



Audio Note (UK) DAC 4.1

KEVIN FISKE EXAMINES THE CURRENT VERSION OF THE BALANCED AUDIO NOTE (UK) DAC 4.1x

KEVIN FISKE

Many audio companies assert that a circuit can sound good even if the resistors, capacitors, diodes and other electronic components are standard commercial off-the-shelf items (COTS is the common acronym). Audio Note (UK) is one of relatively few companies which argue that component quality matters very much indeed. The company is not saying that cheap components flying in formation cannot sound good. It is saying that the same circuit implemented with quality components may sound even better.

For the most expensive Audio Note UK products, nothing less than the best will do, such as silver end-capped and-wired non-magnetic tantalum resistors, *Black Gate* electrolytic capacitors, and in-house designed and built transformers using costly core materials and silver windings on both primaries and secondaries.

That this is still a contentious issue, and draws snorts of derision from some quarters is illustrative of the bizarre state of denial that exists across much of the audio industry today. Even the most junior engineer will acknowledge that carbon film and metal film resistors of identical electrical values sound different. To argue therefore that the use of alternative materials to these doesn't similarly result in different sonic fingerprints being realised is

inconsistent. Whether we *like* the alternative sound is a matter of honest subjectivity, and we might cavil about the alternative materials on the grounds of affordability, but to deny that materials make a sonic difference, or to ridicule companies that seek to push the materials boundaries, is either revealingly ignorant or simply commercial gamesmanship.

Capacitors

After conducting bench and listening tests of *Black Gate* capacitors for *HiFiNews* in 2003, Martin Colloms observed: "Referenced to the benchmark of the best known non-Black Gate capacitors (including Nichicons, Elna Cerafines etc), the soundstage of the test amplifier after its treatment was remarkably expanded in width and depth, yet its focus is still more solid. Images now hung in space, set in floodlit pools of detailed acoustic ambience. Subtleties which were previously just hinted at were now firmly and expressively delineated. Every point in the audible frequency range was clarified, sharpened, resolved. Rhythm and timing are redefined. Musical notes appear to linger in time and space, of near perfect entity and with breathtakingly natural instrumental and reverberant decay compared with previous experience of that design.

Colorations which were previously blamed on circuit behaviour and specific active devices (if you like, its technology makeup) were in this unit now seen to be largely the fault of

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the previous capacitors, and these familiar errors were almost banished by the progressive and graded installation of the Black Gates.”

Audio Note (UK) originally supplied Colloms with the *Black Gate* capacitors for his test, and later, in 2006, when *Black Gate* intellectual property owner Jelmax Co. Ltd. and Japanese manufacturer Rubycon decided to call time on production, Audio Note (UK) bought up as much as it could afford of the remaining stock – such a large quantity, in fact, that despite installing them liberally in products since then, it still has sufficient key values left more than a decade later to use them in the higher-end amplifiers and power supplies for several years yet.

That said, a looming cliff-edge meant that Audio Note (UK) had to begin thinking about what it would do when the *Black Gates* run out, so it began working with Rubycon in 2010 to develop a new generation family of capacitors that would match or exceed the performance of the discontinued types. Audio Note (UK)’s chairman Peter Qvortrup and his chief designer Andy Grove have racked up significant air-miles between the UK and Tokyo over the last few years to discuss the project with Rubycon’s development and production engineers, agree a way forward, and make regular checks on progress. It’s a long way there and back, but you don’t invest the thick end of £1 million in a new generation of capacitors without several look-sees.

Black Gate capacitors feature carbon-impregnated paper as the separator between cathode and anode. This results in an increase in the electron transfer between the plates, via the electrolyte, creating the cap whose qualities so impressed Colloms. In seeking to recreate the magic, Audio Note (UK) has pooled development costs and ideas with Rubycon to develop three tiers of new capacitors, two of which – the standard and the *Kaisei* range – are now available and being built into products, while the third tier (the *Black Gate* replacements) remain in development.

That final piece of the jigsaw for the re-creation (or improvement) of *Black Gates* is still ongoing. In an e-mail sent to HIFICRITIC from Japan during a visit in early February, Andy Grove updated us on progress: *“The Kaisei is a capacitor we developed with Rubycon to be the best for audio, given what we can put together with modern materials and processes. The upcoming, new Black Gate, will be that, or a modification of it, plus a carbon impregnated paper, which we are experimenting with now. We seem to have the carbon process reliably sorted; now we need to zoom in on a particular type of Japanese paper to use. We are registering a name right now and the Black Gate replacement will likely be available in 2018.”*

Resistors

If *Black Gates* remain the most highly regarded capacitor for audio applications, Shinkoh non-magnetic tantalum resistors are similarly revered, and noted for a detailed and musical transparency far in excess of that achieved by metal film or carbon devices. Alas, it’s a similar story of loss, as Shinkoh has also ceased production, so remaining stocks of all resistor values are dwindling. Audio Note (UK)’s response has been to work on a replacement with an alternative Japanese manufacturer, resulting in non-magnetic tantalum resistors across the full range of resistance values and in 0.5W, 1W and 2W versions.

Re-engineering the original Shinkoh design with its high copper content brass end cap and tinned OFC copper lead-out wires proved relatively easy, even if the new manufacturer insisted on Audio Note (UK) committing to a very substantial first order. Pushing the 2W range up beyond 100kohms proved less simple, and forced a return to the old sputter target method of vacuum deposition instead of the more modern deposition process used to create SMD components. Still, investigations continue. Grove revealed in the same e-mail that the manufacturer is using tantalum film and nichrome film (a type of nichrome metal glaze), and is now experimenting with niobium. He also pointed out that while the recreation of the old Shinkoh design deserves attention, these are not the only type of resistor that Audio Note (UK) has to hand when selecting and combining components during the product voicing process.

