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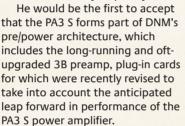
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DNM PA3 S power amp

Does enormous power always make musical sense? **Martin Colloms** hears a new stereo power amp from a designer who begs to differ

NM's long-awaited update to the PA3 power amplifier has finally arrived. Fully regulated, the PA3 S reflects the uncompromising approach of its designer Denis Morecroft. Offering just 23W per channel but costing £3750, this stereo power amp has undergone a long gestation, the reasons for which Morecroft outlines in our interview boxout [see p129].

For the purposes of this review, DNM supplied the entire 3B/PA3 S system including integral, factory standard, DNM single-strand cabling. On request, DNM also supplied





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a 'one-off' PA3 S, standard in all respects except for the provision of phono input sockets and speaker cable binding posts to enable more precise comparisons within the context of a standard review system.

CURRENT AFFAIRS

DNM operates a trade-in upgrade policy whereby older and more junior members of the range may be returned in exchange for a full allowance on a new model, minus a £50 handling charge. So, for example, DNM's previous PA1 (£1650) may be exchanged for the unregulated 45W-per-channel DNM PA3 (£2500) or the PA3 S. The returned models are remanufactured to factory condition, and then resold with a full three-year guarantee.

The 'S' version of the PA3 is said to be half as powerful as its unregulated predecessor, Denis Morecroft asserting that the cleaner, more dynamic delivery makes these two power amps equally loud, subjectively at least. In theory, the

ABOVE: The DNM PA3 S power amp with its separate transformer box (top) cost £3750 when released in 1998

3dB difference corresponds to just one volume control notch – or so I keep telling myself!

What you receive is a compact acrylic-cased power amp linked umbilically to a separate transformer box, the latter equipped with a power switch and a detachable IEC plug cable. Inputs are on 5-pin DINs; dealer-set outputs, as required, are for single, double or triple pairs of speaker connections, via buried 2mm gold-plated sockets.

Discrete components are used throughout the PA3 S, which operates in push-pull, direct-coupled, Class A/B mode. Single FET output devices are sufficient at this power level. Stable, rail-to-rail differential circuitry avoids current mirrors, and while this amplifier uses substantial negative feedback, great care has been taken to make the current paths as pure as

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possible to help maximise ultrasonic stability and allow feedback to be optimally effective, unconstrained by stray inductance and higher order modulation effects.

With its near-zero metal content, signal paths aided by 'super short' surface mount technology, and idealised 3D topology, the perfected amplifier kernel is fed from stable, clean and dynamic regulated power supplies, these push-pull circuits essentially as refined as the audio amps themselves. While the unregulated version of the amp uses 'Slit Foil' reservoir capacitors. the 'S' version employs the latest 'T' network 10,000pF types, which have been patented by the designer.



Several visiting products enlivened matters here, including the revived JBL 4312-II, a three-

'Inside the

PA3 S are

three stacked

way standmount speaker with a rated sensitivity of 93dB/W. Other models included the Wilson WITT Series II, the Quad ESL63, Spendor SP2-2 and the Circuit boards Electa Amator II from

Sonus faber. Reference amplification : best references, the sound remained was the Krell KPB 600, Cary 572 SE triode, Conrad-Johnson Premier 11a and the Naim NAP 250. Control was in-built with sources such as the Krell KPS20i/1 and DAX Decade, these supplemented by the Conrad--Johnson ART and the XTC PRE and, of course, the matching DNM preamplifier, the DNM 3C.

The set of triple-paralleled

DNM speaker cables supplied with the PA3 S were terminated in 4mm plugs. For the 'one off' power amp, Transparent, Siltech and van den Hul speaker cables were used. The interconnect to the power amp and links to the 3C were as defined by DNM Design, and DNM's single-stranded mains cables were fitted.

If, for any reason, you have to turn off the PA3 S, you'll find its subsequent rapid warm-up remarkable. From the very first track, the sound unfolds and 'opens out'. Instead of waiting 20 minutes for the mists to clear, they disappear in practically no time at all.

