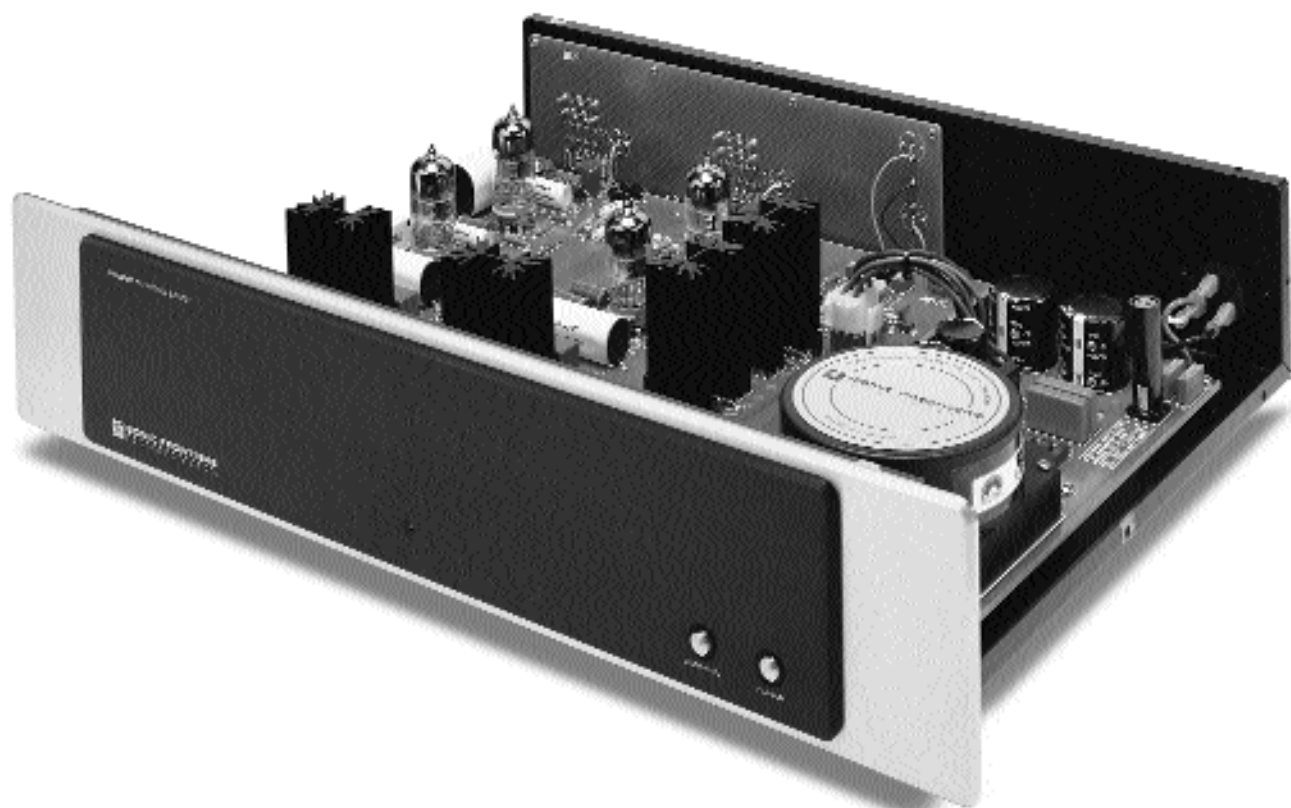


SONIC PHONO 1 PHONO STAGE FRONTIERS

OPERATING MANUAL



We at Sonic Frontiers are sure that you will derive many years of listening pleasure with your new PHONO 1 Phono Stage. This Owner's Manual contains important information regarding the operation and care of the PHONO 1 Phono Stage. Be sure to read this manual carefully and follow these instructions in order to keep it looking, operating and sounding its best.



BREAKING THE SOUND BARRIER

Sonic Frontiers can be reached from 9:00 a.m. to 5:00 p.m., Eastern Standard Time, or 24 hours a day by facsimile. 2790 Brighton Road, Oakville, Ontario, Canada, L6H 5T4 Telephone: (905) 829-3838 Facsimile: (905) 829-3033 E-Mail: SEI@sonicfrontiers.com Web Site: <http://www.sonicfrontiers.com>

OPERATING MANUAL FOR THE SONIC FRONTIERS PHONO 1 PHONO STAGE

We at Sonic Frontiers hope you will derive many years of listening pleasure from your new PHONO 1 Phono Stage. This Operating Manual contains important information regarding the operation and care of this Phono Stage. Be sure to read this manual carefully and follow these instructions in order to keep it performing and sounding its best. Please contact Sonic Frontiers if you have any questions - a Customer Service Representative will be pleased to assist you.

