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REVIEWED THIS ISSUE:

FOCAL DIABLO
PMC TWENTY.24
WIDEALAB AURENDER S10
AUDIO NOTE CDT-SIX/FIFTH ELEMENT
ARCAM FMJ D33
KRK ROKIT 10-3G2
VERTEX AQ ALETHEIA DAC-1
BURMESTER 089
VOXATIV AMPEGGIO DUE
REGA RP6
TIGER PAW KHAN
CYRUS AUDIO STREAM XP
MARANTZ NA7004
PRO-JECT STREAM BOX DS
TOWNSHEND ALLEGRI
ALACRITY AIDIO CATERTHUN
EVENT ELECTRONICS OPAL
MUSICAL FIDELITY V-DAC II
MUSICAL FIDELITY V-LINK 192

ULTIMATE CD?

Is Audio Note's four-box CD player the best ever?

ARCAM'S SUPERDAC

Rafael Todes tries Arcam's FMJ D33 DAC

VOXATIV VOBISCUM

The ultimate single driver speaker.....probably!

A REGA COMPARISON

How much better is an RP6 than an RP3?

STREAMING MUSIC

Cyrus, Marantz and Pro-Ject music streamers assessed

ULTIMATE CONTROL

Is Townshend's Allegri the bargain-of-the-decade?

MUSIC & MUCH MORE



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It does one good to get out now and again. True. But the world outside can be a confusing and daunting place.

For more than twenty years, most of my attention has been firmly focused on loudspeaker reviewing, mainly for *Hi-Fi Choice* magazine. I came into the business through an early chance relationship with Spendor, have always liked loudspeakers and their foibles, and feel some empathy with their unique combination of simplicity, subtlety and complexity. Add in the fact that new models are always queuing up to get themselves reviewed, and not much time has been left over to get too involved in other components.

One major bonus of reviewing loudspeakers is that it fits in neatly with the key paradigm for scientific method, to change one variable at a time. Sure, variations in positioning and room interaction, and changes in speaker cables and (sometimes) stands can affect the end result, but by and large the signal source can be kept more or less constant throughout, which brings some consistency to one's judgements.

Or so I thought, before the Voxativ *Ampeggio Dues* arrived, forcing me to confront some of the more subtle aspects of the amp/speaker interface. Sure the Voxativs work well enough on the end of the Naim *NAC552/NAP500* amp combo which I normally use and continue to regard as a fine reference point. But the characteristics of these speakers do tend to highlight the limitations of that particular class of amplification, instead favouring some single-ended triode alternatives I had to hand.

It's not that one set of amplifiers was actually better than the other. Rather that one was better suited the strengths and weaknesses of this particular pair of speakers. Admittedly it took a while for the pennies to drop, but because the Voxativs have very high sensitivity and favour the broad midband over the frequency extremes, they really do work best with the low power, low noise and midband-oriented valve amps. The corollary is that more conventional large multi-way speakers tend to better suit solid state amps.

Power amps, loudspeakers and their interactions are interesting enough, but their ultimate influence on the sound of a system is never going to be as musically or emotionally significant as improving the source.

Reducing my speaker reviewing activities has meant getting more involved in components further up the chain. I'm not sure whether this is better described as a quicksand or a minefield, but either way it has taken me further outside my comfort zone than I expected. That has much to do with a considerable increase in the number of possible extra variables one has to deal with: support furniture, mains cables and signal cables, to name just the most obvious three.

We're talking moving targets here, not to mention an unavoidable bubble of uncertainty. For example, early in this issue's schedule I was starting to wonder whether digital audio in general and computer audio in particular was getting close to challenging vinyl replay. Then the Tiger Paw *Khan* arrived, upgrading my vinyl source and confirming anew its sonic supremacy.

Paul Messenger
Editor

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Computers *can* deliver the goods



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Martin Colloms finds an inexpensive, high quality compact Pro monitor from KRK on page 22



Ultimate CD?

