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## POWER AMPLIFIER

Stereo power amplifier. Rated at 100W/4ohm  
 Made by: Chord Electronics Ltd, Kent  
 Supplied by: Chord Electronics Ltd  
 Telephone: 02890 279839  
 Web: www.chordelectronics.co.uk  
 Price: £2750

# AUDIO FILE

# Chord TToby

This latest power amp from Chord may be diminutive, to match the company's Hugo TT DAC/headphone pre, but together the two make a very potent compact system  
 Review: **Andrew Everard** Lab: **Paul Miller**

**E**xpect the unexpected – that ought to be the slogan of Chord Electronics, given the company's ability to launch unusual products to fit into niches you didn't even know existed. And there's more to it than that: the company has also worked out how to develop acclaimed products in the 'cost no object' sector, using in-house technology rather than taking the simpler 'bought in' route, and then scale its designs down to fill those niches.

The result is a direct line both up from the long-running Hugo DAC to the flagship DAVE [*HFN* Apr '16] and down to the pocketable Mojo [*HFN* Jan '16], and now from the company's massive power amplifiers to the new £2750 TToby stereo power amp, styled and sized to match the Hugo TT DAC/headphone amp/preamp [*HFN* Dec '15].

### GOOD OLD ENGLISH NAME

The slightly odd name? Well obviously the TT bit comes from the partnering DAC with its 'Table Top' suffix; but unlike the DAVE ('Digital to Analogue Veritas in Extremis!') there doesn't seem to be any reason for the 'oby' in TToby. Maybe like Hugo it's just thought to sound good in a kind of English way – and there's no harm in that.

So, what is the TToby? Well, the obvious thing is that it's a power amplifier of the same size as the Hugo TT, at 23.5cm wide, 22.5cm deep and just 5.5cm tall, and also available in black or silver. That would seem like some kind of masterclass in packaging had not Chord already shown what it can do in this respect with the tiny Mojo DAC/headphone amp, which manages to cram high-end audio technology, and even the long-running battery to power it, into a unit not much larger than a pack of cards.

The Mojo was designed with portability as its main priority, albeit with a version

**RIGHT:** Two compact switchmode PSUs (left) feed a powerful MOSFET power amp (centre). LEDs don't just bathe the TToby in a green glow – they are used in place of resistors for biasing the amplifier's constant current sources

of Chord's FPGA-based digital-to-analogue technology somehow squeezed into a machined aluminium case for a bargain price. And the claim for its TToby is just as impressive – designed to be a high-end power amplifier built for what the company calls 'compact living'.

