

Gato Audio DIA-250S NPM

Here's a compact amp with both digital and analogue inputs, plus a full Roon-ready network audio implementation, and radically lowered price – what's not to like?

Review: **Andrew Everard** Lab: **Paul Miller**

A lot can happen in three years, and while the amplifier we have here is very much the smaller sibling of the DIA-400S [HFN Oct '16], it's also boosted by the inclusion of the Danish company's NPM module, a complete network audio solution giving access to a wide range of streaming options.

There's something else new here, too: until recently the price of the DIA-250S NPM was in the region of £4900, which is what you'd pay through UK distributor Elite Audio. However, in June this year, the Danish manufacturer instituted a direct selling policy, with a substantial 40% not so much shaved as lopped off the price across its range. Look online and you'll see that the DIA-250S NPM is now just €2995.

The company describes the new policy thus: 'when developing hi-fi equipment, it is all about shortest possible signal path. Now we are introducing a super lean distribution model without the traditional distributors, local inventory and marketing – the shortest possible path from factory to the consumer'.

SPEEDY DIALOGUE

Obviously this put its distributors in the invidious position of being undercut by the very manufacturer whose product they were supporting, so it's clear some rapid talking went on behind the scenes to ensure the UK price remained aligned with that of the factory direct offering. So the latest £2995 ticket via Elite seems very fair – though who knows where the Euro/Sterling exchange rate will be when you read this!

Elite's Mark Cargill says that under the new deal, Gato won't supply UK customers direct, and adds 'I think the new pricing structure makes the Gato products incredible value for money'. He won't get any argument from me on that last

RIGHT: Upsampling and D/A conversion are handled by chips from Wolfson and TI [left] while the switchmode PSU [screened, right] and Class D MOSFET power amp are governed via a solution from Infineon Technologies AG

count. Having spent some time with the DIA-250S NPM, I'd say that if its facilities and performance made it a great buy at the previous price, then the new ticket makes it nothing less than a stone bonker of an absolute bargain.

Permit me to explain why. Like other Gato Audio products, this one has its roots in Scandinavian company GamuT, where Gato co-founder Frederik Johansen ran R&D and production before linking up in 2007 with industrial designer Kresten Dinesen, responsible for the not inconsiderable style of the new company's products. PM explains the technology behind the amp design [see boxout, p69] but in short, the Gato amplifiers are built around a desire to take a cool-running Class D topology and make it sound more like a conventional Class AB amplifier. So anyone who runs screaming in horror at the very thought of

a Class D amplifier can hang up their Nikes now – there's nothing to see here, people, and much to enjoy.

WHOLE NEW WORLD

So, housed within the sleek 'figure-of-eight' casework that's become a Gato hallmark, complete with its clever use of slatted side panels for heatsinking, we have an amp able to accept both analogue (on two sets of RCAs and one pair of balanced XLRs) and digital sources (coaxial, optical and asynchronous USB-B, plus Bluetooth). The latter are all upsampled to 192kHz/24-bit before being passed through balanced Burr-Brown PCM1794A DACs.

There's also the facility to designate one of the RCA inputs as 'direct', bypassing the volume control, for use with a home cinema processor – just select input 1 and hold the button down for four seconds,



and the display to the left of the volume control changes over to 'HT'.

The basic specification of 250W/8ohm and 500W/4ohm, and RCA/XLR line pre-outs to feed external power amps, active speakers and subwoofers, has not changed from the original DIA-250S amplifier [see PM's Lab Report, p71]. Similarly, the controls are minimal, with nothing more than that large central volume control, input selector, plus a standby button, on the front panel. The display shows volume and input as standard, but when playing digital sources the right-hand panel can be set to show input sampling rate, either for a few seconds via remote control, or by default using the display dimmer button on the rear panel.

Crucially, Gato has now added its NPM (network player module) to the DIA-250S, opening up a whole new world of digital streaming to the user. Inserted into the upper part of the rear panel, where once

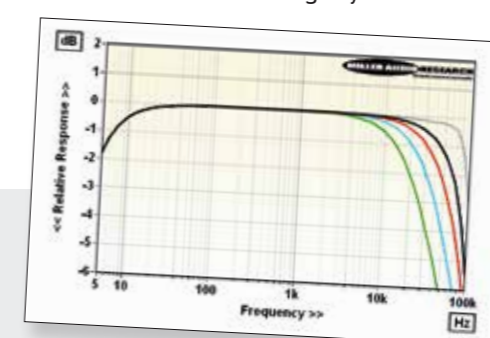
was just a screw terminal to connect a Bluetooth stub antenna, this adds an Ethernet port and a USB-A socket into which can be inserted a supplied Wi-Fi dongle, and upgrades the Bluetooth provision to aptX HD.

