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# Owner's Manual

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**MODEL PH3/PH3SE**

**PHONO PREAMPLIFIER**

**audio research**  
HIGH DEFINITION®

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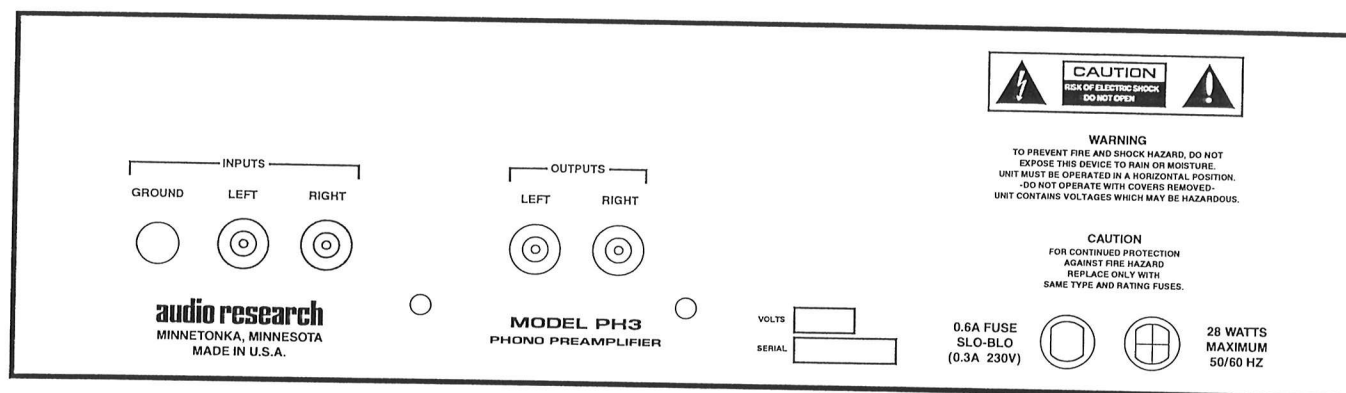
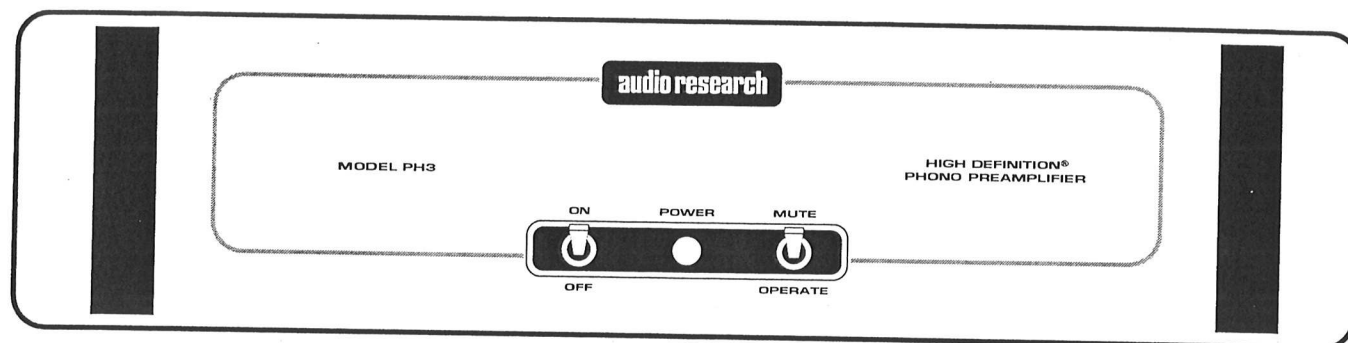
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# Model PH3/PH3SE



**Note:** The information in the PH3 Owner's Manual applies to the PH3SE, with the exception of the removable IEC power cord supplied with the SE version, and clear damping rings supplied on the tubes in the PH3SE (installation instructions for these rings are on the reverse side of the separate tube location sheet enclosed with the unit).

# Model PH3/PH3SE

## Preface

Please take the time to carefully read this instruction manual prior to installation or use of your PH3 phono preamplifier. Because it is a highly advanced electronic instrument, there are several facts and procedures you should know before you place it in operation.

