

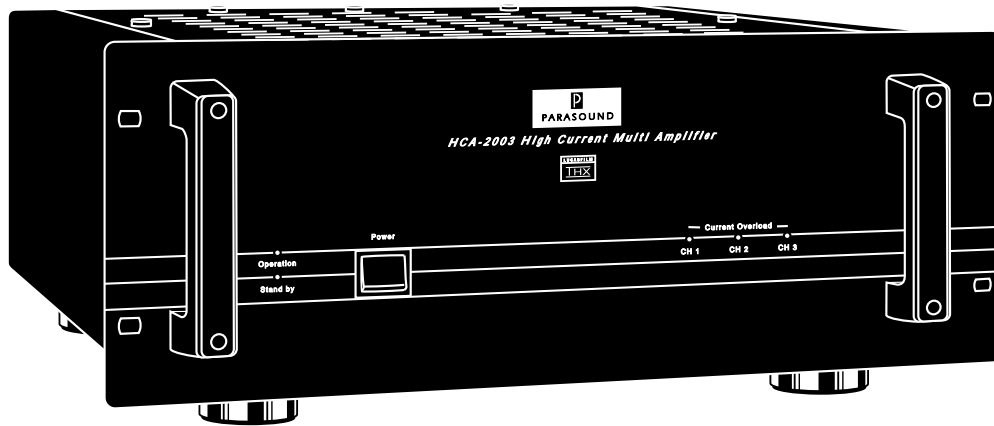


PARASOUND

*HCA-2003 High Current Multi Amplifier*



Congratulations on your purchase of this precision audio component and thank you for your selection of Parasound. Your HCA-2003 was designed by renowned circuit designer John Curl to meet or surpass the stringent standards required by Lucasfilm for use in THX Home Cinema systems. Each part within your HCA-2003 has been painstakingly selected for optimum sound quality on even the most challenging music and film soundtracks. Please take a few moments to read these instructions so you may fully understand the capabilities of your new Parasound power amplifier.



### Unpacking Your HCA-2003

The HCA-2003 is packed in two cartons. To unpack the amplifier, open both cartons and use the front and rear handles to facilitate remove of the HCA-2003 from its inner carton. Be careful not to cut or scratch yourself on the exposed extruded metal heatsinks on either side of the unit. Save your cartons and packing inserts for safe transport in case you move or if the unit ever requires shipping. Due to the weight of the HCA-2003, the white inner carton is not strong enough for safe shipping by itself. You *must* place it into the additional outer carton before shipment. The audiophile grade AC cord is packed separately in the inner carton. This is the only cord we recommend for use with your HCA-2003. Please take the time now to find the serial number located on the rear panel of your unit. Record it here for future reference or in case of casualty loss or theft:

Serial Number: \_\_\_\_\_

## Placement of Your HCA-2003

Place your HCA-2003 away from heat sources such as air ducts or radiators. Always mount the HCA-2003 horizontally and make sure that your cabinet or shelf can support its weight. It is best to provide a separate shelf for your HCA-2003 rather than stacking it directly above or below your other components.

## Rack Mounting Your HCA-2003

Your HCA-2003 can be mounted into a standard 19 inch equipment rack and will occupy four rack spaces. If you decide to rack mount your HCA-2003, make sure you select heavy duty mounting bolts and nuts and use nylon washers under the heads of the bolts to avoid scratching the amplifier's front panel. Do not attempt to hold your unit in place yourself while you attach the bolts and nuts. Have someone help support the unit as it is being fastened to the rack rails.

## Ventilation Requirements for Your HCA-2003

Your Parasound power amplifier is designed to operate with high idling, or bias, current to reduce higher-order harmonic distortion. This bias optimization of all Parasound power amplifiers results in noticeably warm operation even when no signal is present. This is a normal condition. While many other amplifier manufacturers have chosen to bias their amplifiers at a lower level to run cooler, we bias our amplifiers so the output transistors are allowed to operate in a much more linear region. Although the amplifier may run a little warmer than other amplifiers, we feel the resulting sonic improvements are significant and more than justified.

