Owners Manual For The

Helix

Loudspeaker System

Table of Contents

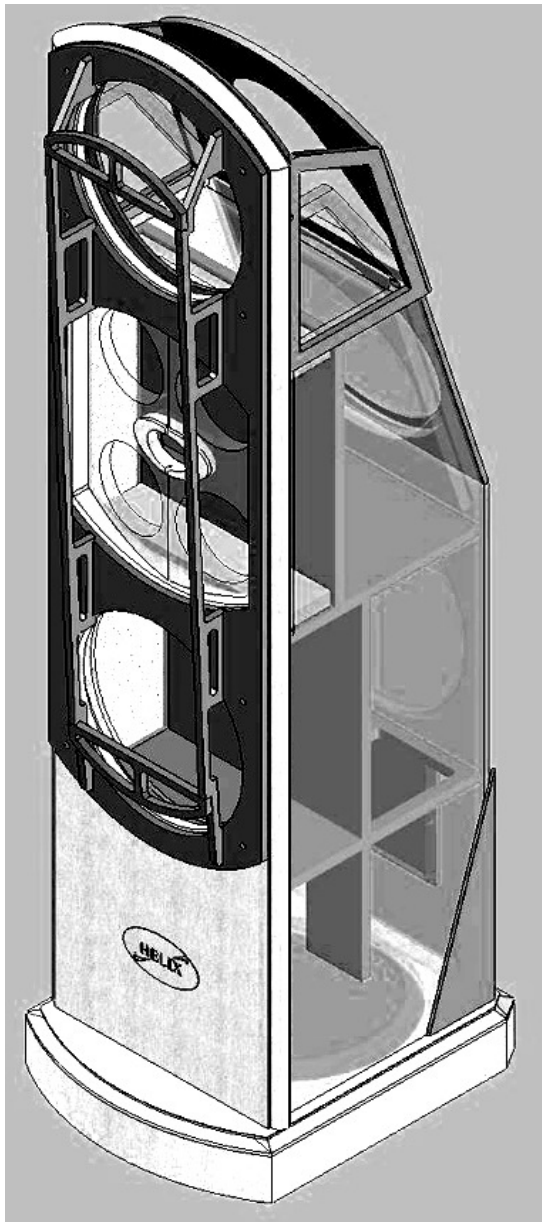
Owners Record

The serial number is located on the rear of the unit. Record this number in the space provided below. Refer to this when calling your dealer regarding this product.

Model: Helix
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.

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.

Warranty

Legacy Audio supports its customers and products with pride. We cheerfully warrant our loud-speaker products we manufacture from defects in materials and workmanship for a period of seven (7) years. Electronic components such as internal amplifiers and digital processors are covered for three (3)years. Please register your product with Legacy Audio. Should you require service Legacy will require a proof of purchase in order to honor the warranty - so please keep your receipt.

- The warranty applies to the original owner and is not transferable.
- The warranty applies to products purchased from an "Authorized Legacy Dealer".
- The warranty on active components such as digital processors or internal amplifiers is limited to three (3) years of coverage.
- The warranty on dealer stock will extend for a maximum of two years from invoice.

The warranty does not cover transportation costs of product to or from the customer, distributor or dealer, or related shipping damage.

Exclusions from Warranty

The following situations or conditions are not covered by the Legacy Audio warranty:

- Accidental damage, electrical abuse or associated equipment failure.
- Use inconsistent with recommended operating instructions and specifications
- Damage caused by modification or unauthorized service
- Costs associated with the removal and reinstallation of defective products. Consequential damage to other products.
- Normal wear such as fading of finishes due to sunlight.

Unpacking Your Speakers

Helix is a large loudspeaker requiring assistance of a dolley, 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 subwoofer power cord and set aside.

