



**iWS**

In-Wall Subwoofer

**OWNER'S MANUAL**

**Now Hear This**  
6400 Goodyear Road  
Benicia, CA 94510  
800-NHT-9993

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# Specifications

## iWS Enclosure

<b>System Type:</b>	In-wall subwoofer
<b>Driver Complement:</b>	12" aluminum cone woofer
<b>Response:</b>	27Hz - 140Hz, +/-3dB
<b>Sensitivity:</b>	86dB (2.83V at 1M)
<b>Impedance:</b>	12 ohms nominal
<b>Inputs:</b>	Professional grade 5 way binding posts
<b>Weight:</b>	36 lbs. each
<b>Cutout Dimension:</b>	13 1/8" H 13 1/8" W
<b>Bezel Dimension:</b>	14 1/2" H 14 1/2" W
<b>Depth behind wall:</b>	3 3/8"
<b>Finish:</b>	Matte black enclosure, white (paintable) bezel/grille



## X1 Crossover

<b>Frequency response:</b>	20Hz - 140Hz +/-3dB through L/R input (continuously variable) 20Hz - 220Hz +/-3dB through LFE input (fixed) 50Hz,80Hz,110Hz-100KHz +/-3dB
<b>Distortion:</b>	< 0.01% subwoofer output @ 100Hz, 1V < 0.001% hi-pass output @ 1KHz, 1V
<b>Signal to noise ratio:</b>	>105dB at Hi-pass output >100dB at subwoofer output
<b>Crossover:</b>	Low-pass continuously variable between 30-220Hz, 12dB/octave Low-pass fixed at 220Hz,12dB/octave High-pass selectable between 50, 80, 110Hz, 12dB/octave
<b>Input connectors:</b>	Gold plated L and R RCA jacks for line level input XLR jacks for line level input Gold plated RCA jack for LFE input XLR jack for LFE input Detachable terminal block for external trigger in/thru 2.1mm x 5.5mm x 9.5mm power connector
<b>Output connectors:</b>	Gold plated L and R RCA jacks for line level high-pass output Gold plated RCA jack for LFE thru XLR jacks for line level high-pass output Gold plated RCA jacks for line level sub woofer output XLR jacks for line level subwoofer output
<b>Phase Control:</b>	Variable between 0 and 90 degrees Switchable 0 - 180 degrees
<b>Gain Control:</b>	+10dB and 0dB subwoofer sensitivity
<b>Stereo / Mono Switch:</b>	Stereo or mono operation
<b>Standby Mode:</b>	Selectable internal or external. External 5 -24 VDC Internal automatic when no signal is present for >20 minutes
<b>Power Consumption:</b>	3W
<b>Weight:</b>	9 lbs.
<b>Dimensions:</b>	1.5"H x 17"W x 11.5"D
<b>Finish:</b>	matte black anodized front panel, black painted chassis



## A1 Amplifier

<b>Frequency response:</b>	10Hz - 65KHz +/-3.0 dB 20Hz - 20KHz +/- 0.5 dB
<b>Distortion:</b>	<0.01% 20Hz-1KHz < 0.075% 10KHz - 20KHz
<b>Power Output:</b>	200W rms into 8 ohms at rated distortion 250W rms into 6 ohms at rated distortion 300W rms into 4 ohms at rated distortion
<b>Signal to noise ratio:</b>	100dB (unwtd)
<b>Input Impedance:</b>	>10K ohms
<b>Damping Factor:</b>	>100 into 6 ohms
<b>Gain:</b>	+27dB (1.7V sensitivity) for full output
<b>Input connectors:</b>	RCA jack for unbalanced line level input XLR jack for balanced line level input Detachable terminal block for external trigger in/thru
<b>Output connectors:</b>	Pair of 5-way binding post
<b>Standby Mode:</b>	Selectable internal and external. External 5 -24 VDC Internal automatic when no signal is present for >20 minutes
<b>Power Consumption:</b>	600W Max
<b>Standby Mode Power Consumption:</b>	<3W
<b>Weight:</b>	18 lbs.
<b>Dimensions:</b>	1.5"H x 17"W x 11.5"D
<b>Finish:</b>	matte black anodized front panel, black painted chassis

Thank you for your purchase of the NHT iWS In-Wall Subwoofer System. Please take a few minutes to read through this Owner's Manual prior to installing your new subwoofer. The information provided will help you to obtain maximum performance from your audio system. If you have questions or need assistance at any time during the installation or operation of your new speakers, please call your NHT Dealer or our Toll-Free Customer Hotline at:

**1-800-NHT-9993**

## ■ Design

NHT loudspeakers are designed to deliver refined, musical sound from attractive and affordable packages. Our efforts are guided by the study of human hearing and are optimized for real-world use. Every NHT speaker undergoes rigorous testing and quality control at the factory to ensure you years of listening pleasure.

The iWS In-Wall Subwoofer System is designed to deliver the sonic performance and value of NHT's acclaimed free-standing subwoofers, while offering the invisibility of in-wall installation. The system comprises a custom-designed 12" woofer, the A1 amplifier, and the X1 crossover. The rigid acoustic suspension enclosure is designed to minimize the audible effects of unwanted vibrations and resonances when mounted within standard frame construction. The powerful and versatile A1 amplifier provides 200W output and a host of convenience features, while the X1 Crossover allows the system to achieve 27Hz bass extension from an extremely small cabinet.

**Caution:** *The iWS should be installed by an experienced and licensed custom installation professional. Be sure that the installer possesses sufficient skill, the proper tools, knowledge of local fire and building codes, and a familiarity with the structure of the building (especially wall and/or ceiling materials, layouts, electrical and plumbing lines, etc.).*

## ■ Placement

The iWS is designed for interior in-wall installation between standard 2"x4" wood studs. Installation in outdoor locations or in moisture-prone interior environments such as indoor swimming pools or saunas is not recommended.

Spend some time considering placement prior to installing the subwoofer(s). Once it is installed, the iWS is permanent, so its location should be selected carefully. Contrary to popular belief, subwoofers are sensitive to placement. Low frequencies produce long wavelengths and thus interact with room boundaries significantly. Placing the subwoofer near a corner will tend to increase its bass output, but may result in "boomy" or "muddy" sound. Conversely, placing the subwoofer farther into the room will tend to decrease its bass output, but may result in improved articulation and clarity. For flattest response, install the subwoofer according to the "rule of thirds": in a location 1/3 or 2/3 across a wall, and not 1/4 or 1/2 across the wall. A 1/3 or 2/3 location will excite fewer standing waves in the room.

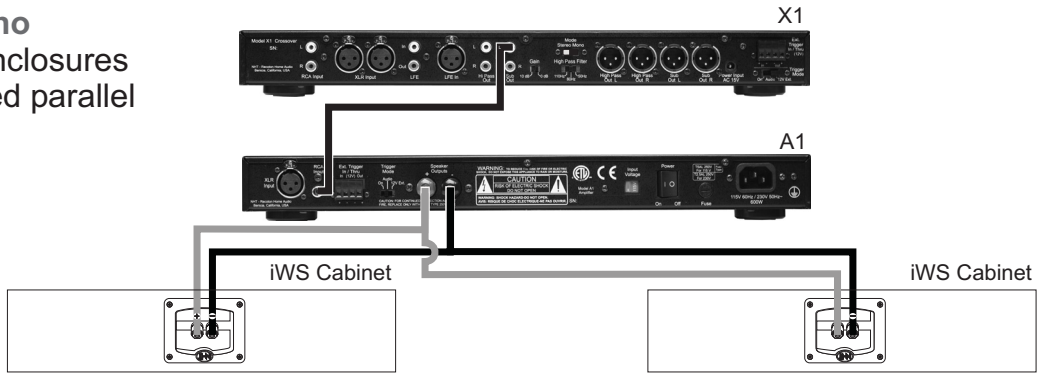
Generally, the iWS should be installed along the same wall as the main (satellite) speakers for optimal integration. Position the subwoofer so that it faces into the room, unobstructed by large furnishings. Install it on a flat wall surface to ensure a good seal between the bezel and the wall. If you are using two iWS subwoofers in the same room, it is preferable to install the second subwoofer assymmetrically. For example, one subwoofer in a front corner, and one subwoofer 2/3 across the front wall.

