CASS AUDIO, INC.

Fine loudspeaker systems for the audiophile

POWER TOWER II

OWNER'S MANUAL

INTRODUCTION

Congratulations on joining the family of proud and satisfied owners of prestigious loudspeaker products from CASS Audio. *PLEASE READ THIS INSTRUCTION BOOKLET CAREFULLY BEFORE CONNECTING OR OPERATING THIS LOUDSPEAKER SYSTEM.*

The Power Tower II (patent pending) is a floor standing, ultra low distortion loudspeaker system. It has been designed to be a neutral transducer with no coloration of its own, and when provided with sufficient power, it can produce uncolored, distortion free sound with dynamic levels to please the most demanding audiophile.

This spectacular loudspeaker system houses an impressive driver complement. Four 12 inch, long throw 200 watt woofers, each with a 60 ounce magnet and 2 inch voice coil with a vented pole piece, ensure impressive, strong, clean bass reproduction to below 20 Hz. The 12 inch woofers are arranged in an Isobarik, compound woofer configuration that cancels out odd order harmonic distortion. This woofer array is acoustically coupled to the massive, user tunable 15 inch subwoofer (PR) that takes the response down to an unbelievable 17 Hz!

At 300 Hz the system crosses over, via an all pass filter, to the two 4.5 inch midrange couplers. These ultra low distortion, high power drivers, housed in their own hermetically sealed, tuned enclosure, employ large 12 ounce magnets to obtain their smooth frequency response and spectacular dynamic range.

At 3 KHz the system crosses over to the perfectly matched inverted titanium dome driver that provides a unique clarity and transparency of sound all the way out to 27 KHz. The all pass networks combine with the driver complement to produce a frequency response, dynamic range and distortion free sound stage that will thrill the most demanding audiophile.

Your new Power Tower II systems are also equipped with a unique high frequency room compensation tool (patent pending). This tool, provided by a 120 watt soft dome driver, is unique in that it adds a high frequency compensation in the form of a slope that ascends as frequency increases.

Your new pair of Power Tower II loudspeaker systems is a matched set in which the left and right front baffles are mirror images of each other.

INSTALLATION

- **UNPACKING**

1. Carefully remove each loudspeaker system from its box. Do **NOT** use a knife to cut the cardboard as the loudspeaker system may be accidentally damaged. If the loudspeaker system has been shipped overseas it will attached to a pallet. The pallet should be removed. **SAVE the pallet until it has been determined that no shipping damage has occurred.**
2. Carefully remove any additional packing materials from the loudspeaker system.
3. Inspect the loudspeaker systems for shipping damage. Overseas orders are shipped insured for full value to cover any damage caused by shipping. CONTACT THE SHIPPER AND CASS AUDIO, INC. IMMEDIATELY IF SHIPPING DAMAGE HAS OCCURRED.
4. The CASS logos, on the loudspeaker system enclosures, are covered with a thin protective material. These protective coverings should be removed after the systems are completely unpacked and installed in their final locations. To remove a protective covering from a logo, just grasp a corner of the covering and ***SLOWLY*** peel it off. Once removed, the coverings can be discarded.

LOUDSPEAKER SYSTEM PLACEMENT

Your Power Tower loudspeaker system is an extremely accurate, state of the art transducer. Although its frequency response is rated at +/- 2 dB from 17 Hz to 27 KHz, its response throughout most of the audio range is +/- 1 dB! Therefore, care should be taken to avoid placement which can color the sound. Although the following steps will provide installation guidelines for proper placement, the user should experiment with loudspeaker placement to obtain the best result. *Remember that room acoustics and loudspeaker placement within the listening environment are key factors that contribute to the sound quality of any sound system.*

1. If possible, use a relatively large room (i.e. 20 feet or longer). This is important since the low end cutoff frequency of the room is indirectly proportional to the length of the room. More simply stated, longer listening rooms have better bass response than shorter listening rooms.
2. Ensure that the floor of the listening room is firm. Wood flooring over concrete is excellent if the wood is covered with a carpet. However, even a well supported, carpeted wood floor works well.
3. If possible, select a room with solid walls and high ceilings.
4. If possible, position the loudspeaker systems so that they face the longer length of the room. This holds true for surround sound systems as well.

