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AUDIO FILE

Devialet D-Premier *(£12,000)*

Premier by name, premier by nature this radical new amplifier from – until very recently – an unknown brand looks set to challenge the very best audio has to offer
Review & Lab: **Paul Miller**

Once in a generation a company will emerge, often from left-field of audio's mainstream, with a concept so original and innovative that it has the capacity to re-define the expectations of a product genre. That company is Devialet of France and its product is the D-Premier integrated amplifier, expected to cost around £12k when launched in the UK.

Embarking on this review, little was known about the nitty-gritty of the D-Premier aside from its description as an 'ADH' (Analogue/Digital Hybrid) amplifier. It was not exhibited at CES in January nor formally announced to the press, so much of what we'll discuss here is derived from very close inspection and even closer lab work, all exclusive to *Hi-Fi News*.

This is an amplifier offering direct digital inputs alongside analogue line and MM/MC phono inputs, an amplifier that fuses the very best of digital and analogue engineering to produce a highly configurable yet supremely elegant solution. The technology inside Devialet's mirrored alloy casework is breathtaking in its originality and scope. Its construction is entirely modular and completely free of wires, right up to its 4mm speaker binding posts. It may just be the finest amplifier we have ever heard. Or not heard.

FRENCH CHEEK

An unkind observer might suggest that its polished casework bears an unfortunate resemblance to a set of bathroom scales, but the single-piece alloy chassis is not simply oozing French chic, it is also beautifully functional. As we will discover, the D-Premier operates at very high frequencies and power – only by sealing these electronics in a gap-free and near enough air-free alloy enclosure can Devialet guarantee the freedom from emissions and interference required for CE compliance and sale in the EU.

There's not even a hole to accommodate an IR eye, for the table-top remote is an RF device [see picture, below left], capable of adjusting volume, input selection, bass roll-off (in 2.1 mode) and phase inversion without line-of-sight of the D-Premier. Spin the weighted RF wheel and the Premier's display registers the volume from –97dB all the way up to +30dB, the peripheral clockface of dots turning red once the amp has reached its maximum output. The latter is a lot easier to gauge when you are employing a digital front-end because 0.0dB on the display represents maximum power. Depending on the signal level applied to its *analogue* inputs, you could reach the end stops substantially higher or lower on this numerical scale.

But even the end stops are 'buffered' in this sophisticated amplifier, for signals above 0.0dB are subject to compression up to +12dB and a form of soft-clipping thereafter up to +30dB. Without this intervention, if the volume were raised above 0.0dB and the digital music content contained peaks close to 0dBFs, the amplifier could suffer momentary but crushing levels of distortion.

THE AUDIOPHILE HUB

Levering off the rear panel, an interference fit at the top and back of the chassis, reveals a mix of connections. These may be individually configured to accommodate digital (coaxial and optical S/PDIF plus balanced AES/EBU), analogue line-level and even MM/MC phono sources. There are even a pair of HDMI input

RIGHT: A backlit LC display indicates both volume and input selection. The display changes orientation depending on whether the amp is laid flat or placed upright against a wall

and output connections to service high resolution two-channel audio from DVD and BD players.

Devialet will supply a PC/Mac application that allows full customisation of the D-Premier, from naming and configuring the sockets (input, output, digital or analogue) and even specifying the output power from 160W to 240W. The default is 165W/8ohm. You customise and store the configuration onto an SD card and simply plug it into the reader on the rear of the amp.

There are plenty of other elegant touches to hand – the display rotates according to the physical disposition of the amp, for example, while high volume settings are automatically reduced if no digital input is sensed for a period. Leave the amp for half an hour or so and it drops into a 5W standby mode. Warm-up time? Well, that's the time taken for its OS to boot – about ten seconds by my reckoning.

Our sample operated in default mode only and while the HDMI facility was not enabled, the HDMI receiver/repeater board was fitted in place [see picture, p24]. At the time of writing, Devialet still has to add the handshaking that ensures the HDMI source (Blu-ray or DVD player) sends two-channel PCM and not multichannel, Dolby or DTS encoded bitstreams...

