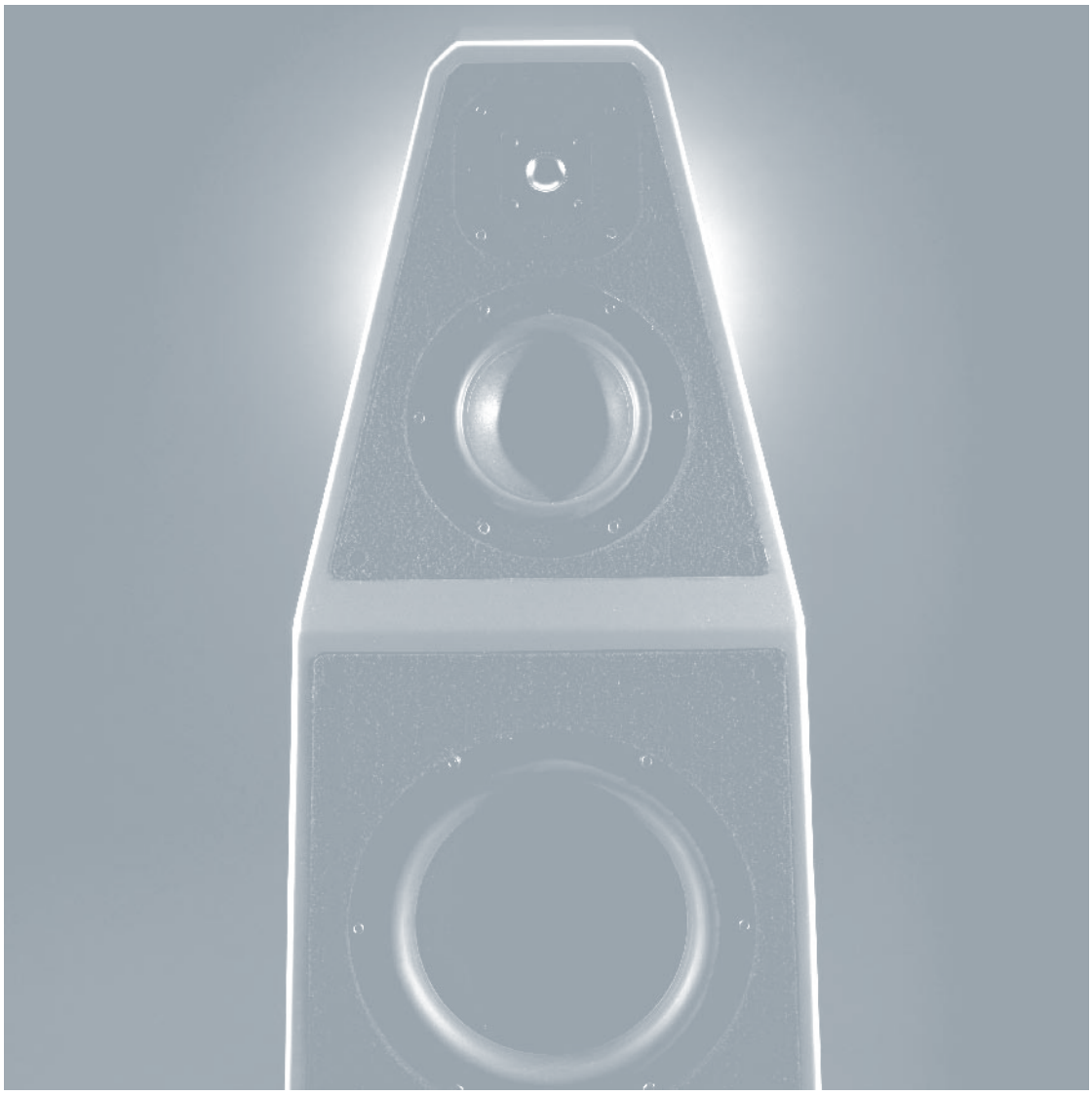
SOPHIA
series 3

Sophia Series 3 Owner's Manual



WILSON

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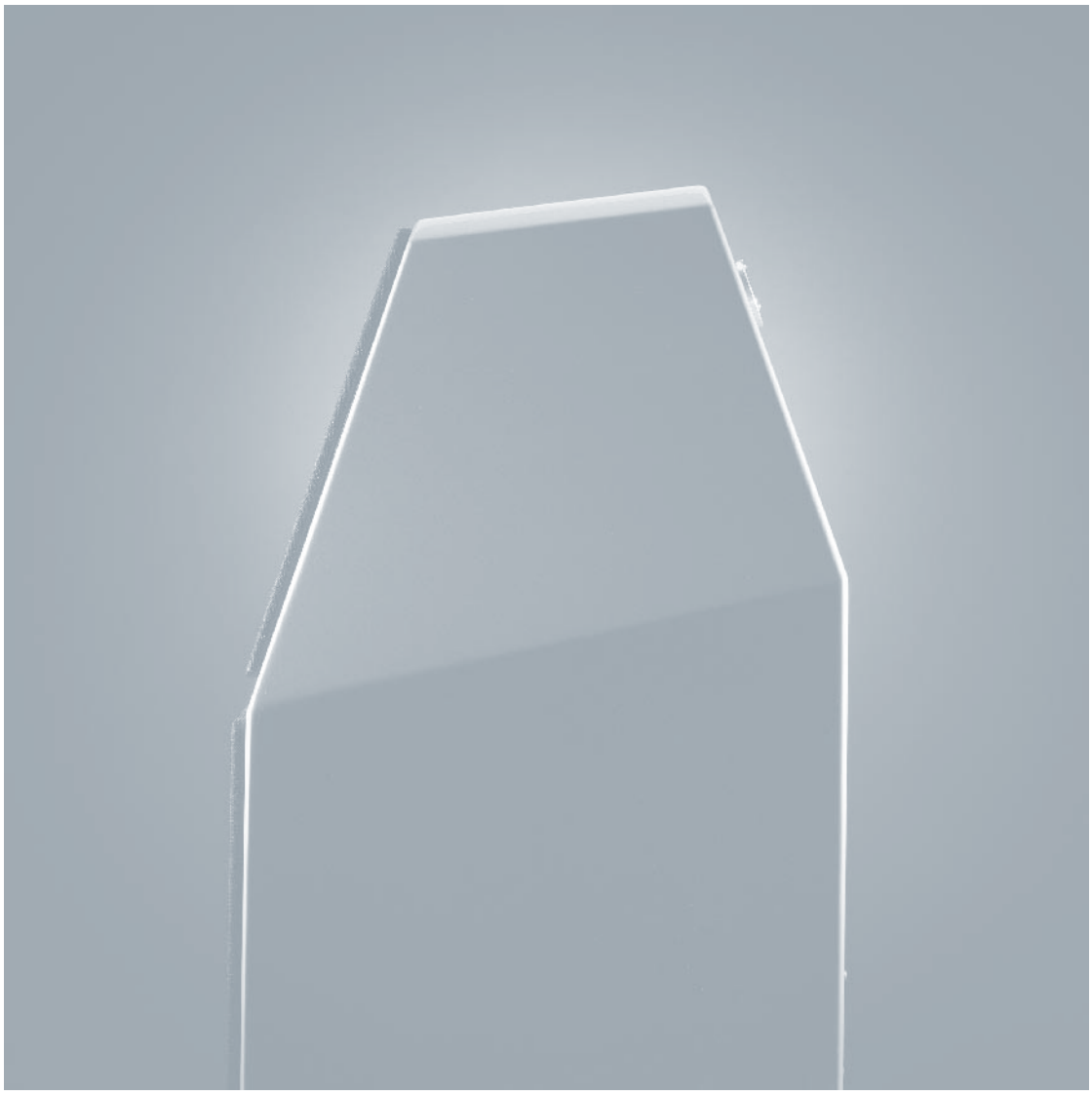
Section 1 – Introduction



Section 1.1 – Sophia® Series 3 Introduction

Since her initial release, Sophia has changed the way many music lovers think of high-end loudspeakers – and Wilson Audio. Sophia challenged the idea that some audio qualities are, by their very nature, mutually exclusive: high resolution and musicality, very wide bandwidth and a relatively compact enclosure, large dynamic swings and a load almost any amp can drive. A designer had to choose; he could include one of these qualities, but this meant omitting or at least compromising the other. And yet Sophia possesses each of these qualities in nearly equal measure.

Perhaps because of this unusual combination of virtues, Sophia, in both Series 1 and 2 iterations, has attracted an almost cult following since her introduction in 2003. When the decision was made to upgrade Sophia to Series 3, the primary engineering goal was to preserve the qualities that endeared Sophia to so many music lovers. The team had advanced the art of music reproduction in the Alexandria Series 2, MAXX Series 3, and in the all-new Sasha W/P with a variety of new technologies developed for those projects. In order to employ the same technical improvements in Sophia, it became clear early on that it would be necessary to design an all-new loudspeaker. At the same time, it was critical to Dave that he honor, preserve, and (ideally) build upon those qualities that clearly define Sophia's character.

The result of those efforts is the Sophia Series 3.

All-new Architecture with new Midrange Enclosure Material

When it comes to a loudspeaker's architectural design, Wilson's philosophy is driven by the notion that a loudspeaker's form is inextricably tied to its function. The unique physical features of correct propagation delay and lowering enclosure panel resonances have for decades now given Wilson loudspeakers their look. Arguably, there is a form of beauty singular to the congruent interplay of technology and aesthetic ideals.

