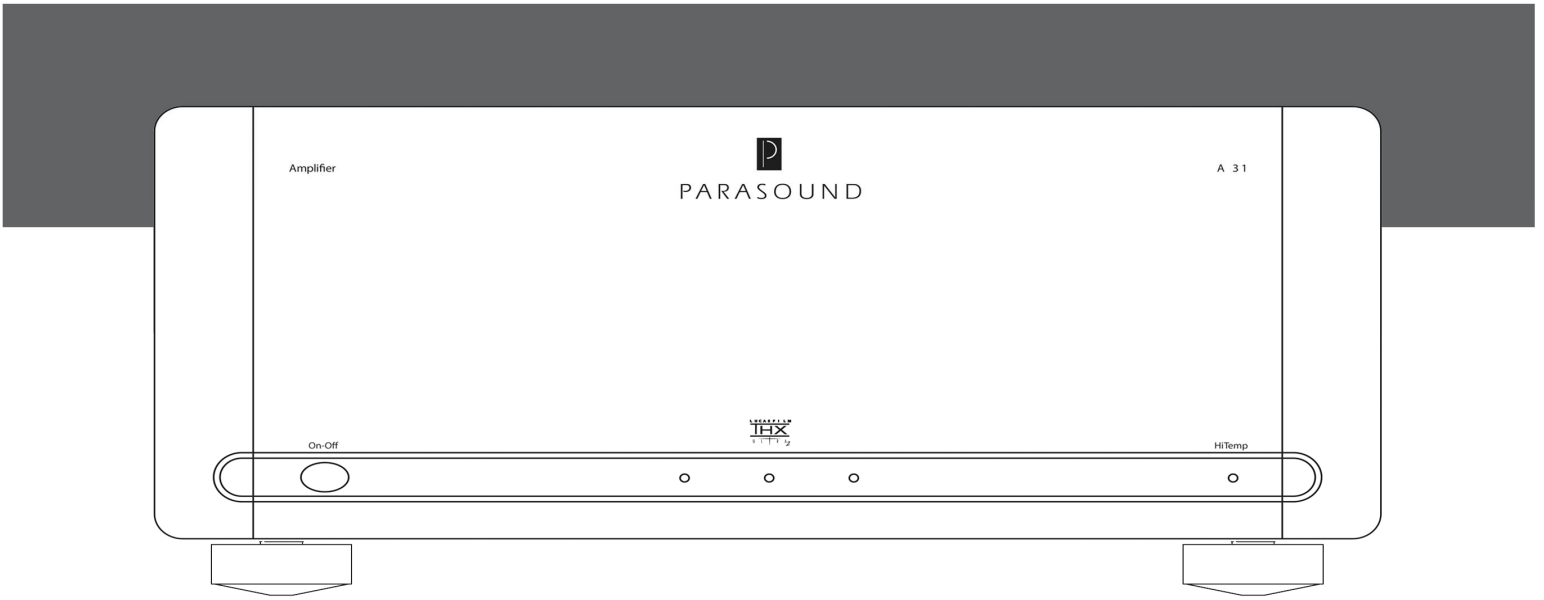
HALO by PARASOUND



A 31

Three Channel Amplifier

OWNER'S GUIDE

Important Safety Instructions

The lightning flash with the arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of "dangerous voltage" inside the product that may constitute a risk of electric shock.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the product.

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

1. **Read Instructions** — Read all the safety and operating instructions before operating this product.

2. **Retain Instructions** — Retain safety and operating instructions for future reference.

3. **Heed Warnings** — Adhere to all warnings on the product and in the operating instructions.

4. **Follow Instructions** — Follow all operating and use instructions.

5. **Cleaning** — Unplug this product from the wall outlet before cleaning. Use a damp cloth for cleaning. Clean the outside of the product only.

6. **Attachments** — Do not use attachments that are not recommended by the product manufacturer; they may be hazardous.

7. **Water and Moisture** — Do not use this product near water.

8. **Accessories** — Do not place this product on an unstable cart or stand. The product may fall, causing bodily injury and damage to the product. A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart to overturn.

9. **Ventilation** — Slots and openings in the cabinet are provided for ventilation to ensure reliable operation of the product and to protect it from overheating. These openings must not be blocked or covered. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided.

10. **Power Sources** — Operate this product only from the type of power source indicated on the label. If you are not sure of the type of power supply to your home, consult your dealer or local power company. This product is equipped with a three-prong grounding plug. This plug will only fit into a grounding power outlet. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding plug.

11. **Power Cord Protection** — Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them.

12. **Lightning** — Unplug the unit from the wall outlet for added protection during a lightning storm and when it is left unattended and unused for long periods of time. This will prevent damage to the product due to lightning and power line surges.

13. **Overloading** — Do not overload wall outlets or extension cords. This can result in a fire or electric shock.

14. **Inserting Objects into Unit** — Never push objects of any kind into this product through any openings; they may touch dangerous voltage points or short out parts that could result in fire or electric shock.

15. **Servicing** — Do not attempt to repair or service this product yourself. Opening or removing covers may expose you to dangerous voltage and other hazards. Refer all servicing to qualified service personnel.

16. **Damage Requiring Service** — Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions: **a)** If the power-supply cord or plug is damaged. **b)** If liquid has been spilled into the product. **c)** If the product has been exposed to rain or water. **d)** If the product does not operate normally by following the operating instructions. **e)** If the product has been dropped or damaged in any way. **f)** If the product exhibits a distinct change in performance.

17. **Replacement Parts** — When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer. Unauthorized substitutions may result in fire, electric shock, and other hazards.

19. **Safety Check** — Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

20. **Wall or Ceiling Mounting** — Mount the product to a wall or ceiling only as recommended.

21. **Heat** — The product should be situated away from heat sources such as radiators, heat registers, stoves, and other products (including amplifiers) that produce heat.

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INTRODUCTION

Thank You for Choosing Parasound

Your new Parasound Halo A 31 power amplifier has been designed with the most advanced, proven class A/AB amplifier technology. The A 31 is built to extremely strict quality and performance standards for which Parasound is renowned. We're proud to offer you this exceptional audio component that will bring you many years of enjoyment and dependability. We designed your new Halo Series A 31 Amplifier to perform at a higher level of sonic performance than you may have expected and we encourage you to read this entire manual to maximize your enjoyment. We wish you many years of listening enjoyment.

