

Qutest expression

Take one Chord Hugo 2. Strip off battery, Bluetooth and headphone amplifier. Shrink what's left. The result? A damn fine DAC, reckons Martin Pipe.

One look at the Qutest DAC shows we're in Chord Electronics territory. Its exquisitely machined aluminium casework, minimalist controls, clever use of coloured LED illumination and BNC sockets are all trademarks of this very British of brands. Indeed, in terms of shape and size the Qutest is redolent of the ground breaking Chord Mojo – that's put on weight! Bigger than a Mojo it may be, but the Qutest is nevertheless compact when compared to rival DACs. You don't get the cheaper Mojo's headphone amplifier, or for

that matter its integral battery power supply aimed at portable use. The Qutest is intended for home-use.

A more apt comparison could be made with the Mojo's bigger brother - the Hugo 2. As DACs they are close in terms of their specifications and operational considerations. Both rely on similar permutations of Rob Watts highly-innovative Watts Transient-Aligned (WTA) algorithms. In both cases no fewer than 49,152 of the constituent Finite Impulse Response (FIR) filter taps can be run on the Xilinx Artix 7 FPGA chip at the heart of the DAC's circuitry. Chord Electronics has however saved money

by making the Qutest a pure DAC that sits between your digital sources and amplification. There's a micro-USB port but this powers the unit via a supplied 'wall-wart' mains supply.

In connectivity the Qutest has two BNC inputs and an optical connector for conventional sources, computer connection being via an asynchronous USB port. The BNCs can automatically join forces for 'dual-data' compatibility with Chord's innovative Hugo scaler and future products that make use of this proprietary high-speed digital audio interface. Sources are selected by a spherical Input button set into



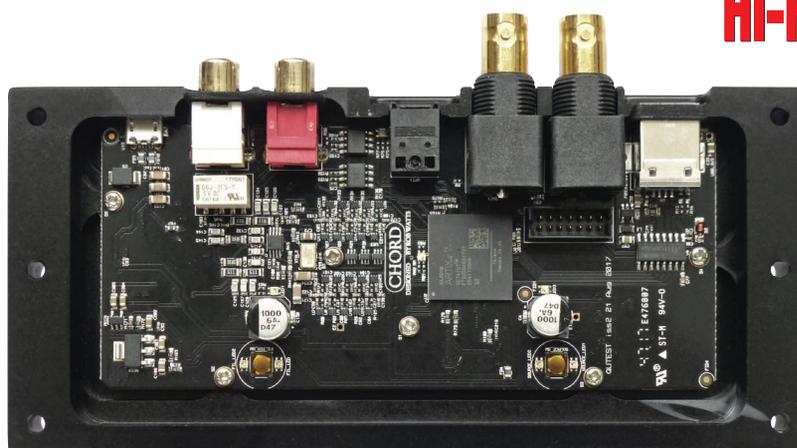
the front edge of the control panel. There's no remote control and no Bluetooth wireless link.

The USB input can accept PCM audio with 32-bit resolution at a staggering 768kHz sampling rate. Is anybody releasing music in this wonderfully OTT form? The drivers you'll need for Windows PCs are available from the Chord Electronics website – Macs and Linux machines don't need such software. The optical input supports PCM sources of up to 24/192 they claim, covering all commercially-available PCM content, and DSD64. Using a coaxial input ups the respective limits to 384kHz and DSD128.

All digital inputs support DSD digital via DoP (DSD-over-PCM). If you're using a PC then DSD512 content is within your grasp in 'native' ASIO mode (the limit is DSD256 with DoP).

As with other Chord Electronics products, LEDs visible through a 'viewing glass' set into the top change colour to indicate the sampling rate of the incoming signal. This can be a great troubleshooting aid, as any unwanted resampling by your source can be revealed! The Qutest's light-show can be quite noticeable in a dark room, but it can be dimmed down.

Analogue output is available on a pair of phono sockets – no balanced



Substantial machined casework and meticulous circuit board. An obvious part of the latter is the large FPGA chip on which Rob Watt's DAC is implemented.

ensuring a good match with other equipment and consequently no 'jumps' in volume.

