HSU RESEARCH

Instruction Manual

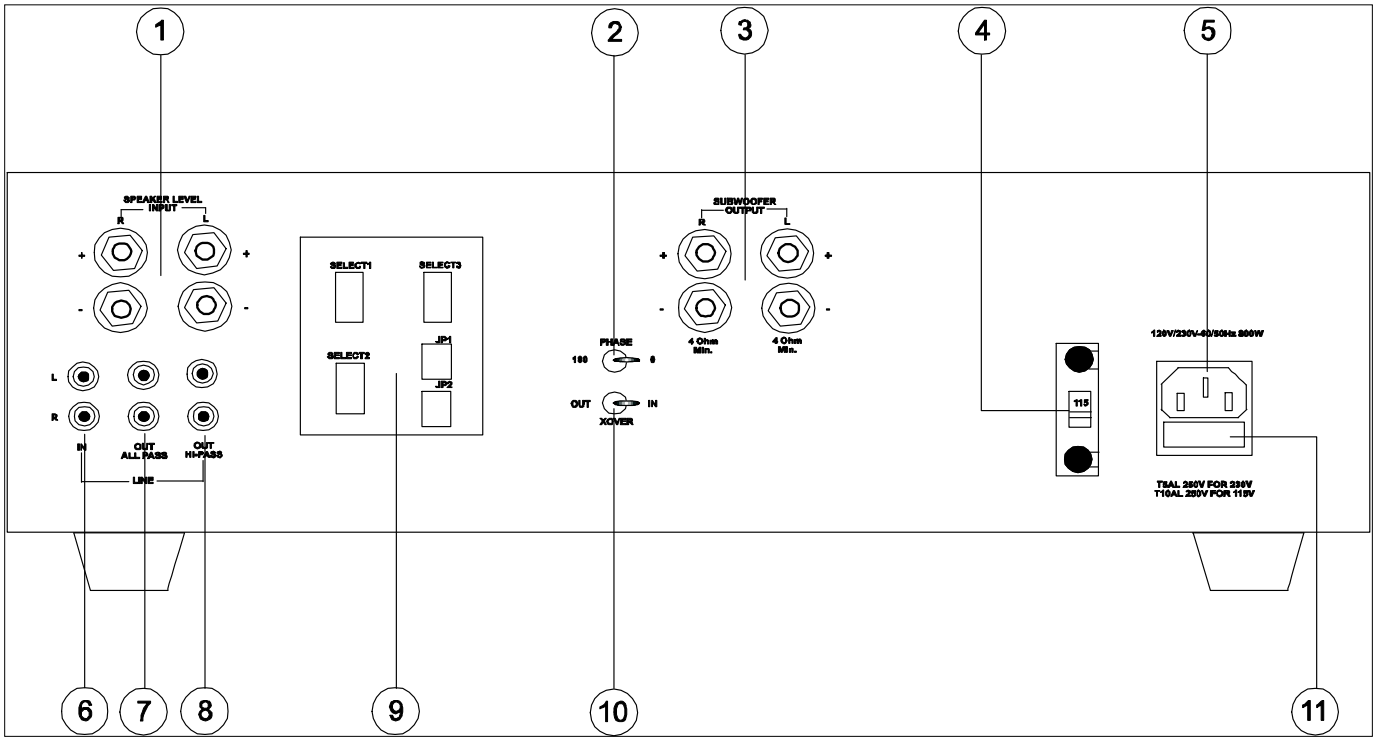
500-Watt Amplifier

Table of Contents

Introduction

Congratulations! By purchasing our 500-Watt amplifier for your Hsu Research Subwoofer, you have chosen one of the best subwoofer and amplifier combinations in the market. Our amplifiers have been optimized to yield the highest performance attainable from our subwoofers so you can be assured that your experience with our product will be a pleasant one. Before beginning to enjoy your new amplifier, please read through this manual to familiarize yourself with all of the features of the 500-Watt Amplifier.