MANY MAY REGARD A £192,000 CD PLAYER AS CONFIRMATION THAT THE WORLD HAS GONE MAD, BUT IT LOOKS A TEMPTING PROSPECT FOR THE (VERY) FORTUNATE (VERY) FEW

“Value for money is inevitably an element in the balancing and weighing up processes of any appraisal, and was clearly going to be a significant factor here. Yet during each listening session – and there were many – considerations of value simply went right out of the window”



The phone rang: “Would you like to hear my latest DAC?” It was that Danish audiophile Peter Qvortrup, *patron* of Audio Note UK, sounding as casual as ever. I thought no more about it until he turned up a month later with four large boxes in the back of a rare Mercedes E36 AMG estate. “I don’t think you’ll be able to pick it up!” he said ominously, and he was right; that task (for the heavier units at least) was left to AN UK designer Andy Grove. A partial demolition of my installed system was required to site this CD player, a two-box CD drive mechanism or ‘transport’, S/PDIF linked to a two box DAC, the secondary full size enclosures containing most of the power supplies. Three mains cables are required, one each for the power supplies, and one more to the DAC to power its digital input stage.

“It’s a bit fresh”, he noted thoughtfully, “Full of those pesky Black Gate capacitors which take several hundred hours to run in, so you’ll have to be patient”. Actually, it sounded more than interesting straight out of the box; then significant performance improvements were recorded with each passing week of use.

Customers already owning Audio Note UK’s ‘high end’ CD replay equipment had been enquiring about the next stage of development, adding that performance mattered more than price. This set the stage for Grove and Qvortrup to explore the boundaries of their exotic approach to audio engineering, primarily founded on triode valve amplification, exclusive and exceptional transformers, and truly heroic valve regulated power supplies. Also leavening the mix are custom-made silver-in-oil capacitors, exclusive resistors, silver internal wiring and transformer windings, and advanced magnetic technology for transformer cores. The idealised approach to the critical I/V (current-to-voltage) conversion stage at the output of the D-to-A chip uses a massive transformer, with costly, high nickel cores that are double the size of those previously

used. In some respects this DAC signal is analogous to the output from a moving-coil cartridge.

The AN UK product line shows a linear improvement path, each stage reflecting the development of circuits and technologies which continue to provide improvement in sound quality. The valves are NOS (new old stock) types from a large company stockpile. Their audio specifications usually assure sufficient subjective accuracy, but elegant test results have never been pursued for their own sake: the constant aim is always best outright sound quality.

Having designed a good sounding DAC implementation, the problem was how to deliver this quality to the output sockets. The answer was no less than a full M9 pre-amp, with a massive power supply but without the volume control and selector switch. Unusually, Grove found an advantage in tailoring the digital output of the transport with a VHF triode buffer, repeating the same as an input buffer for the DAC.

The CDT-Six disc playing unit, largely constructed from copper slabs, weighs an extreme 36kg. A very heavy, low resonance floating subchassis is used for the Philips CDM Pro9 CD mechanism, configured as an optically sealed, magnetically clamped top-loader. Separate power supplies are used for the digital, the motor drive, the servo sections, and the S/PDIF output. Mains enters at the power supply box and three locking cables supply power to the disc player proper. Digital output is via a silver plated RCA connection. CD playing may be controlled remotely from a sensibly simple, compact and unpretentious plastic handset, with all the usual features including display dimming to ‘off’ in three steps.

Dubbed the *Fifth Element*, this non-oversampling two-box DAC is a further development of AN UK’s single-box DAC 5 *Signature*. It’s founded on the Analogue Devices AD1865 chip, requires two separate

mains cables – one to the power supply and one to the DAC proper (to power the digital circuits and the triode-buffered S/PDIF input). The reconstructed audio signal benefits from some RFI filtering from the I/V format, and then continues with the two stage triode pre-amplifier section borrowed from the *M9*, including top quality silver-wound C-core output transformers with their convenient balanced and single ended outputs. Custom capacitors are extensively used, including numerous Black Gate examples from the company's stockpile.

Sound Quality

As those who know me are well aware, I am rarely lost for words, but in this case it was some time before I dared commit my thoughts to paper. Value for money is inevitably an element in the balancing and weighing up processes of any appraisal, and was clearly going to be a significant factor here. Yet during each listening session – and there were many – considerations of value simply went right out of the window.

The sound quality was consistently overwhelming, almost defying critical opinion, constantly demanding one's attention with the beautiful sounds it rendered from digital sources. An opinion on a medium can only be as good as your latest and best experience: whatever we may have considered was the limit for CD's Red Book 16-bit/44.1kHz format and its historic recordings, that barrier has now been comprehensively overturned.