With Sophia, the primary engineering goal was to further reduce the already very low resonant enclosure. To this end, the X-material enclosure panels of the upper and lower modules are thicker. A new

internal bracing strategy, which now includes X-material, also contributes to Sophia's performance by lowering resonance-borne colorations in its enclosure panels.

Additionally, the Sophia Series 3 joins Sasha W/P in its use of Wilson's latest proprietary composite – S-Material. Used in the mid/tweeter baffle of the Sophia Series 3, S-Material dramatically reduces measurable and audible noise. S-Material is combined with X-Material to form an extremely inert and low-resonance enclosure.

Revised Crossover

In his earliest commercial designs, David Wilson recognized and uniquely addressed the relationship between the mechanical alignment of a loudspeaker's drivers and its time-domain performance. Since that time, Dave and his engineers have worked to discover additional sources of time-domain distortion. During the development of the original Alexandria, Wilson found that the interaction between the high- and low-pass filters created a specific type of time-domain-generated noise, which he dubbed "crossover jitter." In each successive design project, Wilson has worked to substantially reduce crossover jitter along with its deleterious audible effects. Continuous refinements in crossover topologies and specific component choices are made in large part with this in mind. The latest beneficiary of this cumulative design approach is now the Sophia Series 3.

Lowering jitter-induced noise and distortion in the Sophia Series 3 allowed Dave, in turn, hear deeper into the loudspeaker. Problems previously obscured by noise were now clearly audible. Thus, reducing crossover jitter not only improved expected areas (lower noise floor and less grain structure), it also facilitated enhancements in other performance categories as well. Midrange beauty and musicality, already a strong point of Sophia, are noticeably improved in the Series 3. These traditional strengths are further enhanced by a greater transparency, spacial resolution, bass linearity and dynamics, and midrange clarity. Instrument texture and timbre are more convincingly rendered and complete. Details masked by low-level noise in the prior versions now effortlessly surface from a black background.