Now you have a single-box solution for your conventional hi-fi components and

streaming, both from local music storage (for example a NAS unit) and from online services. These include Apple Music and Google Play, Qobuz, Spotify, Tidal and many more, including Tuneln Internet radio,

all controllable using Gato's preferred mConnect app on Android and iOS devices. The DIA-250S NPM is also Roon-ready, and thus able to be 'driven' using any Roon

'Those who run from Class D amps can hang up their Nikes'



CLASS D MOSFET

All Gato's amplifiers are distinguished by their use of just two power FETs per channel [see Opinion, HFN Jun '17], typically in a quasi-complementary Class AB design. Only in the DIA-400S [HFN Oct '16] and this latest DIA-250S are these FETs employed in the high-speed PWM switching stage of a Class D amplifier design – versions of International Rectifier's MOSFET-based IRAUDAMP and switchmode power supply solution. IR was acquired in 2015 by Infineon Technologies AG, and Gato Audio has availed itself of this well-supported technology to offer huge power outputs from a very compact and well-screened enclosure. Running at 85-90% efficiency ensures the case barely gets warm even when your speakers are 'cooking'. However, like other Class D amps of this type, the DIA-250S's response is still influenced by speaker load impedance, the treble falling away as impedance drops [see inset Graph: no speaker load, grey trace; 80hm, black; 40hm, red; 20hm, blue; 10hm, green]. Also, in order to optimise PSU performance, the DIA-250S's left channel is inverted, and its red speaker terminal connected to the right channel's grounded black speaker output. As a result, you must avoid any earthed speaker types. PM

ABOVE: The 'figure 8' fascia is a Gato Audio hallmark, as is the large rotary volume control and bold white LED multi-function display (input, sample rate, volume and over-temp)

remote device via a computer running Roon Core software.

GRIP 'N' GRUNT

Starting with the basics – its performance when fed via its analogue inputs – this is a very fine amplifier, requiring no allowances to be made for its compact size. It's easy to use, either via the front-panel controls or the remote [see p71] – the latter showing the wisdom of the large, clear, white-on-black display readouts – and proves fuss-free when driving speakers, as you might expect from that healthy output rating.

What's more, the manufacturer's claim of a more 'organic' sound is borne out in use. There's nothing mechanical or clinical here, despite the highly detailed presentation, there being plenty of ambience on offer and a fresh, clean overall balance. Playing music in through the balanced inputs from the Mola-Mola Tambaqui DAC [see p56], the DIA-250S NPM really got to grips with the Pittsburgh Symphony Orchestra/Manfred Honeck recording of Bruckner's Symphony No 9 [Fresh! FR-733; DXD 352.8kHz/24-bit], with both speed and sheer grunt in the bass deployed to fine effect, plus a lovely sense of dynamic freedom allowing the music to breathe.

And with the bouncy guitar-led jazz of Tettero's Plays Eddie Harris & Les McCann set [Sound Liaison SL1028A; DSD 256], the crispness with which this Gato amplifier rocks along, while keeping a close eye on all the elements of the mix and revealing their timbral textures, is entirely gratifying. The amp is equally adept when playing music in through the digital inputs, especially the USB-B from my Mac mini running Audirvana. Excellent though the 192kHz/24-bit capability here →

GATO AUDIO DIA-250S NPM

While the DIA-250S NPM did not *quite* meet its rated 250W/500W 8/4ohm power output, the figures of 2x240W and 2x480W into 8/4ohm, respectively, still demonstrate the perfect 'stiffness' of its regulated PSU. As expected, there is very little extra headroom under dynamic conditions, but the 243W, 505W and 860W into 8, 4 and 2ohm loads is still a lot of bang for this elegant form factor. The maximum (protected) 20.7A current yields 415W/1ohm [see Graph 1]. Distortion climbs gently with power output from 0.001%/1W to 0.005%/10W, 0.017%/100W and 0.06%/200W through bass and midrange, and more steeply at higher frequencies up to 0.08%/20kHz/10W. This is not atypical of Class D architectures as the amplifier's output impedance rises from 0.02ohm through bass and midrange to 0.2ohm/20kHz and 2.5ohm/100kHz as a function of the output filter's reactance. Noise is much lower than measured with the more powerful DIA-400S amp [*HFN* Oct '16], and the A-wtd S/N wider at 83dB (re. 0dBW), despite it sharing the same +29.6dB gain.

Gato's digital board features TI's PCM1794 DAC with its linear phase/fast roll-off filter offering a full 99dB stopband rejection [the circuit refined from Gato's PRD-3 preamp/DAC – *HFN* Oct '14 – and mirroring almost exactly the performance measured for the DIA-400S]. Tested via its balanced preamp (2.06V at 0dBFs, Vol = 66), distortion is uniformly low at 0.002-0.006% (20Hz-20kHz), reaching a minimum of 0.0005% at -20dBFs [see Graph 2, below], while the A-wtd S/N ratio is a ~17-bit 101dB. Jitter is fabulously low at <10psec while the DAC/preamp response is flatter than the amp's Class D output at -0.7dB/45kHz and -2dB/90kHz (96kHz and 192kHz media). PM



ABOVE: Substantial 4mm speaker outlets, single-ended (RCA) and balanced preamp outs (XLR) are joined by three line inputs (one balanced on XLR). The digital inputs include optical, coaxial, USB-B and LAN plus USB-A (Wi-Fi) and BT antenna sockets

sounds, showing a clean pair of heels to CD quality when delivered by the clear, precise and gutsy Gato Audio amplification, it may yet be something of drawback for those having a collection including higher bitrates or DSD files. Oh well, there's always Roon, with its built-in downsampling for that.