2. Next remove front panel of crate and set aside.

3. Remove side panel of crate as shown.

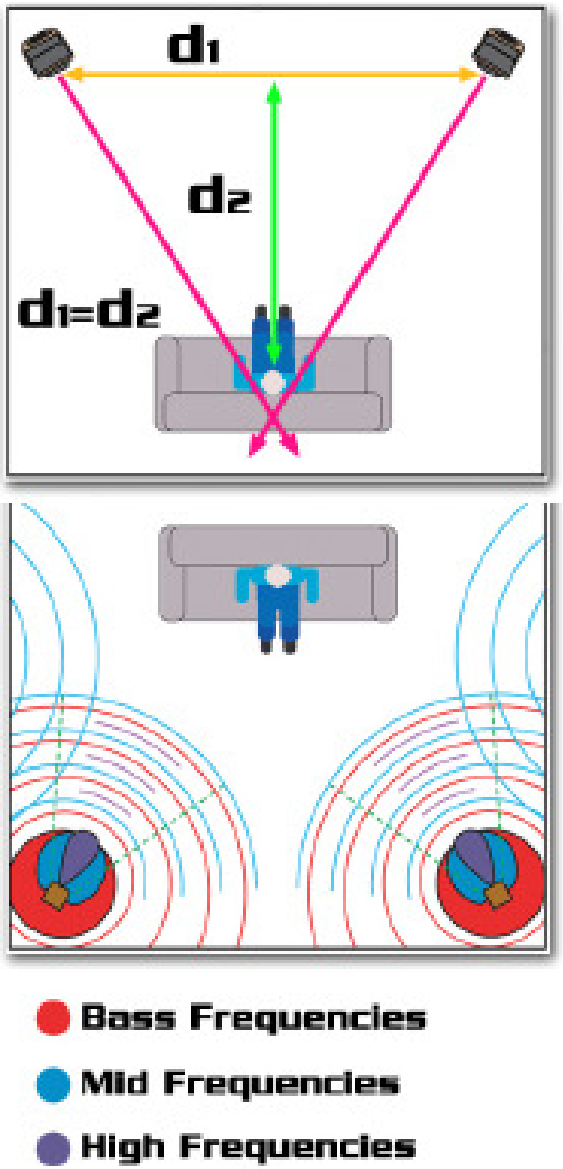
4. Remove foam from top lid and use as ramp as shown in bottom photo.

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.

Speaker Placement

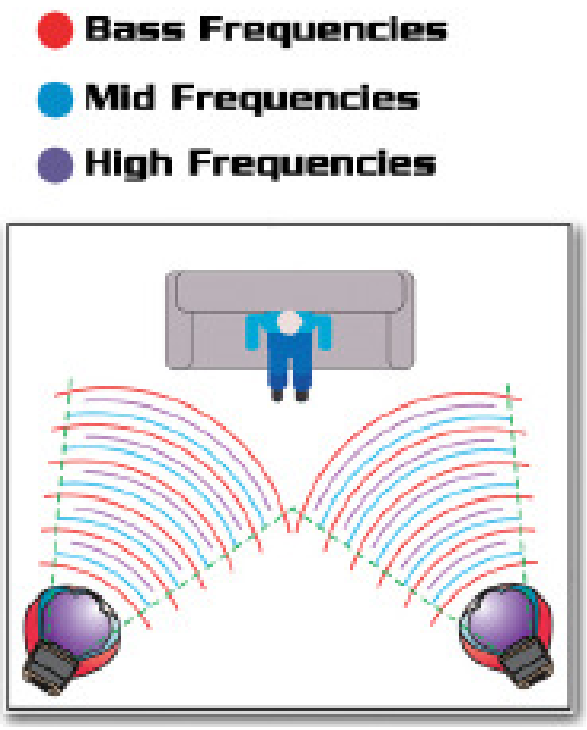


1. A speaker setup (left) that works well with HELIX follows these ratios:

   Distance, d1, between the speakers (center to center) = Distance, d2, from plane of speaker front to listener.

2. Toe the speakers into the listening area. In most circum stances crossing speaker axes just slightly behind of the lis tener's head works best. This will broaden your sweet spot horizontally. If dispersing into an L-shaped seating arrange ment 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.

Speaker Placement



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.