The iWS subwoofer is not magnetically shielded, and the woofer will distort a direct view (picture tube) type TV if installed too close. Make sure that if the woofer is oriented directly behind the TV, the TV is at least two feet away. If the TV is off to the side or above of the woofer, make sure it is three feet away.

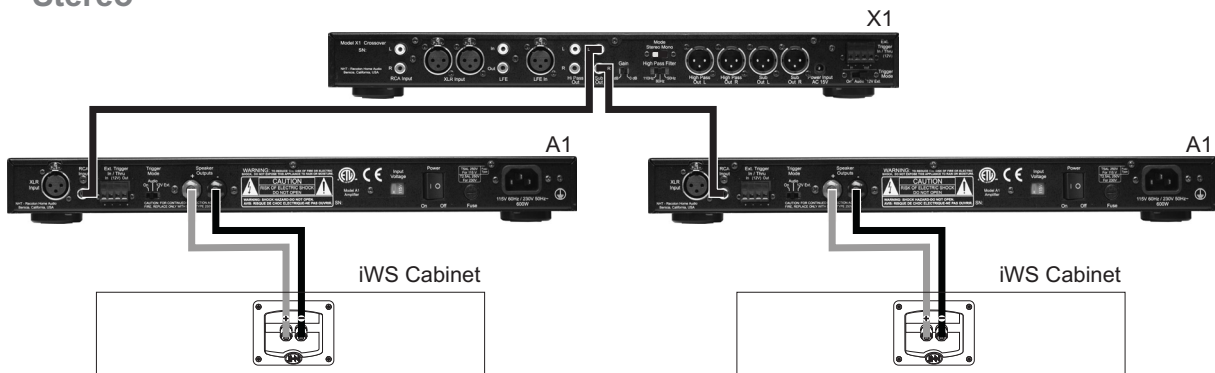
## ■ Configurations

The basic configuration of the iWS can be expanded. For increased low frequency response and clarity, two iWS enclosures may be connected in parallel to the A1 amplifier, which is designed with enough current capability to drive two subwoofers. Below are illustrations of 3 possible configurations.

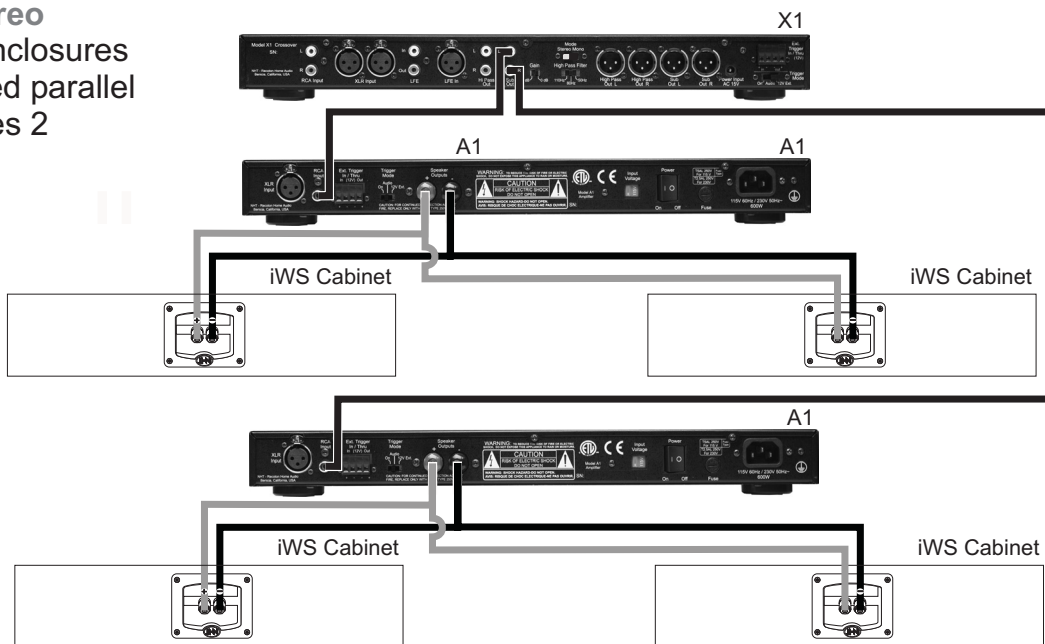
**Mono**  
2 enclosures  
wired parallel



**Stereo**



**Stereo**  
2 enclosures  
wired parallel  
times 2



## ■ Connections

***Before connecting the iWS to your system, it is important that you turn off the power to all components to avoid damage. Before installing the iWS, map out the wiring paths between the enclosure and the A1 amplifier. Make sure that the speaker cable does not rest on sharp or pointed objects.***

The iWS is designed for use with the A1 amplifier and X1 crossover. As it does not have an internal crossover and requires these components, or it will not function properly. Proper wiring of the subwoofer is essential to good sound. At a minimum, 14AWG 2-conductor speaker wire is recommended for runs of 10 feet or less, with heavier special purpose speaker wire used for longer runs. ***When permanently installing wire inside walls, be sure to use cable that is rated for in-wall use and has special jacketing for fire prevention. In the U.S., the U.L. standard is CL-2, CL-3 and CM cable, and in Canada the CSA standard is FT4 wire. The wires should be run in accordance with National Electrical Code and any applicable local building codes.*** Prepare the wire by stripping 1/4" to 3/8" of insulation from the ends and twisting the exposed wire strands tightly. The 5 way binding posts accept all types of wire ends.

***Be sure to wire the subwoofer "in-phase." That is, the Positive (red) terminal on the amplifier output must be connected to the corresponding Positive (red) terminal on the subwoofer. Likewise with the Negative (black) terminals.*** All speaker wires have some sort of marking along one or both conductors to help you make the correct connections. Take care to wire the subwoofer correctly in-phase, because once the wall is sealed there is no access to the terminals.

## ■ Parts List (one system):

- (1) iWS subwoofer enclosure with driver
- (1) A1 amplifier (packaged separately)
- (1) X1 crossover (packaged separately)

## iWS bezel and grille pack includes:

- (1) Bezel
- (1) Metal grille
- (4) 1/4-20 X 2 1/4" panhead machine screws
- (4) 1/4" washers
- (1) Paint shield

## ■ Tools Needed:

- #2 Philips screwdriver
- Pencil
- Caulking
- Tape measure
- Utility knife or keyhole saw
- Level
- Wire strippers
- Safety goggles
- Protective gloves

## Tech Tips: Pre-Wiring for New Construction

1. For best results, avoid running speaker wire near AC wiring, as it may induce a 60Hz hum in the audio signal. It's a good idea to run the speaker wire after the electrical wiring has already been completed, so that you can route the speaker wire at least three feet away from the electrical wiring. If speaker wire and AC wiring must run parallel, install the wire within a metal conduit. Note that low-voltage wiring (doorbell, intercom, telephone, security, etc.) are unlikely to induce hum and can typically be run parallel to speaker wire with no detrimental effects.

2. When drilling holes through wall studs or ceiling joists, use a drill bit that is at least as wide as the speaker wire that will be routed through them. Always drill through the center of the stud or joist. If the hole must be drilled within one inch of the edge of a wall stud, add a nail plate to the drywall side to protect the wire from possible nails and screws put in the wall later. Line up the holes in the studs or joists as you go, so that pulling the wire through them will be easier.

### ■ Enclosure Installation: New Construction (unfinished walls)

**Note:** If the bezel and grille are to be painted to match the wall, they must be painted first before being installed. See "Painting" for further instructions.

