

LEGACY

Owners Manual For The
HELIX
Loudspeaker System



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Uncrating Helix

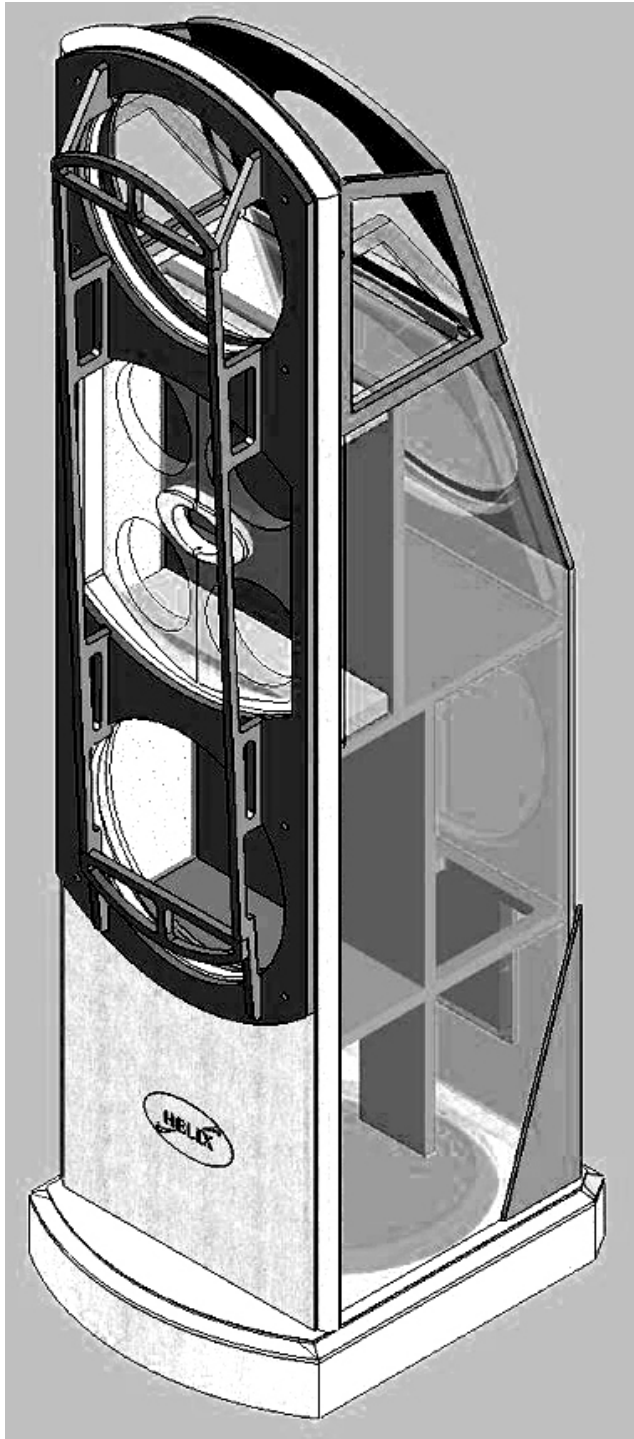
Helix is a large loudspeaker requiring assistance of a dolly, a cordless Philips screw driver and two or more physically capable individuals to uncrate and locate.

Here are some uncrating tips:

1. Carefully remove screws securing the lid of the crate, and lift panel away. Locate sub-woofer power cord and set aside.
2. Next remove front panel of crate and set aside.
3. Remove side panel of crate as shown.
4. Remove foam from top lid and use as ramp as shown in bottom photo.
5. Helix is setting on four heavy duty casters, allowing is to be maneuvered on level ground.
6. Take care to avoid damaging floors when locating.
7. Helix is a field serviceable loudspeaker, so it is unlikely that an entire cabinet would ever need to be returned to the factory. However, when moving or storing, the crates are extremely useful for protecting the cabinets.



The Cabinetry / Our Commitment



Handcrafted

Beneath the surface of Helix'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.

The renowned "Legacy Satisfaction Guarantee" backs your purchase of this product.

Designer's Note (From Bill Dudleston)

The **HELIX** system employs digital signal processing (DSP) to sculpt a unified acoustic wave-launch into an optimal radiation pattern. The benefits are outlined below.

