Headphone preamplifier. Rated at 6W into 16ohm
Made by: Benchmark Media Systems, Inc., NY, USA
Supplied by: SCV Distribution
Telephone: 03301 222500
Web: www.benchmarkmedia.com; www.scvdistribution.co.uk
Price: £3295

Benchmark HPA4

Designed to match its compact DACs, Benchmark's all-analogue headphone amplifier employs the same THX 'Achromatic' tech debuted in its 100W AHB2 power amp

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

With the boom in headphone listening outpacing even the uptake of new turntables, the hi-fi landscape has changed to a significant extent. Not only are hi-fi shows shining a spotlight on the personal listening experience but dedicated headphone events have spun out in their own right. And the hardware is changing, too: the market is awash with DAC/headphone amp combos, all the way from the tiny (and highly portable) AudioQuest DragonFly models [*HFN* Oct '16], to the 'transportable' Chord Hugo 2 [*HFN* Aug '18] and mains-powered units such as the iFi Audio Pro iDSD [*HFN* Sep '18].

Arguably closer in outlook to Luxman's P-750u [*HFN* Sep '18], Benchmark's HPA4 is none of the above. Available in either silver or black finishes and selling for £3295 here in the UK, it has no built-in digital-to-analogue conversion and so, like Luxman's luxury heavyweight, is merely an all-analogue headphone amp.

Well, when I say 'merely' I do the HPA4 a disservice, as there's nothing mere about it. The fact Benchmark describes its product as a 'Reference Stereo Headphone Amplifier and Reference Line Amplifier with Relay Gain and Input Control', which should give you some idea of what's going on here, but only hints at the fact that this is actually two completely separate products packed into one relatively compact unit.

DOUBLE ACT

The diminutive dimensions – it's just 22cm wide, not much deeper and a sniff under 10cm tall – should come as no surprise given the similarly small, but ever-so-mighty AHB2 power amp also from the Syracuse, NY, company [*HFN* Mar '15]. What's more unusual is that, unlike most headphone amps able to double as a preamp, this one doesn't split its output between headphone sockets and preouts, but actually has discrete amplifier sections for the two functions. The headphone section is powered by a power amp from THX, employing the same AAA (Achromatic Audio Amplifier) technology first used by the company in its AHB2 [see PM's boxout, p71]. Alongside, Benchmark's line amplifier uses relays for input selection, gain control and muting while four independent 256-step attenuators, with gold-plated contacts, boast 'silky smooth volume changes'. Two of these attenuators feed the headphone outputs and two service the preamp outputs.

As PM notes in his Lab Report [p73], this design gives the HPA4 not only outstanding performance, but also rather impressive – to say the least – signal delivery, whether into headphones or external power amplification. There's a choice of a standard 6.35mm stereo or four-pin balanced XLR connections for headphones, while the amplifier has a choice of RCA and balanced XLR preamp outputs plus, unusually, a summed mono balanced output, which could be used to drive a suitable subwoofer, for example.

Inputs are provided on two sets apiece of balanced XLRs and RCA phonos, and there's also a pair of 12V trigger connections to allow remote amplifiers to be switched on and off. The colour touchscreen allows the function of these to be adjusted, along with niceties such as input naming, setting volume offsets (*ie*, the relative levels of each input and separate levels for the preamp and headphone outputs) and so on. It's also possible to integrate the operation of a

RIGHT: Four independent 256-step relay-switched attenuators are used here, two each for the stereo headphone and line outputs [top left]. This and the THX AAA-888 headphone amp [top right] are fed from a switching PSU [bottom]

LEFT: **The HPA4 is 'half width', with a single control for volume; there are 6.35mm and balanced XLR headphone sockets, and the touchscreen accesses the set-up menu**

Benchmark DAC with the HPA4, allowing the two to work as a single unit, both operated with the same remote handset.

That touchscreen, although apparently at odds with the all-analogue simplicity of the HPA4, only adds to its user-appeal, though if you don't share my view you can dim the display, and indeed set it to turn off a set period after you last touched it. This ensures the flexibility of the unit while also keeping things simple in use. You can even lock out the settings should you share your life with someone likely to fiddle – or if you are unable to resist the temptation yourself!

