

Dave Strikes a Chord

Chord Electronics' new Dave DAC/pre-amp/headphone amplifier is a tour-de-force of digital engineering, says Jon Myles.

Chord's recently released Dave DAC has to be one of the most highly-anticipated standalone digital-to-analogue converters to come around in a long time. First announced to much fanfare at last year's Munich High-End Show enthusiasts have been waiting for it with bated breath ever since.

Not surprising, really, as the Kent-based company has its own take on getting the best out of digital audio. That means it eschews the usual path of buying in DAC chips from other manufacturers and instead uses bespoke designs from renowned digital guru Rob Watts.

These are based around an FPGA (field programmable gate array) chip that can be loaded with Chord's own proprietary software to achieve the best possible sound. Allied to this is the Watts Time Aligned (WTA) filter which has formed the basis of Chord's

digital products for the past 15 years but has been steadily improved and upgraded over that time.

Put more simply, instead of buying an off-the-shelf DAC chip and designing a circuit around it (as most manufacturers at all sorts of price levels do) Chord's approach is to take control of all elements themselves - especially the all-important conversion of digital to analogue.

Dave is the most sophisticated example of this philosophy they have ever produced. The FPGA chip, for example, is the LX 75 version of Xilinx's Spartan-6 - which is said to have around ten times the processing power of that used in Chord's previous QBD76

flagship.

This, in turn, allows for the most advanced iteration of the WTA filter - with 164000 taps making use of 166 DSP taps.

It's all heady stuff and allows Dave to accept just about any size of digital file you currently have or may purchase in the future. The four electrical S/PDIF co-axial inputs on the rear accept sample rates up to 384kHz, while the Toslink handles up to 96kHz and USB can process PCM at 768kHz. The latter may not sound very useful at the moment - but who knows in the future?

It will also process DSD64, 128, 256 and 512, plus there's a (rarely provided on domestic equipment) AES/





the harsh channel separation in this recording and bring a much more lifelike out-of-the-head experience through a pair of AKG 'phones.

But that's the way of the Chord Dave DAC/digital pre-amp/headphone amplifier - whatever you ask it to do it performs in a way only a select few products can match.

A full set of digital inputs on the rear plus RCA and balanced outputs. Interestingly, on the right there are also four co-axial digital outputs which are said to be for use with forthcoming (but as yet unannounced) Chord products.

it also switched between the quiet and loud sections with total fluidity and assurance. In this it becomes one of a select few DACs around that I can honestly say simply lets the music breathe.

Turning the digital pre-amplifier off - hold down the left and right buttons on the top to do this - and using Dave as a DAC only into Icon Audio's new ST-30se single-ended valve amplifier (see review this issue) showed a subtle difference between the pre-amp sections of the two products. Via this method the sound was creamier and richer with a subtle extra warmth. The guitar on Bruce Springsteen's 'Atlantic City', for example, had a little less bite than

through the Chord's own pre-amp section but was rather silkier. There is no right or wrong here - just what you may prefer.

Switching to headphone mode it was obvious this section is no mere afterthought on Chord's part. Plug in a set of 'phones and the main output is automatically muted while the Crossfeed function can be accessed from the remote control, or the buttons on the unit itself.

I'm not usually a fan of this sort of digital signal processing but on Dave, Chord seem to have got it just about right. Playing John Coltrane's live 'One Down, One Up: Live At The Half Note' and moving the Crossfeed setting up to three really did get rid of some of

CONCLUSION

The Chord Dave is a remarkable piece of design that quite probably sets the benchmark for just what a DAC is capable of at present. From the quality of its handcrafted casework to the sheer engineering prowess of the proprietary electronics inside this is quite simply an outstanding product. Yes, £7950 is a decent amount of cash in anyone's language but if you can afford it you'd be daft not to try it out. Even if you can't, it's still worth listening to for an indication of just how good state-of-the-art digital replay can be nowadays. And of course Chord Electronics have less expensive versions...