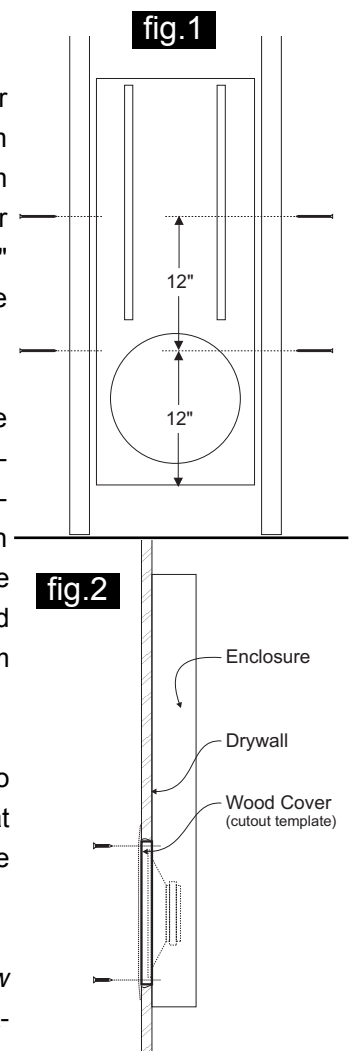
1. Locate the centerline of the studs that the iWS cabinet is to be installed between. For a 2 x 4 that is 3 5/8" deep, this will be 1 13/16" from one surface. Locate and mark this point on the inside surface of each of the two studs in at least two locations. With a straightedge, connect these two marks to form the centerline of the 2 x 4.

2. Decide how high you are going to mount the iWS from the floor. Make sure to leave room for the bezel to clear any baseboard that may be applied over the drywall. Higher up is safer from this standpoint. Once you have determined the vertical location of the iWS, measure 12" up from the bottom of the iWS. (Fig. 1) Make a mark on the 2 x 4 centerline at this location. Repeat for the other 2 x 4. Repeat for both 2 x 4s at a height of 24" from the bottom of the iWS. Drill a 3/8" hole through the 2 x 4s at each of the four marked locations. Try to keep the drill square to the surface of the 2 x 4.

3. Insert the iWS cabinet into the wall between the studs. If the subwoofer is not going to be mounted on the bottom of the wall, raise it to the desired height by placing blocks of wood underneath. Do not remove the woofer protector board. Put one of the supplied 1/4" washers on the 1/4-20 x 2.25" machine screw. Push this screw through the 2 x 4. Start this screw several turns with a HAND SCREWDRIVER. Repeat this step for the other three screws. Tighten all four of the screws until the washers are just touching the 2 x 4. Make sure that the iWS cabinet is centered between the front and rear surfaces of the 2 x 4s. Tighten the screws moderately. Once the foam on the cabinet has been crushed some, stop.

If the iWS is going to be installed in the corner of the room where you may not have access to the opposite side of the stud, or the stud is too thick for the screws, the threaded insert in that side of the iWS cabinet MUST be filled with caulking. Failure to do this will cause air leaks, noise and poor performance from the subwoofer.

4. Complete the pre wiring before the drywall goes up (see "Tech Tips: Pre Wiring for New Construction"). Connect the speaker wire to the binding posts on the top of the enclosure, making sure to observe correct polarity (see "Connections"). It's a good idea to leave an extra few feet of speaker wire.



5. During the drywall phase, the wood cover that protects the woofer also serves as the cutout template. The template is 13 1/8" square with 1/2" radiused corners (fig. 2). Once installed, the bezel outer frame will extend out about 5/8" beyond the perimeter of the cutout to hide minor imperfections in the cutout .

6. When painting the wall, leave the wood cover to protect the woofer, and don't worry about overspray. If the bezel frame and grille are to be painted, paint them separately before installing them. (see the 'Painting' section in this manual)

7. Once the drywall and paint are complete, remove the wood cover and attach the bezel to the enclosure via the (8) 8 X 2" panhead screws (fig. 3). Tighten screws snugly, making sure not to over-tighten, as this may compromise the fit of the bezel. **DO NOT USE** a power screwdriver for this. The foam strips on the drywall side of the bezel frame reduce unwanted vibrations against the drywall and will compress slightly to allow the bezel frame to rest flush against the wall.

8. Attach the metal grille by inserting it into the grooves in the bezel (fig. 4).

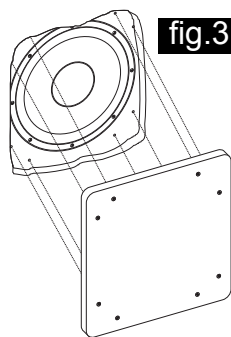


fig.3

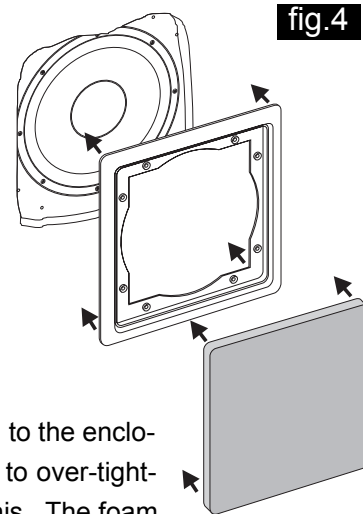


fig.4

■ **Enclosure Installation: Existing Construction (retrofitting finished walls)**

**Note:** The iWS is primarily designed for new construction installations. Installing it into finished walls requires cutting away a large piece of drywall and patching it once the subwoofer is installed. If you are not comfortable or experienced with precision drywall work, consult a professional contractor or custom installation professional. If the subwoofer bezel and grille are to be painted to match the new wall, they must be painted first before being installed.

**Warning:** Exercise caution when drilling or cutting into existing walls. Do not drill through existing wires, pipes, conduits, heating or air conditioning ducts. If you feel resistance while drilling, stop immediately.

1. Once you've selected the desired location for the subwoofer, use a studfinder or the "knocking" method to locate the studs in the wall area where you wish to mount the subwoofer enclosure. The enclosure is 14" wide, 3-3/8" deep and mounts neatly between 2 x 4 studs spaced 16" apart on center.

2. Determine that there are no obstructions behind the desired cutout area. This is accomplished by drilling a hole in the center of the cutout area and using a long "L"-shaped piece of metal (like a coat hanger) to "feel around" behind the wall. Most walls will have a run of Romex (electrical wiring) approximately one foot up from the floor (fig. 5). **Do not attempt to cut the electrical wires!** In these cases, the enclosure will need to be mounted above the electrical wiring. If you discover any other obstructions (such as pipes, conduits or ducts), fill the hole with patching compound and try another location.

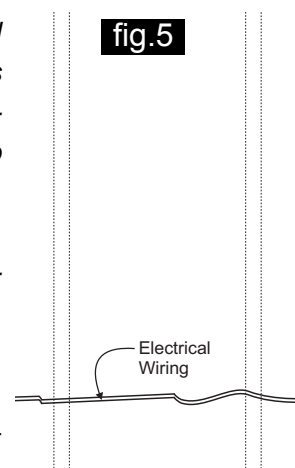


fig.5

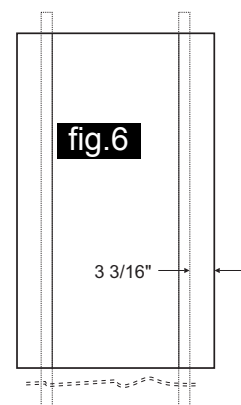


fig.6

3. Once a suitable wall location has been found, carefully cut away a section of drywall 24" wide and 38" tall. Center the 24" wide hole over the two studs. There should be an opening 3 3/16" wide on either side of each stud (fig. 6). If the section of drywall is cut out carefully, it may be re-used later to patch the wall once the enclosure is installed.