> 'The HPA4 has jaw-dropping impact, openness and vivacity'

LIFE IN MUSIC

In the absence of the obvious power amp partner, the £3095 AHB2, I pressed into service the punchy Exposure 5010 monoblocks [see p66] while sources included my usual Naim NDS/555PS, connected to the HPA4 via conventional cables, and the excellent Pioneer PD-70AE 'do it all' player [*HFN* May '18] via its balanced outputs. I also experimented with both single-ended and balanced connections between the Benchmark HPA4 and the Exposure 5010s, with all cabling from the Chord Company and QED, while the speakers were my resident PMC OB1s and Neat's Iota Xplorer [*HFN* Jul '18].

Headphones? I had a range to try, including the Quad ERA-1 [*HFN* Aug '18], B&W's P9 Signature [*HFN* Mar '17], a well-used pair of Focal's Spirit Professional [*HFN* Dec '15], and the Oppo PM-1 [*HFN* Jul '14] to which I find myself returning often, these last also allowing me to try the HPA4 in both conventional and balanced modes. Both the HPA4 and the iFi Audio Pro iDSD (on hand by way of comparison) claim the same kind of sonic attributes of definition, low noise and wide-ranging drive capabilities, but it's hard not to acknowledge that iFi Audio's model undercuts the HPA4 by a healthy 25%, and throws in a very good DSD-capable DAC as part of the deal. Clearly Benchmark would be starting any kind of head-to-head with one hand tied behind its back.

At least, that's the impression until you spend some time listening to the all-analogue contender. All of a track or two should do the trick, as whether with revealing headphones such as the Oppo PM-1s or used as a preamp, the HPA4 simply drops jaws with the sheer impact, openness and vivacity of the way it plays music. I played a new Channel Classics recording, pianist Anna Fedorova's *Four Fantasies* [CCS 41318; DSD 256], and was instantly struck by the way it sprang to life, with every element of the playing, and the size of the Steinway in a credible concert-hall acoustic, readily on display.

ACE AT ATMOSPHERE

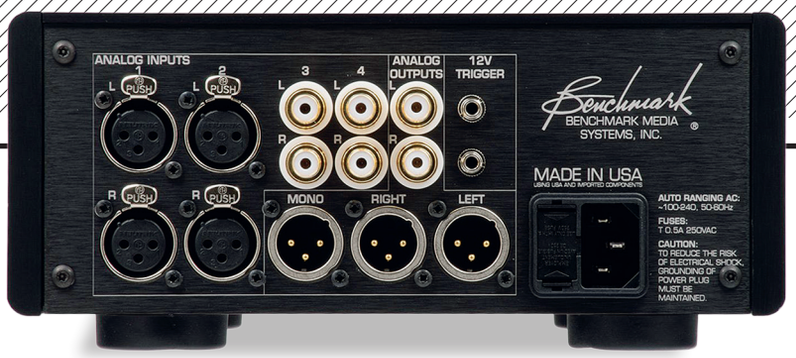
It was one of those real 'performer in the room' experiences and I was instantly transported back to the time I spent monitoring the recording as it was being made in the Eindhoven Muziekgebouw back in July. Then the effect, through producer/engineer Jared Sacks's spare pair of AKG K1000 'earspeakers', was spine-tingling. Listening to the released version [from NativeDSD.com] via the Oppo PM-1s driven in balanced mode by the HPA4, was every bit as emotional, and just as fulfilling as Fedorova attacked the last section of Beethoven's 'Moonlight' sonata with remarkable speed, spirit and precision.

