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HIGH DEFINITION®
5740 GREEN CIRCLE DRIVE / MINNETONKA, MINNESOTA 55343-4424 / PHONE 612/939-0600 FAX 612/939-0604

PH1

PHONO PREAMPLIFIER

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PREFACE

Thank you for choosing the Audio Research PH1 Phono Preamplifier for your music system. Please take the time to carefully read this Instruction Manual prior to installation or use. Although it has a simple control layout and is operationally straightforward, there are several facts and procedures you should be aware of before placing it in operation.

INTRODUCTION

The PH1 was designed to allow every music lover to discover how wonderful analog LP's can sound in the midst of the present digital revolution. There are hundreds of millions of LP's in existence, many of them irreplaceable and of great musical value.

Sonically, the PH1 is simply the most neutral device of its kind. Although solid-state in its architecture, the final design was realized for its sonic attributes - the way it musically involves the listener - alone. Even its standard preamp-sized housing was utilized in order to minimize the deleterious proximity effects of a smaller chassis.

The purpose of a phono preamplifier is very simple: to deliver a line-level output to the line-stage preamplifier, which is why the control functions on the PH1 have been kept to a minimum. The "loading" sometimes necessary with phono cartridges is easily accomplished by soldering the necessary resistors to turret terminal posts on the bottom of the main circuit board. This is the most direct and best sounding method of achieving the proper load.

The gain stages utilize an all Field Effect Transistor design. The power supply features extensive and massive electronic regulation together with a low-noise torroidal power transformer. Mechanical shielding and careful internal layout minimize electromagnetic interference upon sensitive circuitry.

The PH1 represents an advance in value as well as in state-of-the-art music reproduction. And it comes to you from Audio Research corporation, an American manufacturer with over 20 years of producing and standing behind the finest high-resolution audio equipment available. It should provide you with many years of musical pleasure.

CONSTRUCTION AND TESTING

Like every Audio Research product, your PH1 phono preamplifier has been designed and carefully handcrafted in the U.S.A., using precision mechanical parts, electronic components and assembly procedures similar to those used in the manufacture of military electronics, aircraft electronics and scientific instruments. To assure performance standards, each PH1 is visually inspected at several assembly points, test run, electronically tested and sonically evaluated prior to shipment.

This time-consuming "perfectionist" approach to the design and manufacture of audio equipment is intended to provide you with the best in musical satisfaction and lasting value.

WARNINGS

1. To prevent fire or shock hazard, do not expose your PH1 to rain or moisture.

2. This unit contains voltages which can cause serious injury or death. Do not operate with covers removed. Refer servicing to your authorized Audio Research dealer or other qualified personnel.

3. The power cord on your PH1 is equipped with a standard three-prong grounding plug. If used normally, it will provide a safe earth ground connection of the chassis.

4. For continued protection against fire hazard, replace fuses only with the same type and rating of fuses as specified at individual fuse holders.

PACKAGING

Save all packaging in a dry place away from fire hazard. Your PH1 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 PH1 from unnecessary damage or delay.

DESCRIPTION OF CONTROLS

POWER SWITCH: Supplies power from AC wall outlet to PH1 when in "Power" position.

MUTE/OPERATE SWITCH: In "Mute" positon the outputs of the PH1 are shorted to allow listening interruptions. The PH1 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 subsonic "Thump" from being amplified down the line, with sometimes disastrous results.

CONNECTIONS

INPUT CONNECTORS: There is one set of RCA input connectors, which should be connected to your turntable/tonearm cable. Input impedance is 47K ohms in parallel with 560pF capacitance. See "Input Impedance 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/ preamplifier.

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 PH1 as it will not provide the gain necessary to amplify the output of the PH1 to adequate levels to the power amplifier.

At the performance level of the PH1, high quality audio signal interconnect cables 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 PH1 comes wired with 47K ohms and 560pF for many high-output, moving-coil and moving magnet cartridges. A kit of precision load resistors is supplied with your PH1 for the load requirements of 30, 60, 100, 200 or 800 ohms 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 PH1, 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 and capacitor values upon request accompanied by US$10.00 to cover order processing costs (certified funds or money order).

Solder the desired resistors (one, or two per channel [in parallel], as required) to the turret terminal posts on the bottom of the main circuit board near the phono inputs (see illustration next page). First wrap the resistor leads around the posts 1/2 to 3/4 turn. Then solder using the special alloy solder supplied with the resistors. Connect the desired resistor combination between the left and center posts and again between the center and right posts.