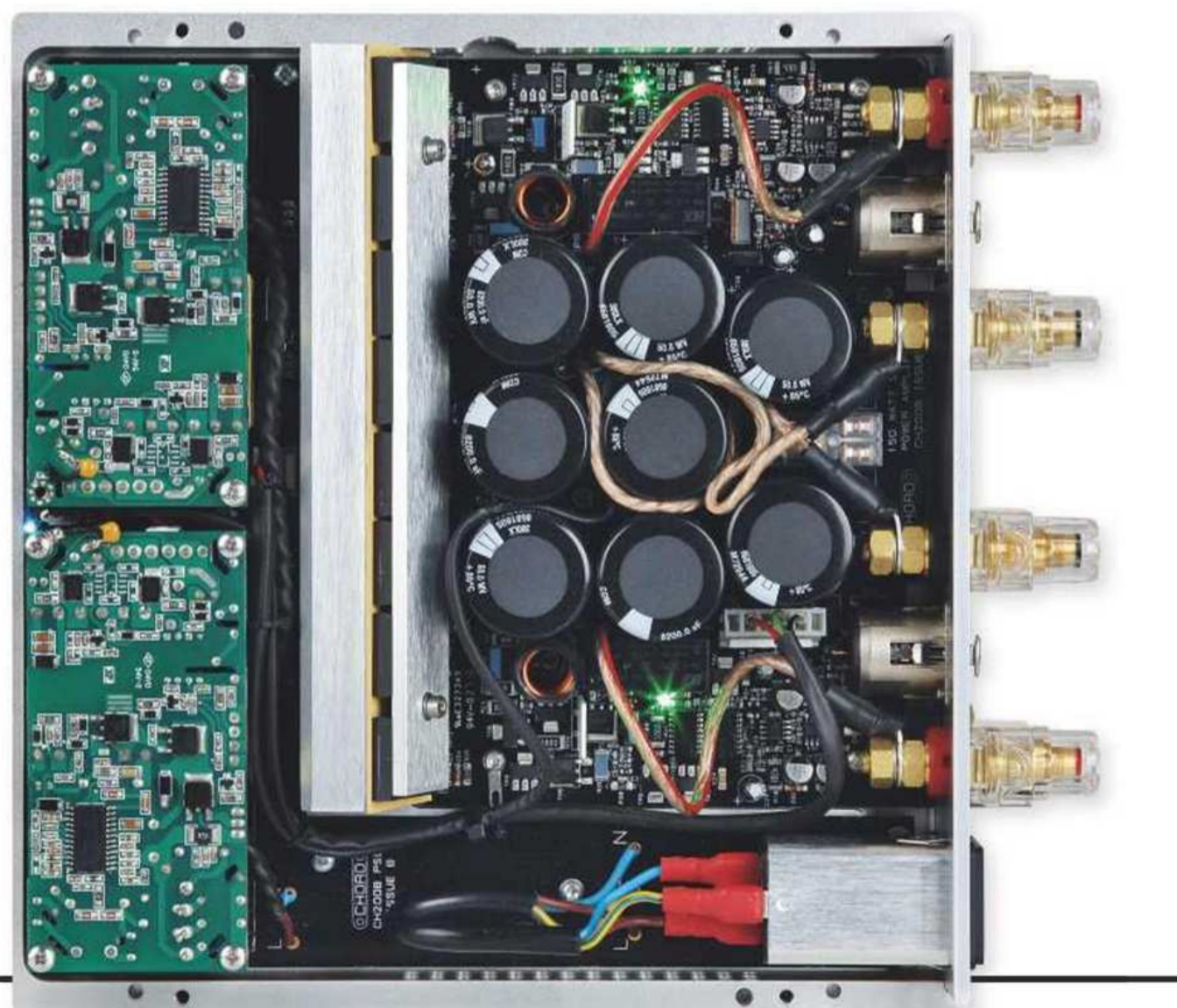
That's a growing trend in hi-fi separates. Given the twin pressures of property prices and increasing populations putting stress on the amount of space in which we have to live, there seems in some quarters to be a move away from the 'big and impressive' trend in hi-fi design, and on to something more compact and room-friendly.

It's something of which British brand Quad has been aware for a very long time, but now it's been joined by stablemate Audiolab. Cyrus, of course, has long had its 'shoebbox' separates, Naim launched its DAC-V1 and NAP 100 'desktop audio'

pairing a while back, and of late we've seen the rise of the Denon Design Series and the revival of the Music Link range from sister company Marantz.

### DESKTOP SILENCE

The HugoTT/TToby combination is very much 'on trend', then, and also fits in with the growing popularity of 'desktop audio' as a means of listening. Here's another concession to the reality of modern living, as many would like to have a dedicated music room in which to listen, but have neither the time nor the space to accommodate 'sit down and listen' music. Instead, we often have to listen when and where we can, and given that often means listening to computer-based music, the appeal of the Chord combination as a 'just add computer and speakers' system isn't hard to see.







