User Guide

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Xenos 3
Headphone Amplifier

User Guide

Issue No: V2.5   Dec 2005

Legal Information

NOTES:

Contents

1. Welcome

Congratulations on your purchase of the Xenos 3 Headphone Amplifier (X3HA) and welcome to a world of astounding audio clarity. This professional amplifier will provide you with superb High-Fidelity sound for many hours of listening pleasure. You will be able to listen to your favourite tracks with incredible clarity and dimension that you never thought existed. It will remarkably enhance the sound quality produced by almost any device that has a headphone output and provide you with the very best sound your headphones can deliver.

Take time to read through this user guide as it will provide you with valuable information to help you ensure that you get the very best performance from your X3HA. Before you call in for technical support, read through and follow the recommendations in chapter 6 of this user guide.

Thank you for choosing Xenos Audio Systems™ and ATP Systems.

2. Introduction

Connecting to Headphone Outputs
Most CD players, MP3 players, personal computers, medium to high end stereo receivers and other audio sources with headphone outputs often make use of "single-chip", "single-ended output" headphone amplifier devices. These devices may without load produce fairly reasonable low-distortion sound but often lack adequate power to effectively drive headphones.
This results in low-volume, inferior quality (high distortion) reproduction of the audio signal by headphone sets. Bass signals sound flat and or higher frequencies sound distorted when listening to audio tracks from these inferior single-chip headphone amplifiers. This can be observed when you turn up the volume to your headphones and is evidenced by increased distortion of the audio signal.
The X3HA Headphone Amplifier provides higher headphone drive levels and enhances audio quality thereby overcoming the weaknesses inherent in lower quality headphone amplifiers.
As mentioned above, headphone amplifiers in CD players, MP3 players, personal computers and stereo receivers, in most cases, can reproduce audio signals with very little distortion as long as there is little to no load connected to their output.
The X3HA takes advantage of this by firstly presenting a negligible load to the output of these headphone amplifiers. The X3HA then uses it's own high quality low-noise pre-amplifier stage that drives the bipolar transistor output stages. The X3HA employs the same amplifier design as that used in high end speaker amplifiers. A DC-DC converter is used to convert the battery voltage to a full dual-rail supply as found in high end stereo amplifiers.

Connecting to Line Outputs
The X3HA can also be connected to the line output of audio playback devices. In most cases the line output provides a higher quality low distortion audio signal but is insufficient for driving headphones. The X3HA can amplify the line output signal to a level suitable for driving headphones. This allows you to take advantage of the superior quality of line output audio.

3. Package Contents

Take a few moments to inspect your package and ensure that all items listed here are included.
If any of the listed items are missing please contact your dealer immediately, or if you purchased direct from Xenos Audio then refer to the contact information found in this guide.

A. X3HA Headphone Amplifier

B. 9V 1.3A Regulated AC adapter

C. 3.5mm (1/8" mini) Stereo Jack patch cord

4. Getting Started

- *General battery use information*

  If you intend to use the X3HA in a portable mode you will require four AA size batteries. The X3HA will work with either Alkaline or rechargeable type batteries including Alkaline or NiMH. **Note that the X3HA does not include a built in battery charger** so you must charge rechargeable batteries in their appropriate charger according to manufacturer instructions before installing them in the X3HA.

  The table below indicates the typical performance of various battery types:

	Battery Life	Time to low-power alarm	Time to dead battery after low-power alarm
Alkaline	7hrs	6hrs	60min
NiMH Rechargeable (2300mAH cells)	8hrs	7h30min	30min

  The above battery performance values are indicative and based on assumptions that the respective batteries are fully charged when installed in the Zenos 3. Also that the X3HA is driving a 32Ohm headphone set continuously at approximately 33% – 50% volume setting. Overall performance will also vary depending on individual battery characteristics and quality.

  Note that with Alkaline batteries assuming the above load conditions the X3HA will continue to operate beyond the 7 hour mark but will not perform optimally. Rechargeable NiMH batteries tend to stop delivering sufficient current after their discharged status voltage is reached (discharged battery condition). This is evidenced by the blue LED indicator being virtually extinguished.