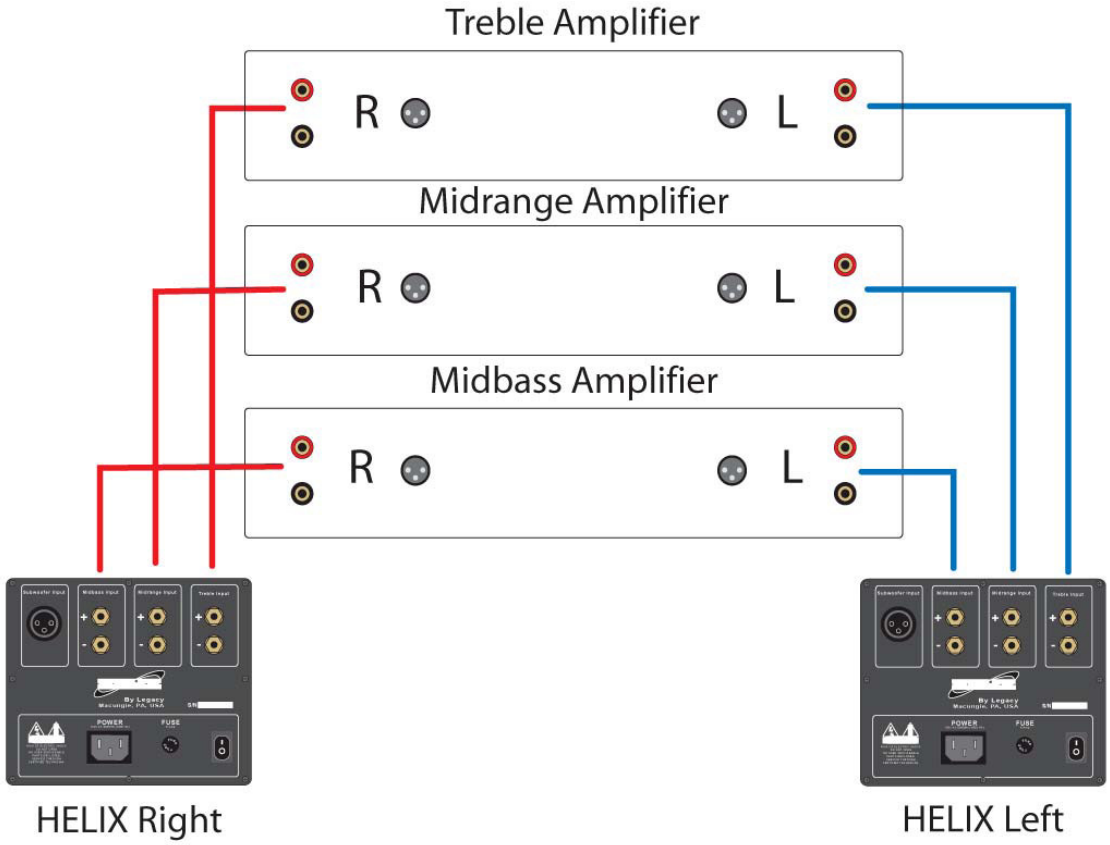
HELIX includes an internal 750-watt amplifier to power the subwoofer section. A balanced XLR input feeds the subwoofer, while three pairs of premium WBT Platinum five-way binding posts are provided for the mid bass, midrange and treble inputs.

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

Speaker Connections

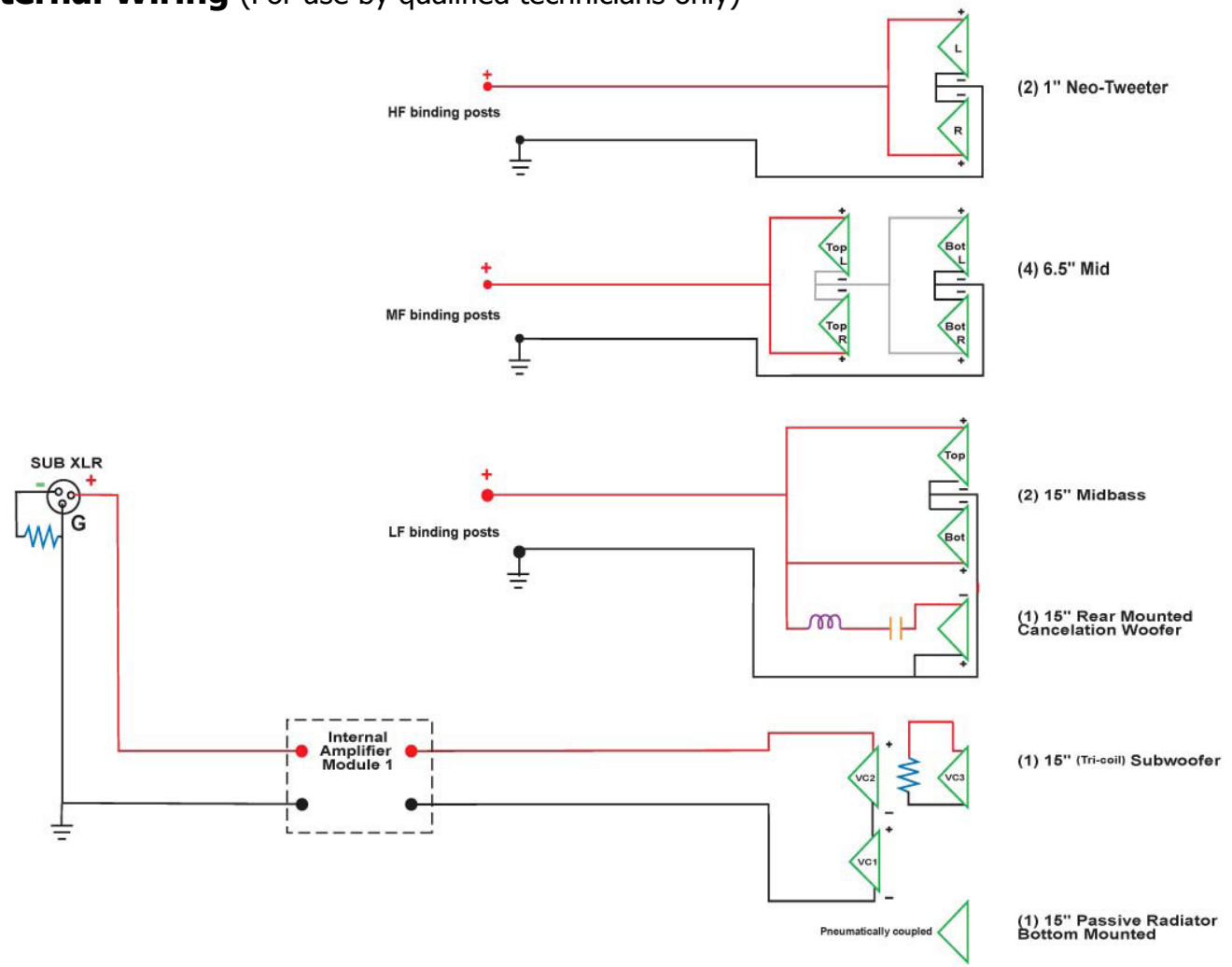
It is advantageous, when practical, to position the amplifiers midway between the HELIX speakers. This will keep the speaker cable lengths to a minimum.