4. Locate the centerline of the studs that the iWS cabinet is to be installed between. For a 2 x 4 that is 3 5/8" deep, this

will be 1 13/16" from one surface. Locate and mark this point on the inside surface of each of the two studs in at least two locations. With a straightedge, connect these two marks to form the centerline of the 2 x 4.

5. Decide how high you are going to mount the iWS from the floor. Make sure to leave room for the bezel to clear any baseboard that may be applied over the drywall. Higher up is safer from this standpoint. Once you have determined the vertical location of the iWS, measure 12" up from the bottom of the iWS. (Fig. 7) Make a mark on the 2 x 4 centerline at this location. Repeat for the other 2 x 4. Repeat for both 2 x 4s at a height of 24" from the bottom of the iWS. Drill a 3/8" hole through the 2 x 4s at each of the four marked locations. Try to keep the drill square to the surface of the 2 x 4.

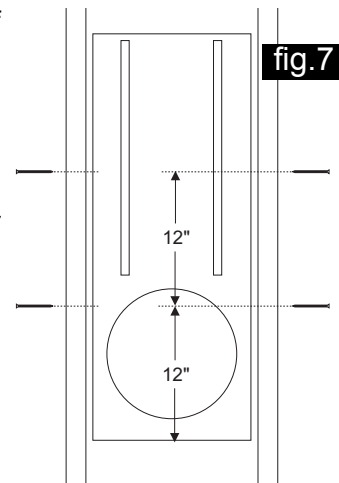


fig.7

6. Insert the iWS cabinet into the wall between the studs. If the subwoofer is not going to be mounted on the bottom of the wall, raise it to the desired height by placing blocks of wood underneath. Do not remove the woofer protector board. Put one of the supplied 1/4" washers on the 1/4-20 x 2.25" machine screw. Push this screw through the 2 x 4. Start this screw several turns with a HAND SCREWDRIVER. Repeat this step for the other three screws. Tighten all four of the screws until the washers are just touching the 2 x 4. Push the iWS cabinet as far back into the wall as possible. Tighten the screws moderately. Once the foam on the cabinet has been crushed some, stop.

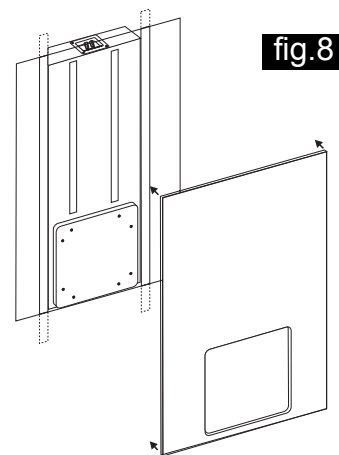


fig.8

7. After running speaker wire to the enclosure location, connect the wire to the binding posts on the top of the enclosure, making sure to observe correct polarity (see "Connections"). Once the enclosure is connected to the speaker wire and secured to the studs, prepare a drywall patch that includes a cutout for the bezel (fig. 8). The wood cover that protects the woofer also serves as the cutout template. The template is 13 1/8" square with 1/2" radiused corners. Once installed, the bezel outer frame will extend out about 5/8" beyond the perimeter of the cutout to hide minor imperfections in the cutout.

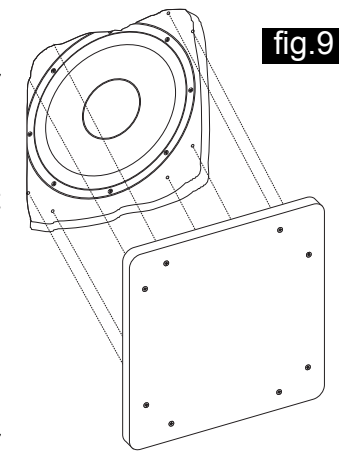


fig.9

8. When painting the wall, leave the wood cover to protect the woofer, and don't worry about overspray. If the bezel frame and grille are to be painted, paint them separately before installing them. (see the 'Painting' section in this manual)

9. Once the drywall and paint are complete, remove the wood cover and attach the bezel to the enclosure via the (8) 8 X 2" panhead screws (fig. 9). Tighten the screws snugly, making sure not to over-tighten, as this may compromise the fit of the bezel. DO NOT USE a power screwdriver for this. The foam strips on the drywall side of the bezel frame reduce unwanted vibrations against the drywall and will compress slightly to allow the bezel frame to rest flush against the wall.

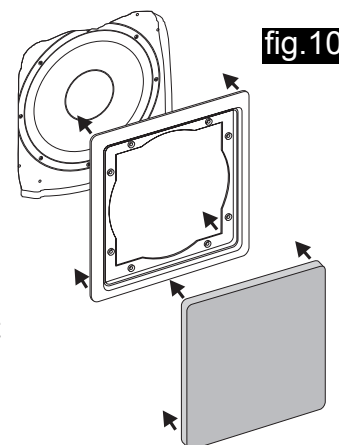


fig.10

10. Attach the metal grille by inserting it into the grooves in the bezel (fig. 10).

## ■ Painting

The bezel frame and grille of the iWS are finished in a matte white powder-coated finish that may be painted to match the wall. The bezel and grille must be painted before they are installed. Keep in mind that the grille contains hundreds of tiny holes that are essential to the sound of the subwoofer. Take care not to cover these holes with paint.

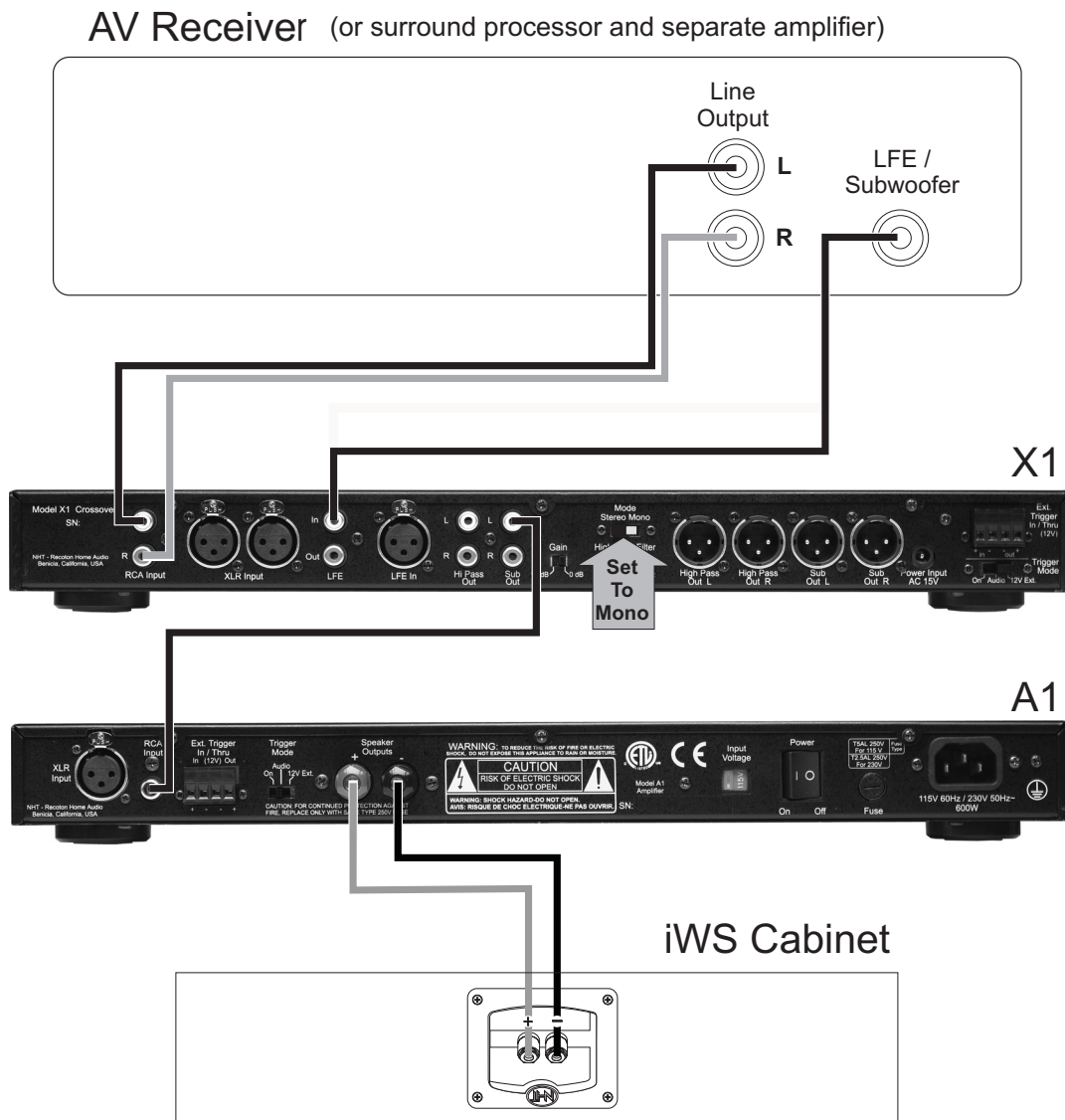
1. Paint the bezel frame and the grille at the same time using the same paint.
2. When using spray paint, apply two thin coats, making sure to let the first coat dry completely before applying the second. This will avoid running. When using a compressor and spray gun, apply the paint using its finest setting. Hold the gun or spray can 24" from the grille when painting, this will help keep the holes from getting clogged. Painting with a brush is not recommended, but when necessary be sure to thin the paint so as not to cover the holes in the grille. If paint does cover any of the grille holes, poke them out with a paper clip.
3. Do not attempt to paint the black surface surrounding the driver on the enclosure. Its black finish prevents the subwoofer's black driver from being visible once the grille is attached.