I was surprised to find myself completely at home with this amplifier system. It may be small scale, but the quality was such that I didn't feel short-changed. This diminutive dynamo really did succeed in conveying dynamics and expression, achieving the same degree of satisfaction that had hitherto required substantially higher listening levels.

Partnering the PA3 S with its matching DNM preamp, it was easy to hear a degree of consonance that lifted this product right out of the ordinary. In terms of tonal balance, the DNM combination was indeed somewhat lightweight, partly due to a small degree of dryness and

> overprojection in the treble, yet the sound was very well focused with wide, atmospheric stereo images and passable image depth. So, while depth fell a little short of the

clear and highly resolved.

In its ability to portray rhythm, the DNM PA3 S was exceptional, contriving to sound both upbeat and dynamically expressive. The bass was tight, agile and 'boppy', with a believable percussive quality. This was an interesting, detailed and musically involving performance. As

ABOVE: DNM founder Denis Morecroft caught on camera in the early '90s at the Hi-Fi News show held at the Penta Renaissance hotel at Heathrow

BELOW: An amp that proves less is more? Original pages from the June '98 issue of HFN in which **Martin Colloms** tested the PA3 S from DNM

a pre/power, despite the peak level limitations, it achieved a standard of performance that is truly audiophile.

HIGHER LEARNING

Although the DNM preamp was very good, it derived from an earlier generation design, and it turned out that the power amp performs to a still higher standard. Using the ART and other 'direct' signal sources, it was obvious that, in the PA3 S, here was something very special.

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In isolation, the PA3 S was found to be close to neutral in tonal quality, in my view somewhere between the big Krell 600 and a Cary 805C SET. The midrange was exceptionally well balanced and, in truth, this even-handed quality was maintained over the entire audible >>



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frequency range. For example, in the treble it was highly resolved, very delicate, airy and neutral. As for the bass, within its dynamic compass and modestly limited extension, I rated it among the best.

UNCANNY ABILITY

Given a reference-grade signal input, the PA3 S amplifier showed gains in transparency, attaining a 'very good to excellent' rating with well layered image perspectives. Exceeding its already satisfying performance on rhythm and dynamics, its timing now reached near textbook standard, so well did it 'lock in' both the performance and the performers. It also had the uncanny ability to make many competing power amplifiers sound rather blurred. Beginnings and ends of notes were superbly defined over the whole frequency range, while complex scoring was read cleanly with none of the usual mixup between the instrumental lines when the music gets complicated.

This stable consistent clarity, and very fine dynamic expression, were both factors in imparting high musical involvement and satisfaction without the need for high listening levels. Aural fatigue was rated



consistently low at moderate listening levels, though the sound thinned a little towards full power (not clipped, monitored with a peak power meter!). Bearing in mind its relatively small size and finite bass weight at very low frequencies, and knowing full well that floorshaking musical events are beyond its compass, I am persuaded by its sheer musicality to rate this amp as pre-eminent in its class.

LAB REPORT

Since the regulated power supply is stabilised to a fixed value, output

ABOVE: The rear of the PA3 S sports 5-pin DIN inputs plus buried 2mm gold-plated sockets for single, double or triple pairs of speaker connections. An umbilical cord from the external transformer case plugs into the central three-pin XLR socket

power may be precisely set, no more and no less. Thus, the PA3 S delivers precisely what is promised, being 13.6dBW or 23W into 8ohm loads. With both channels driven, there's about 1dB less output. Meanwhile, almost twice that power was available into 4ohm, and for this moderate powered amplifier, ample current was available. Even for 2ohm loads, more than 6A is generated, given due consideration to the self-resetting thermal cutout.

As for the output impedance, this was remarkably constant at about 0.25ohm, low enough to be \hookrightarrow

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'NOT FOR HEADBANGERS'

The company's amplifiers represent the antithesis to mega-muscle power. As Denis Morecroft, DNM's founder and designer, says, 'I'm not designing for headbangers! They've got to look elsewhere! But in my defence, I'd argue that the dynamic expression I try to achieve makes my amplifiers sound louder and more satisfying than amplifiers of nominally greater power.

'The sense of power in live unamplified music derives from the fine detail, not from the loud parts. For reproduction, resolution is thus more important than brute force... resolution without intermodulation effects.