-The Parasound Staff

Keeping Records for Future Reference

Record the serial number located on the back panel or bottom of your A 31 in the space below. Also note your Parasound Dealer's name and telephone number. Your purchase receipt/bill of sale is required to determine if your A 31 is eligible for Parasound warranty service. We recommend that you make an extra copy of your original purchase receipt/bill of sale and store it inside the A 31's carton.

Parasound A 31 Amplifier Serial #: _____ (5 digit number below the bar code)

Parasound Dealer: _____

Parasound Dealer Phone Number: _____

Date of Purchase: _____

Important Warranty information

There is no Parasound warranty for this unit if it was not purchased from an Authorized Parasound Dealer. Investigate warranty coverage statements made by an *unauthorized* dealer very carefully, as you will need to depend entirely upon your dealer, and NOT upon Parasound. Unauthorized dealers lack the capability to make repairs or arrange for repairs of Parasound equipment. A list of Authorized Parasound Dealers and detailed warranty information is available at ***www.parasound.com*** or you can call **415-397-7100** between 8:30 am and 4 pm Pacific time. A missing or altered serial number could indicate that this unit was re-sold by an unauthorized dealer or is stolen merchandise. If this unit is missing its serial number or the serial number has been altered, you should return it to your dealer immediately for a full refund.

Unpacking Your A 31 & Placement Guidelines

Unpacking Your A 31

Carefully remove your A 31 from its shipping carton and locate the enclosed accessories:

- AC power cord
- Two trigger wires, one with 3.5 mm mini plugs, one with a 2.5mm and a 3.5mm mini plug

While you are unpacking your A 31, inspect it thoroughly for possible shipping damage and tell your Parasound dealer immediately if you find any evidence of shipping damage.
This would be a good time to make a copy of your sales receipt to store with the A 31's original packing.
Note: Please save and store both the inner and outer cartons and, most especially, the foam packing inserts to protect the A 31 if you have to move it or ship it. You may wish to flatten the cardboard cartons to save room in storage after cutting the taped seams on the bottom flaps.

Placement Guidelines

The A 31 will be easier to use and will last longer if you follow these simple guidelines:

- Place the A 31 on a surface that will adequately support its substantial weight.
- Use input and output cables that are long enough to leave some slack; that will enable you to pull the A 31 out of a cabinet to check or to change connections without inadvertently disconnecting cables.
- The A 31 should never be placed in a completely enclosed cabinet
- Place your A 31 where you can route input and output signal cables as far as possible from any AC cords.
- Where signal cables must cross AC cords they should do so only at a 90° right angle.

Ventilation Requirements

- Always position the A 31 horizontally.
- The A 31 should never be stacked above another power amplifier.
- Do not install the A 31 in an unventilated equipment cabinet or compartment. Pockets of stagnant hot air can build up even in a cabinet with an open front and back. A ventilation fan such as the Parasound Zbreeze is highly recommended to prevent "hot spots" in confined spaces.

AC Mains Voltage

NOTE: Before you plug this amplifier into an AC mains outlet:

If you live in a region with 220V-230V AC mains:
Plugging this amplifier into a 220V-240V AC mains outlet when the unit is wired internally for 115V and its main fuse rated for 115V operation will severely damage it and could put you at risk of personal injury. If you are unsure of the internal voltage setting for this amplifier you should have a qualified electronics technician inspect it and change it as required.

AC Voltage Rewiring Technical Information

Parasound will provide technical information which pertains to the interior of this amplifier only to a qualified electronics technician. This restriction is for your safety as well as the correct functioning of your amplifier.

AC Voltage Warranty Exclusion

Amplifiers set for 115V which are damaged by 220V-240V are not covered under the Parasound Limited Warranty.

Before Making Any Audio Connections

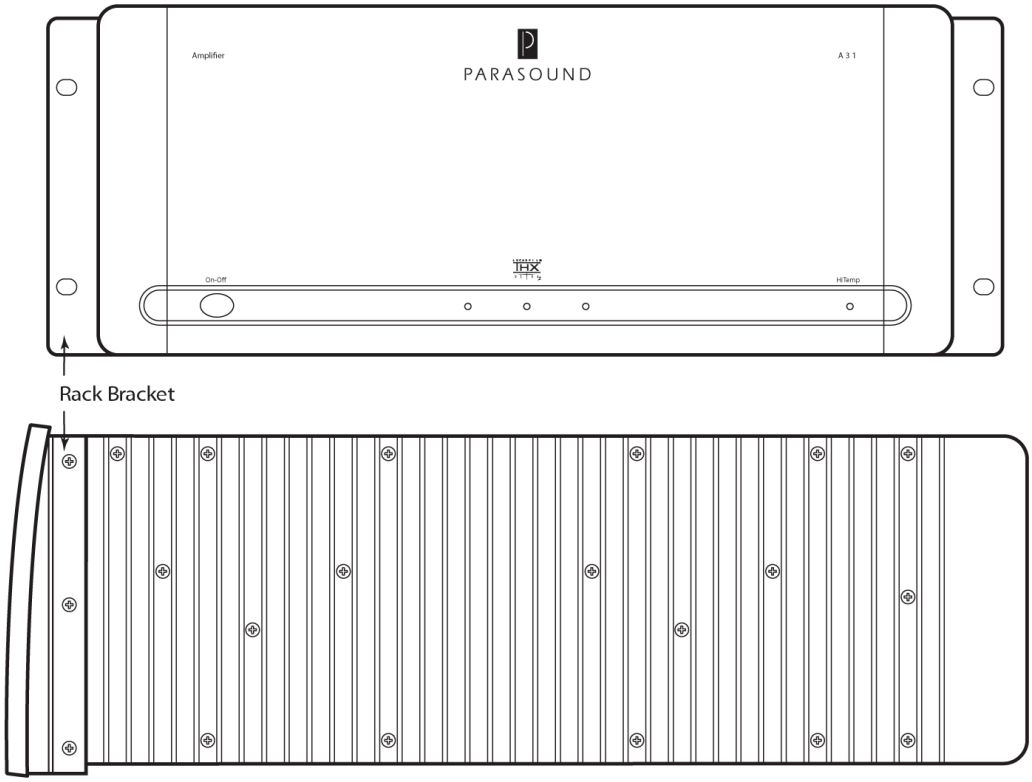
Always turn off your A 31 and disconnect the AC cord before making or changing any input, output or trigger wire connections. Inserting or removing an input or output cable while the A 31 and your preamp are turned on can result in a blast of sound that can damage your loudspeakers.

