Conrad-Johnson Owner's Manual:

GAT Preamplifier

conrad-johnson It just sounds right.

Thank you for selecting the conrad-johnson GAT Preamplifier as the control center for your audio system. The GAT Preamplifier is conrad-johnson's latest reference, designed for our own reference use as well as other industry professionals and dedicated audiophiles. The GAT Preamplifier is capable of unprecedented recreation of the dynamics, textures, tonalities, and ambience of live musical performances. We believe that you will experience the excitement of discovery in hearing more from your favorite recordings than ever before.

At conrad-johnson, we expect our products to be a source of satisfaction and of pride to their owners for many years to come. Accordingly, circuit designs, parts and materials for all conrad-johnson products are selected with a view to maintaining optimal performance over the years. Our reputation for producing among the industry's most reliable components is a natural consequence of this engineering approach.

Although the GAT Preamplifier has been designed to operate in an intuitively apparent way, you will find useful information on its installation and operation in this manual. Please take a few minutes to read the manual to better understand the features and capabilities of your GAT Preamplifier. Note that this unit is phase inverting. See the section entitled "Getting The Most From Your GAT Preamplifier" for details on correct hookup in your system.

In closing, we'd like to welcome you to the family of conrad-johnson owners. We want you to enjoy your conrad-johnson product to the fullest. To this end, our staff stands ready to answer any questions you may have about the function and application of your GAT Preamplifier, and to provide any needed service both during and after the warranty period. Our goal is to heighten your enjoyment of recorded music.

Limited Warranty for Conrad-Johnson Components

Conrad-Johnson Design, Inc. will provide service under warranty to the original owner on products sold new in the United States for the lesser period of three years from the date of purchase by the original purchaser, or five years from the date of shipment to the authorized conrad-johnson dealer. During the warranty period, conrad-johnson will repair defective units without charge for labor or parts (with the exception of vacuum tubes and batteries).

Exclusions. The following are not covered under this warranty:

a) Units which have been damaged by misuse, abuse, or accident.
b) Units which have been modified, altered, or improperly repaired by anyone not specifically authorized by conrad-johnson design, inc.
c) Units not purchased from an authorized conrad-johnson dealer in the United States for use in the United States.
d) Normal wear
e) Incidental or consequential damages are not covered under this warranty. Some states do not allow the exclusion of incidental or consequential damages, so this exclusion may not apply to you.

Obtaining Warranty Service: To obtain warranty service, the unit must be shipped, along with evidence of purchase, in factory packing to conrad-johnson design (or designated service center) with freight and insurance prepaid by the owner. After repair, the unit will be returned with freight and insurance prepaid by conrad-johnson design to any destination in the United States.

All implied warranties, including merchantability and fitness for a particular purpose are limited in duration to the duration of this express warranty. Some states do not allow limitations on the duration of implied warranties so the above limitations 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.

Conrad-Johnson products purchased outside the United States are covered by warranty terms of the importing distributor in the country in which the product was originally purchased, which may differ from the terms set out herein. Importing distributors are not obligated to provide warranty service for products originally purchased outside their country. Conrad-Johnson will provide warranty service for products outside the United States, but in these cases, the customer must pay all shipping, handling and customs costs both to and from our Service Department.

Questions about this warranty should be addressed to:

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

The conrad-johnson service department can also be reached by e-mail at service@conradjohnson.com, by phone at 703-698-8581, or by fax at 703-560-5360.

Service

If your conrad-johnson audio component requires service, repack it using the original box and packing material and ship to the Service Department address above. Boxes and packing materials can be purchased through our service department if you no longer have yours. Include with the unit a note describing the problem you are having in as much detail as possible. It is especially important for our technician to know if the problem is intermittent. If you want an estimate of cost for out of warranty service, be sure to request it in this note. Be aware that requesting an estimate will delay service to your unit, as we will have to contact you for approval before commencing service.

Registering the Warranty

Please return the enclosed card to the factory within 30 days of purchase to register the warranty

Installation

The first step in preparing your GAT Preamplifier for use is to install the vacuum-tubes. To do this, remove the top plates of the two tube guard assemblies by removing the three socket screws in each using the supplied hex-head screwdriver. The GAT Preamplifier uses two type 6922 tubes. After checking the pin orientation, insert one tube in each tube socket. Next, fit two of the included silicone rubber rings over each tube, spaced at roughly 1/3 and 2/3 distances. These rings will minimize the effects of air-borne microphonics on the tubes. Finally, reinstall the tube guards.

Set Up

To maintain proper ventilation, mount the GAT Preamplifier horizontally on a flat, hard surface, and take care that the ventilation holes in the bottom are unobstructed. Allow at least two inches of clearance above the unit and keep the cabinet or shelf open at the back.

All GAT Preamplifiers sold in the United States are configured for operation on a 60Hz ac power line producing between 108 and 126 volts. Export versions of the GAT Preamplifier will have the correct operating voltage and frequency clearly marked on the back panel of the unit, near the ac power cord. In all cases, the actual line voltage should be within + 5/- 10% of the nominal rated voltage.

