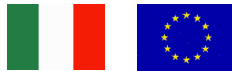


# OWNER'S MANUAL

**AudioNemesis**

*Enjoy the Music*

*Superior Audio Products  
Handmade in Italy*



## **CLASS A MONO POWER AMPLIFIER PA-1m**

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Graphic Fabio Camorani — Giuseppe Intorrella

M\_PA1m REV.01 ENG OCT 2009

## INTRODUCTION

Thank you for your purchase of the **AudioNemesis PA-1m!**

This product represents a great evolution in audio technology at affordable price. It represents an important step to Music bringing the listener to emotion of live Music events. This product is designed for the best quality of sound and reliability, matching unprecedented performance with convenience not obtainable from most high performance products.

All **AudioNemesis** products are made for helping you in listening to your favourite Music for many years; no compromises in core parts.

**AudioNemesis** products are not made for a limited life, every part is used to take you in listening to your favourite Music for a very long time: we respect You and Music above all.

## THANK YOU FOR CHOOSING AUDIONEMESIS

## PREFACE

- Read carefully these instructions before turning on this appliance. Keep these instructions in a safe place for future readings.
- Heed all warnings.
- Follow all instructions.
- Do not use this device near water, or with high humidity, or under the rain or moisture.
- Do not install near heat sources such as radiators, stoves or other apparatus (including amplifiers) producing heat.
- Clean only with a dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- This device can be used only for purposes it is designed for.
- Never open the appliance: risk of electric shock. Refer servicing to qualified personnel only.
- Do not modify the appliance.
- Use high quality cables and power cord. Protect the cord from being walked on or pinched, particularly at plugs, extension cords and the point at which they exit the unit.
- The device is connected to ground through the power cord. Be sure that the power cord you are using has the ground connection. Be also sure that your connector has the ground connection. A grounding type plug has 2 blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit, into your outlet, consult an electrician for replacement of the obsolete outlet.
- Before connecting this appliance to the mains, be sure that the voltage information in the rear label of the appliance is compatible with your mains voltage.
- If the appliance had wide thermal shocks (for example, from low external temperature to high room temperature), do not turn on the appliance, but wait till the appliance temperature equals the room one (about 1 hour).
- Unplug this device during lightning storms or when not used for long periods of time.
- Refer all servicing to qualified service personnel only. Servicing is required when the unit has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the device, the unit has been exposed to rain or moisture, does not operate normally, or has been dropped.

**No expressed or implied warranty is made for any AudioNemesis product damaged by accident, abuse, misuse, natural or personal disaster, unauthorized modification. Any disassembly, components or parts replacement, perforation or modification of the chassis or modifications performed to the unit will void the warranty.**

## CAUTION

To reduce the risk of electric shock do not remove the cover or the front panel or any other part. Inside there is no user serviceable parts. Refer servicing to qualified personnel only.

## WARNING

To reduce the risk of electric shock or fire, do not expose this appliance to moisture or rain.



This symbol, wherever it appears, alerts you to the presence of dangerous voltage (inside the enclosure) that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.



This symbol, wherever it appears, alerts you to the need of specific disposal, due to recycling, following the Directive 2002/96/EC (WEEE). Please refer to your National Register for the correct procedure or call your official **AudioNemesis** dealer / distributor.



This product complies with the EMC directive (89/336/EEC) and the low voltage directive (73/23/EEC).

## A LETTER FROM FABIO CAMORANI

Dear Audio Enthusiast,  
Thank you for your purchase of the **PA-1m**.

**AudioNemesis** was born to offer serious and reliable products, instruments for Music lovers. At the centre of all **AudioNemesis** products there is only Music. Most of competitors are offering products for impressing Audiophiles, but after a few discs only, audiophiles feel the need for a change! This is due to a poor and not natural sound. The reproduction of Music is a repeatable event by definition and also imperfect. I think that reproduction may have many interpretations. The one by **AudioNemesis** put Emotion behind everything, a step ahead, because this is the only common element between Produced (Live) Music and Reproduced (Home) Music. Emotion is the essence of the Music. Listening to Music using **AudioNemesis** products you will have all the Emotion of Live Music, without special effects, without pretending, no false creations. Natural feeling, richness of harmonics, details of the event: everything is reproduced with a very clear sense of LIVE, without false aspects, without false sounds.