Rack Mounting Your Parasound A 31

To mount the A 31 into a 19" wide equipment rack, you must first attach its two “L” shaped rack mount brackets (included). With its four feet removed, the A 31 chassis and front panel height occupies four rack spaces (7" or 176 mm). When mounting equipment below the A 31, you will also need to allow about 1⁄8" below the unit for the bottom chassis screws.

To attach the rack mount brackets:

- Remove the three screws from each side of the A 31. These are arranged vertically, behind its front panel and in front of its first heatsink fin.
- Line up the three holes on each bracket with the three holes on the A 31 and reinsert the screws.
- Make sure the screws are tight because they will support the entire weight of the A 31 in the equipment rack.

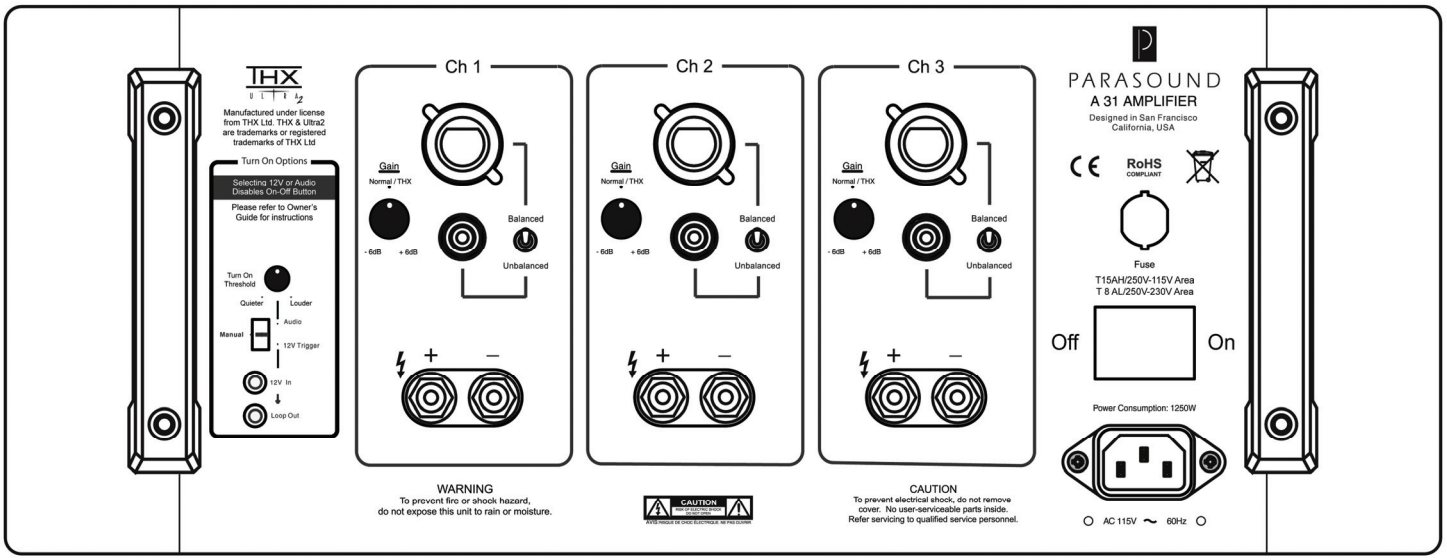


Note: Tighten each bolt just enough to keep the unit secure in the rack to avoid deforming the shoulder washers. Eliminating metal-to-metal contact reduces the likelihood of creating a ground loop that might introduce hum into your system.

A single standard rack space is 1-3⁄4" (44mm) high in a 19" wide equipment rack. This measurement standard was developed by the EIA (Electronic Industries Association) so manufacturers of electronic components and equipment racks could build products in standardized heights that would fit in a uniform space. Please call your Parasound dealer or Parasound Technical Services if you need additional advice about rack mounting the A 31.

Audio Connections

Always disconnect the AC cord to your A 31 before making or changing any input, output or trigger wire connections. Inserting or removing an input or output cable while the A 31 is turned on can result in a blast of sound that can damage your loudspeakers. Make sure there is no strain or tension on any cables that could cause them to pull loose.



Audio Input Connections

Balanced XLR Input Jacks

Balanced connections will give you the best sound. If your surround sound preamplifier has balanced XLR output jacks, we recommend that you connect them to these inputs. Refer to the Balanced and Unbalanced Lines in the Technically Speaking section for additional information about why we recommend using balanced lines.

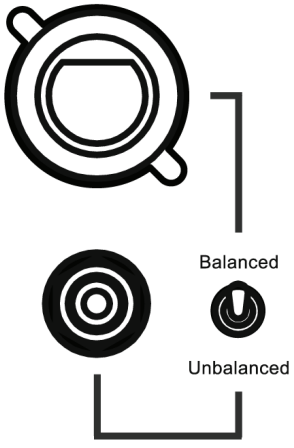
Unbalanced RCA Input Jacks

Use these inputs if your surround sound preamplifier doesn't have balanced output connections or if you simply prefer to use unbalanced connections.

Balanced/Unbalanced Selector Switches

Place the switch in the position for the input type you will be using.

Note: The Balanced/Unbalanced switches are not input selectors. Their function is to optimize the s/n ratio for each type of input. You should not connect both the Balanced and Unbalanced jacks at the same time with the expectation of switching between to different signals.



Balanced XLR Pin Configuration

The balanced inputs of the A 31 use XLR jacks that conform to the industry standard of:

Pin 1: Ground Pin 2: Positive (+) Pin 3: Negative (–).