AT YOUR SERVICE

On which subject, good though the amplifier is when used entirely conventionally with 'physical' inputs, it really comes into its own when you use it to the full extent of its NPM-equipped capabilities, under the control of that familiar mConnect app or, even better, Roon. Do this, and the wide-ranging service compatibility (subject to the appropriate subscriptions, for course) is a major feather in the cap of the DIA-250S NPM, as is the slickness with which it operates. This may be an existing model with a network module bolted in, but that's not how it feels in use, for it's much more integrated than that.

The sound is crisp and precise, and particularly clear with well-recorded rock and pop such as The Divine Comedy's *Office Politics* [Divine Comedy Records Limited; DCRL1 12CDX]. In this case, the assurance of the musicianship is as obvious as the cleverness of the lyrics, while the whole is underpinned with

a bass that's taut, yet has richness and convincing textures. Yes, it may be a little dry for some tastes, but what it lacks in absolute warmth it more than makes up for in the way rhythms are played, and the amp keeps even weighty-sounding speakers under firm discipline, propelling the music relentlessly.

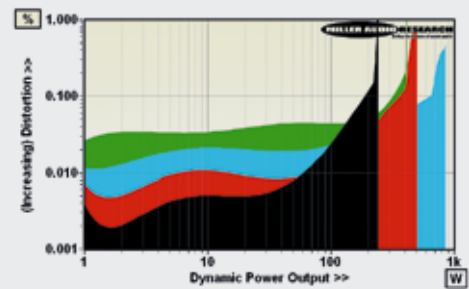
That rhythmic drive is obvious with anything backed by drums and bass, but also in the rigorous timing of a set such as Isata Kanneh-Mason's beautiful overview of Clara Schumann's piano music, *Romance* [Decca 4850020; 96kHz/24-bit]. Not only does the DIA-250S NPM's measured presentation make an excellent job of resolving the balance between pianist and orchestra, it also has the slickness and microdynamics to make every note clearly apparent, even given the speed of the Rondo of Schumann's Piano Sonata in G minor.

Whether playing bass-heavy music from the darker recesses of the Tidal catalogue, or exploring the huge range of pop, jazz and classical recordings available on the end of a Qobuz Studio subscription, this amp gives just as good an account of itself as it does when used with traditional 'physical' sources. ☺

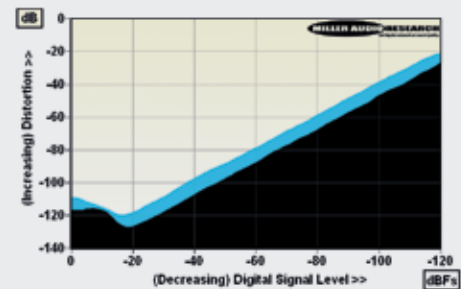
HI-FI NEWS VERDICT

This is a remarkably well-sorted and extremely flexible amplifier, with a sound treading a confident path between power and poise, drama and delicacy. It's easy to set up and use, has the ability to drive a range of loudspeakers with confidence, and is a real looker, too. That would make it a fine buy at the previous UK price, but at the new, lower one, it's a no-brainer. There's simply no excuse for not trying it!

Sound Quality: 88%



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 20.7A



ABOVE: Distortion versus 24-bit digital signal level over a 120dB range at 1kHz (black) and 20kHz (blue)

HI-FI NEWS SPECIFICATIONS

Continuous power (<1% THD, 8/4ohm)	240W / 480W
Dynamic power (<1% THD, 8/4/2/1ohm)	243W / 505W / 860W / 415W
Output impedance (20Hz-20kHz)	0.021-0.20ohm (72ohm, pre)
Freq. resp. (20Hz-20kHz/100kHz)	-0.14 to -0.23dB/-5.5dB (8ohm)
Digital jitter (S/PDIF at 48kHz/96kHz)	<10psec / <10psec
A-wtd S/N ratio (re. 0dBW/0dBFs)	83.2dB (Analogue) / 101.1dB (Dig)
Dist. (20Hz-20kHz: 0dBW/-20dBFs)	0.0028-0.110%/0.0015-0.003%
Power consumption (idle/rated o/p*)	24W / 526W (W standby)
Dimensions (WHD) / Weight	325x105x420mm / 10kg



LEFT: Gato's slim RC-5 IR handset offers digital/analogue input selection, volume up/down, mute and display dimming