Crossover and Resistor Access Panel

The crossover access panel formerly located on the bottom of the Sophia has been moved to the rear of the enclosure. This provides much easier access to the user-serviceable resistors.

New Midrange Driver

When it came to choosing a midrange driver, Dave and the engineers focused on using proven tools. Sophia Series 3 features a simplified version of the remarkable Wilson Audio cellulose/paper pulp composite midrange driver first developed for the Alexandria X-2 Series 2 and since implemented in the MAXX Series 3 and Sasha W/P.

New Tweeter

A great deal of confusion remains in the market place as to what technical qualities are important to musically authentic high-frequency performance. While other manufacturers pursue dubious performance parameters such as ultra-wide bandwidth or exotic – and exotically expensive – materials, Wilson continues to focus on those technologies that truly contribute to better performance. Sophia Series 3 sources its tweeter from MAXX Series 3 and Sasha W/P. This proven design is slightly more efficient than the tweeter it replaces. It is also more expressive of both large and small scale dynamics. Most importantly, it is better suited and matched to the Wilson midrange driver.

Additionally, aspects of diffraction and noise are more effectively ameliorated in this tweeter. All tweeter diaphragms are partially acoustically transparent. Any out phase or time-delayed reflections that make their way out of the front of the diaphragm is heard and measured as noise and distortion. Wilson's tweeter topology dramatically reduces this distortion. Proprietary materials in combination with proprietary mechanical configurations are extremely effective at reducing these time-delayed reflections behind the inverted dome, preventing them from corrupting the primary wave. This

reduces measurable and audible in-band "noise" heard as artificial texture or grain. Sweet, delicate highs were already a hallmark of Sophia. The Series 3 tweeter builds on these strengths greater air, sweetness, and resolution. Highs emerge from a silent background, free of spurious grain and texture.

New Woofer

The proprietary Sophia woofer, which debuted in the Series 1, has been worked over with special attention to the driver's frame and motor. The Sophia Series 3 woofer features a magnet structure twice the size of the earlier woofer. The goal was to retain the tunefulness of the original design, and increase the overall impact, speed, agility, and linearity of the bass. The new woofer also has much greater tonal shading and nuance.

Section 2 – In Your Room

Section 2.1 – The Wilson Audio Setup Procedure

You are surely excited about setting up your Sophia Series 3 and doing some listening, but before you begin, we would like to discuss some of the important room acoustical information that will help you set up your loudspeakers properly.

Final Listening Room Setup (Voicing)

For Sophia Series 3's size and single-module configuration, it is unmatched in its ability to reproduce the musical event. However, room acoustics and boundary interactions affect the sound of a loudspeaker to such a large degree that poor setup can seriously degrade your enjoyment of even the finest loudspeaker.

Therefore, we offer the following section, which will present some guidelines on room acoustics and their interactions with loudspeakers. While we will also outline some detailed suggestions on the setup of the Sophia Series 3, we strongly suggest that you have your local Wilson Audio dealer perform the final speaker "voicing" with you. Wilson dealers are specially trained in setting up Wilson loudspeakers and will ensure that you realize the full value of your purchase. What follows is an outline of the Wilson Audio Setup Procedure (WASP). When carefully followed, the process has proven to be the most effective method for setting up Wilson loudspeakers.

Zone of Neutrality: Main Left and Right Channel

The "Zone of Neutrality" is an area in your room where the speakers will sound most natural. This location is where the speakers interact the least with adjacent room boundaries. It is important to have a clear working space while determining the Zone of Neutrality.

The following is a simple method to locate the Zone of Neutrality within your listening environment:

1. Stand against the wall BEHIND the location where you intend to position

your loudspeakers. Speaking in a moderately loud voice and at a constant volume, project your voice out into the room. Your voice will have an overly heavy, "chesty" quality because of your proximity to the rear wall.

2. While speaking, slowly move out into the room, progressing in a direction parallel to the sidewall. It is helpful to have another listener seated in the listening position to assist you during this process. Listen to how your voice "frees up" from the added bass energy imparted by the rear wall boundary. Also notice that your voice is quite spatially diffuse (to your assistant, your voice will sound spatially large and difficult to localize) as you begin to ease away from the rear wall.

3. At some point during your progression forward into the room, you will observe a sonic transition in your voice; it will sound more tonally correct and less spatially diffuse (your assistant can now precisely localize the exact origin of your voice). When you hear this transition, you have entered the inner edge of the Zone of Neutrality. Place a piece of tape on the floor to mark this location. Although it will vary from room to room, in most rooms the zone begins between two and a half to three feet from the rear wall.

4. Continue to walk slowly away from the rear wall. After some distance, usually one to two feet past the first piece of tape, you will begin to hear your voice lose focus and appear to reflect (echo) in front of you. This is caused by the return of the room's boundary contribution; your voice is now interacting with the opposite wall. At the point where you begin to hear the reflected sound of your voice, you have reached the outer edge of the Zone of Neutrality. Place a piece of tape on the floor and mark this location. The distance between the "inner" and "outer" edge tape marks is usually between eight inches (for small, interactive rooms) and three feet (for large, more neutral rooms).

5. Now position yourself against the side wall perpendicular to the intended speaker location. Stand between the two tape marks. Using the same procedure as above, begin moving into the room toward the opposite sidewall, progressing between the two pieces of tape. As above, listen for the

point in the room where your voice transitions from bass-heavy and diffuse to neutral. Mark this point with tape. Continue your progression until there is an obvious interaction with the opposite wall in front of you and mark this point with tape. The four pieces of tape now form a rectangle that establishes the Zone of Neutrality for the loudspeaker located on that side of the room. Using the four marks as your guide, tape an outline to define the boundaries of the rectangle.