Electromagnetic Interference (EMI)

Considerable care has been taken in the design of the GAT Preamplifier to minimize its susceptibility to radio frequency interference and other forms of EMI. Choice of materials, physical layout, grounding practice, and power supply design have all been specified with a view to reducing the impact of electromagnetic fields on the performance of this unit. At the same time, however, our primary goal is the accurate reproduction of recorded music in the normal home environment, and we have elected not to compromise this objective by the application of heavy-handed RFI filters, or by using grounding practices that reduce RFI at the expense of degraded audio performance. We find that the approach we have taken has worked extremely well, resulting in only rare instances of EMI problems which could be treated locally as needed, rather than compromising the performance of our product in the 99.9% of installations where EMI is not a problem.

Care in installation can often avoid EMI induced problems. The following practices should generally be observed in any application, and will be especially important where EMI may be a problem.

Interconnect cables should be kept as short as possible (3 meters or less), and shielded cable should be used (cable which has two center conductors, and a separate external shield connected at only one end).

Physical location and cable “dress” can be an important factor in minimizing hum pickup. The installation should situate the preamplifier well away from the power amplifier, and power (ac mains) cords should be dressed to remain at least 4" (100mm) away from input/output cables.

Connection

SOURCES (PH/AUX, TUNER, CD, VIDEO, AUX2): These high level inputs are electronically equivalent. The load they present to the source varies with the volume control setting, but in no case will it drop below 12 kOhms. Connect the corresponding source components to these inputs.

EPL1: A set of line-level inputs and outputs provided for connection of external signal processors (e.g. parametric equalizer, tone controls). These can also be used for the connection of a tape recorder. In this case, connect the EPL OUT to the recording input of your tape recorder, and the EPL IN to the output of your tape recorder. The EPL IN connection can also be used as an additional line level input.

THEATER: This is an external processor loop designed to conveniently accommodate the addition of a surround-sound processor (SSP) to a high-quality two-channel system without compromising two-channel performance. Connect the front left and front right channel outputs from your SSP to the EPL2 input. You can also connect the THEATER OUT to an input on your SSP, allowing you to do matrix processing on selected two channel sources. When THEATER is selected, the level controls are set to unity gain. Level and balance control is then accomplished via your surround sound processor.

MAIN OUT: Two pairs of main outputs are provided. Connect to the input of your amplifier (or crossover in a bi-amplified system). We recommend the use of an amplifier with an input impedance of 20k ohms or higher. Since the GAT Preamplifier inverts phase, it may be necessary to invert the speaker leads to maintain correct absolute phase. See the section on “Getting the most out of your GAT Preamplifier" for an explanation.

TRIGGER OUTPUT: When the GAT Preamplifier is switched on, these terminals provide a dc voltage that can be sensed by the “trigger” circuits used to switch on some power amplifiers. If your amplifier employs such a trigger circuit, and you wish to switch it on and off from the preamplifier, connect these outputs to the trigger input on your amplifier. Observe the coded polarities (“+” and “-“).

Controls

<power>: Press the switch labeled power to switch the preamplifier on. A time delay auto-muting circuit is incorporated into the GAT Preamplifier to eliminate transients generated by the warm-up, and cool down cycles of the vacuum-tubes. All outputs are grounded via relays for approximately 60 seconds after the unit is turned on in order to suppress warm-up transient noises. During this auto-muting period, the mute indicator led will flash. All control functions are disabled during the auto-muting cycle. The muting relay also grounds the outputs immediately at turn-off or in the event of any power line interruption. When the GAT Preamplifier is turned off (by pressing the power switch again), the standby led will be illuminated.

When first connected to ac mains, or after an interruption of power, the GAT Preamplifier will turn on in a default mode (after auto-muting), with the level set at 20, and the CD input selected. In subsequent sessions, as long as the ac mains supply has not suffered a power outage, the unit will turn on at the last used volume setting and input.

<mute>: Pressing the mute button will silence the preamplifier's main outputs, and set the level display to zero on both channels. Pressing the mute button again will restore the previously selected level setting.

<vol up>, <vol dn>: Level setting on the GAT Preamplifier is achieved by using a programmed microprocessor to select combinations from among an array of high-quality precision resistors. This arrangement allows 100 steps of approximately .7 dB per step. The steps are numbered 0 through 99, with 0 being silence, and 99 being maximum volume.

The level setting can be changed by pressing the vol up and vol dn buttons on the front panel. Each time a button is pressed, the level will move up or down one step. If a button is pressed and held, the level control will cycle through the steps at an accelerating rate. With each step, a slight "click" will be heard from the opening and closing relays inside the GAT Preamplifier. Balance can only be set using the remote control.

<source>: Pressing the button labeled source will cause the unit to step through the five source inputs (ph/aux, tuner, cd, video, aux2). The selected input will be indicated by an illuminated led.

