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Constellation Revelation 2

Long anticipated, Constellation's series two amplifiers witness the transition from huge linear supplies to custom switchmode PSUs. Weight is slashed, and performance boosted
 Review: **Mark Craven** Lab: **Paul Miller**

California amplifier specialist Constellation Audio isn't one to regularly refresh its product catalogue, so when – after years of maintaining the same models – it begins a complete overhaul of its entire range, audiophile ears prick up. First to hit the market are the new Inspiration 2 and Revelation 2 series, with the latter's stereo pre/power system being debuted at the UK Hi-Fi Show *Live* 2024 [see p26]. These will be followed by the Performance 2 and Reference 2 [see interview sidebar, p41], with the lineup then topped off by the flagship Statement amps first 'teased' in 2023 at the Munich High End show.

There's a clear hierarchy to these series, and the Revelation 2, like its predecessor, is intended as the 'strategic link' between Constellation's entry-level Inspiration hardware and its costlier models. To that end, the Revelation 2 Stereo Amplifier sells for £35,000, while the Revelation 2 Preamplifier is £29,998. There's also a new £33,998 Revelation Phono Preamplifier, with flexible loading options for MC and MM pick-ups, plus the Revelation 2 Mono amplifier at £35,000 a piece. Not pocket change prices, then, but not quite as vertiginous as that of Constellation's step-up Performance 2, where the incoming Stereo 500 amplifier, which is the successor to the Centaur II 500 Stereo [HFN Sep '19], will set you back £97,998.

TIME TO SWITCH

What's spurred this all-new product line? As the manufacturer puts it, a 'need to push beyond traditional designs and embrace innovation' – and that means a wholesale transition from linear power supplies to custom switchmode designs. The result is the new Constellation Switch Mode Power Supply (C-SMPS), fine-tuned over a

five-year R&D period in partnership with a third-party specialist. Two C-SMPS modules reside inside the Revelation 2 Stereo in a separate enclosure [see pic, below], and are clearly not 'off-the-shelf' solutions.

Constellation says its modules 'increase in sophistication, rectification and parts used' as you move up through its new hardware ranges. Advantages over transformer-based linear power supplies – high frequency switching noise notwithstanding – include universal AC mains voltage selection, reduced shipping weight (and cost), improved efficiency and, potentially, reduced build costs. Hand in hand with this is Constellation's Power Factor Correction (PFC) circuitry, ahead of the C-SMPS, to maintain stability regardless of AC voltage.

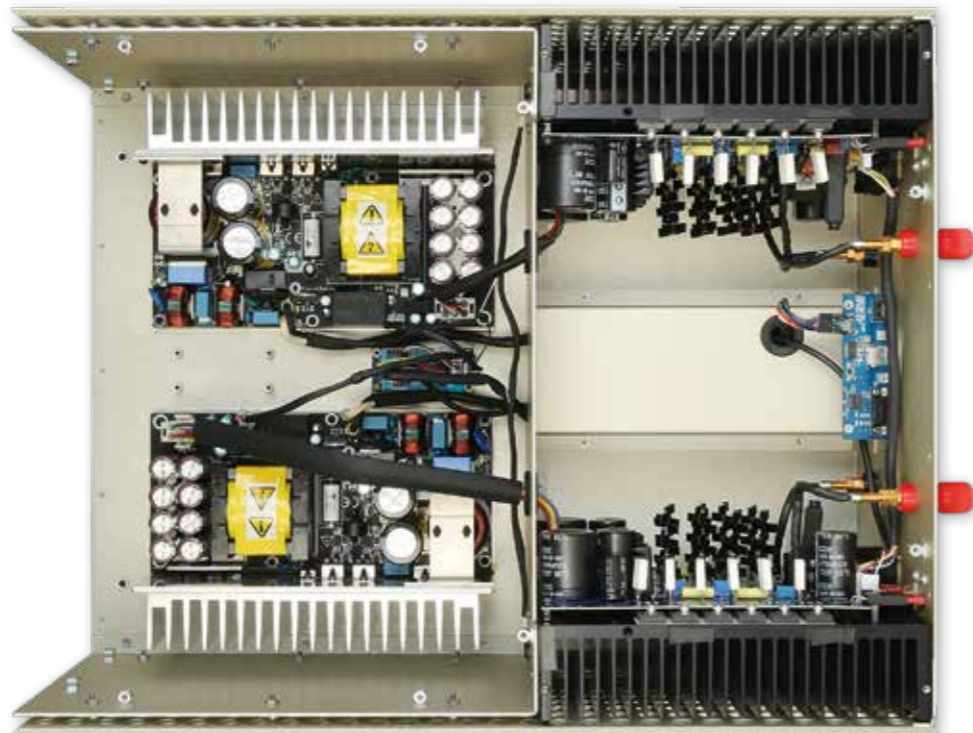
Yet, as PM reveals in his boxout [p44], the move away from linear PSUs hasn't

