

LEGACY

Owners Manual For The
HELIX
Loudspeaker 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

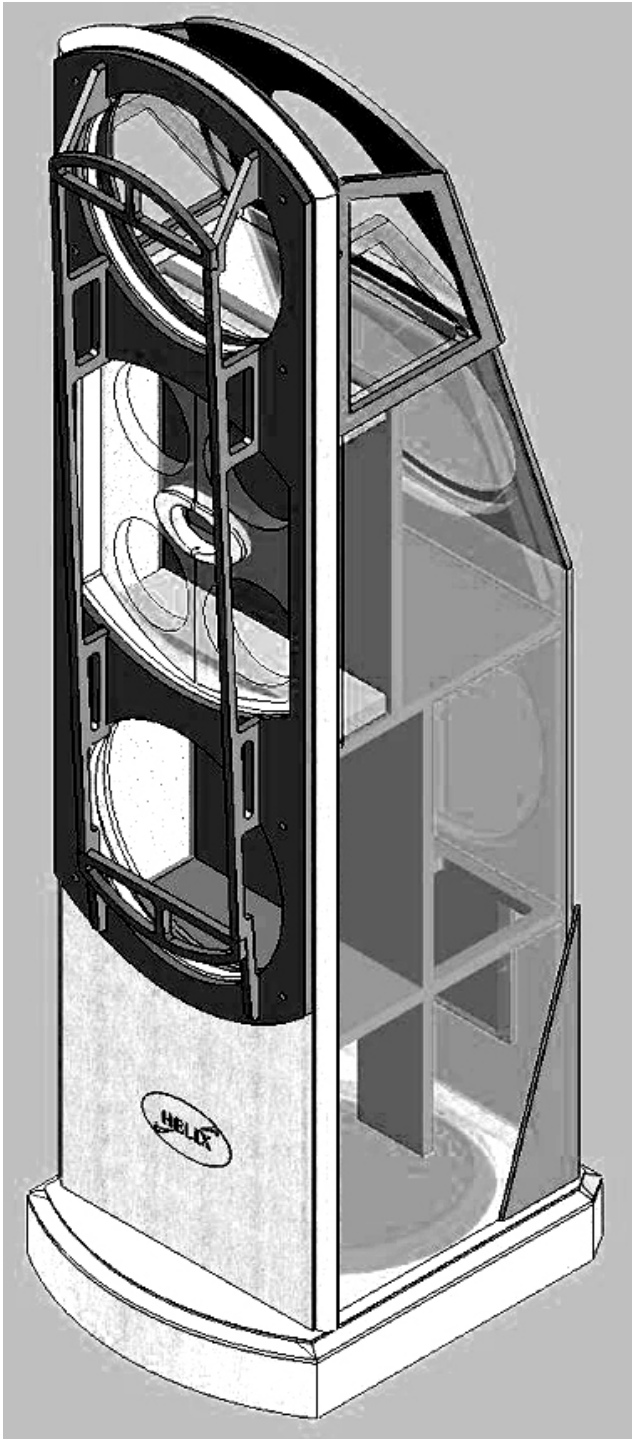
Beneath the surface of Helix's elegant exterior lies rigid MDF construction. Interlocking joinery maximizes the strength of the cabinet parts. Polyester fiberfill is selected for internal damping. A sharp rap on the enclosure will leave you with little more than bruised knuckles.

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.

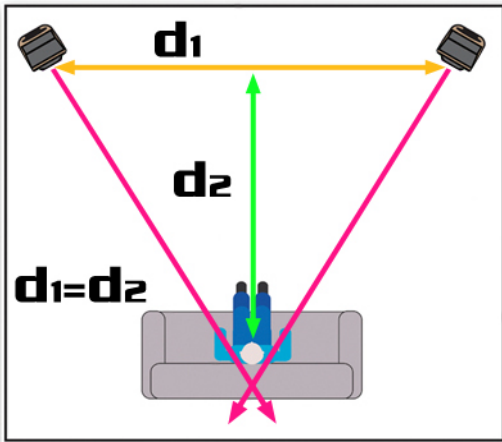
The HELIX project represents seven years of research led by Legacy Audio’s chief designer, Bill Dudleston. A study of room acoustic interactions with loudspeaker radiation has been conducted. Investigations of the detrimental effects of these interactions on image localization, tonal balance and transient 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.

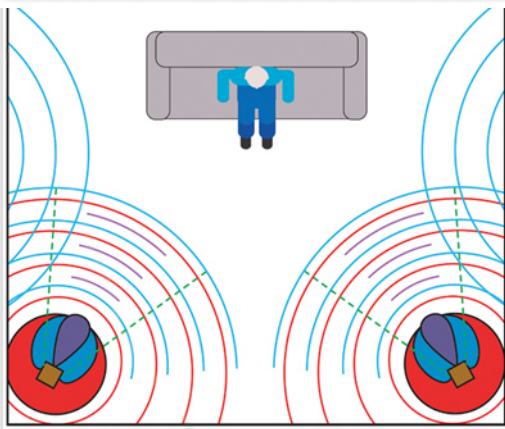
Speaker Placement



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.