A single set of 4mm speaker outlets are fitted but if you are to benefit from this amplifier's fabulously low output impedance then kindly discard any notions of using scrawny cables, regardless of audiophile pretention. With this proviso in mind, if hooking-up the D-Premier is a doddle then keeping it free of fingerprints is an exercise in severe self restraint. Visitors, whether audiophile or not, will be compelled to touch that beautifully mirrored surface, so keep Devialet's monogramed cleaning cloth to hand!

PREVENTION, NOT CURE

A glance at our technology boxouts on this and p25 suggests a deal of custom DSP overseeing the D-Premier's operation. But these powerful Analogix processors do not only calculate the PWM signal required to drive the Class D current dumpers, they also provide a measure of compensation for non-linearities in both Class D and, particularly, Class A stages. Calibrated for frequency, digital volume position and output level the heightened precision of the DAC and Class A I-to-V stages are what shape the performance of the D-Premier as a whole. If we were able to measure or listen to the Class D stage in isolation, we'd discover it was far 'rougher' sounding than the combined efforts of its ADH output [see boxout, below].

'Warm-up time? About ten seconds by my reckoning'

ABOVE: The 6.9kg D-Premier is fashioned from a single alloy casting – 32mm thick, gently radiused, chromed and polished to a perfect mirror finish. White gloves are supplied!

Moreover, my experiments showed Devialet has programmed the DSP with a very sophisticated protection regime. Rather than wait for an over-voltage/current or temperature condition to arise in the Class D stage (although such a failsafe is also implemented), the digital audio is continuously monitored for patterns of level and/or frequency that would over-modulate the PWM stage. Thus the protection is in part *predictive* – the D-Premier simply never allows any data into the Class D amp that would cause it to fail. And believe me, when a beefy Class D amplifier even momentarily exceeds its safe operating area a parasitic oscillation can see it destroyed in an instant.

SOUND OF SILENCE

How to describe the performance of this amplifier? Imagine you are sitting in a concert hall. The orchestra finishes its warm-up and the sound of individual strings and winds drift away to the vaults of the venue. The audience's coughs, splutters and rustling of programme notes diminish to a respectful hush. The lights dim and you close your eyes. Silence.

