

**OWNER'S MANUAL
MV100
VACUUM TUBE AMPLIFIER**

**conrad-johnson design
703-698-8581**

Congratulations on your purchase of the conrad-johnson MV100 amplifier. You have acquired one of the finer pieces of musical reproduction equipment available today. The MV100 is the result of conrad-johnson design's research into the application of vacuum-tube devices to the reproduction of recorded music. The design and materials have been carefully selected to yield years of unvarying excellence.

Please take a few minutes to read this manual so that you will better understand the features and capabilities of your MV100.

LIMITED WARRANTY FOR THE CONRAD-JOHNSON MV100

1. conrad-johnson design, inc. warrants to the original owner that the conrad-johnson MV100 will perform to specifications as published in the owner's manual and that it will be free from defects in material 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 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, VA 22031

REGISTERING THE WARRANTY

Please return the enclosed card to the factory within 30 days of purchase to register the warranty. Proper registration of the warranty is important! It will 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 circuit of the MV100 is remarkably straightforward. A single triode input amplifier is direct coupled to a cathode follower. This arrangement offers exceptional phase linearity. This stage is direct coupled to a cathode coupled differential phase inverter using high current triodes to provide balanced, low impedance drive to the push-pull output stage. The output stage utilizes paralleled EL34s- a total of four per channel. 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. A substantial main power supply enables the MV100 to easily meet these extraordinary current demands. Voltage regulators for the voltage amplifiers and phase inverters provide nearly absolute isolation of these sensitive stages from the output stages.

INSTALLATION

Because of the number and type of vacuum tubes, the MV100 dissipates considerable heat (approximately 250 watts at idle). 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 unobstructed. At least eight inches of clearance should be provided above the unit, and at least four inches on the sides. The cabinet or shelf should be open at both front and back. For more restricted installations, cooling fans are essential.

The front panel of the MV100 will fit in a standard 19" equipment rack and is designed to carry the weight of the unit so that it may be rack mounted. Again, it is important that adequate clearance be provided above so that ventilation is not impeded. About eight inches of the front of the rack should be left open above the unit.

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

THE MV100 IS TO BE OPERATED ONLY ON AC LINE VOLTAGE OF 108 TO 125 VOLTS.

The MV100 is available wired for 100 volt, 120V, 220V or 240 volt, 50/60 Hz current.

CONNECTION

INPUT: Connect the preamplifier to your MV100 amplifier at the RCA type connections located on the back of the amplifier.

OUTPUT: Terminal strips are provided for connection of your loudspeakers. They will accept bare wire or spade lug connectors.

Three different taps- 4 ohm, 8 ohm, and 16 ohm are provided in addition to the "C" or ground tap.

Matching the rated nominal output 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.

The two channels should be connected in correct "relative phase". This means that when the same signal is applied to both channels, the right and left channels 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 4,8, or 16 ohm amplifier terminal marked on each channel to the red or "+" coded terminal on each speaker, and connecting the "C" tap to the black or "-" coded terminal on each speaker.

In phase connection of the speakers can be readily ascertained by ear. With the preamplifier mode switched into 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.

GETTING THE MOST FROM YOUR CONRAD-JOHNSON MV100

The Conrad-Johnson MV100 offers an unparalleled level of sophistication and refinement in music reproduction, but it cannot transform an inferior stereo system. Only the very best loudspeaker systems will be capable of fully revealing the capabilities of this precision instrument. On the other hand, the MV100 is ruthlessly revealing. For example, it can render unacceptable faults in the phono system which may be just discernable with an amplifier of lower resolution.

Proper set-up is important in any high-fidelity system, but with state-of-the-art components it is essential. Before attempting to evaluate the MV100, be sure that your phono system has been set up carefully according to manufacturer recommendations. Adjustment of the cartridge vertical tracking angle can be especially critical with modern stylus configurations.

Given a system of high quality components, there remain a number of important details which must be attended to.