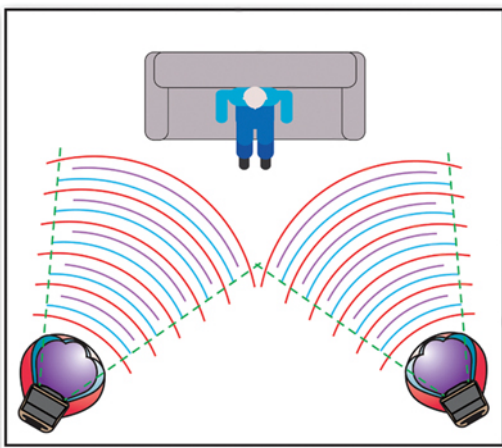
2. Toe the speakers into the listening area. In most circumstances crossing speaker axes just slightly behind of the listener's head works best. This will broaden your sweet spot horizontally. If dispersing into an L-shaped seating arrangement you might find the best results by aiming the left speaker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

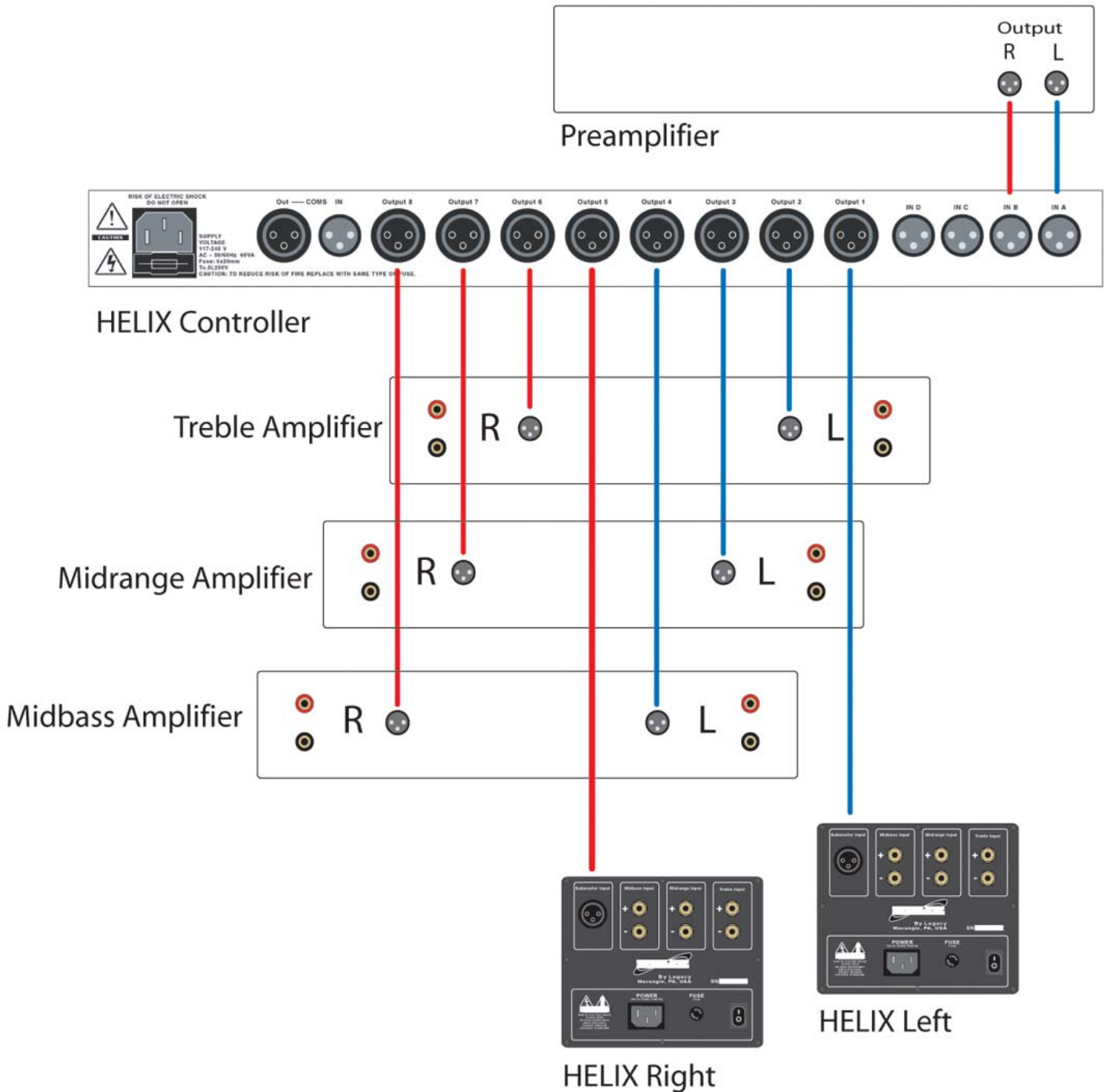
Your Legacy dealer can assist you with your specific cabling needs.