■ **Connecting the iWS to your system**

### iWS Connection Method #1

Connect the iWS from the front L & R audio signal and employ a high-pass filter for the front L & R speakers

Use if:  
You wish to send your front L & R speakers a high-pass filtered signal



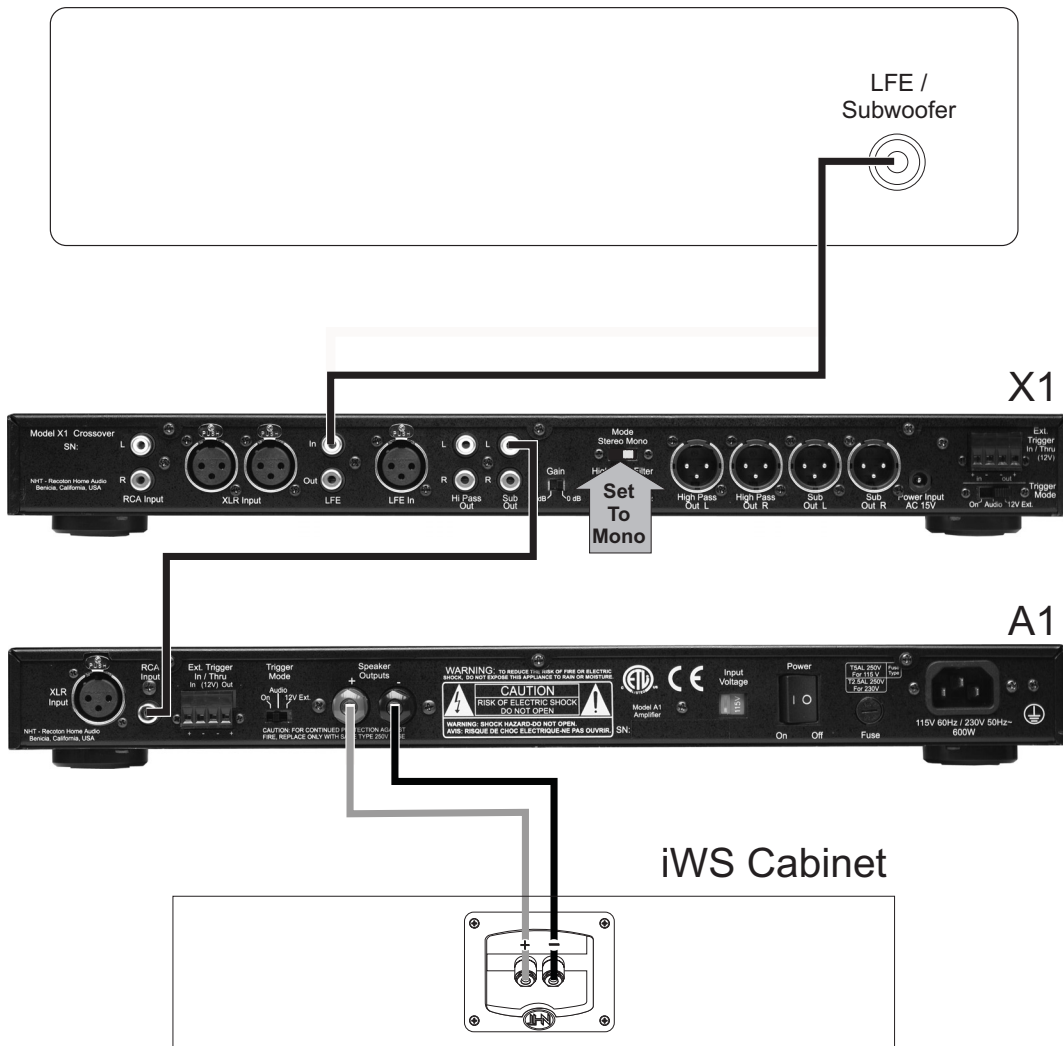
## iWS Connection Method #2

Connect the iWS from the "Subwoofer Out"  
and run the front L & R speakers full-range

Use if:

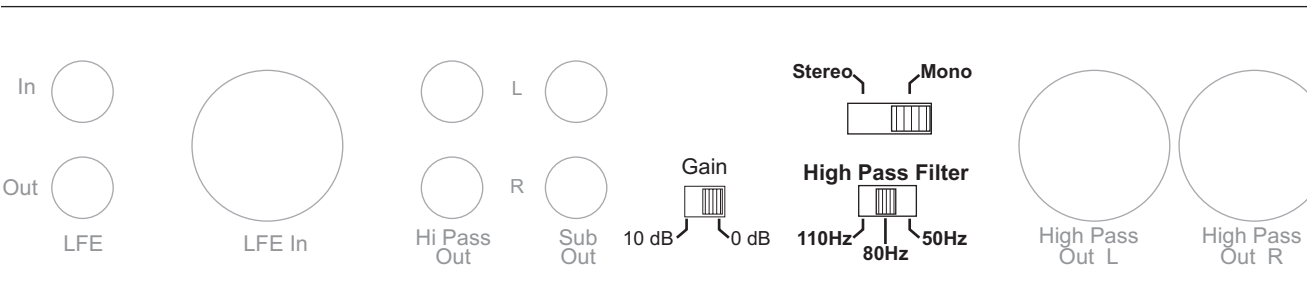
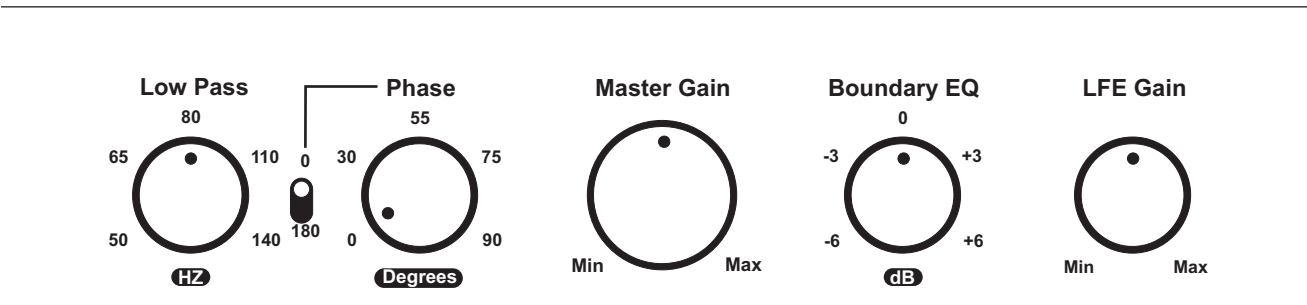
You wish to run your front L & R speakers full-range (no high-pass filter)  
You have a receiver / integrated amplifier with "Subwoofer Out" jacks

AV Receiver (or surround processor and separate amplifier)



■ **Basic Settings for the X1 Active Crossover**

The following diagrams will provide starting points for each control feature on the X1. Begin with these basic settings and then move onto the next section which describes each X1 control function in detail and provides advice for fine tuning the X1 to your listening room.