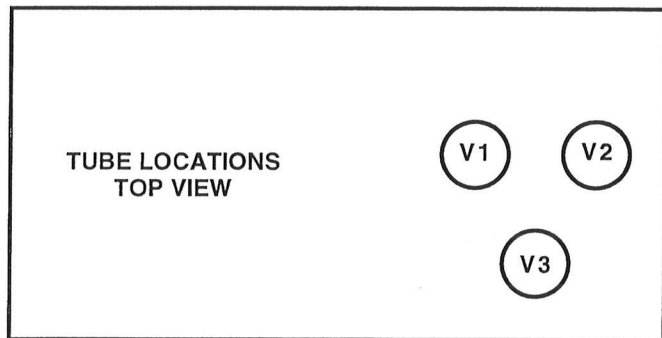
Just as you would not purchase and attempt to operate an expensive camera, computer system or high-performance automobile without first learning something about performance parameters and correct operating procedures, so too your phono preamplifier requires some familiarization before you make it part of your music reproduction system. Your reward, in terms of maximum performance and a long service life, will be well worth the effort.

## Warnings

1. To prevent fire, or shock hazard, do not expose your PH3 to rain or moisture.
2. This unit contains voltages which can cause serious injury or death. Do not operate with cover removed. Refer servicing to your authorized Audio Research dealer or other qualified personnel.
3. The power cord on your PH3 is equipped with a standard three-prong grounding plug. For absolute protection, **do not defeat the ground power plug**. This provides powerline grounding of the PH3 chassis to provide absolute protection from electrical shock.
4. For continued protection against fire hazard, replace the fuse only with the same type and rating as specified at the fuse holder.

**DO NOT ATTEMPT TO OPERATE THIS EQUIPMENT BEFORE INSTALLING THE VACUUM TUBES IN THEIR PROPER SOCKETS.**

REAR



FRONT

## Packaging

Save all packaging in a dry place away from fire hazard. Your PH3 phono preamplifier is a precision electronic instrument and should be properly cartoned any time shipment is made. You may not have occasion to return your unit to the factory for service, but if that should prove necessary, or other occasion requiring shipment occurs, the original packaging will protect your PH3 from unnecessary damage or delay.

Note that your PH3 has been shipped with the vacuum tubes installed in a protective foam block under the top cover. With the PH3 unplugged, use a phillips-head screwdriver to loosen the fastening screws, remove the top cover and set aside. Install the numbered tubes in their respective sockets, refasten the top cover and store the foam block with your carton.

## Description of Controls

**POWER SWITCH:** Supplies power from AC wall outlet to PH3 when in "On" position.

**MUTE/OPERATE SWITCH:** In "Mute" position the outputs of the PH3 are shorted to allow listening interruptions. The PH3 should *always* be put into "Mute" when the phono cartridge's stylus is cued up from, or especially cued down onto an analog LP, preventing a potentially damaging subsonic "thump" from being amplified down the line.

## Connections

**INPUT CONNECTORS:** There is one set of RCA input connectors, which should be connected to your turntable/toner arm cable. Input impedance is 47K ohms in parallel with 90pF capacitance. See "Input Impedance Adjustment" and "Input Capacitance Adjustment" to change these values.

**OUTPUT CONNECTORS:** There is one set of RCA output connectors which should be connected to line inputs (Direct, Aux, Spare, Tuner, etc.) of your line stage/pre-amplifier. Single ended RCA-to-balanced adapters are available from Audio Research allowing the PH3 to be connected directly to a balanced input preamplifier using single ended RCA interconnects.

All input/output connectors are gold plated and connect "ground" before "hot". On disconnect, "hot" is disconnected first.

**NOTE:** A "passive" line stage is not recommended for use with the PH3 as it will not provide the gain necessary to amplify the output of the PH3 to adequate levels to the power amplifier.



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At the performance level of the PH3, high quality audio signal interconnect cables such as the Audio Research Litzlink 2 are critical to preserving maximum fidelity. Please consult your Audio Research dealer.

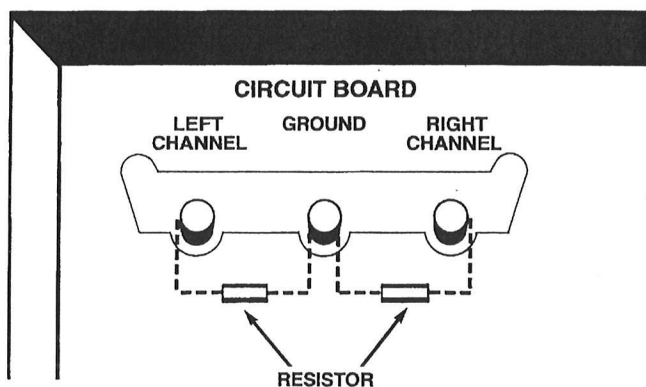
## Input Impedance Adjustment

For the best sonic performance from your phono pickup cartridge, it should connect to the proper load impedance as recommended by the cartridge manufacturer. Your PH3 comes wired with 47K ohms and 90 pF for moving-coil and moving magnet cartridges. A kit of precision load resistors is supplied with your PH3 for the load requirements of 30, 60, 100, 200 or 800 ohm moving-coil cartridges. Consult your cartridge manufacturer or dealer to determine the optimum load impedance for your needs. You may wish to connect the load resistors at the output of your turntable, rather than in the PH3, especially if you may be using more than one turntable or cartridge, with different load requirements.