Another spherical button cycles through (with visual confirmation) the Qutest's quartet of digital filters, which are claimed by Chord to subtly-modify the tonal characteristics. In Chord's words, this is achieved "not by strictly applying an equalisation curve, but by changing the way in which the FPGA handles the data". You're given a choice between 'incisive neutral' (an ultra-linear frequency response, regardless of sample rate, with a 16Fs to 256Fs WTA2 filter), and Warm (adds 'warmth', courtesy of a 16Fs WTA1 filter). The other two are based on

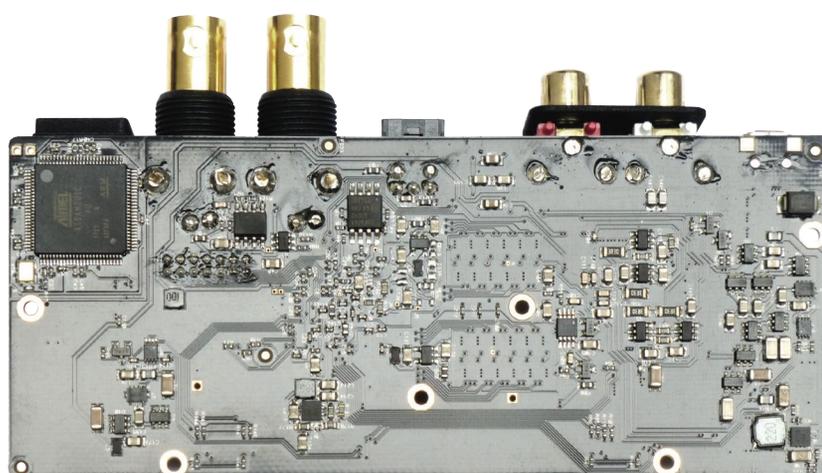
256Fs is sixteen times that!

WTA and WTA2? Time for an explanation from Rob Watts: "In terms of core principle, there is no difference between WTA1 and 2, both using the same algorithm. WTA1 is input at 16Fs, while WTA2 works between 16Fs and 256Fs. However, the tap lengths are different and of course filter at different output rates. The sound quality is different with WTA2, allowing one to perceive the starting of notes properly - transient edges have more natural impact. Removing WTA2 makes the sound warmer. It is however incorrect to say that WTA1 is used for warmth - engaging the HF filter is instead responsible for that. WTA1 is actually what we called plain old WTA, before the flagship Dave came along. In the past there was only one WTA filter, but now there are two and so we need to distinguish between them".

SOUND QUALITY

I relied on my trusty Arcam A49 and Quadral Aurum Wotan VIII floorstanders to turn Qutest output into listenable form. Sources included a USB-interfaced Windows 7 PC (running Foobar2000, suitably-configured), and Cambridge's CXN streamer. I also an Auratic streaming transport. The material played included lossless CD rips, DSD and hi-res PCM stored both locally and on a Synology RT1900ac network router with in-built NAS function.

I started off with Pye Corner Audio's atmospheric 2012 epic Sleep Games (CD rip), one of my favourite electronic-music albums of recent times. Its melodies, performed with analogue synthesisers, are dark and eerie yet beautiful and catchy. The Qutest proved capable of conveying their texture and warmth,



Much of the circuitry is associated with the all-important Xilinx FPGA chip. A 32-bit ARM-based Atmel microcontroller looks after the Qutest's operation, and provides its USB interface.

XLR output is provided. There's no continuously-available volume control, as there is on the Hugo 2, meaning that the Qutest cannot drive power amps or active speakers directly. However, its output can be cycled between 1V, 2V and 3V RMS,

these, but with HF filtering that rejects anything above 20kHz "to remove high-frequency distortion and noise" from high sample-rate PCM recordings. 16Fs, by the way, means 16 times the sampling frequency e.g., 705.6kHz for 44.1kHz-sampled CD.



Digital input (S/PDIF) is via gold plated BNC connectors, rather than the usual RCA phono sockets, so BNC terminated connecting leads are required. Otherwise socketry is conventional, except that the micro-USB socket at right is a power input only.

drawing me into the recording's distinctive yet nostalgic-drenched sonic world. With this music, I found that the 'warm' filter settings were preferable.

When listening to more percussive music of this genre (Kraftwerk Tour de France Soundtracks, for example) though, the 'incisive' filter seemed a better match; here, the agility and timing of the Qutest were brought to the fore for tracks like Étapes 1 to 3. These and other electronic tracks – among them Palace Posy, from Board of Canada's Tomorrow's Harvest – also revealed that the Qutest's low-end is musically-articulate, tightly-controlled and in the correct proportion. Bass guitars (as heard on Nick Lowe's So It Goes and Fela Kuti's Coffin for Head of State, amongst other CD-sourced tracks) also benefited from the depth and impressive definition of which the Qutest is capable.

