



Balanced Desktop Amp

headphone amplifier
Owner's Manual



Welcome to full-sized balanced headphone performance in a 6"X 6" footprint. The Balanced Desktop Amp demolishes all previous sound, size, and price barriers, and it's immersive sonics and spacious soundstage are an audiophile breakthrough. We've condensed high-end balanced-drive into a small but complete solution, delivering true balanced audio from any analog or digital source. It's the newest way HeadRoom gets it perfectly Right Between Your Ears.

Toll Free: 800-828-8184
Phone: 406-587-9466
Fax: 406-587-9484

2020 Gilkerson Drive
Bozeman, MT 59715
www.headphone.com

The Balanced Desktop Panel Descriptions



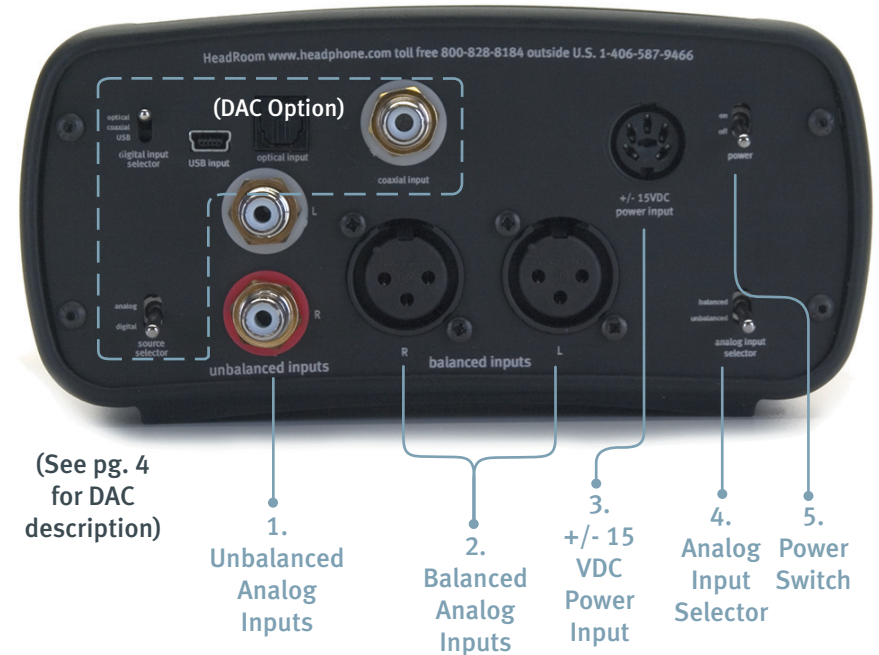
1. Headphone Outputs The headphone outputs are where you plug in your headphones. The Balanced Desktop amp can drive either one headphone with stereo-XLR balanced connectors or two headphones with single-ended unbalanced 1/4" plugs. You can use either balanced or unbalanced headphones at any time.

2. Crossfeed Switch This switch engages the crossfeed circuit. Audio imaging 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 crossfeed signal gives your brain enough information to build the stable and natural audio image needed to have a quality listening experience. see page 7 for more info.

3. Gain Switch The 3-position Gain Switch accommodates various headphones' power needs. For instance, the Low Gain setting would be used for ear canal headphones, 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.

4. Volume Control As you turn the volume control knob clockwise, the volume increases. 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.

The Balanced Desktop Rear Panel



(See pg. 4 for DAC description)

1. Unbalanced Analog Inputs One set of RCA connectors allow for connectivity of non-digital (analog) sources like a CD player, tape deck or pre-amp into the Balanced Desktop Amp. If you are using balanced headphones, this input automatically converts the signal to balanced.

2. Balanced Analog Inputs The balanced input accepts a signal from a balanced output source (like from a quality CD player, for example) via stereo XLR connectors.

3. +/- 15VDC Power Input Plug in your power supply here. The 'brick' power supply included with the Balanced Desktop, as well as the Desktop Power Supply, will use this connector.

