

TRINAURAL PROCESSOR

USER MANUAL



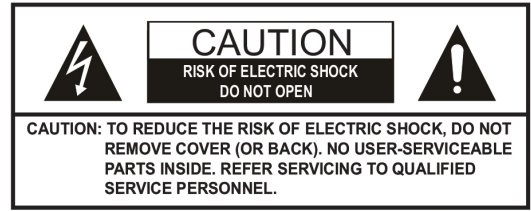
What's Included

- Trinaural Processor
- User Manual
- Detachable power cable

Important Safeguards

- All the safety and operating instructions should be read before this product is operated.
- The safety and operating instructions should be retained for future reference.
- All warnings on the appliance and in the operating instructions should be adhered to.
- Follow all instructions.
- The appliance should not be used near water or moisture – for example, in a wet basement or near a swimming pool, and the like.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding plug. A polarized plug has two blades with one wider than the other. A grounding plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at the plugs, convenience receptacles, and at the point where they exit from the apparatus.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way such as the power cord or plug is damaged. Other damage may occur if liquid or objects have been dropped or spilled into the apparatus. Dropping the apparatus, exposure to rain, and excessive moisture may cause additional damage.
- Keep the unit in a well ventilated environment.
- CAUTION: These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.
- WARNING: To reduce the risk of electric shock, do not expose this apparatus to rain or moisture. The apparatus shall not be exposed to dripping or splashing and that objects filled with liquids, such as vases, shall not be placed on apparatus.
- WARNING: The mains plug/appliance coupler is used as disconnect device, the disconnect device shall remain readily operable.
- The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of non-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

- No naked flame sources, such as lighted candles, should be placed on the apparatus.
- **WARNING:** The terminals marked with symbol of “+/-“ may be of sufficient magnitude to constitute a risk of electric shock. The external wiring connected to the terminals requires installation by an instructed person or the use of ready made insulated leads or cords.



- **Correct Disposal of this product.** This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.



- **Keep your packaging!** It is custom made for your unit and will effectively protect it for possible future use.
- **Be sure to register your product.** It is very important to complete the warranty registration form located on our website. Complete and submit the form within 30 days of purchase to activate your warranty.

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Introduction

Human hearing processes sonic information by direction, distance and recognition. Where a typical stereo system falls short is the first of these: direction. The second and third items become redundant if direction is not satisfied. If the main goal of sound reproduction is the “you are there” or “it is here” factor, then recreating correct and proper directional cues is paramount since they are the primary source of the illusion of reality in the acoustic presentation. The importance of this facet further increases because vision is not part of the equation.

The Trinaural Processor was invented by Jim Bongiorno to address this directional deficiency (and thus lack of realism) inherent in all music systems based on two channels (ie stereo). According to Jim’s research, there is very little absolute left or right information in the real world. The sonic panorama is shaped more like a large arc across the soundstage, wherein the most important information comes from the center. Thus for truly “live” sounding acoustic reproduction, it’s essential to have a center channel as part of the listening experience.

The technical hurdle was how to properly integrate a center speaker. To simply add a summed center channel wouldn’t work because normal power levels are not created to accommodate three channels and moreover, things would sound odd. **Proper implementation requires re-vectorization of the composite stereo information for three channels.** The Trinaural Processor was created for this purpose, and the end result is that center information comes primarily out of the center channel and very little comes out of the right or left. Additionally, the cross-coupled error information present in every stereo configuration is virtually eliminated.

Another important technical note is that the Trinaural Processor is a linear, completely analog device with no digital processing. The Trinaural also has a bypass switch which allows you to connect your home theater pre/pro/receiver as a pass-through, enabling you to use your two-channel preamplifier for music reproduction without having to go through the Trinaural. So get ready—listening to music will never be the same again!