Rear Panel



1. Speaker Level Inputs: For connecting to a system that does not have line level outputs available.
2. Phase Switch: For switching the phase of the subwoofer with respect to the main speakers. See page 6 for details.
3. Subwoofer Outputs: For connecting the amplifier to the subwoofer(s).
4. Voltage Selector: For setting the amplifier to run on 115V or 230V. (For dual-voltage versions)
5. Power Cord Jack: For connecting the amplifier to your AC outlet.
6. Line Level Input: For connecting to systems with sub-out or pre-amp outputs.
7. Line Level All Pass Output: Full range output for daisy chaining.
8. Line Level High Pass Output: For connecting to your main amplifier when you want to keep the low frequencies out of the main speakers.
9. Crossover/EQ Panel: For accessing the crossover modules and equalization. See page 6 for details.
10. Crossover Switch: For bypassing the internal low pass crossover when using an external crossover.
11. Fuse Holder: Holds a 20 mm, 10A (5A for 230V) slow blow fuse that may need to be replaced if the unit is not turning on.

Chapter 1

Chapter 1: Setting Up

In this chapter, we will unpack and setup your new amplifier!

Features

The 500-Watt Amplifier features built in high pass and low pass crossovers, a phase switch, high and low level inputs and a dual voltage switch. These features will be discussed throughout the manual. The amplifier is designed to power up to two of our TN series subwoofers in parallel.

Unpacking

Carefully open the box and remove the amplifier. Included in the box you will find this manual, a power cord, and a ground cheater plug (three prongs to two prongs). Use the cheater plug if you are experiencing humming or buzzing noise due to ground loops problems. When using the cheater plug, bend back the grounding tab away from the side that plugs in to the wall so that you do not ground it, as this would ground the amplifier and defeat the purpose of using the cheater plug.

Amplifier Placement

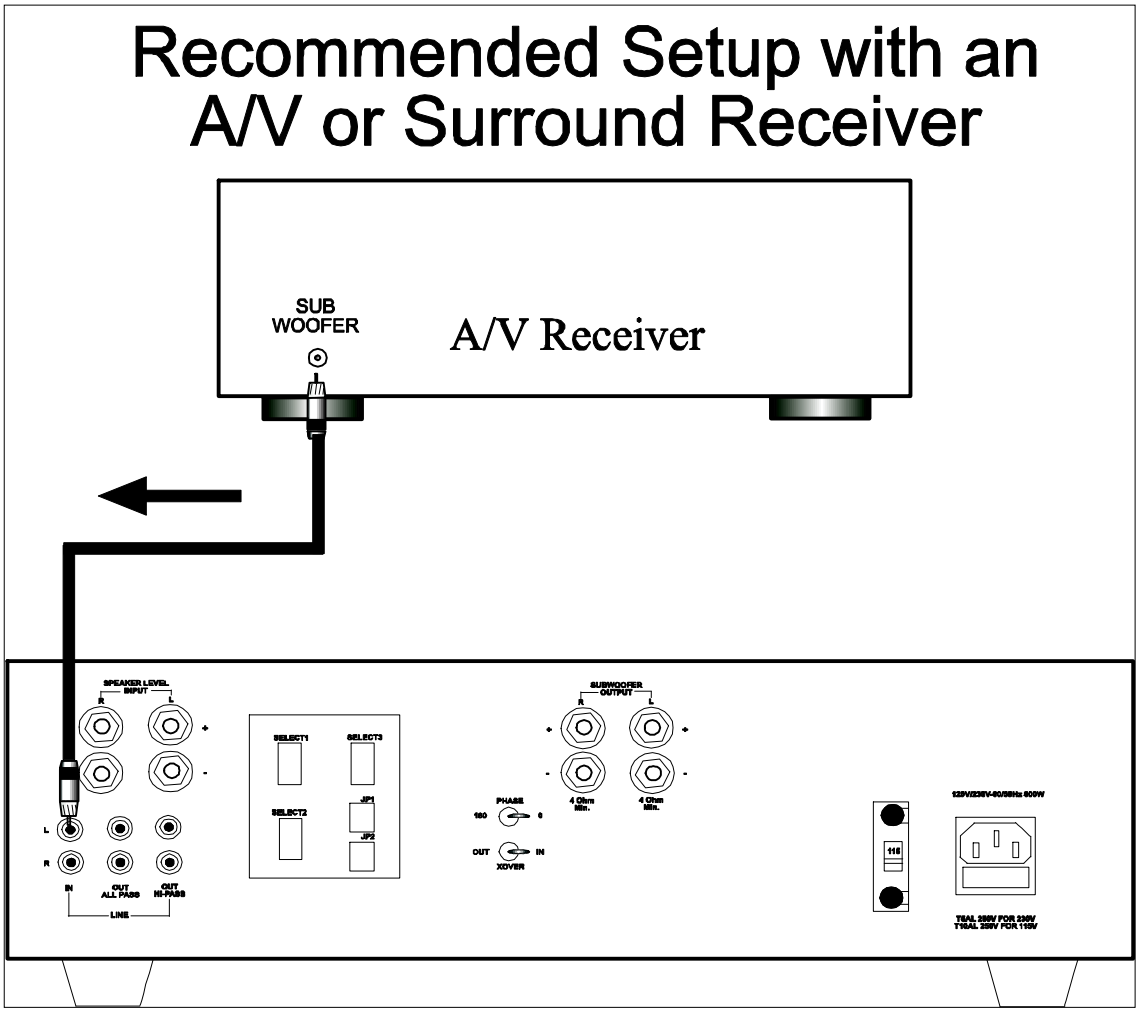
Our preference is to place the Hsu amplifier close to your main amplifier and/or receiver/processor. This allows you to use short interconnects. Make sure you have adequate ventilation around the amplifier. If you are running two subwoofers in parallel, some forced cooling may be advisable. A couple of AC 3-inch whisper fans from Radio Shack (wire them in series – this makes them run very quietly) on top of each heat sink blowing up works well.