Speaker Connections

The low level connections from the preamplifier to the HELIX controller, and from the HELIX controller to each amplifier channel should be made with high quality XLR cables.

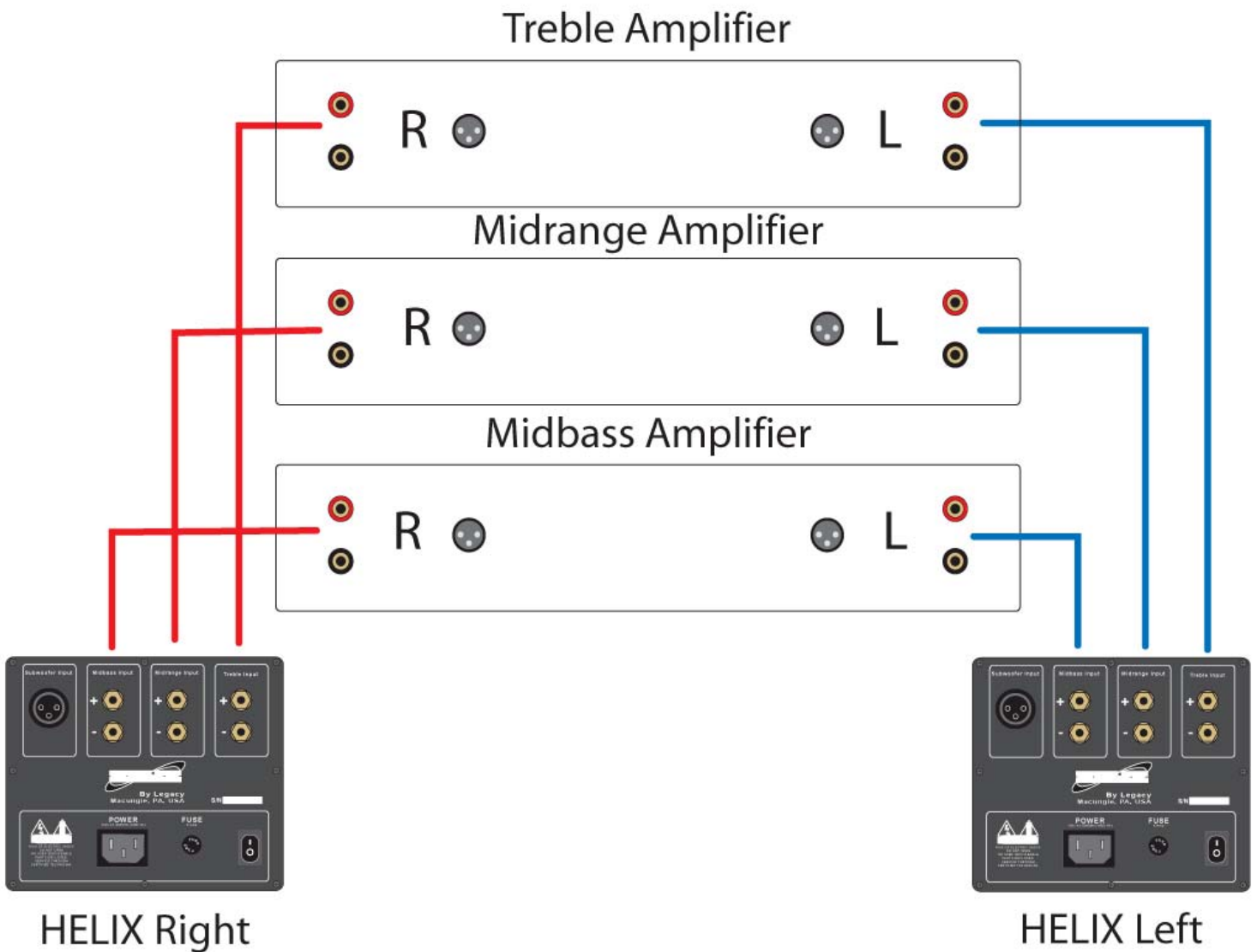
Low Level HELIX Connections



Speaker Connections

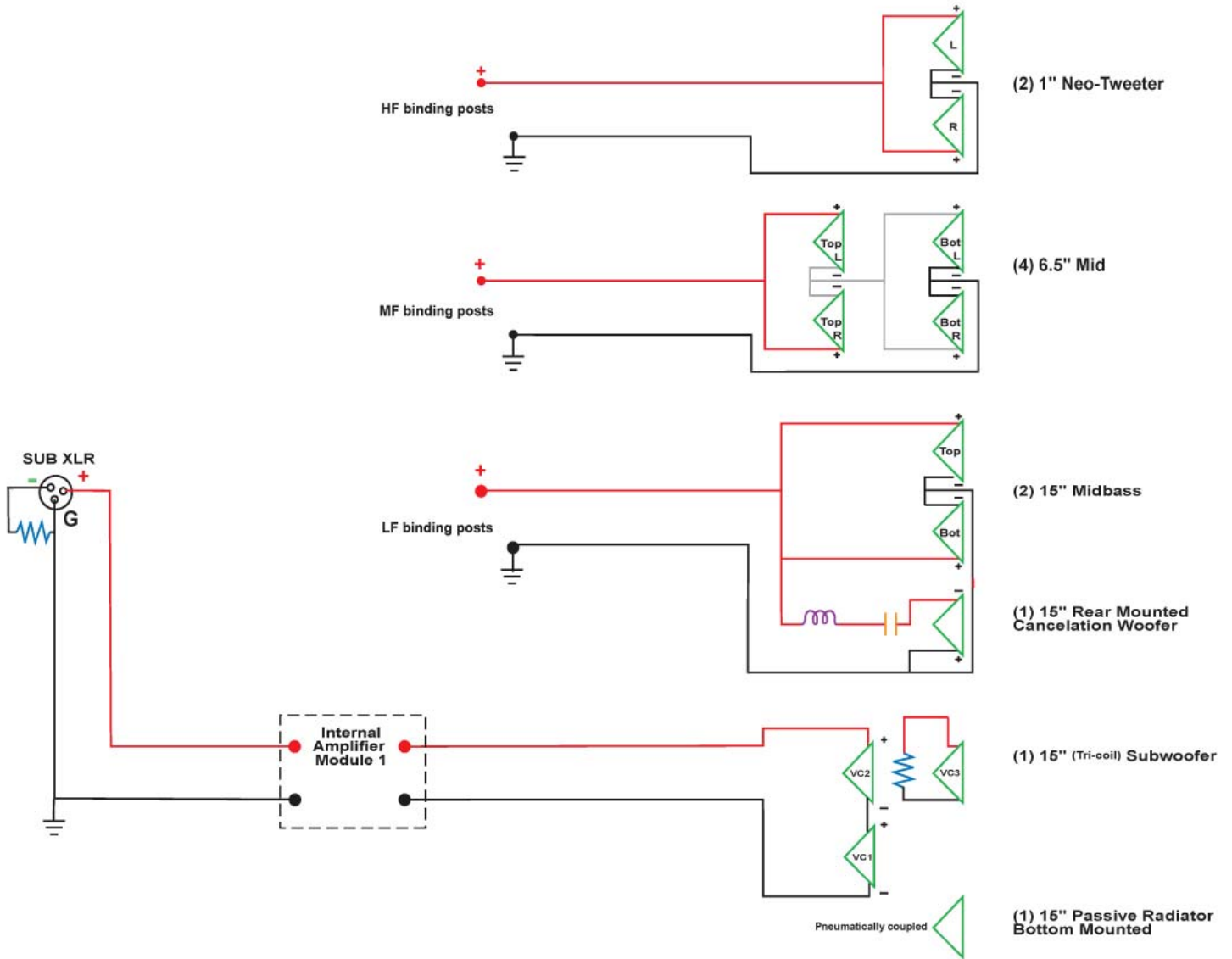
It is advantageous, when practical, to position the amplifiers midway between the HELIX speakers. This will keep the speaker cable lengths to a minimum

High Level HELIX Connections



Speaker Connections

HELIX Internal Wiring (For use by qualified technicians only)



Processor Setup

Legacy Audio has chosen the Klark Teknik DN9848 Loudspeaker Processor as the digital interface to control the HELIX system. This unit is intended to remain “powered on” except when not utilized for extended periods of time.

Before turning on the DN9848, be certain that all power amplifiers are turned off, including the HELIX internal subwoofer amplifiers. Allow two minutes for the DN9848 to boot up and stabilize. You will note that the knobs light up and green LCD front panel displays “Legacy Helix” and a date.



Taking the unit out of mute mode.

Looking at the front panel of the DN9848, note that a red ring illuminates each of the eight output control knobs. This indicates that each channel of output is still in the mute mode. Activate these eight channels (taking them out of the mute mode) by pressing each of the output control knobs inward, one at a time. Note that the red ring goes out when activated.

Now turn on all amplifiers including the HELIX subwoofer amplifiers, and play a stereo CD with full spectrum information. All channels and all drivers in both speakers should be playing.