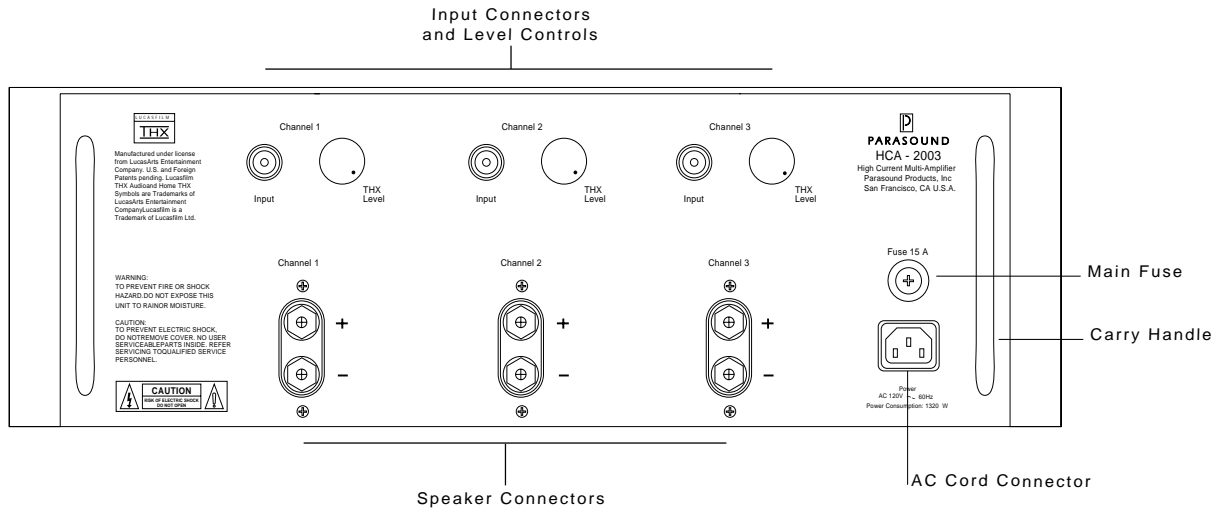
To insure safe and reliable operation, it is very important that the amplifier has *plenty of ventilation* to prevent overheating and automatic shut down from its thermal protection circuitry. Please observe the following ventilation guidelines when installing your Parasound power amplifier in a cabinet or other enclosed area:

1. If you are not using a fan, allow *at least* six inches on each side and above the amplifier, and *do not* close off the front with a cabinet door or panel.
2. If you are enclosing the amplifier in an equipment cabinet, use a fan to draw in cool air and exhaust warm air. In either case, two vent holes are required: one for intake and one for exhaust.
3. Do not place the amplifier on carpeting which will obstruct the air flow into the bottom of the amplifier chassis and heatsinks.
4. If you plan on stacking power amplifiers, you *must* use a fan to circulate the warm air that quickly becomes trapped between them.

