



## The Micro Amp & DAC

headphone amplifier  
& digital-analog converter  
Owner's Manual



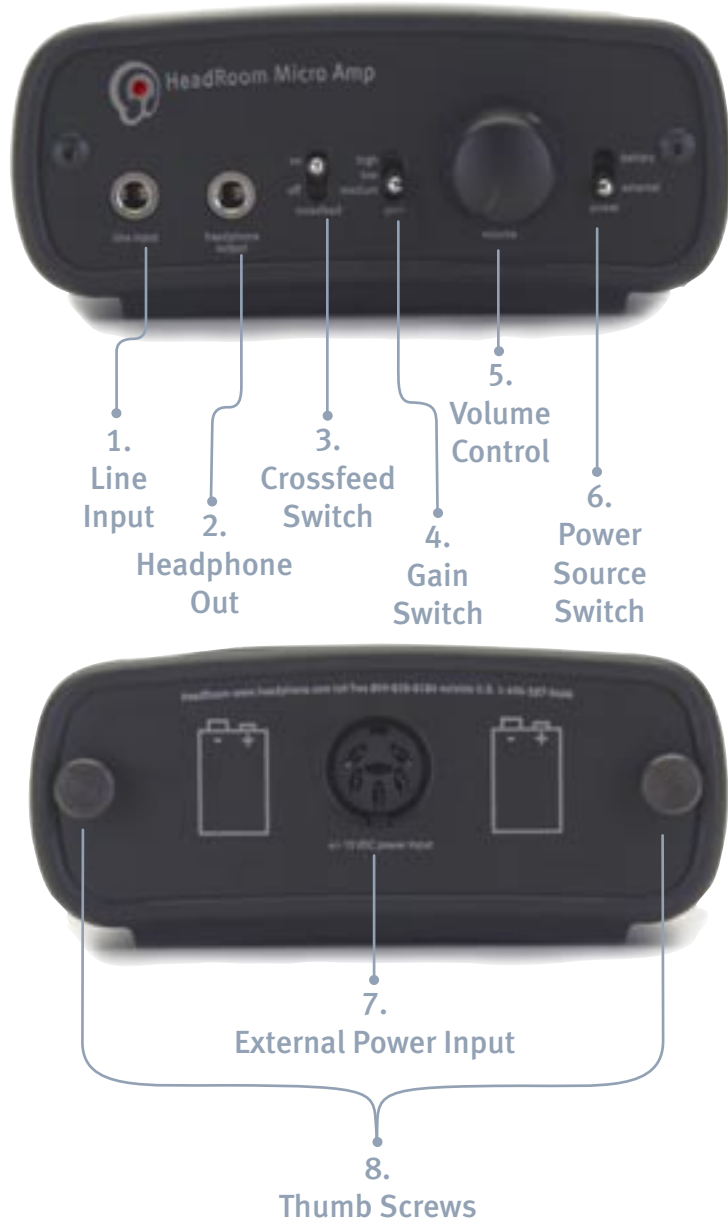
Congratulations! You've just received the cutest little piece of hard-core audio hardware known to the world of audiophilia. The Micro Amp and Micro DAC are jam packed with all the sweet parts, terrific engineering, quality manufacturing, and years of experience needed to make luscious tunes bloom in your head. So get out your best headphones, put on your favorite music, and prepare for the perfect pleasures of personal listening made right between your ears.

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2020 Gilkerson Drive  
Bozeman, MT 59715  
[www.headphone.com](http://www.headphone.com)

## The Micro Amp

Packing HeadRoom's mobile electronics module, two nine-volt batteries, and all the knobs and switches you need into an all but bullet proof aluminum enclosure is pushing it a bit, but you won't care because your head will be thanking you for the lovely tunes.



## The Micro Amp Panel Descriptions

### Front Panel

**1. Line Input** The line input is where you plug in the source. Preferably the Micro DAC; but it could be the line out of your iRiver or the headphone out of an iPod. You will need a mini-to-mini cable to hook up your Micro Amp.

**2. Headphone Out** The headphone out is where you plug in your headphones. There isn't room for a full sized jack, but this 1/8th inch mini-plug will take the small plug of all 1/8" headphone jacks. We also sell a short flexible Grado 1/4"-1/8" adaptor for your big cans; and you can get a replacable Cardas headphone cable with a mini connector for many types of headphones, call us or consult our website for details.