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This symbol is intended to alert the user to the presence of uninsulated "dangerous voltages" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

UNPACKING

At this point we assume that you have successfully opened the box flaps and found this manual. This box was designed to ensure the safe transport of your PHONO 1 Phono Stage. Sonic Frontiers strongly recommends the storage of this box in a safe dry place. In the event that the PHONO 1 may have to be shipped in the future, the original box is the best means for the protection and safety of the phono stage during transportation.

Here is a chart listing what you will find in the box:

| | |
|-----------------------|----------------|
| Tube Complement | 4 - 6922/E88CC |
| Phillips Screwdriver | 1 |
| Screws | 18 |
| Power Cord | 1 |
| Cotton Gloves | 1 pair |
| Extra Fuses | 2 |
| PHONO 1 Phono Stage | 1 |
| Phono Stage Top Cover | 1 |
| Warranty Card | 1 |
| Operating Manual | 1 |

If after your inspection of the contents there is a discrepancy, contact your dealer or Sonic Frontiers immediately.

OPERATION, CONNECTIONS AND CONTROL FUNCTIONS

PHONO 1 FRONT PANEL

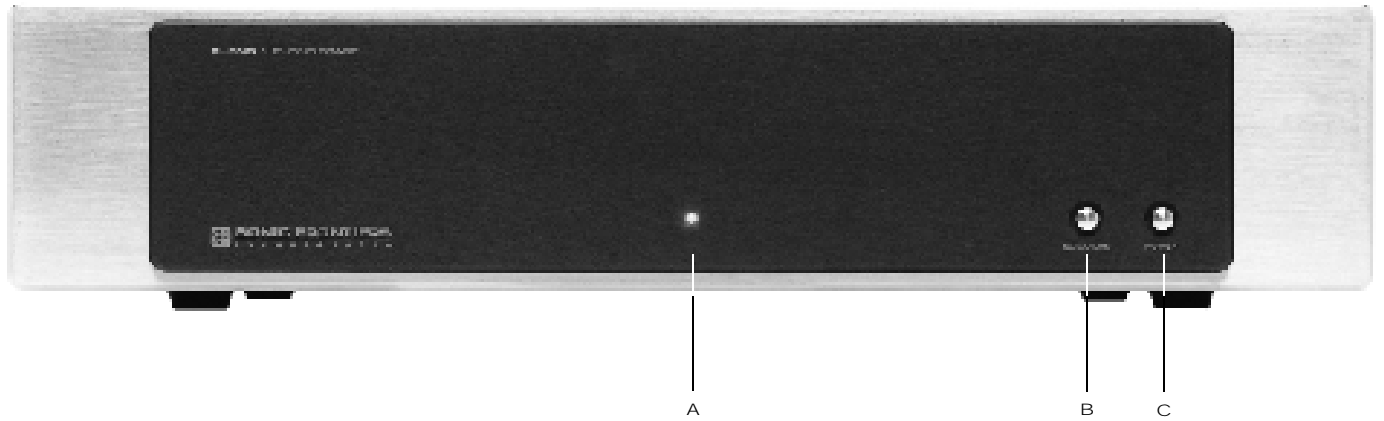


Figure 1 - PHONO 1 Front Panel

PHONO 1 REAR PANEL

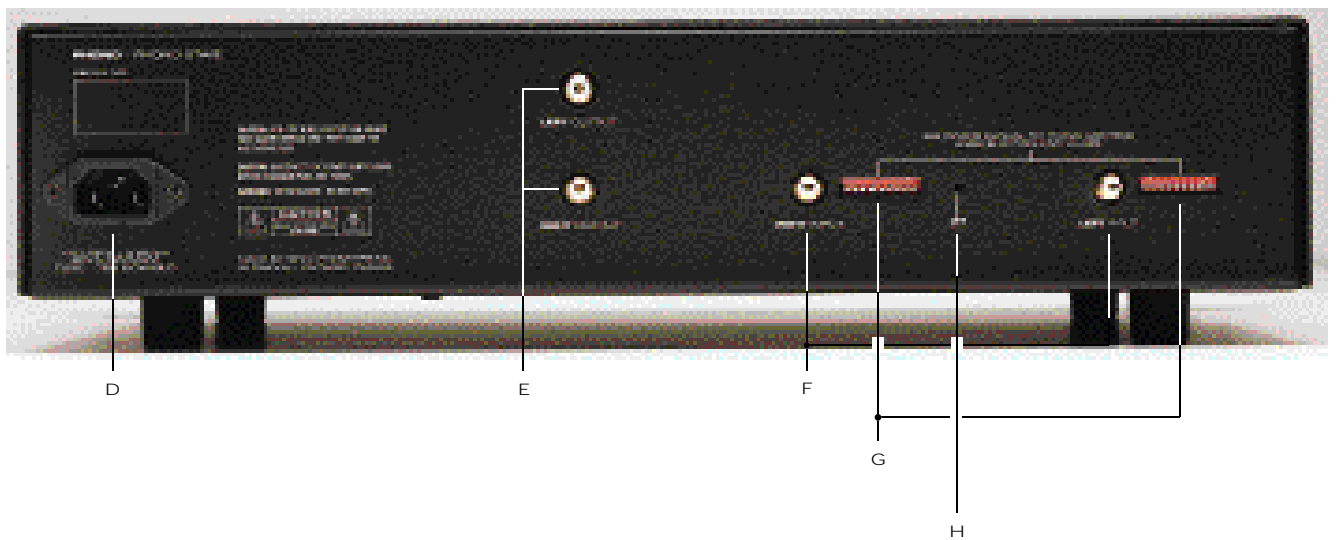


Figure 2 - PHONO 1 Rear Panel

CONTROL AND CONNECTION FUNCTIONS

FRONT PANEL

- A - Front Panel LED Indicator - When the Power Switch (C) is pushed to the "ON" position (IN) this LED will light.
- B - Cue/Mute Button - Pushing this switch in will attenuate or mute the phono stage output, depending on the setting of the internal 2 position dip switch. When this dip switch is set to "CUE," the output will be attenuated by approx. 9dB.
- C - Power Button - This switch, when pushed to the "ON" (IN) position powers up the phono stage. After a delay of approx. 40 seconds, the phono stage is ready for playback. Pressing and releasing the Power Switch while in the "ON" position will remove AC power from the unit.