  Caution: Never mix batteries of different types in the X3HA.
  It is highly recommend to use 1.2V 2300mAh or 2400mAh NiMH capacity batteries in the X3HA.

- *Installing batteries*

Step 1 - Open the battery compartment door on the bottom of the unit by gently pressing down on the indicated location while simultaneously pushing towards the rear of the unit as illustrated.

View of Battery Compartment

Step 2 – Install the batteries as illustrated being careful to align the batteries with the polarity markings in the battery compartment. The unit is protected against reverse polarity however it will not function with incorrectly installed batteries.
Replace the battery compartment door.

**View of Battery Compartment with
Batteries Installed**

- *Using the AC Adapter*

The included AC power adapter is rated at 9VDC 1.3A regulated output.
It is not necessary to remove the batteries from the unit when using the AC power adapter. The batteries are automatically disconnected when the adapterr is in use.
When using the AC power adapter the X3HA operates in high-power mode and produces higher output power than in battery mode (refer to Chapter 8 in this guide). **NOTE: Turn the X3HA power switch off before plugging in the AC adapter.**

WARNING: The included power adapter must be used as an external power source for the X3HA. The X3HA may be damaged if plugged into any other power source thereby voiding the warranty.

Always turn the power switch of the X3HA off before connecting the AC adapter.

Locate the Power Jack on the rear of the X3HA, insert the DC Jack Plug from the power adapter into the DC Power Jack of the X3HA. Plug the power adapter into a standard 110V/240V wall outlet.

