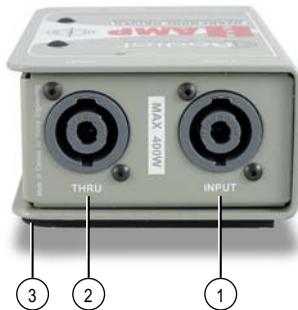


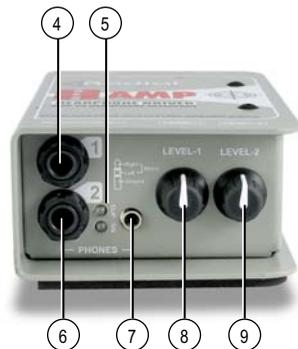
INPUT PANEL

1. INPUT: Speakon NL4 connector is used to connect the full-range output from a loudspeaker or amplifier to the H-Amp. Maximum 400 watts.
2. THRU: A second parallel Speakon NL4 is used to connect another H-Amp.
3. NO SLIP PAD: Full bottom surface neoprene pad provides electrical isolation and mechanical insulation. Keeps the H-Amp from moving around on active drum risers!



OUTPUT PANEL

4. HEADPHONE-1: 1/4" TRS jack supplies a mono signal to the first set of headphones.
5. LED INDICATORS: Separate signal and peak indicators provide visual monitoring of audio levels for up to date signal status.
6. HEADPHONE-2: 1/4" TRS jack supplies a mono signal to the first set of headphones. When a plug is inserted here the 3.5mm headphone jack is disconnected.
7. HEADPHONE-2: 3.5mm (1/8") jack designed to accommodate ear buds. This output is wired in parallel with Headphone-2 and supplies a mono signal. Inserting a plug into the 1/4" Headphone-2 output will disconnect this jack.
8. LEVEL-1: Controls the out level to Headphone-1.
9. LEVEL-2: Controls the out level to Headphone-2 and the 3.5mm mini headphone jack.



SIDE PANEL

10. TONE SHAPING EQ FILTER: Three band cut-only filter lets you tailor the sound of the headphones to compensate for the type of headphone used or to adjust the mix going to a loudspeaker to better suit the headphones.



LOW-CUT (high-pass) filter used to cut lows and reduce muddy bass to compensate for bass heavy mixes.



MID-CUT notch filter helps headphones sound more musical when excessive mids are present.



HIGH-CUT (low-pass) filter is used to roll-off highs from an overly bright mix that may be compensating for a dull sounding speaker.



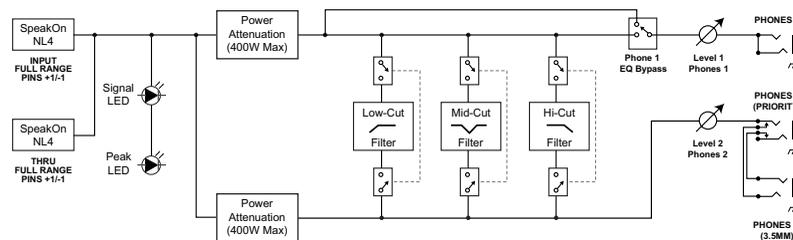
11. PHONE-1 BYPASS: Allows Headphone-1 to bypass the EQ. Lets you assign the EQ Filter to Headphone-2 only so two types of phones can be used while still allowing each to be tailored differently.



True to the Music

RADIAL H-AMP SPECIFICATIONS

Input:	Speakon NL4FC - full range speaker level Pin +1 = speaker positive / Pin -1 speaker negative
Maximum input:	400 watts RMS
Impedance load:	80 Ohms typical minimum
Headphone outputs:	Mono with variable level control
Construction:	14 gauge chassis, outer shell, baked enamel finish
Size:	3.3" x 5.0" x 2" (84 x 127 x 48mm)
Weight:	1.55 lb (720g)



RADIAL ENGINEERING 3 YEAR TRANSFERABLE LIMITED WARRANTY

RADIAL ENGINEERING LTD. ("Radial") warrants this product to be free from defects in material and workmanship and will remedy any such defects free of charge according to the terms of this warranty. Radial will repair or replace (at its option) any defective component(s) of this product (excluding finish and wear and tear on components under normal use) for a period of three (3) years from the original date of purchase. In the event that a particular product is no longer available, Radial reserves the right to replace the product with a similar product of equal or greater value. In the unlikely event that a defect is uncovered, please call 604-942-1001 or email service@radialeng.com to obtain an RA number (Return Authorization number) before the 3 year warranty period expires. The product must be returned prepaid in the original shipping container (or equivalent) to Radial or to an authorized Radial repair center and you must assume the risk of loss or damage. A copy of the original invoice showing date of purchase and the dealer name must accompany any request for work to be performed under this limited and transferable warranty. This warranty shall not apply if the product has been damaged due to abuse, misuse, misapplication, accident or as a result of service or modification by any other than an authorized Radial repair center.