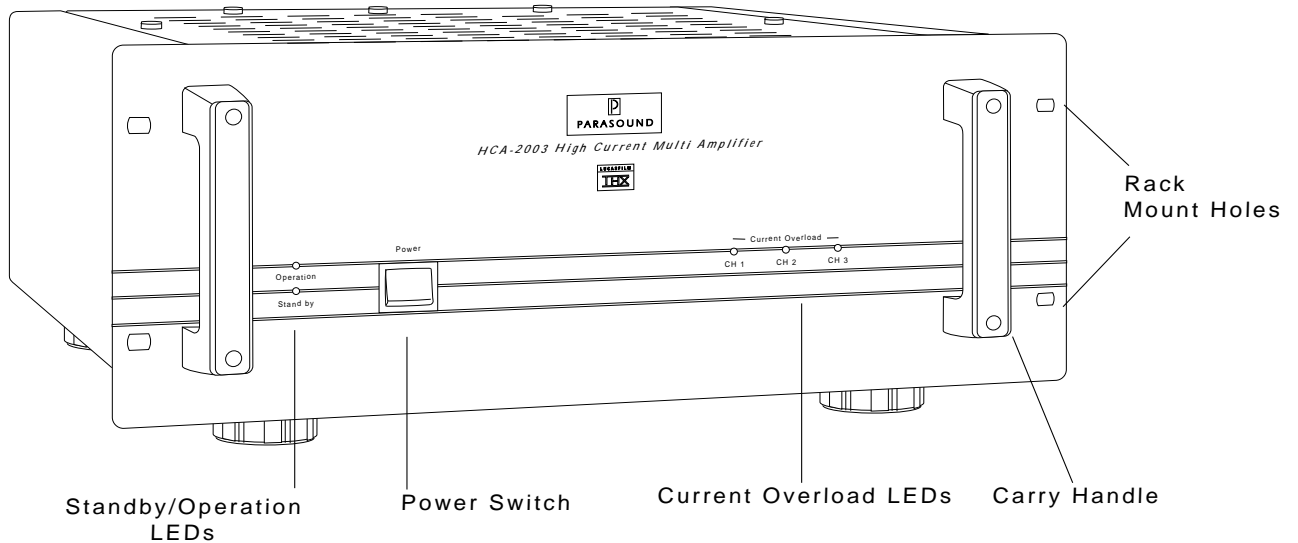
## Minimum Impedance Precautions

You may connect loudspeakers with a 4  $\Omega$  or 8  $\Omega$  nominal impedance for normal operation. Your HCA-2003 is capable of driving speakers with occasional impedance dips well below 2  $\Omega$ . However, sustained high power operation into loads of less than 4  $\Omega$  may cause overheating and is not recommended.

# HCA-2003 Front and Rear Panel Drawings



**Figure #1 HCA-2003 Rear Panel**



**Figure #2 HCA-2003 Front Panel**

## Home Theater Configurations and Input Connections for the HCA-2003

*Refer to Figure #1*

Before making any signal connections, make sure your three HCA-2003 level controls are turned fully counterclockwise and its power is turned off. Make sure there is no strain or tension on any wires that could cause them to pull loose. Depending on the requirements of your home theater system, you can configure your HCA-2003 in a variety of ways:

### Option 1

If you are converting your existing two channel stereo system into a home theater system, you can use the HCA-2003 to power the front left, center, and right speakers. This allows you to use your existing two channel stereo amplifier to drive your left and right surround speakers. You can also add a powered subwoofer for extended low frequency response. Use the following input configuration so you have an easy way to remember the connections to each channel for level setting and troubleshooting:

- Connect the left front output of your processor to INPUT 1 of your HCA-2003.
- Connect the center output of your processor to INPUT 2 of your HCA-2003.
- Connect the right front output of your processor to INPUT 3 of your HCA-2003.
- Connect the right surround output of your processor to INPUT 1 of your two channel stereo amplifier.
- Connect the left surround output of your processor to INPUT 2 of your two channel stereo amplifier.
- Connect the subwoofer output of your processor to the input of your powered subwoofer.

### Option 2

If you are converting your existing two channel stereo system into to a home theater and you prefer to keep using your existing two channel amplifier for your front left and right channels, you can use your HCA-2003 for the front center and left and right surround channels. You can also add a powered subwoofer for extended low frequency response. Following is the suggested input configuration for this option:

- Connect the left front output of your processor to INPUT 1 of your two channel stereo amplifier.
- Connect the right front output of your processor to INPUT 2 of your two channel stereo amplifier.
- Connect the center output of your processor to INPUT 1 of your HCA-2003.
- Connect the right surround output of your processor to INPUT 2 of your HCA-2003.
- Connect the left surround output of your processor to INPUT 3 of your HCA-2003.
- Connect the subwoofer output of your processor to the input of your powered subwoofer.

### Option 3

If you do not have an existing amplifier, you can use two HCA-2003s to power all six channels of your home theater system that includes a passive subwoofer. Following is the suggested input configuration for this option:

- Connect the left front output of your processor to INPUT 1 of your first HCA-2003.
- Connect the center output of your processor to INPUT 2 of your first HCA-2003.
- Connect the right front output of your processor to INPUT 3 of the your HCA-2003.
- Connect the right surround output of your processor to INPUT 1 of your second HCA-2003.
- Connect the left surround output of your processor to INPUT 2 of your second HCA-2003.
- Connect the subwoofer output of your processor to INPUT 3 of your second HCA-2003.