6. Repeat this process for each speaker location individually. These are your Zones of Neutrality, one for each channel.

Theoretically, the Zone of Neutrality for any room runs like a path, parallel to the walls all around the room. Adjacent to very large windows and open doors, the outer edge of the Zone of Neutrality moves closer to the wall and becomes wider. If you were to extend the inner and outer boundaries of the Zone for the sidewalls and the front wall (behind the speakers), they would intersect. After you complete this procedure for the other loudspeaker, you will now have two rectangles, one on the floor on either side of the room.

Section 2.2 – Room Acoustics

Note: The following section contains general information on room acoustics and loudspeaker/room interaction. The concepts outlined below are equally relevant when dealing with multi-channel audio or home theater. The careful application of these concepts, as you evaluate the acoustical characteristics of your own room configuration, will allow you to optimize the performance of your Sophia Series 3.

Slap Echo

Probably the most obnoxious form of reflection is called “slap echo.” With slap-echo, primarily midrange and high frequency sounds reflect off of two parallel hard surfaces. The sound literally reverberates back and forth until it is finally dissipated over time. You can test for slap echo in any room by clapping your hands sharply in the

middle of the room and listening for the characteristic sound of the echo in the mid-range. Slap echo destroys the sound quality of a stereo system in two ways:

- It adds harshness to the upper midrange and treble by storing time-domain smearing energy.
- It destroys the delicate phase relationships, which help to establish an accurate soundstage.

Slap echo (see Figure 1) is a common acoustical problem in the typical domestic

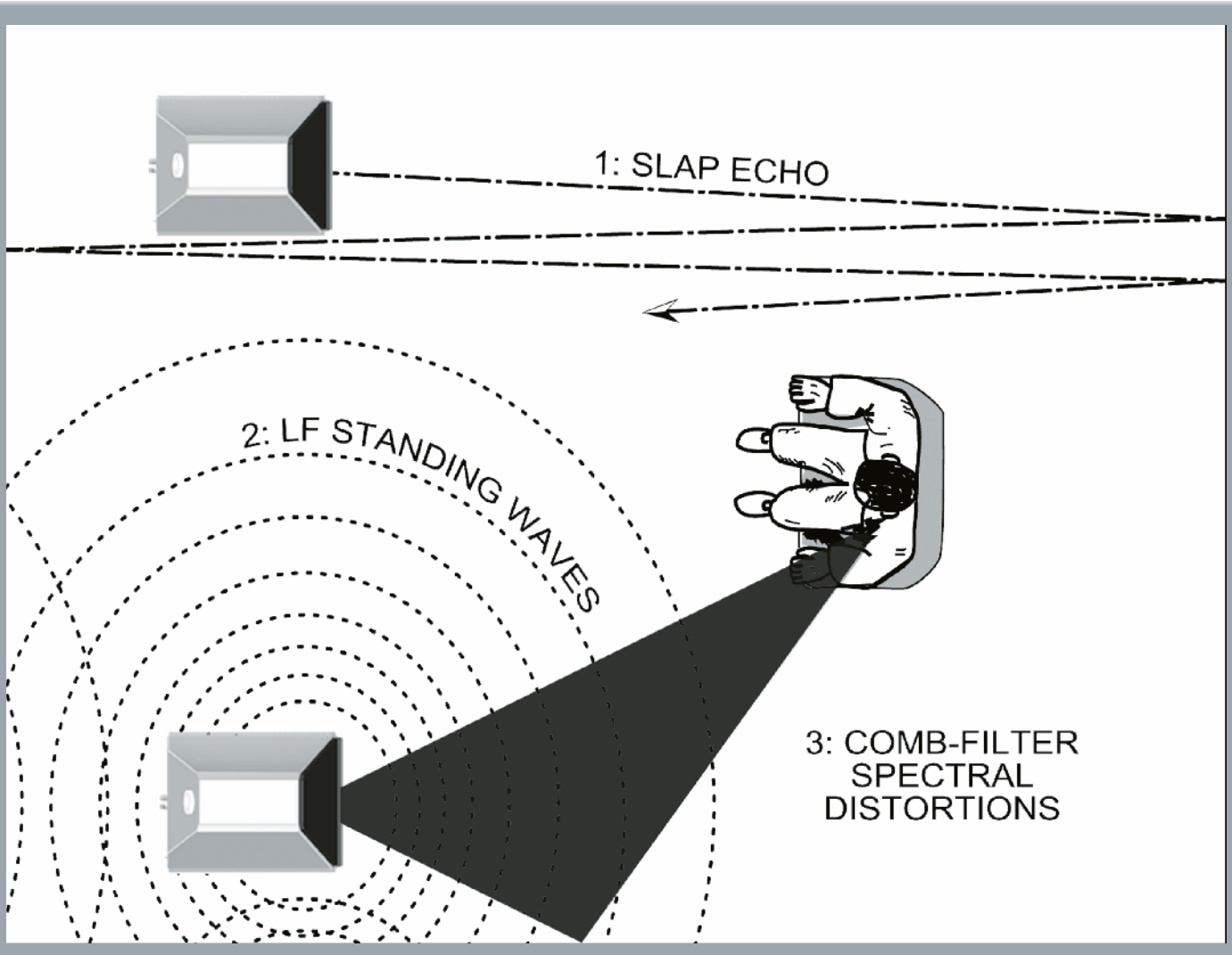


FIGURE 1: COMMON ROOM REFLECTION PROBLEMS

listening room because most of these rooms have walls with a hard, reflective nature, only occasionally interrupted by curtains, wall art, or drapes. The best (but least practical) solution to eliminate slap echo is nonparallel walls. This is because, rather than support slap-echo, nonparallel walls allow the sound to diffuse. This approach can be accounted for during the construction process. For existing rooms, slap echo can also be controlled entirely by the application of absorptive materials to the hard surfaces. These are absorptive materials that can be used to ameliorate slap echo:

- Illbruck Sonex®
- Air duct board
- Large ceiling to floor drapes
- Carpeting to wall surfaces

In many domestic listening environments, heavy stuffed furnishings reduce slap echo somewhat. Unfortunately, their effectiveness is not predictable. Diffusers are sometimes also used to very good subjective effect, particularly in quite large rooms. Sound absorbent materials such as described above will alter the tonal characteristic of the room by making it sound "deader," less "bright and alive," and "quieter." These changes usually make the room more pleasant for conversation, but sometimes render it too dull in the high frequencies to be musically involving. Soundtrack effects will be more localized. However, over-damping the room skews the tonal balance unnaturally toward the bass, and also compresses dynamics, robing the system of musical life excitement.

Diffusers, on the other hand, do not affect the tonal balance characteristic of the room as much. Placed properly, diffusers create a smoother and more open sound. Some diffusers, due to their construction, create narrow midrange peaks and suck out

the warmth region. Do not use diffusers on the wall behind the speakers or on the side-walls directly beside the speakers. It is our experience that all of these room treatment devices should be used judiciously.

Standing Waves

Another type of reflection phenomenon is "standing waves." Standing waves cause the unnatural boosting or accentuation of certain frequencies, typically in the bass, to be found at certain discreet locations in the room. These locations differ according to room dimension and size. A room generating severe standing waves creates difficulty in setup. In these rooms, the speaker will sound radically different as it is moved around. The effects of standing waves on a loudspeaker's performance are primarily in the areas listed.

- Tonal balance
- Resolution of low-level detail
- Soundstaging

Standing waves are more difficult to correct than slap echo because they tend to occur at a lower frequency. Absorbent materials, such as Illbruck Sonex®, are ineffective at controlling reflections in the bass region. Moving speakers about slightly in the room is, for most people, their only control over standing waves. Sometimes a change of placement of as little as two or three inches can dramatically alter the tonal balance of a small system.

Fortunately, minor low frequency standing waves are well controlled by positioning ASC Tube Traps™ in the corners of the room. Very serious low frequency accentuation usually requires a custom-designed bass trap system.

Low frequency standing waves can be particularly troublesome in rooms con-

structed of concrete or brick. These materials trap the bass in the room unless it is allowed to leak out of the room through windows and doors.

In general, placement of the speaker in a corner will excite the maximal number of standing waves in a room and is to be avoided for most direct radiator, full-range loudspeaker systems. Some benefit is achieved by placing the stereo pair of loudspeakers slightly asymmetrically in the listening room. This is so the standing waves caused by the distance between one speaker and its adjacent walls and floors are not the same as the standing wave frequencies excited by the dimensions in the other channel.

Comb Filter Effect

The "comb filter" effect is a special type of standing wave noticeable primarily at higher frequencies and shorter wavelengths.

Acoustical comb filtering occurs when sound from a single source, such as a loudspeaker, is directed toward a microphone or listener from a distance. The first sound to reach the microphone is the direct sound, followed by a delayed, reflected sound. At certain frequencies, cancellation occurs because the reflected sound lags in phase relative to the direct sound. This cancellation is most apparent where the two frequencies are 180 degrees out of phase. Further, there is augmentation at other frequencies where the direct and the reflected sounds arrive in phase. Because it is a function of wavelength, the comb filter effect will notch out portions of the audio spectrum at linearly spaced intervals. Subjectively, comb filter effect evidences itself as follows:

- Added roughness to the sound
- Reduction of harmonic richness
- Smearing of lateral soundstage image focus and placement

Comb filter effects are often caused by side wall reflections. They are best con-

trolled by very careful speaker placement and by the judicious placement of Illbruck Sonex® or air duct panels applied to that part of the wall where the reflection occurs.

Section 2.3 – Resonances

Resonance in listening rooms is generally caused by two sources:

- Structures within the listening room.
- The volume of air itself within the listening room.

Structural Resonance

Structural resonances are familiar to most people as buzzes and rattles, but this type of resonance usually only occurs at extremely high volume levels and is usually masked by the music. In many wood frame rooms the most common type of structural resonance problem is "booming" of walls and floors. You can test for these very easily by tapping the wall with the palm of your hand or stomping on the floor. Most rooms exhibit mid-bass "boom" when struck. The loudspeaker playing in the room also excites these resonances. To give you an idea of what the perfect wall would sound like, imagine rapping your hand against the side of a mountain. Structural wall resonances generally occur in the low to mid-bass frequencies and add a false fullness to the tonal balance. They, too, are more prominent at louder levels, but their contribution to the sound of the speaker is more progressive. Rattling windows, picture frames, lamp shades, etc., can generally be silenced with small pieces of caulk or with blocks of felt. However, short of actually adding additional layers of sheet rock to flimsy walls, there is little that can be done to eliminate wall resonances.

Volume Resonance

The physical dimensions and volume of air in a room will also support standing wave modes and resonances at frequencies determined by the size of that room. Larger

rooms will resonate at a lower frequency and have more complex (better) modal distributions than will smaller rooms. Volume resonances, wall panel resonances, and low frequency standing waves combine to form a low frequency coloration in the sound. At its worst, it is a grossly exaggerated fullness, which tends to obscure detail and distort the natural tonal balance of the speaker system.

Occasionally, however, there is just enough resonance to give a little added warmth to the sound – an addition some listeners prefer. Careful placement of loudspeakers in the room can dramatically reduce the speakers' destructive interaction with low frequency modes. ASC Tube Traps™ are effective in reducing some of this low frequency room coloration. Custom designed bass traps, such as perforated Helmholtz resonators, provide the greatest degree of low frequency control.