■ **X1 Active Crossover**



The subwoofer enclosure must be correctly connected to the A1 amplifier and X1 crossover in order to function properly.

■ **X1 Design**

The NHT X1 active crossover is designed to allow convenient front panel adjustment necessary to integrate the iWS subwoofer with most popular satellites. It also provides unbalanced RCA and balanced XLR inputs and outputs for connection with all types of receivers or separate audio components.

NOTE: The X1 contains special equalization circuitry specifically designed for the iWS and Evolution subwoofers. It is not recommended for use with other subwoofers.

The X1 Active Crossover can operate as either a mono (single channel) or stereo unit (dual channel). See the Configurations section on page 5. In the stereo mode, you may add an additional subwoofer without purchasing an addi-

tional amplifier. Two subwoofers can be used for stereo bass (which is desirable for music reproduction) or for additional mono bass reinforcement (for movie soundtracks).

Note: Do not use both the unbalanced (RCA) and balanced (XLR) inputs at the same time. The unbalanced (RCA) and balanced (XLR) outputs are buffered separately and may be used simultaneously.

## ■ X1 Placement

The X1 Crossover may be used on a shelf, or in a standard 19" equipment rack using the optional rack ears and hardware. See section **Rack Mounting the A1 and or X1** on page 16.

Ideally, the X1 should be placed in close proximity to the receiver or surround processor. Minimizing cable lengths reduces the chance of noise contamination. If your other audio equipment has balanced inputs or outputs we strongly recommend connecting the X1 and A1 to your system with them.

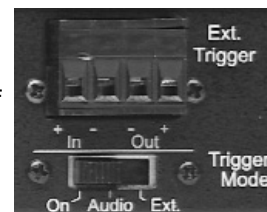
If you are using the X1 in combination with the Evolution A1 amplifier, we recommend that you place the X1 underneath the A1 amplifier. Or, in a stereo configuration, place the X1 between two A1 amplifiers. The A1's are equipped with lamps under the front edge, which illuminate the X1 controls. See **A1 Courtesy Lights** on page 17 section for more details.

## ■ X1 Features and Controls

This section describes the various controls and functions of the X1. Make sure that your X1 controls initially are set as described in the previous section before continuing.

### Power/Standby Mode (Rear Panel)

Your X1 crossover does not have a power switch but has been designed with the ability to turn itself on and off under various conditions. There are three methods for triggering the X1.



On the rear panel of the X1 is a 3-position switch that determines the trigger mode:

- 1) On; the X1 is always on.
- 2) Audio; the X1 automatically turns on when it detects an audio signal and turn off after 20 minutes with no signal.
- 3) 12V Ext; the X1 is remotely turned on when it detects a DC control signal from another component in your system. The external trigger will accept 5 - 24 volt (DC) signals. For more information regarding external triggers, consult your authorized dealer.

### Master Gain (Front Panel)

The Master Gain control allows you to adjust the volume of the subwoofer relative to the other speakers in the system. Use the Master Gain judiciously. A properly calibrated subwoofer blends seamlessly with the Monitors or satellites without calling attention to itself. Here are some general guidelines for setting the Master Gain control:



Begin by playing some stereo music you are familiar with. Set your AV Receiver or Surround Processor volume to a comfortable listening level. Slowly increase or decrease the Master Gain on the X1 crossover, listening for a natural frequency balance between the subwoofer and the front left and right satellites. When properly balanced, you will hear natural bass extension, without being aware that it is coming directly from the subwoofer.

Once the Master Gain is set, the volume control on your AV Receiver or Surround Processor will control the volume of your entire system, including the subwoofer.

#### LFE Gain Control (Front Panel)

LFE is short for 'Low Frequency Effects'. Low Frequency Effects originally were low frequency sounds added to movie soundtracks in order to increase their impact. For consumer electronics, there is no standard concerning what type of signal might be present on the LFE channel. Therefore, we have added an LFE input and gain control to the X1 so that you can integrate whatever is present on the LFE channel with the signal being reproduced by the rest of the system.



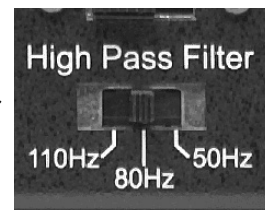
After you have adjusted the Master Gain control as described above, play a multi-channel recording through your system (as from a movie). Sources with lots of bass output will be the most useful. Adjust the LFE gain control until the bass produced by the subwoofer reaches the desired level. Most users initially set the level of the LFE gain control too high, so be prepared to adjust the control over a long period of time. You have reached an appropriate level setting when movies soundtracks have impact and music sources have punchy bass, but the overall character of the bass produced by the subwoofer is not thick and ill defined.

The level of the signal on the LFE channel varies considerably from source to source, in most cases this can be adjusted. Consult the manual for your receiver or processor for further details.

There is an LFE "Thru" output on the back of the X1. For more information concerning the use of this output, visit our website, [www.nhthifi.com/technicalhelp/evolution](http://www.nhthifi.com/technicalhelp/evolution).

#### High Pass Filter Switch (Rear Panel)

Note: If you are using Connection Method #2, the X1 High Pass Filter is not in the circuit path. Your left and right speakers will reproduce the frequency range selected by your AV Receiver.



The High Pass Filter determines the range of frequencies that the left and right main speakers ("satellites") will reproduce. For example, a high pass setting of 80Hz means that the main speakers receive a signal containing only frequencies above 80Hz. The 3-position High Pass Filter is selectable between 50Hz, 80Hz, and 110Hz to accommodate a variety of speaker sizes.

Set the High Pass Filter to a frequency above the rated low frequency limit of the main speakers. For example, if your speakers have a rated low frequency response of 40Hz, use the 50Hz high-pass setting. If your speakers have a rated low frequency response of 90Hz, use the 110Hz high-pass setting. Check the owner's manual for their rated low frequency response.

#### Low Pass Filter Control (Front Panel)

The continuously variable Low Pass Filter determines the range of frequencies produced by the subwoofer. For example, a low pass setting of 100Hz means that the subwoofer reproduces only

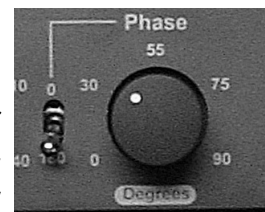


frequencies below 100Hz. The LFE input is not affected by this control.

Adjust the Low Pass Filter to approximately the same setting as the High Pass Filter as a starting point. Adjust the Low Pass Filter in small increments up or down until the blend between the Evolution Subwoofer and your main speakers is seamless and the subwoofer does not call attention to itself. Music featuring male vocals, cello and acoustic bass, bass guitar and certain wind instruments (like saxophone and trombone) is useful for setting the low pass frequency.

#### Phase Controls (Front Panel)

The Subwoofer Phase switch and continuously variable control change the phase of the subwoofer output anywhere from 0° to 270° relative to the high pass output. Proper subwoofer phase is important to achieve smooth bass response. An improper phase setting causes a dip in the frequency response of the combined subwoofer/satellite system at the listening position. The result of this dip is low frequency production that is very deficient around the crossover frequency and a lack of seamless integration between the satellites and subwoofer.