Processor Setup

SETTINGS

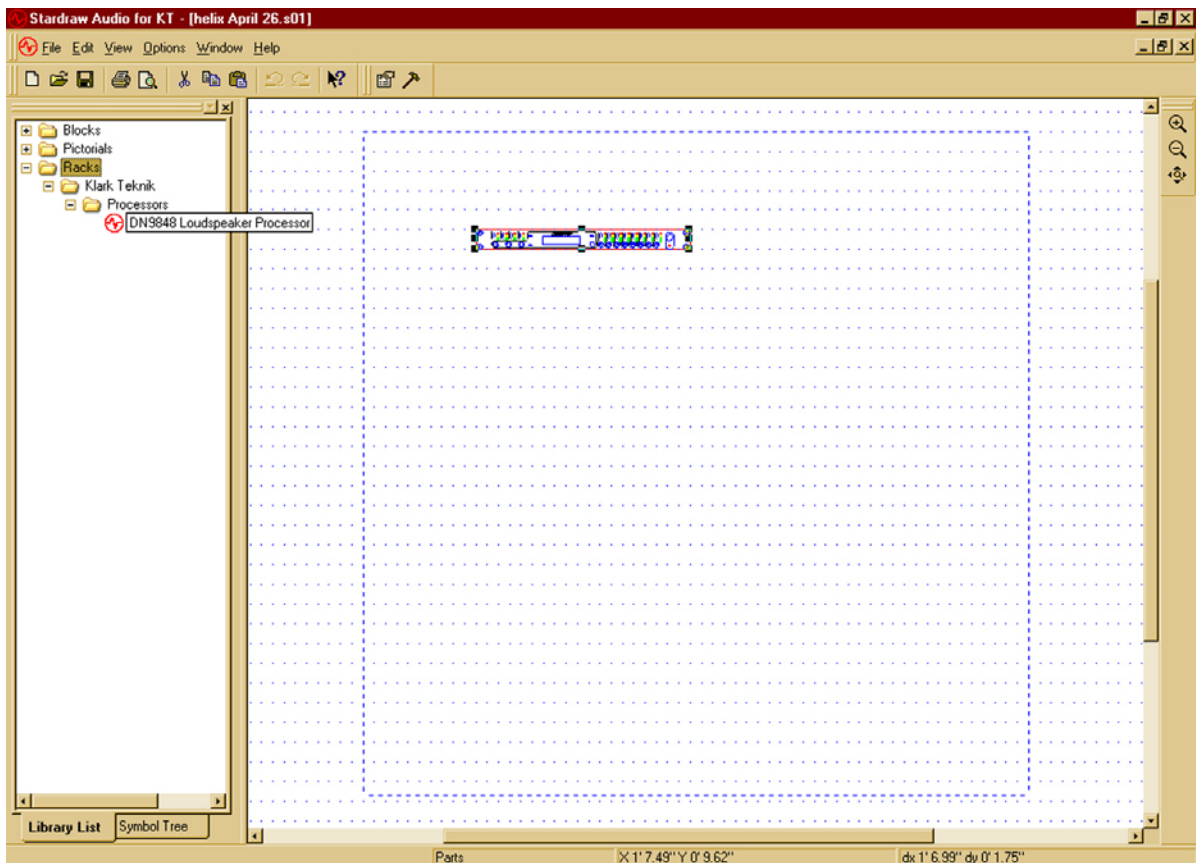
One useful feature of the DN9848 is the ability of the user to adjust the level of the subwoofer, midbass, midrange and treble section of each HELIX speaker independently. This allows simple adjustment for recording imbalances or room asymmetries. The knobs for each channel and frequency bands are allocated as follows:

Input Feed	Output Control Knob	Frequency Range	Adjustment Range
A (Left)	1 (Left Subwoofer)	16 – 85 Hz	off to +12 dB
A (Left)	2 (Left Midbass)	85 – 300 Hz	off to +12 dB
A (Left)	3 (Left Midrange)	300 -5 kHz	off to +12 dB
A (Left)	4 (Left Treble)	5k – 30 kHz	off to +12 dB
B (Right)	5 (Right Subwoofer)	16 – 85 Hz	off to +12 dB
B (Right)	6 (Right Midbass)	85 –300 Hz	off to +12 dB
B (Right)	7 (Right Midrange)	300 – 5kHz	off to +12 dB
B (Right)	8 (Right Treble)	5k – 30 kHz	off to +12 dB

One should exercise care when boosting the controls (clockwise) as it can quickly drive an amplifier into clipping, which can result in damage to the speaker and the amplifier.