Section 2.4 – Your Room

Room Shapes

Standing waves are pressure waves propagated by the interaction of sound and opposing parallel walls. This interaction creates patterns of low and high acoustical pressure zones that accentuate and attenuate particular frequencies. Those frequencies are dependent on room size and dimension.

There are three basic shapes for most rooms: square, rectangular, and L-shaped (see Figure 2).

A perfectly square room is the most difficult room in which to set up speakers. By virtue of its shape, a square room is the perfect medium for building and sustaining standing waves. These rooms heavily influence the music played by loudspeakers, greatly diminishing the listening experience.

Long, narrow, rectangular rooms also pose their own special acoustical problems for speaker setup. They have the ability to create several standing wave nodes, which

will have different standing wave frequency exaggerations depending on where you are sitting. Additionally, these long rooms are often quite lean in the bass near the center of the room. Rectangular rooms are still preferred to square rooms because, by having two sets of dissimilar length walls, standing waves are not as strongly reinforced and will dissipate more quickly than in a square room. In these rooms, the preferred speaker position for spatial placement and midrange resolution would be on the longer walls. Bass response would be reinforced by speaker placement on the short walls.

In many cases, L-shaped rooms (see Figure 2) offer the best environment for speaker setup. Ideally, speakers should be set up along the primary (longest) leg of the room. They should fire from the end of the leg (short wall) toward the L, or they should be along the longest wall. In this way, both speakers are firing the same distance to the back wall. The

Figure 2: Possible Loudspeaker Placement within Various Room Shapes

asymmetry of the walls in L-shaped rooms resists the buildup of standing waves (see Figure 2).

Speaker Placement Versus Listening Position

The location of your listening position is as important as the careful setup of your Wilson Audio loudspeakers. The listening position should ideally be no more than 1.1 to 1.25 times the distance between the tweeters on each speaker. Therefore, in a long, rectangular room of 12′ x 18′, if the speaker tweeters are going to be 9′ apart, you should be sitting 9′11″ to 11′3″ from the speaker. This would be more than halfway down the long axis of the room.

Many people place the speakers on one end and sit at the other end of the room. This approach will not yield the finest sound. Carefully consider your listening position. Our experience has shown that any listening position that places your head closer than 14″ from a room boundary will diminish the sonic results of your listening.