## **Speaker Connections to the HCA-2003**

*Refer to Figure #1*

### **Use Good Speaker Wire**

For best results, use 16 gauge or thicker speaker wire and keep its length short as possible. This will help maintain a high damping factor and avoid deteriorating bass response. Also, each channel should be connected with the same length speaker wire. You may wish to experiment with audiophile-grade speaker wire.

### **Polarity**

It is important to observe correct speaker connection polarity to prevent phase cancellation. One side of each speaker wire will have some sort of mark on one conductor: either printing, a raised ridge on the insulation or a different color of conductor. This permits you to know which wire you had connected to the + and which to the — speaker terminals so you can do the same at the power amplifier terminals.

### **Five-Way Binding Posts**

The five-way binding posts on the rear panel of your HCA-2003 will accept banana or dual banana plugs, most high-quality 1/4" spade lugs, or up to AWG 12 bare solid or stranded wire.

### **Banana Plugs**

Banana plugs offer the most convenient connection to the speaker terminals. They also have a large amount of surface to make contact with the speaker terminal. For these reasons, we recommend the use of banana plugs in most applications. However, you may want to use the “gas tight” connection provided by spade lugs or bare wire.

### **Spade Lugs**

If you prefer to use speaker cable with spade lugs, make sure you do not permit the lug to rotate as the terminal is tightened. Do not overtighten the speaker terminal onto the spade lug. The Parasound limited warranty excludes terminals that are sheared off as a result of overtightening.

### **Bare Wire**

If you use bare speaker wire without plugs, make sure you strip off only enough insulation so the exposed bare wire fits into the hole that runs sideways through the terminal’s metal shaft. Before inserting the wire, twist all its strands tightly to prevent strays that could cause a short circuit. If you have a soldering iron, it is a good idea to “tin” the bare wire with solder to keep it from unraveling and to prevent oxidation.

## **AC Power Connections and AC Grounding**

*Refer to Figure #1*

Before you connect the AC cord, make sure the HCA-2003 power switch is in the off position. If possible, try to make a direct connection to an AC wall outlet. Do not connect the amplifier to the accessory AC outlet on your preamplifier or processor. The amplifier's current draw exceeds the ratings of most preamplifier's power switches and power cords. If you use an external AC line conditioner or surge suppressor, make sure it can handle the current draw of the amplifier.

Grounded three pin AC cords are standard on most high end components. However, in some cases, it may be necessary to "lift" the ground or reverse the polarity of the AC plug to reduce hum. You may use a 3 pin -to- 2 pin AC plug adaptor to lift the AC ground. You will not compromise the sound quality of your system by lifting the AC ground of your amplifier.

## **Operating Your HCA-2003**

*Refer to Figure #2*

### **Power Switch**

The upper position of the power switch is on and the lower position is off.

### **Standby/Operation LEDs**

When you first turn the unit on, the red standby LED will illuminate for about four to five seconds while the amplifier circuits are stabilizing. After that, the red standby LED will extinguish and the green operate LED will come on to signal that the amplifier is operational.

The red standby LED also illuminates whenever protection circuits are triggered. If this happens, turn the unit off and remove all connections to the HCA-2003 then turn it back on. If the red LED continues to glow with no inputs or outputs connected to it, there may be an internal fault. If the green operate LED comes on with no inputs or outputs connected to it, check for a shorted speaker wire. In rare cases, there may be DC coming from your preamplifier or processor. Have a qualified technician check for this.

### **Current Overload LEDs**

These LEDs indicate overload of the power supply just before the onset of audible distortion. The current overload LEDs for channels 1 through 3 will illuminate whenever the corresponding channel is driven beyond its maximum current capacity. In virtually all listening situations, these LEDs will rarely illuminate.