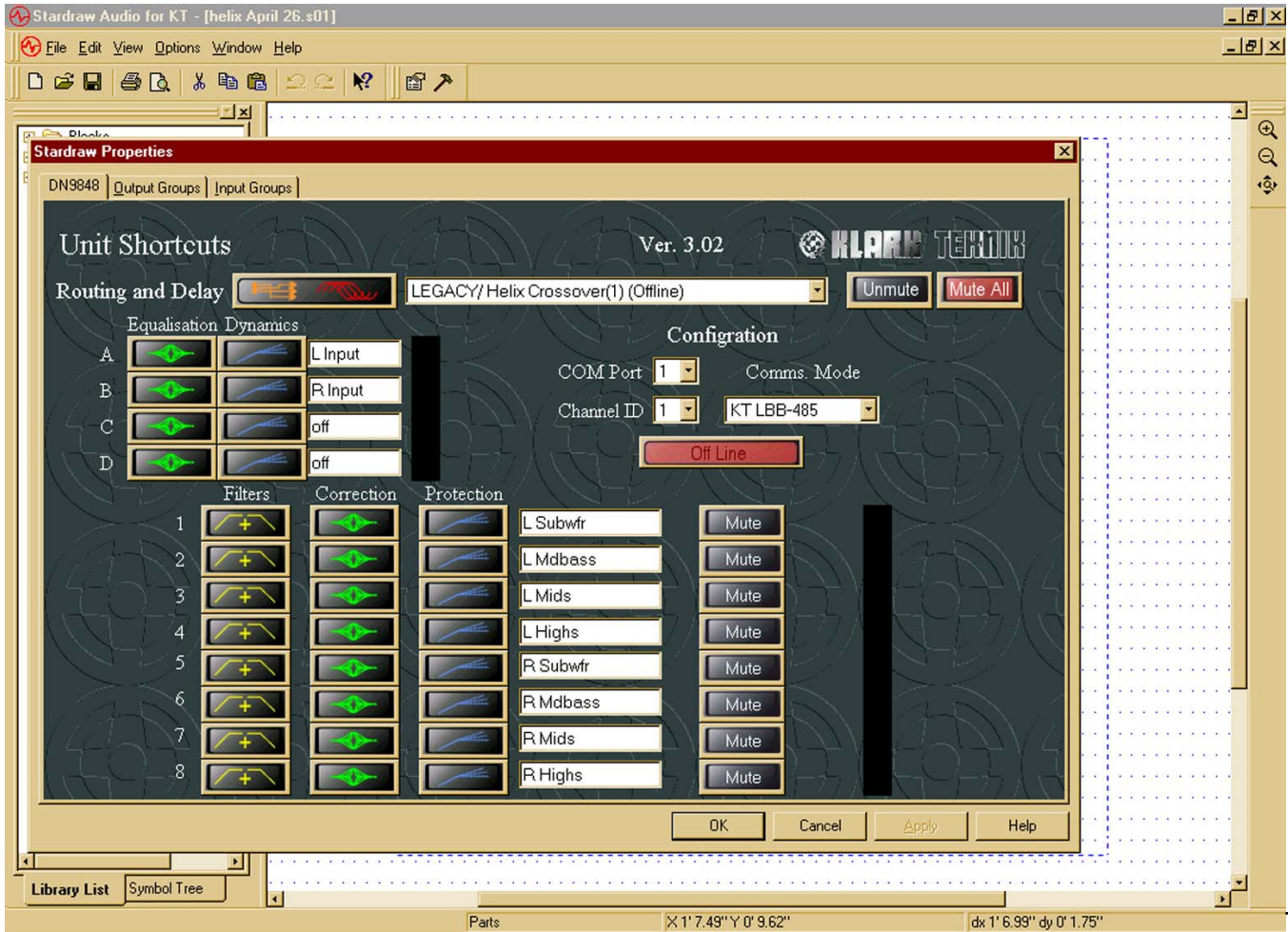
DEALER ADJUSTMENTS

More specific room related adjustments may be made only by a Legacy certified dealer or technician. These adjustments require connecting the Klark Teknik DN9848 via the front PC port to a notebook computer. The software for the DN9848 is downloadable from the Klark Teknik web site at <http://www.klarktechnik.com/software.htm>.