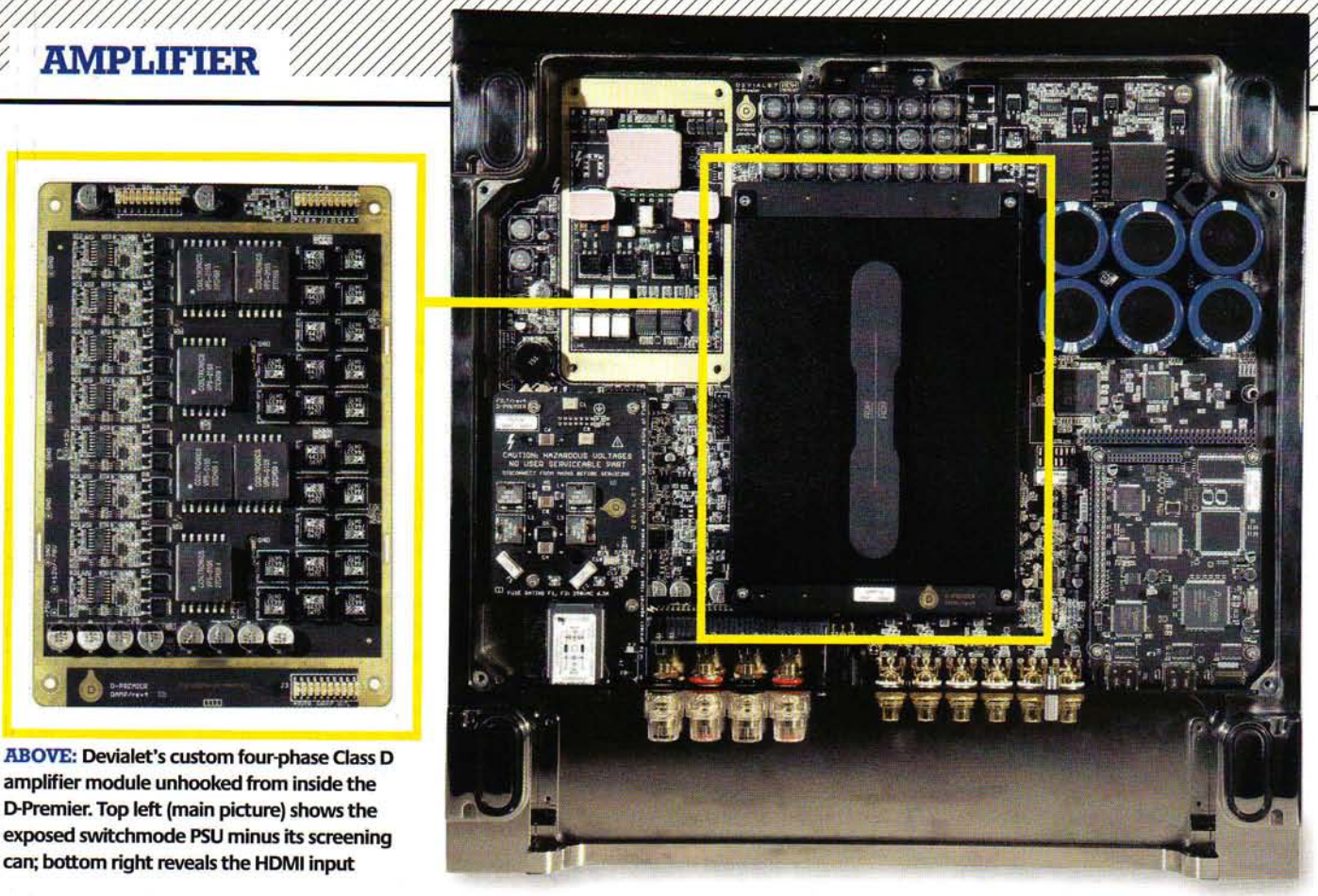
For a long moment the audience holds its collective breath for there is no lead-in groove, no tape noise or hiss of electronics to announce the first notes of this overture. Then it comes. The striking crash of cymbal and deep resonant wave of the tympani strike your body. Eyes now wide open, heart roused from its lazy rhythm you know you are witnessing a visceral, live performance. No hi-fi comes close, you think, no hi-fi can realise this spontaneous dynamic range, this vivid colour and expression of real instruments throbbing before your eyes and ears.

Generally speaking I would agree, but the sound of the D-Premier fed from 24-bit Studio Master quality digital files comes astonishingly close. In fact, the only time I experienced the uncanny perception of music rising from a similarly ⇨

ADH TECHNOLOGY

ADH – Analogue/Digital Hybrid – amplifier technology is an entirely proprietary regime that combines the services of a very low power analogue Class A amplifier with a very high power, truly digital Class D amplifier. Here's how it works: the analogue Class A amplifier is directly coupled to the speaker and defines the full *voltage* swing available while the digital Class D amplifier provides 99% of the *current* required to maintain this voltage across the speaker load. The idea is not dissimilar to Quad's 'feedforward' Class A/B Current Dumping technique applied in its 405 power amplifier some 35 years earlier [*Wireless World*, Dec 1975]. In both cases the Class A control amplifier (a high voltage preamp) utilises an error signal derived from the current dumpers to compensate for their non-linearities.

In practice, when we measure and listen to the Devialet, it's the performance of this very linear Class A control amp that defines both the numbers and its sound. Moreover in this French example of the art, the Class A amp also filters the triangular ripple current from its noisy digital Class D switching stage. In one step the need for an invasive LC filter – used between the modulator and speaker outputs of all other Class D amps – is avoided. Uniquely for a Class D design, the D Premier is fundamentally insensitive to variations in load between one speaker and the next, opening up a huge choice of partnering boxes for the audiophile.