- **HELIX** preserves clarity by avoiding early room reflections via controlled directivity.
- **HELIX** is time synchronized by launch sequencing and phase and group delay adjustment.
- **HELIX** broadens the listening “sweet spot” by maintaining channel correlation over longer distances.
- **HELIX** delivers greater than 120 dB of clean output *full spectrum*.
- **HELIX** eliminates energy robbing passive filters from the signal path.
- **HELIX** reduces electronically induced distortion by dividing the amplification loads into multiple bands.

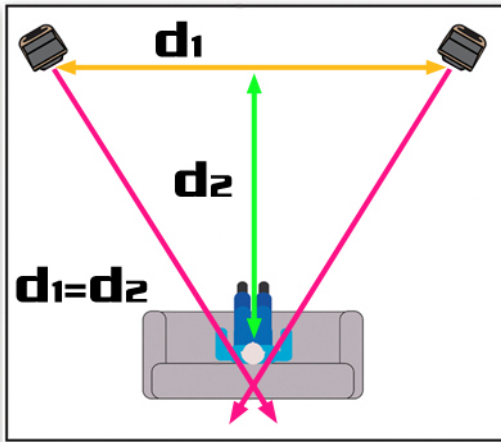
The HELIX project represents seven years of research led by Legacy Audio's chief designer, Bill Dudleston. A study of room acoustic interactions with loudspeaker radiation has been conducted. Investigations of the detrimental effects of these interactions on image localization, tonal balance and transient response have led to the development of a highly controlled radiation pattern. With assistance from component manufacturers from France, Italy and the United States, Legacy has also developed a new family of drivers for the **HELIX** system.

HELIX is a reference monitor system. It will deliver more than 120 dB over the full audible spectrum owing to the application of Neodymium magnets in the woofer and high frequency motors. The foundation of each **HELIX** monitor is a 15” subwoofer with a copper anodized, aluminum diaphragm driven by a 750-watt internal amplifier.

Symmetrically arrayed midbass and midrange drivers provide a carefully shaped directivity pattern that virtually eliminates sidewall and early floor reflections. Dual 1” tweeters are splayed precisely to complement this radiation pattern. Each tweeter takes advantage of dual pole neodymium magnets. A special lens was designed to provide acoustical impedance to the diaphragms and prevent comb filtering.

The brain of HELIX is a 24 bit digital processing unit. Featuring balanced XLR inputs and outputs, the processing unit provides to each stereo channel four bands of phase coherent Linkwitz-Riley filters, room contour, and time arrival adjustment. Implementing an internal 56-bit accumulator, the processor allows room adjustments to be readily implemented by the dealer via a serial port. The **HELIX PROCESSOR** also features a two level security lockout feature to protect factory and dealer settings.

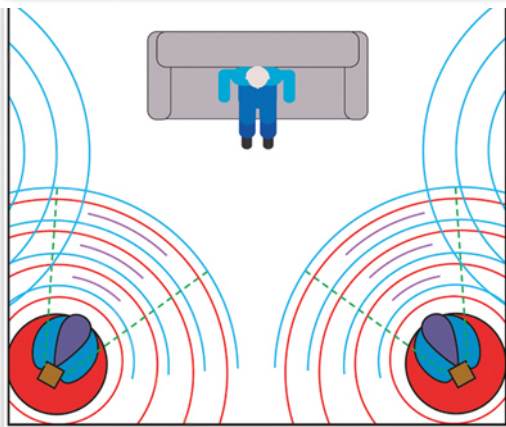
Speaker Placement



1. A speaker setup (left) that works well with HELIX follows these ratios:

Distance, d_1 , between the speakers (center to center) =
Distance, d_2 , from plane of speaker front to listener.

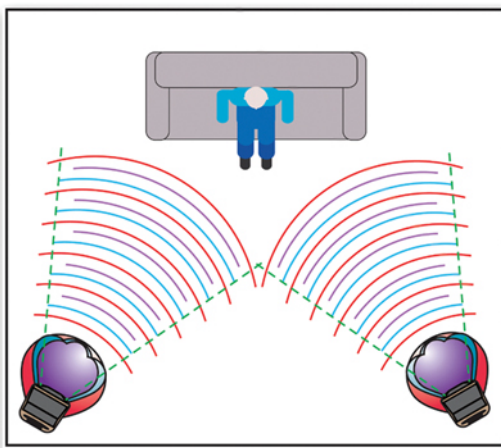
2. Toe the speakers into the listening area. In most circumstances crossing speaker axes just slightly behind of the listener's head works best. This will broaden your sweet spot horizontally. If dispersing into an L-shaped seating arrangement you might find the best results by aiming the left speaker at the right most seating position, and the right speaker at the left most seating position.