“We have different end caps and leadoffs on our resistors, magnetic like everyone else uses, nonmagnetic and silver. All of our finished products use a selection of components from our range to achieve what we want tonally, rather like a painter uses his palette. It’s not a case of just using type A or type B. Although the majority of components may come from a certain box in stores, we will use others to achieve the appropriate sonic balance.”

The availability of these new components has secured Audio Note (UK)’s ability to make finished product to its own high quality formula, but at the same time it has presented the company with a new and profound challenge. Like-for-like swaps of new components for the old types in well-established circuits have not always resulted in like-for-like sound, so now still more R&D effort is being invested in re-voicing all affected finished products so that they adhere to the company’s sonic aesthetic.

The price ticket for the resistor development program and the associated stockholding requirements is somewhere north of £1m, bringing Audio Note (UK)’s total investment in new capacitors and resistors to £2m (and still climbing!).

DAC 4.1x Balanced

Among the first Audio Note (UK) products to be given the treatment is the £11,707 *DAC 4.1x Balanced*. First introduced a decade ago (in 2007), this non-oversampling DAC is simple, well executed, and exemplifies the company's established less-is-more take on digital. Grove's design features a tube-rectified choke-type power supply, an in-house designed and wound digital input transformer, an Analog Devices 1865N R-to-R multi-bit DAC followed by I/V transformers (in-house designed and wound), a tube output stage in which an *ECC82* is followed by a *5687* or equivalent, and finally a pair of chunky C-core HiB output transformers (again in-house designed and wound), switchable for true balanced or single-ended output. This DAC design uses no upsampling, no re-clocking or de-jittering, and no digital or analogue filtering.

*Kaisei*s sound leaner than *Black Gates*, lacking the former's exceptional weight and substance, but they have a clean openness and speed that in some applications can occasionally make *Black Gates* sound comparatively rather shut-in and hazy. And (important to the less patient among us) *Kaisei*s also don't make us wait 200 hours or so of run-in time before delivering their sonic best, unlike *Black Gates*.

The revised *DAC 4.1x* combines dynamic weight and presence along with an open and fast presentation, almost as if someone has thrown open a window and let some fresh air in, such is the combined impact of the new components and the re-voicing. It is not a divergence from the established Audio Note (UK) voice, but at the same time it is invigorating. Grove's engineering assistant Darko Greguras was given the task of making the revised DAC sing. He has used several resistor types in a highly selective way to balance the characteristics of the new capacitors.

Too many alternative DACs deliver an analogue output with a brutal stop-start angularity, often adding to this somewhat mechanical presentation with a top coat of bright hardness. People who really ought to know better call this type of presentation 'detailed'. It is nothing of the sort: it is an aberrant coloration, if our definition of 'good sound' is natural sound.

In the *DAC 4.1x* the *Kaisei* capacitors don't quite result in the "floodlit pools of detailed acoustic ambience" ascribed to *Black Gates* by Colloms, but they do deliver a truly beguiling helping of glowing harmonic complexity that puts the revised DAC ahead of its predecessor and, in my view, anything else up to (and some way beyond) its price point. There's no hint of mechanical *sturm*

und drang, no hint of glassy hardness; just a sweet and natural ebb and flow, rise and decay, with a separation between sounds that allows the brain to comprehend musical intentions with little effort and considerable satisfaction.

The revised *DAC 4.1x* reminds me of the Grove-designed *Tomei 211* integrated amplifier. The DAC and amplifier share a funky strand of sonic DNA that elevates both beyond the ordinary in the enjoyment of any and every kind of recorded material. Yes, a still more refined sound can be had for more money; and yes, one can spend less and acquire some of what the *DAC 4.1x* and *Tomei* achieve. However, for buyers of modest means but high expectations – what my late mother used to call 'champagne tastes but beer money' – both these products might be regarded as occupying a particular sweet spot.

The *DAC 4.1x* will not play 24-bit/96kHz (or higher-res) files. What it will do, if you team it with a quality transport that doesn't mess about with the data streaming from its drive is reveal just what an astonishing depth of information was previously hidden on your CDs (16-bit/44.1kHz files): not 'detail' as in hi-fi faux emphasis, but detail as in timbre, timing nuance and dynamic contrast.

We ought to resist getting too carried away: after all, this is digital, not benchmark vinyl. Nonetheless the new *DAC 4.1x* is to be commended for its enhanced ability to reveal the differences between recordings, showing the bad to be what they are, and the best to be sublime. If Red Book CD is your bag – and which of us doesn't have a very substantial investment in the format – this is an extremely appealing prospect. It presents us with an opportunity to reconnect at a deeper level with the recorded material that we own, and to derive greater musical enjoyment and satisfaction from it. Audio Note (UK)'s *DAC 4.1x Balanced* is therefore a shoo-in for *HIFICRITIC* Audio Excellence status.

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Manufacturer's Specification

Inputs	RCA 75ohms S/PDIF, XLR 110ohms AES/EBU
Output Impedance	600ohms, Balanced or Single Ended
Output level	3.2V RMS
Channel Balance	< 0.2dB
Valves	1 each: 5814a, 5687WB, ECL82, 6X5
Weight	22kg
Size	450x145x425mm
Digital	Analogue Devices AD1865N (non-oversampled)
Price	£11,706.75