Like all other **AudioNemesis** products, **PA-1m** has been designed without preconceptions, without following trends, and without following the latest technology “innovation”. This is our philosophy, using simple and elegant designs for the highest emotions. Circuit simplicity and a minimum number of components are key elements. Less is better, but we do want to use the right device for the right purpose in the right way. Our products are simple appliances, using only the minimum quantity of parts for the proper work, following “the simpler the better, but not even simpler”. **PA-1m** design is a breaking point, because it’s totally different from what offered by the market: a simple circuit, full of uncommon choices for its class and rare in absolute, no matter the cost, all together in a new typology I called **Echidna**. The market of power amplifiers is full of similar products, similar in schematic and sound. And lots of them declare low feedback, despite tens of decibels. It’s very rare to see original designs, with real study and research on sound (with clear ideas and listening tests).

If You have the **PA-1m** in your hands, You are a Music lover. I’m sure you’ll love it, and you’ll listen to your favourite Music for many years using the **PA-1m** . Enjoy the Music!

Sincerely,  
Fabio Camorani

## PA-1M AUDIO POWER AMPLIFIER: PRODUCT PHILOSOPHY AND DESIGN

Echidnas (sometimes also Ekidna) are unusual animals living in Australia and New Zealand: they are small egg-laying (primitive) mammals that are covered with coarse hair and spines. So, it's a very "strange" animal, it's a "hybrid". And it's very "nice" and "sweet".

We at AudioNemesis called **ECHIDNA** our original topology for a hybrid power amplifier, developed and used for the first time in this model **PA-1m**. Echidna puts together, in an original form, a few known circuits and ideas, creating a very unique simple topology.

Echidna idea is simple: a triode voltage gain stage plus a bipolar current gain stage, without loop feedback. However, this hybrid configuration is unusual from many points of view.

Triodes are the best devices for voltage gain. Nothing is more linear than a triode. It's the only device which can be used without any kind of feedback, assuring a very low distortion. Bipolar transistors are the best devices for current gain. They can work only using local feedback but they can allow very low distortion also in simple topology, if well designed, and very high current.

Hybrid designs usually have triodes plus Mosfets and not bipolar transistors. New York Audio Laboratories (NYAL) in early '80 proposed the Moscode topology and since then it seems that the only way of doing hybrid designs is triode and Mosfets. Recently, a few examples of hybrid amps with bipolar transistors appeared on the market (and DIY magazines).

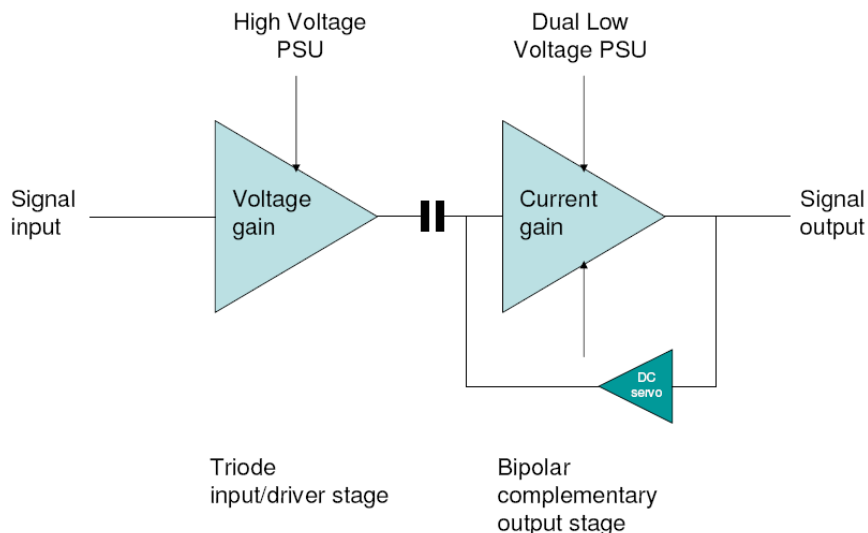
Echidna is a very special configuration with **only 3 active devices in series to the signal**. All other devices are passive. So, there are **only 7 components in series to the signal!**