Speaker Connections

Speaker Terminals

The A 31 speaker terminals accept speaker wires with banana plugs, spade connectors or bare wire. Refer to “Bare Wire Speaker Ends” in the Technically Speaking section for information about bare wire termination.

Correct Speaker Polarity is Important

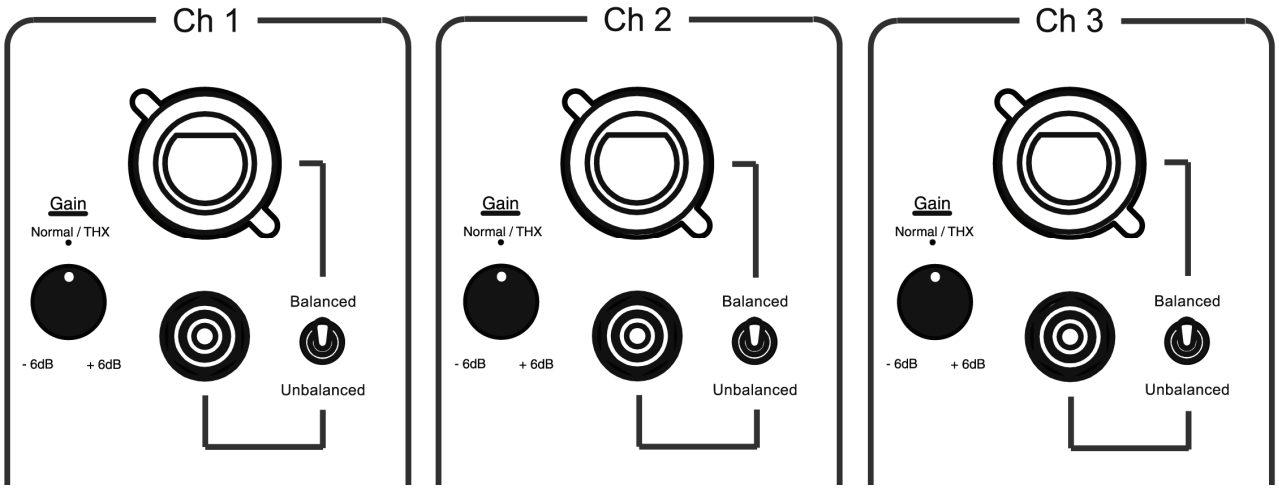
Polarity refers to + and – connections. Speaker wires are coded with color, printing or a ridge on the insulation on one of the leads so you know which lead was connected to the + and – terminals at the other end. This coding will help you keep the + and - polarity consistent for all channels. If some of the speakers are wired with incorrect polarity you will significantly affect sound quality.

Speaker Wire Length and Gauge (thickness)

When selecting speaker wire, follow these guidelines:

- Keep the length of your speaker wire as short as possible.
- Use the thickest wire practical. For lengths greater than 50 feet, use speaker wire with an AWG (gauge) of 14 or lower. The smaller the AWG number, the thicker the wire.
- Do not use speaker wire that is thinner than 16 AWG.
- Keep wire lengths for both channels as close to equal as possible.

Gain Control Settings



The Gain control knobs should be left at the 12 o'clock Normal/THX setting for most applications. When a Gain control knob is set to Normal the gain for that channel is 29. This is the THX Ultra2 Reference Level where 1V input = 28.28V output. (28.28V driving an 8Ω speaker equals 100 watts.) If you are unsure where to set the Gain control knobs it is best to start with them in the Normal position and only change them if needed, as described below.

When to Set the Gain Control Knobs Above or Below Normal

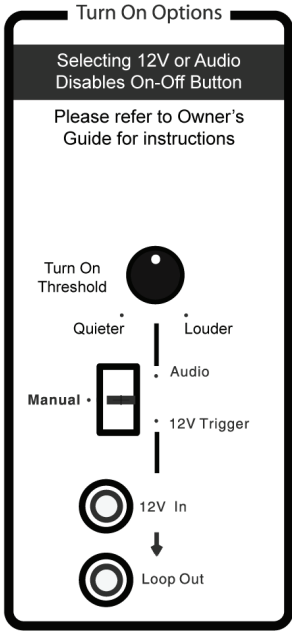
You can increase loudness by turning the Gain control knobs clockwise if your system will not play loud enough with the Gain control knobs set at Normal. This could be the case if your A 31 is driven from the pre-out jacks of an AV receiver (as opposed to an AV processor). We recommend advancing the gain as little as possible past Normal. As you increase gain settings you increase the chance of hearing a "hiss" sound from your speakers. You also run the risk of damaging your speakers (not to mention your hearing) if the volume level is too high.

The primary reason to reduce the gain below Normal would be if your speakers' efficiency is extremely high and your listening position is close to your speakers. Reducing the gain would reduce audible "hiss" from your speakers.

Don't worry about setting the A 31 Gain control to exactly the same levels for all channels because you can always balance the channel volume using the speaker level calibration in your home theater AV receiver or AV processor's setup menu.

Note: We recommend re-calibrating your AV receiver or processor's speaker levels after adjusting the A 31 gain controls.

Turn On Options



For convenience, there are three ways the A 31 can be turned on and off:

- ***Manually****, by pressing the On-Off (Power) button on the front panel.*
- ***Automatically****, when an audio signal is present at any of the audio Input jacks.*
- ***Automatically****, when a suitable trigger voltage is applied to the 12V input jack.*

> ***Note:*** When either automatic turn on option is selected the front panel On-Off button is disabled so that power on/off is determined solely by the triggering preamp, receiver or active audio signal.

Manual Position

When the Turn On Options switch is in its Manual position, the Turn On Options function is disabled and the A 31 must be turned on and off manually by pressing the On-Off button on its front panel every time you wish to use your audio system.

Audio Position (Automatic on/off)

When the Turn On Options switch is set to its Audio position, the A 31 will be turned on only when an audio signal is present at any of the Input jacks. After the audio signals cease the A 31 will remain on for about 8 minutes before shutting off. This prevents unintended turn-off during pauses in your music or movies.