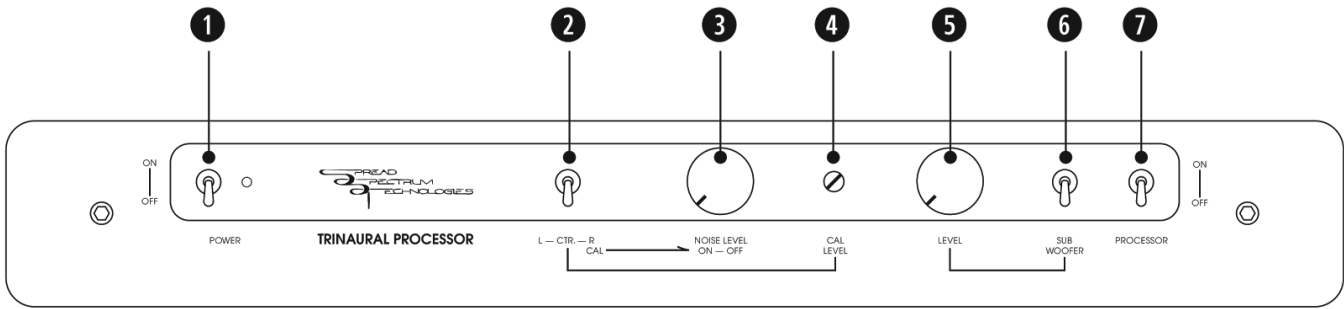
We hope you enjoy your new Trinaural.

Noteworthy Features

The Trinaural is a revolutionary device in many ways. Below are some highlights.

- CES “Best of the High-End” Award and Stereophile Magazine “Class A” Recommended Component
- Creates a more real, live sounding experience than any traditional two-channel system can
- Completely analog processor; no digital processing whatsoever
- Home theater bypass
- Subwoofer-out with built-in crossover and level control
- Balanced design
- XLR and RCA inputs and outputs
- Compact chassis

Front Panel Overview



- 1. Power switch**
- 2. L-CTR-R switch**
With NOISE LEVEL ON – OFF turned on, toggle this switch between Left (L), Center (CTR) and Right (R) to hear the generated white noise through your front three speakers
- 3. NOISE LEVEL ON – OFF knob**
Turn to click on and generate white noise for which to evaluate sound pressure levels from your speakers
- 4. CAL LEVEL screwdriver adjustment**
Rotate to adjust and calibrate the sound pressure level from the center speaker to match the level from the left and right speakers
- 5. LEVEL knob**
Adjusts the subwoofer level, provided a subwoofer is connected
- 6. SUBWOOFER switch**
Activates the subwoofer high-pass filter
- 7. PROCESSOR switch**
Toggle this switch on or off to engage or disengage the Trinaural from your system. When the PROCESSOR switch is “off”, home theater bypass functionality is activated, allowing all inputs to “pass through” the Trinaural.

System Setup

Trinaural Setup

Refer to the “Connections” section for diagram. The Trinaural can be integrated into your existing audio system between source and preamplifier or between preamplifier and power amplifier. Be sure all components are off before making any connections. A note on balance control: When using the Trinaural, your stereo balance control will no longer function in the normal manner. It is therefore critical that the left to right balance be adjusted before the Trinaural is installed and calibrated.

Inputs

Connect your source main left/right outputs to the left/right inputs labeled PROCESSOR INPUT. If you have a 5.1 multichannel source, connect the other outputs to the left (rear), right (rear), center and subwoofer inputs labeled 5.1 INPUTS.

Outputs

Balanced XLR output jacks have been provided for all outputs (left, right, center and subwoofer). Standard RCA outputs are also provided for single ended operation. In addition, both the center channel output and the subwoofer output have RCA jacks for both polarities: “+” and “-” phases.

Subwoofer Connection

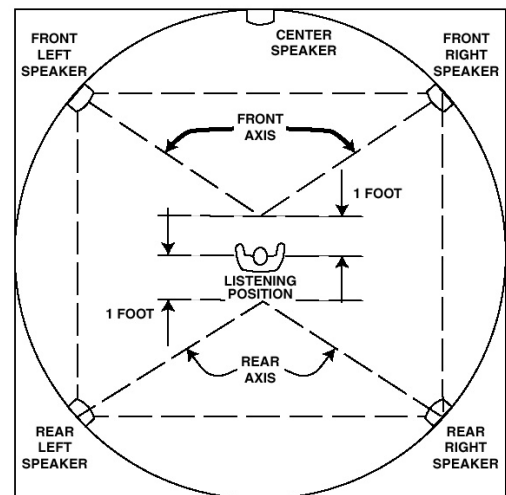
If you are using a subwoofer, connect it via the SUBWOOFER XLR or RCA output jacks. The Trinaural has a built-in crossover set at 80Hz. The crossover is phase equalized and 2nd order. Use the LEVEL knob on the front panel to adjust the subwoofer level. Note that the subwoofer output is always active. The front panel SUBWOOFER switch merely activates the high-pass function—intended for those who are using satellite speakers which cannot handle much low frequency energy.