<epl/thtr>: Pressing the epl/thtr button will cause the unit to step from source through epl1 and theater. When source is selected, the input selected by the source selector will be passed directly to the volume control. When the EPL1 or THEATER inputs are selected, the selected source will first pass through the external processor loop before being routed to the volume control. When THEATER is selected, the level will be set and locked to unity gain.

Remote Control

All operations of the GAT Preamplifier can be controlled by the wireless remote unit.

MUTE: Pressing the mute button will cause the main outputs to mute and the level display to be zero. Pressing it again will restore the last level setting. Pressing and holding the mute button for more than three seconds will switch the GAT Preamplifier into standby mode (all tube circuitry switched off). Pressing the mute button when the unit is in standby mode will switch it back on.

SELECTORS (PH/AUX, TUNER, CD, VIDEO, AUX2): You can directly access any of these inputs by pressing the associated button on the remote.

EPLS (EPL1, EPL2): Pressing the EPL buttons inserts the associated processor in the signal path. Pressing the button again will re-establish a direct connection to the selected source. Pressing the EPL2 button selects the THEATER input, setting the level to unity gain.

LEVEL (+, -): Duplicates the function of the front panel <vol up>, <vol dn> controls.

BALANCE: Allows attenuation of either channel independently of the other. Pressing the right balance button will reduce the left channel level setting by one step. Pressing and holding the right balance button will cause the left channel to cycle down through its level settings at an accelerating rate. Pressing the left balance button will attenuate the right channel in the same manner.

Vacuum Tube Replacement

The GAT Preamplifier circuit employs two vacuum tubes (V1 – V2), both 6922s. The 6922 offers low noise, low microphonics, and gain well suited to use in a zero-feedback line-stage. The brands of tubes we supply have been chosen by first selecting those brands which are known to be most reliable, then by extensive auditioning of these acceptable brands with the final choices being made solely on the basis of sonic performance. We know of no vacuum tubes available which will improve the sonic performance of your GAT Preamplifier. 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, and then selected for minimum residual noise. Replacement tubes are prepared and selected in the same way. Therefore, we highly recommend that you purchase replacement tube sets from conrad-johnson design.

We anticipate tube life to accommodate two to three years of operation without degradation in normal use - if the preamplifier is switched off when not in use. If the preamplifier is left on at all times, tube life can be exhausted in a matter of a few months.

Getting the Most from Your GAT Preamplifier

In a system of commensurate high quality components, the conrad-johnson GAT Preamplifier offers a high level of sophistication and refinement in music reproduction. To get the best performance out of any audio system, there are a number of important details that 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 almost 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 terms of 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 either preserves the phase of the incoming signal, and is said to be phase correct, or inverts the phase and is said to be phase inverting. It is unimportant whether an individual component is phase correct or phase inverting, as long as the system as a whole is phase correct. This will be the case if the number of phase inversions is even (or zero).

The GAT Preamplifier is phase inverting. If your system has an odd number of inversions, (for example, if the GAT Preamplifier is the only phase inverting unit in the chain) then you must add one phase inversion. This is conveniently done by reversing the positive and negative connections to your speakers (be sure to reverse both channels). If you are not sure about the phase of every piece 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 recordings 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 little better than average. To complicate matters, our experience suggests that the choice of interconnects will be system dependent - those that are top ranked on one system may be a poor choice for a different system. Consult your conrad-johnson dealer for recommendations for your specific system.

Performance Tip

Warm up the GAT Preamplifier before listening: The sonic performance of the GAT Preamplifier improves noticeably as the unit warms up. The midrange becomes more lucid, the highs smoother, and the soundstage expands. The warm up period can be expected to last about fifteen minutes.

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

Specifications

Gain: 25 dB
Maximum Output: 20V rms
Bandpass: 2Hz to more than 100kHz
Hum and Noise: 100 dB below 2.5V output
Distortion at 1.0 V output: less than .15% THD or IMD
Phase: inverts phase of all inputs at main out
Ouput Impedance: 100 ohms

Mechanical
Dimensions: 15.375"D x 19"W x 4.81"H
Net Weight: 35 lbs.

Fuses

The GAT Preamplifier has two power transformers (one for the tube circuitry, one for the control circuits), each of which is protected by a fuse. In addition there is one fuse on the ac mains. A failure of any of these fuses is a symptom of a more serious problem, and a competent service technician should be consulted. In no event should these fuses be replaced with a value or type different than that originally supplied. Two of the fuses are located on the input/output pc board at the back of the chassis. F1, the fuse for the tube circuit transformer is located nearest the back panel. F2, for the control circuitry, is located nearest the front panel. The third fuse, F3, is in a tray that is part of the IEC power line connector. The correct fuse values are:

If configured for 100 or 120V:

F1 3/4 Amp, slow blow
F2 1/2 Amp, fast blow
F3 T800 mAmp, slow blow

If configured for 220 or 240V:

F1 1/2 Amp, slow blow
F2 1/4 Amp, fast blow
F3 T400 mAmp, slow blow