> ***Note:*** The Audio position of the Turn On Options switch disables the front panel On-Off button.

Turn On Threshold

This knob sets the audio signal level required for the A 31 to automatically turn on when the Turn On switch is set to the Audio position. Fully counter-clockwise is the most sensitive setting and therefore is labeled "Quieter." Fully clockwise will require a higher audio signal voltage and is therefore labeled "Louder." In most systems the best results will be with the Turn On Threshold knob set towards the Quieter position. In some systems the A 31 might turn on if there is transient noise in the AC line, even when an audio signal is not present. Similarly, the A 31 might never shut off even after waiting more than 10 minutes. In this case, try setting the knob towards the Louder position.

> ***Note:*** When the Turn On Options switch is set to Audio the A 31 will turn itself on immediately when you connect its AC cord, even without any audio signal present. This is normal.

> ***Note:*** If the A 31 is driving only the sub(s), surround, center, or rear channels you will achieve more consistent automatic turn on by using the 12V DC trigger. At the beginning of most films the sub, center and surround levels are lower than the minimum level required by the Audio sensing circuit.

12V Position (Automatic on/off)

When the Turn On Options switch is set to its 12V position, the A 31 is turned on and off only with an external +9 V to + 12 V voltage from your preamp or AV Receiver. When the external voltage ceases the A 31 will turn off immediately. The 12V switch position disables the front panel On-Off button.

12 Volt Jacks

12V In Jack

The A 31 12V input uses a 3.5mm jack (mono). To use the 12V trigger, insert the trigger wire plug into this jack and the plug at the wire's other end into the AV receiver or preamp's 12V output jack. We have included a 3.5mm to 3.5mm trigger wire as well as a 3.5mm to 2.5mm trigger wire.

> ***Note:*** If the controller's trigger output is a + and – terminal, you can cut the 3.5mm plug off one end of the included trigger wire and attach the bare wires to these terminals. The lead with the white stripe on it corresponds to the plug's tip and the unmarked lead corresponds to the sleeve of the plug. The trigger plug tip is + (positive) and its sleeve – (negative).
>
> ***Note:*** The A 31 trigger circuit draws a negligible 15 mA. The total load on your preamp's trigger output(s) is the sum of the trigger current drawn by each of the components you've looped together. Check the maximum capacity of your AV receiver, processor or home controller's trigger outputs so you do not overload them by connecting too many power amplifiers. Typical ratings are 50mA to 100mA.

12V Loop Out Jack

The Trigger Out jack lets you loop or "daisy-chain" the incoming trigger voltage to an additional A 31 or another component(s).

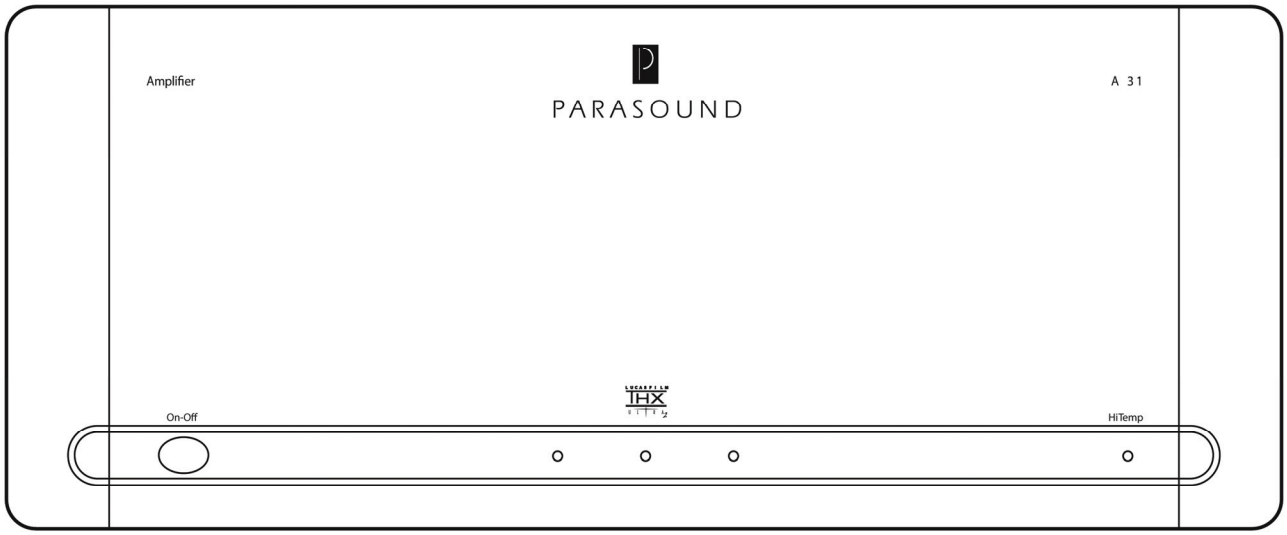
3.5mm vs. 2.5mm jacks

Some other Parasound power amplifiers and preamplifiers might use 2.5mm "sub-mini" trigger jacks. To use the A 31 with products that use a 2.5mm jack we have included a trigger wire with a 3.5mm plug at one end and a 2.5mm plug at the other end.

AC Power Cord

The IEC standard AC cord supplied with your A 31 is an audiophile-grade component. Please connect it directly to an AC wall outlet or power conditioner that is always "live." If possible, plug your A 31 into the same AC outlet that your preamplifier is plugged into. If different AC outlets are used for the A 31 and the preamplifier the ground potential may be higher or lower between the outlets, resulting in audible hum.

Front Panel Operation



On-Off Button

Push once to turn on the A 31. When the A 31 is turned on the blue glow around the On-Off button will be brighter, the red P badge will glow brighter and then the 3 channel indicators will illuminate blue. Push again to turn off the A 31. The front panel On-Off button will be disabled when the Turn On Options switch is set to Audio or 12V.

Whenever the A 31 is turned on, the soft blue glow behind its On-Off button will change to red for a few seconds as its internal circuits stabilize. Then the red glow is replaced by a brighter blue glow to indicate normal operation. If the glow remains red after turn on or while the amp is playing, it indicates activation of the A 31's protection circuits and no sound will be heard from the speaker.