Connecting To Your System

Connecting to a Dolby Digital or DTS system

All Dolby Digital and/or DTS processors have subwoofer/LFE outputs. If you decide to use the crossover in the processor, connect your receiver or processor subwoofer/LFE out to the line level input of your 500-Watt amplifier via a Y adapter (splitter) to both line-in on the back of the 500-Watt amplifier. Set the crossover frequency of your processor appropriately for your main speakers and set the "x'over" switch on the back of the 500-Watt amplifier to "out".

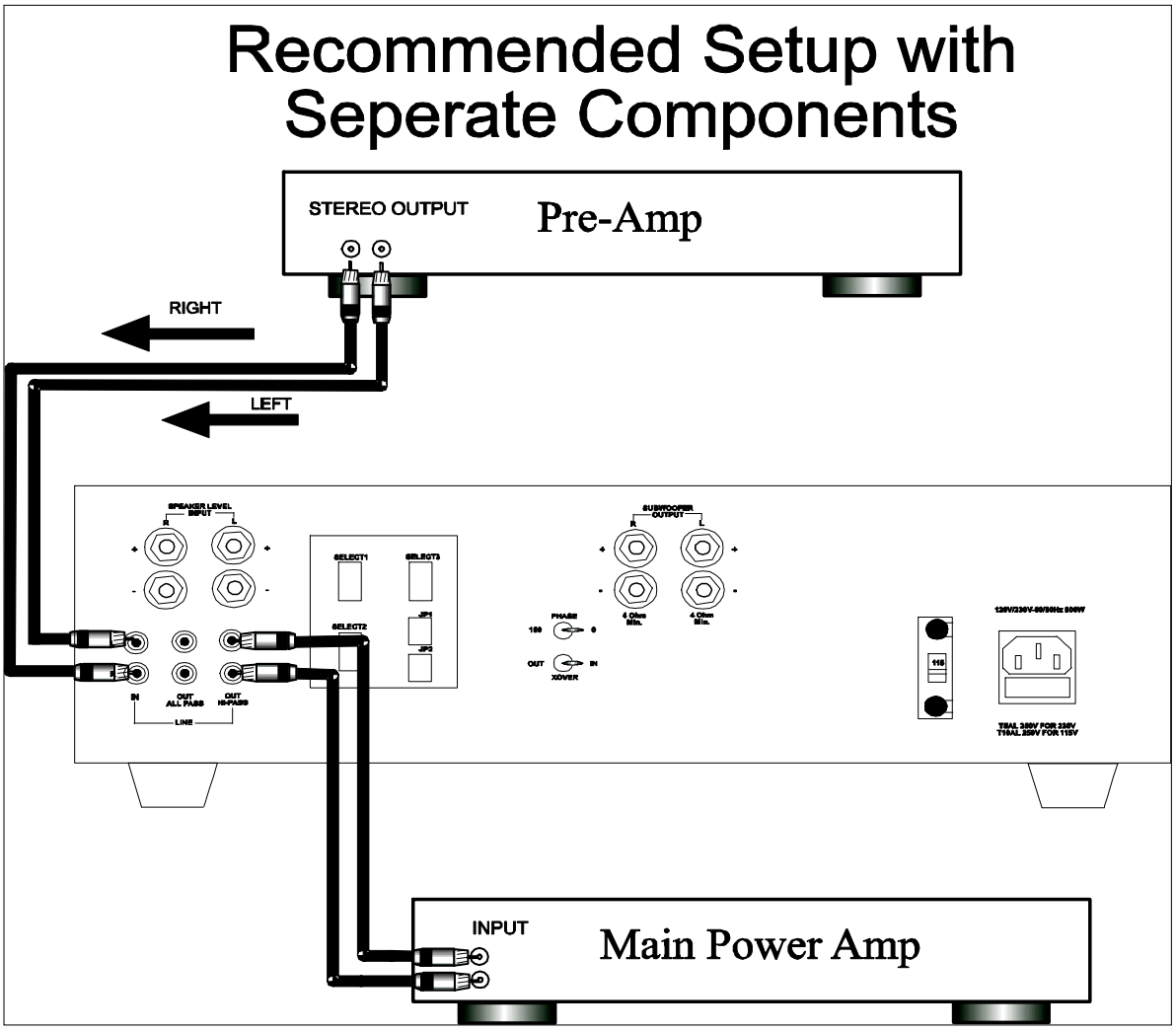
If your processor does not allow you to select the optimal crossover frequency, follow the instructions below for connecting to a system with separate components.



Connecting to a system with separate components

If you have separate preamp and power amp, and wish to keep the bass from the main speakers, connect the front left and right preamp outputs to the line-level "in" of the 500-Watt amplifier. Next, connect from the "out high pass" of the 500-Watt amplifier to the inputs of your power amplifier. Set the "x-over" switch on the back of the 500-Watt amplifier to "in". The 500-Watt amplifier has a high quality Class A 24 dB/Oct high and low pass Linkwitz-Riley crossover built in, pre-installed with 51 Hz crossovers. If this is not appropriate, you can get optional crossover modules from us (see Appendix A for the list of available frequencies).