Rear View of X3HA

- *Input Connections*

When facing the controls, the input connections are located on the right side of the X3HA. As illustrated two connections are present, the 3.5mm (1/8" mini) jack socket and a six-pin mini-din socket. The six-pin mini-din socket is used as an expansion port allowing the X3HA to connect to other Xenos Audio products.
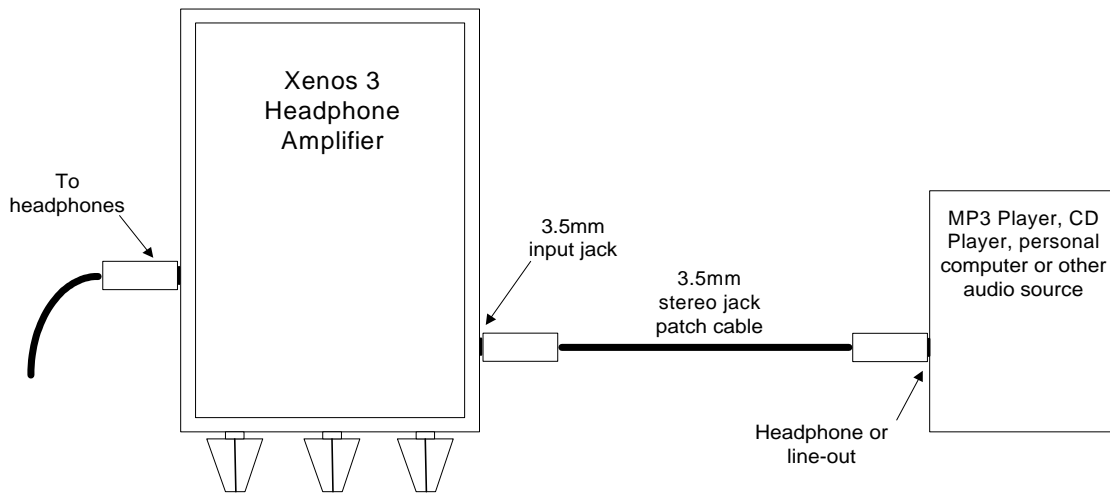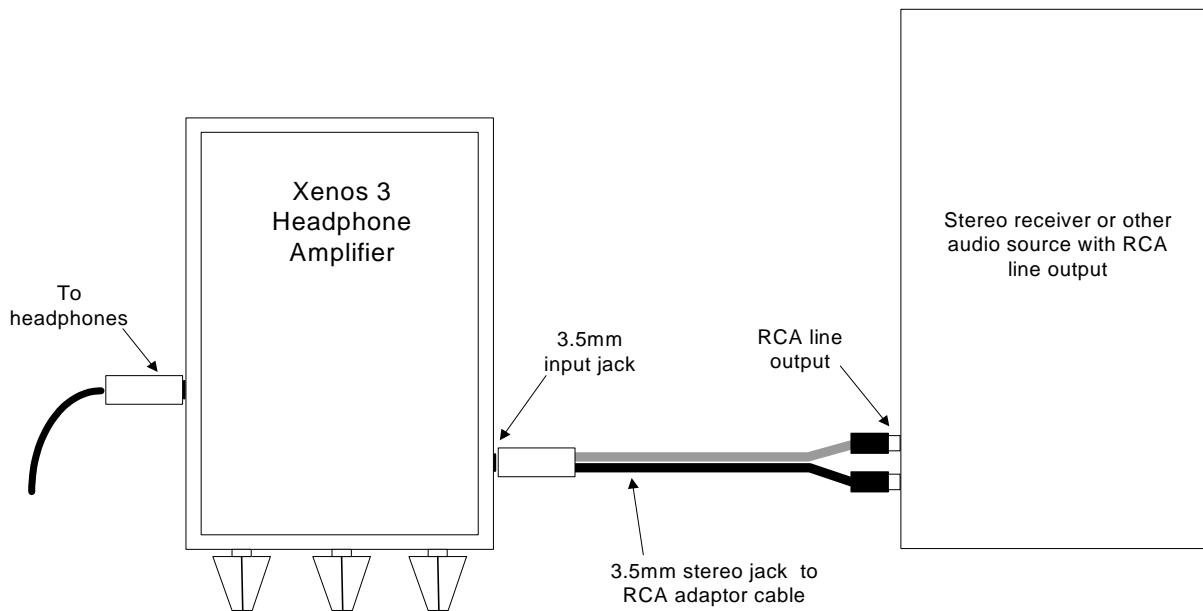
Viewing the X3HA Input Connectors
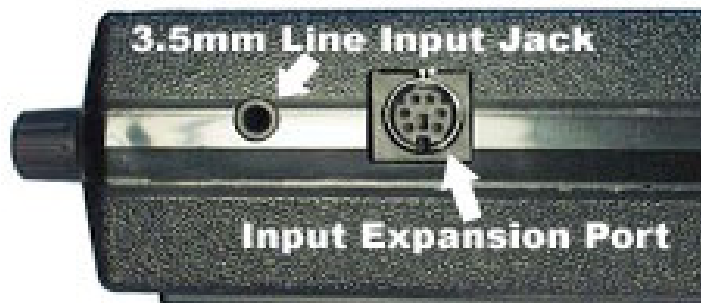
For normal use, the 3.5mm stereo input jack socket on the X3HA is used. You may use the provided 3.5mm stereo jack plug extension cable or an optional 3.5mm stereo jack to RCA adapter cable to connect the X3HA to either the headphone output or the line output of your sound equipment as in the following illustrations.

**Connecting the X3HA to an audio source with
headphone or line-out jack.**

Xenos 3
Headphone
Amplifier

To
headphones

3.5mm
input jack

3.5mm
stereo jack
patch cable

MP3 Player, CD
Player, personal
computer or other
audio source

Headphone or
line-out

**Connecting the X3HA to an audio source with
RCA type line-out.**

Xenos 3
Headphone
Amplifier

Stereo receiver or other
audio source with RCA
line output

To
headphones

3.5mm
input jack

RCA line
output

3.5mm stereo jack to
RCA adaptor cable

- ***Plug in your Headphones***

  The X3HA has two 3.5mm (1/8" mini) headphone jacks outputs and can drive up to two headphones simultaneously. You may use standard headphones with typical impedance of 16 Ohm up to 600 Ohm. The X3HA is specially designed to drive mid to high end headphones but it will also work with lower cost headphones.

  CAUTION: Do not connect more than one headphone with impedance lower than 16 Ohm, this could damage the output stage of the amplifier.

View of 3.5mm (1/8" mini) Headphone Output Jacks

5. The Controls

- *Adjusting sound levels*

The front panel of the X3HA has three controls being Volume, Treble and Bass.

