

**OWNER'S MANUAL
MV45A AND MV75A
VACUUM TUBE POWER AMPLIFIERS**

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

Thank you for your considered purchase of a conrad-johnson vacuum tube amplifier.

In it, you have acquired one of the finest pieces of music reproduction equipment available today. You will find your amplifier capable of reproducing with great accuracy the dynamics, tonalities and textures of a live musical performance. The design and materials have been carefully selected to assure enduring excellence.

Please take a few minutes to read this manual so that you will better understand the features and capabilities of your conrad-johnson amplifier.

**LIMITED WARRANTY FOR THE conrad-johnson MV45A/MV75A
AMPLIFIERS**

1. conrad-johnson design, inc. warrants to the original purchaser that his conrad-johnson MV45A or MV75A amplifier 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 packing is available from the factory.
 - 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

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 reasonable 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

It has been our experience that simple designs with few active stages when executed with care and great attention to detail will be both more musical and more reliable than overcomplicated alternatives. Accordingly, the audio circuits of the MV45A/MV75A amplifiers are remarkably straight-forward. A single triode input amplifier is direct coupled (MV75A) or RC coupled (MV45A) to a cathode coupled differential phase inverter made up of high current triodes to provide balanced, low impedance drive to the push-pull output stage. This stage features ultralinear operation which permits high power levels while greatly reducing the source impedance of the stage. As a result, the amplifier is capable of supplying the large current demands of high amplitude musical transients driven into reactive speaker loads. Substantial main power supplies enable the conrad-johnson amplifiers to meet these extraordinary current demands. Separate voltage regulators for the voltage amplifiers and phase inverters provide nearly absolute isolation of these sensitive stages from the output stage.

INSTALLATION

Vacuum tube power amplifiers dissipate considerable heat. It is essential, therefore, that proper attention be paid to ventilation. The unit should be mounted horizontally on a flat hard surface. At least four inches of clearance should be provided above the unit, and at least three inches on the sides. The cabinet or shelf should be open at both front and back. For more restricted installations, cooling fans are essential.

Optional panels are available to facilitate rack mount installation. Again, it is important that adequate clearance be provided above the amplifier so that ventilation is not impeded.

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

THE MV45A/MV75A IS TO BE OPERATED ONLY ON AC LINE VOLTAGE OF 108 TO 125 VOLTS (Also available wired for 100 volt or 230 volt, 50/60 Hz).

CONNECTION

Input: Connect the left and right outputs from the preamplifier to the amplifier inputs for Channel A and Channel B.

Output: The speaker wires will be connected to the amplifier's output terminals with one wire connected to the screw terminal marked C and the other to the 4, 8, or 16 ohm screw terminal. Proper connection of the speakers is critical for achieving optimum performance. There are three criteria for correct connections:

1. *Correct Relative Phase:* The two channels must be wired in phase. This means that when the same signal is applied to both channels, the right and left channel speaker diaphragms should move synchronously – in and out together. Terminals on the speakers are usually coded - one designated “C”, "earth", "ground", "-" or black, the other designated "+" or red. "In phase" connection of the speakers can normally be achieved by taking care to connect the wire from the amplifier terminal marked C on each channel to the same coded terminal on each speaker.

In phase connection of the speakers can be readily ascertained by ear. With the preamplifier mode switch in the MONO position, play a record of a solo vocalist. With the speakers in phase the voice should be clearly focused between the two speakers. With the speakers connected out of phase, the voice will be diffused, with no identifiable source. Relative phase may be reversed by switching the "+" and "-" leads at one speaker only.

2. *Correct 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 MV45A or MV75A is phase correct) 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 speaker "-", 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 either be accomplished at the speaker by wiring amplifier C to speaker "+" and 4, 8, or 16 to speaker "-" or by reversing the positive and ground leads of the cartridge. The latter method is preferable if one inversion occurs in either your pre-preamplifier (the HV-1 is inverting) or in your preamplifier phono stage (but not both). Making the correction at the cartridge will then permit phase correct tape recording and playback.

If you do not know the phase of each component in your system, try listening with your speakers hooked up both ways. When correctly phased, plucked strings and other sharp transients will sound noticeably better defined.