ABOVE: Devialet's custom four-phase Class D amplifier module unhooked from inside the D-Premier. Top left (main picture) shows the exposed switchmode PSU minus its screening can; bottom right reveals the HDMI input

black background was during my time with a prototype true digital Class D amplifier in 1995, the forerunner of the TacT Millennium. At the time I likened the experience to 'stepping out into a clear road only to be knocked over by an electric car turning the corner'. But this was operating at just 16-bits and the huge swell of ultrasonic requantisation noise just outside of the audioband had yet to be dealt with.

THE NEXT GENERATION

Years later and Devaliet's D-Premier evokes very similar emotions. This time, however, the background isn't just black, it's a chasm of calm, a cool silence that stretches back beyond the obvious reaches of the stereo soundstage.

This abyssal canvas explains why I sat transfixed by an NHK presentation of the Saito Kinen Festival on Blu-ray [Berlioz's *Symphonie fantastique*, NSBS-13457]. Only now was the 24-bit dynamic range of this digital recording finally being realised, injected directly from the S/PDIF output of a Marantz UD9004 universal player [*HFN*, Dec '09]. The only analogue stage in the signal path a low power, Class A voltage amp guiding the output of the D-Premier...

Every performer in this substantial orchestra was revealed with the precision and clarity of a soloist. The wistful colour of cor anglais separated from the reedier oboe, the cello playfully mocking the grander double basses while horn, trumpet and trombone soared – metallic but richly coloured, never too cool or dispassionately brassy. And the whole? This was simply superb, so rounded and harmoniously balanced you felt compelled to reach out and embrace their ranks.

I also had occasion to enjoy a two-channel rendering of Eric Clapton, Roger Taylor *et al* in *A Concert by the Lake* [ERBRD5049 Blu-ray], the Devaliet capturing the open atmosphere of this very select event with its customary transparency. The crisp night air was palpable as Clapton and Rutherford traded some slick riffs, but this was a gentlemanly performance, the fellas clearly lacking the gusto of their youth. Well, I never said the Devialet was sympathetic.

'You know when you are witnessing a live, visceral performance'

In general, the very best amps are able to make your speakers melt from the room, projecting a musical performance into the space between and around them and you. There's no obvious sense of boxes in the room as the music hangs, palpable but independent. The insight this provides into the music is fantastic – when it happens.

PIERRE CALMEL

The innovative brains behind the D-Premier was insufficiently taxed at the R&D dept. of Nortel Networks. 'I started day-dreaming about designing the best amplifier ever, with the highest efficiency ever,' he says, 'and the idea of associating Class D and A amplifiers came swiftly.' The underlying technology was patented in 2004 and Devaliet SAS in Paris was on its way, Pierre assisted by another ex-Nortel colleague Mathias Moronvalle.

Funding and encouragement from an industrial designer (and audiophile) brought the D-Premier prototype to production from 2007 to 2010. 'It has been a real team effort' reveals Pierre, 'involving a lot of core competencies'.

ABOVE: Seen from above, or mounted vertically on a wall, Devialet's port hole not only reveals its ADH technology motif but also houses a hidden Wi-Fi antenna. A riser for an extension board is already in place to accommodate streaming of hi-res audio

But the D-Premier does something else, something quite wonderful.

I returned to that tympani, to experience the shocking pulse of musical energy once again and realised that while the body of the instrument was perfectly proportioned, the image of the bowl and taut skin was not just simply projected into the room. Instead it seemed as if the speaker itself was the instrument, as if the very walls of my substantial B&W 802s were the kettle of the drum.

The control exercised by this amplifier over any of the speakers I tried, including models as diverse as Sonus faber Minima, Magico M50 and B&W 802 floorstanders, is seemingly total. After all, it has a vanishingly low output impedance, a response flat to within 0.1Hz of DC and a power supply capable of doubling its output with each halving of speaker load impedance. The most recalcitrant of speakers are rendered utterly compliant.