The A 31 protects itself from external conditions such as excessive heat, load impedance that is too low, or a short-circuited speaker connection or wire. After you correct the fault, the A 31 will resume operation. If the A 31 remains "in protection" after it has cooled down and you've confirmed there are no external faults, it could indicate an internal problem. Please contact Parasound's Technical Service Department.

Channel Indicators

When all three blue channel indicators are lit, the A 31 is operating normally. If one or more of the indicators do not light even though the amp is turned on there is a fault in your system. In the case of a fault first check that there is no short circuit with your speaker wire or speakers.

Hi Temp Indicator

This indicator is near the right side of the panel recess. It will glow red if any channel overheats. The On-Off button will also glow red if the A 31 overheats. If such a condition occurs you must provide for better ventilation around the amplifier or check speakers for faulty operation that is causing the A 31 to over heat.

Technically Speaking

Balanced and Unbalanced Lines

Recording and broadcast studios use balanced connections exclusively because of their inherent ability to reject noise and hum, thus assuring the best sound. Certain high quality preamplifiers and surround controllers built for residential use utilize balanced connections with XLR jacks for the same reasons. All Parasound Halo series power amplifiers have balanced inputs with XLR jacks so you can take full advantage of their inherent noise reduction capability and superior sound quality.

Unbalanced connections with RCA jacks are found on all home audio equipment. RCA jacks and two-conductor wires are less costly than the additional circuitry, higher priced XLR connectors and three-conductor wiring required for balanced connections.

In an unbalanced line, the positive audio signal appears at the center pin of the RCA jack and the negative signal on the outer shield wire, which also functions as the ground connection. Unbalanced interconnect cables are vulnerable to hum from an AC line, or other noise, such as RF (Radio Frequency), which can be reproduced through your loudspeakers. Since the unbalanced line's ground also carries the audio signal, there is no way for the connected amplifier or preamplifier to distinguish between the audio signals you want and unwanted noise emanating from external sources.

Balanced lines are superior because they utilize separate conductors for audio and ground: two inner conductors carry the positive and negative audio signal, and a third outer wire connects the grounds and also shields the two signal conductors. When the positive and negative signals appear at the component receiving the signal they are equal, but 180 degrees out of phase with each other with respect to ground. To send and receive balanced signals requires special differential circuitry.

A differential input circuit amplifies only the difference between the positive and negative signals. For example, when a 1 Volt signal arrives at a balanced input stage, the differential input "sees" a positive 1 Volt minus a negative 1 Volt, or 2 Volts total. External hum and noise that somehow gets into a balanced line is common to both its positive and negative conductors with respect to ground. Therefore, it is canceled or rejected by the differential input circuit.

This phenomenon of rejecting noise signals common to both positive and negative conductors is called common mode rejection. Differential inputs are specified according to how well they reject signals common to both conductors. This is measured in dB and is called the common mode rejection ratio or CMRR.

Ground Loops - Eliminating Hum and Buzz

Audible hum and buzzing noises in a system are usually related to issues with the component grounds. Ground (sometimes called common) is a point of reference for voltages in virtually all audio and video components. Ground is supposed to remain at zero volts while the audio signal swings positive (voltage above ground) and negative (voltage below ground). If ground isn't at zero, there can be an audible 60 Hz hum (or 50 Hz hum in regions with 50 Hz AC). The harmonics of these frequencies (120 Hz, 240 Hz, 480 Hz or 100 Hz, 200 Hz, 400 Hz) may add buzz in addition to the hum.

The ideal of zero voltage ground for all the components in a system is practically impossible, because some resistance between the ground points of different components is inevitable. By keeping components close together with their power cords plugged into a common AC outlet or power strip, you'll avoid the problems created by resistance in the house's wiring.

Hum and buzz is also caused when unwanted voltage flows through multiple component ground points called ground loops. Here are three tips to avoid ground loops:

1. Your Cable TV or Satellite receiver box might require a Cable TV ground isolator.

2. Use balanced input lines with your Parasound A 31. (See Balanced and Unbalanced Lines in this section).

3. When rack mounting, always use the insulated “shoulder” washers. These break the ground loops caused by metal-to-metal contact between the rack, the components, and their rack-mount bolts. Extra washers are available from rack manufacturer Middle Atlantic Products, www.middleatlantic.com.

Bare Speaker Wire Ends

If you plan to use connections with bare wire ends, use a wire stripper to remove just enough insulation to expose a 1⁄2" (13 mm) length of bare wire. You can insert the stripped wire into the hole that goes sideways through the terminal’s metal post. Before inserting the wire, twist its bare strands to prevent any of the strands from making contact across the two speaker terminals. If you have a soldering iron, you can “tin” (apply a small amount of molten solder) to each stripped bare wire to prevent it from unraveling, fraying and oxidizing.

Parasound A 31 Design Overview

Circuit Designed by John Curl

Parasound design consultant John Curl has been a legend among audiophiles and electronic engineers for decades. He pioneered measurements to correlate musical accuracy with the materials used in parts, worked with world-class touring companies, has designed highly coveted audio classics, including the original Mark Levinson JC-2, Denneson JC-80, Vendetta Phono Preamplifier, and CTC Blowtorch preamplifiers; master recorders for Wilson Audio and Mobile Fidelity; and the mixing consoles used in live concerts by The Grateful Dead and the Montreux Jazz Festival in Switzerland.

As our featured amplifier designer since 1990, he has created many products that have earned Parasound worldwide acclaim. John is particularly proud of what he and Parasound have accomplished together: “The circuits I design for Parasound are extremely sophisticated and are typical of products that are far more expensive. I can’t think of any other audio products that offer nearly as much bang for the buck.”

Parts Selection

Every part within the A 31 is carefully chosen for its accuracy and reliability. Metal film resistors with 1% tolerance are selected for their precision and because their values don’t drift as they heat up during operation. Polypropylene and mica capacitors are used extensively for their superior linearity and low dielectric absorption. Semiconductors are selected for superior performance in their specific roles in the circuit. Gold has the best conductivity of any metal, so we use high quality gold-plated input connectors and speaker terminals. The double-sided circuit boards are FR4 glass epoxy for long-term durability. The chassis is made of heavy gauge steel to safely house the internal circuitry. This attention to detail when selecting parts makes the difference between a very good amplifier and an outstanding amplifier.