3. *Impedance Matching* - Matching the rated nominal impedance of your speakers with the amplifier output taps will not necessarily guarantee optimum performance. The sound with a given set of speakers will vary with the different impedance taps. We suggest listening to each of the three taps to select the best match for your speakers.

Monaural Operation - (MV75A only)

Set the switch on the amplifier to the "mono" position. Connect the output of your preamplifier to either input (only one input should be used; the other must be left open.) Connect the speaker to either output as follows: a 4 ohm speaker should be connected to the 8 ohm terminal, an 8 ohm speaker should be connected to the 16 ohm terminal, or a 16 ohm speaker should be connected to the 16 ohm terminal (in this case power will be considerably more than 75 watts but will not achieve 150 watts). A single jumper of heavy gauge wire should be connected from the selected impedance terminal (4, 8, or 16 ohm) to the same impedance terminal on the other channel's output.

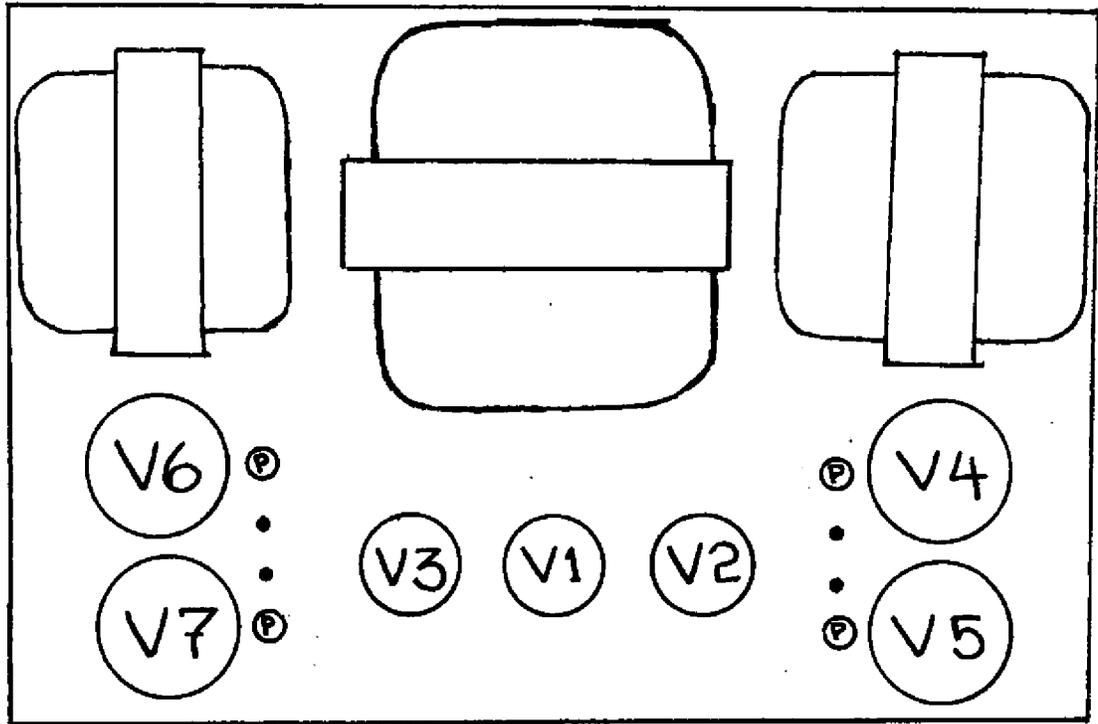
Warning: When the outputs are connected for monaural operation as just described, the stereo-mono switch must be in the mono position to avoid possible damage to the amplifier.

TUBE REPLACEMENTS

The MV45A/MV75A amplifiers each use seven vacuum tubes of three different types. 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 and reliability without regard to either cost or prestige. We know of no vacuum tubes available which will improve the sonic performance of your conrad-johnson amplifier. Also, the tubes in your amplifier have been tempered by a controlled burn-in procedure that permits them to perform for a greatly extended period without sonic degradation. We anticipate one to two 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.