DO PASS JAIL

If the performance of the D-Premier's analogue inputs are rather at the mercy of both input (source output) level and the ADC's ineffectual anti-aliasing filter [see Lab Report, p27] then its various digital inputs are certainly not. ⇨

THE DIGITAL CORE

All inputs to the D-Premier end up in the digital domain, analogue inputs via a 48kHz sampling ADC and digital inputs via 192kHz upsampling. This 24-bit/192kHz audio data is used to derive the ~300kHz PWM (Pulse Width Modulated) signal for the Class D amp. This describes the signal amplitude by the relative 'width' of pulses in the chain, the underlying audio signal being recovered by filtering through the highly linear Class A amp [see ADH boxout, p23].

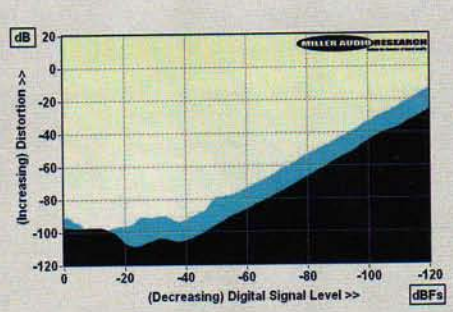
The Class A amp, meanwhile, is also driven by this digital data after volume and other correction is applied. Devialet uses pairs of Burr-Brown PCM1792 DACs in a proprietary 'current reflector' configuration that encompasses both I-to-V conversion and gain for the bias-corrected Class A output stage.

LAB REPORT (DIGITAL)

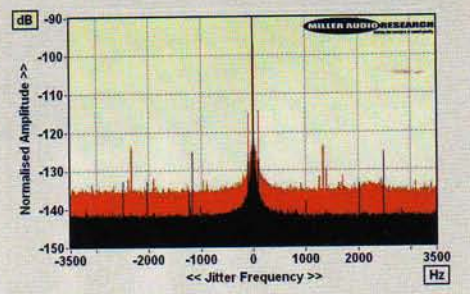
DEVIALET D-PREMIER *(£12,000)*

The following measurements represent the performance of the D-Premier's digital core and the graphs may be compared directly with those obtained from any CD/DVD/BD player or outboard DAC reviewed in *HFN* in the last three years. Only here the output at 0dBFs (peak digital) is not the customary 2V but a full 36.3V developing 165W/8ohm. While performance via the analogue inputs is limited by a mere 48kHz sampling, the digital inputs offer a full 0.1Hz-90kHz output bandwidth with up to 24-bit/192kHz data. Crucially, the distortion versus digital level (less than 0.005% over the top 50dB of its dynamic range) is superior to any outboard DAC measured so far while digital jitter is an almost invisible 40/50psec with 48/96kHz data at 10W/8ohm – a fabulous result aided by all clocks being transmitted in differential mode across the amp. Equally superb is the 120dB A-wtd full scale S/N ratio via the digital inputs (this is closer to 90dB re. 1W/8ohm via the analogue inputs).

Depending on the sensitivity of the speaker, the programme content and preferred listening level, the position of the D-Premier's volume control may well be shifted off the 0.0dB spot, prompting a change in (digital) distortions, particularly at higher frequencies. Unity gain occurs at volume position –22.5dB while, with a 0dBFs input, 1W/8ohm is achieved at –22.0dB. Distortion falls to just 0.00025% at 1kHz in this position, increasing to 0.012% at 40kHz with 96kHz/24-bit data. Readers are invited to view a comprehensive QC Suite test report for the D-Premier's digital input, DSP and DAC performance by navigating to *www.hifinews.co.uk* and clicking on the red 'download' button. **PM**



ABOVE: Distortion vs. digital signal level from 0dB (165W) to –120dB (0.17nW) with 24-bit data at '0.0dB' vol. position (1kHz = black; 20kHz = blue)