The volume control adjusts the signal level to the output amplifier stage that drives the headphones. Before powering up the X3HA, reduce the volume setting to below ¼ position or half way between 0 and 5 positions on the Volume dial. After the X3HA is powered up and the music source is playing place the headphones on your head and adjust the Volume control to a suitable sound level.

The Treble and Bass controls are part of the active tone control circuit that allow you to adjust equalization to suit your listening pleasure.
When the Treble and Bass controls are in the 0 position (centre) the X3HA frequency response is flat and the input signal will be amplified without any noticeable equalization adjustments.

WARNING: Excessively high volume levels for extended periods can cause permanent damage to your ear drum and hearing. Use prudence and good judgment when using this headphone amplifier. Discontinue use immediately if you feel discomfort or experience pain in your ears.

Front Panel view of X3HA

- *Powering up*

  The X3HA power switch is located on the right side (same side as the input connectors) of the unit when viewing from the control panel.
  To turn the power on, slide the power switch towards the front panel as illustrated.

  Turn the X3HA off at the power switch when not in use to preserve battery life.

- *Power indicator*

  The blue power indicator LED is located on the front panel near the volume control and has two functions:
  - **On steady** - the power is on.
  - **Pulsating** – the power is on and the low battery alarm is on. Assuming continuous use at 1/3 volume setting the flashing LED indicates the following battery status:
    i. For alkaline cells the battery level is at 4.3V and there is approximately 60 minutes of battery power remaining.
    ii. For NiMH rechargeable cells the battery level is at 4.3V and there is approximately 30 minutes of battery power remaining.

6. Troubleshooting

The X3HA is designed to provide years of trouble free service. However as with any electronic audio appliance some servicing may be required from time to time. Careful operation of the unit within it's operating parameters and treating it with care will ensure trouble free listening pleasure.

No power, power LED does not light up.
Check that batteries are good or fully charged and correctly installed, replace batteries, turn on power check that LED lights up.
Plug in AC adapter, turn on power check that LED lights up.

No sound in headphones.
Check that the power switch is in the On position and that LED is lit.
Ensure that there is an input audio signal. Check by plugging the X3HA into another audio source, try a different input cable.
Ensure that the X3HA Volume control is turned up.
Check that headphones are functioning, plug them into another audio source to test them.

Distorted sound from headphones.
Check to make sure that the connected audio playback device volume is not set too high as this could be the potential cause of distortion. Set volume at ¼ setting on your playback device then try again. If distortion is still present try using another playback device (CD player or other). **NOTE:** Some computer sound cards may inherently produce distortion and add noise to the audio signal, the X3HA cannot correct an inherently distorted or noisy signal.

Service
The X3HA does not contain any user serviceable parts inside and therefore should not be opened. For service please refer to your dealer or contact ATP Systems directly, refer to Chapter 9 of this user guide.

7. Caring for your X3HA

Always observe environmental conditions as documented in Chapter 8 of this user guide.

Cleaning – surfaces may be cleaned with a slightly damp cloth and mild detergent. Do not use any solvents or alcohol.

Avoid high temperatures – do not store or operate near a heat source or in direct sunlight.

Keep dry – keep free from moisture, water and dust.

**Shock** – do not subject the unit to shock from dropping.

Do not disassemble – never disassemble or modify the unit in any way.