Note: This is not a gain switch, and is not intended to be used for playback. When this switch is set to "MUTE," full muting of the phono stage output occurs.

Note: Before switching off the phono stage, make sure the line level preamplifier is muted or off.

REAR PANEL

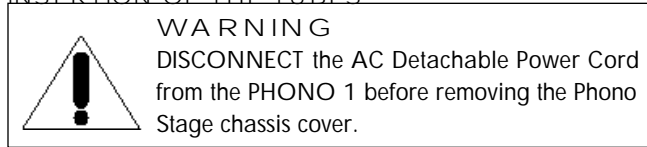
- D - Detachable Power Cord Socket - Plug the supplied power cord (female) end into this inlet, and after checking that the power switch (C) is in the out position, plug the other (male) end into a suitable AC wall outlet.
- E - Left & Right RCA Output Jacks - These are connected with a suitable length of interconnect to an appropriate input on a line level preamplifier. The top jack is the left and the lower is the right output.
- F - Phono Input RCA Jacks - These jacks accept the output RCA plug from the turntable. Facing the front of the Phono 1, the left jack connects to the left channel, and the right jack to the right channel.
- G - Phono Cartridge Loading Dip Switches - The individual positions are best activated with a tooth pick or tip of a pencil. See the section "Connections and External Adjustments" for more details.
- H - Grounding Post - This is a chassis connection intended to ground the turntable's motor body and/or tonearm body. Attach the ground wire from the tone arm leadouts to this groundpost.

Note: It may be necessary to experiment with different grounding configurations to obtain the lowest hum level.

PHONO STAGE SET-UP

You are now ready to begin setting up your phono stage.

INSERTION OF THE TUBES



Please read and follow these instructions carefully. Great care was taken in the testing, selection and matching of the supplied tubes in order to ensure proper operation of the unit. Failure to follow these instructions will cause this phono stage to suffer in performance and sound quality.

The PHONO 1 is supplied with four 6922 (6DJ8-type) tubes, individually boxed and labeled V1-V4.

1. In order to install the tubes, use the supplied Phillips screw driver and remove the top cover of the chassis. For your convenience, only a few screws were installed at the factory to facilitate the easy removal of the Top Cover.