But we're getting a little ahead of ourselves here, and while much of the inside story of the T'Toby is described in PM's 'Petite Powerhouse' boxout [below], and you can see how tightly packed things are within in our 'lid off' shot, this is not just a small desktop amplifier, but a Chord power amplifier in miniature, with a clear commonality of parts and design with the company's heavyweight stereo amps and monoblocks. To match the outputs on the HugoTT, it has both single-ended RCA inputs and a pair of balanced XLRs, while speaker outputs are on decent-quality combination terminals able to take 4mm banana plugs, bare wires or spades.

It draws on the same technology as the company's 'big' power amps, and is kept on an even keel by fan-cooling. However, before you raise an eyebrow at the thought of a fan whirring away inside an amp likely to be used in close proximity to the listener (eg, on a desk), Chord has thought this one through. It employs what it describes as 'a sonically closed anechoic miniature multi-speed quadruple-fan plenum chamber',

'After all, it's called T'Toby, not MMickey MMouse!'

drawing in air and using the casework as part of a heat-dissipating tube.

On which subject, it should be pointed out that while Chord's headline figure is 100W per channel, this is into a 4ohm load. As PM makes clear in his lab report [p61], that means that the T'Toby might more accurately be described as a 50W

amp able to deliver 100W into lower impedances. I'd argue this isn't a case of massaging the figures – after all, very few speakers present an amp with anything like a consistent 8ohm load, so arguably the 4ohm capability is

more meaningful. And the T'Toby is a very rugged amplifier, well-equipped to handle the nasty load some speakers present at certain frequencies – get down to just 2ohm and it's delivering peaks over 200W.

Add to that the fan-cooling and Chord's near-legendary build quality and reliability – the T'Toby is laid out both logically and neatly, housed in the company's usual 'machined from solid' aluminium casework, and of course built in-house in Kent – and you have what looks to be a very superior

**ABOVE:** Not very much to see here, beyond the familiar logo and a power lamp – but the T'Toby is beautifully built in its machined aluminium casework, and has silent fan cooling within

little amplifier for a not-inconsiderable price. After all, it's called T'Toby, not MMickey MMouse.

### OUT OF ITS SKIN

Just as the Chord HugoTT defies expectations when it comes to its sound quality, so the T'Toby plays out of its skin when called on to turn the little DAC/headphone preamp into a complete hi-fi system. As already suggested, this is so much more than just a very good desktop amplifier, combining as it does neutrality with seemingly effortless and endless power, such that most users won't ever approach its limits even with the most dynamically demanding music.

I tried the T'Toby with a range of speakers and sources, up to and including my long-serving PMC OB1s and T+A's spanking new MP1000E DAC/Network client [full review next month] connecting to the power amplifier using both balanced interconnects and standard RCA-terminated cables. However, much of my listening was done with a more compact system comprising the HugoTT fed from a Mac mini computer as the source, and with Neat's little Iota Alpha speakers [HFN Oct '16] on the end of the T'Toby's outputs.

And what a potent package that made, although the Chord amplifier combination clearly also has the power and definition to bring out the best in a wide range of speakers. Indeed, it's more than good enough to be considered as a power amplifier for a number of systems, even though I have a suspicion that the majority of buyers will be using it as its makers intended – as an adjunct to the HugoTT.

And first off the blocks was the latest Rolling Stones set, *Blue & Lonesome* ↻

## PETITE POWERHOUSE

Chord Electronics was employing switchmode power supplies in its amplifiers long before the technology was 'discovered' by competing boutique brands and, indeed, many mainstream producers. With decades of experience already under its belt, Chord partnered with an outside resource to develop a very compact switchmode supply with exceptionally stiff regulation, this specialism being required to shrink both supply and amplifier down into the HugoTT form factor. In practice the T'Toby has *two* switchmode supplies, not one per channel, but one per rail at +36V and -36V respectively, with a common ground and feeding a total 8x10,000µF of reservoir capacitance. The PSU is so well regulated that, under dynamic conditions, it enables an increase in power of +2.9dB between 8 and 4ohm loads and +2.6dB between 4 and 2ohm loads (a 'perfectly stiff' supply would support +3dB for each halving of load impedance). The amplifier itself is a fully balanced design, albeit with a single-ended speaker output, featuring no fewer than two pairs of dual-MOSFET power transistors per channel. PM