And so to something completely different – Emily Palen's Glass (Blue Coast Records, DSD64). This 'straight-to-DSD' recording of a solo violin performance took place in San Francisco's Grace Cathedral. Heard via my PC, the track Light in the Fracture bristled with vitality, dynamism and subtle detail (like bow noises) while the instrument's timbre was delivered with natural richness – and I could distinguish the signature of Michigan-born Palen's violin from another.

Space was also conveyed well by the Qutest, a definite sense of the cathedral's acoustic ambience being imparted via my speakers. I preferred the 'warm' filters here, but your preferences may differ – much depends on the equipment you'll be using with the DAC. On which subject, I could hear a difference between the Auralic and Cambridge transports, the former sounding perceptibly more 'open' – such is the

Qutest's resolving power.

Stronger musical forces are also within the Qutest's grasp, as a 1987 Naxos recording of Mussorgsky's Pictures at an Exhibition (Slovak Philharmonic/Daniel Nazareth, CD rip) amply demonstrated. Here I could pick out individual orchestral textures and hues. There was a wonderfully organic flow to the music, coupled with an effortless

drive that lesser DAC technologies find difficult to match.

Qutest shines with more modern hi-res PCM material too. With the Nosedá/LSO performance of Britten's War Requiem (24/48) the energetic brasses, foreboding strings and massed choirs were given sufficient dynamic room to impart the recording's sheer scale. Yet there was just as much detail here as in the quieter sections – where the solo instruments, operatic vocalists and (especially) subtleties like decay of the bell were handled with panache.

CONCLUSION

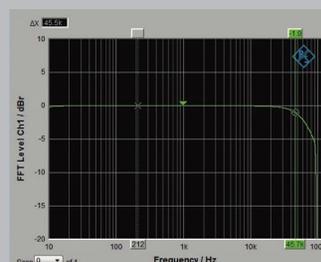
Once again, Chord has come up with a desirable DAC that combines elegant design, future-proofed technology and a stunning performance that will do justice to any music you care to feed it. If your budget can't quite stretch to the Hugo 2, the Qutest will give you its core features and exquisite sound quality for £600 or so less.

MEASURED PERFORMANCE

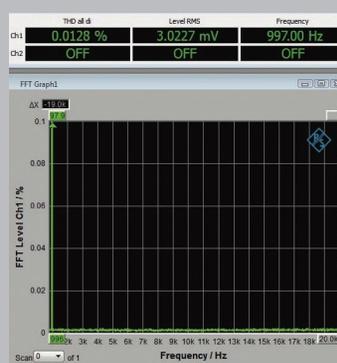
Frequency response of the Qutest reached 46kHz (-1dB) before rolling off to the upper theoretical limit of 96kHz, our analysis shows, with 24/192 digital PCM data and the 'Incisive Neutral' (white) filter. The 'Incisive Neutral HF roll-off' (green) filter curtailed the response significantly, imposing a 20kHz (-1dB) upper limit – relatively low and just audible in its softening effect, with both hi-res and CD.

The 'Warm' (orange) and 'Warm HF

FREQUENCY RESPONSE



DISTORTION



roll-off' (red) filters gave the same frequency domain results as the Incisive Neutral filters and are likely to sound similar, but without an oversampling stage Chord Electronics say they will have "warmth".

Whilst the BNC electrical inputs worked at 192kHz sample rate the optical had a 96kHz upper limit, becoming intermittent according to plug alignment at 176.4kHz and 192kHz where nowadays most products do not our tests show.

Distortion was extremely low, measuring just 0.013% (-60dB, 24bit), our analysis showing only a little noise. This resulted in a class leading EIAJ dynamic range value of 124dB – better than all else except top ESS DACs costing much more.

Output measured 3V maximum (1V and 2V options exist). The Qutest offered best results at 3V since this raises signal above output amplifier noise; it was tested at this setting.

The Qutest is simple – but sets measurement standards. The only problem is an optical input with a 96kHz sample rate limit. **NK**

Frequency response	4Hz- 46kHz
Distortion (24bit, -60dB)	0.013%
Separation	101dB
Dynamic range	124dB
Noise	-122dB
Output	1V / 2V / 3V

CHORD QUTEST
£1195



OUTSTANDING - amongst the best

VALUE - keenly priced

VERDICT

Another winner from the Chord Electronics stable...

FOR

- insightful and musical
- future-proofed compatibility

AGAINST

- no Bluetooth
- no remote

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