● **Bass Frequencies**

● **Mid Frequencies**

● **High Frequencies**



Room reflections and resonance typically contribute 85% of the total energy arriving at the listener's ears. Often, a loudspeaker designed to measure well under laboratory conditions, will become blurred, dissonant and placement dependent in the actual listening room.

The HELIX speaker has a carefully shaped polar pattern. This assures that the wave-launch generated will sum coherently at the listening position. To the left is an illustration of how our new Helix speaker performs.

Conventional speakers (top) beam treble and scatter midrange about the imaging room, while loading up the corners with booming, lingering bass.

Legacy's directivity controlled designs focus the radiation pattern toward the listeners (bottom). The result is a broader sweet spot for imaging, markedly greater clarity and a slamming bass line that is quick and tight

Speaker Connections

The Terminal Plate

The four-way **HELIX** requires the user to provide three channels of amplification per speaker. This may be accomplished via three stereo amplifiers, a combination of mono blocks and stereo amplifiers, or a single six-channel amplifier.

HELIX includes an internal 750-watt amplifier to power the subwoofer section. A balanced XLR input feeds the subwoofer, while three pairs of premium WBT Platinum five-way binding posts are provided for the mid bass, midrange and treble inputs.

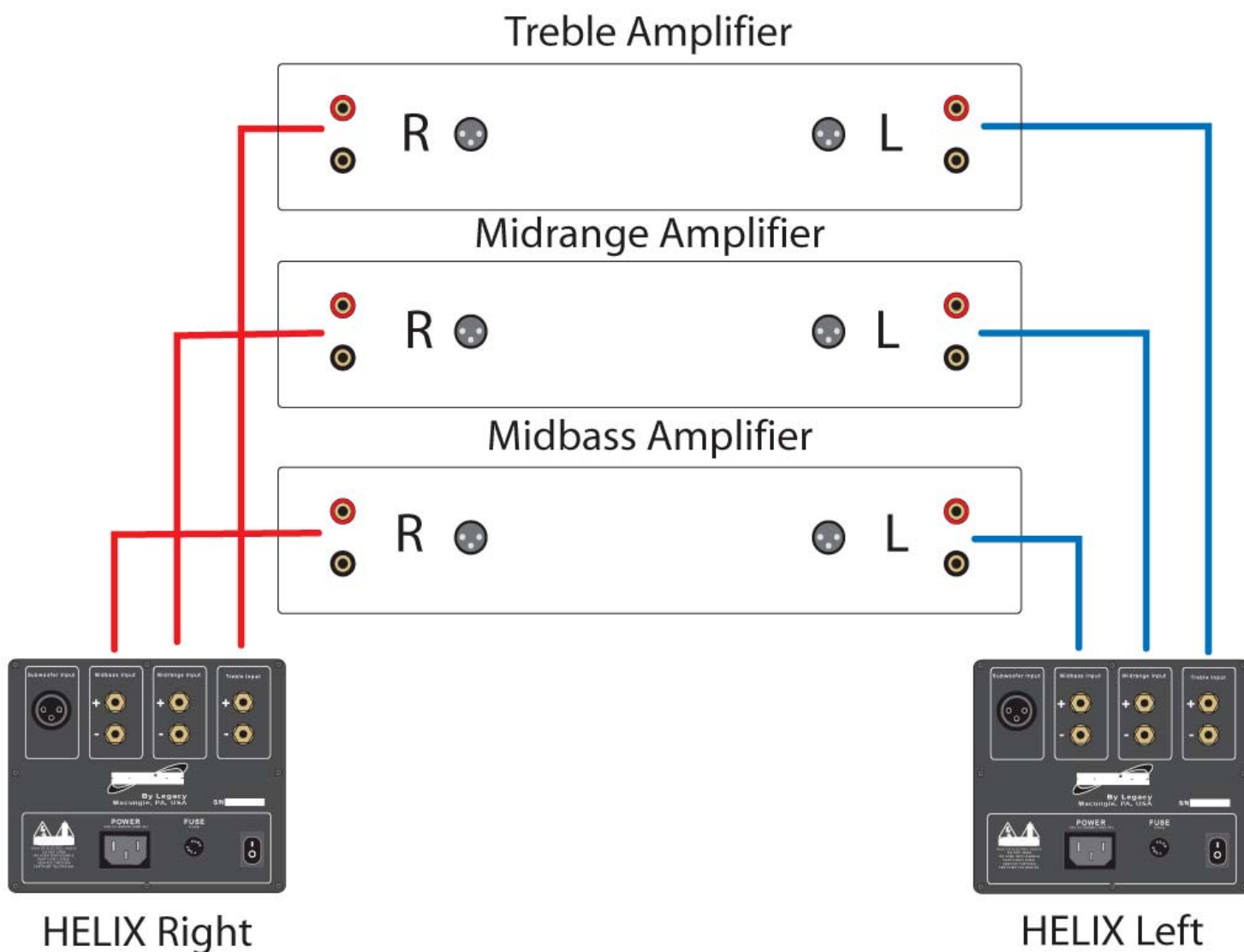
Your Legacy dealer can assist you with your specific cabling needs.