## POWER AMPLIFIER



**ABOVE:** Simplicity itself – single-ended (RCA) and balanced (XLR) inputs are joined by a single set of unswitched 4mm speaker binding posts and switched IEC mains inlet

[Rolling Stones Records 571 494-2; 88.2kHz/24-bit Qobuz download], which is an object lesson in crafting an album in the studio – British Grove, in this case – to sound rough, raw and immediate. While Chord Electronics is known for its precision, clarity and control, what's most impressive is the way the TToby, fed from the HugoTT, gets down and dirty here. It sounds fresh, vibrant and above all authentically gritty, albeit with fine insight into the contributions of the four musicians.

Jagger's voice, in particular, is presented with excellent character and impact, while his harp playing has a wonderful sandpaper edge to it. The TToby drives the big PMC speakers with ease, and delivers both slamming bass and good detail in Charlie's crisp drumming.

### RAZOR SHARP DRIVE

On more obvious hi-fi ground, with the recent 96kHz/24-bit re-release of Bowie's *Young Americans* [HDTracks download], the TToby proves more than capable of driving out the groove of the title track while really projecting both the voice and the sax. The backing singers sound glorious, while the funk of 'Fame' really benefits from the clean, razor-sharp presentation on offer.

Yet even when pushing hard with the amp used in close-up desktop mode there's not a hint of mechanical noise from the cooling system, and the TToby remains more than cool enough to be used stacked together with the Hugo TT if required, though I'll admit to preferring the low-slung style of using the two side by side.

And it does sweet and smooth very impressively, too, as it shows with Tasmin Little's *A Violin For All Seasons* [Chandos CHSA 5175; 96kHz/24-bit Qobuz download], where the soloist brings Vivaldi's over-familiar work up fresh, and

complements it with a new work, Roxanna Panufnik's *Four World Seasons*. The TToby presents the violin with beautiful fluidity and real bite, while the drama and power of the performance is never in doubt, thanks to the unfettered dynamics and drive the amplifier can unleash.

Change gear to the scale of the Bach Collegium Japan's recent release of Mozart's C minor Mass, K427 [BIS 2171; 96kHz/24-bit download], and the scope and detail of the performance sings through with the Chord combo, the directness and effortless of the TToby playing a major part in the free expression on offer here. The multiple facets and interior details of the choir and orchestra are revealed in sparkling fashion, while the range and emotion of the performance is never in question.

The TToby, for all of its unusual naming and compact dimensions, is sold short if one considers it in any way as a 'little amplifier'. In practice there's nothing small or shrunken about its sound or abilities, and it proves capable of driving even large floorstanding speakers to good effect, making it suitable for a wide range of applications. ☺

### HI-FI NEWS VERDICT

This is an exceptionally good power amplifier – it just happens to be small, which will no doubt expand the possibilities for its use beyond partnering its matching HugoTT DAC/headphone preamp. To think of it as a great desktop choice is to do it a disservice – yes, it will perform that function very well, but this miniaturised version of Chord's mighty power amplifiers has lost none of its heritage in the process.