resulted in Constellation throwing the baby out with the bathwater...

POWERING UP

As is the case with the company's earlier amplifiers, the Revelation 2 employs N-channel power MOSFETs in its balanced output stage plus a J-FET-based line-level gain stage that can be bypassed, if desired, by connecting a preamp to the XLR inputs marked 'Direct'. Also like its previous amplifiers, the Revelation 2 claims a power commensurate with the price: 2x300W/8ohm and 2x600W/4ohm. For those keeping count, that's 50W-per-channel more than the first-generation Taurus Stereo [HFN Dec '17], even while this new amplifier manages to be marginally more 'manageable' in terms of size, and less than half the weight at 25kg compared to 54kg.

'The series 2 amp is more manageable in size and weight'



RIGHT: This dual mono layout sees two custom switchmode PSUs [left, top and bottom] feeding the J-FET (balanced) input and separate N-channel MOSFET-based power modules, each with six pairs of devices per channel [on heatsinks, right, top and bottom]

"We need to push beyond traditional designs and embrace innovation"



PRE/POWER AMPLIFIERS



Otherwise, the progression to series 2 has yielded little change to the external design, apart from switching the natural aluminium chassis finish to a champagne gold colourway. The austere look of the Revelation 2 Stereo, where the front panel is blank save for a long power/mute button with colour-changing status LED, carries on a now-familiar aesthetic that Constellation says will 'please the eye, but never distract the eye'. And yes, I'd agree with the second part of that, while suggesting that many other amplifiers at this premium level offer more when it comes to 'pride of ownership'. But beauty is in the eye of the beholder.

The stablemate Revelation 2 Preamplifier gets the same champagne gold finish for its full-width chassis, which measures 381mm deep and is therefore amenable to placement on a standard hi-fi rack. This comes with its own, external power supply chassis, to fully isolate its C-SMPS circuitry from the preamp electronics. The two units make for a neat, stacked install, and are laced together by three umbilicals, with multi-pin connectors, into sockets marked

'It's straight down the middle Oscar bait, really'

ABOVE: IEC mains inlet is joined by audio ins on RCAs and 'Direct' (low gain)/'Balanced' (high gain) XLRs, directed by a small toggle above [see boxout, p44]. Spacing between the 4mm speaker terminals is improved on this model. Blade fuses sit behind panels in each corner

left, right and control. USB-B and RS-232 ports on the back of both amplifiers then facilitate their use with automated control systems, while 12V triggers are provided for a more basic form of communication between the two enclosures.

SCREEN TEST

If I had to pick an aspect where this pre/power system could be more refined it would be the preamplifier's display. There's nothing particularly wrong with this, but the method of control – small, physical keys underneath and some touch-sensitive areas on the LCD screen →

BELOW: A monochrome LCD touchscreen on the Revelation 2 Preamp's fascia – showing input, phase, max/min levels and screen setup – is flanked by rotaries for balance and volume



MURALI MURUGASU

Constellation's 'series 1' engineers were assembled by Peter Madnick as Project Manager in 2009 – the good and great of audio engineering that included John Curl and the late Bascom H King. For this series 2, co-founder and CEO of Constellation Audio, Dr Murali Murugasu, prefers instead to focus on the Constellation engineering team as a unified resource. 'There is no one person who designs any single product and it is always a group effort', says Murali. Peter, most recently designing for MoFi alongside Andrew Jones [HFN Dec '23], is still involved with Constellation, however.