ABSOLUTE PHASE

Musical notes are heard through the ear's response to waves of alternating rise and fall of air pressure. Musical transients are exclusively positive: that is, the initial effect is a rise in pressure. The ear is capable of distinguishing these positive transients from the musically unnatural alternative of a negative transient (an initial fall in air pressure). In your stereo system, these transients are created by your loudspeakers. If the speakers respond to musical transients by first moving out, they are creating a rise in pressure, and the system is said to be "phase correct". If they respond by moving in, they create a fall in pressure and the system is said to be "phase inverting". Each component in the stereo system is either phase correct or phase inverting (including the cartridge and speakers—these are normally phase correct). It is of no consequence if an individual component is phase inverting, as long as the system as a whole is phase correct. This will be the case as long as the number of phase inversions is even (or zero). If your system has an odd number of inversions, then you must add one phase inversion. This is conveniently done by reversing the positive and negative connections on either your cartridge or your speakers (be sure to reverse both channels).

If you are not sure about the phase of every component in your system, you can establish correct absolute phase by careful listening. When the system is in correct phase, transients will be noticeably cleaner and more sharply defined. The effect is especially apparent on plucked string sounds. A final warning—not all records are phase correct (including some "audiophile" recordings), so listen to several before concluding your investigation of absolute phase.

THE IMPORTANCE OF WIRES

Interconnect and speaker wires are an important element in your stereo system. Interconnects are available which will permit a reference quality system to blossom and fulfill its promise of musical reality. Others will strangle the system to the point where it becomes no better than average. To complicate matters, our experience suggests that the choice of interconnects will be system dependent-those that are ranked first on a given system may be a poor choice for a different system. Consult your Conrad-Johnson dealer for recommendations for your specific system.

QUESTIONS?

If you have any questions about the installation or function of your MV100 do not hesitate to call Customer Service at (703) 698- 8581.

TUBE REPLACEMENTS

The MV100 uses twelve vacuum tubes of three different types: two 5751 (V1 and V2), two 6FQ7 (V3 and V4) and eight EL34s (V5 through V12). 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 MV100. 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 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.

The MV100 has 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. The MV100 has built in bias indicators so that no instruments are required to make this adjustment.