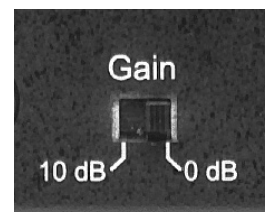


The optimal phase setting will vary depending on room conditions and placement. While fine tuning the phase controls, have a familiar stereo CD available. You should listen to the same song while alternating phase settings. Find the best setting while sitting at the primary listening position.

Begin by setting the phase knob at 0°, alternating the switch position between 0° and 180°. From the listening position, choose the switch position that yields the most bass output and leave the switch in that position. Then use the knob to fine-tune the phase setting. Slowly twist the knob, listening for the point at which the bass at the listening position is the loudest. Small changes in phase generally produce subtle changes in bass output. You may have to adjust the knob now and again over a period of a few weeks to find the best setting for your listening room.

#### Gain Switch (Rear Panel)

The Subwoofer Gain switch allows you to increase the gain of the X1 subwoofer output by 10dB. Normally, the factory default "0" position will give you a wide range of volume adjustment. However, if the sensitivity of your satellite speakers is greater than 93dB, your range of volume adjustment on the X1 may be limited. In this case, set the Gain Switch to 10dB.



#### Boundary EQ (Front Panel)

Reflective boundaries (such as walls) reinforce a speaker's bass output (3dB for two walls, 6dB for a corner) if the subwoofer is placed near them. Conversely, placing a subwoofer out in the room results in a relative decrease in bass output. Boundary reinforcement may lead to low frequency response that is uneven. Some frequencies will sound exaggerated relative to others, or the subwoofer will sound thin and lack impact. The Boundary EQ control allows you to compensate for the effects of room boundaries on the frequency response of the subwoofer. Adjusting the control enables you to achieve smooth low frequency output from the subwoofer regardless of its location in your room.

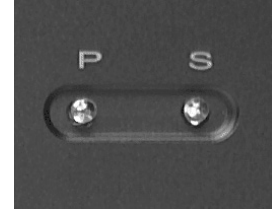


■ **X1 System Status Indicators (Front Panel)**

Located on the right hand side of the front panel are two LEDs. They are used to indicate the functional status of the X1 Crossover.

P - Power LED (green) - indicates the X1 is on and in a ready condition.

S - Standby LED (amber) - indicates the X1 crossover is in "standby" mode.

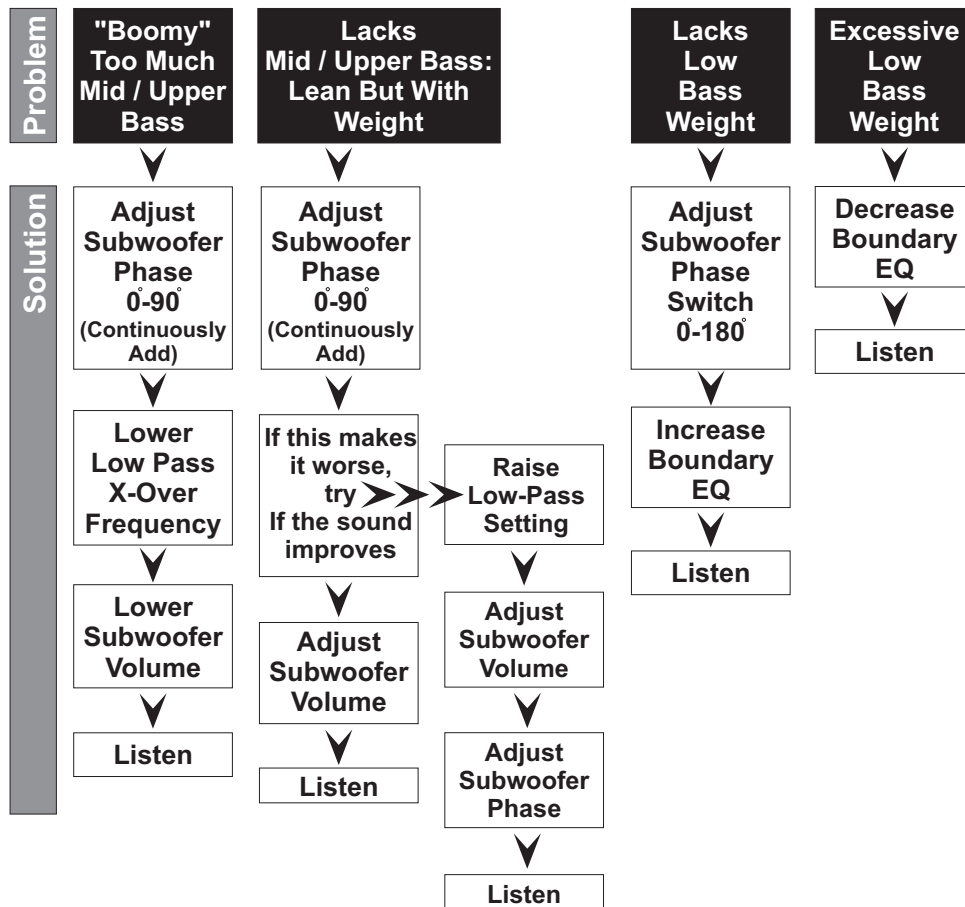


■ **X1 Fine Tuning Chart**

The chart below was developed to assist you in the further fine tuning of your subwoofer or tower system. Should you be unable to achieve satisfactory performance from your iWS subwoofer system using the fine-tuning chart, contact your authorized NHT dealer or call our Customer Hotline at 1-800-NHT-9993 (648-9993).

Low Bass	Mid Bass	Upper Bass	Lower Mid	Mid	Upper Mid	High
Below 50Hz	50Hz ↓ 100Hz	100Hz ↓ 180Hz	180Hz ↓ 300Hz	300Hz ↓ 700Hz	700Hz ↓ 3KHz	3KHz and Above

**Fine Tuning Flow Chart**





## ■ A1 Monaural Amplifier

### ■ A1 Design

The A1 is a full range (20Hz - 20kHz) audio power amplifier. It provides RCA and XLR inputs for connection with all types of receivers or separate audio components. The A1 is a single channel or monaural amplifier and can be used to drive any loudspeaker with a minimum impedance of 3 ohm.

The A1 is a Class G design, which operates at lower temperatures than typical amplifier designs and is typically more efficient. The A1 offers the wide dynamic range and low distortion typical of more conventional class AB designs.

### ■ A1 Placement

The A1 amplifier may be placed on a shelf, or in a standard 19" equipment rack using the optional rack ears and hardware. See instructions on rack mounting below.

Ideally, the A1 should be placed in close proximity to the receiver or surround processor. Minimizing low level signal wire lengths reduces the chance of noise pickup. If long runs (more than 20') of signal cable are required we recommend using the balanced (XLR) input on the amplifier.

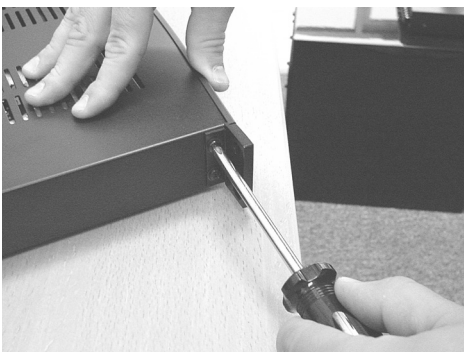
Note: Due to the placement of the A1's power switch on the rear panel, do not install the A1 in a wooden box or similar enclosure where access to the power switch is blocked or inconvenient.

### ■ Rack Mounting the A1 and or X1

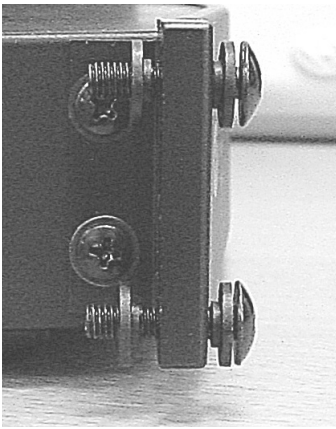
You may need assistance to hold the A1 or X1 in place while mounting them in a rack.