The decision to adopt a custom SMPS in place of the original, hefty linear PSU followed a decade of evaluation. 'I was personally rather wary', admits Murali, 'however the science and sonic improvements convinced me. Our PFC is rock solid, ensuring the SMPS's output is stable even if the AC line voltage drops below 80VAC. Also, our custom-made transformer allows for zero current switching at ~69kHz while offering a short-term peak capacity of 1.4kW'.

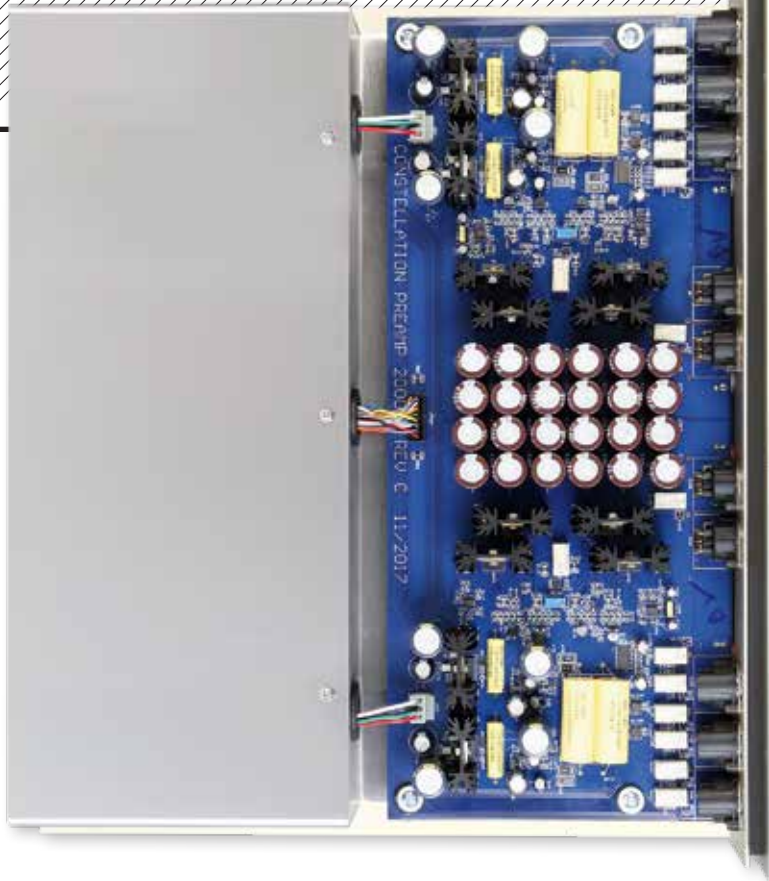
Although the new C-SMPS is fundamental to the Revelation 2's sonic uplift, Constellation also took the opportunity to update its board designs, where needed, shortening and optimising signal paths.

As to the future, 'We will launch the Performance 2 Amplifiers, Preamplifier and Phonostage in the first quarter of 2025, all with the new C-SMPS and PFC. The Reference 2 Amplifiers and Preamplifier will follow shortly with similar changes and improvements'. PM



LAB REPORT

CONSTELLATION REV. 2 PREAMP



itself – is a bit fiddly. When a manual must go into considerable detail to explain how to achieve what should be a basic adjustment, it's a clue that more polish is required.

