

LEGACY

Owners Manual For The
VS 12.2
Subwoofer System



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Owners Record

The model and serial numbers are located on the rear of the unit. Record these numbers in the spaces provided below. Refer to them when calling upon your dealer regarding this product.

Model No. _____

Serial No. _____

Date of purchase: _____

Thank you for selecting a Legacy Loudspeaker System. These hand-crafted instruments will provide you with many years of listening enjoyment. Please take a few moments to read this brief manual to insure maximum benefit from your speaker system.

The Cabinetry / Our Commitment

Handcrafted

Beneath the surface of Marquis's elegant exterior lies rigid MDF construction. Interlocking joinery maximizes the strength of the cabinet parts. Polyester fiberfill is selected for internal damping. A sharp rap on the enclosure will leave you with little more than bruised knuckles.

Each cabinet is impeccably finished on all exposed surfaces with select veneers. The exquisite finish is hand-rubbed several times to assure a patina at home with the most elegant decor.

Our Commitment

A great deal of forethought, love and satisfaction is instilled in each piece of Legacy workmanship. We take pride in getting to know many of our customers on a first name basis.

Your purchase of this product is backed by the renowned "Legacy Satisfaction Guarantee".



Unpacking Your Speakers

Your new subwoofer has been very carefully packaged to insure that it travels to you safely. Each subwoofer is protected by a double-wall outer carton with heavy V-board corner protectors. Molded foam end caps are used to protect the elegant cabinetry, and a plastic liner is provided as waterproofing. Please save this packing for future transportation. If cartons become damaged or misplaced, new ones can be purchased from Legacy Audio.

Speaker Placement

Since the human ear is rather poor at localizing radiation frequencies below 125 Hz, good results may be obtained in a variety of room placements. Careful adjustment of the convenient front panel controls will lead to seamless transition.

Low frequency reinforcement occurs whenever woofers are placed near room boundaries. The distance from the walls, floor and ceiling correspond to the wavelengths of the frequencies, which will reflect in phase and thus reinforce bass output. Therefore, the actual dimensions of your listening room play a definite role in what ultimately arrives at your ear. In fact, rooms tend to have their own set of favored frequencies.

We can calculate what the most strongly reinforced frequencies in a room will be by the formula shown below:

Resonant Frequency = (1130 ft/sec) / (ft. between boundaries x 2)

For example, a room with an 8 ft. ceiling height has a strong resonance at:
 $(1130 \text{ ft/sec.}) / (8 \text{ ft.} \times 2) = 71 \text{ Hz.}$

Speaker Placement


Now, while such reinforcement might actually be beneficial at very low frequencies, excessive excitation can cause “overhang” or a droning effect at mid-bass frequencies. A way to minimize excitation of these resonances is to place your subwoofer asymmetrically relative to room boundaries. For instance, if the subwoofer is 2 ft from one corner wall, then place it 1.5 ft to 3 ft from the other.

Placing the subwoofer in a corner will reduce the radiation angle and thus increase efficiency. It will also excite the maximum number of room modes and decrease distortion.

A best case scenario is to actually use two subwoofers, one to each side of the listener. The subs should be placed 90° out of phase with each other. This improves spaciousness and bass uniformity, with a reduction in room level peaks.

Hook Up Cables

The ideal conductor would have negligible resistance, inductance and capacitance. The table below shows how a few actual speaker cables measure up.



Cable	Ω s/ft	pF/ft	μ H/ft
12 ga.	0.0033	24	0.21
14 ga.	0.0048	17	0.13
16 ga.	0.0079	16	0.18
18 ga.	0.0128	28	0.21

Capacitance is considered insignificant in each cable because its effect is well out of the audio bandwidth; inductance can be decreased (at the expense of increased capacitance) by keeping the conductor pair closely spaced.

How long would a cable have to be before inductance effects would impinge on the audio spectrum? Approximately 300 feet of 12 gauge would be required to establish a corner frequency of 20 kHz with an 8 Ohm loudspeaker. As you see, inductance is not a problem for most of us.

Hook Up Cables

What about phase shift due to frequency dependent travel times down the speaker cable? Measurements show that 100 Hz waves will be delayed about 20 billionths of a second behind 10 kHz waves when traveling to the end of a 10 foot speaker cable. Since the cilia of the ear requires 25,000 times longer than this just to transmit phase information, phase shifting is obviously not the primary concern when considering speaker cables.

