

**OWNER'S MANUAL
PV4
VACUUM TUBE PREAMPLIFIER**

**conrad-johnson design, inc.
703-698-8581**

Thank you for purchasing the conrad-johnson model PV4 vacuum tube preamplifier. We believe that it will be one of the most satisfying purchases of audio equipment that you will make.

The PV4 was designed to provide audiophiles with a moderately priced preamplifier of high quality which would accurately reproduce the dynamics, tonalities and textures of a live musical performance. The design and materials have been carefully selected to yield many years of unvarying excellence.

Please take a few minutes to read this manual so that you will better understand the use of your PV4.

LIMITED WARRANTY FOR THE conrad-johnson PV4

1. conrad-johnson design, inc. warrants to the original purchaser that the conrad-johnson PV4 will perform to specifications as published in the owner's manual and that it will be free of defects in materials and workmanship for a period of three years from the date of original purchase.
2. conrad-johnson will repair defective units without charge for labor or parts (with the exception of the vacuum tubes) subject to the following conditions:
 - a) The unit must not have been altered or damaged through misuse, abuse, negligence, accident, or improper operation.
 - b) The purchaser must provide evidence of purchase at the time service is requested.
 - c) All repairs must be undertaken at the factory or other service center designated by conrad-johnson design, inc. Units submitted for warranty repairs must be shipped in the factory packing carton to conrad-johnson design or its designated service center, freight and insurance prepaid by the owner, and will be returned to the owner, freight and insurance prepaid by conrad-johnson design. Replacement cartons are available from the factory for a nominal charge.
 - d) Normal wear and maintenance are not covered by this warranty.
3. The above warranty may be transferred to subsequent owners provided that the warranty registration card has been returned to conrad-johnson design, inc. within 30 days of the original purchase and that the registered owner provides the factory with a signed notice giving the new owner's name and address and the model and serial number of the unit.
4. Where permitted by law, conrad-johnson design's liability shall be limited to that set forth in this warranty. No other warranty of any kind, expressed or implied, is made by conrad-johnson design, inc., and all implied warranties, including merchantability and fitness for a particular "purpose", which exceed the obligations and time limits set forth herein are hereby disclaimed. conrad-johnson design, inc. shall not be liable for incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you.
5. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Questions about warranty service should be addressed to:

Service Department
conrad-johnson design, inc.
2733 Merrilee Drive
Fairfax, Virginia 22031
(703) 698-8581

ABOUT conrad-johnson design

We are a small company offering exclusively audiophile products designed for our own use as well as our customers'. We believe that our commitment to the purchaser of our products is nearly unique in the industry. The services we offer to conrad-johnson owners include:

- Information - Registered owners of conrad-johnson equipment will be directly informed of new equipment we have to offer. They will also be informed of any significant changes in the design of their equipment resulting from our ongoing development program.
- Factory updating - Should significant design changes be made, conrad-johnson design will, whenever practical, offer to update existing equipment, This service will be offered at a minimal charge to cover parts, labor, and handling.
- Factory service - Any conrad-johnson product may be returned to the factory for service. All equipment serviced at the factory will perform to its published specifications when returned. Factory service will be offered at reasonable rates,
- Transferable warranty - conrad-johnson design guarantees its products, not the owner. Should you decide to sell the product, the warranty may be transferred to the new owner. (See Registering the Warranty).

REGISTERING THE WARRANTY

Please return the enclosed card to the factory within 30 days of purchase to register the warranty. The warranty may be transferred to a new owner if it has been properly registered initially and if the registered owner sends a signed notice providing the name and address of the new owner and the model and serial number of the unit.

Proper registration of the warranty is important: Not only will it preserve transferability of your warranty, it will also enable us to inform you of any alterations in the design of a given model and of any new products we offer which are likely to be of interest to you.

CIRCUIT DESIGN

The phono stage of the PV4 consists of two cascaded triode amplifiers direct coupled to a cathode follower for low output impedance. Phono equalization is accomplished by R-C networks in a direct coupled feedback loop driven by the cathode follower. The RIAA components are 1% tolerance, with RIAA capacitors being polystyrene dielectric. The audio circuitry is executed entirely with precision, low noise metal film resistors. The line stage consists of a single voltage amplifier direct coupled to a cathode follower with an overall feedback loop.

Plate voltage is supplied by a sophisticated, low impedance voltage regulator. The regulator's output supplies the audio circuitry directly to minimize power supply source impedance. The power supply's output is bypassed by film capacitors to avoid the distortions introduced by electrolytics. Filaments are operated on d.c. voltage to minimize noise at the low signal levels in a preamplifier.