5. The positions of the loudspeaker systems, together with the listener's position, should form an isosceles triangle in which the distance between the left and right loudspeaker system is six to 12 feet. In a room 20 feet long the loudspeaker systems should be approximately 8 to 10 feet apart. In addition, the loudspeaker systems should be at least two feet from any side or rear wall. The listener should be positioned equidistant between the two loudspeaker systems. The distance from each loudspeaker system to the listener should be at least 10 to 12 feet.
6. Although the Power Tower loudspeaker systems are designed for a smooth average power output and, therefore, are less sensitive to angular positioning than the competition, CASS Audio still recommends that the loudspeaker systems be equally toed in slightly toward the listener. The listener should experiment with this subtle effect.
7. If possible, the loudspeaker systems should be placed at least 2 feet from any rear or side wall. Reflections off of any wall can cause cancellation of sound energy at certain frequencies.
8. Damp the floor surface with a good sound absorbing material. A large heavy rug is excellent.
9. If possible place damping material on the walls and ceiling. Rugs and other tapestries are excellent.
10. Cover glass windows with heavy draperies.

- **LOUDSPEAKER CONNECTIONS**

The **POWER TOWER II** loudspeaker systems have a nominal input impedance of **4 ohms**. This means that any **SINGLE PAIR** of **POWER TOWER II** loudspeaker systems should be driven by a power amplifier capable of driving 4 ohm loads. If **two** pairs of **POWER TOWER II** loudspeaker systems are operated together the driving amplifier must be rated to safely drive a **2 ohm load**. An alternative solution is to drive each **POWER TOWER II** loudspeaker pair with its own dedicated amplifier.

- If **one** pair of **POWER TOWER II** loudspeaker systems is operated **together** with an additional pair of loudspeaker systems rated at either 4 ohms or 8 ohms nominal input impedance, the driving amplifier should be rated to safely drive a **2 ohm load**. An alternative solution for driving this type of low impedance load is to drive each pair of loudspeaker systems with its own dedicated amplifier. **REMEMBER THAT SOLID STATE AMPLIFIERS REQUIRE A MINIMUM IMPEDANCE THAT THEY MUST OPERATE INTO. DO NOT ATTEMPT TO USE AN AMPLIFIER TO DRIVE AN IMPEDANCE LOWER THAN THE MINIMUM SPECIFIED MY THE AMPLIFIER MANUFACTURER.** If a tube amplifier is used, ensure that it is set to the appropriate output impedance setting.

- **CONNECTIONS FOR SINGLE POWER AMPLIFIER OPERATION.**

The instructions below connect each loudspeaker system to be powered by a single power amplifier. If you wish to operate your loudspeaker systems in a bi-amp configuration, skip this section and proceed to the next section titled "BI-AMP WIRING".

1. Ensure that both gold straps are installed in the loudspeaker systems input terminals. These straps **MUST** be installed for single amplifier operation. Your loudspeaker system is delivered with these straps factory installed for single amplifier operation.
2. Ensure that the power amplifier is unplugged from the wall outlet and that its power switch is in the "OFF" position.
3. Connect the "+" terminal from the left channel of the driving amplifier to the "**RED**" input terminal on the left loudspeaker system.
4. Connect the "-" terminal from the left channel of the driving amplifier to the "**BLACK**" input terminal on the left loudspeaker system.
5. **ENSURE THAT THE WIRES IN STEPS 3 AND 4 ABOVE ARE NOT SHORTED TOGETHER. SUCH A SHORT MAY DAMAGE THE AMPLIFIER.**
6. Connect the "+" terminal from the right channel of the driving amplifier to the "**RED**" input terminal on the right loudspeaker system.
7. Connect the "-" terminal from the right channel of the driving amplifier to the "**BLACK**" input terminal of the right loudspeaker system.
8. **ENSURE THAT THE WIRES IN STEPS 6 AND 7 ABOVE ARE NOT SHORTED TOGETHER. SUCH A SHORT MAY DAMAGE THE AMPLIFIER.**