8. Technical Specifications

Parameter	Typical Measured	Conditions
Total Harmonic Distortion and Noise	0.01% +/-0.001%	60mV input, output at 315mV (-10dBV reference level) gain is 14.4dB, 1kHz input signal, 30kHz bandwidth
Signal to Noise Ratio	94dB	0dBV reference level, 30kHz bandwidth
Frequency Response	10.5Hz – 40kHz, -3dB / +0.3dB	0dB reference at 1kHz input signal (output at -10dBV)
Channel-to-Channel Crosstalk	-72dB	1kHz input signal, 60mV input level, output at -10dbV, 30kHz bandwidth
Maximum Input Level	6.70VRMS (+16.5dBV)	1kHz
Maximum Output Level	6.14VRMS (+15.8dBV)	1kHz, 600 ohm load
Maximum Gain	+26.4dB	1kHz input signal, 600 ohm load
Output Power - per channel With Battery With Power Adapter With Battery With Power Adapter With Battery With Power Adapter With Battery With Power Adapter With Battery With Power Adapter	RMS, (Peak) 485mW, (970mW) 755mW, (1505mW) 370mW, (740mW) 580mW, (1160mW) 280mW, (560mW) 432mW, (864mW) 115mW, (230mW) 183mW, (366mW) 62mW, (124mW) 96mW, (192mW)	 32 ohm load, 1kHz input signal 64 ohm load, 1kHz input signal 120 ohm load, 1kHz input signal 300 ohm load, 1kHz input signal 600 ohm load, 1kHz input signal
Input impedance	20 kohm nominal	
Headphone Load Impedance	16 ohm to 600 ohm < 16ohm	Up to two headphones Only one headphone
Bass control response parameters	-17dB to +17dB -15dB to +15dB -12dB to +12dB 550Hz	@ 49.5Hz (centre frequency) @ 80.0Hz @ 140.0Hz -3dB cut-off with Bass control at max setting
Treble control response parameters	-17dB to +17dB -16dB to +16dB -12dB to +12dB 1.3kHz	@ 17.2kHz (centre frequency) @ 12.0kHz @ 5.0kHz -3dB cut-off with Treble control at max setting

Power Requirements Battery Power Consumption	
	4 x 1.5V AA Alkaline cells OR 4 x 1.2V 1800mAH or 2300mAH AA NiMH cells (charger not included) 150mA @ 6VDC idle
Power Adapter	9V 1.3A regulated output, 100-240VAC 50/60Hz input power adapter included with X3HA headphone amplifier
Power Consumption	160mA @ 9VDC idle
Power LED indicator	Blue, Steady = Power OK, Pulsating = Battery low

Environmental	
Operating Temperature	32°F to 131°F (0°C to 55°C)
Storage Temperature	4°F to 167°F (-20°C to 75°C)
Humidity	95% maximum (non-condensing)
Dimensions	6.3L x 3.56W x 1.68H(Inch), 160H x 90.5W x 43H(mm)
Weight	12oz, 330g (excluding batteries)
Warranty	2 Years (see detail warranty info)

X3HA Frequency Response
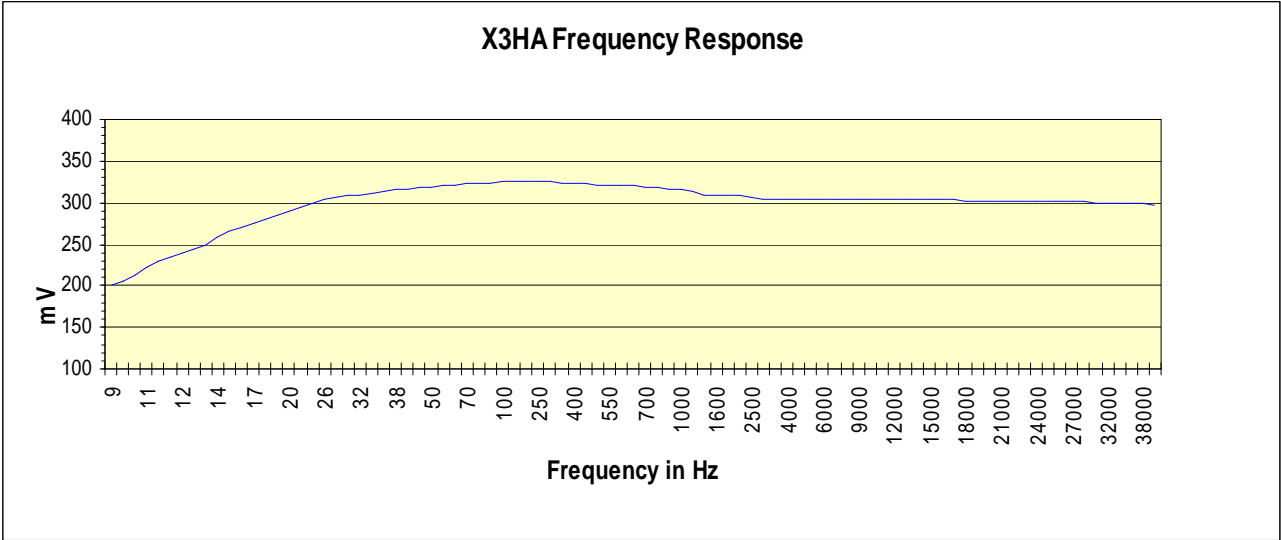
9. Warranty Information