These amplifiers have been designed to make tube replacement as simple as possible. Because the output tubes are individually biased, replacement tubes need not be matched pairs. No a-c balance adjustment is necessary. It is necessary to re-bias the amplifier when the output tubes are replaced. Your amplifier has built in bias indicators so that no instruments are required to make this adjustment.

Tube locations:



Tube complement:

	MV75A	MV45A
V1	5751	5751
V2,V3	6FQ7/6CG7	12AT7
V4 - V7	6550	6CA7/EL34

ADJUSTING OUTPUT TUBE BIAS

Biasing the amplifier is a simple procedure that can readily be done by the owner. Only a screwdriver is required. After replacing the tubes, the amplifier should be connected to a load (your loudspeakers will work fine) and there should be no signal applied to the amp. It should be connected to your preamplifier with the volume control fully down. Turn amplifier on. After about one minute, turn each of the four screwdriver adjustable controls (marked with a "p" in the diagram) counterclockwise until the associated indicator LED just goes off. Clockwise rotation may be necessary first to turn the LED on; do not turn the adjusting screw any further in the clockwise direction once the LED has come on.

After the amplifier has warmed up for thirty minutes, the procedure just described should be repeated. NOTE: It is normal for these LEDs to flash or flicker when the amplifier is in use. This is normal and no cause for alarm.

This biasing procedure should be performed whenever the amplifier's output tubes are replaced and also after each six months of average use.

SPECIFICATIONS

MV75A: Power

Stereo: 75 watts per channel, minimum RMS at 4, 8, or 16 ohms from 30Hz to 15kHz, with no more than 1% total harmonic distortion or intermodulation distortion.

Mono: 150 watts minimum RMS at 4 or 8 ohms from 30Hz to 1kHz, with no more than 1% total harmonic distortion or intermodulation distortion.

Sensitivity: 2.35 volt to full power

Small Signal Distortion: less than .05% at mid-band

Phase: Phase correct (non-inverting)

Frequency Response: 20Hz to 20kHz to -.5db

Hum and Noise: 100 db below full power output

Input Impedance: 100k ohms

Dimensions: 15 x 10½ x 9"

Weight: 43 lbs.

MV45A

Power: 45 watts per channel, minimum RMS at 4, 8, or 16 ohm from 30Hz to 15kHz, with no more than 1% total harmonic distortion or intermodulation distortion.

Sensitivity: .80 volt to full power

Small Signal Distortion: less than .1% at mid-band

Phase: Phase correct (non-inverting)

Frequency Response: 20Hz to 20kHz to -.5db

Hum and Noise: 90 db below full power output

Input Impedance: 100k ohms

Dimensions: 14¼ x 9½ x 6½"

Weight: 33 lbs.

Fuses

The AC line is fused to protect the power 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**

MV75A only: The power supply to the output stages of the MV75A are fused to prevent damage to the amplifier in the event of failure of an output tube. The fuse holders are located adjacent to the output strips. When one of these fuses opens the corresponding channel will be dead. An LED adjacent to the fuseholder will light to indicate a blown fuse. Should the fuse blow, the output tubes in that channel are suspect and should be replaced.

Fuses:	MV75A	MV45A
ac line:	7 amp slow blow	5 amp slow blow
output stage:	KTK1 (1 amp fast blow)	none

SERVICE

If service becomes necessary, the amplifier may be either returned to your dealer or sent to conrad-johnson for service. In either case, a written description of the difficulties encountered must be provided. If the problem is intermittent, please indicate.

To ship the amplifier, MV75A: remove the entire rack panel and protective cover assembly by removing the switch nut and three machine screws from each side of the chassis. Next remove, and separately box, the tubes. The amplifier chassis and the set of tubes must be packed in the original factory carton and packing materials. The amplifier should be shipped without its rackplate and cover.

To ship the amplifier, MV45A: remove the protective cover by removing two screws on each side of the chassis. Next remove and separately box the tubes in their individual boxes. Pack the boxed tubes into the tube carton. Reinstall the cover over the tube carton and box the amp in its original factory carton and packing materials.

Shipping cartons and packing materials are available from conrad-johnson at a nominal charge. Ship by United Parcel Service (UPS) to:

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