The extreme price is not the issue here. What is important is that it can be done, and has been done. With this player hooked up, a music catalogue becomes a place of wonder. I revisited disc after disc, track after track, not merely to sample pieces to see how they might turn out, but to play them through as complete works, marvelling at the musical revelations this amazing player continually provided.

Friends and colleagues queued up to hear these units, agreeing that at the present state of our understanding and experience it could not reasonably be faulted. Despite wide differences in taste and experience, all who experienced it heard what they wanted to hear: rhythm guys got great rhythm; power merchants got dynamics and powerful percussion; image aficionados got massive depth and highly focused soundfields. Hi-fi enthusiasts heard deep powerful tuneful bass and sparkling, detailed and open sounding treble.

Singers sounded open-throated and beautifully articulate, choirs were explicit and well separated, and the panoply of orchestral sounds was very natural and finely differentiated. Greater musical clarity was somehow extracted from numerous

familiar recordings. By comparison, several of these had previously sounded a touch noisy, rather two dimensional, even glazed and hardened. Piano recordings sounded particularly good, and the absence of a digital replay filter was immediately evident in the open dynamic expression, natural timbres, and freedom from false ringing.

Some recordings demonstrated a remarkable sense of presence, where close-miked singers seemed to step right into the room when replayed at the correct sound level. Conversely natural acoustic recordings showed immense depth, seemingly 20 foot behind the speakers and imbued with subtle detail and rich reverberation. Occasionally some of these qualities can be heard from some equipment, but never the whole package provided here, with its natural fluid sweetness, vivacity, and an extraordinarily infectious level of communication.

I consider myself an exacting critic that demands high standards, but have been overwhelmed by the consistently inviting sound quality of this player. The team responsible seem to have taken excellent vinyl replay sound as the target and have found a way to reach it. The sound is so like fine analogue can be that I can concede that in many arrangements this performance would be hard to master without access to master tapes.

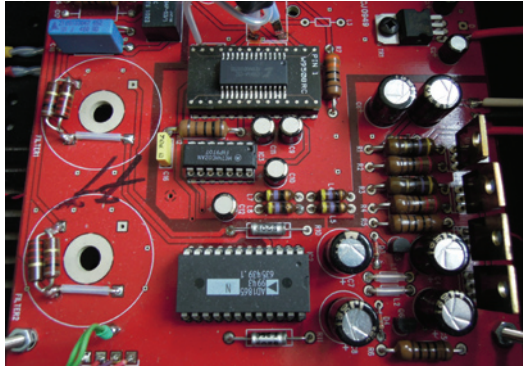
Extensive comparisons with other references confirmed that there was no faking, and that no subtle equalisation or voicing is involved. Tests using the DAC and the CD drive separately confirmed that each was universal, and of comparable merit. This *CDT-Six* (Level Six) CD drive spiced up the sound of every DAC I tried it with, delivering firmer bass, substantially clearer and better resolved treble, and providing major gains for image depth, focus and detail while maintaining top class rhythmic performance and dynamic drive.

The *Fifth Element* DAC was just the same, here fed from a variety of S/PDIF sources up to 24-bit 96kHz, and it was able to read much of the higher sound quality of HD programme. (Note that it truncates words to 18-bit resolution, and the mute relay rattles helplessly with still higher sample rates.) Two extra bits and a doubled sample rate were easy to hear, which testifies to the very high quality of the DAC interface.

Material lacking in timing quality was not spared. Tracks with less resolution indeed sounded less well resolved, and inherent hardness or grain was never smoothed over. Nevertheless with this DAC my own varied digital sources have never sounded better, especially the network music server, rendering S/PDIF *via* a Naim *UnitiServe*. The original disc loaded in the *CDT-Six* disc drive was clearly better,

Review System:

Finite Elemente *Pagode* supports; Krell *Evo 402e* power amp; Audio Research *Reference 5SE* and Townshend *Allegrì* controllers; MSB *Platinum Signature DAC/Diamond PSU*; Transparent *MM2* cables; Wilson Audio *Sophia 3* speakers. Vinyl replay used a Linn *LP12/Radikal/Keel*, Naim *Aro*, *Superline/Supercap*, Koetsu *Urushi Vermilion* cartridge. A Meridian *200* and a Naim *UnitiServe* were used for network S/PDIF rendered audio.



with superior control of residual grain, better clarity, bass depth and rhythm. However, when streaming the few 24/96 tracks available, there was now sufficient advantage to leapfrog the CD drive's 'Red Book' performance. Now the *Fifth Element* DAC showed gloriously just how much more transparency, detail, openness and image scale could be generated from the higher resolution format, notwithstanding that the DAC only has an 18-bit non-oversampled chip (though admittedly a very good sounding one).

