
MOON 230HAD

Headphone Amplifier / DSD DAC



Owner's Manual

M O O N
by SIMAUDIO

ATTENTION

Do not ingest the battery, Chemical Burn Hazard
The remote control supplied with this product contains a
coin/button cell battery.


If the coin/button cell battery is swallowed, it can cause
severe internal burns in just 2 hours and can lead to death.

Keep new and used batteries away from children.

If the battery compartment does not close securely, stop
using the remote control and keep it away from children.

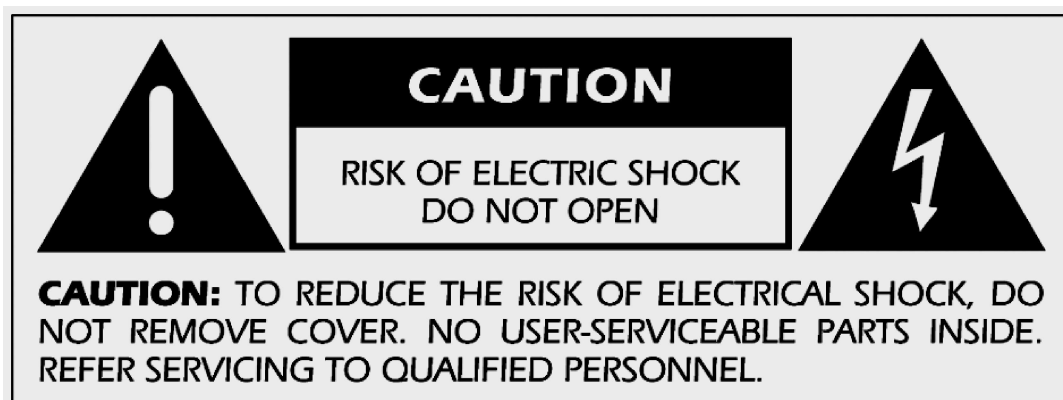
If you think batteries might have been swallowed or placed
inside any part of the body, seek immediate medical
attention.

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves or another apparatus that produces heat.
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for safety. If the provided plug does not fit into the outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. Unplug mains cord during transportation.
11. Only use attachments and accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip over.
 
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power cord or plug has been damaged; liquid has been spilled or objects have fallen into the apparatus; or the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. No naked flame sources, such as candles, should be placed on the apparatus.

WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.



Important Safety Instructions (cont'd)



The lightning flash with the arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



Marking by the "CE" symbol (shown left) indicates compliance of this device with the EMC (Electromagnetic Compatibility) and LVD (Low Voltage Directive) standards of the European Community

Please read all instructions and precautions carefully and completely before operating your MOON 230HAD Headphone Amplifier.

1. **ALWAYS** disconnect your entire system from the AC mains before connecting or disconnecting any cables, or when cleaning any component. To completely disconnect this apparatus from the AC mains, disconnect the power supply cord plug from the AC receptacle.
2. The 230HAD must be terminated with a three-conductor AC mains power cord which includes an earth ground connection. To prevent shock hazard, all three connections must **ALWAYS** be used. Connect the 230HAD only to an AC source of the proper voltage; Both the shipping box and rear panel serial number label will indicate the correct voltage. Use of any other voltage will likely damage the unit and void the warranty
3. AC extension cords are **NOT** recommended for use with this product. The mains plug of the power supply cord shall remain readily accessible.
4. **NEVER** use flammable or combustible chemicals for cleaning audio components.
5. **NEVER** operate the 230HAD with any covers removed. There are no user-serviceable parts inside. An open unit, especially if it is still connected to an AC source, presents a potentially lethal shock hazard. Refer all questions to authorized service personnel only.
6. **NEVER** wet the inside of the 230HAD with any liquid. If a liquid substance does enter your 230HAD, immediately disconnect it from the AC mains and take it to your MOON dealer for a complete check-up.
7. **NEVER** spill or pour liquids directly onto the 230HAD.
8. **NEVER** block air flow through ventilation slots or heatsinks.
9. **NEVER** bypass any fuse.
10. **NEVER** replace any fuse with a value or type other than those specified
11. **NEVER** attempt to repair the 230HAD. If a problem occurs contact your MOON dealer.
12. **NEVER** expose the 230HAD to extremely high or low temperatures.
13. **NEVER** operate the 230HAD in an explosive atmosphere.
14. **ALWAYS** keep electrical equipment out of reach of children.
15. **ALWAYS** unplug sensitive electronic equipment during lightning storms.
16. **WARNING:** Do not expose batteries or battery pack to excessive heat such as sunshine, or fire or the like.