ABOVE: High resolution jitter plot showing 48kHz/24-bit (black) and 96kHz/24-bit data (red) measured at 10W/8ohm output. Jitter is exceptionally low

HI-FI NEWS SPECIFICATIONS

Maximum Output Level (0dBFs)	36.3Vrms
A-wtd S/N Ratio	119.5dB
Distortion (1kHz, 0dBFs/–30dBFs)	0.0014% (165W) / 0.00056% (0.17W)
Distortion & Noise (10kHz, 0dBFs)	0.003% (165W)
Frequency resp. (192kHz/24-bit)	+0.0dB (10Hz) to –8.7dB (90kHz)
Digital jitter (48kHz/96kHz, 24-bit)	37psec / 49psec
Resolution @ –110dB	±0.2dB
Power efficiency	90% (165W)
Dimensions (WHD)	400x44.5x400mm

ABOVE: Devialet has equipped its amp with an HDMI v1.3 input and output, two Toslink optical digital inputs (up to 24-bit/192kHz) and a balanced AES/EBU digital input. The MM/MC phono and line input, two coaxial digital inputs/outputs (up to 24-bit/192kHz) may be configured to use any of the six visible RCA sockets.

Frankly I am inclined to treat the analogue inputs as a 'get out of jail' feature for legacy gear including analogue tuners, reel-to-reel or pre-digital out CD hardware. Otherwise you're necessarily going to use the digital output of your disc player. But that's just the start. In practice, the D-Premier is manna from heaven for those enthusiasts already tempted by music on DVD/DVD-A or Blu-ray or, indeed, the high resolution music downloads offered by Linn, Naim, Chesky and others. And boy, does the step-up from 16-bit CD to 24-bit DVD-A, BD, FLAC or WAV formats at 48kHz to 192kHz make a difference!

RESOLUTION EVOLUTION

There's a nifty DVD-A from The Resolution Project, a collaboration between DPA microphones, Dolby, Minnetonka software and others, that includes a live recording of the Mary Louise Knutson Trio in a small church presented in a variety of formats including 16-bit/44.1kHz (CD quality) up to the holy grail of 24-bit/192kHz – the native internal resolution of the D-Premier. The CD resolution still sounded fabulous, the delicate brushwork of percussion and Mary's dexterous action over the keyboards all lifted by the dark, dark backdrop afforded by this amplifier, free of any hint of hardness or digital hash. It sounded as pure as cool, crystal-clear water.

Switch to the 24-bit/192kHz format and this dark floor just falls completely away, revealing the collective intake of breath from the audience the instant before Mary begins her countdown and Phil Hey's bass drum announces the trio. The resonant depth of both the drum and acoustic bass just keeps on going, drawing out low frequencies I didn't know existed from the substantial B&W 802s, as the percussive impact of ivory mingles with the chink of ice in a glass, reflected off the brick walls of this lively but intimate church venue. The atmosphere, detail, the harmonious integration of the performers and, above all, the palpable *realism* of the piece was captivating.

DIGITAL STREAMING

I cherished the time spent listening to the highest resolution (Studio Master quality) digital files stored on a 4TB QNAP NAS server, navigated by PC and rendered via the digital output of a Linn DS player. As CD begins to lose its lustre for committed two-channel audiophiles, there's an inclination to gravitate towards the luxuriant sound of top-notch vinyl and/or the sensational resolution afforded by 24-bit DRM-free audio downloads.

Certainly I've never heard a plain vanilla CD player offer the performance of a Linn DS delivering 24-bit/96kHz digital audio through the Devialet D-Premier. The sound of Claire Martin's voice caressing the gentle tune that is 'Shadowville' [*Perfect Alibi*, 24-bit/96kHz FLAC] sounded truly alluring, her presence as solid, the intonation as velvety and emotive as if she really were standing in front of those B&Ws. For those so inclined, this is the future of exquisite music making in the home, short of hiring Ms Martin to perform for an evening.