The use of precision fixed resistors provides better load accuracy and sonic performance at lower cost than most adjustable or switchable loads. Audio Research can supply audiophile grade non-standard load resistor values upon request accompanied by U.S. \$10.00 to cover order processing costs (certified funds or money order).

With the PH3 unplugged, remove the bottom cover and solder the desired resistors (one, or two per channel, in parallel, as required) to the turret terminal posts located on the bottom of the main circuit board near the phono inputs (see illustration).

Bottom view, rear corner, cover removed.



Wrap, solder resistors to mounting posts.

First, wrap the resistor leads around the posts one-half to three-quarter turn, then solder using the special alloy solder supplied with the resistors. Connect the desired resistor combination between the left and center posts and between the center and right posts. Reinstall the bottom cover.

For 30 ohms: Add brown-black-black-black and yellow-orange-red-gold resistors.

For 60 ohms: Add brown-black-black-black and brown-green-black-black resistors.

For 100 ohms: Add brown-black-black-black resistors.

For 200 ohms: Add red-black-green-black and brown-black-black-red resistors.

For 800 ohms: Add brown-black-black-brown and yellow-orange-red-brown resistors.

## Input Capacitance Adjustment

The PH3 has a total input capacitance of 90 picofarads. Different value capacitance can be added to match the requirements of your moving magnet cartridge (consult your cartridge manufacturer or dealer for proper loading values). Following the installation procedure used for resistor loading described under "Input Impedance Adjustment", connect the capacitor(s) for each channel with the lead at the banded end soldered to the center (ground) post to maintain correct polarity.

## Installation Instructions

While the PH3 does not dissipate an unusual amount of heat, it is important that it have a reasonable airflow to assure long, trouble-free operation. In addition, the following installation guidelines will help insure maximum sonic performance as well as reliable service.

1. Upright and horizontal mounting is required if extended operation (longer than one hour) is contemplated.
2. Do not "stack" the PH3 on top of other equipment; not only could this cause overheating, but "hum" may be introduced into the phono circuits from the proximity of the power transformer of the other equipment.
3. Do not place or operate unit on a soft or irregular surface such as a rug. This will prevent proper ventilation.
4. Do not operate unit without the top and bottom covers installed. These are required both for safety as well as shielding from interference (except in service operations).
5. If rack mounting is employed, use Audio Research Rack Mount Ventilators (RMV-3) below and above the PH3.
6. If side-by-side mounting with other equipment is employed, place the PH3 to the left of the other chassis, so as to provide maximum spacing between the transformer of the PH3 and the other component.
7. In a cabinet or rack-mount installation which has an enclosed back, an exhaust fan is desirable so as not to operate the PH3 in overheated ambient air. Operation of vacuum tube equipment for long periods of time in hot ambient air will shorten tube life and increase chance of failure of other component parts.

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## Operating/Start-up Procedure

1. Make sure Power switch is set to "Off" position.
2. Secure connections between turntable, PH3, and line stage preamplifier. Note: Given the advanced performance capabilities of the PH3, it is extremely important that high-quality interconnects be used for connection to ancillary electronics. Audio Research brand interconnects, in either unshielded or RFI-shielded configurations, are strongly recommended. Your authorized Audio Research dealer can assist you in determining which type and lengths are optimal for your system.
3. Plug 3-prong power cord into a grounded AC wall receptacle.
4. Turn Power switch to "On." The green "Power" LED will glow *dimly* for approximately 80 seconds while the power supply stabilizes, indicating operation of the automatic muting circuit. After this warm-up period the LED will brighten (when the Mute/Operate switch is set to "Operate"), indicating that your PH3 is ready for operation.

Note: For superior sonic performance, a warm-up period of at least one hour is recommended. In addition, your PH3 may be safely left "on" continuously for maximum performance at all times, but at the expense of higher maintenance costs (more frequent tube replacement). When not in use, simply use the "Mute" switch. The PH3 draws less wattage continuously than a 60-watt light bulb.