Sound Quality: 86%



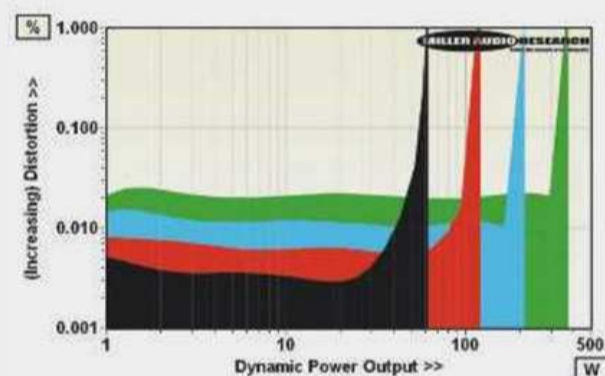
## LAB REPORT

### CHORD TToby

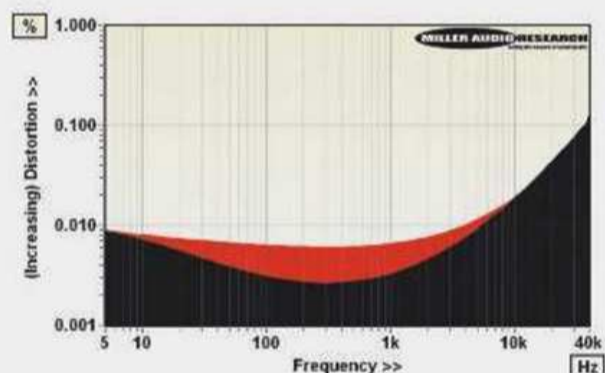
Before we launch into this lab report, I should offer some clarity on Chord's specification for the tiny TToby. You'll probably see this compact amplifier rated verbatim in the red tops as a 100-watter, but look a little closer and you'll see this is a 4ohm specification. In practice, the TToby maintains 2x58W/8ohm and 2x107W/4ohm, so would ordinarily be described as a 50-watter. Under dynamic – music-like – conditions it achieves 60W/8ohm followed by a near-theoretical doubling to 118W/4ohm and 215W/2ohm. Only into lower impedances still is the output restricted by a current limit: 19A or 360W/1ohm for <1% THD/10msec [see Graph 1, below]. I've discussed the nature of this very 'stiff' power supply in our boxout [p59].

Chord has the TToby's gain set at +27dB (balanced in), requiring 125mV for 0dBW and 890mV for the rated 50W output, but the A-wtd S/N ratio is still a little below average at 81dB (re. 0dBW). Importantly this is a 'pure' white noise as there is no evidence of switchmode artefacts in the audioband. Subjectively, this may actually serve to *enhance* the listening experience rather than introduce any obvious hiss (very sensitive and/or horn loudspeakers notwithstanding). The corollary is also true, as many amplifiers designed with a 90dB+ A-wtd S/N ratio are still no guarantee of listening bliss.

Distortion is held to a consistent 0.003% through bass and midrange from 1-45W, increasing to 0.04%/20kHz [see Graph 2] much as its output impedance is a consistent 0.024ohm from 20Hz-8kHz, rising thereafter to 0.05ohm/20kHz and 0.35ohm/100kHz. The response follows suit: within ±0.05dB from 1Hz-20kHz with a very gentle roll-off to -1.2dB/100kHz/8ohm (and -0.4dB/20kHz to -2.8dB/100kHz into 1ohm). PM



**ABOVE:** Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) loads. Maximum current is 19.0A



**ABOVE:** Distortion versus extended frequency from 5Hz-40kHz at 10W/8ohm (left, black; right, red)

### HI-FI NEWS SPECIFICATIONS

|                                     |                          |
|-------------------------------------|--------------------------|
| Power output (<1% THD, 8/4ohm)      | 58W / 107W               |
| Dynamic power (<1% THD, 8/4/2/1ohm) | 60W / 118W / 215W / 360W |
| Output impedance (20Hz-20kHz)       | 0.024-0.048ohm           |
| Frequency response (20Hz-100kHz)    | +0.0dB to -1.2dB         |
| Input sensitivity (for 0dBW/50W)    | 125mV / 885mV (balanced) |
| A-wtd S/N ratio (re. 0dBW/50W)      | 81.2dB / 98.2dB          |
| Distortion (20Hz-20kHz, 10W/8ohm)   | 0.006-0.040%             |
| Power consumption (Idle/Rated o/p)  | 14W / 171W (1W standby)  |
| Dimensions (WHD) / Weight           | 225x55x235mm / 3.75kg    |