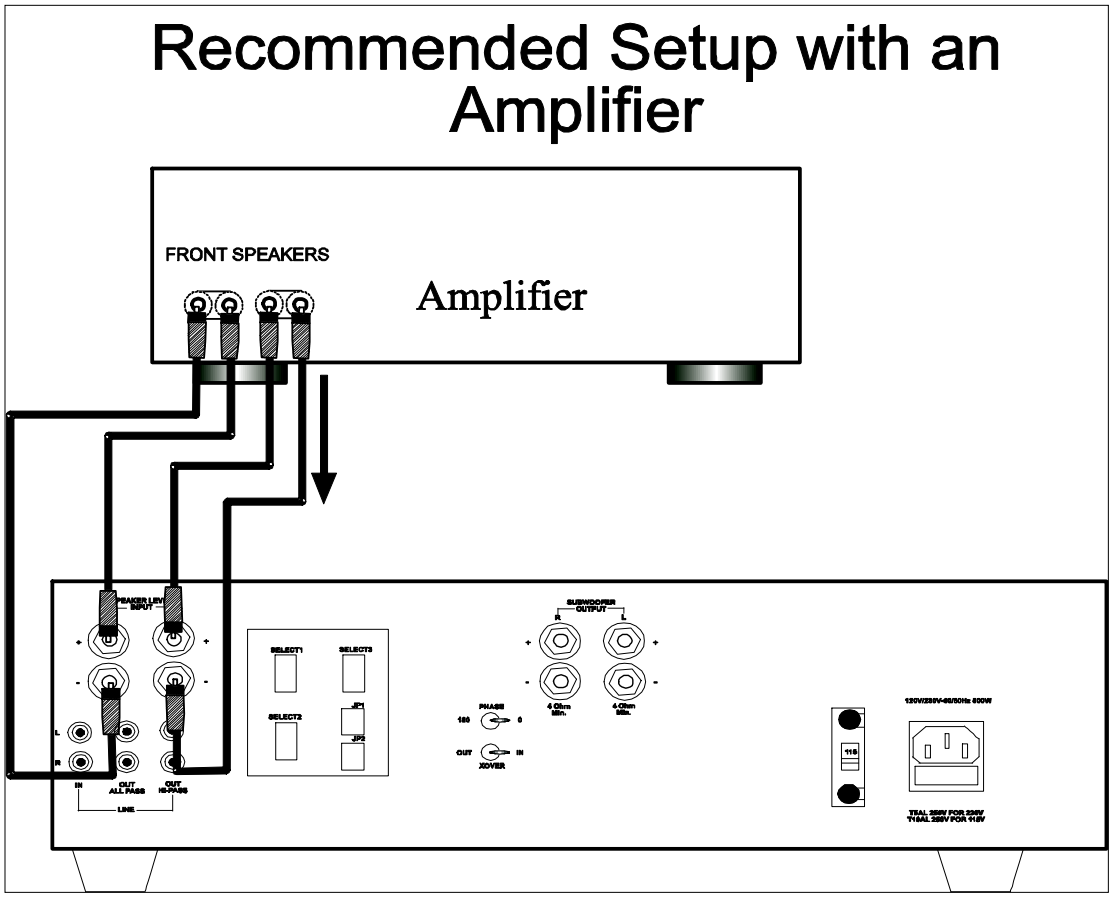
If you do not have a dedicated sub-out jack on your receiver or amplifier or if your preamp/processor does not allow you to select the optimal crossover frequency, you can set your preamp/processor for no subwoofer and large main speakers, then connect the front left and right pre-outs to the line-level "in" of the 500-Watt amplifier. Next, connect from the "out high pass" of the 500-Watt amplifier to the main-in of your receiver or to the input of the main amplifier that drives your main speakers. Set the "x'over" switch on the back of the 500-Watt amplifier to "in".



If you only have one set of pre-amp output on your receiver/processor and need to send the signal to the subwoofer amplifier as well as another amplifier, first send the signal to the subwoofer amplifier as described above and then use either the "out hi pass" or "out all pass" outputs on the subwoofer amplifier to send the appropriate (high-pass filtered or full frequency) signal to the second amplifier.

Connecting to a system with no pre-amp outputs

If no low level output is available, you need to run speaker wires from your main amplifier or receiver to the subwoofer amplifier. Run the left and right channel to the subwoofer amplifier and secure the speaker wires to the appropriate input binding posts located on the back of the subwoofer amplifier under "speaker level input". Be sure to double check that the polarity (-/+) on the receiver or amplifier matches the polarity on the binding posts of the subwoofer amplifier. Also, make sure that the ' - ' outputs on your main amp are true ground, otherwise you would short the output of your main amplifier. Call or email technical support if the ' - ' outputs on your main amplifier do not have true ground.



Connecting the Amplifier to the Subwoofer

Run a long speaker cable from the 5-way gold-plated binding posts on the subwoofer amplifier to each of the 5-way gold-plated binding posts on the bottom of the subwoofer. Use 12 AWG for runs over 25 feet, while 14 AWG is sufficient for shorter runs.