INSTALLATION

Because of the number and type of vacuum tubes used, the PV4 dissipates a significant amount of heat (approximately 30 watts). It is essential, therefore, that proper attention be paid to ventilation. The unit should be mounted horizontally on a flat hard surface so that the ventilation holes in the bottom are un-obstructed. At least three inches of clearance should be provided above the unit and the cabinet or shelf should be open at the back. Vertical installation is not recommended.

To minimize hum pickup, keep the unit well away from the power amplifier, and route power cords away from input cables.

THE PV4 IS TO BE OPERATED ONLY ON AC LINE VOLTAGE OF 108 to 125 VOLTS, 50 or 60 HZ.

In any system of audio electronics minute leakage currents from the ac line transformers will flow in the signal ground connections between preamplifier and amplifier. These currents can intermodulate with the signal and affect the clarity of sound. Generally one orientation of the line cord will provide much lower current flows. When combined with the finest associated equipment this effect is clearly audible with the PV4. After installing the unit try reversing the line cord at the wall outlet to pick the most satisfactory orientation.

CONNECTION

Inputs:

Phono - The phono inputs provide the additional amplification and RIAA equalization required by most high fidelity cartridges. The input impedance is 47,000 ohms shunted by approximately 100 pico-farads capacitance. This is the industry standard load and will work well with most moving magnet cartridges and all pre-preamplifiers for moving coil cartridges. A few moving magnet cartridges perform better with a 10,000 ohm load which may be achieved by having a service technician shunt the phono inputs with 12,000 ohm resistors.

For some moving magnet cartridges, optimum performance requires higher capacitive loads. This may be achieved by soldering suitable value capacitors across the phono input jacks. Polystyrene capacitors are recommended for this purpose.

Tuner, Tape - These are high level inputs and are electronically equivalent. The *outputs* of your tape recorder should be connected to the *Tape* input.

Outputs:

Record - Connect to the inputs of your tape recorder.

Output - Connect to the inputs of amplifiers with impedance of 10k-ohms or greater.

The use of a high quality interconnect cable (such as the conrad-johnson IW144) is recommended to provide the best sonic performance in your stereo system.

POWER ON/POWER OFF PROCEDURES

Because of different warm up characteristics, SPECIAL PRECAUTIONS MUST BE TAKEN WHEN TURNING ON A SYSTEM WITH A VACUUM TUBE PREAMPLIFIER AND A SOLID STATE POWER AMPLIFIER. Switch the preamp on first, allowing about 30 seconds for it to warm up before switching on the power amplifier. Similar precautions are required when shutting off the stereo system. Always turn the power amplifier off first, allowing about 30 seconds for its power supply to bleed down before turning off your preamplifier. Failure to observe these precautions may easily result in damage to your amplifier or speakers.

CONTROLS

Phono/Tuner:

Switches between phono and tuner inputs. The selected source will be available at the source position of the monitor switch and at the record outputs.

Source/Monitor:

Switches between the selected source and tape inputs. May be used to compare source and tape copy when recording.

Balance:

Permits continuous control of location of stereo image from left to right. In the full counterclockwise position only the left channel will be heard. Similarly, the full clockwise position will reproduce only the right channel. In normal use this control will be centered.

Volume:

The PV4 volume control is an extremely precise control, maintaining channel to channel tracking within $\pm 1/2$ db throughout its rotation.

ABSOLUTE PHASE

Musical transients are positive going - that is they first create a pressure front in the surrounding air. It is important that your stereo system reproduces transients in the same way since the ear can distinguish between positive and negative transients. This means that on a transient the speaker diaphragms should first move toward the listener - creating a pressure front.

Each component in your system is either phase correct (non-inverting) or phase inverting. If you know the phase of each component in your system (your PV4 is phase inverting) then correct absolute phase is obtained by the following simple rule:

THE TOTAL NUMBER OF PHASE INVERSIONS IN THE SIGNAL PATH SHOULD BE EVEN.

If the number of phase inverting components is either none, or even, then simply wire the speakers in a phase correct manner (amplifier C to speakers "-", amplifier 4, 8, or 16 to speaker "+").

If the number of phase inverting components is odd, then one more inversion should be added. This may be accomplished at the speaker by wiring amplifier C to speaker "+" and 4, 8, or 16 to speaker "-".