The output stage is made by bipolar transistors only. It's a complementary configuration composed by the output devices and the driver devices. As output devices we chose the best available audio power transistors: they are made by Sanken and they are ring emitter type. These devices are able to supply 17A DC, and up to 35A for 10ms. This outperforms any requirement in real applications.

As driver devices we chose a very linear device, with 100Mhz Ft and a very low capacitance (ensuring low distortion in real life loads), made by Toshiba.

This output stage is **unconditionally stable** and it has low output impedance assuring a **high damping** of the loudspeaker, for better bass response.

A DC servo circuit assures an output DC voltage near zero without output capacitors.



Linearity of base current of output devices is essential for the best audio performance. So the voltage gain stage must be able to drive the output stage with high linearity of base current.

Triodes are the most linear devices for voltage gain. But usually they don't have much current capability. The standard common cathode stage (standard gain stage) is linear if properly designed but cannot guarantee the current we want for the best performance and proper driving of the output stage. For this reason it is very common to use a cathode follower stage after the gain stage. This configuration is standard and it is used really often. We don't think this stage has the right sound, so we designed a driver stage using two triodes in a single very fast stage, able to drive the current base of the output stage in a linear way.

The power supply makes use of a high quality and low noise toroidal transformer with many separated secondary windings, dedicated to each requirement of the circuit. Requested voltage for the output stage has very special, very fast and soft-recovery diodes, with low ESR electrolytic capacitors. The ripple is very low assuring very low noise. High value capacitors assure energy while low value and very fast ones (positioned close to the power transistors) assure speed. The voltage is unregulated. Regulated power supply sounds better than un-regulated one only if regulation is necessary for a stable work of the audio stage. Otherwise, it's very difficult to reach better results. Our driver stage is very stable with stable sound performances and this allows the use of a very good but un-regulated power supply too. Filament (heater) power supply is regulated and precisely stabilized at the optimum voltage for assuring long life of the triode. Furthermore, stabilized dual voltages are dedicated to other non-audio circuits. A custom designed mains filter completes the power supply.

The complete circuit is divided in three different PCBs: audio signal, output stage power supply, high voltage and filament power supply. This does optimize space and performance. The signal path is as short as possible.

As usual, all components are of the best quality, with Sanken ring-emitter power transistors, Toshiba audio driver transistors, very high quality passive parts and a NOS 5687WB double triode with a ceramic socket.

The pure aluminium heat sink let the circuit manage the high temperature of the output transistors caused by the high idle current for a correct Class A bias. The Bias circuit, moreover, sets a very stable output idle current since the turn on of the amplifier. The fast correction this circuit is capable of allows a warm-up of about 30 minutes, even if we suggest a longer period for the best performance.

The chassis is very similar to the one used in other **AudioNemesis** products, adapted to the high temperature typical of Class A amplifiers.

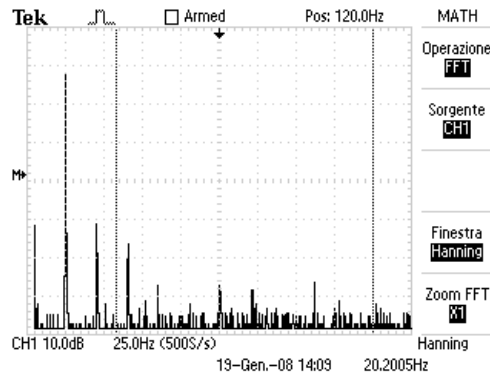
# AudioNemesis

Why ECHIDNA?