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www.simaudio.com

Simaudio Ltd., 1345 Newton Road
Boucherville, Québec J4B 5H2 CANADA

Date Code: 20161028

Introduction

Thank you for selecting the **MOON 230HAD** Headphone Amplifier/DAC as a part of your hi-fi reproduction system. This Headphone Amplifier has been designed to offer state-of-the-art high-end performance in an elegant package, while retaining all the sonic hallmarks on which Simaudio has made its reputation. We have spared no effort to ensure that it is among the finest headphone amplifiers available. We have been building high-performance audio equipment for 35 years, and the know-how gained through our cumulative experience is an important reason why **MOON** Headphone Amplifiers are so musically satisfying.

The performance of your **230HAD** will continue to improve during the first 300 hours of listening. This is the result of a "break-in" period required for the numerous high quality electronic parts used throughout this headphone amplifier.

Before setting up your new **MOON 230HAD**, we encourage you to please read this manual thoroughly to properly acquaint yourself with its features. We hope you enjoy listening to the **MOON 230HAD** Headphone Amplifier/DAC as much as the pride we have taken in creating this fine audio product. We understand the power and emotion of music and build our products with the goal of faithfully capturing these elusive qualities.

The information contained in this manual is subject to change without notice. The most current version of this manual is available on our official website at <http://www.simaudio.com>

Your **MOON 230HAD** Headphone Amplifier incorporates many significant design features to achieve its "world-class" level of performance. This is an abbreviated list of the more important features:

Pure analog amplifier includes a **transconductance** circuit topology

Inputs include 1 single-ended on rear-mounted RCA's and 1 single-ended on 1/8" jack located on the front panel.

Outputs include a 1/4" TRS headphone jack on the front panel, as well as, both fixed and variable line-level single-ended RCA stereo pairs in the rear

An **oversized power supply** using 1 toroidal transformers in conjunction with 8 stages of DC voltage regulation (4 each for the amplifier and the DAC).

Digital-to-Analog Converter (DAC) with four (4) digital inputs (S/PDIF x 2, Toslink x 1 & USB x 1) allowing for use with virtually any digital source; Supports DSD64, DSD128 and DSD256 (USB input only); Supports PCM 16/44.4kHz to 24/192kHz (all inputs) and up to PCM 32/384kHz (USB input only)

Rigid chassis construction to minimize the effects of external vibrations

Optimized selection of very high quality electronic components throughout

Low operating temperature for an ultra-long life expectancy.

Unpacking

The **MOON 230HAD** headphone amplifier should be removed from its box with care.

The following accessories should be included inside the box with your headphone amplifier:

- ✓ *AC power cable*
- ✓ *"CRM-3" remote control with two 'CR-2032' batteries*
- ✓ *This owner's manual*
- ✓ *Warranty and product registration information (USA and Canada only)*

Once the **MOON 230HAD** is unpacked, inspect it thoroughly and report any damage to your dealer immediately. We suggest that you keep all of the original packaging, storing it in a safe, dry place in case you're required to transport this product. The customized packaging is specially designed to protect the **230HAD** from any potential damage during transit.

Please write the serial number of your new **MOON 230HAD** in the space provided below for future reference.

Serial Number

Installation & Placement

The **MOON 230HAD** requires only minimal ventilation to maintain an optimum and consistent operating temperature. However, you should avoid placing it near a heat source as this could compromise the headphone amplifier's performance and reliability. As well, it should be placed on a solid level surface. The **230HAD** uses toroidal transformers; even though they are well shielded, you should not place the preamplifier too close to source components sensitive to EMI, such as a turntable.

If you intend to use the USB input connection (PCM or DSD) with a Windows-based computer, you will need to install our USB HD DSD driver, which can be downloaded from the support section of our website.

Note: Apple-based computers don't require this driver.