Still, you might not make much use of the preamp's screen/buttons anyway, as apart from displaying volume and source, functions are limited to setting maximum and minimum volume levels, instigating the amp's Home Theatre Bypass mode for a specific input, and changing the brightness, contrast

BELOW: A trio of umbilicals feed power [bottom case] to the Revelation 2 Preamp's L, R and logic circuits. Three balanced (XLR) and single-ended (RCA) inputs are joined by two sets of XLR/RCA outputs. The trigger, USB-B and RS232 ports are for control and updates only

ABOVE: The rear half of the Preamp is empty [under the silver can] while the large PCB hosts Constellation's fully balanced, FET-based line stage. The outboard PSU [see below] feeds the left/ right channels, and the control circuits

and time-out settings of the screen itself. Balance, phase and source selection can also be set here, but are also offered by the preamp's (champagne gold!) remote [p45].

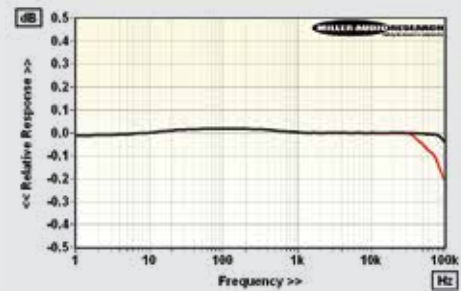
SLAM DUNK

Calling your pre/power system Revelation is a bold move, but Constellation's second-generation pairing lives up to its name with the kind of performance that separates the merely 'good' from the truly 'great'. Used with several different loudspeakers in the *HFN* listening ☞



With no phono stage or integrated DAC on board – Constellation offers the Revelation 2 Phono preamp to service vinyl fans – the Revelation 2 Preamp remains a fully analogue, balanced line preamplifier. The volume control 'number' reflects attenuation rather than *gain*, so '0.0dB' is full volume (a very high +26.6dB gain) and '6.0dB' is half the output – if '0.0dB' yielded 2V then '6.0dB' would give 1V, for example. In practice the ± 0.5 dB steps are less precisely calibrated over the top of the preamp's range where there's a ± 0.2 dB variation in accuracy with each increment. Over the top 12 steps (0 down to 6dB) the resulting level is actually -6.5dB, '10dB' is -10.6dB but the error reduces at '20dB' to deliver -20.2dB, etc. Over the top 60dB of its range the cumulative error is just +0.05dB and over a full 90dB range (180 steps of 0.5dB) the error falls to an insignificant +0.01dB. The Revelation 2 Preamp's maximum balanced output is a very healthy 24V from a 113ohm source impedance (rising to 127ohm at 100kHz) while the input overload threshold is >14V.

The frequency response is only minutely affected by volume position, being flat to within ± 0.05 dB from 2Hz to 100kHz at '0.0dB' but falling to -0.21dB/100kHz at volume '6.0dB' [see Graph 1, below]. The A-wtd S/N clocks-in at 90.8dB (re. 0dBV) while distortion beats the 0.001% specification with a very low 0.00025-0.00055% (20Hz-20kHz, re. 0dBV), rising fractionally to just 0.001%/40kHz [see Graph 2, below]. Channel balance is a tight 0.01dB and stereo separation better than 90dB from 100Hz-20kHz. Finally, and intriguingly, the impact of the display is measurable here – spurious peaks at 1.75kHz (-98dB re. 0dBV), 3.5kHz, 5.25kHz, 7kHz, 8.75kHz, etc, disappear once the touch-sensitive display times out and goes dark... PM



ABOVE: Balanced line frequency response at 0dBV (1Hz-100kHz). Vol setting '0.0dB', black; '6.0dB', red



ABOVE: Distortion versus extended frequency at 0dBV (Balanced in/out; left, black; right channel, red)