What about resistance? Finally we are getting somewhere. Resistance is the controlling factor of the amplifier/loudspeaker interface. Excessive resistance can cause major shifts of speaker crossover frequencies. The lower the impedance of the loudspeaker, the greater the effects of series resistance. A 20 foot run of 18 gauge cable can cause up to 10% deviations of crossover center frequencies. That same 20 feet can un-damp your damping factor and reduce your systems' output by one-half decibel.

In summary, there are no perfect cables. The best way to approximate the ideal would be to keep loudspeaker leads as short as is practical.

Unit Connections

Once you've found a place in your room, the next step is to connect the VS 12.2 to your system. There are a variety of ways this can be accomplished, all of which will be listed and explained.

Option 1: Connecting the VS 12.2 using the Low Level Inputs (from preamp/processor).

NOTE: if using the low-level inputs, we suggest using the shortest run of shielded cables possible. Longer lengths of RCA cable can result in greater noise and attenuation of the signal. If using Left/Right output jacks from the preamp, the internal circuit module of the Thumper will sum the two channels together. When using the left and right low level inputs on the subwoofer, the internal crossover of the subwoofer is being used. The crossover frequency and level will be controlled by the appropriately labeled controls on the front panel of the sub or the remote control. Connect the preamp/processor's "sub out" to the left channel RCA input (beneath where it's labeled "from preamp/processor.") If your receiver/processor has two subwoofer output jacks, you can connect either one or both of these to the corresponding input jacks on the subwoofer.

Unit Connections

Option 2: Connecting the VS 12.2 using a STEP One or Whisper Environmental Processor.

If you are using a Legacy Audio StepOne or a Whisper controller in your system:

Stereo Amplifying: In a stereo configuration, the output from the preamplifier feeds the inputs of the StepOne/Whisper Processor and the variable outputs of the StepOne/Whisper Processor feed into the stereo amplifier. The **fixed outputs** of the StepOne/Whisper Processor can be used to connect to the subwoofer. The fixed outputs allow the signal to pass through without being effected by the StepOne/Whisper Processor's processor.

Biamping: If you are biamping your front channels, the variable output from the StepOne/Whisper Processor will be used to feed the low frequency amplifier input. The fixed outputs of the StepOne/Whisper Processor would require a Y-adaptor or signal splitter, such as a dual amp balancer, to feed both the high frequency amplifier inputs and the subwoofer inputs. We do not, however, recommend using a Y-adaptor coming off the variable outputs into the inputs of the subwoofer, as its processing is not appropriate for the sub

Unit Connections

Option 3: Connecting the VS 12.2 using the High Level Inputs (from amplifier).

A. If using the high level inputs , it is highly recommended that you connect them in parallel with your main left and right loudspeakers.

B. One may decrease the low frequency demands from the main left and right speakers by connecting them to the binding posts labeled **High Level Out**. This will reduce the current flow below 100 Hz to the main speakers. A more precise management is possible through some surround processors.

NOTE:

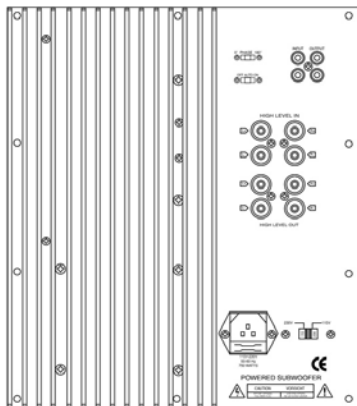
1. DO NOT use the output from a bridged amplifier output as a high level input to the subwoofer.

2. When using high level inputs from a stereo amplifier be sure that they are polarized correctly with the power amplifier, (positive output to positive input, negative output to negative input.) Failure to do so may result in damage to your subwoofer, power amplifier and any associated equipment connected to it.

3. Terminating your bare wire leads with banana plugs or gold spade lugs is also recommended.

Unit Connections

Powering Up VS 12.2



1. Power Cable: The supplied power cable will plug into a socket on the back terminal plate of the unit.

NOTE: Try to plug into the same AC circuit as the rest of your audio system, as this will avoid hum from ground loops.

2. Power Switch: The power switch is on the rear panel. Three settings are available, **Off/Auto/On**. In the **Off** mode, the amp is turned off. In the **Auto** position, the amp will remain off until a signal is applied. After a long period with no signal, the sub will return to its off state. The **On** position will cause the amp to stay on all the time.

