

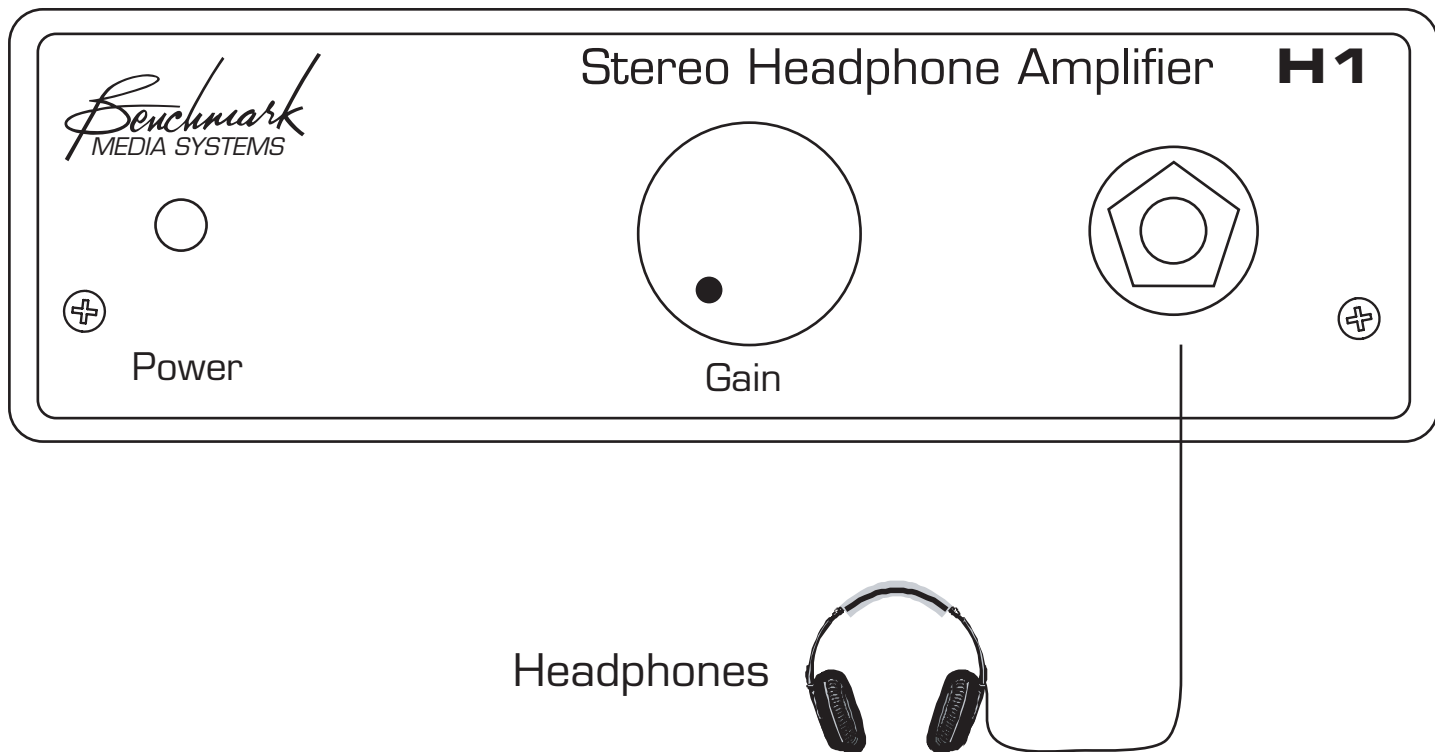
Audiophile Grade Stereo Headphone Amplifier



The Benchmark H1 is a high-power audiophile-grade stereo headphone amplifier. The H1 features sonic purity that fulfills even the most demanding headphone applications.

The H1 is designed to power all headphones that have a load impedance of 30 Ω or higher. It is not designed to power headphones that have 8 Ω load impedance. The H1 requires a bipolar power supply, such as the Benchmark PS-1 or PS-12.