HI-FI NEWS SPECIFICATIONS

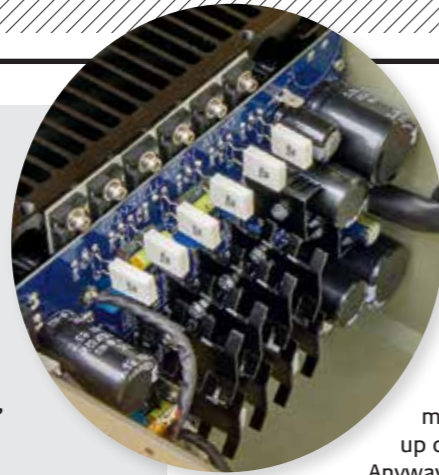
Maximum output (<1% THD, 47kohm)	24Vrms (Balanced)
Maximum input level (<1% THD)	>14Vrms (Balanced)
Output impedance (20Hz-100kHz)	113-127ohm (Balanced)
Freq. response (20Hz-20kHz/100kHz)	+0.02dB to -0.00dB/-0.05dB
Input sensitivity (re. 0dBV)	45mV (Balanced)
A-wtd S/N ratio (re. 0dBV)	90.8dB
Distortion (20Hz-20kHz re. 0dBV)	0.00025-0.00055%
Power consumption	32W (1W standby)
Dimensions (WHD, pre) / Weight (total)	432x140x381mm / 21kg

PRE/POWER AMPLIFIERS

CONSTELLATION REV. 2 STEREO

REVELATION OR REVOLUTION?

Fortunately, when developing its custom SMPS, Constellation was not tempted to radically alter the 'jewel' in its amplification crown – its exclusively N-Type MOSFET-based output modules. Here, instead of using one power amp stage comprising multiple complementary transistors, each Revelation 2 Stereo employs two NPN-only modules in a balanced bridged configuration [see inset picture]. Also, as in its earlier amplifiers, Constellation's Revelation 2 Stereo has three inputs, including traditional RCA and 'Balanced' XLRs in addition to a second XLR that services its proprietary 'Direct' option. In practice, both 'Direct' and 'Balanced' are balanced, but the former omits the company's J-FET line stage module, making use of the higher output voltage capacity of the partnering preamp [see Lab Report, p43].



This J-FET input stage adds a further +13dB gain to the Stereo, bringing the total to +25dB, but it's not a given that the sound of the power amp will necessarily improve by cutting this input buffer from the signal path. Why? With the Stereo in full 'Balanced' mode, the Preamp will run at lower gain just as the Stereo's J-FET stage may arguably provide better balanced 'signal conditioning' to drive the N-channel FET output modules. In this latest amplifier, measurable differences in either distortion or S/N ratio between 'Direct' and 'Balanced' are very slight indeed, although the response in 'Direct' is now flat to within ±0.1dB from 1Hz-100kHz. Personal preference will doubtless be informed by your choice of source, preamp and loudspeakers. PM

room, including B&W's 801 D4 Signatures [HFN Sep '23], Parker Trio floorstanders from Marten, and the special 'fx' version of Wilson Audio's Alexx Vs [HFN Jan '22], these amplifiers seemed to get the best from all of them. There is no single trait that leaps out of the Revelation 2's performance, just a fine blend of hi-fi's sought-after attributes, by which I mean depth, slam, detail, openness and rich tonality. Tracks you might have heard countless times before sound fresh and exciting.

ROCK REDISCOVERED

As an example, listening to AC/DC's 'Ride On' [Dirty Deeds Done Dirt Cheap, Columbia; 96kHz/24-bit] focused my attention on elements that, at other times, seem to get washed over, such as the lean tone of Angus Young's guitar in the bridge,

the layers of grit to Bon Scott's vocal, or the faintest of backing chants in the chorus. It was as if I could almost hear the tubes of the guitar amp thrumming away during the one-and-done improvised solo, such was the clarity of the presentation.

This ability to convey fine detail, but on a grander scale, was apparent from Dire Straits' 'Telegraph Road' [Love Over Gold, EMI; DSD64], where deep, well-rounded basslines were accompanied by the most minute of percussive ticks and Mark Knopfler's careworn vocals. This is another song I'm very familiar with, but through the Constellation duo it was like hearing it anew, courtesy of the detail pulled from the mix, the subtle changes in timbre, and the confident handling of the dynamics.