The Power Supply

The heart of the power supply is a 1.5 kVA toroid power transformer, chosen for its efficiency, low hum field, and high power rating. Encapsulating this massive power transformer in an epoxy-filled steel canister assures ultra-quiet performance.

The A 31 power transformer employs multiple independent secondary windings so that each amplifier channel has its own power supply, assuring more than ample DC voltage at all

times and under all conditions. It also reduces inter-channel crosstalk that can blur the sound and impair the correct sense of where instruments, dialogue and effect are positioned.

Each channel's +/- 80 Vdc B+ and B- supply rails use high-speed rectifier diodes and four enormous 8,200 uF electrolytic filter capacitors, chosen for their low Equivalent Series Resistance (ESR) and dielectric absorption. In addition, these filter capacitors are bypassed with smaller polypropylene capacitors to reduce AC ripple in the DC supply and to further eliminate noise and interference that is generated in AC power lines from computers and other appliances in the home.

Relay-Bypassed Soft Start Circuit

When the A 31 is first turned on, there is a significant amount of in-rush current required to charge the enormous power supply capacitors. In order to suppress this in-rush current and to prevent nuisance tripping of circuit breakers, we employ NTC (negative temperature coefficient) resistors. These resistors cut the in-rush current by approximately 50%. Once they heat up, they essentially become a jumper with zero ohms resistance. However, the A 31 goes one step further for this circuit. After the NTC resistors have done their job of suppressing in-rush current a gold contact relay automatically is activated to jump across the NTC resistors to completely bypass them. This extra step insures that the resistors do not restrict any current whatsoever to the power supply once the A 31 is in full operation.

Audio Circuit Path Topology

Parasound's circuit topology is a hybrid of carefully chosen discrete transistors that result in superior performance at each stage. We use JFETs (Junction Field Effect Transistors) for the input stage; MOSFETs (Metal Oxide Field Effect Transistors) for the driver stage and bipolar transistors for the output stage. Discrete transistors are more sonically accurate than integrated circuits commonly used by other brands.

Complementary Configuration

Each stage of amplification has transistors fed by the positive DC power supply and complementary transistors fed by the negative DC power supply. Thus, half of the devices amplify the positive half of the musical waveform while the other half of the devices amplify the negative half. This complementary topology is inherently linear, which reduces distortion and improves sonic accuracy.

The Input Stage

The A 31's input stage uses matched pairs of discrete JFETs arranged in a differential configuration. JFETs are ideal for the input stage because their inherently high impedance is unaffected by the impedance of source components. Differential configuration provides superior noise reduction. These precision input JFETs are also cascaded to produce the current necessary to drive the MOSFET drivers in the following stage.

The Driver Stage

The driver stage provides critical amplification for which we employ a complementary matched pair of MOSFETs selected for their tube-like sonic qualities. MOSFETs tend to generate less odd-order harmonic distortion than bipolar transistors. This is important because odd-order distortion sounds unnatural and fatiguing to the human ear, whereas even-order distortion is less offensive because it is consonant, rather than dissonant. Our MOSFET driver stage prevents the harshness and brittle sound so often found in other solid state amplifiers.

The Output Stage

The amplifier's sonic characteristics are established by its input and driver stages. Now, the sole job of its output stage is to deliver the enormous current and voltage from its power supply to the speakers. Bipolar output transistors are better than MOSFETS in the output stage because of their higher safe operating area (SOA) and inherent ruggedness. Each channel's output stage employs four pairs of high current (15-ampere) bipolar transistors to insure long-term reliability, even with continuous high power operation and challenging speaker loads. Lightning-fast (60 MHz) transistors respond instantly to complex demands in the musical signal, virtually eliminating distortions that occur with slower transistors. Slew rate limiting and Transient Intermodulation Distortion (TIM) are simply not an issue in the A 31.

Class A-A/B Operation

Pure class A operation provides the purest sound. However, an amplifier operating entirely in class A operation would be enormous, highly inefficient, and generate too much heat. Class A/B combines some of the advantages of Class A with the efficiency of Class B operation. It is a compromise that reduces the heat generated in pure class A operation and the odd-order harmonic distortion created in class B. In class AB, the driver and output stages are always partially turned on, which provides a nominal amount of pure class A operation. At higher power levels, when the musical waveform swings from positive to negative and vice versa, each bank of transistors is allowed to rest momentarily. This resting, or quiescent time, makes it possible to deliver high amounts of power without overheating. It also makes it possible to use passive cooling and avoid fans, whose noise can be heard over the music. The A 31 input and driver stages employ pure Class A while its output stage operates with higher pure Class A power than many amplifiers selling for twice or three times its price. The result is less fatiguing, more natural sound.

Total Protection - DC Servos

Direct Current (DC) burns out speakers. Every power amplifier must have some way to insure that DC from its power supply never reaches its + or - speaker terminals. Most amplifiers simply use trim controls to reduce their DC offset or capacitors to block DC. Unfortunately, trim controls can allow DC offset to increase over time, and even the most expensive capacitors in the audio signal path will "veil" sonic clarity and attenuate bass response.

Parasound power amplifiers incorporate ingenious and fast-acting DC servo circuits, completely eliminating the need for coupling and blocking capacitors. The A 31 is direct (DC) coupled from its input jacks to its speaker terminals. This advanced circuitry never needs adjustment or maintenance. It operates outside the audio signal path to keep the DC offset at the output of the A 31 at a constant 0.00 Vdc. The results are startling clarity, freedom from listening fatigue, and formidable bass response.

Total Protection - Relays

Each channel of the A 31 has a high-quality protection relay with gold-plated contacts for long-term reliability. These relays function to protect either the amplifier, the speakers, or both. When the A 31 is first powered on, these relays remain open for three seconds as the positive and negative power supplies stabilize and reach equilibrium. This prevents annoying popping or other transient noises. Relay protection also prevents damage to your speakers in case of a catastrophic amplifier failure. Any amplifier that doesn't use relay protection for its speaker outputs compromises the safety of the amplifier and your speakers.