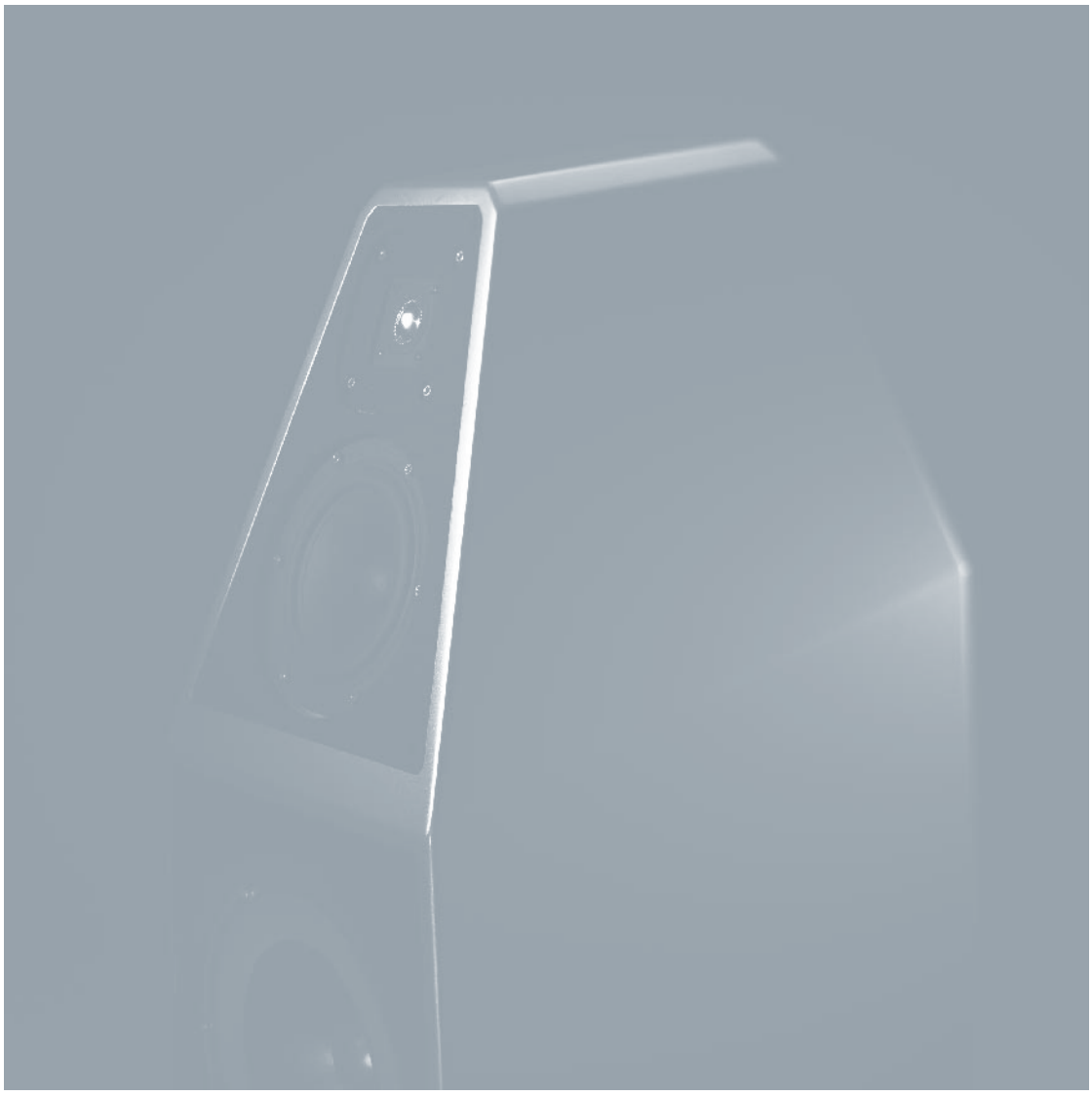
Speaker Orientation

Speaker placement and orientation are two of the most important considerations in obtaining superior sound. The first thing you need to do is eliminate the sidewalls as a sonic influence in your system. Speakers placed too close to the sidewalls will suffer from a strong primary reflection. This can cause out-of-phase cancellations, or comb filtering, which will cancel some frequencies and change the tonal balance of the music. The Wilson Audio Setup Procedure (Section 2.1) is the best method with which to position your loudspeakers. Start with the speakers about 18″ from each wall (as measured from the rear of the enclosure) and, if you need to move them relative to the side wall, move them away from the wall, not closer.

A very important aspect of speaker placement is how far from the back wall to place the speakers. The closer a loudspeaker is to the back wall, the more pronounced the low bass energy and centering of the image will be. However, this comes at a defi-

nite reduction in stage size and bloom as well as a deterioration of upper bass quality. You must find the proper balance of these two factors, but remember, if you are partial to bass response or air and bloom, do not overcompensate your adjustments to maximize these effects. Overcompensated systems are sometimes pleasing in the short-term, but long-term satisfaction is always achieved through proper balance.

Section 3 – Uncrating Your Sophias



Note: In your listening room or home theater, clear out two spaces, one for your left and one for your right channel. Place the ODD numbered Sophia in the LEFT channel section and the EVEN in the RIGHT channel section.

Section 3.1 – Uncrating the Sophia Series 3

Initial Check

The Sophias are shipped in two wooden crates. Upon receiving these crates, please check their condition. If any of the crates are damaged, please report it to the shipping company immediately for insurance verification.

The following items are recommended for this procedure:

- Electric Screwdriver
- Phillips head drive bit
- Masking tape (for use in speaker setup)

Uncrating the Sophia

A minimum of two strong adults is required to set up the Sophias.

1. With the crate lid facing up, unscrew the wood screws securing the lid. Remove the lid.
2. One crate will contain the tool kit.
3. The Sophia Series 3 is shipped with casters installed. Carefully lift the crate upright so that the Sophia is now vertical. With the Sophia's bottom toward the floor and one person holding the crate, the second person should reach in and gently roll the Sophia out of the crate, carefully, so as not to hit the Sophia on the crate and scratch the paint.
4. Place the Sophia with an odd serial number on the left side of the room and the Sophia with an even serial number on the right side of the room.

Note: These two loudspeaker enclosures are very heavy and care should be taken to prevent injury.

Section 3.2 – Crate Content Checklist

Now that you have unpacked your Sophia Series 3, you can inventory all the additional items in the crates. (See Figure 3.)

- 1 – Owner's Manual
- 1 – Warranty Registration (located in the manual)
- 2 – Upper Pin Style Grilles (1 per enclosure)
- 2 – Lower Pin Style Grilles (1 per enclosure)
- 8 – Woofer Acoustical Diodes
- 8 – 1 1/2″ Set Screws
- 8 – Spikes with Hex Nut
- 8 – 1″ Brass Spike Pad
- 1 – 5/32″ Allen Wrench
- 1 – 9/16″ Combination Wrench
- 1 – 1/2″ Nut Driver
- 1 – 3/16″ Long Arm Allen Wrench
- 1 – Polishing Cloth