**3. Crossfeed Switch** This switch engages the crossfeed circuit. The audio image on headphones is often not very good; typically the image is a blob on the left, a blob on the right, and a blob in the middle. The HeadRoom crossfeed provides the natural acoustic cross-feed normally heard at the left and right ear as heard from the left and right speaker. Adding back the normally occurring cross-feed signal gives your brain enough information to build the stable and natural audio image needed to have a quality listening experience. See pg.8 for more info on the HeadRoom crossfeed.

**4. Gain Switch** The 3-position Gain Switch accomodates various headphones' power needs. For instance, the Low Gain setting would be used for in-ear monitors, allowing a larger range on the volume control pot. Experimenting with your headphones and the gain switch may help you to determine which setting you prefer. If have any questions regarding your headphones, feel free to call and ask us.

**5. Volume Control** You never know where the volume control should be set as different headphones often have widely different impedances and efficiencies, so use your ears to choose your listening level, not the level on the dial. (We recommend you choose a moderate level so as not to blow out your ears.) You also need to turn the amp OFF or ALL THE WAY DOWN before plugging in or unplugging your headphones to avoid short-circuiting the amp. As you turn the volume control knob clockwise, the volume increases.

**6. Power Source Switch** Immediately to the right of the volume control is the power source switch. It will run on either the two internal 9-Volt batteries or an external power supply. If the batteries are in and external supply is attached, the only way you can turn it off is by selecting 'external' and then unplugging the connector. We offer two power supplies: the less expensive, lovingly known as "brick", power supply comes with the amp, the more expensive Desktop Power Supply will give you cleaner juice, and therefore cleaner, more dynamic sound.

### Rear Panel

**7. External Power Input** Connect either your brick or Desktop Power Supply here.

**8. Thumb Screws** To change your batteries, unscrew the screws and remove the rear panel. Orientation of 2 nine-volt batteries is indicated by the illustrations on the rear panel.

## The Micro DAC

The unlikely marriage of a well supported Texas Instruments USB sound device chip (to get the S/PDIF signal), Cirrus Logic's flagship D/A converter, and two 9-Volt batteries bears the fruit of incredibly good sound anywhere you want to set up a personal listening station. Take a tour of the front and rear panels and here's what you'll find:



1. Line Output
2. Optical/Coaxial Digital Input
3. USB Input
4. Input Select
5. Power Source Switch



6. External Power Input
7. Thumb Screws

## The Micro DAC Panel Descriptions

### Front Panel

**1. Line Output** The line out is the best sounding stereo-mini plug out there. This is the signal source you plug into the input of your headphone amp. Don't forget to check out our Cardas mini to mini cables; they come in many flavors . . . ok, four different lengths.

**2. Optical/Coaxial Digital Input** The optical input is your typical Toslink connector. You get this input signal from the optical output of your player. Not so many portable audio players have optical outputs anymore (call or check our web site for recommendations), but many portable DVD players and some hard disk drive players do. Of course, you can get this signal from many pieces of home equipment.

**3. USB Input** The USB input gets its signal from a computer: laptop or desktop; PC, Mac, or Unix. There aren't any portable players of any kind that have the ability to talk to an external USB sound device . . . yet.

**4. Input Select Switch** If you are using both inputs select the one you want to listen to with this switch.

**5. Power Source Switch** To the far right is the power source switch. It will run on either the two internal 9-Volt batteries or an external power supply. If the batteries are in and external supply is attached, the only way you can turn it off is by selecting 'external DC' and then unplugging the power supply from the back of the unit. We offer two power supplies: the less expensive version, lovingly known as "brick", power supply comes with the amp, the more expensive Base Station One will give you cleaner juice, and therefore cleaner, more dynamic sound.

### Rear Panel

**6. External Power Input** Connect either of your power supplies here.

**7. Thumb Screws** To change your batteries, unscrew the screws and remove the rear panel. Orientation of 2 nine volt batteries is indicated by the illustrations on the rear panel.