Front Panel Controls

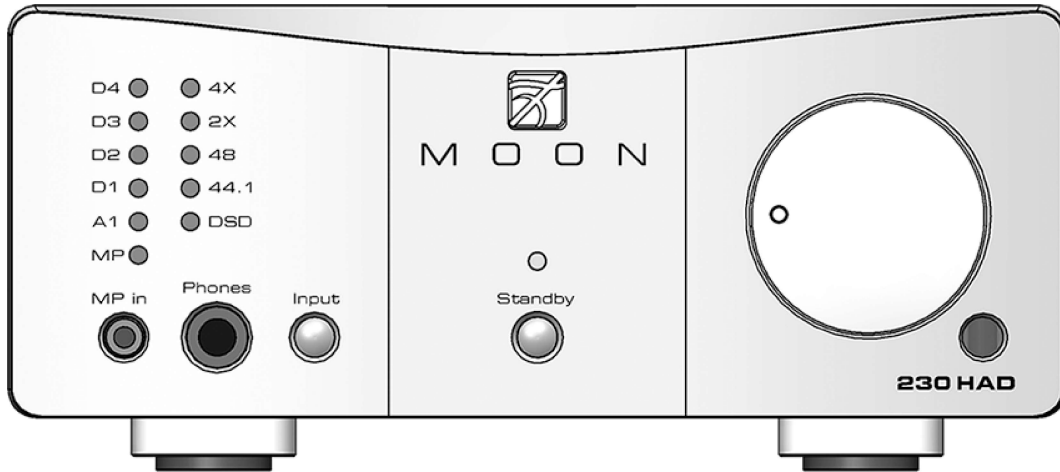


Figure 1: MOON 230HAD Front panel

The front panel will look similar to Figure 1 (above). The “Standby” button toggles the **MOON 230HAD** between standby mode and operational mode. When switching back from “Standby” to the “on” mode, the selected ‘input’ will be memorized from the previous listening session. The blue indicator LED turns off when the **230HAD** is in “Standby” mode.

There are two columns of LED indicators. The first column identifies the selected input; The second column indicates the sample rate of the selected digital input once the **MOON 230HAD** has successfully locked onto the digital signal. Refer to the following page for further details.

The “MP” input uses a 1/8” mini-jack connector which is the most common type of connection found on portable media players. This is an analog only input .

The “Phones” jack is used for connecting a pair of stereo headphones to the **230HAD**. The input connector uses a standard single-ended ¼” TRS jack. When a pair of headphones are used with the **MOON 230HAD**, the output signal will continue to be sent to both the fixed and variable output connectors located on the rear panel.

The “Input” button allows you to sequentially scroll, forward through all six (6) available inputs: “MP”, “A1”, “D1”, “D2”, “D3” and “D4” These abbreviations correspond to the labeling of the inputs as follows. “MP” on the front panel. “A1”, located on the rear panel is intended for use with any type of source component that outputs a single-ended analog signal.

“D1”, “D2”, “D3” and “D4” are the four (4) digital inputs located on the rear panel: “D1” uses an optical Toslink connector, “D2” and “D3” use S/PDIF on a female RCA connector and “D4” uses a type-B USB connector. The “D1” is intended for use with a source equipped with a Toslink digital output such as a satellite dish receiver or DVD player; The “D2” and “D3” inputs are intended for use with a source equipped with a S/PDIF digital output such as a network player, music server or CD transport. The “D4” input is for use with a computer equipped with a USB connector and music player software; you cannot connect a USB flash drive or external hard drive to the “D4” input.

Notes: (i) DSD format signals can ONLY be played through the USB (“D4”) input. (ii) PCM format signals with sample-rates of 352.8kHz and 384kHz can ONLY be played through the USB (“D4”) input

The rotary “Volume” control determines the output level.

The IR sensor for the included CRM-3 remote control is located below and to the right of the volume control.

When you select one of the four digital inputs, the second column of LED's will indicate that the DAC has

successfully locked onto a digital signal and indicate the sampling rate in the following manner:

PCM Sampling Rate	Illuminated LED(s)
44.1kHz	44.1
48.0kHz	48
88.2kHz	44.1 & 2X
96.0kHz	48 & 2X
176.4kHz	44.1 & 4X
192.0kHz	48 & 4X
352.8kHz	44.1 & 2X & 4X
384.0kHz	48 & 2X & 4X