### **Level Controls**

Each channel has a separate input level control. If you are using your HCA-2003 in a THX installation, set each level control at maximum for THX reference level. If you have a non-THX processor or preamplifier with high gain, it may be necessary to reduce the input level control settings on the HCA-2003 to allow more range of operation for its volume control. The HCA-2003 level controls are

located on the rear panel, so they can be set once and forgotten.

### **Maintaining your HCA-2003**

To avoid risk of electric shock, never remove the top cover. Your HCA-2003 requires no periodic maintenance and has no user serviceable parts inside. To keep it clean use only a soft cloth and never use any solvents or abrasives. The exterior of the amplifier may be cleaned with a soft cloth moistened only with water or Windex sprayed onto the cloth.

### **Fuse**

The HCA-2003 has one external 15 ampere fuse that may blow as a result of an internal fault condition or improper operation. This protects the unit from possible damage to internal parts. Never replace this fuse with a larger value. Substitution of a larger fuse may create serious stress or damage to internal parts and will void your warranty.

### **In Case of Trouble**

If you suspect a problem with your HCA-2003, first turn the amp off and check all your connections. The trouble may be caused by another component or even a defective hookup cable. If you are hearing hum out of any of your speakers, turn off the amplifier and disconnect the inputs to it. If the hum goes away, it is probably be caused by your processor or one of the source components connected to it.

Frequently hum in a home theater system is caused by a grounding problem with the cable TV system. Contact your cable provider if necessary to make sure the cable feed into your house is properly grounded. There are cable isolation devices available such as the Video Link #634 or the Mondial Magic specifically designed to cure this problem. In rack mounted systems, ground loops and hum can sometimes develop via the metal rack rails of the equipment rack. This problem can be solved with nylon shoulder washers available from Middle Atlantic Products.

If you still suspect a problem with your amplifier, we suggest you contact your authorized Parasound Dealer or Installer, or Parasound. We may be able to suggest other diagnostic tests you can easily perform. If we determine that your HCA-2003 should be returned to Parasound for inspection and possible servicing, you will need to obtain a Return Authorization number and repack the unit in its original packing and both of its cardboard cartons for proper protection in transit. Units that arrive improperly packed or without a Return Authorization number, will be refused. We cannot accept collect shipments. After we repair the unit repair under warranty, it will be returned to you at no charge.

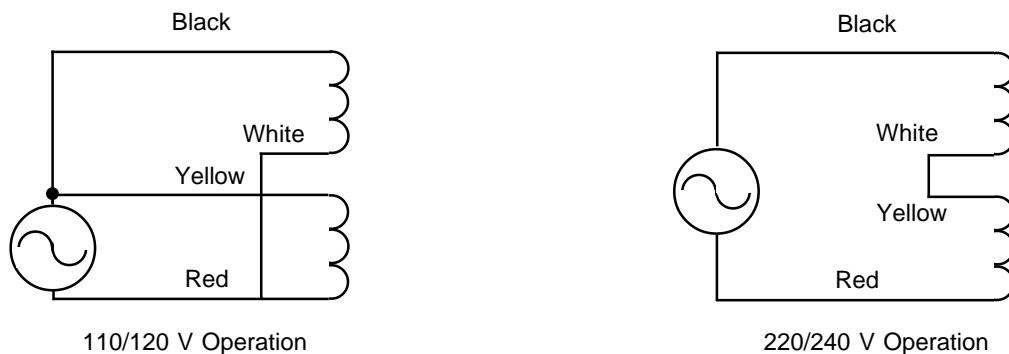
### **Notes:**

## Rewiring Your HCA-2003 for 220 V - 240 V 50 Hz Operation

The HCA-2003 may be rewired for operation abroad. This involves changing the primary wires on the power transformer. Please refer this conversion to a skilled electronics technician to avoid personal injury or possible damage to the amplifier. There are hazardous high voltages present inside the chassis even after the power is turned off and the AC cord has been disconnected.

For 110 V - 120 V operation, the red and white transformer primary wires are connected together and the yellow and black primary wires are also connected together. The 120 V AC source is then connected to the black/yellow and red/white wires.