Speaker Setup

Refer to the diagram at right for visual aid (the rear speakers are not required and are purely optional). There are three critical points to understand about speaker setup:

1. The speakers must be placed dimensionally in order for the “time of arrival” of all sounds to be precisely correct.
2. The angles must coincide properly.
3. The acoustic levels must be calibrated.

The best way to begin is to try to arrange your listening setup in a perfect square. Even if your room is longer in the listening direction, try to center the speaker setup to achieve this.



The ideal setup should have the left, right and center speakers in the front as shown. The correct angles of location for the right and left speakers is approximately 45° off-center but still located on the arc of the circle. This is extremely important as the distance to the point where all three speaker axis cross must be the same. As shown, this axis point should be about 1 foot in front of your sitting position. It is also recommended that you position the height of your speakers at least to ear level, or a little above. Secondly, we recommend that your center channel speaker is of at least the same quality as your left and right speakers, if not of better quality.

Preparation and Usage

After setting up your new system but before turning it on, be sure that the CAL-LEVEL control is turned all the way down (to the left). Turn your audio system on but do not play any music. Now, turn the NOISE LEVEL ON – OFF knob so that you feel a click and the noise generator has been engaged. Ensure the L-CTR-R switch is in the CTR (center) position. You should hear broadband white noise coming only from the center speaker. Now, use the L-CTR-R switch to toggle to the left or the right channel. You should now hear noise only from the right or left speaker, depending on which you chose. As you toggle through the speakers, you will probably hear more noise quantity from the right and left speakers than from the center speaker. If the noise level is too low to hear, carefully turn up the NOISE LEVEL ON – OFF knob. Be careful, however. Noise is very powerful; you don't want to inadvertently damage your speakers. Now, carefully adjust the CAL LEVEL control with a flathead screwdriver so that the noise is the same level coming from the center compared to the right or left. You may want to use an SPL meter for this. Your system is now calibrated.

The Learning Curve

When presented with a new listening paradigm that replaces the one you're familiar with, you will, in effect, need to relearn how to listen. Patience, time and open-mindedness are the keys to success when first using the Trinaural, as well as a willingness to reconfigure your system. It is important not to compare the Trinaural system with your old stereo system as this will just lead to confusion. Approach the Trinaural experience with a fresh outlook.

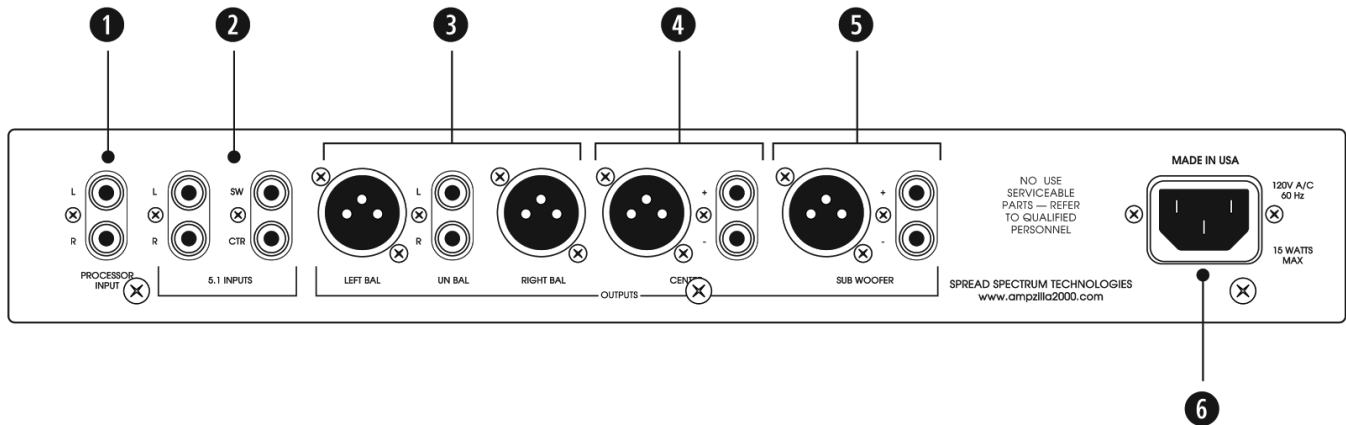
Our human hearing is "leading tone sensitive" – a musical term. It means that our hearing tends to primarily identify higher frequencies. For example, in listening to a group of moving chords, our hearing will identify the top note of each chord as the melody. Because of this, your initial listening observation with the Trinaural system might be that the overall sound quality is a little "hot" or strident in the higher frequencies. Additionally, you might also observe a "center-heavy" quality to the presentation. These initial observations might tempt you to turn down the level of the center speaker. Please refrain from doing this. Realize that these odd perceptions are due to the introduction of a center speaker, and that you are experiencing entirely new informational cues from the new center channel.