DSD Sample Rates	Illuminated LED(s)
DSD 64	DSD
DSD 128	DSD & 2X
DSD 256	DSD & 4X

Rear Panel Connections

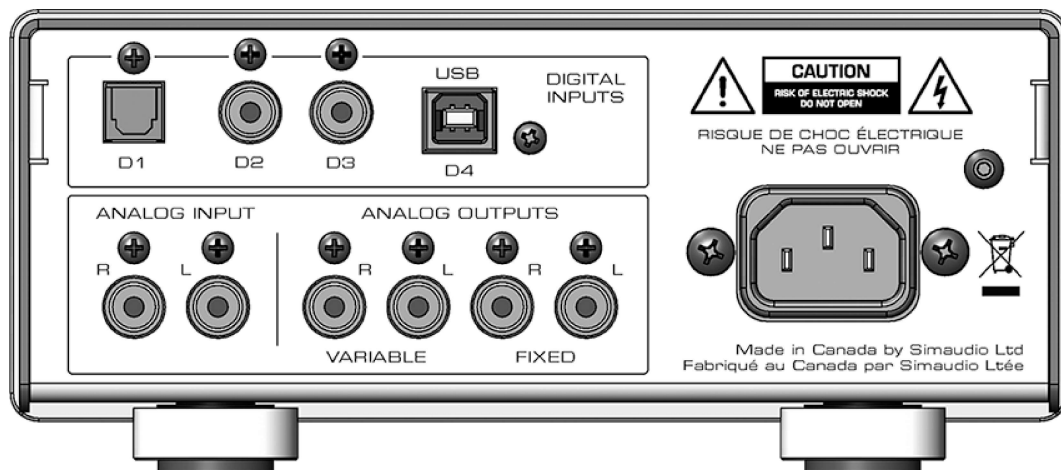


Figure 2: MOON 230HAD Rear panel

The rear panel will look similar to Figure 2 (above). There are four (4) digital inputs labeled D1, D2, D3 and D4. The D1 input is on an optical Toslink connector; both the D2 and D3 inputs are on a S/PDIF connector; the D4 input is on a USB type B connector. Directly below there is one (1) pair of single-ended analog inputs on RCA connectors labeled "A1".

The **MOON 230HAD** headphone amplifier has two (2) pairs of single-ended outputs on RCA connectors, labeled 'FIX' and 'VAR', located next to the "A1" analog input. The 'FIX' output is intended as an output to a preamplifier or integrated amplifier when the **230HAD** is used as a DAC. Keep in mind that the output level is fixed and cannot be adjusted by the **230HAD's** volume control. The 'VAR' output is designated for output to a power amplifier with single-ended RCA inputs. *Don't hesitate to use high quality interconnect cables*. Poor quality interconnect cables can degrade the overall sonic performance of your system.*

Connect the supplied AC power cable to the IEC receptacle, located on the headphone amplifier's rear panel. Ensure that the AC wall outlet you use has a functioning ground. For the best sonic performance, it is preferable that you plug your **230HAD** directly into a dedicated AC outlet and avoid using an extension cord.

* Please speak with your MOON Authorized Retailer about the benefits of high quality cables for your system, and superior quality AC wall outlet.

Operating the MOON 230HAD

We recommend leaving your **MOON 230HAD** powered up at all times to maintain optimal performance. When you plan on being away for a few days, it may not be a bad idea to power off your amplifier. Please keep in mind that once fully "broken-in", your **230HAD** requires several hours of operation before reaching optimal performance after powering it up again.

Turning on your MOON 230HAD for the first time

Prior to turning the amplifier on for the first time, make sure that every cable is properly connected to avoid any problems. Next, briefly press the push button labeled "Standby" located on the front panel. You will hear a very faint click sound confirming that everything is in order. The blue LED on the front panel will illuminate, indicating that the **230HAD** is now powered up and ready for use.

On and Off Sequence

To avoid having any annoying noises (ie. "thumps" and "pops") emanate from your headphones when powering your **230HAD** on or off, you should always power up any source components prior to powering up your **230HAD**. As well, always power down your **230HAD** prior to powering down any source components.