2. When handling the tubes, it is recommended the cotton gloves provided be worn to prevent skin oils from depositing on the glass surface. Find the tubes appropriate for your phono stage, boxed in the packaging storage compartment.

3. Inspect the tubes for code markings. They will be coded individually, each with one of the following codes: V1, V2, V3, V4.

4. Now inspect the printed circuit board (PCB) above the tube sockets in the PHONO 1 for the codes matching the codes on the tubes (See Figure 3 for further clarification).

5. Take the V1 tube and inspect the pins noting the large space between two of the pins. This space will align with the same larger space between two of the pin holes on the socket. Insert the V1 tube into the V1 tube socket, making sure all pins and pin holes are aligned (see Figure 4). Do not force the tube into the socket. Rock the tube gently while pushing slowly until the tube is firmly seated. Repeat this step for the remaining tubes, V2 tube to the V2 tube socket, V3 tube to the V3 tube socket, V4 tube to the V4 tube socket.

6. Once all the tubes are installed, it is now necessary to choose a setting for the CUE/MUTE function. This is an internal adjustment, see figure 5 for switch location. The setting of this switch will depend upon whether the line level preamplifier has a conveniently located mute switch (ie. the line level preamplifier may be on an inconvenient lower shelf). Please feel free to experiment to determine the most ergonomic operation of this feature.

Replace the Top Cover, and using the Phillips screw driver, fill all the screw positions with the screws provided. There are extra screws provided in case you misplace a few.

Note: Partially install the screws, then go back and tighten them all. Do not over-tighten.

7. You have now completed the preliminary steps of setup.

PHONO STAGE CHASSIS PLACEMENT

The feet of the PHONO 1 Phono Stage are temperature sensitive and may deform if exposed to excessive heat. DO NOT place the PHONO 1 on top of any equipment which generate extreme temperatures.

The unit must be placed on a hard flat surface (NOT on carpet), preferably side by side or on separate shelves with plenty of unobstructed space all around the phono stage to allow for free movement of air for proper cooling. Do not operate this phono stage in an enclosed cabinet - overheating will result.

Allow at least 6" (15 cm) of clear space all around the Phono Stage chassis for proper ventilation.

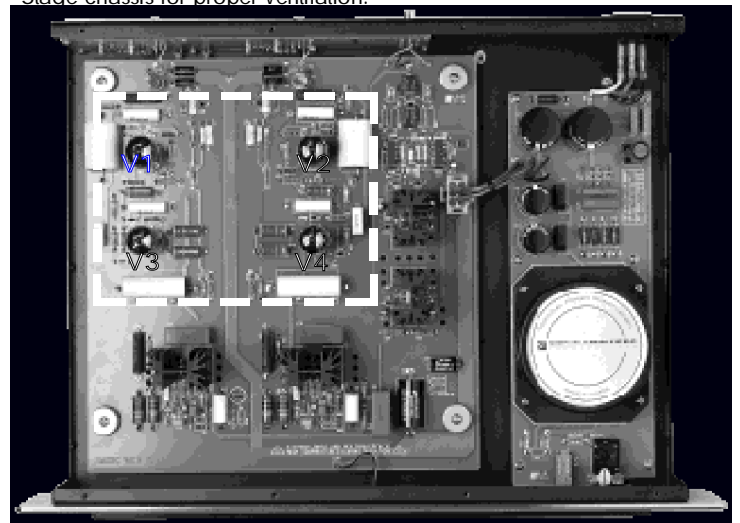
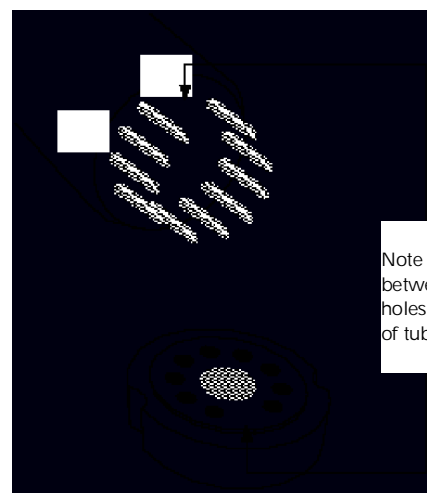


Figure 3 - PHONO 1 tube installation locations.



Note the larger space between two of the pins and holes for proper alignment of tube and socket.

Figure 4 - Tube pin alignment with the socket.