For 220 V - 240 V operation the yellow and white wires are connected together and the 220 V AC source is connected to the black and red wires. When you change the voltage from 120 V to 220 V, be sure to change the main fuse from 15 amps to 7.5 amps.



## Special Features

- Designed by John Curl
- THX certified by Lucasfilm Ltd.
- Massive Encapsulated 1.2 kVA Power Transformer with Separate Windings for Each Channel
- 90,000 uF Computer-grade Capacitors in the Power Supply
- Multiple Polystyrene Film Bypass Capacitors to Smooth the Power Supply
- Independent Power Supplies for Each Channel
- Separate Regulated Power Supplies for Driver Stage
- Cascode Class A Input Stages with Matched Complementary J-FET Pairs
- Hand Picked Complementary MOSFETS in High Voltage Driver Stages
- 12 Complementary Pairs of Beta-Matched 50 MHz, 15 Ampere Output Transistors
- Output Transistors Direct-Coupled to Speakers Without LRC Networks
- Linear Tracking, Instantaneous Acting DC Servos
- High-Bias Class A/AB Operation
- Gold-Plated Metal Structure RCA Input Jacks
- Multiple Temperature Sensors and Silver-Cadmium Relay Protection
- FR-4 Glass Epoxy Circuit Boards, Double-Sided for Precision
- Custom Designed Audiophile-Grade AC Power Cord

## Parasound HCA-2003 Specifications

### Continuous Power Output

> 200 watts RMS x 3, 20 Hz - 20 kHz, 8  $\Omega$ , all channels driven  
> 300 watts RMS x 3, 20 Hz - 20 kHz, 4  $\Omega$ , all channels driven

### Current Capacity

60 amperes peak, per channel

### Slew Rate

> 130 V/ $\mu$ second

### Frequency Response

20 Hz - 20 kHz, +/- 0 dB

### Power Bandwidth

2 Hz - 150 kHz

### Total Harmonic Distortion

< 0.05% at full power  
< 0.006% typical levels

### IM Distortion

< 0.03%

### TIM

Unmeasurable

### Dynamic Headroom

> 2 dB

### Interchannel Crosstalk

> 88 dB at 1 kHz  
> 74 dB at 20 kHz

### Input Impedance

50 k $\Omega$  per channel

### Input Sensitivity

1 V for 28.28 V Output, THX Reference Level; 1.5 V for full output

### S/N Ratio

> 98 dB, input shorted, IHF A-weighted

### Damping Factor

> 800 at 20 Hz

### Dimensions

19" wide x 7" high x 16" deep (7 5/8" high with feet)

### Weight

54 lbs. net

## Parasound Limited Warranty (USA only)

Your Parasound HCA-2003 amplifier is covered by a limited warranty against defects in materials and workmanship for a period of two years from date of purchase. This warranty is provided by the Parasound dealer where the unit was purchased. Warranty repair will be performed only when your purchase receipt is presented to validate your ownership, date of purchase and authorized status of the selling dealer. Defective parts will be repaired or replaced without charge by your authorized dealer's store or the location designated by your dealer that is authorized to service Parasound equipment. Additional information is available by contacting Parasound. Charges for unauthorized service and transportation costs are not reimbursable under this warranty.

This warranty becomes void if the product has been damaged by alteration, misuse, accident or neglect. Alteration includes any removal or modification of the serial number. This warranty becomes void if unit has been connected or operated contrary to printed instructions. The warrantor assumes no liability for property damage or any other incidental or consequential damage whatsoever which may result from the failure of this product. Any and all warranties of merchantability and fitness implied by law are limited to the duration of this expressed warranty.

Some states do not allow limitations on how long an implied warranty lasts, 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 state by state.



Manufactured under license from Lucasarts Entertainment Company. U.S. and foreign patents pending. Lucasfilm Audio and Home THX are trademarks of Lucasarts Entertainment Company, Lucasfilm is a trademark of Lucasfilm Ltd.



PARASOUND  
*affordable audio for the critical listener*

*Parasound Products, Inc. 950 Battery Street, San Francisco, CA 94111  
415-397-7100 / FAX 415-397-0144*

© 1996 Parasound Products, Inc.