Lovers of 'Telegraph Road' will know that its final five minutes are where the

volume deserves to be pushed, although this is easier said than done with the Revelation 2 Preamp – its 100-step attenuator makes it easy to find the level you want, but makes it hard to go up or down quickly.

Anyway, once set to a level that made full use of the listening room's soundproof insulation, the power amp bounded along without belying any sense of strain, its dynamic flair and clean delivery intact. By the end of the song, my feet were tired from tapping while the amp seemed ready for more.

IT'S A BLAST

Ease off the throttle for vocal-led performances, and the Revelation 2 system just continues to impress with the scale of its sound, and its blending of richness and detail. With Adele's 'Someone Like You' [21; XL Recordings XLCD 520] it created a powerful vocal performance that was both big and intimate at the same time. The locked-in central image threw a spotlight on Adele's bittersweet lyrics, given brilliant definition in front of piano chords that sounded thrillingly authentic.

The revealing and open sound of the Revelation 2 system (which I subjectively preferred using its 'Balanced' input, making use of its internal gain stage) means it easily turns its hand to other instrumental textures. John Barry's 'Bond Back In Action', from Goldfinger: Original Motion Picture Soundtrack [Capitol/EMI; 96kHz/24-bit] came across in all its cinematic glory, with suspenseful strings contrasted with dramatic, throaty blasts of brass.

The same composer's 'Main Title' for Kevin Costner's Dances With Wolves [Epic ES 46982] is less idiosyncratic – more straight down the middle Oscar bait, really – but the Constellation system grabbed attention with the mass and weight given to the

LEFT: Carried over from earlier Constellation amps, the Revelation 2 Stereo's four flat soft rubber feet are supportive but leave little room for fingers to lift the chassis! The offset hole patterns on the side panels are both stylish and functional (the heatsinks lie behind)



ABOVE: Pressing the left side of the bar for three seconds initiates a series of self-diagnostic checks. Once completed, the light turns from green to blue and the Revelation 2 Stereo is ready for action

orchestra, and the sense of space around the players. The image depth was sublime too: military drums, followed by deep timpani beats, appeared far off in the distance.

The Gil Evans Orchestra's cover of George Russell's 'Stratusphunk'

from Out Of The Cool [Analogue Productions; DSD64] is arguably a piece entirely about showing off the comically evocative tone of the trombone solo (played, I think, by Tony Studd).

Again, this sounded vivid and real, a huge presence in the room precisely placed left of centre, before it faded away. As more instruments bubbled up in the stereo spread it was easy to visualise the band on the stage.

There's no feeling that Constellation is softening the treble or managing the bass in pursuit of a more mass-market sound, which is as it should be given the likely partnering speakers. Playback of Prokofiev's 'No 2. In F Major Op 91: I. Allegro sostenuto', by the Calidore String

LEFT: The partnering alloy remote has flush buttons to control standby, mute, volume, input selection, balance and phase inversion



Quartet [Resilience; Signum Classics 96kHz/24-bit], was a masterclass in transient attack, decay, bite and texture. Even better was the spine-tingling sound of the Cappella Nova choir reciting James McMillan's 'Lux Aeterna' [Super Audio Collection 6; Linn Records AKP 408], where the voices soared high into the church.

GRAND FUNK

And, yes, the Revelation system appears effortlessly powerful, and

grippy and tight with it. It let its hair down with 'Good Times' by Chic [The Best Funk Album In The World... Ever!; Virgin VTDCD44], delivering funky finger-plucked bass,

fizzing hand claps and generally a happy, upbeat vibe. But even here, just as the Constellation amps had done with music as diverse as LTJ Bukem's minimalist dance classic 'Horizons' [Looking Good Records; 44.1kHz/16-bit] or the croony blues of B.B King's 'Exactly Like You' [Reflections; MCA 0602498010440], it brought out all the musical thrills on offer. So here comes the pun: these are a revelation. ☺