4. Analog Input Selector Allows you to select between your balanced analog inputs and your unbalanced analog inputs. You may want to plug more than one analog source into your Balanced Desktop Amp. Whether you are using one input or both, you will need to indicate which analog inputs you want to listen to by choosing either 'balanced' or 'unbalanced' with the analog input selector.

5. Power Switch Turn the switch up to turn your Desktop Amp on. The green LED will illuminate in the center of the HeadRoom logo in the upper left hand corner of the amp.

The Digital-Analog Convertor Option

The DAC is an option that you may choose when purchasing the Desktop Amp. If you did not purchase the DAC option with your amp initially, you can have this upgrade performed at a later date.

HeadRoom's DAC in the Balanced Desktop Amp allows you to convert a digital signal into balanced drive. If you plug balanced headphones into your Desktop Amp, you will receive a fully balanced signal from the DAC. If you plug in regular headphones, you will receive an unbalanced signal from the DAC.

- 1. Coaxial Input** The coaxial input is your typical coaxial connector. We recommend using a 75 ohm digital cable when using the coaxial input.
- 2. Optical 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, 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. Digital Input Selector** When using the DAC, the digital input selector allows you to choose which digital input you would like to listen to.
- 4. USB Input** The USB input gets its signal from a computer: laptop or desktop; PC, Mac, or Unix.
- 5. Source Selector** When using the DAC, you will need to choose whether you are using a digital input or an analog input. The source selector switch allows you to have both digital and analog sources connected at the same time, and you may change between the two with a simple flip of this switch.



(See page 8 for DAC hook-up information.)

Internal Components & Available Upgrades

Home Module

Home Module- The Home Module consists of two pair of 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 without going up the ridiculously steep part of the diminishing returns curve. The output current amplifier is our version of the highly regarded Diamond Buffer discrete transistor design by Walt Jung; internal input buffer, crossfeed, summer, and gain stage use the Burr-Brown OPA2134 op-amp. All these active circuits are forced in to class "A" bias with constant current sources. Resistors are 1% metal thin film, and caps in the signal chain are polyphenylenesulfide (poly film). The sound of this module is not only well balanced and punchy, it's also liquid and integrated. This is a sweet listen.

Desktop Stepped Attenuator Upgrade

Our Desktop line of amplifiers come standard with a very good Alps potentiometer. Putting a signal through the wipers and conductive element of a potentiometer, however, does slightly degrade the sound. One way to get rid of degradation from a pot is to use a stepped attenuator, which is simply a multi-pole switch that allows you to select one of a series of resistors to adjust the volume. There are a couple of different ways to build a stepped attenuator; we built a shunt attenuator where the voltage is divided between a single fixed resistor on the circuit board and the resistor selected by the stepped attenuator. We prefer this method as keeps the number of contacts the audio signal has to go through to a minimum. We use parts from the well regarded Elma Type 04, 24-position switch, but we manufacture our own Electroless Nickel/Immersion Gold (ENIG) switch contact circuit boards. This is just a fancy way of saying that these boards are highly corrosion resistant, and have a very heavy gold plating---significantly heavier than normal circuit board gold coatings. This contributes to the increased lifetime of the switch.

Home DAC

You can also have the digital to analog converter upgraded in your Balanced Desktop. The Home DAC starts to become a very serious digital to analog converter: not only does it use the flagship Cirrus Logic CS4398 DAC, it also uses the spendy---but oh so sweet sounding---Burr-Brown OPA627 op-amps in class "A" bias as the output devices. The result is the kind of liquid clarity found in multi-thousand dollar high-end CD players.

To go along with the previously mentioned class "A" biased OPA627s, only metal thin film resistors and polyphenylenesulfide (poly film) capacitors are used in the audio circuits. Three low-noise, ultra-low dropout power supply regulators isolate the various digital, analog, and mixed signal circuits.