Protection

VS 12.2 features a special thermal reset to prevent damage to the internal amplifier. This is invisible under normal operation, however should your subwoofer be over-driven for long periods it will enter the “protect” mode and turn itself off. Once the unit cools down normal operation is restored by resetting the unit to **Off**, then back to **Auto/On** If you have any questions about this please call us.

Fine-tuning

Controls

Level: This will allow you to adjust the volume level played by the subwoofer. It only controls the subwoofer level, not the level of any of the other loudspeakers in the system, even if they're hooked up in parallel. This motorized control can also be operated with the included remote control.

Frequency: This will allow you to adjust low frequency information amplified and played by the subwoofer. The crossover frequency of the VS 12.2 is 40 - 170 Hz. so the point you set it will be somewhere in between. This feature is also operable from the remote.

Phase: Located on the back panel (fig. 1). This switch allows the user to optimize the "phase" of the subwoofer output. This is important to properly integrate with your main speakers.

Fine-tuning

Adjustments

Be sure to sit in your normal listening area when making these final adjustments.

1. Begin by setting both the rear panel **Frequency** and **Level** controls to the 12 O'clock position.
2. Using pink noise, a warble tone centered between 50-80 Hz, or a recording with rich bass content, have someone **try the phase switch in the 0° and 180° position**. Select the position providing the strongest or smoothest output.
3. Now **adjust the Level** to a setting that smoothly integrates with the rest of your system.
4. Finally, **fine-tune the crossover Frequency** to prevent holes in the spectrum or excessive overlap.

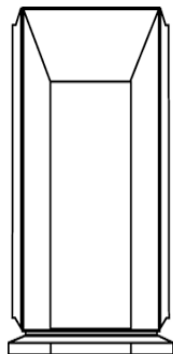
Designer's Note (From Bill Dudleyston)

- VS 12.2 is a carefully engineered subwoofer, capable of integrating with the finest speakers.
- Unlike many woofers that suffer from overshoot, VS 12.2 applies a special EMF countering circuit, which increases power handling and radically reduces low frequency distortion.
- An enormous stacked magnet structure is custom fabricated to provide excellent sensitivity. These units are bolted in compression to secure nearly 20 lbs. of motor structure per driver.
- Asymmetric placement of pistons reduces mid-bass cancellation by 9 dB.
- Dual custom woofers are concealed beneath VS 12.2's stylish grill to deliver awesome mid-bass punch, while the lowest frequencies emerge tight and clean.
- A high current 400 watt amplifier maintains control of VS 12.2's twin 12" sub-bass pistons.

Designer's Note (From Bill Dudleyston)

- Rear panel controls allow you to adjust VS 12.2's Level, and Frequency controls. Tuning so simple, it can be done from the comfort of the couch.
- VS 12.2 features automatic turn on/off when presented with an audio signal.
- The high pass filter alleviates the deep bass demands from compact satellite speakers, thus preventing low frequency strain due to long excursion.

Specifications



System Type: Sealed enclosure.

Driver: Dual 12" Carbon reinforced pulp.

Alignment: 5th order.

Amplification: 400 watts.

Low Pass Crossover: 40 - 150 Hz.

Low Pass Filter Slope: 12 dB per octave.

Maximum SPL: 120 dB @ 40 Hz.

High Pass Crossover: 85 Hz @ 6 ohms.

High Pass Slope: 12 dB per octave.

Binding Posts: 2 RCA, 2 pair High Level binding posts

Phase Adjustment: 0, 180°

Frequency response: 10 - 150 Hz, 22 - 100 Hz +/- 3 dB.

Input Impedance: 10k ohms minimum (low level inputs).

Dimensions: 29 x 15 x 19.5

Weight: 135 lbs.

Troubleshooting

1. If the subwoofer has a noticeably higher noise floor compared to your other speakers, it is likely that the cable run between the preamp/processor and subwoofer (or between the amplifier and subwoofer) is too long. Typically, you want to use a length of less than 3 meters if using the low level inputs and a length of less than 15 meters if using high level inputs.
2. If you are using the low level inputs and you notice a “hum” while all of your other audio equipment is turned off, it is likely that the inputs to the subwoofer are creating an “antenna effect” and picking up noise. The best way to eliminate this problem is to turn off the subwoofer when you turn off the rest of your equipment.
3. VS 12.2 features a special thermal reset to prevent damage to the internal amplifier. This is invisible under normal operation; however should your subwoofer be over driven for long periods it will turn off. Once unit cools down normal operation is restored, by resetting the rear power switch to **Off**, then back to **Auto/On**. If you have any questions about this, please call us.

Notes:



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