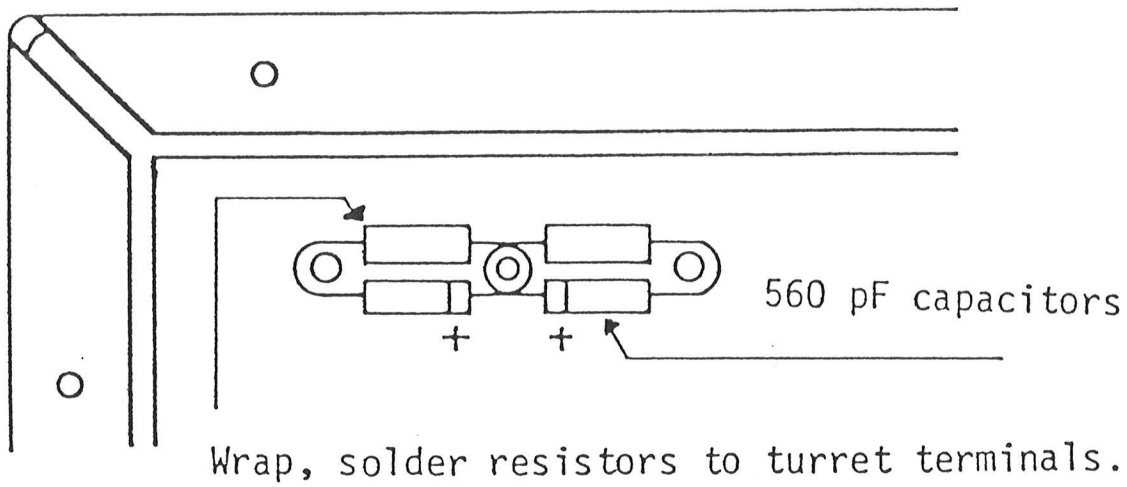
For 30 ohms: Add brown-black-black-black and yellow-orange-red-gold resistors.
For 60 ohms: Add brown-black-black-black and brown-green-black-black resistors.
For 100 ohms: Add brown-black-black-black resistors.
For 200 ohms: Add red-black-green-black and brown-black-black-red resistors.
For 800 ohms: Add brown-black-black-brown and yellow-orange-red-brown resistors.

NOTE: All PH1's have two 560 picofarad capacitors mounted on the impedance loading pegs, one for each channel. When using moving coil cartridges, these capacitors should not be removed when adding load resistors. The load resistors should be installed in parallel with these capacitors.

INPUT CAPACITANCE ADJUSTMENT

The PH1 has a total input capacitance of 600 Picofarads with the 560 picofarad capacitors installed and 40 picofarads without them. Different value capacitors can be installed to match the requirements of your moving magnet cartridge. Observe the polarity as shown in the diagram on the next page when adding capacitors.

PH1
Bottom view,
rear corner.



INSTALLATION INSTRUCTIONS

While the PH1 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 PH1 on top of other equipment. Not only will this prevent proper ventilation, 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 the unit from having 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, obviously).

5. If rack mounting is employed, use Audio Research Rack Mount Ventilators (RMV-3) below and above the PH1.

6. In a cabinet or rack-mount installation which has an enclosed back, an exhaust fan is desirable so as not to operate the PH1 in overheated ambient air. Operation for long periods of time in hot ambient air will increase the chance of failure of component parts.

OPERATING/START-UP PROCEDURE

1. Make sure Power Switch is set to "Off" position.

2. Secure connections between turntable, PH1, and line stage amplifier.

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 60 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 PH1 is ready for operation.

NOTE: The PH1 may be left on continuously for maximum performance: when not in use simply use the "Mute" switch. The PH1 draws less wattage continuously than a 60 watt light bulb.

CLEANING

To maintain the visual appearance of your PH1, 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.

3-YEAR LIMITED WARRANTY TERMS AND CONDITIONS

1. LIMITED WARRANTY. Audio Research warrants the product designated herein to be free of manufacturing defects in material and workmanship, subject to the conditions hereinafter set forth, for a period of three (3) years from the date of purchase by the original purchaser or no later than five (5) years from the date of shipment to the authorized Audio Research dealer, whichever comes first, excepting vacuum tubes which are warranted for 90 days only (See 6).

2. CONDITIONS. This Warranty is subject to the following conditions and limitations. The Warranty is void and inapplicable if the product has been used or handled other than in accordance with the instructions in the owner's manual, abused or misused, damaged by accident or neglect or in being transported, or the defect is due to the product being repaired or tampered with by anyone other than Audio Research or an authorized Audio Research repair center. The product must be packed and returned to Audio Research or an authorized Audio Research repair center by the customer at his or her sole expense. Audio Research will pay return freight of its choice. A RETURNED PRODUCT MUST BE ACCOMPANIED BY A WRITTEN DESCRIPTION OF THE DEFECT AND A PHOTOCOPY OF THE ORIGINAL PURCHASE RECEIPT. This receipt must clearly list model and serial number, the date of purchase, the name and address of the purchaser and authorized dealer and the price paid by the purchaser. Audio Research reserves the right to modify the design of any product without obligation to purchasers of previously manufactured products and to change the prices or specifications of any product without notice or obligation to any person.