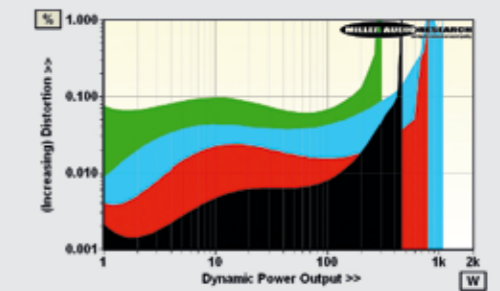
HI-FI NEWS VERDICT

The minor cosmetic refresh to Constellation's Revelation amplifiers does not reflect the transformation under the hood, where new, precision-engineered power supplies seemingly boost every facet of performance. Play any genre and this system excels, muscular and attacking one moment, insightful and fluid the next. It's a premium sound worthy of the price, and a fine way to kick off the brand's new era.

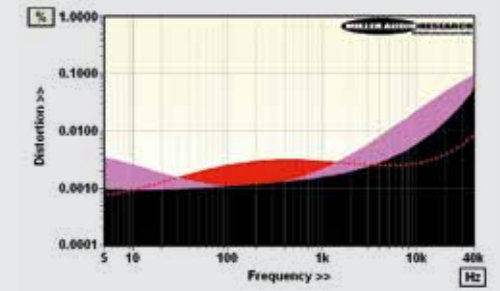
Sound Quality: 90%
0 - - - - - 100

The closest 'first generation' Constellation power amp to the Revelation 2 is the Taurus Stereo [HFN Dec '17] which, though rated at a lower 250W/8ohm still achieved 455W, 820W and 1.14kW into 8, 4 and 2ohm under dynamic conditions. The new Revelation 2 Stereo is rated at 300W/8ohm and while it delivers a higher 2x475W/8ohm and 2x805W/4ohm continuously, the tight regulation of the new switchmode PSU means that power under dynamic conditions is actually fractionally less, and almost identical to the Taurus at 460W, 795W and 1.1kW into 8, 4 and 2ohm loads. Again, maximum power/current is limited to 305W/1ohm [see Graph 1, below] though it'll still drive any likely partnering speaker with ease. The distortion profile is largely unchanged – a function of the bridged/NPN power modules – from a minimum of 0.0018%/1W to 0.003%/10W, rising after 40W to 0.005%/100W and 0.065% at the rated 300W (all re. 1kHz/8ohm). Versus frequency there's an increase from 0.003-0.025% between 1kHz-20kHz, a trend that continues until it levels off at higher power [see red trace, Graph 2].

The uniform 0.033-0.037ohm output impedance is actually slightly 'flatter' than in the Taurus but the response is not, falling here to -2.6dB/100kHz in place of the Taurus's -0.4dB/100kHz [see boxout, p44]. More importantly, from a listening standpoint, Constellation has 'tweaked' the DC servo – and hence group delay – of this amplifier which now has a -3dB point at 3Hz instead of 18Hz. Noise, however, is higher in the Revelation 2 Stereo than it was in the Taurus Stereo – this is an increase in 'white' noise rather than hum – leading to an A-wtd S/N that's some 10dB behind at 85dB (re. 0dBW), PM



ABOVE: Dynamic power output versus distortion into 8ohm (black), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Maximum current is 23.5A



ABOVE: Distortion versus frequency versus power output (1W/8ohm, black; 10W, pink; 100W, red)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	475W / 805W
Dynamic power (<1% THD, 8/4/2/1ohm)	460W / 795W / 1.1kW / 305W
Output imp. (20Hz-20kHz/100kHz)	0.033-0.037ohm / 0.238ohm
Freq. resp. (20Hz-20kHz/100kHz)	-0.1dB to -0.25dB/-2.6dB
Input sensitivity (for 0dBW/300W)	155mV / 2755mV
A-wtd S/N ratio (re. 0dBW/300W)	84.8dB / 109.6dB
Distortion (20Hz-20kHz, 10W/8ohm)	0.0011-0.050%
Power consumption (Idle/Rated o/p)	110W / 1070W (1W standby)
Dimensions (WHD) / Weight (each)	432x216x584mm / 25kg