It may take a week or two to become acclimated to your new setup. After conditioning however, and provided that your system has been properly set up and calibrated following this User Manual, the rewards can be astonishing and more "real" sounding than you've ever experienced. You will be continuously surprised at the level of detail, clarity and realism unlike anything you've experienced before.

Further thoughts:

- An interesting effect that was noticed during our listening sessions is that lesser quality speakers tended to sound much better than they did in a normal stereo configuration. This is because the sound field has been opened up to such a degree as to make the speakers more transparent and therefore less obvious.
- Those of you that may want to have a dual setup (also using rear speakers for certain recordings) should use amplifiers that have level controls so that the levels can be precisely matched to the front setup. This way, you don't have to recalibrate every time you switch from front to rear. The calibration technique is however, exactly the same for the rear speakers. Why would you want to use rear speakers under certain circumstances? Some live recordings may produce an effect that puts you right in the middle of the audience when using the Trinaural. When properly calibrated however, ALL of the musical information will still emanate from the front, even though the left and right speakers are behind you. This is because the front center speaker is always dominant.

Connections



1. PROCESSOR INPUT

Main left/right (stereo) source inputs.

2. 5.1 INPUTS

Intended for use with a multichannel source. Connect main left/right outputs to PROCESSOR INPUT (above) and the remaining outputs (left rear, right rear, center and subwoofer) to the 5.1 INPUTS.

3. LEFT BAL, UN BAL, RIGHT BAL Outputs

Balanced and unbalanced left and right channel outputs to preamplifier or amplifier, depending on where the Trinaural is integrated into your system.

4. CENTER Output

Balanced and unbalanced center channel output to preamplifier or amplifier, depending on where the Trinaural is integrated into your system. Note the RCA jacks are not for left/right but are marked "+" and "-" for positive or negative phase connection. Typically you would use the "+" (positive) output.

5. SUBWOOFER Output

Balanced and unbalanced subwoofer output to preamplifier or amplifier (or directly to subwoofer), depending on where the Trinaural is integrated into your system. Note the RCA jacks are not for left/right but are marked "+" and "-" for positive or negative phase connection. Typically you would use the "-" (negative) output. This will cause the subwoofer to be out of phase with the center channel, which was Mr. Bongiorno's intention. Feel free to experiment with either the "+" or "-" output to determine which sounds best to you.

6. AC Input

Be sure to observe proper voltage for the AC cable.

Specifications

Input Impedance	50k
Maximum Output Voltage	11V RMS unbalanced; 22V RMS balanced
Output Impedance	47 Ω
THD (Awt)	.001% max 20Hz-20kHz 4V out
Dimensions	6 1/2" L x 17 3/8" W x 2 3/4" H
Weight	6 lbs.

