



P1000-1 & P1000-2

STEREO TURNTABLE PREAMPLIFIER

OPERATING AND MAINTENANCE MANUAL



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GENERAL

A turntable preamplifier is a deceptively simple device which, although it has major effects on your sound, has been the victim of an amazing amount of poor design. One problem frequently encountered results from the use of oversimplified design techniques for the RIAA equalizer network and/or loose tolerance equalizer components. Equalizer errors can have major audible effects on your sound because the result of shifting an equalizer corner frequency slightly is to boost or cut a wide band of frequencies. For example, dropping all levels from 2kHz all the way up to 20kHz to buy only one dB due to a ten percent tolerance equalizer error is far worse audibly than flat response up to 15kHz with a drop of 1 dB between 15 to 20 kHz. However, both fit within the typical ± 1 dB response specification on the data sheet. A professional preamplifier should hold these midband equalizer response errors to ± 0.25 dB using precision film resistors and polystyrene capacitors for long-term stability. The P1000 preamp will typically run ± 0.1 dB from 50 to 15000 Hz.

Another chronic problem is insufficient input stage headroom. Headroom limitation can result from making the first stage gain high to overcome a high noise level in the following output stage. With digitally mastered and direct-to-disc recordings regularly exceeding 50cm/sec peaks at midband, a high output cartridge can readily overdrive the 80 mV maximum input level limit of many preamplifiers.

The P1000 phono preamp will comfortably accept 350 mV peaks (250mVrms) at mid frequencies and up to 2V peak levels at 20 kHz. These levels are so far in excess of the velocity capability of both cutter heads and playback cartridges that you can forget about input headroom as a limitation for the foreseeable future.

The RIAA feedback equalizer, when scaled down in impedance to minimize input noise generation, forms a low impedance, high capacity load for the input stage and can readily overload almost all low noise IC op-amps. A high slew rate specification for the input IC amplifier, although very necessary, is no guarantee of protection from slew rate problems. Equally important, the amplifier must have sufficient output current swing capability to drive the high capacity of the equalizer network. ATI preamps use the 5533 IC, which has a 35 mA peak output current and can drive the equalizer with full rail-to-rail output swings at its rated internal slewing rate of 13 volts per microsecond.

INSTALLATION

MOUNTING

Your P1000 phono preamp may be desk mounted on its suction cup feet and left out for everyone to see since it is so pretty. If you want to keep knob twirlers away, you can bury it inside your turntable cabinet using the two angle brackets provided. Place them at diagonal corners under the lower cover mounting screws. Avoid magnetic fields from the turntable motor. Make sure your cartridge leads reach the preamp before permanently mounting the unit.

Rack Mounting Kits are available. P/N 21075-501 mounts one or two units side by side in 1-3/4" of vertical rack space. P/N 21098-501 is a 1/2 RU Filler Panel for use if you are rack mounting only one unit.

WIRING

The third wire ground can cause a ground loop with your facility ground. If you are sure your facility ground will provide adequate protection to personnel in case of an AC line short to the chassis, a 3-to-2 AC line adapter can be used to isolate the power line ground. We recommend that the adapter be removed and the power line ground reconnected prior to any service work requiring removal of the facility ground connection from the P1000 chassis.

The four inch copper strap which you are, of course, using for your facility ground is not going to fit around the #6 chassis ground screw on the P1000 rear panel. Run the strap to within a few inches of the chassis and jump to the chassis ground with shield braid. Connect the tone arm ground lead to the same point (or any other place that works better).

Plug cartridge leads into the phono jacks. Convention is white for left channel, red or black for right channel.

Output wiring is indicated on the rear panel label. HI outputs are in phase with each other and are in phase with the input signal. P1000-1 units with transformer outputs may have either HI or LO outputs grounded (but not both).

CAUTION

The Active-Balanced differential output unit (Model P1000-2) has active drivers for both HI and LO output terminals. Do not ground either HI or LO terminals. To drive an unbalanced (one side grounded) load connect it between HI and GND terminals and let the LO terminal float. Two separate 600 ohm unbalanced loads can be driven from each output without interaction by connecting one between HI and GND and the other between LO and GND. The two loads thus driven will be out of phase with each other. Individual grounds are provided for left and right outputs.

ADJUSTMENTS

The P1000 has sufficient gain and output capability to overdrive some console inputs, particularly those providing preamps for high level input channels. Two o'clock on the level pot will provide +8 dBm for 0 VU (5 cm/sec) recording level with typical cartridges providing 1 mv/cm/sec; 12 o'clock is approximately 0 dBm, and 10 o'clock is approximately -10 dBm output. Operation with the P1000 pot below 10 o'clock degrades noise performance and a fixed attenuator pad should be placed between the P1000 output and console input to allow operation around two o'clock.