- **BI-AMP WIRING.** The Power Tower I loudspeaker system can be operated in an enhanced bi-amp mode. This means that the system woofers are operated by one power amplifier while the midrange and high frequency drivers are operated by a second less powerful power amplifier. This is accomplished very easily with the entire line of Power Tower loudspeaker systems. To make bi-amp operation even easier ***no external crossover is required!***

1. Remove the gold shorting straps from the input terminal binding posts on the rear of the loudspeaker systems. Each loudspeaker system has two gold straps (four gold straps for the pair of loudspeaker systems). ***Place these 4 gold straps in a safe place so that they will be available if they are required in the future.***

2. There a two pairs of binding posts on the rear input terminal cup of each loudspeaker system. The **upper** pair is the input connection for the midrange and high frequency drivers. The **lower** pair is the input connection for the woofer assembly.
3. Connect the "+" terminal of the amplifier used to drive the midrange and high frequency drivers to the **RED UPPER** binding post on the appropriate loudspeaker system..
4. Connect the "-" terminal of the amplifier used to drive the midrange and high frequency drivers to the **BLACK UPPER** binding post on the appropriate loudspeaker system.
5. Connect the "+" terminal of the amplifier used to drive the woofer assembly to the **RED LOWER** input terminal on the appropriate loudspeaker system.
6. Connect the "-" terminal of the amplifier used to drive the woofer assembly to the **GREEN LOWER** input terminal on the appropriate loudspeaker system.
7. Ensure that the preamplifier can source two amplifier inputs.
8. **ENSURE THAT NO ADJACENT BARE WIRES ARE TOUCHING EACH OTHER. IF TWO BARE WIRES TOUCH EACH OTHER A SHORT CIRCUIT OCCURS. A SHORT CIRCUIT CAN DAMAGE YOUR AMPLIFIER.**
9. Your Power Tower loudspeaker systems are now wired for bi-amp operation.

- **RELATIVE PHASE TEST.**

It is critical that the loudspeaker systems are wired in phase with respect to each other. If the loudspeaker systems are not wired in phase with respect to each other, the sound quality will be greatly degraded. The sound may seem to originate mostly from one loudspeaker system. This is true for **ANY** quality loudspeaker system. If the loudspeaker systems are in phase with respect to each other the sound stage will be stable. If set up properly your Power Towers will sonically disappear leaving a sound stage so realistic it can only be described as awesome.

1. Set your preamplifier mode control to "**MONO**".
2. Set the balance control to its center position.
3. Play an instrumental or vocal recording through your new Power Tower loudspeaker systems. The sound should seem to originate from a well defined single point centered between the two loudspeaker systems.
4. If the sound does **NOT** originate from a point centered between the two loudspeaker systems, the loudspeaker systems are wired out of phase with respect to each other. Correct this problem by reversing the "+" and "-" leads on **ONE** speaker system. Then repeat steps 1 through 4 to ensure proper performance.
5. Reset your preamplifier mode back to its "**STEREO**" position.

- **ADJUSTMENT OF LOUDSPEAKER SYSTEM CONTROLS.**

Your Power Tower II loudspeaker systems are shipped with the controls set for a flat response. However, room acoustics and personal taste may require adjustment of your Power Tower loudspeaker system. Follow the guidelines below for proper adjustment.

1. The red dot on the midrange and treble controls should initially be set to the twelve o'clock position for a flat response.
2. The control for the super dome driver should initially be set to a position just ***before*** the nine o'clock position.
3. If equipped with the rear high frequency driver option, this control should initially be set to the eleven o'clock position.

The above controls can be varied clockwise to increase the output, or counter clockwise to decrease output of the associated driver.

- **SUBWOOFER ADJUSTMENT.**

Your Power Tower loudspeaker system is equipped with a feature found only on some of the most expensive and exotic full range loudspeaker systems - **ADJUSTABLE BASS!** The loudspeaker system is factory adjusted for a flat low frequency response. In most cases adjustment will **NOT** be necessary.