Both the supplied AN UK digital cables, *Pallas* and *Black Pallas*, were very good; the latter clearly superior. Lesser alternatives were quickly discarded, save for Naim *DC1*. Clarity and grain were poorer with the Naim cable, and there was some hardness too, but also promising indications of still better dynamics and bass rhythm. Not having an RCA to RCA version to hand, I was using a BNC adapter, which turned out (as Naim has often noted) not to have fully engaged with the RCA transport socket. I got out pliers, careful tensioned the adapter splines, and was immediately rewarded by greater depth, a cleaner sound overall and still better rhythm and dynamics – further testament to the intrinsic performance of this AN pairing. Depending on your system and inclination I can recommend the Naim cable, though for ultimate transparency the top AN UK cable was pre eminent.

I almost forgot to try the player's 'display off' feature, and what a bonus this was, opening up the sound still further and delivering yet more depth detail and clarity – not a subtle difference at all. Until now I had no idea my reference system could sound so transparent, but this DAC's superiority was clearly audible through the potential barriers of Audio Research *Reference 5SE* pre-amp and Krell *Evo 402e* power amplifier and cables, very good though they undoubtedly are. There remains the distinct possibility – indeed likelihood – that a still better replay chain could extract even more music from this remarkable CD player.

Awarding a merit score for this four-box CD player seems a faintly ridiculous idea, given that my

numeric results are successively amplified by the power law progression stemming from my percentage improvement scheme, even though it still makes intuitive sense to me when judging performance gains.

The following figure can only be regarded as an estimate, since it's dependent on the quality of the replay chain. Comparing notes with colleagues who shared the experience, and with previous references, an estimated sound quality score is 'around 450': I can visualise some die-hards reeling in horror. At present, when replayed *via* the network, Red Book rips are about 30 marks below that figure, while hi-res audio from the same source scores 25 marks above it. And for the CD transport, *not* turning off the display will cost you 20 points, with more thickening and vocal congestion, and less overall clarity and immediacy.

I noted that at very high volume settings I could just hear (ear to the speaker cones) a low level grumbling from the power supply. On instruction I replaced the *OB2* gas regulator valve, which fixed this for a while, but it came back. A power off/on cycle then caused it to vanish again!

Lab Report

As expected from a non-oversampled design, there's no output filtering save for the natural high frequency roll-offs in the circuits and transformers, the latter nevertheless represents a certain benefit to subsequent components in the chain. Channel balance was excellent, holding within 0.08dB 20Hz to 20kHz, while the output, unaffected by loading, is sourced from a very low impedance of about 27ohms. Channel separation was fine: 39dB at 20 Hz, 76dB midband and 65.5dB by 20kHz. Distortion was unexceptional at 0.85% at full level, but rapidly improved at normal modulation levels, *eg* 0.08% at -10dB and 0.05% at -20dB.

With its single-ended triode output stage, the harmonic content was dominated by second harmonic, a little third harmonic and nothing else. With no digital filtering there's no pre-echo, so accurate 1kHz square waves may be reproduced. The frequency response was flat in the primary central range +/- 0.15 dB 30Hz to 5kHz; 20Hz was at -0.25dB and 17kHz at -1.5dB – barely audible, since 10kHz was only -0.63 dB. At full level 20kHz the aliasing beat tones with the 44.1kHz sample rate were unattenuated (see graph), but as usual reduce quite quickly with reducing modulation level. At full level there is a 4kHz intermodulation product at -25dB, but at -20dB modulation that had fallen to -48dB and is likely to be inaudible. The valve output stage has a finite noise floor, so the 'jitter gram' for a pure 1kHz tone, while clean of itself, may only be



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resolved down to -115dB; no unwanted sidebands could be seen thus far.

