

Chord Electronics use their own custom output devices in the new Ultima 6 power amplifier. Noel Keywood listens.

Custom Device



I've just been reading – well re-reading – Chord Electronic's lengthy and intense explanation about why their new Ultima 6 stereo power amplifier that I'm reviewing here – price £5995 – is different to most else.

Known for their high technology digital-to-analogue convertors (DACs) designed in-house, Ultima follows Chord Electronics tradition. With its own custom output transistors this power amplifier is, by definition, different and unique. See what I was reading in our box out – but have a strong cup of coffee first!

In outline Ultima 6 is simple. There are no fripperies. Plug an analogue cable into one end, press the large illuminated power button, make sure loudspeakers are attached – and that's just about it. At your disposal is huge power, spec'd at

180W per channel (but we measured 300W) from a package weighing a substantial 22.4kg and measuring 420mm wide, 360mm deep and 150mm high. It's a difficult lift, even though no big mains transformer lurks inside; amusingly the company say keep it away from toroidals (anathema to Chord Electronics).

A classic 19in (482mm) wide rack shelf accepts it. Limited height and depth make Ultima 6 able to fit the bottom shelf of most hi-fi racks, or of course it can be placed on the floor.

Lack of fripperies means there's nothing at rear that needs setting or adjusting. Nor at front either. No volume control for example, so any source – such as a phono stage – must have its own volume control. There is a small hidden slide switch to change internal light level: high or low.

In Chord Electronics fashion, pressing the large frontal power button that glows dull red when off, causes it to light up bright green. Internally, and visible through the top air vents, a blaze of "teal" coloured LEDs light up to show electronic activity. What you don't get are power output LEDs, a headphone output or remote control. The latter functions must lie in an accompanying preamplifier, or DAC. Since most DACs have volume control this should not be an issue and I reviewed the Ultima in as simple a set-up as possible, without preamplifier.

The Ultima 6 is massively built, having substantial aluminium heatsinks to keep the output transistors cool. This is an analogue amplifier – not Class D – but it has the company's own switch-mode power supply. Much of the technical data I read was devoted to why this



The top view shows the switch-mode power supply, with its many transformers and capacitors, is situated at front. Although switch-modes have transformers, they are not big and weighty like traditional types, because the conversion process works at high frequency.

switch-mode supply is not like others, and why switch-mode is potentially better. Most run from 110V-240V but the Ultima 6 was marked as 230V only, with no mention of this in the manual.

The interesting bit of their tech notes that caught my attention was the fact that this amplifier uses their own custom designed and manufactured MOSFET output transistors. As they note, most power transistors are designed to switch on and off, meaning they are not purposed to amplify smoothly changing audio signals. Solution to this problem is to use a bias current to keep them switched on and apply heavy feedback in order to lower the distortion they exhibit. In effect, an electronic sticking plaster. Ultima has output transistors designed for audio, not switching, Chord Electronics say – and our measurements confirm. See our box-out for more information.

The power input socket is not a standard IEC type, but a heavier duty 16A C-19 type, so Ultima comes with its own mains cable that cannot be easily changed or upgraded. The rear panel carries unbalanced RCA phono socket inputs and balanced XLR inputs. I used XLR only. There was an issue with the Phono sockets on our demo-sample amplifier that restricted bandwidth (see Measured Performance). I presume this will be sorted out, but such an amplifier is best driven through balanced XLR socket input in any case.