**ECHIDNA - Exclusive Circuit for Hybrid Improved Design by Nemesis Audio**

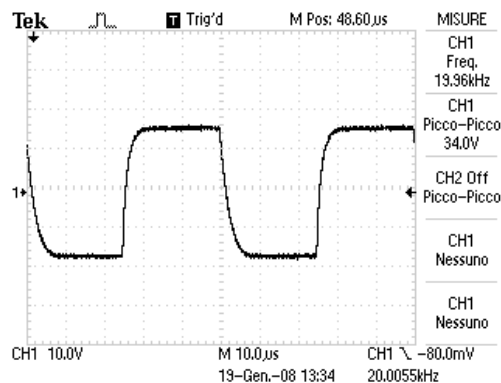
The Echidna output stage has **no output choke and no Zobel network!** Despite this, it is **unconditionally stable** and the low output impedance is assuring a **high damping** of the loudspeaker, for better bass response.

This amplifier is able to drive any efficient loudspeaker, thanks to the low distortion and high current capability. However, it has **no protection system!** So it's not protected against short circuits. Warning!



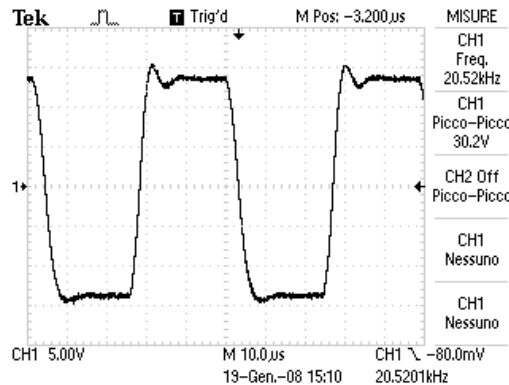
20 khz distortion before clipping

The second harmonics is -40dB, third and fourth with linear decay.



Square wave response at 20 khz and 8ohms, 34 Vpp

Many famous amplifiers have bad response and don't self-oscillate thanks only to a choke in series to the output and a Zobel network when they drive 0,1µF in parallel to the 8 ohms resistor.



Square wave response at 20 khz and 8 ohms + 3,3µF (3 point 3 micro farad!), 30 Vpp