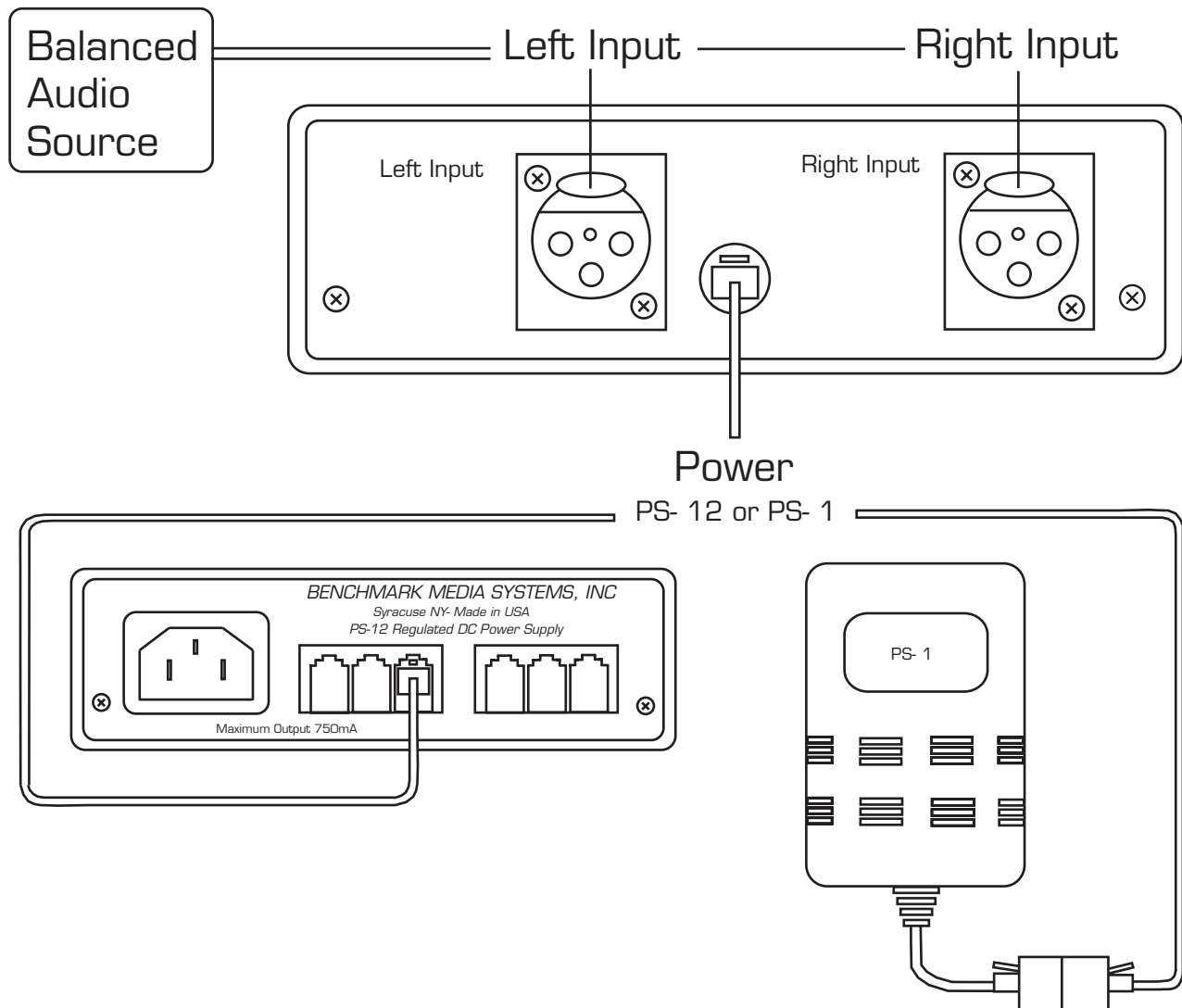
Benchmark



Connections

Connect the signal input lines to the input connectors. These connectors are located on the back of the H1. Whether feeding from a balanced source or an unbalanced source, you should wire the input as though it were receiving its signal from a balanced source. Use the “forward reference” technique outlined in the Benchmark Media Systems application note – “A Clean Audio Installation Guide”. This application note is available for download from the Benchmark web site. Using this wiring technique will help eliminate hum pickup from the system.

Connect the power cord extending from the back of the H1 to a PS-1 or PS 12 power supply. Because the H1 power input is bridge-rectified it will operate normally with the + and – supplies reversed, so you can use either a reversing or non-reversing RJ-11 coupler as necessary. The H1 must be powered from a bi-polar DC power supply with a recommended minimum power voltage of ± 9 volts and an absolute maximum power voltage of ± 18.7 volts. Voltages that are less than ± 9 will generally not provide adequate output volume from the headphones. Voltages that are higher than ± 18.7 may cause damage to the H1. The Benchmark PS-1 or PS-12 power supplies are ideally suited to power the H1.



Circuit Design

Input Stage

The input stage of the H1 features balanced 200-k Ω inputs with over-voltage protection. The balanced inputs provide common-mode rejection of interfering signals. Maximum input level is +29 dBu at +/- 15 V, and +27 dBu at +/- 18 V. 0.1% precision resistors provide a common mode rejection of approximately 60 dB without trimming. This stage has a bandwidth of 356 kHz and a gain of -6 dB.

Volume Control Stage

The variable gain stage has a range of “off” (– infinity) to +26 dB and a bandwidth of 730 kHz. The overall gain of the H1 is from “off” to +20 dB.

Output Stage

The output stage consists of a high current buffer inside a high-bandwidth feedback loop. The feedback virtually eliminates any distortion caused by the headphone load. The buffer provides output current of up to 0.5 amps. This current capability is sufficient to adequately drive most modern headphones. The “0 Ω ” output of the amplifier stage directly drives the diaphragms of the headphones. The overall bandwidth of the H1 exceeds 300 kHz. As such, the H1 has a very high damping factor and excellent high frequency, transient, and distortion performance.

Specs

Input	Stereo 200 k Ω Balanced Inputs with over-voltage protection
Input Clip	+26.5 dBu with ± 15 volt supplies
Output	Stereo, for use with 1/4" Tip/Ring/Sleeve plugs only, short-circuit protected
Output Impedance	"0 Ω "
Output Clip	Dependant upon power voltage and load [+20 dBu @ ± 15 V and 60 Ω load]
Load Impedance	30 Ω or higher
Output Level	Up to +20 dBu into 60 Ω [dependent upon power source]
Output Control	Dual log taper response
Gain Range	Off to +20 dB
Bandwidth	0.1 Hz to 300 kHz minimum
THD+N	0.0003% typical at headphone inputs - under load!
Noise Floor	Better than -75 dBu at maximum gain
Power	(Bipolar) ± 9 to ± 18 volts, bridge-rectified, maximum peak current needed = 1.1 Amp at maximum peak output into 30 Ω
Peak Output	7.5 watts [± 18 volt supplies. 30 Ω load]
Max Avg Output	1.35 watts [-8 dB peak to average ratio]
Dimensions	5.5" (139.7mm) Deep 1.5" (381.1mm) High 5.5" (139.7mm) Wide.
Weight	1.17lb

H1 Instruction Manual, Revision 1
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