PHONO STAGE SET-UP CONT'D

CONNECTING EXTERNAL EQUIPMENT & EXTERNAL ADJUSTMENTS

Connect the turntable to the Phono 1 input RCA jacks (F) and using a suitable length of interconnect cable, connect the PHONO 1 outputs (E) to your Sonic Frontiers Line 1, 2, or 3, or other line level preamplifier input. If there is a ground or earthing wire on your turntable, connect it to the binding post (H) on the chassis rear. It is very important to ensure that all connections are solid and that the RCA plugs on your interconnect cable are of good quality. It is also preferable to have the same metal to metal contact on the connectors. Your Phono 1 phono stage uses custom made gold plated RCA jacks so it is recommended that gold plated RCA plugs be used. Dissimilar metal to metal contacts can have galvanic reactions that could cause low level noise, particularly in humid climates. Periodically clean your RCA plugs and jacks to ensure optimum sonic quality.

THE PHONO CARTRIDGE TO PREAMP INTERFACE
Most phono cartridges have been carefully designed to provide the flattest and widest frequency response into a specific load impedance, most commonly 47000 Ohms. Due to mechanical and electrical design constraints or other special characteristics, some cartridges require additional resistive and or capacitive loading to achieve optimum performance.

The Sonic Frontiers PHONO 1 provides the user with the ability to adjust the optimum load values beyond the default 47K5 ohm input load impedance. Adjacent to the input RCA jacks (F), are the phono cartridge loading switches (G). Activation of these switches either individually or in various combinations allows the user to optimize cartridge frequency response by placing additional parallel resistance and capacitance (RC) across the phono inputs. The loading options provided should be satisfactory for most if not all currently available moving-coil phono cartridges.

The switches are 10 position per channel precision gold DIP types. Four switch positions provide resistance, four positions provide capacitance and two are spare user positions. The spare user positions allow a custom value of resistance and capacitance to be conveniently switched in. Custom component values may be easily installed by persons with reasonable electronic soldering skills on internal terminals provided on the rear panel printed circuit assembly.

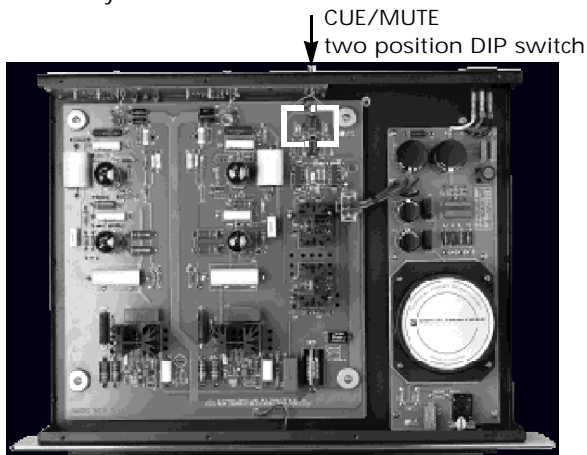


Figure 5 - The internal CUE/MUTE switch is located in the rear

To select a loading value, it is necessary to refer to the position number on the loading switch(s), (G). The values are as follows:

pF = picofarads = X .00001
K ohms = X1000

- Position 1 - 10 ohms (RL1 and RL2)
- Position 2 - 100 ohms (RL3 and RL4)
- Position 3 - 1K ohm (RL5 and RL6)
- Position 4 - 10K ohm (RL7 and RL8)
- Position 5 - 47pF (CL1 and CL2)
- Position 6 - 47pF (CL3 and CL4)
- Position 7 - 100pF (CL5 and CL6)
- Position 8 - 100pF (CL7 and CL8)
- Position 9 - User 2
- Position 10 - User 1

These positions apply to both left and right channels.

Any combination of resistance and capacitance may be selected by depressing various switch combinations, and will be added in parallel to the 47K5 nominal input impedance. Resistors divide when added in parallel and capacitors add. eg., if positions 2, 3, 5, and 6 were selected, the loading value would be 90.73 ohms resistance and 147pF capacitance. As can be seen by the above example, combinations of resistance result in relatively minor changes in total resistance. It is recommended that for major value changes, the "user 1" and "user 2" positions be used. To order alternate resistor types and/or values, please contact the Parts Connection*. To calculate the possible combinations, use the following formula:

$$\frac{R1 \times R2}{R1 + R2} = R \text{ total, and then, } \frac{R \text{ total} \times 47500 \text{ ohms}}{R \text{ total} + 47500 \text{ ohms}} = R \text{ load}$$

Capacitors simply add in value, eg., 47pF + 100pF = 147pF. The capacitor values provided may also provide some relief from RF interference which can occur in urban areas, particularly in apartment buildings.