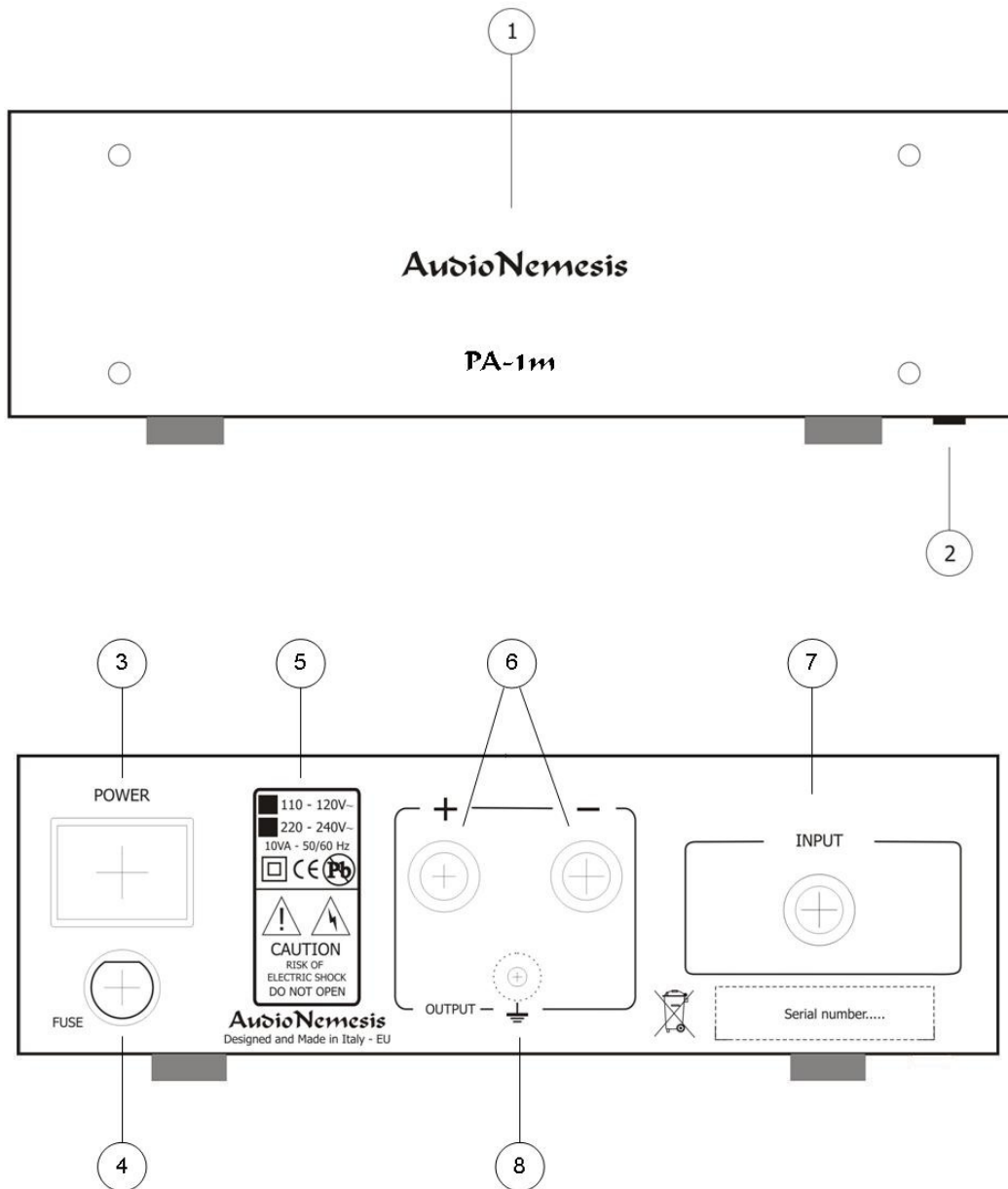
## SPECIFICATIONS

Obtained after 1 hour warm-up, with regulated 230 Vac power line

Frequency Response	20 Hz to 50 KHz + 0dB/ -1dB @ 15W @ 8 ohms 20 Hz to 50 KHz + 0dB/ -1dB @ 1W @ 8 ohms
Gain	15 dB
Power Output	15 Watts @ 8 ohms 27 Watts @ 4 ohms 45 Watts @ 2 ohms
THD @ 1kHz	<0.03% @ 1,5 W <0.3% @ 15W
THD @ 20kHz	<1% @ 15 W
Input Impedance	475 kohm
Damping Factor	>80 @ 8 ohms nominal
Output:	Inverting
DC offset	< 50mV
Input Connectors	Gold plated RCA, Teflon
Output Connectors	Gold plated RCA for audio signal Gold plated screw type for GND
Dimension (WxHxD):	23 x 8,5 x 34 cm.
Weight:	6 Kg
Shipping weight:	7 Kg
Power consumption:	<80 Watts
Power Supply:	110/120 Vac or 230/240 Vac 50/60 Hz +/- 10%
Fuse	2,5 A slow blow type for 230 Vac 5 A slow blow type for 115 Vac

All specifications can change without notice.

# AudioNemesis



- 1. Name *AudioNemesis***  
When the item is ON the name turns ON with a blue light.
- 2. Power switch**  
The power switch is in the bottom part of the chassis, front-right side.
- 3. Mains connector**  
Always connect the power cable with the power switch turned OFF (power switch pushed to the rear side of the chassis)
- 4. Fuse**  
The main power fuse is inside the connector. Never change it if not blown. Never open it if the appliance is ON. Always verify the data reported in this manual.
- 5. Mains characteristics**  
Verify that the data reported on the rear panel of the chassis match the characteristic of the mains line of your country.