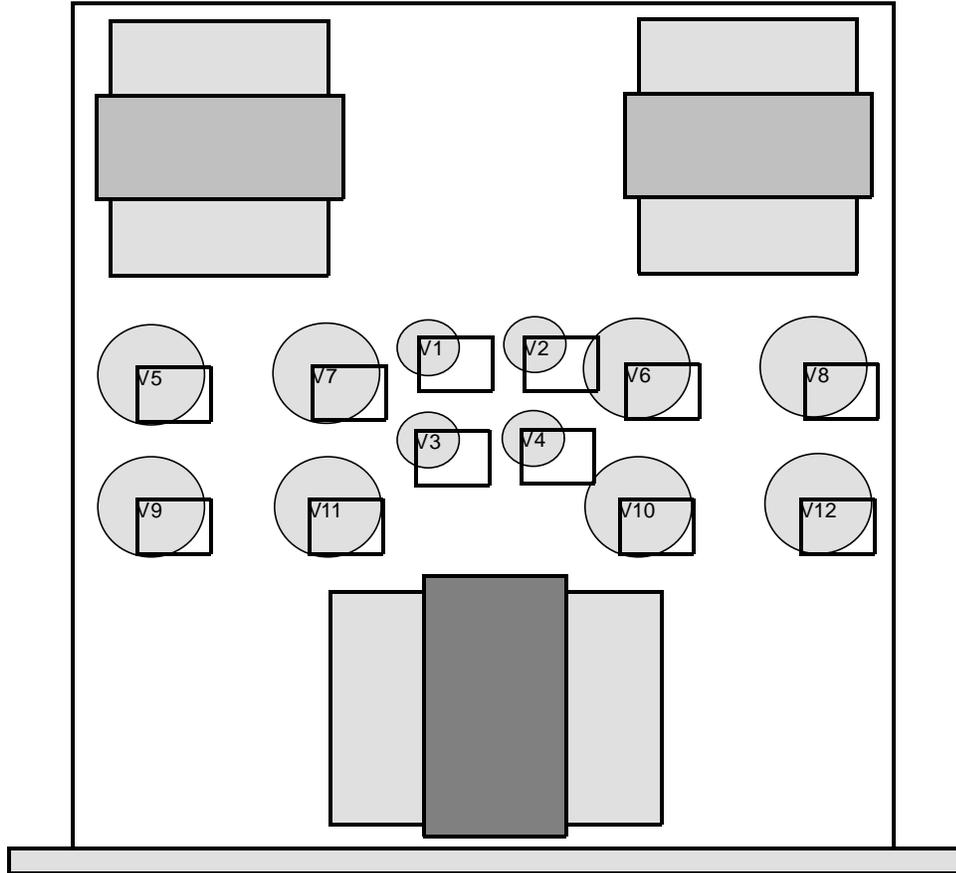
ADJUSTING OUTPUT TUBE BIAS

Biasing the amplifier is a simple procedure that can easily be done by the owner. Only a plastic screwdriver is required. A red plastic screwdriver has been included with your amplifier for this purpose. 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 you preamplifier with the volume control turned fully down. Turn the amplifier on. After about one minute, turn each of the eight screwdriver adjustable controls (marked 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 farther in the clockwise direction once the LED has come on.

After the amplifier has warmed up 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.

Tube Locations:



TUBE COMPLEMENT:

V1, V2	5751
V3, V4	6FQ7/6CG7
V5-V12	EL34

FUSE COMPLEMENT:

Line Fuse: 3AG 10amp slo-blo (for 120Vline)
Plate Fuses: BUSS BBS-2

FUSES

LINE FUSE: 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.**

PLATE FUSE: Your MV100 has been fitted with plate supply fuses which are designed to protect the amplifier circuitry in the event of output tube failure. The fuse holders are physically located near the speaker connectors. The cap unscrews counter clockwise to remove the fuse (a BUSS BBS-2). An LED near the fuse holder will light when the fuse is blown.

What happens when the plate fuse blows? If one of these fuses should blow, it usually indicates a marginal EL34 tube (one of four for each channel) and an attempt should be made to identify and replace it, by either (a) replacing the fuse and turning on the amp while watching the EL34s carefully; if a bright white or blue flash is seen inside the tube, you've got the culprit. If nothing happens, then (b) lightly tap the EL34s one by one with the plastic handle of a screwdriver while watching for flashes inside the tube. If all efforts to identify the bad tube fail, the best course of action is to replace all tubes in the channel that blew the fuse. If the tubes are over two years old, or have more than 1,500 hours on them, a complete replacement tube set is probably in order.

The sonic effects of a blown fuse are very low, very distorted sounds from the speaker being driven by that channel.

TO AVOID SHOCK, ALWAYS TURN OFF THE AMPLIFIER BEFORE REMOVING THE FUSE HOLDER CAP.

Replacement fuses and tubes are available from conrad-johnson dealers.

SPECIFICATIONS:

Power: 90 watts per channel RMS both channels driven into 8 ohms from 20Hz to 20KHz at no more than 1% total harmonic distortion or intermodulation distortion.

Sensitivity: 875mv to full power.

Small Signal Distortion: Less than .05% at midband

Phase: Phase correct (non-inverting)

Frequency response: 20Hz to 20KHz +0, -.5dB

Hum and noise: 96dB below full power output.

Input impedance: 100K ohms.

Dimensions: 20.5D x 19W x 9H inches.

Weight: 80 lbs.

SERVICE

In the event your conrad-johnson MV100 stereo amplifier requires service, repack it with the original packing material and ship via truck freight to:

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

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, be sure to enclose a copy of your receipt as proof of purchase.