Remote Control Operation

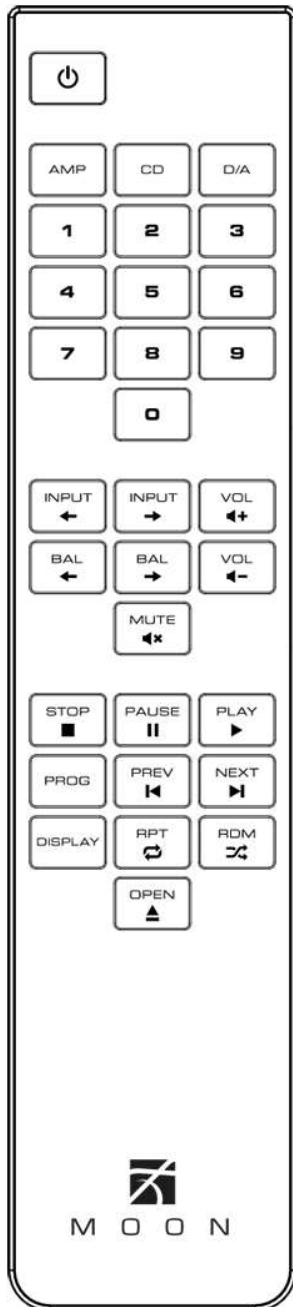



Figure 3: CRM-3 Remote Control

The **MOON 230HAD** Headphone Amplifier uses the '**CRM-3**' full-function remote control (figure 3). It operates on the Philips RC-5 communication protocol and can be used with other Simaudio MOON components.

The '**CRM-3**' remote uses two CR-2032 batteries (included). To install them, simply unscrew the two screws from the removeable lower section of the back plate then slide downwards to remove the plate..

To engage the '**CRM-3**' remote for use with the **MOON 230HAD** Headphone Amplifier/DAC, you must first press the button labeled **D/A**.

The  (Power) button, located on the upper left, will switch the Headphone Amplifier to either 'Standby' or 'On' mode.

The 2 buttons labeled **← INPUT →** allow you to sequentially scroll, either backwards or forwards, through all available inputs. For example, to switch from the "A1" to the "B1" input, press **INPUT ←** two (2) times. To switch from the "B1" to the "A1" input, press **INPUT →** two (2) times. Pressing and holding down either of these buttons results in only a single change to the selected input.

The 2 buttons labeled **- VOL +** allow you to control the volume level. Pressing **VOL -** results in a decrease in the volume level; Pressing **VOL +** results in an increase in the volume level. You may either press and hold these buttons down or press them briefly to make volume adjustments.

NOTES: The **← BAL →** buttons don't affect the operation of the **230HAD**.
The **MUTE** button doesn't affect the operation of the **230HAD**.

Specifications

Configuration	Single-Ended
Headphone Impedance	20 - 600Ω
Power Supply Transformers	1 x 10VA
Power Supply Capacitance	13,200μF
Type of Amplification	Transconductance
Single-ended inputs (RCA)	1 pair
Mini-jack input	1 (1/8")
Input Impedance	22,000Ω
Output Device Type	Bipolar
Single Ended Headphone Output	1/4" Stereo TRS
Single Ended Preamp Outputs (RCA)	2 pairs (fixed and variable)
Output Power @ 600Ω	100mW
Output Power @ 300Ω	200mW
Output Power @ 50Ω	1W
Audible Frequency Response	20Hz-20kHz ±0.1dB
Full-range Frequency Response	5Hz - 100kHz +0/-3.0dB
Output Impedance	1.25Ω
Signal-to-noise Ratio (20Hz-20kHz)	115dB @ full output
Crosstalk @ 1kHz	80dB
Total Harmonic Distortion (20Hz-20kHz)	0.005%
Intermodulation Distortion	0.005%
Remote Control	Full-Function (CRM-3)
Power Consumption @ idle	10 W
AC Power Requirements	120V / 60Hz ou 240V / 50Hz
Shipping Weight	6.2 lb / 2.8 kg
Dimensions (W x H x D, inches / cm)	7.0 x 3.0 x 11.0 / 17.8 x 7.6 x 28.0



Fuse Replacement: 120V version uses a 0.2A slow blow (5 x 20mm size)
 230V version uses a 0.1A slow blow (5 x 20mm size)

Specifications (cont'd)

Digital-to-Analog Converter:

Digital Input Types	S/PDIF (RCA) x 2 USB x 1 Toslink x 1
DSD Data Rates	(2.8224MHz), Double (5.6448MHz) and Quadruple (11.2896) (via USB only)
DSD Sample Rates	DSD64, DSD128 & DSD256 (via USB only)
PCM Bit-depth range	16 - 32 bits (32-bit via USB only)
PCM Sampling Frequency Rates	44.1 - 384kHz (352.8 & 384kHz via USB only)
Frequency Response (audible)	20Hz - 20kHz +0/-0.2dB
Frequency Response (full range)	2Hz - 72kHz +0/-3dB
THD @ 1kHz, 0dBFS (A-weighted)	0.001 %
IMD	0.004 %
Dynamic Range	118dB
Signal-to-noise Ratio	114dB @ full output
Channel Separation	114dB
Intrinsic Jitter	100 picoseconds RMS