If you are interested in having your amp upgraded, visit www.headphone.com or call us at 800.828.8184 for pricing information and various options.

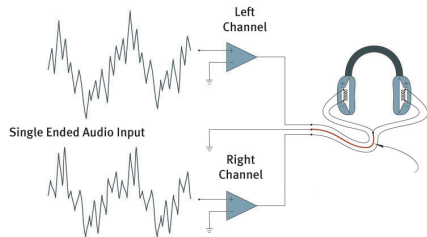
About Balanced Headphone Drive

Headphones share a common connection on the non-driven side of the driver elements. You can see this by looking at a headphone plug; the left channel connection is at the tip, the right channel connection is the ring, and the common connection were talking about is the remainder of the plug shaft, called the sleeve. The problem is that the summed left and right channel return current will develop a signal across the series resistance of the common return path, which muddies the stereo presentation on headphones with cross-talk. It is this headphone connector found on all headphones that makes it impossible to drive the return side of the headphone coils with the separate left and right inverted signals of a fully balanced amplifier. HeadRoom has overcome this problem with the Balanced Desktop, Balanced Home, and Balanced Max Headphone Amplifiers, along with Cardas custom headphone cables.

Driving headphones in balanced mode effectively delivers twice the slew rate, half the amplifier output impedance, and rids the headphones of significant cross talk due to the common return connection from the drivers. It really is a whole new headphone listening experience.

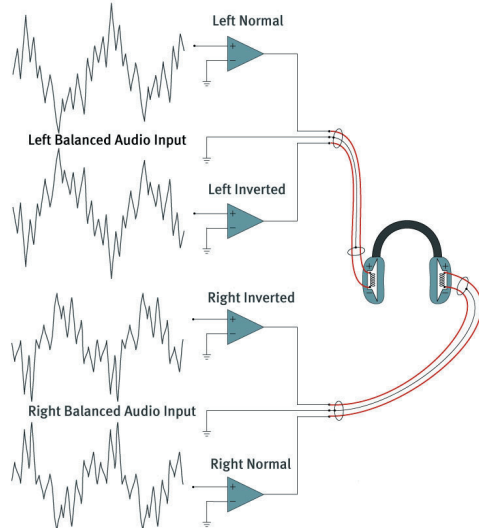
For you scientifically inclined folks out there, here's the techspeak about balanced amps: Any time an electrical signal passes through a cable, outside (electrical) noise interference can be induced, even when using shielded cables. In an unbalanced system, both the positive and negative halves of the waveform travel together down the positive and negative signal leads and can be influenced by the outside noise. In a balanced system, the positive and negative halves of the waveform are separate; when these separate halves pickup the same outside electrical noise interference, the noise components on one half are out-of-phase with the noise components on the other half (almost like a mirror image). When the negative and positive halves of the signal are combined in the balanced amplifier, the out-of-phase noise components on the two halves cancel each other out as they are combined, leaving only the original, clean output signal... Translation: superb sound!

Traditional Headphone Amplifier



Ground wire resistance of common signal return develops inter-channel cross-talk distortion

Balanced Headphone Amplifier



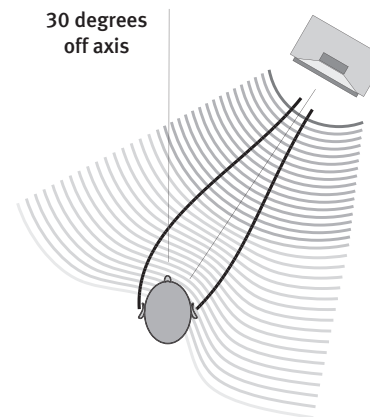
What is the HeadRoom Crossfeed?

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 processor 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.