High Level HELIX Connections



Speaker Connections

HELIX Internal Wiring (For use by qualified technicians only)



Speaker Connections

Xilica XD Cable Connections

From	To
Left channel of preamp output	Processor Input 1
Right channel of preamp output	Processor Input 2
Processor Output 1	Left Subwoofer
Processor Output 2	Left Midbass
Processor Output 3	Left Midrange
Processor Output 4	Left Treble
Processor Output 5	Right Subwoofer
Processor Output 6	Right Midbass
Processor Output 7	Right Midrange
Processor Output 8	Right Treble

Wave Launch Processor

The high definition Digital Wavelaunch Processor hosts a LEGACY custom algorithm which automatically loads when the processor is powered on. Factory settings are 'plug and play', and do not require a computer to utilize. Connections between the preamp, power amplifier, and speakers should be as shown on previous page.

Selecting the Program

1. Press the MENU left arrow
2. Scroll through the programs using the job wheel
3. Press enter to select the program of choice
4. Press enter again to confirm selection. The program will now load.

Users are welcome to load the included software and learn to make individual adjustments as desired. However it is recommended that any changes be saved as Program 6 or higher to avoid overwriting the factory settings.

Wave Launch Processor

Downloading and Installing the XConsole software

Downloading

From Included CD

Your Wave Launch Processor will come with a CD or USB drive containing the XConsole software. Insert the CD and find the install file. Move/Save the install file to your computer.

From Xilica Website

- Go to www.xilica.com
- Click on the "Downloads" tab at the top of the screen
- Click "XConsole" on the Left and then Click "Software"
- Click "XConsole software" to start the download
- Save and Extract the installation file on your computer

Installing

- Double click on the install file and follow the on– screen instructions to install the software.

Wave Launch Processor

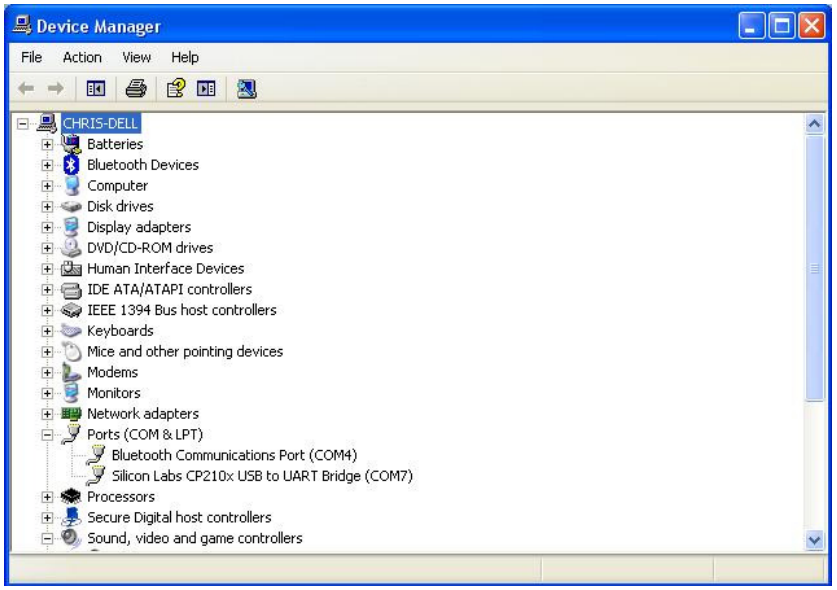
The XD processor will allow you to make adjustments to your system from a laptop computer from your listener position.

