

LEGACY

Owners Manual For The  
**LF Xtreme**  
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.

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## 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".



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## Unpacking Your Speakers

Your new subwoofer has been very carefully packaged to insure that it travels to you safely.



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## 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 ft/sec.) / (8 ft. x 2) = 71 Hz.

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## 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.

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## 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	$\Omega$ /ft	pF/ft	$\mu$ 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.



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## 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.

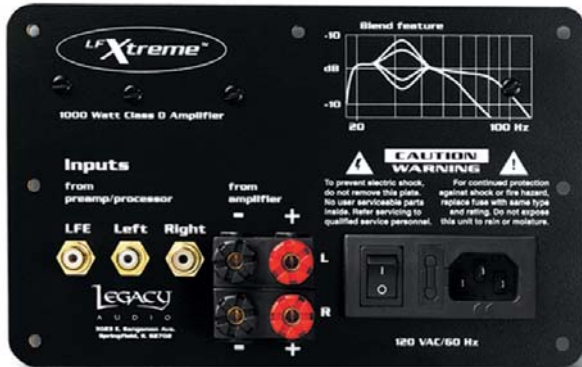
In summary, there are no perfect cables. The best way to approximate the ideal would be to keep loudspeaker leads as short as is practical.

# Speaker Connections

Once you've found a place in your room, the next step is connecting the LFXtreme to your existing system. Listed below you will find 5 options.

## Option 1: Connecting the LFXtreme using the LFE input

If your preamplifier/digital processor/receiver has a subwoofer output, it can be connected (via RCA cable) directly to the LFE (Low Frequency Effects) input. The LFE input bypasses the subwoofers internal crossover and allows you to control your low frequency settings (Frequency, Level) from your preamp.



*NOTE: When using the LFE input, the freq. control on the front panel of the LFXtreme will be bypassed. The level control will then function as a sensitivity control, allowing the preamp/processor to control volume.*

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## Speaker Connections

### **Option 2: Connecting the LFXtreme using the stereo Low Level preamp/processor inputs**

If using Left/Right output jacks from the preamp, the internal circuit module of the LFXtreme 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.

*NOTE: if using the low-level inputs, we suggest using cables that are no longer than 5 meters. Longer lengths of RCA cable can result in greater noise and attenuation of the signal.*

### **Option 3: Connecting single sub out**

Connect the preamp/processor's "sub out" to the left channel RCA input (mono).

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## Speaker Connections

### **Option 4: Connecting the LFXtreme using a StepOne (Steradian)/Whisper Environmental processor**

If you are using a Legacy Audio StepOne (Steradian) 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 box and the variable outputs of the StepOne/Whisper box feed into the stereo amplifier. The **fixed outputs** of the StepOne/Whisper box can be used to connect to the subwoofer. The fixed outputs allow the signal to pass through without being effected by the StepOne/Whisper box's processor.

**Biamping:** If you are biamping your front channels, the variable output from the StepOne/Whisper box will be used to feed the low frequency amplifier input. The fixed outputs of the StepOne/Whisper box would require a Y-adapter 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-adapter coming off the variable outputs into the inputs of the subwoofer, as its processing is not appropriate for the sub.

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## Speaker Connections

### **Option 5: Connecting the LFXtreme using the High Level Inputs (from amplifier)**

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

*NOTE: DO NOT use the output from a differential Monobloc amplifier as a high level input to the subwoofer. 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. Terminating your wire leads with banana plugs or gold spade lugs is recommended.*

### **Powering Up LFXtreme**

**1. Power Cable:** The supplied power cable will plug into the 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.*

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## Speaker Connections

**2. Power Up:** In the rear of the subwoofer to the immediate left of the power cable input is the power switch. This switch controls current flow to the entire unit as follows:

**Pressed in = off**

**Pressed in = on**

**Off/Auto On switch:** This switch starts or stops signal flow to the unit. In **Standby** the preamp unit stays active but the amplifier shuts down.

**Auto On:** Once bass signal is received, LFXtreme will turn on automatically. If the unit has not received a bass signal after 30 minutes, LFXtreme will mute.

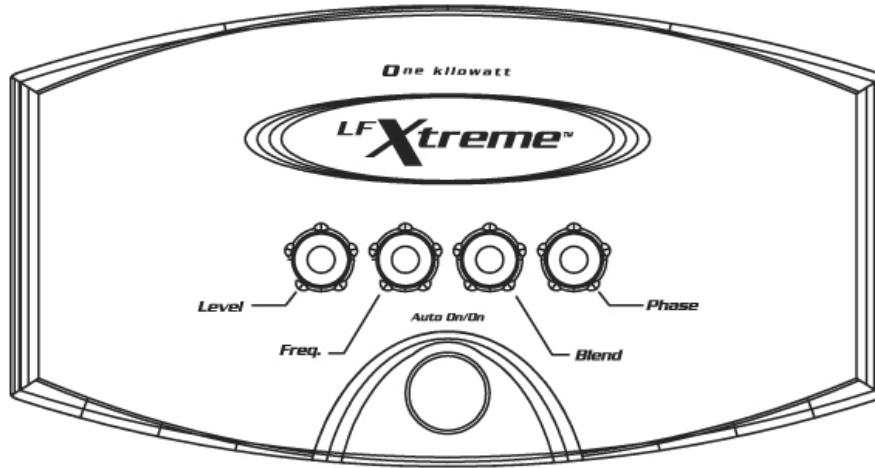
**Off:** Will manually set unit to mute (standby)