That total openness was also much in evidence with Tom Jones's 2010 album *Praise And Blame* [Island 274 129-7], with ⇨

THE HEAT OF THE MATTER

The past decade has seen a lot of engineering effort expended on developing efficient (cool-running) amplifier technologies, avoiding the severe crossover distortion incurred by a 'cold' (zero-bias) Class B output stage, while competing on sonic grounds with the best 'traditional' Class A and A/B designs [see Investigation, *HFN* Feb '15]. Class D amplifiers are one solution – representing the audio signal as a series of very high frequency pulses – and they have improved in leaps and bounds in respect of load tolerance, response flatness, low noise and distortion. Alternatives include Class H, which is the US designation of Europe's Class G. These employ two or more PSU rails, each of higher voltage, with the lowest voltage always selected to accommodate the prevailing signal. Excess dissipation in the output stage is thus minimised, and efficiency improved.

For the headphone amplifier in its HPA4, Benchmark uses THX's 'Class H Achromatic Audio Amplifier' (THX AAA) technology – a further refinement of the breed that uses two or more pairs of DC rails of increasing voltage. Here, however, any rail-switching glitches or crossover distortion in its final Class B output stage are largely eliminated by the use of feedforward error correction. Of course, supreme 'green' efficiency is not vital for an AC-powered headphone amp of limited output and the specific THX AAA-888 module used here still has a quiescent (idle) consumption of a few watts. In practice, Benchmark is using THX AAA tech on grounds of *performance*, and so the HPA4 still runs fairly warm! PM



ABOVE: No digital inputs here... the HPA4 is pure 'analogue' with two balanced ins on XLRs, two single-ended (RCAs) and line outputs also on XLR and RCA (inc mono)

the powerful band resolved with superb impact, but most of all the close-up view of that remarkable voice, notably on the opening 'What Good Am I?' but also Sister Rosetta Tharpe's 'Strange Things' or the slamming 'Burning Hell'. The album may have famously been dismissed pre-release by a label boss as a 'sick joke', but listening to Jones giving the songs full commitment through equipment as revealing as this shows just how wide of the mark that assessment was – the sound just drips with atmosphere and sincerity.

RIGHT ON TRACK

The sound here is technically about as immaculate as you're going to get, but the real beauty of the HPA4 is the way it lets through all the intent of performers, producers and engineers. Play the flat dynamics of a recent release such as Nicki Minaj's *Queen* album [Young Money/Cash Money/Republic 00602567712183] and, for all the swagger and attitude supposedly in there somewhere, it sounds dull. But switch to Bill Frisell and Thomas Morgan's live *Small Town* set [ECM 2525] and instantly all the presence, ambience and instrumental timbre is restored.

So yes, this isn't a preamp to flatter poor recordings, nor indeed to give so-so source components an easy time, but get it right and it can turn on the magic in a way that eludes many a much more expensive preamp, let alone one doubling as an outstanding headphone amplifier. And it loves voices and real instruments, which allow it to shine, as is clear with Loreena McKennitt's recent *Lost Souls* album [Quinian Road QRCD117], which absolutely sparkles, or the even more atmospheric *Shine A Light*, Billy Bragg and Joe Henry's 'Field Recordings From The Great American Railroad' [Cooking Vinyl COOKCD623], where the ambient effects on these location recordings are often quite literally startling – especially via headphones!

Railway platform sounds and voices bubble away in the background, adding to the live ambience, and even the one 'indoor' track, 'Waiting For A Train' (recorded in the same San Antonio hotel room that Robert Johnson had his first session), has a lovely vintage atmosphere and intimacy to it.

The HPA4 can certainly rock out, its prodigious capability when it comes to output levels meaning it can give as much as your power amp or 'phones can take. In fact, it gets louder without the sound changing one iota, so some caution is to be advised if one isn't to drive partnering components to their limits. But that's testimony to the purity and skilled design of this thoroughly remarkable product.

LEFT: Benchmark's solid little remote covers off input selection, volume, mute and display brightness

HI-FI NEWS VERDICT

Despite PM's humorous note of caution, power amp destruction or ear-bashing isn't what the Benchmark HPA4 is all about. Instead its beauty is that it sets no limits on your system: any failings audible will need to be looked for elsewhere. Yes, it's a slightly more complex buy than your average headphone amp, its all-analogue design meaning most will need a partnering DAC, but the sound is beyond question.