Processor Setup

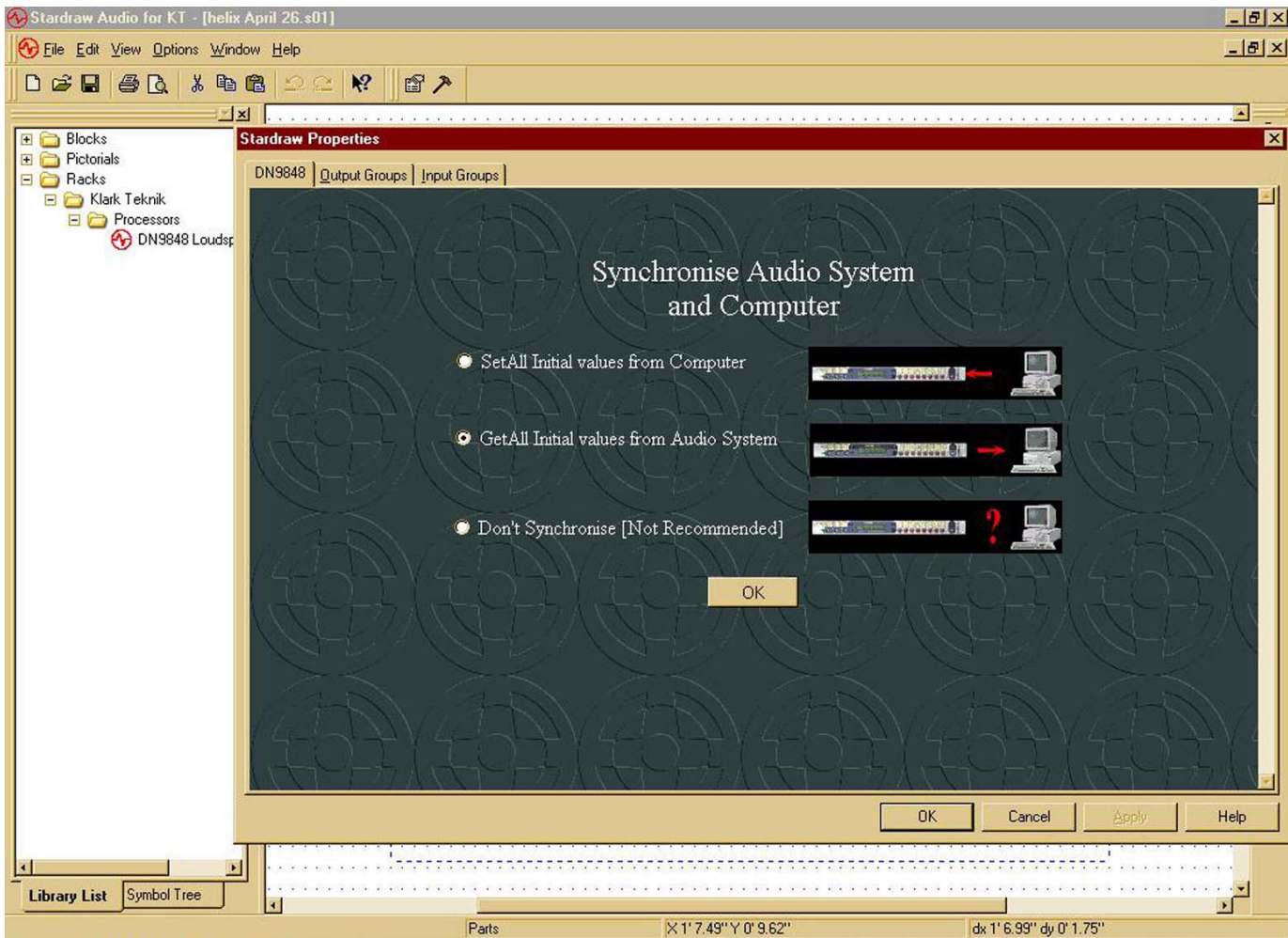
1. After installing Stardraw onto the PC, open the program.
2. Select Racks---Klark Teknik –Processors. Open Processors folder and the DN9848 Icon will appear. Select and drag onto the page at right.
3. Now double-click on the processor unit illustration, advancing to the **Unit Shortcuts** page.



4. To initialize communication between the DN9848 and the PC, connect the provided cable's 8-pin DIN connector to the DN9848 front panel and the other end to the PC's RS-232 serial port.
5. Hold in the HOME button on the DN9848 for two seconds, then rotate the data knob until it reads COMS 1.

Processor Setup

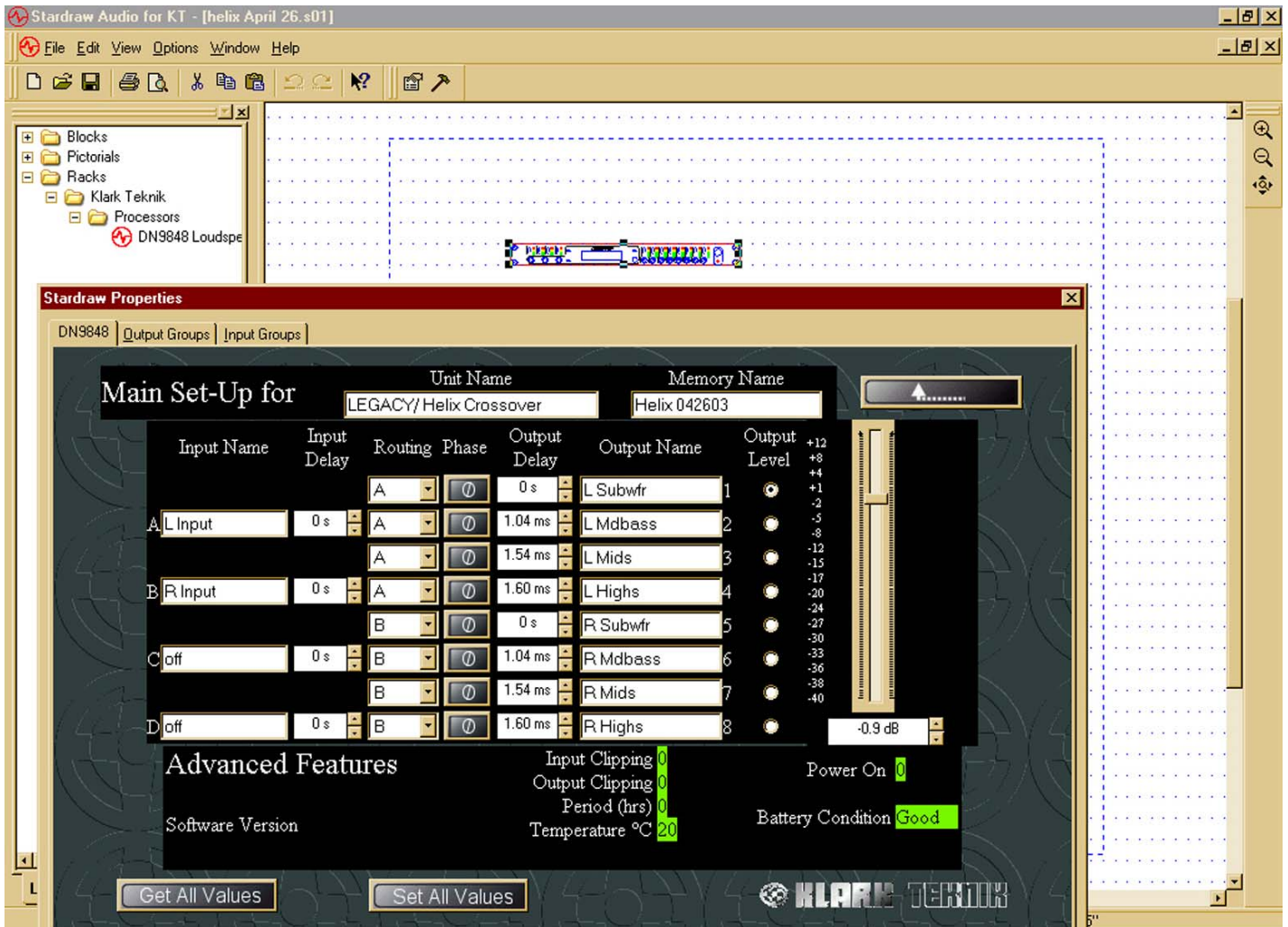
- Returning to your PC screen, click the red OFFLINE button as shown in the illustration. This will bring you to the **Synchronise Audio System and Computer** window.