*NOTE: Be sure the front panel switch is in the OFF position before flipping the rear panel power switch. This will avoid unnecessary transients through the subwoofer. In either **Auto On** or **Off** position the LED display will remain lit. Only when the rear power switch is in the off position, will the LED go off.*

## Fine-tuning

### Adjusting LFXtreme

On the front panel of the LFXtreme you'll notice four controls: **Level**, **Freq.**, **Blend**, and **Phase**. These allow an extraordinary amount of control over your subwoofer. These controls will allow you to tailor the sound of the sub to your room and integrate with your main speakers.



**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. When using the LFE input, the level can be controlled from your preamp/processor menu while the subwoofer level control can be left at the 12.

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## Fine-tuning

**Freq.:** This control will allow you to adjust low frequency information. The crossover frequency range of the LFXtreme is 40 - 100 Hz.

**Blend:** The graph on the back panel of the LFXtreme illustrates the effects of the Blend control. Turning the knob counter-clockwise reduces energy from the subwoofer in the range of 35-50 Hz. Turning the knob clockwise will increase gain in this area. This can reduce excessive energy or give more low frequency impact in this range depending on the setting. This control is very similar to that of a graphic EQ. The 12 O'clock position is neutral. The center frequency of this control has been carefully chosen to match the first cancellation node of most rooms.

**Phase:** This control is essential in the proper setup of your subwoofer. If not set up properly, your main speakers and subwoofer can actually work against each other. If operating out-of-phase the subwoofer and mains will cancel, creating nulls at some frequencies (primarily upper bass). What is desirable is to have the subwoofer and the mains operating in phase, relative to the primary listening position. Here is an effective method of accomplishing this:

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## Fine-tuning

*While seated at your listening position, have someone sweep the phase control slowly from one extreme to the other.*

*Using pink noise or a 50-60 Hz test tone, listen for the strongest output. Now take note of that setting. Next, play music program material and optimize the level and phase settings further; adjusting for the smoothest output.*

*NOTE: Because the LFE input bypasses the subwoofers internal crossover in favor of the preamp/processors crossover, the Freq. control will be inactive when using the LFE connection.*

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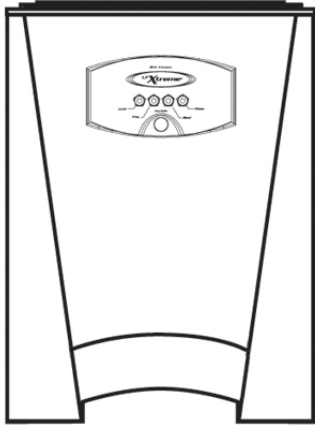
## Designer's Note (From Bill Dudleyston)

LF Xtreme is a carefully engineered subwoofer, capable of integrating with the finest speakers.

- Unlike many woofers that suffer from overshoot, LF Xtreme 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. This unit is bolted in compression to secure nearly 40 lbs. of motor structure.
- A high current 1000 watt amplifier maintains control of LF Xtreme's 15" sub-bass piston.
- LF Xtreme 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.
- Level, Crossover Frequency and Phase controls allow LF Xtreme to integrate precisely into your system.

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## Specifications



**System Type:** Subwoofer, pneumatically coupled

**Driver:** 1 active 15", Tri-coil radiator, 1 passive, mass-loaded coupler

**Alignment:** 6th Order/back EMF canceling circuit

**Low Pass Crossover:** 40-100 Hz.

**Amplification:** 1000 watts.

**Frequency response:** 10-100 Hz.

**Low Pass Filter Slope:** 18 dB per octave.

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

**Binding Posts:** RCA jacks (LFE, 1 right, 1 left), 2 pair high level binding posts

**Phase Adjustment:** 0-180°.

**Dimensions:** 28" H x 18"W x 18" D

**Weight:** 115 lbs.

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## Troubleshooting

If you ever encounter problems from your subwoofer there are a number of factors that could be involved.

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 the 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 high level inputs and you notice a “hum” from the subwoofer while all of your other audio equipment is turned off, it is likely that the subwoofer is still on and 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. Failure to mute the front panel switch can lead to a loud thump when rear panel rocker is switched.



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