Connecting Your Computer with the Xilica Processor

- Connecting will require a long USB Device cable. These can be found at most electronic or big box stores. It is the same cable that a USB printer would use. This 16 ft cable is available at Radio Shack.
http://www.radioshack.com/product/index.jsp?productId=3584358&filterName=Length&filterValue=16-20+ft.

- Once the cable is connected, start the XConsole software. It will ask "Do you want to connect to the device?", answer "No" for now.

- You now must access the Windows Device Manager. This processes can vary depending on the version of Windows in use, but typically it is found in the Control Panel. Then click on "System." On the tabs across the top, click "Hardware" and then "Device Manager" This will bring up a list, find "Ports (COM & LPT)" and click the plus (+) next to it. You should then find a device called "Silicon Labs CP210x USB to UART Bridge" with a COM number listed next to it. This number will change on all computers, but take note of this number.



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Wave Launch Processor

- Go back to the XConsole software. At the top of the screen click "Setup" then "Port Connections" This bring up a new dialog box. Select the COM port number you obtained from the device manger and click "OK." The software will warn you that you must restart the software for your changes to take effect.

- Restart the XConsole software. This time, when it asked "Do you want to connect to the device?", answer "Yes".

- You should now be connected to the device and ready to use.

Room Equalization

Before making adjustments with your processor, a basic understanding of parametric and graphic equalization is needed.

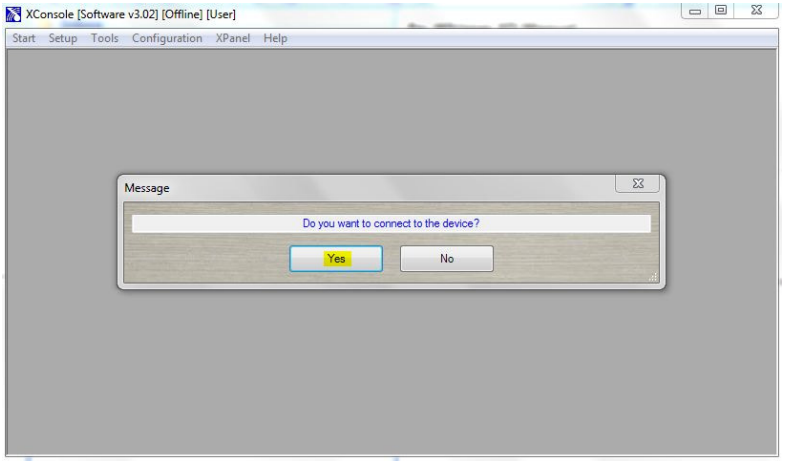
Parametric filters allow you to control the three primary parameters of a useful band-pass filter. These parameters are amplitude (boost or cut), center frequency (pitch) and bandwidth (tonal range). Bandwidth is typically labeled "Q" on the unit, which stands for Q factor. The amplitude of each band can be controlled, and the center frequency can be shifted, and widened or narrowed.

Simpler graphic filters are fixed in frequency and bandwidth, so the music spectrum is divided into uniform third-octave spacings.

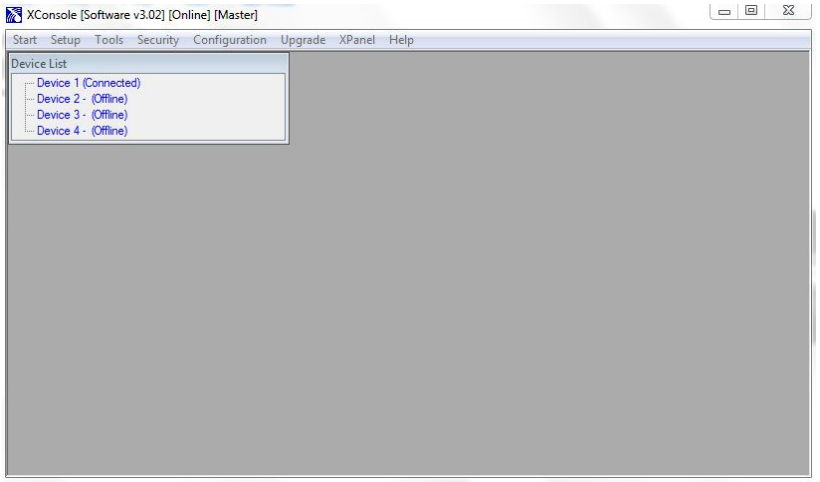
Wave Launch Processor

Making Adjustments with Wavelaunch Processor

After installing the included software, connect the processor to the computer via a USB cable. Launch the XConsole software.



When asked if you want to connect to the device, click yes.