Signal-to-noise ratios were more than satisfactory, albeit with some imbalance between channels, averaging 91dBA, 84dB CCIR (1kHz) and 83dB unweighted. High frequency intermodulation at full level was a poor -26dB, and very loud cymbal crashes might show slightly altered timbre, though I did not hear such, and this aspect improved rapidly at normal signal levels, eg to 0.35% at -10dB modulation. Linearity was good down to -75dB but some 'expansion' error was seen below that, with -80dB reading -86.5dB. This 'negative' error continued to -100dB where the output finally dropped out and may be a function of the I/V method used. (This DAC chip has the potential for trimming the low level matching, but that is not done here.) One might speculate that this characteristic would attenuate and reduce low level detail, but as the listening showed this was far from the case.

As with the Metrum *Octave* results, it seems that much lab data for -70dB and below has little relevance to sound quality. Incidentally, I measured the RFI at the output up to 1.5GHz, and found that it fell to low levels above a few hundred kHz.

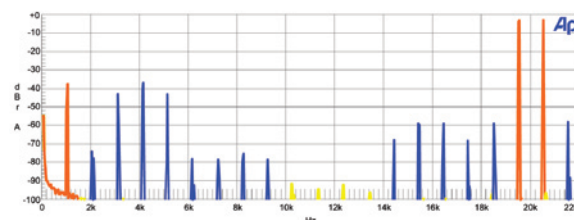
Conclusions

When this review was first proposed, my first reaction was hysterical laughter. UK houses cost a similar amount on average. How would a CD player like this sound in a complete system made up using comparably priced components? And what would such a system cost? A million pounds? I have tried to answer these questions by extrapolation and with an extensive set of listening sessions with a variety of audio components and listeners.

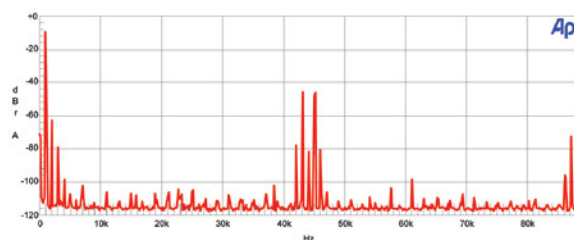
But my basic task is to observe and report, and my finding is that this CD 'transport'/DAC is outright marvellous, newly defining the inherent quality of Red Book digital audio, which can be so much better than we had imagined was possible. It poses the question: "Why has it taken a specialist valve audio manufacturer to achieve this after 30 years of highly informed digital engineering by the audio industry as a whole?" While there is some hi-res audio material now, it is also clear that CD has been potentially 'hi-res' all along, but we never truly experienced it. Instead we've suffered the distortions and masking of digital filters, op-amps, and accompanying digital noise, for all these years.

While very few examples will be made and sold at such extravagant prices, we owe a debt to the Audio Note UK team for showing just what is possible. Here is a CD player which really can give high end analogue a run for its money.

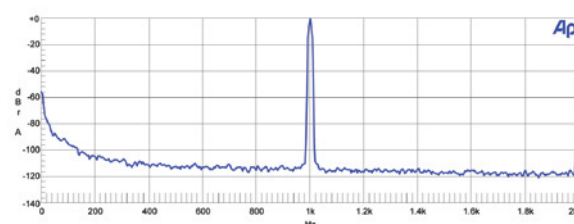
AN level 5 DAC Digital 20kHz intermodulation @ -12dB



AN level 5 DAC Digital 1kHz distortion and alias spectrum



AN level 5 DAC Digital jitter 1kHz full level, 0-2kHz span, 140dB resolution



HIFICRITIC Test Results

Make Audio Note	Date 14/05/12		
Model Fifth Element DAC	Ser. No. FF004		
Distortion, THD inc noise	20 Hz	1 kHz	20 kHz
0dB	-dB	-47dB	-dB
Channel separation 0 dB	38.8 dB	76.2 dB	65.5 dB
Frequency response	-0.25 dB	0 dB	-1.68 dB
Channel Balance ref. 0dB L ch	0.04 dB	0.02 dB	0.08 dB
Intermodulation Distortion			
19kHz/20kHz 1:1 0 dB output	-26.3 dB		
1kHz diff tone -10 dB o/p	-48.5dB		
Signal-to-noise ratio, dB	88/95 A wtd	82/87 CCIR 1k	82/85 unwtd
Linearity ref 0dB	-70.3dB	-70.8 dB	
	-80dB	-86.5 dB	
	-90.7dB	-97.1 dB	
Maximum output 100k Ohm load	+1.4dB	2.77 V S-E	2x 2.77VBal
Output impedance	27 Ohms		
DC offset	Left 0 mV	Right 0 mV	

