x115x385mm