MEASURED PERFORMANCE

Dynamic range is a crucial metric for DACs and - worldwide - there are only two DAC manufacturers, ESS of the USA and Chord Electronics of the UK, conspicuously ahead in the game. Where the best DACs today can manage 119dB or so, ESS DACs start at 122dB and reach 133dB.

Chord Electronics reply with Dave, that managed a massive 129dB under measurement - ahead of most else. Its unusually high dynamic range value is a clear indicator of its advanced nature.

This value was obtained at +3dB on the volume control, which avoids output overload occurring with a full level (0dB) digital signal, and was via AES/EBU balanced digital input and the balanced analogue XLR output. The unbalanced phono-socket output, that is usually derived from the balanced line, was just -1.5dB worse, with digital input via optical.

Dave's designer, Rob Watts, insists distortion is more important than dynamic range (which sums distortion and noise). In this area Dave was all but distortion free with 24bit, measuring 0.0015% our analysis shows, at -60dB - lower than all else. With CD it was 0.21%, the usual figure that is a measure of 16bit quantisation noise, not convertor linearity. So Dave has less distortion than all other DACs.

Output from XLR was a massive 12V, and from the unbalanced phono sockets 6V - 3x higher than usual. The headphone socket gave 6V output, more than enough for any headphones.

The volume control of Dave is unusual in controlling level early in the signal chain. Turning it up too far will cause overload on musical peaks, but it

also improves effective dynamic range. Chord have given it a 0dB safety value that avoids overload, but measurement showed +3dB can be used - and this setting was used for all measurements. Far more gain is available - up to +19dB, but overload is likely to become obvious, except when playing very low level recordings.

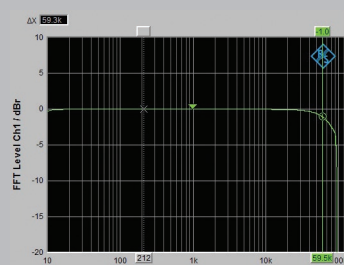
Frequency response measured flat to 55kHz (-1dB) with a 192kHz sample rate signal, our analysis shows, filter out. With the filter in output starts to fall above 22kHz, again with a 192kHz sample rate signal. So the filter will barely be audible in effect, serving to reduce supersonics and likely improve impulse response. With CD the filter has little effect.

The optical inputs will not accept sample rates above 96kHz, falling silent with any higher input, so Astell&Kern players will not work with Dave when playing 176.4k or 192k files - disappointing in such an expensive item.

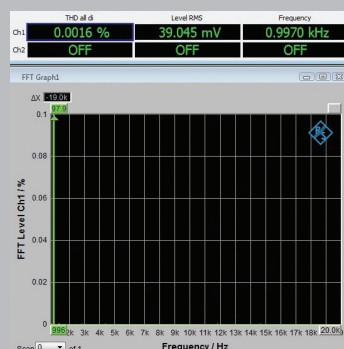
The USB input worked up to 768kHz sample rate with Mac's El Capitan operating system (OSX-10.11.3) and dynamic range via USB was also 129dB, so Dave is not noisy through USB.

Measurement showed Dave is one of the world's most advanced DACs. A low 96kHz sample rate limit via optical is the only limitation. **NK**

FREQUENCY RESPONSE



DISTORTION



CHORD DAVE £7950



OUTSTANDING - amongst the best

VERDICT

A veritable tour-de-force of digital engineering - has the ability to transform your CDs and high-resolution files.

FOR

- exceptional sound quality
- rhythmic ability
- superb build
- comprehensive features

AGAINST:

- controls take a little getting used to

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The raised rotary dial in the centre controls volume when the Chord is used in pre-amp mode while the four buttons around it control input and the various selection settings.

EBU balanced digital input.

Alongside all these inputs there are single-ended and balanced outputs - which both provide a healthy voltage (see Measured Performance for more information). There's also what are described as 2x ultra-high-speed coax 768kHz dual-data mode connectors which Chord says are for use with forthcoming but as yet unannounced products. Intriguing, to say the least.