## Servicing

Because of its careful design and exacting standards of manufacture, your PH3 should normally require only minimal routine service to maintain its high level of performance.

**CAUTION:** Your PH3 contains sufficient levels of voltage and current to be lethal. Do not tamper with a component or part inside the unit. Refer any needed service to your authorized Audio Research dealer or other qualified technician.

The vacuum tubes inside your PH3 are 6922 dual triodes, and with normal use should not need to be changed for approximately 2,000 hours of use.

## Cleaning

To maintain the visual appearance of your PH3 phono preamplifier, occasionally wipe the front panel and top cover surfaces with a soft damp (not wet) cloth to remove dust. A mild, non-alkaline soap solution may be used to remove fingerprints or similar smudges. Cleaners containing abrasives should *not* be used as they will damage the "brushed" grain of the front panel finish. A dry 2-inch pure bristle paint brush works well to remove dust from bevels, reliefs and switches.

## Limited Warranty

Audio Research Corporation products are covered by a 3-Year Limited Warranty (all products except CD players, transports, and vacuum tubes), a 2-Year Limited Warranty (CD players and transports), or a 90-Day Limited Warranty (vacuum tubes). This Limited Warranty initiates from the date of purchase, and is limited to the original purchaser, or in the case of demonstration equipment, limited to the balance of warranty remaining after original shipment to the retailer or importer.

In the United States, the specific terms, conditions and remedies for fulfillment of this Limited Warranty are listed on the warranty card accompanying the product in its shipping carton, or may be obtained from the authorized retailer or from the Audio Research Customer Service Department. Outside the United States, the authorized importing retailer or distributor has accepted the responsibility for warranty of Audio Research products sold by them. The specific terms and remedies for fulfillment of the Limited Warranty may vary from country to country. Warranty service should normally be obtained from the importing retailer or distributor from whom the product was purchased.

In the unlikely event that technical service beyond the ability of the importer is required, Audio Research will fulfill the terms and conditions of the Limited Warranty. Such product must be returned at the purchaser's expense to the Audio Research factory, along with a photocopy of the dated purchase receipt for the product, a written description of the problem(s) encountered, and any information necessary for return shipment. The cost of return shipment is the responsibility of the purchaser.



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# Model PH3/PH3SE

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## Specifications

FREQUENCY RESPONSE:  $\pm 15$ dB of RIAA, 10Hz to 60kHz;  
3dB points below 0.5Hz and above 400kHz.

DISTORTION: Less than .005% at .50V RMS 1kHz output.

GAIN: 54dB at 1kHz (MC & MM compatible).

SWITCHES (2): Power, Mute.

INPUT IMPEDANCE: 47K ohms and 90pF Unbalanced.  
(Provisions for any value below 47K ohms or added input capacitance for matching certain magnetic cartridges.)

OUTPUT IMPEDANCE: 200 ohms Unbalanced. Recommend-  
ed load 50K-100K ohms and 100pF. (10K ohms minimum and  
2000pF maximum.)

MAXIMUM INPUTS: 60mV RMS at 1kHz (240 mV RMS at  
10kHz).

RATED OUTPUTS: .50V RMS 10Hz to 60kHz, 100K ohm  
load (output capability is 30V RMS output at 1/2% THD at  
1kHz).

POWER SUPPLIES: Electronically-regulated low and high  
voltage supplies. Line regulation better than .01%.

NOISE: 0.1uV equivalent input noise, IHF weighted, shorted  
input (80 dB below 1mV 1kHz input).

TUBE COMPLEMENT: (3) 6922/E88cc dual triodes with JFET  
input. Solid state power supply.

POWER REQUIREMENTS: 100-135VAC 60Hz (200-270VAC  
50/60Hz) 28 watts maximum. Line fuse 0.6A SLO BLO (0.3A  
SLO BLO 230V).

DIMENSIONS: 19" (48 cm) W x 5.25" (13.4 cm) H (standard  
rack panel) x 10.25" (26 cm) D. Handles extend 1.50" (3.8 cm)  
forward of front panel. Rear chassis fittings extend 0.75"  
(2.2 cm).

WEIGHT (PH3): 10 lbs. (4.5 kg) Net; 19 lbs. (8.6 kg) Shipping.

WEIGHT (PH3SE): 11 lbs. (5.0 kg) Net; 20 lbs. (9.1 kg)  
Shipping.

Specifications subject to change without notice.

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