Total Protection - Current Overload

Specialized current-sensing transistors are connected to the output stages of the A 31 to constantly monitor the current flow through the output transistors. If the current drawn by this stage exceeds a predetermined safe level due to a load impedance below 1 ohm or a short circuit at the speaker terminals, the output relay will open immediately to prevent any of the output transistors or other parts from failing.

Total Protection - Fuses

Each channel of the amplifier has a separate fuse for its positive and negative DC voltage rails. These fuses provide backup protection in case the over-current protection does not work in time, or if an internal part fails. In the event of a part failure, these fuses halt operation to minimize damage to additional parts.

Problems and Remedies

Unit will not turn on

- Check the setting of the Turn On Options switch. (The front panel On-Off button will be disabled if the switch is set to Audio or 12V)
- If using Audio Turn on, try increasing the sensitivity of the audio trigger by turning the audio threshold knob to the “Quieter” position.
- Check that the AC power is live.

No sound from speakers

- Check that input cables and speaker wires are secure at both ends.
- Make sure the surround preamp is switched to the correct input.
- Is the Hi-Temp light illuminated? All three blue channel indicators should be illuminated. Check for excessive temperature, short-circuited speaker wires, low impedance speaker load, and inadequate ventilation.

Background Hum or Hiss

- Move audio cables and AC cords away from each other.
- Try different routes for the audio cables and AC cords.
- Make sure insulating shoulder washers are used if unit is rack mounted.
- If you have cable or satellite TV, try disconnecting the incoming TV or satellite cable; if hum is eliminated you will need a Cable TV Ground Isolator or contact your TV service provider for assistance.
- Try turning down the input gain controls

Overheating

- Remove any nearby external sources of heat such other audio equipment or heaters.
- Increase ventilation around the A 31.
- Check speakers for faults

Are You Having Difficulty?

Repair or Service

Call your Parasound dealer first. If the dealer can't help you with your problem we encourage you to call Parasound's Technical Service Department at **415 397 7100**, Monday - Friday, 8am - 4pm Pacific Time. We can suggest other diagnostic tests you can easily perform. If we determine that your A 31 should be returned to Parasound or an Authorized Parasound Warranty Center for inspection and possible servicing, we will provide the location of a warranty center near you or shipping instructions for the unit's return to Parasound.

Before You Return Any Unit to Parasound for Service

Before you send your unit to Parasound, you will need to obtain a specific Return Authorization (RA) number and shipping instructions from Parasound's Technical Department. The RA number must be clearly marked on the outer carton. Use the original factory packing materials and arrange adequate insurance to cover its value. You must include a copy of your purchase receipt, since this document establishes the validity of this unit's warranty. Warranty repairs are only performed by Parasound or Parasound Authorized warranty centers when your purchase receipt is from a Parasound Authorized Dealer or Parasound Authorized Reseller.

Shipments Will Be Refused by Parasound Under the Following Conditions:

1. Unit was sent without the Parasound-assigned RA number marked on the carton.
2. Unit was sent in an unsuitable shipping carton and packing inserts and is likely to have been damaged in transit.
3. Unit has inadequate packing materials and is likely to have been damaged in transit. Wrapping the A 31 with bubble wrap will not protect it during shipment.
4. Unit was shipped collect for shipping charges. We do not accept collect shipments.
5. Unit was shipped via the US Postal Service.
6. Unit was sent to an address other than the address instructed by our Technical Department.

Warranty Repair

Please read your accompanying Parasound Limited Warranty carefully to understand the applicable rights and limitations. This section provides instructions for obtaining repairs, both for units covered under the Parasound Limited Warranty and for units or situations which are outside the Warranty. The complete warranty can be found at www.parasound.com.

Unit is not eligible for repair under the terms of the Parasound warranty if:

1. Unit was not purchased from a Parasound Authorized Dealer.
2. You do not have the original bill of sale or sales receipt from a Parasound Authorized Dealer.
3. You are not the original owner. The Parasound warranty is not transferable.
4. Unit's serial number was removed, modified, or defaced.
5. Unit shows evidence of abuse and/or misuse.
6. Unit was modified in any way.
7. A prior repair was attempted by an unauthorized repair station.

Specifications

Power Output - All Channels Driven
250 watts RMS x 3, continuous,
(20 Hz - 20 kHz, 8Ω)
400 watts RMS x 3, continuous,
(20 Hz - 20 kHz, 4Ω)

Current Capacity:
60 amperes peak per channel

Slew Rate
> 130 volts per microsecond

Frequency Response
5 Hz - 100 kHz, +0/-3 dB at 1 watt

Total Harmonic Distortion
< 0.2 % at full power
< 0.03 % at typical listening levels

IM Distortion
< 0.04 %

TIM
Unmeasurable

Dynamic Headroom
> 1.5 dB

Interchannel Crosstalk
> 78 dB at 1 kHz
> 63 dB at 20 kHz

Input Impedance
Unbalanced: 47k Ω
Balanced: 94k Ω per leg

Input Sensitivity for 28.28 V Output into 8Ω
Unbalanced: 1 V
Balanced: 1 V per leg
(Gain controls set to Normal / THX)

S/N Ratio
> 112 dB, input shorted, IHF A-weighted
> 102 dB, input shorted, unweigh

Damping Factor
> 1100 at 20 Hz

DC Trigger Requirements
+9 Vdc to +12 Vdc, 2 mA

Audio Trigger Requirements
2 mV AC - 10 mV AC

XLR Pin Identification
1 = Ground (Shield)
2 = Positive
3 = Negative (Return)

Dimensions
Width: 17½" (445 mm)
Panel height: 7" (178 mm)
Height with feet: 7 5⁄8" (194 mm)
Depth: 19 1/8" (485 mm)

Net Weight
65 lb. (29.5 kg)

Shipping Weight
79 lb. (35.9 kg)

Power Requirement
Standby: 1 Watt
Maximum: 1800 Watts

Specifications and features subject to change or improvement without notice.

Rev. 1.0

www.parasound.com

PARASOUND

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