GENERAL

Surface gap (CDT-Six) (PV 31 1.5mm)	passed, good		
Size (WxHxD) (four units)	45 cm	14 cm	48 cm
Weight	Up to 36kg ea.		
Price UK £	2x £96,000		

Subjective Sounds

PAUL MESSENGER

HIFICRITIC

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BECAUSE HIFICRITIC IS FUNDED BY ITS READERS THE SUBSCRIPTION COST IS NECESSARILY HIGHER THAN FOR MAGAZINES SUBSIDISED BY ADVERTISING REVENUE, THOUGH CERTAINLY NOT AS HIGH AS PROFESSIONAL SPECIALIST JOURNALS.

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Our independence from product advertising allows us to criticise and comment without fear or favour. The HIFICRITIC team scrutinises interesting and internationally important issues and equipment in depth and detail, technically and subjectively, and provides comprehensive investigations into the key issues facing high quality stereo music recording and reproduction today.

Martin Colloms, Publisher

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Work has required me to use computers for decades – my first Mac arrived more than 20 years ago. But because it's for work I've never really embraced its leisure possibilities. True, I've put some of my music into the iTunes program that came already installed, but have never really developed the habit of accessing it. That might be about to change, though quite which route I shall take is still undecided, since there are a number of options.

Although I personally find computers confusing, alienating and irritating in more or less equal measure, I do appreciate that's a minority view, and for much of the population the home computer (and now the smartphone) sits at the heart of leisure activity. And although it might have limited audiophile appeal, the home computer has increasingly become the music source of choice for a great many consumers.

Audiophiles are more likely to embrace the music file products developed by leading hi-fi brands like Naim and Linn that are actually computers in all but name, and may operate alongside hard drive music storage and other peripherals. Such components (though not necessarily the peripherals) are designed to fit in both physically and ergonomically with typical hi-fi systems, connecting up and operating on a simple 'plug'n'play' basis. But they do cost significantly more than computer based alternatives.

However, I recently encountered an audio source that does use a computer and which was patently up there with the very best digital audio sound quality I've heard to date. Audiophile Scott Berry has gone to great lengths to get the best possible sound quality from his computers, developing a top quality (if regrettably costly) USB-only DAC, and recently started Computer Audio Design (CAD) to make and sell it.

We may have covered similar ground previously with Andrew Harrison and Stephen N. Harris (*eg HIFICRITIC Vol5 No3*), but I thought Berry's techniques for using computers to rip and replay music files deserved exposure (see pp51-53). Here I'm looking more specifically at his *DAC 1543*, which takes a number of established techniques to their logical conclusion, but above all sounds very good indeed.

It's a very purist component, deliberately built into self-damping, non-magnetic acrylic casework, and well stuffed with audiophile-type components. As many breaks in the circuitry as possible are eliminated: the only input is a solitary USB, as switches were found to compromise sound quality; the only output is a pair of phono sockets. Even the mains lead is captive here, avoiding the usual IEC switched socket mains input, and the front panel has no on/off switch either, to encourage the unit to be kept permanently powered, as the power supplies apparently take 24 hours to achieve best performance.

As the name suggests, it uses Philips' multi-bit *TDA1543/N2* 'ladder-network' DAC chips – interestingly, the same as used in the Vertex AQ's *Aletheia dac-1* (p24) – but in this implementation there are no fewer than 16 such chips in parallel, to lower noise and output impedance and allow a wholly passive, non-oversampled, non-filtered output. It ticks all the audiophile boxes, incorporating an asynchronous USB interface and galvanic isolation from the computer.

I only had 24 hours to play with Berry's computer audio system, and the DAC was clearly a prototype, but that was more than enough to convince me of its superb sound quality, alongside all the convenience of remote *iPad* control.

However, cheap computers notwithstanding, the *1543 DAC's* hefty £6,500 pricetag takes a complete computer music source well into the zone of established hi-fi specialists like Naim and Linn, without offering their dedicated music-oriented 'plug'n'play' simplicity. I suspect it will be competitive on sound quality grounds, but am also concerned that it involves a degree of computer knowhow and enthusiasm. My next task must clearly be to check out one of Naim's computer-style packages.