## 6. Analogue output terminals

Connect a high quality analogue speaker cable to these high quality output pins. Then connect the other side of the cable to the connectors of your speaker. Be sure that the output characteristics of this unit matches the input characteristic of the unit you want to connect to. Correct polarity of the connections between the amplifier and speakers is essential. The positive terminal on the amplifier is marked + (plus) and coloured red, and the negative terminal is marked – (minus) and coloured black. This amplifier is inverting (see SPECIFICATIONS). **Bi-wiring** and **bi-amping** connections and suggested.

## 7. Analogue input connection

Connect this input pin to the audio signal cable from your preamplifier.

## 8. “Earth” or “Ground” terminal

For best performance this terminal should be connected to the “earth” or “ground” terminal of the speakers, if offered by your model. This screening effect can give an improvement in detail clarity, depending on the speaker used. Optimum results are achieved using a screened loudspeaker cable designed for such a system. If a screened loudspeaker cable is not in use but you wish to utilise the earthing facility, run a single cable between the “earth” or “ground” terminal on the amplifier to the earth (ground) connection on the loudspeaker.

## HOW TO USE THE APPLIANCE

- **How to turn on the converter**

Turn ON the appliance AFTER turning on the preamplifier.

- **Mains voltage**

No power cable is offered with this appliance. Please use a good quality power cable: this improves the performance of this power amplifier. A screened cable is suggested.

- **Connection cables**

No analogue cable is offered with this appliance. Please use good quality cables both for analogue connections. Using good quality cables may give a very big improvement in sound quality reproduction and gives you even better Music listening sessions.

- **Mains filtering**

In this appliance there is a high quality mains filtering unit. This is a custom design to assure the highest final quality and to meet CE requirements. Before using an external filter, conditioner, stabilizer or any other appliance please do a deep listening session to verify effectiveness, to avoid sound quality problems.

- **Cleaning**

Use a high quality lint-free cloth that has not been treated with chemicals of any kind. Dampen the cloth with warm water only. Do NOT use cleaning agents of any kind, such as alcohol or other common cleaning products.

## TROUBLE-SHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
The appliance does not turn on	Main voltage is not present, the power cable is not properly connected or it is damaged, the fuse is blown	Be sure that the turn on switch is in ON position. Verify that the power cable is properly connected and that it's in proper working condition, verify that the fuse is working.
There is no output signal	The digital cable is not properly connected or it is damaged	Verify that the digital cable is properly connected and that it's in proper working condition. Turn off then turn on the appliance.
The appliance does not work properly, it has distortion, it works to strokes	Main voltage with noise or incorrect main voltage	Remove the sources of noise or use stabilizers, verify that the appliance is connected to the right main voltage as reported by the rear label (5)

For any other problem, please contact your dealer.

**WARRANTY RECORD FORM**

**Model:** Audio Power Amplifier PA-1m

**S/N:**

**Owner's information**

Last name ..... First name.....

Address.....

City ..... ZIP Code.....

Country .....

**Purchasing:**

**Warranty:** This appliance has a limited warranty of 3 years from the date of purchasing on labour and parts . The mechanical and electronic components of this appliance are warranted to be free of defects in material and workmanship for that period. The warranty does not include damage due to misuse or abuse or modified products and also does not include consequential damage. The warranty begins on the date of the original retail purchase, as noted on the bill of sale or receipted invoice from an authorized **AudioNemesis** dealer or distributor.

**Privacy:** All data from this document will be used for standard administration records and warranty and will be protected and taken secure.

**Note:** Every effort is made to ensure the highest standard of quality. The producer reserves the right to change the specifications without any notice. The specifications and the design of the device may differ from the information given in this manual.