## Connecting Your Micro Stack

Hooking up your new Micro Stack (or just one of them) is a quick and easy process. Your source will need an analog line out, or if you are using the Micro DAC, a digital output which could be USB, coaxial, or optical. You will need a mini-mini cable to hook up your Micro Amp and DAC. Shown here is a 6" Cardas mini-mini cable, available for purchase on our website.

### The Micro Stack



1. Plug the mini-to-mini cable into the line input of the Amp and line output of the DAC. Don't forget to select the appropriate power source on each unit.



Cardas  
mini-mini  
cable

### Micro Stack and digital source



2. Connect your digital source to the DAC by plugging in a coaxial or optical cable into the optical/coaxial digital input or a USB cable from your computer into the USB input.

3. If you are only using the Micro Amp, then connect the source to the amp using the (preferably) line out or headphone jack of your player to the line input.

4. Plug your headphones into the 1/8 jack on the front of the Micro Amp. Adjust the volume on the HeadRoom amp.



Micro Amp  
and source

## Changing Batteries

The Micro Amp and DAC run on DC power or two 9 volt batteries. The battery life of your Micro Amp will last approximately 15-20 hours, depending on the impedance level of the headphones you are using, as well as the electronics module you have (The DAC will not last quite as long). Most people have the Micro Module, which allows for about 15-20 hours of battery life. If you have the Desktop Module, then you should typically get around 8-10 hours of battery life.

To remove your 9 volt batteries, you need to remove the rear panel. Unscrew the thumb screws, and the panel will fall away from the enclosure. You can also gently grasp the panel by the center cut-out for the power supply and pull the panel off the unit, shown below.

Micro Amp or DAC,  
thumb screws  
removed



Micro Amp or DAC with rear  
panel removed



Some rechargeable batteries are slightly longer than a standard 9 volt battery. If you are using a longer 9 volt battery, slide them in allowing for the rubber flap to fold up into the top of the enclosure, shown lower left. The Micro Amp does not recharge your rechargeable batteries.

Micro with 9 volt  
rechargeable batteries



Micro with 9 volt  
alkaline batteries



When using standard alkaline batteries, or standard size rechargeable batteries, pull up the small rubber flap and slide the 9 volt battery in. The battery will slide completely into the enclosure and the rubber flap will hang down in front of it, shown upper right.

## What is the HeadRoom Crossfeed?

Imagine you are listening to a pair of speakers. If you turn off the left speaker, both ears hear the sound from the right speaker. But because the left ear is slight farther away than the right ear, it hears the speaker's sound slightly after the right ear; about 300 microSeconds. This time difference is called the "inter-aural time difference" and it is the main thing your brain listens for in order to tell where to place sound left-to-right.

But in headphones if you turn off the left channel, only the right ear hears the sound. In headphones, if there is any sound that is only in the left channel, or only in the right channel, then only that ear hears the sound. This is not natural, and you brain becomes fatigued trying to figure out where sound is coming from when only one ear is hearing it. This tends to create an audio image that is a blob on the left, blob on the right and a blob in the middle.

HeadRoom amplifiers cure the problem by allowing you to cross-feed a little of the left and right channels across to each other through a short time delay using the crossfeed switch. The usefulness of the circuit varies depending on what type of recording you are listening to; mono and binaural recordings need no processor at all. Old studio recordings that have instruments panned hard left or right, benefit greatly from the processor. Live and classical recordings miked from a distance benefit somewhat less, and can often be listened to without the processor quite comfortably.

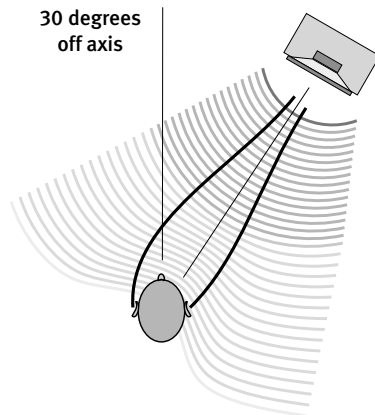
The crossfeed switch in HeadRoom amplifiers allow you to cross-feed a little of the left and right channels across to each other through a short time delay.