Dave is not simply a digital-to-analogue convertor, though. It also contains a volume control, meaning you can plug it straight into a power amplifier if you fancy, and there is a headphone circuit with a 6.3mm jack on the front.

The styling of the whole unit is typical Chord - a superbly-finished brushed aluminium casing which is both weighty and immaculately constructed. At the centre is a large display window which serves to let you see what settings you have selected, plus incoming sample rate. You can dial through four different displays, one of which is basic black and white, two others which are rather more colourful and a final one which goes off after 30 seconds. Personally I preferred the basic one for its pure simplicity.

The slanted front panel also contains four control buttons for navigation around menu options as well as the volume button if the Dave is being used as a pre-amp.

A supplied remote control replicates all these functions and is, frankly, much easier to use. The reason? Chord has decided not to label any of the buttons (nor the inputs on the rear, by the way) so a thorough read of the instruction book is essential to find your way around.

Other facilities include a switch to select positive or negative phase

depending on your system and tastes, a high-frequency filter to reduce noise plus a four-level Crossfeed system on the headphone output which blends information between the left and right channels to move the presentation away from the typical stark left/right in-your-head balance of most headphones to present something closer to that of a traditional stereo loudspeaker set-up. You can even configure Dave to prioritise its processing for PCM or DSD signals depending which type of file you are playing. Not surprisingly, it does sound better when this is correctly dialled-in.

Chord rendered this instrument - one that is notoriously difficult to recreate realistically through digital equipment.

But using Dave in its pre-amp mode driving a pair of Quad's powerful QMP monoblocks with Martin Logan ElectroMotion ESL X electrostatics there was a body, depth and timbre to the piano notes. Jarrett's complicated syncopation and his changes of pressure on the keys could be made out.

Soundstaging was precise, layered and I was able to pick apart tracks with ease. The various elements of Led Zeppelin's dense 'When The



There are four different options for the screen display on the front of Dave. Here is one of the more colourful ones - but the basic black and white version is easier to read.

As you can probably guess, all this digital engineering expertise and build quality doesn't come cheap, Chord Dave costing £7950 - although anyone looking at its specifications and distinctive styling may well guess at a much higher price.

Oh, and as for the name - if you didn't know it is an acronym for Digital to Analogue Veritas in Extremis. Meaning, in Chord's own words, this is the closest you can get to hearing the true digital signal from your files.

So, is it...?

SOUND QUALITY

That Dave acronym might sound like a piece of marketing waffle but the Latin word Veritas (meaning truth) is a pretty accurate description of the new Chord.

It only takes a few minutes to realise Dave has a remarkable ability to convey music with timing, realism and exceptional detail, giving a truly lifelike presentation. This holds true whether you are playing standard Red Book CD or feeding it some of your higher-resolution files.

Playing Keith Jarrett's Paris/London: Testament, I was immediately impressed at just how well the

Levee Breaks' (24/96) were laid out before me - guitar, drums, bass vocals and wailing harmonica each occupying their own space. But it's not done in a clinical manner. Instead, Dave propels the track along with all verve it deserves, despite the slightly laid-back demeanour of the Quads.

It's a quality I kept noting throughout the listening period; the Chord always sounds incredibly fast and meaty. It's undoubtedly a factor of the amount of detail it extracts from files but also the fact that its tonal balance is even-handed with no element of the frequency spectrum emphasised over another. Hence there's no sluggish bass, no searing treble and a deliciously open and clear midband.

Those qualities come through no matter what the source material - be it CD, high-res of whatever flavour or DSD. Indeed Michael Tilson Thomas and the San Francisco Symphony's DSD recording of 'Mahler's No 1' sounded better than I'd ever heard it before. Not only did the Chord deliver the crescendos with complete authority,



The supplied Chord system remote is probably the best way to control Dave given its comprehensive nature.