HI-FI NEWS VERDICT

If I could award Devialet two badges then I would, because the D-Premier is both this Editor's choice and *the* Outstanding amplifier thus far of the new Millennium. The taut precision of its performance will not supplant the gloriously rich sound sought by tube-loving audiophiles, and that's just fine. But for enthusiasts running very high resolution digital front-ends, the D Premier is Hobson's binary choice.

Sound Quality: 90%

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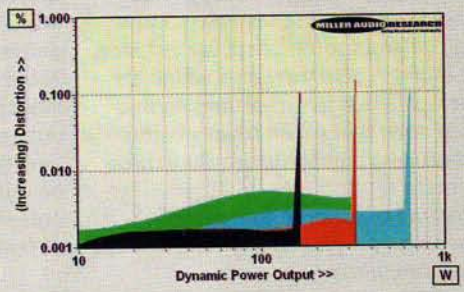
LAB REPORT (ANALOGUE)

DEVIALET D-PREMIER *(£12,000)*

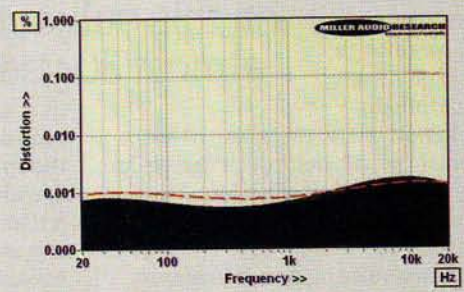
Via its analogue inputs, the gain of this amplifier is unusually high at +52.5dB (+30dB volume setting) or +22.5dB at the 0.0dB setting. This allows it to accommodate MM pickups via the phono input. Via its optical, coaxial or AES/EBU digital inputs, a full-scale 0dBFs digital signal yields 165W/8ohm and 330W/4ohm at the 0.0dB volume setting – the point at which Devaliet's sophisticated digital compression is invoked. Because the output is digitally defined, and the custom power supply so rigidly regulated, there is no difference in either continuous or dynamic power output, amounting to 165W, 330W and 650W into 8, 4 and 2ohm loads [see Graph 1, below]. This is as close to the perfect 3dB doubling of power as I have ever measured.

Neither is there the typical increase in distortion with decreasing load impedance seen with other amplifiers, a tolerance of speaker loads also indicated by the fabulously low 0.006ohm output impedance that holds true not just through the bass but right across its bandwidth. Distortion varies slightly with both the digital volume setting and frequency but over 1-150W and from 20Hz-20kHz it settles around 0.001% [see Graph 2, below]. Once again this consistency is remarkable.

Less remarkable is the input ADC which samples all analogue sources at 48kHz, limiting the response to –3dB/20kHz, channel balance to 0.1dB and crosstalk to –80dB/20kHz. Aliasing images are also poorly suppressed (–3.5dB re. 20kHz). All such issues are avoided via the digital inputs [see Lab Report, p25]. Readers are invited to view comprehensive QC Suite test reports for Devialet's D-Premier by navigating to *www.hifinews.co.uk* and clicking on the red 'download' button. **PM**



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads



ABOVE: Distortion vs. frequency at 10W/8ohm (black = left, red = right channel) showing exceptionally consistent performance across the audio range

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	165W / 330W
Dynamic power (<1% THD, 8/4/2/1ohm)	165W / 330W / 650W / 325W
Output impedance (20Hz–20kHz)	0.005–0.006ohm
Frequency response (20Hz–20kHz)	–0.0dB to –2.9dB (see Lab p25)
Input sensitivity (for 0dBW/165W)	6.7mV / 86.2mV
A-wtd S/N ratio (re. 0dBW/165W)	91.3dB / 113.7dB
Distortion (20Hz-20kHz)	0.00075–0.0013%
Power consumption (Idle/Rated o/p)	27W/450W (5W Standby)
Dimensions (WHD)	400x44.5x400mm