Sound Quality: 90%

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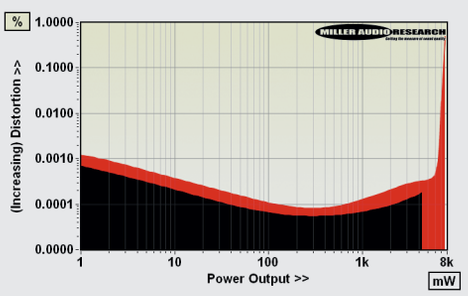
LAB REPORT

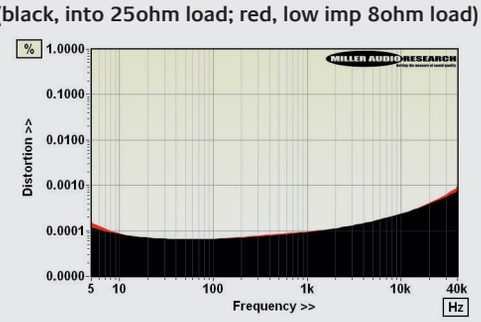
BENCHMARK HPA4

Here's a brand that's aptly named – its products typically providing a 'benchmark' technical performance. The HPA4 is no exception with its relay-switched stepwise volume attenuator calibrated in 0.5dB steps over a 'useable' 105dB range with the top +15dB to –15dB sequence offering a ±0.03dB accuracy and –16dB to –48dB within ±0.09dB. At –60dB the error is just –0.12dB. Gain is precise too, so 0.0dB on the display really *is* unity, +6.0dB is +5.98dB (x2) and +15.0dB is +14.98dB (x5.61) via its balanced line outputs. Distortion and noise are vanishing low, amounting to 0.00008% through bass and midrange at 0dBV, increasing to 0.00018%/20kHz and 0.0005%/40kHz [black trace, Graph 2, below]. The frequency response is ruler flat (±0.01dB) from 1Hz-100kHz, the source impedance is a sensible 30ohm and the maximum output a huge 22V – sufficient to drive any power amplifier beyond clipping and into, protection notwithstanding, a charred pit of smoke.

Via the headphone amp, the maximum voltage is 11.2V (or 209mW/600ohm) and, with protection kicking in, the maximum power output is a substantial 4.4W/25ohm and 7.7W/8ohm [black/red traces, Graph 1]. So, not only will the HPA4 drive the toughest headphone loads but its wide 103.3dB A-wtd S/N ratio and insignificant –102dBV (8µV) residual noise also ensures exceptionally quiet backgrounds when listening with the most *sensitive* headphones/earbuds. Distortion is broadly unaffected by loading, the values as vanishingly low as via the line output [Graph 2] but there's some very slight adjustment in HF response. The source impedance is a low <0.6ohm up to 10kHz, increasing to 0.78ohm/20kHz and 1.5ohm/100kHz, so the response tips very slightly from 0.0dB/20kHz and –0.38dB/100kHz (unloaded) to –0.12dB/20kHz and –0.7dB/100kHz (25ohm). **PM**



ABOVE: Continuous power output versus distortion (black, into 25ohm load; red, low imp 8ohm load)



ABOVE: Distortion versus frequency from 5Hz-40kHz (black, 1V unloaded; red, 10mW into 25ohm load)

HI-FI NEWS SPECIFICATIONS

Maximum output (<1% THD into 47kohm)	22100mV (22.1V, XLR line out)
Maximum power output (<1% THD)	4.37W/25ohm / 7.65W/8ohm
Output Imp. (20Hz-20kHz, line/head)	30ohm / 0.46-0.78ohm
A-wtd S/N ratio (re. 10mW/0dBV)	103.3dB / 103.3dB
Distortion (20Hz-20kHz, re. 10mW/0dBV)	0.00005-0.0002% (both o/ps)
Frequency resp. (20Hz-20kHz/100kHz)	+0.0dB to –0.0dB/+0.01dB
Stereo separation (20Hz-20kHz)	80-120dB
Power consumption	17W
Dimensions (WHD) / **Weight**	220x99x237mm / 3.6kg