In the Device List, click on the device that is connected. This will launch the program that is currently on the processor.

Wave Launch Processor

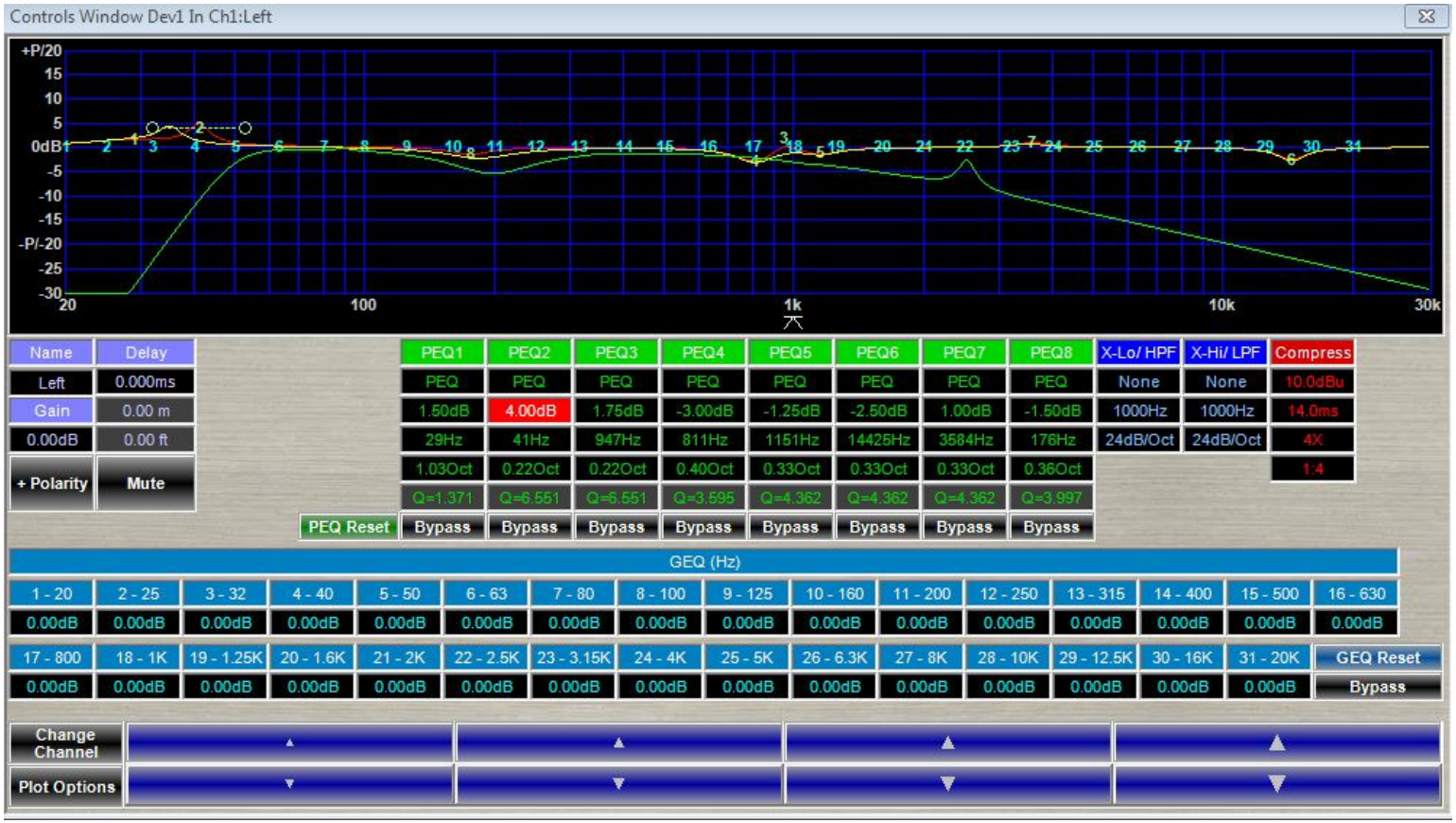
In the Device List, click on the device that is connected. This will launch the program that is currently on the processor.

Adjustments to the processor can be made to "Input 1: Left" and "Input 2: Right".
Clicking on "In 1: Left" opens the controls for the Left speaker.

In this window, you are presented with 31 channels of graphic EQ and 8 channels of parametric EQ.