3. REMEDY. In the event the above product fails to meet the above Warranty and the above conditions have been met, the purchaser's sole remedy under this Limited Warranty shall be to return the product to Audio Research or an authorized Audio Research repair center where the defect will be rectified without charge for parts or labor, except vacuum tubes (See 6).

4. LIMITED TO ORIGINAL PURCHASER. This Warranty is for the sole benefit of the original purchaser of the covered product and shall not be transferred to a subsequent purchaser of the product.

5. DURATION OF WARRANTY. This Warranty expires on the third anniversary of the date of purchase or no later than the fifth anniversary of the date of shipment to the authorized Audio Research dealer, whichever comes first.

6. VACUUM TUBES. Vacuum tubes are warranted for the original 90-day period only.

7. DEMONSTRATION EQUIPMENT. Equipment used by an authorized dealer for demonstration purposes is warranted to be free of manufacturing defects in materials and workmanship for a period of three (3) years from the date of shipment to the dealer. Vacuum tubes are warranted for 90 days. Demo equipment needing warranty service must be packed and returned to Audio Research by the dealer at his sole expense. Audio Research will pay return freight of its choice. A returned product must be accompanied by a written description of the defect on an AUDIO RESEARCH RETURNED GOODS AUTHORIZATION form. Dealer-owned demonstration equipment sold at retail within three (3) years of date of shipment to the dealer is warranted to the first retail customer to be free of manufacturing defects in materials and workmanship for the duration of the 3-Year Limited Warranty remaining (as measured from the date of shipment of the equipment to the dealer). Vacuum tubes are not warranted for any period under these conditions of sale. In the event warranty service is needed under these conditions,

the owner of the equipment must provide a copy of his purchase receipt, fulfilling the requirements described under "2. Conditions" above. The product must be packed and returned to Audio Research or an authorized Audio Research repair center by the customer at his or her sole expense. Audio Research will pay return freight of its choice.

8. MISCELLANEOUS. ANY IMPLIED WARRANTIES RELATING TO THE ABOVE PRODUCT SHALL BE LIMITED TO THE DURATION OF THIS WARRANTY. THE WARRANTY DOES NOT EXTEND TO ANY INCIDENTAL OR CONSEQUENTIAL COSTS OR DAMAGES TO THE PURCHASER. Some states do not allow limitations on how long an implied warranty lasts or an exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

9. WARRANTOR. Inquiries regarding the above Limited Warranty may be sent to the following address:

Audio Research Corporation
6801 Shingle Creek Parkway
Minneapolis, MN 55430

WARRANTY OUTSIDE THE USA

Audio Research has formal distribution in many of the countries of the free world. In each country the Audio Research Importer has contractually accepted the responsibility for product warranty. Warranty should normally be obtained from the importing dealer or distributor from whom you obtain your product.

In the unlikely event of service need beyond the capability of the Importer, Audio Research does, of course, back up the warranty. Such product would need to be returned to Audio Research, together with a photostatic copy of the bill of sale.

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PH1 PHONO PREAMPLIFIER PRELIMINARY SPECIFICATIONS

Frequency Response: ±.25dB of RIAA, 10Hz to 60 kHz
3dB points below 0.5Hz and above 150kHz

Distortion:
Less than .005% at .25V RMS 1kHz output

Gain:
48dB at 1kHz (MC & MM compatible)

Switches (2):
Power, Mute

Input Impedance:
47K ohms (Provisions for any value below 47K ohms or added input capacitance for matching certain magnetic cartridges.)

Output Impedance:
350 ohms. Recommended load 50K-100K ohms and 100pF. (10K ohms minimum and 2000pF maximum)

Maximum Inputs:
160mV RMS at 1kHz (800mV RMS, 10kHz).

Rated Outputs:
.25V RMS 10Hz to 60kHz, 100K ohm load (output capability is 50V RMS output at 1/2% THD at 1kHz)

Power Supplies:
Electronically-regulated low and high voltage supplies and electronic decoupling. Shielded toroid transformer. Line regulation better than .01%

Noise:
0.12uV equivalent input noise, IHF weighted, shorted input (78dB below 1mV input)

Power Requirements:
100-135VAC 60Hz (200-270VAC 50/60Hz) 35 Watts

Dimensions:
19" (48 cm) W x 5 1/4" (13.4 cm) H (standard rack panel) x 10 1/4" (26 cm) D. Handles extend 1 5/8" (4.1 cm) forward of front panel. Rear chassis fittings extend 7/8" (2.3 cm).

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