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True to the Music

H-AMP™ User Guide Passive Headphone Driver



Order No. R800 8020



Headphone Safety Warning

Due to hearing safety concerns you must read through the manual before using the H-Amp. As with all products capable of producing high sound pressure levels (SPL) users must be very careful to avoid the hearing damage that may occur from prolonged exposure. This is particularly important as it applies to headphones. Prolonged listening at high SPLs will eventually cause tinnitus and can lead to partial or complete loss of hearing. Please be aware of the recommended exposure limits within your legal jurisdiction and follow them very closely. The user agrees that Radial Engineering Ltd. remains harmless from any health effects resulting from the use of this product and the user clearly understands that he or she is entirely responsible for the safe and proper use of this product. Please consult the Radial Limited Warranty for further details.

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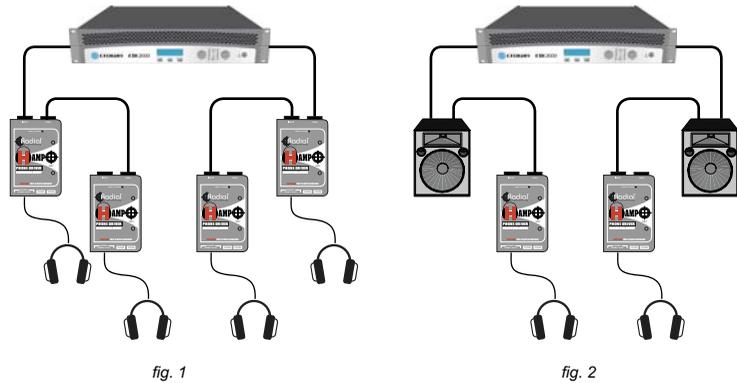
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Congratulations and thank you for purchasing a Radial H-Amp. We think that you will find the H-Amp to be a wonderfully functional tool that will provide you with years of enjoyment. As with all Radial products, we invite you to take a few minutes to familiarize yourself with the H-Amp and the many functions that have been built into the design. If by chance you do not find everything you need, please visit the FAQ section on our web site. This is where we post updates and answer questions from users like yourself. If you require further assistance, we invite you to contact us via email at info@radialeng.com and we will do our very best to reply in short order. Now get ready for a whole new monitoring experience!

Overview

The Radial H-Amp is a unique device that can take the high power output from an amplifier and convert it for use with headphones. The amplifiers output can be a routed directly to one or more H-AMPs (fig.1) or ‘tapped’ off a full-range loudspeaker (fig.2). The intent is simple: to provide an easy to use interface for situations where headphones are needed.

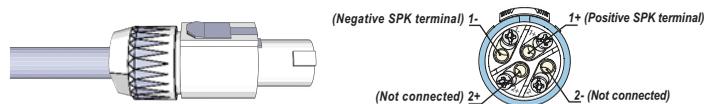


Because the source signal is the mono output from a single amplifier the H-Amp also operates in mono. There are two headphone outputs, each with a separate level control to allow two musicians to share the same H-Amp. This makes it great for situations where a large orchestra may need separate headphones for all of the musicians. A special EQ has also been added in the case that two different types of headphones are being used or maybe one player wants to tailor their EQ for a specific need.

Best of all, the H-Amp is completely passive. In other words, it does not require any form of powering. The H-Amp uses the output from the power amp to drive the circuit and inside, special high-temperature ceramic potentiometers are able to withstand the amp’s high power output without concern.

Using the H-Amp

The Radial H-Amp can be connected directly to a solid state power amp or be connected in parallel with a loudspeaker. Connection to the H-Amp is made via a Neutrik Speakon 4 pole connector with two poles wired following common practice for full-range loudspeaker cabinets as shown here:



As with all electronic equipment, always turn down levels and turn off your audio system before making connections. This will protect sensitive equipment from damage due to turn on transients. Depending on power, we recommend using 12awg (2.0mm) or 14awg (1.6mm) gauge speaker wire for optimal signal transfer between the amp or loudspeaker and the H-Amp. The H-Amp is equipped with two Speakon connectors wired in parallel for input and throughput connections. The ‘THRU’ jack allows multiple H-Amps to be connected in parallel to create a larger network of headphone for application such as orchestras, conferencing and so on.