- Select GET ALL INITIAL VALUES FROM AUDIO SYSTEM, and then click the OK box.
- After a few moments the green display on the front panel of the DN9848 should begin flashing dash symbols, indicating the unit is now synchronized with your PC.
- Return to the **Unit Shortcuts** page and click on the green parametric EQ icon corresponding to channel A. This will allow custom equalization of your left HELIX speaker to your room's actual listening position. Selecting the similar icon for channel B will allow equalization of your right HELIX speaker.
- It is recommended that before any changes are actually made to the settings, that the original factory settings be saved by clicking FILE—SAVE AS and storing onto your computer as backup.

Processor Setup

DO NOT ALTER SETTINGS ON THIS PAGE AS IT WILL VOID WARRANTY AND RISK DAMAGE TO YOUR SPEAKERS. Should this page appear, merely exit by clicking on the Return arrow at the top right.



Save/load Routine RECALLING PATCHES

Pressing RECALL initiates the Recall sequence allowing the screen data entry controllers X,Y and Z to be used to select the memory bank (Preset, System and User). A message instructs that the Recall sequence can be aborted by pressing the HOME (SETUP) key, whereupon the display returns to the HOME page. Note that patch Recall will not be possible if this operation is locked out - see Security section.

Pressing RECALL a second time loads the currently selected patch into the working memory unless the patch selected is identical to the one already loaded. In this case the system is intelligent enough to know that it doesn't need to load the patch. The three screen data entry controllers access the three memory types: User, System and Preset. The recall sequence may be aborted at any time prior to pressing RECALL a second time by pressing the HOME (SETUP) button.

Processor Setup

SAVINGPATCHES

Pressing STORE initiates the Store sequence and displays a message asking the user to select the desired User or System memory bank. As with Recall, the sequence can be aborted at any time prior to saving by pressing the HOME(SETUP) button, whereupon the display returns to the HOME page.

The X screen data controller may be used to step through the System and User memories unless the System memories are locked, in which case these will not be accessible. If empty memory banks are available, the first available one will be shown by default. Once all patches are full, the system will automatically go to the last patch recalled, though the user may step through to any other location.

Pressing STORE a second time calls up a dialogue box requesting the user to enter a name for the stored patch.

X: Cursor left or right.

Y: Scroll characters.

Z: Not used.

By default, the name initially displayed will be that of the working memory, i.e. the currently selected patch.

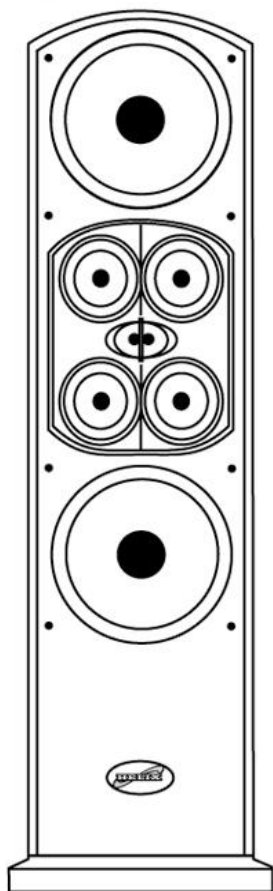
Once the name has been entered, pressing STORE for a third time will save the patch to memory and return the user to the HOME page.

Diagram showing the save and load menu screens:

```
RECALL U01  user,sys,Pre
U01: DEFAULT
```

```
STORE  U01  user,sys,---
U01: DEFAULT
```

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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