Adjustment is accomplished by adding or removing mass from the huge mass loaded, downward firing 15 inch subwoofer. **Do NOT disassemble the loudspeaker system as the warranty will be voided. The subwoofer is accessed for adjustment by reaching through the three inch wide slot at the base of the front of the loudspeaker system.** The system is shipped with 25 grams of mass loaded on the subwoofer. To adjust the subwoofer response follow the instructions below.

1. Locate the plastic bag containing the six pieces of putty. Each of these six pieces of putty is actually 5 grams of mass. ***Mass should be added or subtracted in increments of 5 grams only.***

2. If a warmer low frequency sound is desired, remove a single 5 gram piece of mass from the 15 inch subwoofer on each loudspeaker system. The mass is installed on the subwoofer in a spiral application. **ALWAYS REMOVE MASS FROM THE OUTSIDE WORKING YOUR WAY TOWARD THE CENTER OF THE PIECE OF MASS.** ***Do not remove more than two pieces of mass (10 grams total) from each 15 inch subwoofer.*** Store this removed mass in a safe place for future use. **DO NOT ATTEMPT TO REMOVE THE CENTER PIECE OF MASS (HOT GLUE) THAT HAS BEEN PERMANENTLY INSTALLED AT THE FACTORY. THIS WILL DAMAGE THE SUBWOOFER.** Additional mass can be obtained by writing to CASS Audio at the address listed at the end of this document.
3. If a dryer sound is required add a single 5 gram piece of mass to the 15 inch subwoofer on each loudspeaker system. Then listen to the loudspeaker system and, if necessary, add an additional 5 gram piece. ***Do not add more than 3 pieces of mass (15 grams total) to each 15 inch subwoofer.*** The mass should be installed in a spiral manner around the outside perimeter of the existing mass (hot glue) already on the subwoofer. With your fingers press the mass against the subwoofer cone to secure in place. That's all there is to it! Just use your ear. **BUT KEEP TRACK OF THE AMOUNT OF MASS YOU ADD OR REMOVE!**
4. **NOTE: The same amount of mass should be either added to, or removed from all 15 inch subwoofers.**

Your Power Tower loudspeaker system is now ready to enjoy. As with any fine piece of furniture, just keep it away from direct sunlight and moisture. Your Power Tower loudspeaker will give you many years of enjoyment. If you do have a problem or question please phone or write us at the address below.

POWER TOWER II TECHNICAL SPECIFICATIONS

Driver complement:

- One 15 inch, long throw user tunable subwoofer (PR) for adjustable bass.
- Four 12 inch, 200 watt, long throw fiber woofers. Each woofer has a 60 ounce magnet, two inch voice coil, vented pole piece and rubber surround.
- Two 4.5 inch long throw, low distortion, high power midrange drivers.
- One high power inverted titanium dome tweeter.
- Optional rear firing inverted titanium dome tweeter.
- One high power super dome.

Nominal impedance: 4 ohms.
Time aligned crossover filter system.
Crossover frequencies: 300 Hz, 3 KHz.
Frequency response (+/- 2 dB using 1/3 octave averaging):

- 17 Hz to 40 Khz (with optional ribbon driver)

Maximum sound pressure level measured at one meter: >127 dB.
Sensitivity: 94 dB/watt/meter.
Minimum required amplifier power: 25 watts.
Power handling capacity:

- 600 watts, continuous;
- 1400 watts peak.

Polypropylene capacitors.
12 AWG copper ultra low capacitance internal wiring for woofers.
High current rear terminals accept banana plugs.
Bi-amp capability (no external crossover required).
Midrange and treble level controls.
High frequency variable slope compensation for room acoustics (patent pending).
User adjustable bass by means of user adjustable 15 inch subwoofer.
Beautiful hand rubbed varnish finish.
Removable front grills.
Size in inches: 51H X 24W X 18D.
Weight: 185 lbs. per side.