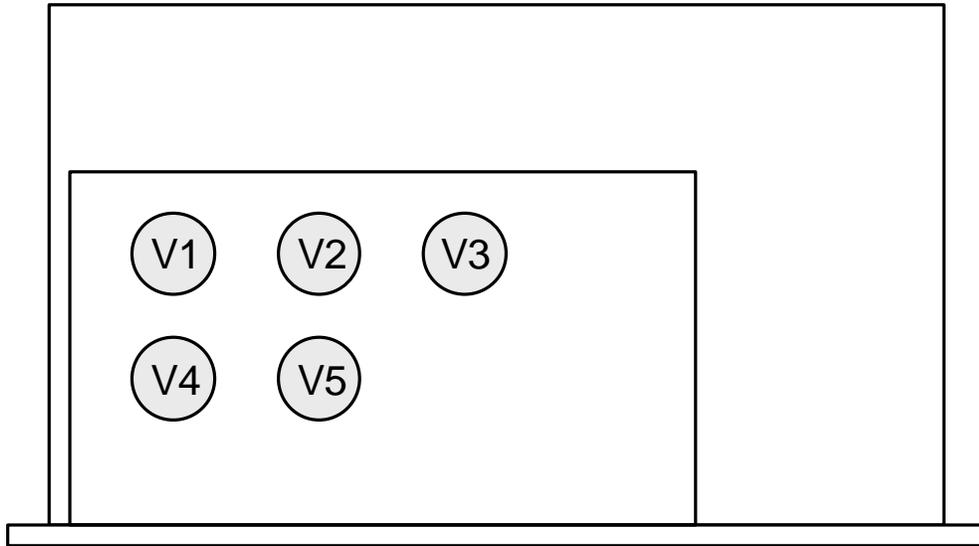
If you do not know whether each element of your system is phase inverting or not, you should try listening to the system with speakers hooked up both ways. When correctly phased, plucked strings and other sharp transients will sound noticeably better defined.

VACUUM TUBES

The audio circuit of the PV4 uses five vacuum tubes of two different types: three 12AX7 (V1, V2 and V4) and two 12AT7 (V3 and V5). Each type has been carefully chosen for its circuit application. It is well known that tubes of a given type vary sonically depending on the manufacturer. We have chosen the brands of tubes that we supply based on extensive auditioning of available brands. The choice of brand has been made solely on the basis of sonic performance without regard to either cost or prestige. We know of no vacuum tubes available of the specified types which will improve the sonic performance of your PV4. Also, the tubes in your preamplifier have been tempered by a controlled burn in procedure that permits them to perform for a greatly extended period without sonic degradation. We anticipate two to three years of operation without degradation in normal use. We highly recommend that, when the time comes to replace the vacuum tubes, you purchase replacement tube sets from conrad-johnson design.

Please note: Substitution of 12AX7 type for the type 12AT7 is likely to damage the 12AX7. Other tube type substitutions may damage the preamp circuitry or transformer.

Tube locations:



Tube complement:

V1, V2, V4	12AX7
V3, V5	12AT7

Fuse: The AC line is fused to protect the transformer. This fuse will not fail in normal operation. Failure of the fuse is a symptom of a more serious problem, so the unit should be taken to a qualified service center. **IN NO EVENT SHOULD THE FUSE BE REPLACED WITH A FUSE OF DIFFERENT TYPE OR RATING THAN THAT SUPPLIED BY THE FACTORY.**

SPECIFICATIONS

Gain: phono stage 38 db
high level 18 db

Outputs maximum 25v rated at 2.5v

Phase: phono is non-inverting; high level stage is phase inverting

Phono overload: in excess of 500mv at 1kHz

Response: bandpass 2Hz to more than 100kHz
RIAA equalization to +/- .25db (20-20kHz)

Total hum and noise (20-2kHz):
Phono inputs, 70db below 10mv input
High Level: 84db below 2.5 volt output

Distortion: THD less than .196
IM less than .1%

Output impedance: Less than 200 ohms

Dimensions: 13 ½ x 9 ¾ x 4"

Weight: 5 lbs.

SERVICE

In the event your conrad-johnson component requires service, repack it with the original packing material and ship it to:

Service Department
conrad-johnson design, inc.
2733 Merrilee Drive
Fairfax VA 22031

For components weighing 90 lbs. or less, we recommend that you ship via United Parcel Service (UPS). In all cases, be sure to adequately insure your component.

Be sure to enclose a note explaining the problem you are having in as much detail as possible. If the problem is intermittent, please indicate. If you do not have the original packing material, replacements are available from conrad-johnson design at a nominal charge. If the unit is under warranty, enclose a copy of your receipt as proof of purchase.