Plain Headphones



With HeadRoom



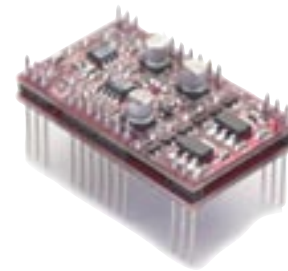
Far ear hears slight delay. Near ear hears sound first.

## Electronics Modules for your Micro Amp

### The Micro Module

This little red module contains all the electronics for a Micro Headphone Amp. There are two 4-layer circuit boards (one each for the left and right channel) that are connected with a series of header pins used to solder the module to the main circuit board. This module is designed to sound great but must provide at least 20 hours of play time on two 9-Volt batteries in the Micro Amp. It uses AD822 op-amps for the internal input buffer, crossfeed, summer, and power amp voltage gain stage. The output current amplifier is our version of the highly regarded Diamond Buffer discrete transistor design by Walt Jung. Resistors are 1% metal thin film, and caps in the signal chain are polyphenylenesulfide (poly film); these are MUCH higher quality parts than you'd ever find in a typical consumer electronics product. The Micro Amp can be upgraded to the Desktop Module. The result will be an approximate halving of play time and moderate improvement in sound quality. If you will be using this amp largely in a portable mode, we suggest sticking with the stock micro module as its better sounding by far than any portable source (accept maybe the Micro DAC) and saving batteries is a good thing.

Micro electronics module



Desktop electronics module



### Desktop Electronics Module Upgrade

The Micro Amp can be upgraded to the Desktop Module. This little green module contains all the electronics for a Desktop Headphone Amp. There are two 4-layer circuit boards (one each for the left and right channel) that are connected with a series of header pins used to solder the module to the main circuit board. This module is designed to sound great but must provide at least 20 hours of play time on four D-cells in the Desktop Portable Amp. It uses Burr-Brown (Okay, now TI) 2134 op-amps for the internal input buffer, crossfeed, summer, and power amp voltage gain stage. The output current amplifier is our version of the highly regarded Diamond Buffer discrete transistor design by Walt Jung. Resistors are 1% metal thin film, and caps in the signal chain are polyphenylenesulfide (poly film); these are MUCH higher quality parts than you'd ever find in a typical consumer electronics product.

## 30 Day Guaranty & Warranty

### HeadRoom 30 Day Guaranty

Unless specifically stated otherwise, all HeadRoom purchases come with a 30-day satisfaction guaranty in order to give you the opportunity to evaluate your purchases. We're happy to provide you with the opportunity to refund or exchange your product, but to keep costs down we do have a few conditions. Products must be returned to us within 30 days of the date you receive the product. So make sure you try your purchase out right away! Products must be in "as-new" condition. This means that they're in pristine cosmetic condition, functioning perfectly, and include ALL materials (plastic bags, warranty cards, tie wraps, etc). In other words, please send products back exactly as you received them. If a product is returned within the 30-day return period, but is not in "as-new" condition, we will charge you a 15% restocking fee plus any labor and materials required to return the product to "as-new" condition. Sorry, but after your 30 day trial, products are no longer exchangeable or refundable.

If you're having trouble with a headphone amp or system, please contact us first to troubleshoot the problem. You can email Sales, (sales@headphone.com) or call 800.828.8184. If we can fix it while you've still got the product, everyone's happy!

### Mico Amp & Micro DAC Warranty:

The HeadRoom Micro Amp and DAC are warrantied for two years. If anytime within the first two years of your purchase you have a problem with your Micro Products, you can return it for repairs under the terms of our 30 Day Guaranty. HeadRoom is the only authorized service center for HeadRoom products, either in or out of warranty. If a unit is under warranty, there is no cost for the repair labor, parts, or shipping from HeadRoom back to you (i.e., You're responsible for paying the shipping charges to get the product to us).

### Out of Warranty Repairs

Non warranty repairs are assessed at an hourly rate of \$50 per hour plus parts, and are only conducted on HeadRoom products. If the cost of the repair is over \$100, we will call you with an estimate. If you have an older HeadRoom amp that is out of production, we may not be able to repair the amp, however please contact us and we will let you know if we are able to. When we receive the equipment, we will initiate repairs and upgrades within 1-2 weeks and return the unit to you. The customer pays for shipping to HeadRoom and we pay for return shipping. Please refer servicing to HeadRoom factory authorized personnel as HeadRoom is the only authorized service center for HeadRoom products, either in or out of warranty. Tampering by persons other than HeadRoom factory authorized personnel is discouraged and will void your warranty. HeadRoom will not accept warranty claims for damage resulting from accident, misuse, neglect, abuse or failure to follow instructions of operation.