Inter-Aural Time Difference



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

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

How to Connect Your Balanced Desktop

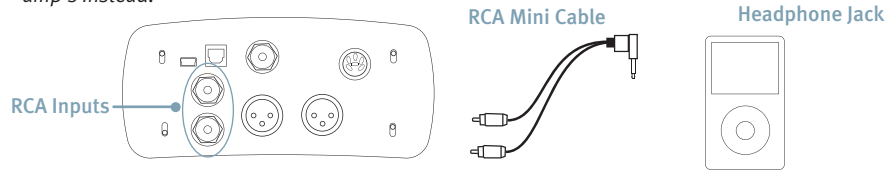
Read the following hook-up instructions and look for the output you will be using on your Computer, CD Player, iPod or other HDP, or other source.

#1 Headphone Jack or Line-out

All hard drive players provide a headphone jack.* An RCA to Mini Cable will allow you to connect the headphone jack/line out of your player into the RCA inputs on the Balanced Desktop. Be sure to note that as always, red or 'R', designates right channel.

- Switch the Source Selector Switch to *analog*.
- Switch Analog Input Switch to *unbalanced*.

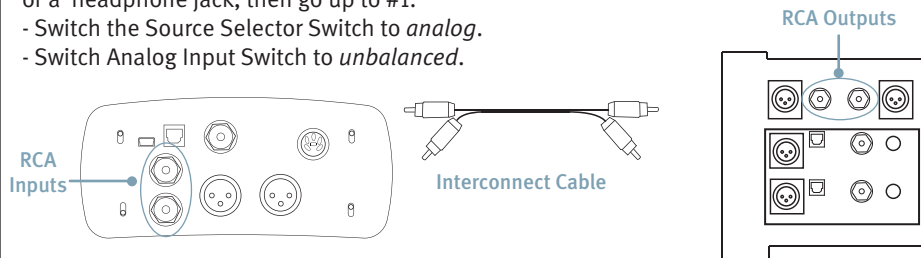
*Use line out if your player has it. Line out bypasses the player's volume control completely; use the amp's instead.



#2 To a home CD player or other Analog Sources (unbalanced) via RCA outputs

If your source has RCA outputs, an RCA to RCA interconnect cable will connect the Balanced Desktop. Plug the RCA inputs into the back of the Balanced Desktop Amp, and connect the other end to the line output of your analog source. If your source only has a line out output or a headphone jack, then go up to #1.

- Switch the Source Selector Switch to *analog*.
- Switch Analog Input Switch to *unbalanced*.

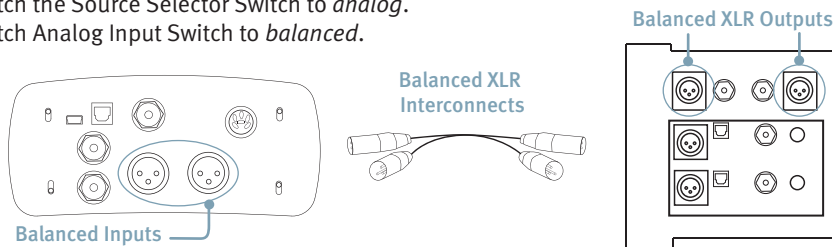


Note- Even though you are using the unbalanced analog input with options #1 and #2, you can still enjoy a balanced signal by plugging in your balanced headphones.

#3 Balanced home CD player or other Balanced Source via balanced analog outputs

If you have a balanced CD player or other source, you will need a set of balanced interconnects. To connect your Balanced CD player to the amp via balanced interconnects, simply connect the balanced outputs to the balanced inputs on the back of the amplifier.

- Switch the Source Selector Switch to *analog*.
- Switch Analog Input Switch to *balanced*.