Warranty for Xenos Audio™ Products

Length of warranty

This warranty on your new Xenos Audio™ product which is manufactured, distributed and warranted by ATP Systems (Canada), remains in effect for the period of five (5) years from the date of consumer purchase either direct from ATP Systems or through an appointed authorized ATP Systems dealer.

What the warranty covers

Except as specified below, this warranty covers all defects in material and workmanship of this product. The following are not covered by this warranty:

❖ Rechargeable batteries of any type.

❖ Any product where the serial number sticker has been removed or modified or defaced in any way.

❖ Damage, wear and tear or malfunction resulting from:
a) Accident, act of nature, abuse, misuse, neglect, unauthorized repair or modification, failure to follow instructions supplied with the product. b) Repair or attempted repair by anyone not authorized by ATP Systems. c) Shipping of the product (claims are to be made with the carrier). Where shipment is arranged by ATP Systems with it's preferred carrier, contact ATP Systems support for additional information regarding making a claim in this regard. d) Normal use, for example wear and tear, imperfections, scratches, blemishes or other damage to the equipment.

What ATP Systems will pay for

If during the applicable warranty period from date of consumer purchase your Xenos Audio™ product is found to be defective by ATP Systems. ATP Systems will repair, or at it's option, replace, such defective product without charge for parts or labour.

How to make a Warranty Claim

If your Xenos Audio™ product requires service, it may be taken or shipped to any authorized ATP Systems service centre or ATP Systems. Please contact ATP Systems for a list of authorized service centres.
The following apply whenever your Xenos Audio™ product must be transported for warranty service:

❖ You the end user are responsible for transporting your Xenos Audio™ product or arranging for it's transportation.

❖ If shipment is required:

  o If shipping it to ATP Systems you must first contact ATP Systems Support to obtain an RMA number and detail shipping instructions.

  o You are responsible for paying shipping charges.

  o All products must be shipped in their original packaging if possible, if not available please contact ATP Systems for assistance.

❖ Include the following: name, address, phone number, model and serial number of the product being returned and a description of the problem.

❖ A COPY OF THE ORIGINAL SALES INVOICE / RECEIPT MUST BE INCLUDED.

THIS WARRANTY IS EXPRESSLY MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
ATP SYSTEMS LIABILITY IS EXPRESSLY LIMITED TO THE REPAIR OR REPLACEMENT, AT OUR OPTION, OF ANY DEFECTIVE PRODUCT MANUFACTURED BY ATP SYSTEMS AND SHALL IN NO EVENT INCLUDE INCIDENTAL OR CONSEQUENTIAL COMMERCIAL, PERSONAL INJURY OR PROPERTY DAMAGES OF ANY KIND.

ATP Systems, 86 Durham St., Oshawa, Ontario, L1J 5P7, Canada   Tel: (Int)+1-905-579-5699 Fax:(Int)+1-905-438-1079

Xenos Audio™ X3HA - Warranty Registration Card
You can register your product on line at: www.aptecpro.com
Or fill in the information requested below and mail to the address above.

Title:___   First name: _____   Last name:_____

Address:

Street:_____ Apt no:_____

City:_____ State/Province:_____

Postal code:_____ Country:_____

Tel:_____ email:_____

Product detail for X3 Headphone Amplifier:

Serial number:_____ Date purchased:_____

Dealer name:_____ City:_____

Place this card in an addressed and stamped envelope and mail to:

ATP Systems, 86 Durham St., Oshawa, Ontario, L1J 5P7, Canada