Wave Launch Processor

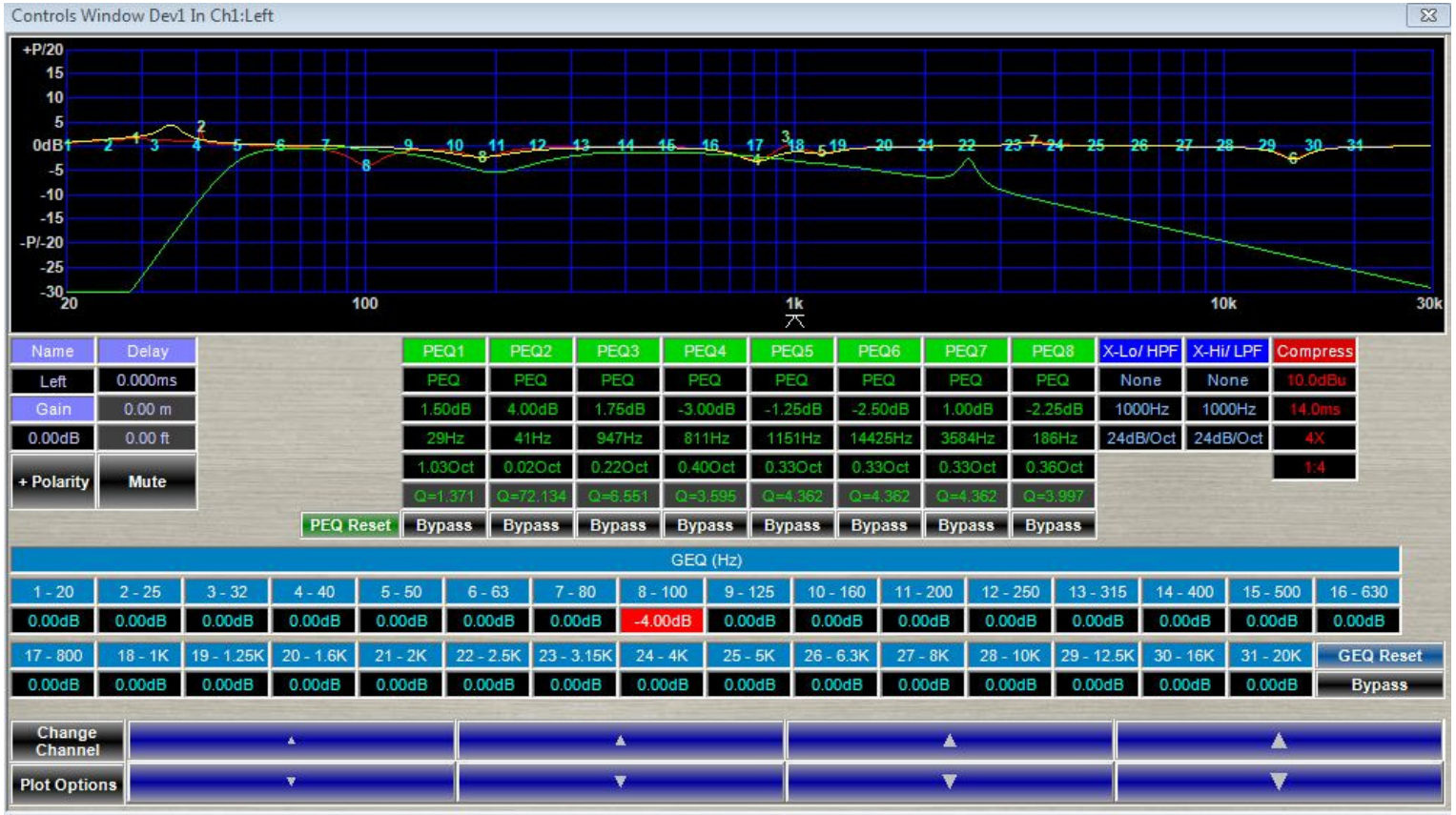
Making a boost with the parametric EQ



In this example, we have selected Parametric EQ 2 (PEQ2) by clicking in its box, which will turn red to indicate your selection. Once highlighted, locate the blue boxes with up and down arrows, at the bottom of the interface. These arrows are used to increase or decrease the gain, frequency and Q of the selected parametric EQ. This column shows a 4.00 dB boost at 41 Hz with a Q of 6.551. A larger Q affects a narrow range of frequencies, while a smaller Q affects a broader range of frequencies. We can adjust gain, frequency and Q by clicking in the corresponding box. Once highlighted, locate the blue boxes with up and down arrows, at the bottom of the interface. These arrows are used to increase or decrease the gain, frequency and Q settings.

Wave Launch Processor

Making a cut with the graphic EQ



In this example, we have selected Graphic EQ 8 by clicking in its box which will turn red to indicate your selection. Once highlighted, locate the blue boxes with up and down arrows, at the bottom of the interface. These arrows are used to increase or decrease the gain of the selected graphic EQ. This column shows a 4.00 dB cut at 100 Hz. Only gain is adjustable in the graphic EQ section because graphic equalizers have a fixed frequency and Q.