## Exchanges & Returns

### Equipment Exchanges

If you would like to exchange your purchase for another item, you have two options. You can simply purchase the item you want, and send the item you don't want back for refund within 30 days of the original purchase (don't forget to fill out the back of the Return & Exchange card and include it with your return). We will refund your credit card after we receive the item. Or, you can send your product back as an exchange, and indicate the product you would like on the Return card. We will adjust your credit card accordingly and ship you the new item. Replacement products are shipped to you as soon as possible, typically within 3-5 days provided the replacement item is in stock.

### Defective Equipment Exchanges

In the uncommon event of receiving a defective product, contact us and we will ship out a replacement product to you at no cost as soon as possible, typically within 3-5 days provided the replacement item is in stock. You will receive the replacement item along with a return shipping label and a card to include with the defective item to return to HeadRoom. Important: Fill in your name and original invoice number of your order on the card and return the item to HeadRoom within 2 weeks. If we have not received the product after 2 weeks (allowing shipping time) we will charge your credit card the amount of the defective item. Please understand that we enforce this policy as an incentive for customers to get defective equipment back to us as soon as possible.

### Shipping Products back to HeadRoom

Please ship products back in the original shipping box (or another that is comparable); please don't send headphones back in JUST the headphone box, as it's a sure bet that they will no longer be in "as-new" condition when we receive them! We HIGHLY recommend that you ship returns using an insured and "signature required" delivery method—we can't be responsible for lost or damaged packages. Finally, don't forget to include the completed Return & Exchange card and WRITE YOUR NAME on the outside of the box!

#### Return Products to:

HeadRoom  
Attn: Returns  
2020 Gilkerson Drive  
Bozeman, MT 59715

#### Contact Us:

www.headphone.com  
Toll Free: 800-828-8184  
Phone: 406-587-9466  
Fax: 406-586-9484



## A Word About Your Hearing

People have a natural tendency to listen to music at much louder levels with headphones than they would with speakers. To avoid permanent hearing damage, it's important to be careful not to listen at extremely loud levels (or to listen for too long at moderately loud levels). Because HeadRoom amps need to be able to drive even the most inefficient dynamic headphones to satisfactory listening levels, they are also able to drive headphones of average or higher efficiencies to extremely high levels. As a result, even though the volume control on your HeadRoom amp may appear to be set to a low level, you may not be listening at a safe level. Generally speaking, when listening to headphones you should only turn up the volume to the point at which the sound isn't too quiet.

As a general rule, sound pressure levels under 80 decibels will not damage hearing, even if experienced continually. On the other hand, anything over 100 decibels may cause permanent damage very quickly. Sustained exposure to sound pressure levels anywhere in between can also be damaging—the louder the sound, the shorter the time required to cause permanent damage. Just to drive this message home, here's a bit of information about hearing damage. The most common type of damage caused by prolonged or excessively loud sound is called tinnitus. It manifests itself as a sustained buzzing and/or ringing in the ears, and can become a permanent condition.

If you find that your ears are ringing or that there is a sensation of pressure or fatigue, your body is trying to tell you that your ears need a break. Give them a rest for a few days (or until they feel fresh). If you ignore these symptoms, you're risking permanent hearing damage.

In addition, don't fool yourself into thinking that you either have full-blown tinnitus or you don't have it at all—there are different degrees of hearing damage. For example, you might have a mild case where you only notice ringing in your ears in the quiet of your bedroom at night. However, once you have a slight case of tinnitus, your ears are much more susceptible to further damage. So if you do experience mild symptoms, it's important to be much more careful about your exposure to loud sounds.

Sorry to sound so sobering, but a lifetime of musical enjoyment requires ears in tiptop shape. Now that we've told you to be careful, don't blame us if you blow it. If you have any more questions about hearing damage, call a doctor.

### Contacting HeadRoom

Toll Free: 800-828-8184  
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