Note: When rack mounting, we recommend you leave at least one rack space between components (particularly amplifiers) for proper cooling.

Step One: Remove the two screws on each front side of the X1 or A1 with a #2 Phillips screwdriver.



Step Two: Position the rack ears over the threaded holes. Replace the two screws and tighten both securely.



Step Three: Arrange the mounting screws included with the rack ears and the plastic insulating washers as shown.

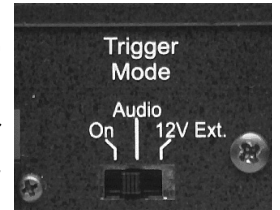
Step Four: Start all four screws, then tighten securely.



### ■ A1 Power/Standby Mode

The main power switch for the A1 is located on the rear panel and does not normally need to be used. The A1 has a standby mode that can be triggered internally or externally. On the rear panel of the A1 is a 3-position switch that determines the trigger source:

- 1) On: The A1 is always on.
- 2) Audio: The A1 automatically turns on when it detects an audio signal and turn off after 20 minutes with no signal.
- 3) 12V Ext: The A1 is remotely turned on when it detects a DC control signal from another component in your system. The external trigger will accept 5 - 24 volt (DC) signals. For more information regarding external triggers, consult your authorized dealer.

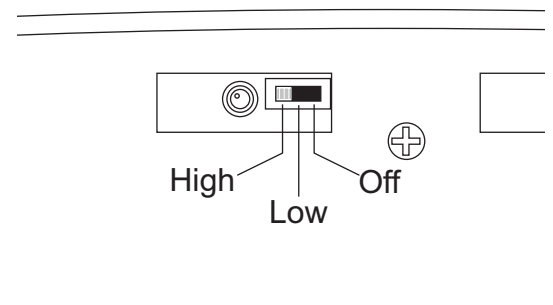
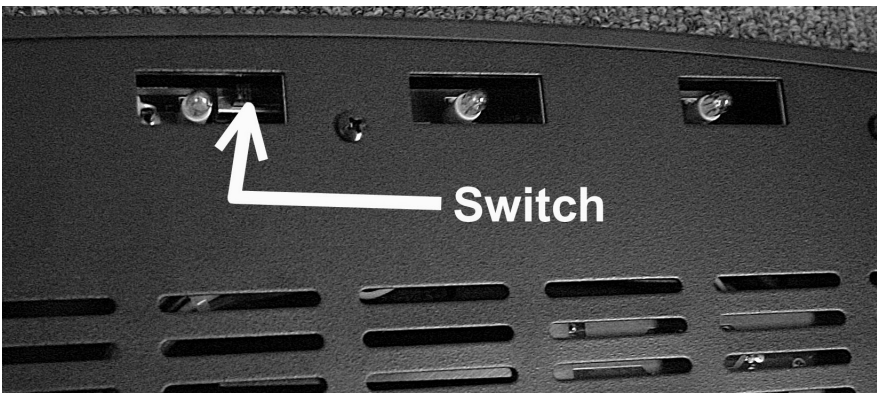


### ■ A1 Courtesy Lights

The A1 amplifier is equipped with courtesy lights to illuminate the controls of the X1. This feature is controlled by a 3-position switch for HI, LO and OFF settings that can be accessed from the bottom of the amplifier just behind the center of the front panel. The A1 courtesy lights are set in the HI position at the factory.



To adjust the intensity or turn off the lights, unplug the A1 from the wall. Use a small flat blade screwdriver and move the switch according to the desired position using the diagram. The courtesy lights will turn off automatically when the amplifier is in "standby" mode.



## ■ A1 System Status Indicators

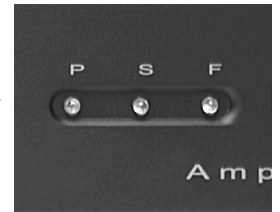
Located on the right hand side of the front panel are three LEDs. They are used to indicate the status of the A1 amplifier.

P - Power LED (green) - indicates the A1 amplifier is on and in a ready condition.

S - Standby LED (amber) - indicates the A1 amplifier is in "standby" mode.

F - Fault/Protection LED (red) - indicates the A1 amplifier is in a fault condition.

Fault/Protection: The A1 can go into Protection mode for several reasons. A common reason is that the speaker output wires have been shorted together. Another could be that the amplifier has overheated. Should either of these conditions occur, repairing the cause of the output short or allowing the amplifier to cool will solve the problem. To reset the A1, turn the power switch (rear panel) off and then on. If the problem persists, contact your NHT dealer.



## ■ A1 - Replacing the Fuse

The A1 amplifier's fuse is user-serviceable.



To replace the fuse:

1. Turn the power off.
2. UNPLUG the power cord from the wall outlet and the A1.
3. Remove the fuse holder cover (next to power cord) with a flat blade screwdriver.
4. Remove the fuse from holder and replace it with the appropriate type.
5. Reinstall the fuse holder.

Always replace the fuse with one of the exact same specifications.

For systems operating at 115VAC, use only a 5x20 mm, T5AL, 250V slow-blow fuse.

For systems operating at 230VAC, use only a 5x20mm, T2.5AL, 250V slow-blow fuse.

## ■ A1 - Changing the Line Voltage Setting

The A1 was designed to operate on two line voltage settings, 115VAC and 230VAC. In the event that it is necessary to change the line voltage setting, begin by turning the power switch to the off position. Remove all the connections from the amplifier, including the detachable power cord. Using a flat blade screwdriver, slide the switch to the correct position. Use the 115VAC position for 110 to 120 VAC, and the 230VAC position for 220 to 240 VAC. Next you will likely need a power cord that fits the AC receptacle and you will need to replace the fuse (see "Changing the Fuse" above).



## **Limited Warranty** **Valid Only in the U.S.A.**

### **Warranty Period**

For the period of 5 years for parts and 5 years for labor from date of original purchase (the warranty period) from an authorized NHT dealer, Now Hear This (NHT) warrants that if our product fails to function properly under normal use due to a manufacturing defect when installed and operated according to the owner's manual instructions enclosed with the unit, it will be repaired or replaced with a unit of comparable value at the option of NHT without charge to you for parts or actual repair work. Parts supplied under this warranty may be new or rebuilt at the option of NHT.

### **What's Not Covered**

This warranty does not cover any product which is used in any trade or business, or in an industrial or commercial application.

This warranty does not cover the cabinet or any appearance item, or any damage caused to the product resulting from: alterations, modifications not authorized in writing by NHT, accident, misuse or abuse, damage due to lightning or power surges, or being subjected to power in excess of the speaker's published power rating.

This warranty does not cover the cost of parts which would otherwise be provided without charge under this warranty, obtained from any source other than an authorized NHT service location. This warranty does not cover defects or damage caused by the use of unauthorized parts or labor or from improper maintenance.

**Altered, defaced or removed serial numbers void this warranty.**

### **Your Rights**

The liability of NHT will be limited to the purchase price of the product, and NHT will not be liable for incidental or consequential damages. NHT limits its obligations under any implied warranties under state laws to a period not exceeding the warranty period. Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of incidental or consequential damages. The above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

### **To Obtain Service**

NHT has appointed a number of authorized service companies throughout the USA should your product ever require service. To receive warranty service, you will need to present your sales receipt showing place and date of original owner's transaction.

To find the name and address of the nearest authorized NHT service location, call or write: **Customer Service Department, NHT, 6400 Goodyear Rd., Benicia, CA 94510, 1-800-NHT-9993 (648-9993), [www.nhthifi.com](http://www.nhthifi.com)**

**Keep this warranty with your sales receipt. Record date and place of purchase for future reference.**