The phono cartridge manufacturers' recommended loading values is a good starting point. Do not be afraid to experiment with loading values. This is a controversial issue among audiophiles and our view is that generally, the loading value is dependent on several system variables, such as tonearm type/brand, type and capacitance of the lead out wire, type and location of turntable grounds, input capacitance of the phono preamplifier, as well as the systems' overall sensitivity. All these system variables will effect the loading value to some degree, and as all systems are different, no hard and fast rule holds for a loading value for a given phono cartridge.

* The Parts Connection Toll Free Order Line 1-800-769-0747

Tel: (905) 829-5858 Fax: (905) 829-5388

E-Mail: TPC@sonicfrontiers.com Web Site: <http://www.sonicfrontiers.com/TPC>

POWERING ON & STARTUP PROCEDURES

POWER CONNECTIONS

Once all input and output signal connections are made, you can begin to make the power connections.

PHONO STAGE POWER CONNECTIONS

Plug the detachable Power Cord into the Power Cord socket (D) on the back of the PHONO 1 chassis. The PHONO 1 phono stage are configured for the line voltage in the country in which it is sold. See the shipping box or the rear of the chassis for voltage settings. If a different operating voltage is required, please contact an authorized Sonic Frontiers dealer or the factory directly.

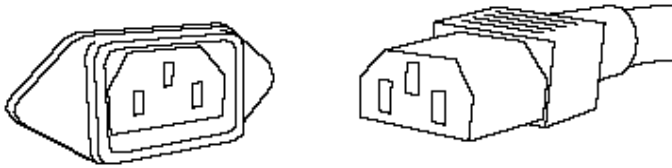


Figure 5 - Align socket pins to corresponding holes and push together.

STARTUP PROCEDURE


1. If you have yet to finally place your new Phono 1 phono stage, do so preferably not more than 3' away from the turntable and connect the turntable leads to the appropriate input jacks (F). Connect the ground lead to the grounding binding post (H). Connect the phono stage outputs (E) to your allocated or desired line level pre-amplifier inputs. Ensure that all the connections are solid.

2. Connect the AC line cord provided to the AC Power Inlet (D), and plug the male end into a wall AC outlet or power-bar.

3. Press the power switch to the "ON" (IN) position. The centrally located LED (A) should be lit. After approximately 40 second delay, you should hear a "click" indicating the CUE/MUTE relay energizing. If the rest of the audio system is powered up, slowly raise the volume control of the line level preamplifier. You should hear a soft "hiss" emanating from the speakers, indicating operation. Upon playback of records, normal operation will be verified.

If you have any problems, see the trouble shooting section, or call your dealer or our Technical Support representative at (905) 829-3838 for assistance.


SHUTTING OFF POWER

| | |
|---|--|
|  | WARNING Always turn "off" your power amplifier and/or line level preamp first, before turning off the phono stage. Failure to do so may cause a transient pulse to be delivered through the amplifier to the speakers. |
|---|--|

When shutting off power from the phono stage, it is good practice to mute and then turn off the line level preamplifier first before switching off the phono stage. Following this procedure will ensure that no transient pulse will reach the power amplifier.

TROUBLE SHOOTING

If the PHONO 1 Phono Stage is not functioning properly, please check each of the following:

| | |
|---|---|
|  | <p>WARNING DISCONNECT the AC Detachable Power Cord from the Phono 1 before beginning troubleshooting.</p> |
|---|---|

1. Check that the AC Detachable Power Cord is plugged into the Phono Stage's Detachable Power Cord Socket (D) and is connected to a live source of AC power. For instance, if using a power bar, check that the bar is turned on.
2. Be sure that the Power Switch (C) is in the "ON" position.
3. Check that input & output connections are correct.
4. Ensure that the phono stage is not in MUTE mode, or still in the 40 second warm-up/turn-on cycle.
5. Check that the AC Line Fuse inside the PHONO 1 chassis is good. Be sure to first unplug the AC Detachable Power Cord from the chassis rear before removing chassis covers to check the fuse. For the fuse location see figure 6. To remove the fuse, simply push down and turn counter-clockwise the fuse holder and remove the fuse. If the fuse has blown, the thin metal conductor will have melted and the glass may appear "smoked". If the fuse has blown, replace with a fuse of the same type and rating (See specifications for fuse ratings).
7. Check to be sure that all the tubes are correctly and firmly seated in their tube sockets and that all nine contact pins are inserted in each socket (i.e. no pins are bent over). Verify that an orange glow (tube filament) is visible from inside of each tube when the unit is on.
8. If you are still experiencing any difficulty with your PHONO 1 Phono Stage, contact your dealer or distributor for assistance.