Connecting Headphones

Connecting the headphones is simply a matter of plugging in and adjusting levels. Always make sure the H-amp’s level controls are turned down (fully counterclockwise) before connecting your headphones. This will ensure that excessively loud systems will not erroneously damage your headphones. Once connected, simply increase the level controls until a comfortable listening level has been achieved.

Note that the H-Amp is capable of producing extreme sound pressure levels that can damage your hearing. Using the H-Amp at high levels is not recommended and subjecting yourself to high levels may in fact be harmful to your well being. Please familiarize yourself with local health and safety regulations and carefully follow these guidelines.

You will notice that the H-Amp produces a mono output for your headphones. This makes sense as the usual source for the H-Amp will be a loudspeaker or wedge monitor fed by a mono auxiliary send from the console. The individual level controls for each headphone output allows each musician to set the volume that is comfortable for their own use.

Using the Tone Shaping EQ Filter

The H-Amp is equipped with a simple Tone Shaping filter that can be set to tailor the sound of the mix going to the headphones. The Tone Shaping filter section is located on the H-Amp’s side panel and uses three recessed switches to prevent accidentally changing the setting. A fourth recessed switch allows Headphone-1 to bypass the filter section in cases where only the Headphone-2 outputs needs to be tailored.

There are two primary uses for the Tone Shaping filter. The first is when the H-Amp is connected in parallel with a loudspeaker. In this case the filter is designed to compensate for the tonal discrepancies between the loudspeaker and the various headphones that are on the market. For instance, if the wedge monitor has added boost in the bass region, you can decrease the bass in the headphones by depressing the low-cut filter (fig.3).

The second application for the Tone Shaping filter can be applied when two headphone users are plugged into one H-Amp. The filter can be assigned to only affect one of the headphone outputs by depressing the PHONE 1 BYPASS recessed switch. This way, you can account for discrepancies between two brands of headphones or maybe tailor the sound for one user to increase the click sound of a tempo track should this be needed (fig.4).

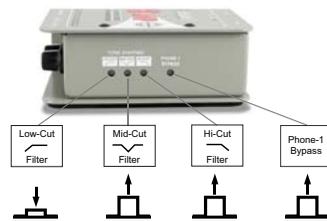


fig. 3

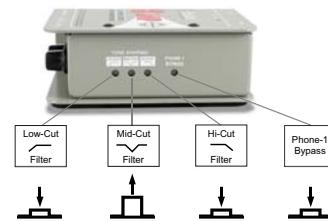
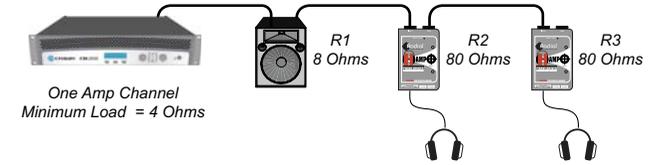


fig. 4

Calculating The Load: H-Amp In Parallel With A Loudspeaker

The H-Amp has an 80-Ohm characteristic impedance that will increase based on how the headphone level control is set. Although this high impedance will have very little effect on the amplifier load, we recommend that no more than two (2) H-Amps be connected in parallel with a loudspeaker.



$$\frac{1}{\text{Load}} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}$$

$$\frac{1}{\text{Load}} = \frac{1}{8} + \frac{1}{80} + \frac{1}{80}$$

$$\frac{1}{\text{Load}} = \frac{10}{80} + \frac{1}{80} + \frac{1}{80} = \frac{12}{80}$$

$$\frac{\text{Load}}{1} = \frac{80}{12} = 6.6 \text{ Ohms}$$

Calculating The Load: Dedicated Amplifier (No Loudspeaker)

When the H-Amp is used with a dedicated power amplifier such as in a studio or orchestral environment, you merely check the minimum impedance of the amp to calculate the number of H-Amps you can use. The following are typical examples:

	2 OHMS	4 OHMS	8 OHMS
NO. OF H-AMPS PER CHANNEL	40	20	10
NO. OF HEADPHONES PER CHANNEL	80	40	20
NO. OF HEADPHONES PER STEREO AMP	160	80	40

Start with the H-Amp’s characteristic impedance of 80-Ohms and divide by the amp’s minimum load rating to determine the number of H-amps the amp can safely drive. For instance, an amplifier with a minimum load of 4-Ohms could have 20 H-Amps connected to it. Because each H-Amp is able to power two headphones, you can connect 20 headphones to each side of a stereo 8 Ohm amp for a total of 40 headphones!



$$\text{No. of H-Amps} = \frac{R}{\text{Amp's Min. Load}}$$

$$20 \text{ H-Amps} = \frac{80 \Omega}{4 \Omega}$$