

Benchmark
...the measure of excellence! ®



THE ULTIMATE HEADPHONE AMPLIFIER

Benchmark Media Systems, Inc. and THX, Ltd. have partnered to introduce the Benchmark HPA4 headphone/line amplifier featuring THX Achromatic Audio Amplifier (AAA™) technology.

THX AAA™ reduces harmonic, intermodulation, and crossover distortion by 20 to 40 dB to guarantee a realistic and fatigue-free listening experience. It accomplishes this using a patented feed-forward topology to null conventional distortion and noise mechanisms, resulting in the world's most linear amplifier. THX AAA allows the amplifier to reach its maximum output power and sound pressure level (SPL) without producing the distortion that normally accompanies increased output levels in traditional amplifiers.

Featuring the flagship THX-888 amplifier design, the revolutionary HPA4 headphone amplifier incorporates the same THX AAA technology that Benchmark uses in the AHB2 power amplifier. The HPA4 delivers sonic perfection. Hear the music without any contamination from electronic noise or distortion. The HPA4 delivers power, audio fidelity, speed and accuracy over an utterly silent background.

THE ULTIMATE LINE AMPLIFIER

The THX-888 amplifier is driven by a Benchmark line amplifier that features relay gain control, relay input selection, and relay muting. The line amplifier incorporates the finest gold-contact relays available. The gain control has 256 steps in 0.5 dB increments. It also features a balance control. Relay closures are precisely timed to deliver silky-smooth volume changes. No other relay gain control offers this level of precision and performance. The HPA4 includes 4 independent 256-step attenuators - two for the L&R headphone outputs, and two for the L&R line outputs. To make this all happen, the HPA4 includes a total of 64 precision relays.



HIGH VOLTAGE, HIGH CURRENT AND HIGH POWER

The THX-888 amplifier can cleanly deliver high voltage into low-sensitivity high-impedance headphones and it can cleanly deliver high power and current into low-impedance headphones. The HPA4 delivers 11.9 Vrms into 300 Ohms and 6 Watts into 16 Ohms. Given these extreme capabilities, Benchmark has incorporated several protection systems to protect expensive headphones and the amplifier itself. These include DC detection, short-circuit detection, over-current protection, over-voltage protection, and thermal protection.

HPA4

HEADPHONE/LINE AMPLIFIER

- THX-888 (AAA™) Headphone Amplifier
- Benchmark Line Amplifier
- 256-Step Relay Gain Control, 0.5 dB Steps
- Precision Timed Relay Closures
- Precision Metal Film Resistors
- Gold-Contact Relays
- Balanced and Unbalanced I/O
- 6 Watts into 16 Ohm Headphones
- 11.5 Vrms into 300 Ohm Headphones
- 0.01 Hz to 500 kHz
- SNR > 135 dB
- THD < 125 dB (0.00006%) under full load
- Short-Circuit Protection
- DC Protection
- Over-Voltage Protection
- Over-Current Protection
- Thermal Protection
- Touch Screen Control
- IR Remote Control (optional)
- 2 Balanced Stereo Line Inputs
- 2 Unbalanced Stereo Line Inputs
- 1 Balanced Stereo Line Output
- 1 Unbalanced Stereo Line Output
- 1 Balanced Mono Sum Output
- 2 Bidirectional 12V Trigger Ports

100% ANALOG SIGNAL PATH

The HPA4 is 100% analog. It is designed to be driven from an external D/A converter or an external analog source. The HPA4 is designed to provide the ultimate analog signal path between inputs and outputs. The HPA4 eclipses the performance of typical high-end preamplifiers by achieving much lower noise and distortion.

SPEED AND PRECISION

The bandwidth of the HPA4 extends from 0.01 Hz to over 500 kHz. This means that the HPA4 delivers very precise amplitude and phase accuracy over the entire audio bandwidth. Wave shapes are accurately reproduced, and the entire spectrum is delivered with precise timing. The HPA4 will deliver musical overtones with life-like accuracy. This means that musical instruments are rendered without changing their sonic character.

BALANCED AND UNBALANCED I/O

The headphone output of the THX-888 amplifier features a 1/4" TRS and a 4-pin XLR. Both outputs deliver the full performance of the HPA4. However, we recommend the XLR4 due to its lower contact resistance. The HPA4 features two balanced stereo inputs and two unbalanced stereo inputs. The line amplifier provides one balanced stereo output, one balanced mono sum, and one unbalanced stereo output.



SYSTEM INTEGRATION

The HPA4 includes IR remote control and can be operated using the optional Benchmark remote. The HPA4 is designed to work with the Benchmark DAC2 and DAC3 converters but may be driven from any high-end D/A converter. When paired with a Benchmark DAC, a single remote control will operate both units.

The HPA4 is the perfect complement to the Benchmark AHB2. It may be the only preamplifier or line amplifier that exceeds the signal to noise ratio of the ultra-quiet AHB2. This means that the HPA4 will extract the full performance of the AHB2. In contrast, other preamplifiers limit the system noise performance because they cannot match the SNR performance of the AHB2. The HPA4 is the only line amplifier/preamplifier that we recommend inserting between a DAC and the AHB2. The HPA4 can be inserted between a Benchmark DAC3 and AHB2 without degrading the system noise performance. With the HPA4 inserted, the DAC3's 32-bit digital gain control is replaced by the HPA4's more-resolving fully-analog relay gain control.

Two bidirectional 12V trigger ports can be used to link the HPA4 with external D/A converters and power amplifiers. The trigger signal controls the power-up and power-down sequencing of the entire audio system. The trigger ports are compatible with most industry-standard trigger input or output ports, but can communicate bidirectionally with other Benchmark products.

TOUCH SCREEN

The touch screen provides easy access to advanced features such as balance control, input level offsets, input names, screen dimming, remote control, and function locking. Help screens explain the special functions.

ROTARY ENCODER

The volume control knob features a high-quality optical encoder that is rated for heavy use. An acceleration feature makes it easy to move through the 256 volume steps while maintaining 0.5 dB/step resolution. A press of the control knob toggles between headphone volume, line out volume, or both.

HPA4

HEADPHONE/LINE AMPLIFIER

Specifications

(using balanced inputs at +24 dBu)

THX-888 Headphone Output:

THD < -125 dB (0.00006%)

SNR > 131 dB, unweighted, 20-20 kHz

SNR > 135 dB, A-weighted

Frequency Response - 0.003 dB at 10 Hz,
-0.001 dB at 20 kHz

-3 dB Bandwidth exceeds 0.1 Hz to 500 kHz

Output Impedance, near 0 Ohms

Output Noise < 2.45 uV at Unity Gain, 20-20
kHz

Maximum Output Power, 6 Watts into 16 Ohms

Maximum Output Voltage, 11.5 Vrms into 300
Ohms

Crosstalk < -133 dB @ 1 kHz, -115 dB @ 10
kHz (XLR4)

Balanced Line Outputs:

THD < -125 dB (0.00006%)

SNR > 135 dB, unweighted, 20-20 kHz

SNR > 137 dB, A-weighted

Frequency Response - 0.003 dB at 10 Hz,
-0.001 dB at 20 kHz

-3 dB Bandwidth exceeds 0.1 Hz to 500 kHz

Output Impedance 60 Ohms

Output Noise < 1.9 uV at Unity Gain, 20-20 kHz

Maximum Output Voltage, 11.5 Vrms into 300
Ohms

Crosstalk < -133 dB @ 1 kHz, -116 dB @ 10
kHz

Power:

18W Typical Input Power

35W Maximum Input power

0.33 W Standby Power (when off)

Internal Universal Power Supply

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