REPLACEMENT OF THE TUBES

Sonic Frontiers strongly discourages non-factory replacement of the tubes. The tubes supplied are measured, selected, and matched in pairs - channel to channel and triode section to triode section - for optimum performance.

Problems arising from non-SFI supplied tubes will not be covered under warranty.

If replacement tubes are needed, desired or required contact Sonic Frontiers for assistance.

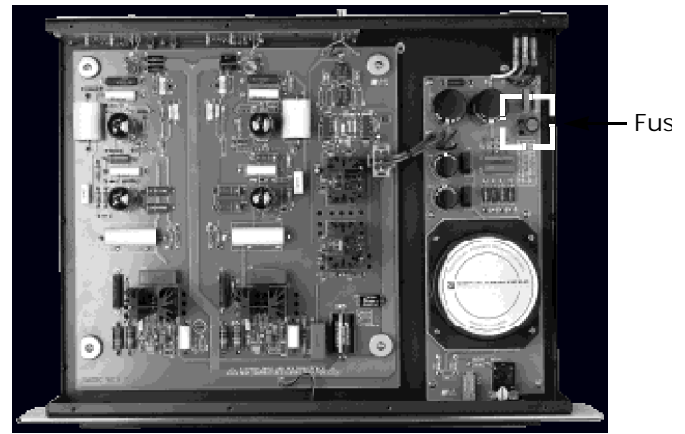


Figure 6 - The Fuse in the Phono 1 is located in the right rear corner of the phono stage chassis.

SAFETY INSTRUCTIONS

1. Ventilation - Although your PHONO 1 Phono Stage generates only nominal heat in use, be sure that the ventilation slots in the top cover have at least 6" of unobstructed air space above them. Do Not obstruct the bottom vent by operating the phono stager on carpet or with the rubber feet removed.
2. Water and Moisture - This product should not be used near water. Do not expose this product to rain or moisture to prevent fire or shock hazard.
3. Heat - This product should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances which produce heat.
4. Power Sources - This product should be connected to an AC power source of the proper rated voltage. The original shipping containers will stipulate the AC voltage this unit can operate with correctly.
5. Cleaning - A regular dusting with a soft, non-abrasive cloth will generally keep the finish of the faceplate and chassis looking like new. At no time should you allow any liquid to come in contact with the PHONO 1 Phono Stage; it may run into the electronic circuitry and cause damage which will not be covered under your warranty.
6. Servicing - Do not open this product. No user serviceable parts inside. Refer servicing to an authorized service technician.
7. Non-Use Periods - The power cord of this product should be unplugged from the outlet when left unused for an extended period of time.
8. Do not remove Preamplifier or Power Supply covers while unit is connected to an AC power source.

PACKING MATERIALS

We recommend that you retain all of the packing material and shipping boxes for your PHONO 1 Phono Stage. They are custom designed to prevent shipping damage from occurring. Sonic Frontiers, Inc. will accept no responsibility for any damage occurring to a PHONO 1 Phono Stage that is shipped in packing material other than the original Sonic Frontiers packing material.

DISCLAIMER OF LIABILITY

Under no circumstances does Sonic Frontiers, Inc. assume liability or responsibility for injury or damages sustained in the use or operation of this equipment or for damages to any other equipment connected to it.

Sonic Frontiers, Inc. reserves the right to make design changes or improvements without the obligation to revise prior versions. All specifications are subject to change without notice.

LIMITED FIVE YEAR WARRANTY

Sonic Frontiers, Inc. warrants to the purchaser that each PHONO 1 is free of manufacturing defects for a period of five (5) years from the date of purchase. This five (5) year limited non-transferable warranty excludes all vacuum tubes, which we warrant for a period of twelve (12) months. To receive this warranty, the original purchaser must complete and mail to Sonic Frontiers, within thirty (30) days from the date of purchase, the enclosed Warranty Registration Form. Sonic Frontiers, Inc. will then validate the warranty to the original purchaser. This warranty is subject to the following conditions and limitations:

1. Warranty applies only to the original purchaser.
2. This warranty is void and inapplicable if the product has been handled other than in accordance with the instructions in this Owner's Manual, abused or misused, damaged by accident or neglect or in being transported, or the defect is due to the product being tampered with, modified or repaired by anyone other than Sonic Frontiers, Inc. or an authorized Sonic Frontiers repair depot.
3. Warranty does not cover normal maintenance.
4. Sonic Frontiers, Inc. shall not be responsible in any way for consequential or indirect damages or liabilities resulting from the use and operation of the product covered herein or resulting from any breach of this warranty or any implied warranty relating to said product.