Speaker Connections

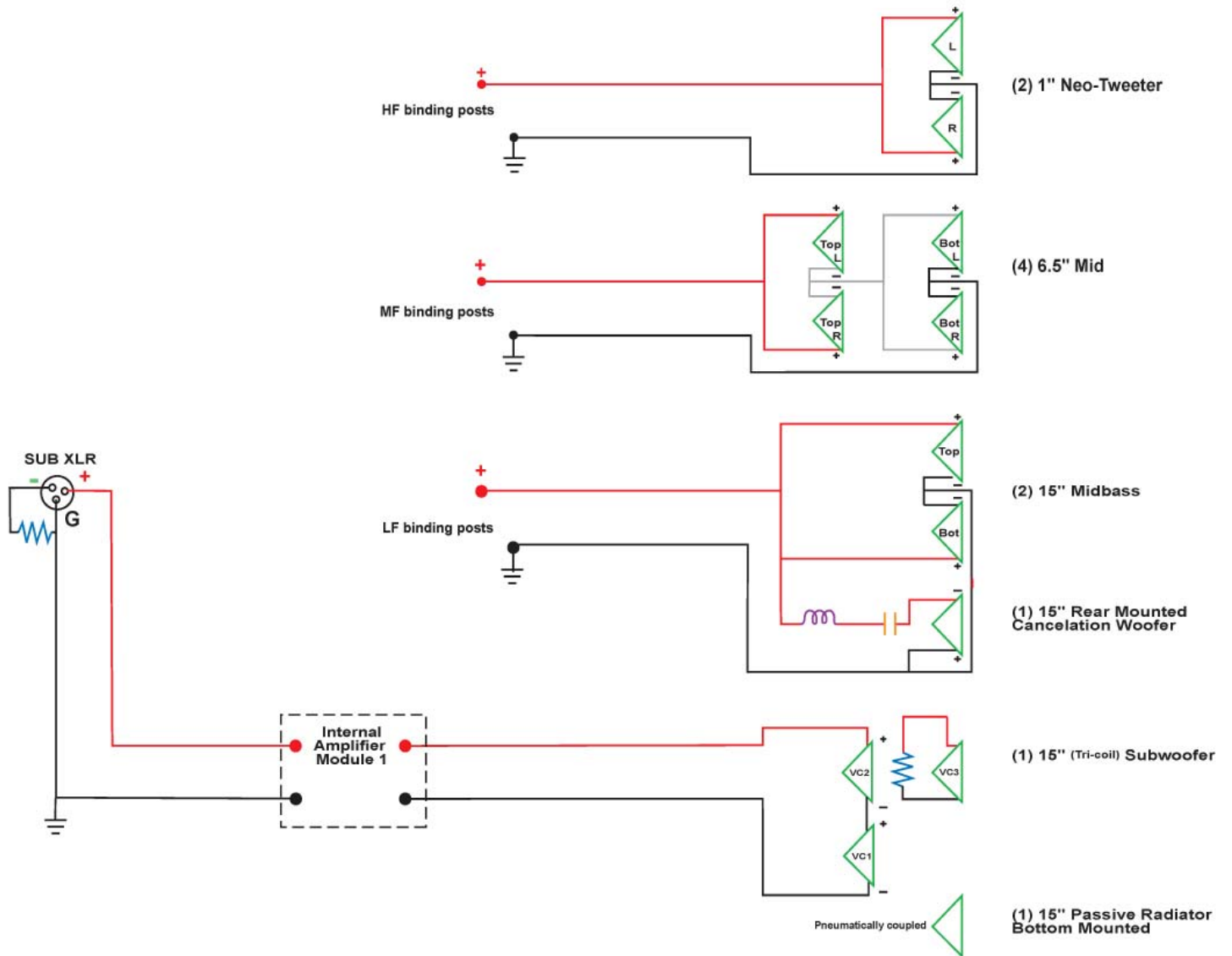
It is advantageous, when practical, to position the amplifiers midway between the HELIX speakers. This will keep the speaker cable lengths to a minimum