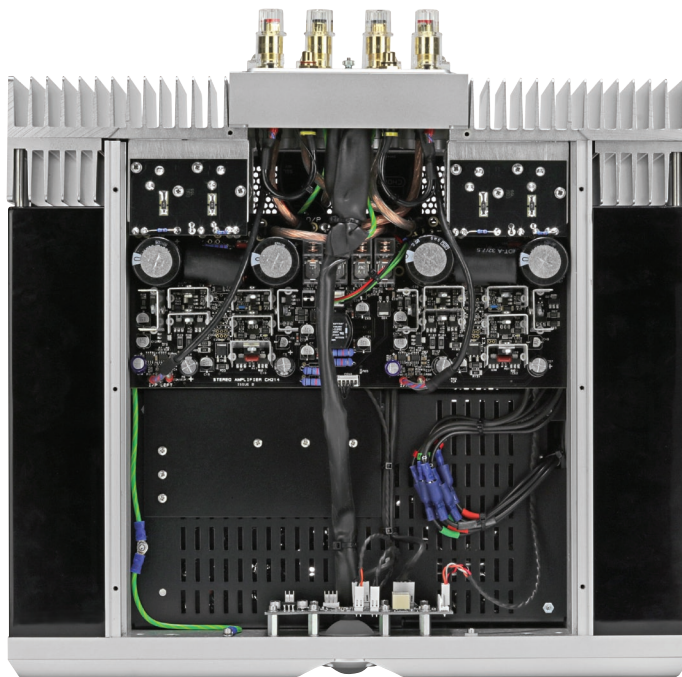
SOUND QUALITY

I used the Ultima 6 to drive our Martin Logan ESL-X hybrid electrostatic loudspeakers, through Chord Company (unrelated to Chord

drive Ultima direct which, because it uses an ESS ES9018 DAC, gives a different sound to Dave. Analogue connections were through Chord Company Epic balanced cables to both DACs.

The qualities of Ultima 6 soon became apparent. It conveys a sense of rigidly imposed structure on music, holding instruments into tight lock on the sound stage, giving plenty of dynamic headroom to allow crescendos to rise unhindered. It was immediately clean, grippy and smooth, powering along The Pink Panther Theme (CD) with a sense of underlying force that eludes our smaller Creek Evolution 100A amplifier. The bass guitar had strength, as did the laconic saxophone that loomed large in front of me.

Quite obviously, from this track and later bass demos such as Safri Duo's Samb Adagio, Ultima was driving the Martin Logan bass bins within moments of losing their life when I turned volume up: I half expected to see cones flying through the air. It has massive power but is almost restrained in presenting it, being so clean and composed.



Underneath, a heavy duty cable runs from the 16A power input to the front power supply. At rear are the amplifier's audio circuits.

Electronics) Signature Reference cables. Primary source was a Chord Electronics Dave DAC fed by an Oppo BDP-205D Universal player acting as a transport, connected by a QED Quartz glass optical digital cable.

I also used the Oppo player to

There was also impressive disconnect between instruments and the pounding bass synth of Sam Adagio: no matter what the bass synth was doing, the other synth lines remained steady on the sound stage; no instrumental line was bumping into another.

This translated over when winding volume up with the London Symphony Orchestra, playing Holts's Mars, from The Planets: horns and violins stayed firmly in position when big kettle drum strikes appeared.

Thunderous pieces like this were a delight for the Ultima: it threw them out with scale, yet also with a tight sense of orchestral order, as if the musicians had been nailed down.

I fancy Ultima 6 was a tad more embodied and empathically engaging than Chord Electronics power amps I have heard in the past. Even our slightly vivid CD of Nigel Kennedy had his Strad. sounding smooth and amenable.

For deep insight and the ability to sustain a powerful sound Ultima 6 was worryingly good. It was a more sympathetic match with Chord Electronics own Dave DAC, than the ESS ES9018 in our Oppo player. There were times when the analysis of Ultima and our electrostatics suggested the Oppo's ESS DAC was slurring high frequencies, where Dave was delineating fast events and sending them in with cutting weight.

Ultima has the ability to receive fast data and resolve it, being symbiotically related to Chord

ULTIMA 6 TECHNOLOGY

Chord Electronics say -

The first truly high volume, high power bipolar transistor, the ubiquitous 2N3055, was developed as a triggering device for an atomic bomb, acting as a switch – as all bipolar transistors are. These devices are not good in their transition period between on and off which – unfortunately for bipolars – is where they are used in audio amplifiers.