'Frequently my amps are used like SE triode models with higher sensitivity speakers (greater than 90dB/W) and my distributor finds a good match with the highly efficient French made Rhedeko speakers, which I also like.'

In the PA3 S, Denis Morecroft tried to concentrate on a number of concepts concerning the perfection of the layout of the amplifier. He was concerned to obtain the right relationship of parts, and to understand the current flow and interaction between circuits. He also tried to minimise unwanted coupling even at very high frequencies.

ON THE BOARDS

In Morecroft's view, 'If power supply and ground routing don't intrude then a close approach to a perfect layout can be achieved. I've used modern technology in the form of surface mount techniques to make the power amplifier uniquely small. But then you have to connect power to it.

'My solution involved three stacked printed circuit boards with the power lines and power grounding running vertically, that is at right angles to the area of the circuit, so minimising the interaction between sensitive low level parts and high current regions.

'My research showed that problems of feedback stability, clarity and dynamic expression often related to these unwanted interactions which I've tried so hard to avoid. In a sense it completes a path of development which began with optimised star grounding, ultra clean power supplies, non interactive casework and, despite the expense, full supply regulation when deemed essential.'

BUILDING BLOCKS

DNM has adopted an evolutionary approach to design. As Morecroft reflects: 'While the PA3 S may be substantially different to previous models, it embodies successful aspects of designs that go back over ten years. For example, regardless of expense I've retained the alumina block thermal coupling between the output FETs and the heatsinks to minimise interaction with the metal of the heatsinks.

'And there are high performance power regulators in the supplies of the top model, which give the cleanest and most stable power. In a sense they are power amplifiers in their own right'.

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inconsequential. The response runs from 36Hz-32kHz (±0.5dB). Simple measurements for total harmonic distortion gave very low residuals, better than 90dB midband at full power, while spectrum analysis was necessary to track down the distortion (typically –100dB for low and mid frequencies, and perhaps –81dB, or 0.009%/20kHz).

CONCLUSION

The PA3 S largely vindicates Denis Morecroft's assessment of negative feedback. He believes that although invariably it is a major source of problems, as long as extraordinary care is taken to overcome common pitfalls, and careful use is made of appropriate circuit topology, the application of negative feedback in a solid-state amp can be justified as a means of obtaining satisfactory linearity and load matching.

Through his efforts to bring : optimised several factors under his control, Morecroft has proved himself to be a highly committed designer who has achieved much. Innovations that testify to Morecroft's achievements include : optimised : optimised

minimisation of stray induced currents; the painstakingly detailed optimisation of stability margins in the ultrasonic range to minimise the feedback signature; development of a unique 'T' network reservoir capacitor; and the use of



costly active push-pull regulated supplies and 3D topology in a tiny, optimised amp kernel. The DNM

PA3 S proves the validity of Morecroft's work very effectively indeed. Perfection in miniature, this reference quality power amplifier is highly rewarding musically. Despite its

high pound-to-watt ratio it is easy to recommend. If, in practice, you find the PA3 S goes loud enough then look no further, unless you have a lot more to spend. (b)



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JADIS ORCHESTRA

French valve specialist Jadis offers its 'affordable' Orchestra system: amp, CD player and speakers at about £1000 each. Ken Kessler listens.

DENON DCD-1550AR

Paul Miller reckons tried-andtested technology makes for a comfortable sound from this new £350 CD player.

EIKOS FR1

Martin Colloms sits down with a speaker that boasts a breakthrough cabinet design.

MUSICAL FIDELITY X-AL

Ken Kessler and Paul Miller test a new integrated amplifier in Musical Fidelity's X Series. Can it live up to the reputation of its famous forebear, the Al?

POT POURRI

Martin Colloms on van den Hul's exotic carbon speaker cable 'The Third', plus Clive Meakins on Trichord's Clock 3 CD player.

BELOW: The PA3 S power amp with its lid removed. It uses custom 10.000pF 'T' network capacitors in the power supply, fully discrete regulation, and single FET devices in the output. Signal paths are aided by 'super short' surface mount technology



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