How to Connect Your Balanced Desktop

#4 DAC Option: To your Computer or other digital source via USB, coaxial, or optical output

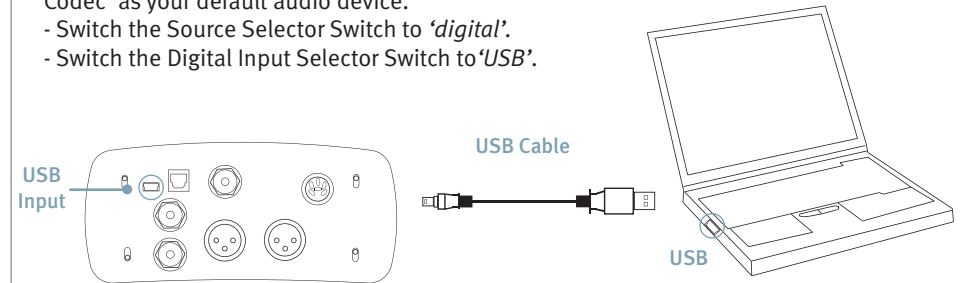
If you have a source with a digital output- like a computer- the Balanced Desktop DAC option* will give one the best possible signals for your headphones!

You can get a fully balanced signal from any of the digital inputs below; all you need are balanced headphones.

Connecting to your Computer:

The most convenient and common way to get a high quality signal out of your computer is with USB output. (If you have optical or coaxial outputs on your machine, then skip to the next section.) Simply plug a USB cable into your computer, and plug the smaller end into the back of the amp. In most cases your computer will instantly recognize the amplifier, but you will need to restart your music management program. If your computer does not recognize the device, restart; if it still is not recognized, you may need to go into your control panel/audio devices or system preferences/sound output and select 'USB Audio Codec' as your default audio device.

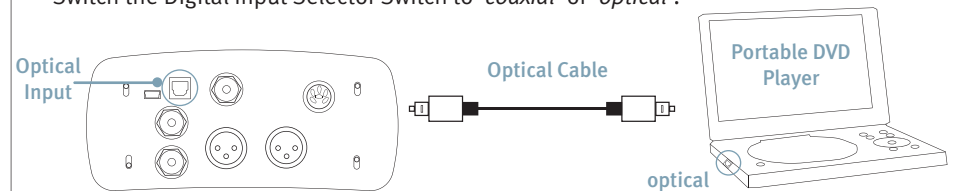
- Switch the Source Selector Switch to *'digital'*.
- Switch the Digital Input Selector Switch to *'USB'*.



To other digital players with Optical/Coaxial outputs:

You will need an appropriate coaxial or optical cable, visit headphone.com to purchase a cable. Plug one end into your source and connect the other end into the appropriate input on the back of the amp.

- Switch the Source Selector Switch to *'digital'*.
- Switch the Digital Input Selector Switch to *'coaxial'* or *'optical'*.



After your amp is hooked up, simply plug in your headphones; the Balanced Desktop will automatically recognize balanced or unbalanced headphones.

*Didn't choose the DAC option with your Desktop Amp? You can send yours in to be upgraded with our Upgrade program. See headphone.com for details.

Balanced Desktop Amp Warranty

HeadRoom Manufactured Products under Warranty:

The Balanced Desktop is warranted for two years. If anytime within the first two years of your purchase you have a problem with your Balanced Desktop, you can return it for repairs under the terms of our Warranty. Visit our website for details about warranting your Desktop Balanced, or give us a call at 800.828.8184, and we will trouble shoot the problem, and if necessary authorize a repair.

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

If you have an older HeadRoom amp that is out of warranty, call us at 800.828.8184 ext.104 to speak with our Service Department to troubleshoot the problem.

The cost of repairing your out-of-warranty HeadRoom amp is a \$50 repair fee, plus parts and shipping costs. Additional costs will include replacement parts along with any additional labor beyond your first hour (the good news is that most repairs can be normally performed within one hour.) If the cost of your repair exceeds \$100, we will call or email you first with an estimate and we will then request your approval for work to continue.

Email us at service@headphone.com for more information. If you have an older HeadRoom amp BEFORE model year 2001-2002, it's imperative that you contact our Service Department first to confirm the amp can be repaired.

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

30 Day Guaranty

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!

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.



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
Phone: 406-587-9466
Fax: 406-587-9484

2020 Gilkerson Drive
Bozeman, MT 59715
www.headphone.com