Connecting Two Subwoofers

To connect a second subwoofer to the amplifier, simply run another set of speaker wires from the amplifier's second set of subwoofer output binding posts to the second subwoofer's binding posts. If the two subwoofers are next to each other, you can also run one cable to the first subwoofer, and a short cable from the first subwoofer to the second subwoofer. If you are running one cable to two subwoofers, use heavier wires – 10 AWG instead of 12 AWG, 12 instead of 14 AWG for the long run. The short wires can be a 14 or 16 AWG wire.

Finishing Up

Check to see that the red voltage selector switch on the back of the amplifier is set to the correct voltage, if you have a dual-voltage version. It is set to 120V by default. Connect the subwoofer amplifier's power cord to an AC outlet.

Congratulations, you have successfully set up your new subwoofer amplifier. For recommended testing and listening material, refer to Appendix B of your Hsu subwoofer manual. Also, try out the test CD-R that was included with your subwoofer.

Chapter 2

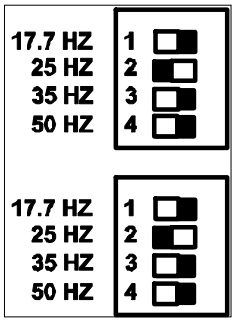
Chapter 2: Fine Tuning

In this chapter we will adjust the settings of the amplifier so that it is fine-tuned to the user's preference and environment.

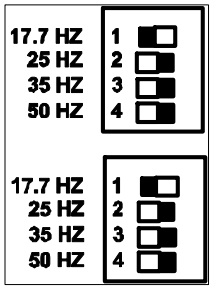
Crossover Panel

The crossover panel can be found in the back of the amplifier, between the inputs and the switches. To access the panel, remove the two screws (at the top and bottom) that hold the panel on. Once the panel is open, you will have access to the crossover modules, and the EQ/subsonic filter dip switches. When using the amplifier with the TN-X1 in extended bass mode, TN1220HO, or 12VA, both of the dip switches should have the 1 switch set to on and the rest of the switches set to off (see diagram at right). This is the default setting for the amplifier so there is no need to change any of the switches. If the amplifier is used with the TN-X1 in maximum output mode or the TN1225HO, both dip switches need to have 2 set to on and the rest of the switches set to off (see diagram at left). WARNING: Do not set the amplifier for 17.5 Hz mode when using with the TN-X1 in max output mode or a TN1225HO as this may damage the subwoofer and void your warranty.

Settings for TN-X1 in max output mode or the TN1225HO



Settings for TN-X1 in extended bass mode or the TN1220HO



The Hsu Research 500-Watt amplifier comes standard with a 51Hz crossover. There are three crossover modules, for low pass, left high pass, and right high pass. The module labeled "Select 1" is the crossover for the left channel high pass, "Select 2" is the right channel high pass, and "Select 3" is the low pass crossover. These plug-in modules set the crossover frequency. We have optional modules for other crossover frequencies. See Appendix A for available frequencies. To purchase extra crossover modules, please contact Hsu Research or visit our website at www.hsuresearch.com.

Phase Switch

Depending on the absolute phase of your main speakers and amplifier, and the relative distance of the subwoofer and the main speakers from the listening position, the bass in the crossover region may be smoother if you reverse the phase of the subwoofer relative to the main speakers. Try flipping the phase switch to determine which way sounds more bass-heavy. The more bass-heavy position is the setting where the output of the subwoofer and the main speakers are most in phase. Play program materials with bass in the crossover region such as music containing bass drums, double basses, bass guitar, etc. to determine the correct setting.

Crossover Switch

If your receiver or processor already has a built in crossover or utilizes base management, you can disable the crossover on the subwoofer by flipping the "x'over" switch to the "out" position. Otherwise, leave the switch in the "in" position so that the crossover is active.

This switch only controls the low pass filter. The high pass filter can be bypassed by using the "out all-pass" outputs.

Volume Level

Using built-in test tones of a receiver/processor, or by using a test CD/DVD (such as the CD-R that comes with Hsu subwoofers), the user should match the levels of all of his or her speakers. We recommend using an SPL meter such as the Radio Shack unit (use "C" weighting and slow settings). Note that the Radio Shack meter is down about 12 dB at 16 Hz, 7 dB at 20 Hz, and 4 dB at 25 Hz. Add these numbers to the readout to compensate for these errors. When using the test tones, measure from the listening chair and set for around 75 dB level in the 40 – 80 Hz range. Do not run test tones at very high SPL as this can potentially damage the subwoofer.