MAINTENANCE NOTES

Power supply voltages are + and -20 VDC nominal, dropping to ± 16 VDC under full output. Maximum allowable voltages are ± 22 VDC (limited by IC). If zener diodes are replaced, remove A1, A2, and A3 ICs and check output voltage before plugging ICs back into the circuit. Remove power when inserting or removing ICs.

IC output DC voltages (no signal conditions) should measure 0VDC ± 0.5 VDC. Significant deviation indicates an IC or circuit problem. Measurable DC difference between inverting and non-inverting amplifier inputs (other than due to meter loading) indicates IC failure.

MODIFICATIONS

230 VAC OPERATION

Your P1000 is wired for 120 VAC 50/60 Hz operation unless otherwise requested at the time of ordering. It can be modified for 230 VAC use by removing the power transformer primary jumpers W1 and W3 and inserting a jumper in the W2 holes.

150 OHM OUTPUT IMPEDANCE

Model P1000-1 transformer output units may be converted to drive 150 ohm audio lines by removing jumpers W4 and W5 located adjacent to output transformers T3 and T2, respectively. Insert two new jumpers for each output transformer between the original jumper terminals and the empty terminals immediately adjacent to, and in line with, the original terminals in order to parallel the secondary windings.

Balanced differential output and single-ended output P1000 units will drive 150 ohm loads without modification but will current limit before full power supply swing is reached.

TECHNICAL SPECIFICATIONS

MODELS

P1000-1

DUAL/STEREO TRANSFORMER
BALANCED OUTPUTS

P1000-2

DUAL/STEREO ACTIVE BALANCED
DIFFERENTIAL OUTPUTS

OUTPUT CLIPPING LEVEL

+22 dBm (P1000-1)
+26 dBm (P1000-2)

**DISTORTION
@ +20 dBm Output**

P1000-1: .2% 30 Hz to 20000 Hz
P1000-2: .05% 20 Hz TO 20000 Hz

EQUIVALENT INPUT NOISE

Shorted Input, .5 Microvolts RMS
Cartridge Input, .8 micovolts, RMS
1000 ohms, +.5 Hy

SIGNAL TO NOISE RATIO

80 db unweighted, ref. 10mVrms, 1kHz
to 20kHz bandwidth

FREQUENCY RESPONSE

RIAA Curve \pm .25 db, 30 to 20000 Hz

INPUT SENSITIVITY

Adjustable, 1.0 mVrms at 1kHz for +8 dBm
output

INPUT OVERLOAD

320 mVrms at 1kHz

INPUT IMPEDANCE

47K ohms and 220 pf

**SUBSONIC WARP AND ARM
RESONANCE FILTER**

-3 db max @ 20 Hz
-18 db @ 10 Hz

HI CUT SWITCH

-3 db @ 10 kHz

HI BOOST SWITCH

+3 db @ 10 kHz

SYSTEM SLEW RATE

13 V/Microsecond

POWER REQUIREMENTS

115/230 VAC (via wiring change), \pm 10%
47-63 Hz

SIZE

8.5" (21.6cm) W x 1.75" (4.4cm) H x 7"
(17.8cm) D

WEIGHT

2.5 lbs. (1.1kg) Net; 4 lbs. (1.8kg) Shipping

One Year Limited Warranty

ATI warrants this product to be free from defects in materials and workmanship to its original owner for a period of one year from date of purchase. ATI will repair or replace such product or part thereof, which upon inspection by ATI, is found to be defective in materials or workmanship.

The Proper Return Authorization Number must be obtained from ATI in advance of return. Contact ATI at 856-626-3480 or email sales@atiaudio.com to receive the number and instructions for return of your unit.

A written statement providing the name, address, daytime telephone number and email address of the original owner, together with receipt from the original purchase, and a brief description of any claimed defects, must accompany all returns. Parts or product for which replacement is made shall become the property of ATI.

The customer shall be responsible for costs of transportation and insurance to the factory of ATI, and shall be required to prepay such costs.

ATI shall use reasonable efforts to repair or replace any product covered by this limited warranty within thirty days of receipt. In the event repair or replacement shall require more than thirty days, ATI shall notify the customer accordingly. ATI reserves the right to replace any product that has been discontinued from its product line with a new product of comparable value and function.

This warranty shall be void in the event a covered product has been damaged, or failure is caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, or lightning, power fluctuations and other incidental or environmental conditions. Further, product malfunction or deterioration due to normal wear is not covered by this warranty.

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ATI reserves the right to modify or discontinue, without prior notice to you, any model or style product.

If warranty problems arise, or if you need assistance in using your product contact us.