The Chord Electronics output stages in Ultima are designed around metal-on-silicon MOSFET devices developed exclusively for Chord electronics by a UK semiconductor fabrication house formerly involved heavily in the aerospace sector. Chord Electronics approached them to produce a 200 Volt / 300 Watt device that has been realised by use of a novel packaging technique, which places two silicon chips in parallel in the same TO3 style case.

This technique has the significant advantage of ensuring perfect thermal matching of the devices, eliminating the need for temperature balancing resistors in the output stage, thereby substantially improving both efficiency and the overall stability of the amplifier.

Our MOSFET design has been refined over time and is now in its fifth generation. Even our smallest amplifiers benefit from using our own bespoke silicon.

John Franks, MD, Chord Electronics.



Massive heatsinks adorn the amplifier's rear, but it runs cool in normal use. One pair of loudspeakers only, and a large/unusual IEC mains socket sits between the analogue inputs.

Electronics DACs in this sense. A challenging sound full of sonic activity and not for the somnolent, but impressive all the same. It's an amplifier for listeners on their toes, those who want it all.

CONCLUSION

Ultima 6 is a very interesting amplifier, technologically and

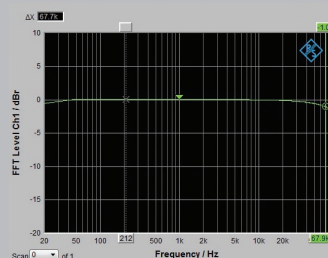
sonically. Vastly powerful at 300W per channel our measurements revealed, it has a sense of unstrained power of the ultra-clean variety. With deep insight giving fantastic detail it demands use with the company's Dave DAC to show its mettle. Not a cheap combo but certainly amongst the best at any price.

MEASURED PERFORMANCE

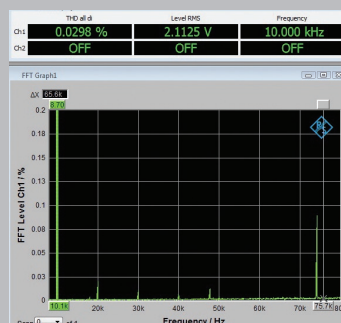
Power of Ultima 6 measured 312 Watts into an 8 Ohm load and 484 Watts into 4 Ohms, making it massively powerful. No noise at full power (no fan) and the heatsinks stayed cool, although full power is applied only briefly, around one minute, when testing. No overload indicators.

Distortion levels were very low, 0.005% in the midband (4&8Ω), and just 0.03% at high frequencies (1W, 10kHz, 4Ω), as shown in our distortion

FREQUENCY RESPONSE



DISTORTION



analysis, worst case being full output at 10kHz where just 0.07% was recorded. These are very low values.

Gain measured x30 (30dB), 1.6V in giving near full output (48V), from both the unbalanced RCA phono socket inputs and the balanced XLR inputs. However, most power amps need 1V for full output; with the Ultima 6 a preamp will be needed for full power, but 1V from a normal preamp still gives 100W output and DAC outputs are usually greater than 2V so can fully drive Ultima 6.

Frequency response via XLR measured 4Hz-66kHz, our response analysis showing the audio band from 2Hz-20kHz. Via the phono inputs treble rolled off, measuring -1dB down at 10kHz, from our generators, as well as Dave and an Audiolab M-DAC+. Presumably production samples will not have this response but XLR is best used in any case.

There was minimal output noise, with a noise figure of -102dB ref. full output of 50V/312W. **NK**

Power (8Ω)	312W
Frequency response (-1dB)	4Hz-66kHz
Distortion (1W, 10kHz)	0.03%
Noise	-102dB
Sensitivity (for full output)	1.6V

CHORD ELECTRONICS ULTIMA 6 £5995



OUTSTANDING - amongst the best.

VERDICT

Powerful yet composed, with massive insight and detail. Best with a Chord Electronics DAC.

FOR

- hi-tech sound
- ease of use
- huge power

AGAINST

- no volume control
- no remote power-off
- no headphone output

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