Alternatively, adjust for a bass level you prefer. Some prefer to set the bass level somewhat higher than the main speakers partly for loudness compensation, since most people do not listen to material at reference levels. A good approach is to set the subwoofer level to the highest level where kick drums, etc., are still tight and non-boomy. A good test track for this is the Sheffield Drum Record/Track Record (CD14/20) track 5 (Ron Tutt). Most people tend to set the subwoofer level higher for home theater applications too. We recommend setting about 3 dB hotter for home theater applications. (Some processors/receivers allow you to set different bass levels for different sources.)

Chapter 3

Chapter 3: Troubleshooting

In this chapter we will discuss problems that users may have and their solutions. If you do not find a solution to your problem on the following pages, please email us at techsupport@hsuresearch.com or give us a call at (714)666-9260.

Problem	Cause	Solution
Humming or Buzzing Noise	You have a ground loop problem.	Try using the provided cheater plug. Do NOT ground the grounding tab on the cheater plug! That would defeat the purpose of the cheater plug for this application.
	You have an amplifier problem.	If ground cheater plug does not help, disconnect all interconnects from the subwoofer amplifier. If still hums, call or email technical support.
	You have a problem with other equipment.	If hum goes away when interconnects are disconnected, hum is coming from the rest of your equipment. Add them back one piece at a time. The one that causes the system to hum is the source of the hum.
No output from the subwoofer (the Blue LED does not light up).	AC power not getting to the amplifier.	Check that the power cord is plugged in securely at both ends and make sure that the power outlet the subwoofer amplifier is plugged into is functioning properly.
	The amplifier's fuse is blown.	Check the fuse. The fuse is located just above the power plug on the amplifier. Unplug the power cord and remove the fuse holder with a screwdriver and check the fuse. If the fuse is blown, replace the fuse with a 20 mm 10A (5A for 230V) slow blow fuse. If the fuse blows again, the output transistors are probably damaged. Email or call technical support for authorization to send the amplifier back for service.

No output from the subwoofer (Blue LED lights up).	The subwoofer is not receiving a signal.	Recheck the connections between the receiver/processor and the subwoofer amplifier as well as the connection between the subwoofer amplifier and the subwoofer.
	Driver or amplifier is faulty.	Connect the subwoofer to your main amp. If it produces undistorted output, the woofer is fine and the amp may be faulty. If there is no output, or the output is distorted, the woofer is faulty. Email or call technical support for authorization to send the amplifier or woofer back for service.
	You used speaker level connections and one or both your main amplifier's ' - ' are not true ground.	Connect only to the channel that has a true ground ' - '. If neither channel has a true ground ' - ', email or call technical support.
Bass output from subwoofer is low.	Level on subwoofer or receiver's subwoofer output is too low.	Increase the volume of the subwoofer and the subwoofer level or LFE level on the receiver or other source. It is best to set the level of the subwoofer relative to the other speakers using the provided CD-R and a Radio Shack SPL meter, or built-in tones on your preamp/processor. See "Volume Level" section on page 7.

Appendix A:

Technical Specifications

Amplifier Output: High headroom, 500W rms @4 Ohms, 800W rms @2 Ohms.

Crossover Frequency: line level 28 – 155 Hz, 24 dB/Oct, high and low pass. Set by plug-in crossover modules. Available frequencies are 28, 34, 43, 51(standard), 62, 75, 91, 108, 133, 155 Hz.

Input Impedance: 10k ohm (line), 1k ohm (speaker).

Inputs: Stereo line level and speaker level.

Output: Stereo line level (high pass, and all pass), and mono speaker level subwoofer out.

Controls: Subwoofer level, phase (0, 180 degrees), and crossover (in/out).

Feature: Soft clipping.

Shipping Weight: 36 lbs.

Dimensions: 6.5”(h) x 19”(w) x 16.75”(d)

Power Requirements: 120/250 VAC, 1100W.

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