Warranty Coverage

Spread Spectrum Technologies' warranty obligations are limited to the terms set forth below:

Spread Spectrum Technologies, as defined below, warrants this Spread Spectrum Technologies–branded hardware product against defects in workmanship under normal use for a period of FIVE (5) YEARS from the date of retail purchase by the original end user purchaser ("Warranty Period"). If the product has been transferred from the original owner to a second hand owner it has a ONE (1) YEAR warranty, valid from the original date of purchase by the original owner. **If a hardware defect arises and a valid claim is received within the Warranty Period, at its option, Spread Spectrum Technologies will either (1) repair the hardware defect at no charge for labor (the price of parts is not included), using new or refurbished replacement parts, or (2) exchange the product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product.** Spread Spectrum Technologies may opt that you replace the defective parts with new or refurbished user-installable parts that Spread Spectrum Technologies provides in fulfillment of its warranty obligation. A replacement product or part, including a user-installable part that has been installed in accordance with instructions provided by Spread Spectrum Technologies, assumes the remaining warranty of the original product or ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you. When a product or part is exchanged, any replacement item becomes your property and the replaced item becomes Spread Spectrum Technologies's property. Parts provided by Spread Spectrum Technologies in fulfillment of its warranty obligation must be used in products for which warranty service is claimed. When a refund is given, the product for which the refund is provided must be returned to Spread Spectrum Technologies and becomes Spread Spectrum Technologies's property. **Any shipping charges are the responsibility of the owner.**

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Obtaining Warranty Service

Please access and review the resources referred to in the documentation accompanying this hardware product before requesting warranty service. If the product is still not functioning properly after making use of these resources, please contact the Spread Spectrum Technologies representatives or, if applicable, an Authorized Service Provider/dealer using the information provided on the Spread Spectrum Technologies website. A Spread Spectrum Technologies representative or an Authorized Service Provider will help determine whether your product requires service, and if it does will inform you how Spread Spectrum Technologies will provide it. Spread Spectrum Technologies or its Authorized Service Providers will provide warranty service on products that are tendered or presented for service during the Warranty Period, as permitted by law. Spread Spectrum Technologies is not responsible for freight charges to or from our facility for warranty repairs. In accordance with applicable law, Spread Spectrum Technologies may require that you furnish proof of purchase details and/or comply with registration requirements before receiving warranty service. For more details on this and other matters on obtaining warranty service contact your dealer. Recovery and reinstallation of system and application software and user data are not covered under this Limited Warranty.

Service

In the unlikely event there is a problem with your Spread Spectrum Technologies component, please contact your dealer, distributor, or Spread Spectrum Technologies to discuss the problem before you return the component to our manufacturing facility for repair. Products shipped to the factory will be refused and returned freight collect if not accompanied by a Spread Spectrum Technologies Service Department issued return authorization number (RA Number). Return authorization numbers must be prominently displayed on the outside of the box and an accompanying letter describing the problem and re-listing the RA number must be inside the box to qualify for service.

To contact the Spread Spectrum Technologies Service Department:

Telephone: 1-805-466-9973

Fax: 1-805-462-8962

Email: support@sst.audio

Website: <http://www.sst.audio>

Once service has been approved, please follow the following procedure:

1. Fill out the Service Request form located on our website and be sure to document all details.

2. If service is approved we will issue a Return Authorization Number (R/A number) from the Spread Spectrum Technologies Service Department. Be sure to confirm the current shipping address.
3. Insure and accept all liability for loss or damage to the product during shipment to the SST facility and ensure all freight (shipping) charges are prepaid.

The product may also be hand delivered to the California facility if arrangements with the Service Department have been made in advance. Proof of purchase from an authorized Spread Spectrum Technologies dealer, distributor or agent will be required for warranty validation at the time of hand delivery. Use the original packaging to ensure safe transit of the product to the factory, dealer, or distributor. Spread Spectrum Technologies may, at its discretion, return a product in new packaging and bill the owner for such packaging if the product received by Spread Spectrum Technologies was boxed in non standard packaging or if the original packaging was damaged to the point it was unusable. If Spread Spectrum Technologies determines that new packaging is required, the owner will be notified before the product is returned. To purchase additional packaging, please contact your authorized Spread Spectrum Technologies dealer, distributor, or the Spread Spectrum Technologies Service Department for assistance. If you did not purchase the product directly from us and require service please contact your dealer or distributors' service department for information regarding service.

If you feel your authorized dealer or distributor is either unwilling or unable to service your Spread Spectrum Technologies products, please contact our service department by emailing support@sst.audio or calling by phone to discuss and resolve the situation.



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