During this period, Sonic Frontiers, Inc. will repair or replace any defective components free of charge. A Return Authorization Number (RAN) is required before any product is returned to our factory for any reason. This number must be visible on the exterior of the shipping container(s) for Sonic Frontiers to accept the return.

Units shipped to us without a Return Authorization Number or without a visible RAN on the exterior of the shipping container(s) will be returned to the sender, freight collect.

Units to be repaired by Sonic Frontiers, Inc. must be sent shipping and insurance prepaid by the original purchaser in the original packing material. A returned product should be accompanied by a written description of the defect. Repaired units will be returned by Sonic Frontiers, Inc. shipping and insurance prepaid.

All other warranties or conditions either written, verbal, expressed or implied are void.

Note: In foreign markets (anywhere outside of Canada and the USA), the warranty is supplied by the authorized International Distributor. Exact terms and conditions may vary.

TECHNICAL OVERVIEW

The Sonic Frontiers Phono 1 is a single chassis phono stage with an equalized gain of 62dB at 1kHz. The circuit topology is non-inverting, and uses a single high quality J-Fet for the input amplifier, and a special series amplifier for the second amplifying stage. In order to provide a low output impedance, a cathode follower is used after the second stage, transforming the high output impedance from the second stage to a lower output impedance suitable for driving any preamplifier with a reasonable input impedance. The input amplifier is a common source amplifier with a high drain load. This provides a gain that is (almost) the drain load divided by the source load, in this case 100X. The second stage uses one section of a 6922 as an active load element, and this minimizes the distortion in this stage regardless of tube variations. The equalization is accomplished by the use of frequency dependent feedback. Only one compensation

network is used, and this is fed from a relatively low impedance, thereby avoiding slew limiting at high frequencies, with its attendant distortions.

Despite the high technical performance achieved by this innovative approach, it was realized that noise would be the final barrier to the finished products performance. Great strides were made in reducing noise from both the circuit and the power supply. Circuit noise reduction techniques such as careful component selection and ground planes as well as advanced power supply noise reduction schemes has helped the PHONO 1 achieve excellent noise specifications, on par with many of the best solid-state units.

TECHNICAL SPECIFICATIONS

FREQUENCY RESPONSE: +/- .1dB, 20Hz to 20kHz, RIAA equalized

NOISE: 0.07uV equivalent input noise,
-83 dB below a 1mV 1kHz input.
IHF - A-weighted , shorted input.

DISTORTION: Less than .01% THD at 1kHz, 1VRMS output, IHF load - 10K ohms, 1000pf.

TUBE COMPLEMENT: (4) 6922/E88CC Dual triodes.

GAIN: 62dB at 1kHz. (1200 X) - recommended for cartridges with 1mV or less output.
(optional 54dB version available from the factory for cartridges with >1mV output)

POWER REQUIREMENTS: 100V - 135VAC 50/60 Hz, (200 - 270VAC 50/60Hz).
60 VA maximum. Line fuse .75A SLO BLO (.375A 240V)

INPUT IMPEDANCE: 47K ohms/10pf standard. 10, 100, 1K, 10K ohms resistance
and 47, 47, 100, 100pf capacitance available by user selected
DIP switches on rear of unit. Two positions available per channel for
user selected components via solder posts.

DIMENSIONS: 19" Wide x 14.25" Deep x 4.5"
High (48cm x36cm x 11.5cm)

OUTPUT IMPEDANCE: 175 ohms at 1kHz unbalanced.

NET WEIGHT: 21.5lbs. (9.75kg) - Unpacked

MAXIMUM INPUT: 50mV at 1kHz and 280mV at 20kHz.

Note: All measurements performed with an Audio Precision System Two test center.

RATED OUTPUT: 1.2VRMS 20Hz to 20kHz, 10K ohm load

Due to Sonic Frontiers desire to continually improve its products, specifications are subject to change without notice