High Level HELIX Connections



Speaker Connections

HELIX Internal Wiring (For use by qualified technicians only)



4080 digital signal processor

The high definition Xilica 4080 processor hosts a custom HELIX algorithm which automatically loads when the processor is powered on. Factory settings allow 'plug and play' operation, and do not require a computer for setup.

The LEGACY factory installed algorithm controls signal routing, crossover frequency shaping, level control, phase and time compensation, polar control and system equalization.

<u>Input</u>	<u>Assignment</u>	<u>Output</u>	<u>Assignment</u>
1	Left Helix speaker	1	Left Subwoofer
2	Right Helix speaker	2	Left Midbass
3	unused	3	Left Midrange
4	unused	4	Left Treble
		5	Right Subwoofer
		6	Right Midbass
		7	Right Midrange
		8	Right Treble

Upon powering up, your processor will initialize, and then upload the last saved setting from flash memory. The setting program loaded is indicated in the LCD display window.

The upper row of buttons (below each channel meter) represent level status:
CLEAR denotes *on* mode (normal)
RED denotes mute mode

The lower row of buttons represent channel adjustment mode:
CLEAR denotes normal operation
GREEN denotes that this channel has been selected for adjustment

Pressing <EXIT> at any time returns back to home.

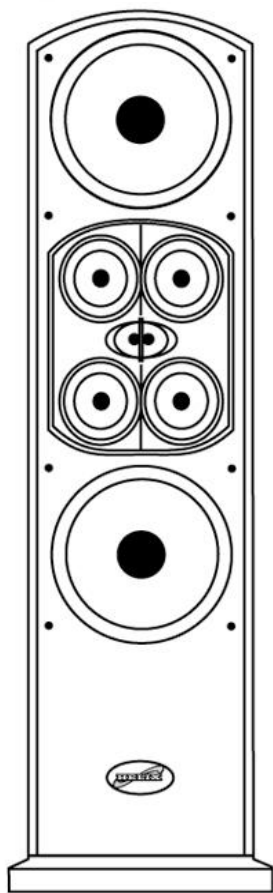
Should you wish to make level adjustments to any one of the channel levels, this may be accomplished by:

1. Selecting the corresponding channel (1-8) in the bottom row of buttons
2. The LEVEL indicator will now blink in the LCD window.
3. The level may now be increased (rotary dial clockwise) or decreased (counterclockwise).

Keep in mind that such alterations should be made judiciously, as the processor settings were specifically calibrated to your loudspeakers. Never tamper with polarity or delay settings.

It is **HIGHLY RECOMMENDED** that both factory settings and customized settings be saved separately on the installer's PC before and after making changes. These settings can be easily restored to the unit should an accidental overwrite occur.

Specifications



Specifications

System Type: 10 drivers, 5-way.

Tweeter: Neo-Quadra-pole

Midrange: (4) 6" Curvilinear

Midwoofer: (3) 15" Neodymium

Subwoofer: (1) 15" Copper/Aluminum.

Low Frequency Alignment: Tri-coil Stabilized

Sensitivity: 100 dB @ 2.83V/1m.

Frequency response: 22 Hz - 30 kHz, ± 2 dB.

Crossover frequencies: 300, 3k, 10k.

Impedance: 4 ohms.

Recommended Amplification: 3 x 300-watts

Binding Posts: 3 pair

Dimensions: 75" x 18.5" x 23"

Weight: 300 lbs.

Notes:



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