After adjusting the left speaker, you may close the window, and click "Input 2: Right" to make adjustments to the right speaker.

Wave Launch Processor

Adjusting using the EQ plot

Adjustments made to both the parametric and graphic EQ are reflected in the graph occupying the upper portion of the screen. You can select them by clicking on their number, and dragging up to boost, and down to cut. Dragging to the left decreases the frequency, while dragging to the right increases the frequency.

Recommendations

Boosts greater than 6 dB can result in ringing, driver overload, or mechanical buzzing.

Boosting and cutting with a smaller Q will affect a broad range of frequencies, and can be helpful for brightening an otherwise dull recording.

Boosting and cutting with a large Q will affect a narrow range of frequencies, and is useful for making precise adjustments.

For the Ambitious: Technical measurements

We highly recommend free measurement software, Room EQ Wizard. This software allows you to measure the in room response of your system. While we obviously cannot provide the technical support for this software, all one needs is a calibrated microphone and a soundcard with microphone preamp and you are off and running.
http://www.hometheatershack.com/roomeq/

Designer's Notes (From Bill Dudleston)

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

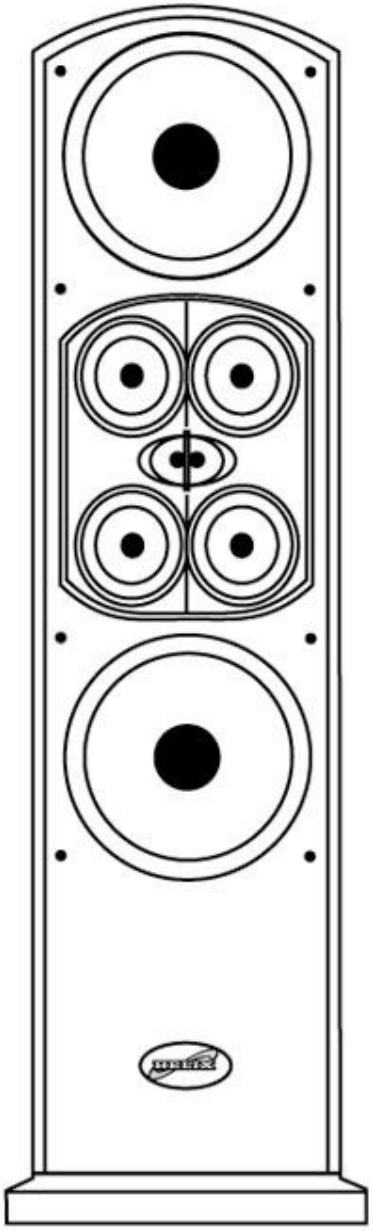
HELIX preserves clarity by avoiding early room reflections via controlled directivity.
HELIX is time synchronized by launch sequencing and phase and group delay adjustment.
HELIX broadens the listening "sweet spot" by maintaining channel correlation over longer distances.
HELIX delivers greater than 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.

Specifications



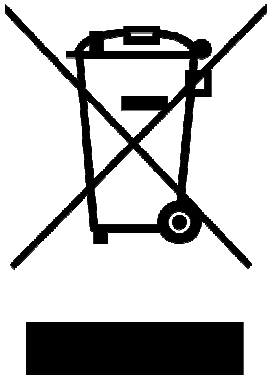
System Type:	10 drivers, 5 way
Tweeter:	Neo-Quadra-pole
Midrange:	4 x 6” Curvilinear
Midwoofer:	3 x 15” Neodymium
Woofer:	1 x 15” Copper/Aluminum
Low Frequency Alignment:	Tri-coil Stabilized
Frequency Response:	22Hz – 30 kHz
Impedance:	4 Ohms
Sensitivity:	100 dB
Recommended Amplification:	3 X 300 Watts
Crossover Frequency:	300, 3k, 10k
Dimensions (H x W x D):	75” X 18.5” X 23”
Weight:	300 pounds each

CE Declaration of Conformity

Legacy Audio
3023 E. Sangamon Ave.
Springfield, IL 62702 USA
800-283-4644
States that this product is in conformity with the with the essential requirements and other relevant provisions of:
Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC

CE

WEEE Compliance



Product Disposal—
Certain international, national and/or local laws and/or regulations may apply regarding the disposal of this product. For further detailed information, please contact the retailer where you purchased this product or the Legacy Audio Distributor in your country. A listing of Legacy Audio Distributors can be found on the Legacy Audio website www.legacyaudio.com
or by contacting Legacy Audio at: 3023 E. Sangamon Ave., Springfield, IL 62702, USA—Phone: +1 217 544-3178.

Notes:

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