- 1 – 1/8″ Allen Wrench
- 1 – 3/32″ Allen Wrench
- 1 – Caster Wrench

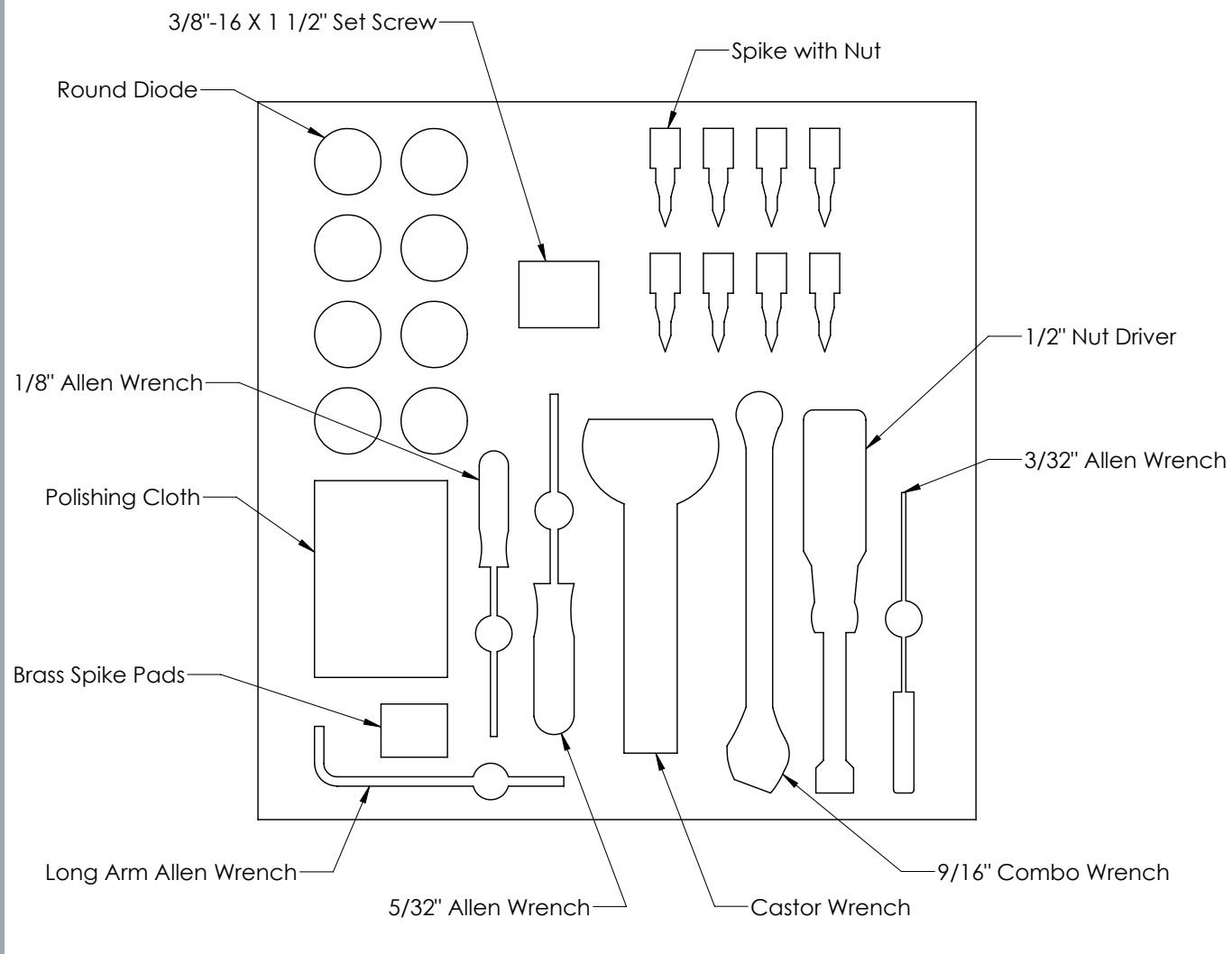


FIGURE 3: SOPHIA TOOL KIT

Section 4 – Final Setup

Note: Before setting up the Sophia Series 3, study carefully Section 2, "In Your Room." It provides valuable information on determining the ideal room location for your speakers.

Section 4.1 – Final Setup

Preparation

You will need the following items:

- Supplied hardware kit
- Tape measure
- Known listening position

Your dealer is trained in the art and science of the Wilson Audio Setup Procedure (WASP) outlined in Section 2. Before the spike/diode assemblies are attached to the bottom of your Sophias, the set up and fine tuning of your loudspeaker should be completed. Before spiking your Sophias, use masking tape to carefully mark their location.

Section 4.2 – Sophia Spikes

The Sophia comes with a set of heavy duty spikes (see Figure 4). These spikes also provide a secure mechanical reference point as well as optimal height placement for the Sophia. Brass disks that fit beneath the spikes are also included for installations where spikes might damage the floor surface (such as wood floors).

After determining the optimal Sophia position, assemble the spikes as follows:

Assembly

1. Insert threaded set screws into the bolt holes located on the bottom of your Sophia with the Allen head facing out.

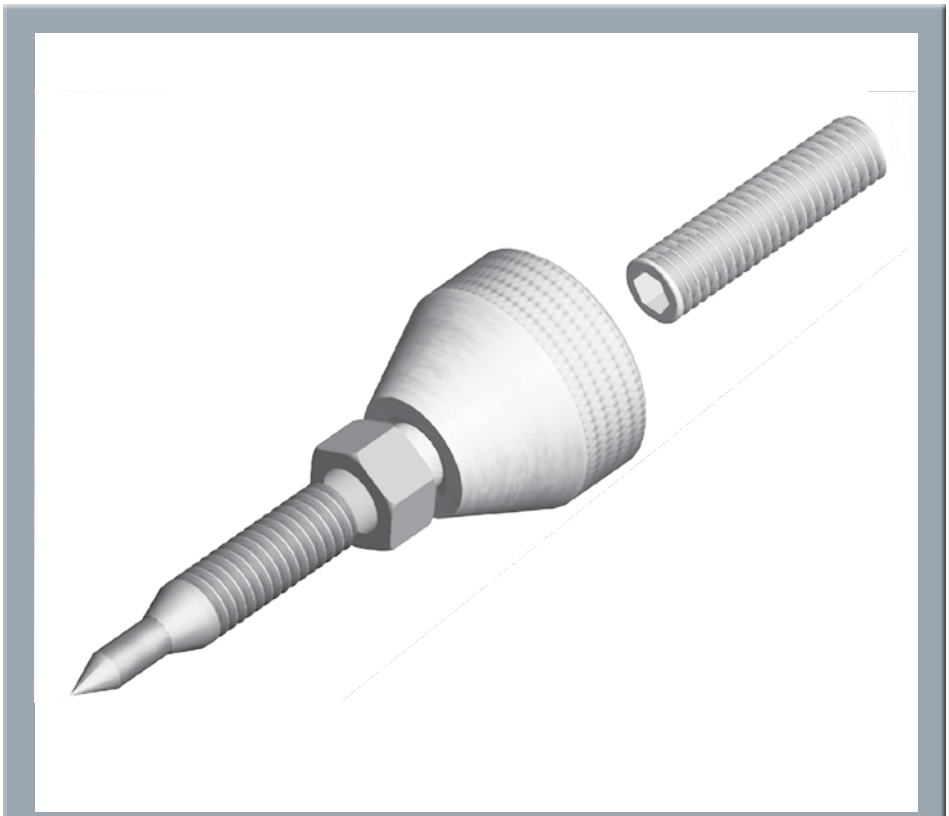


Figure 4: Spike Assembly

2. Screw the acoustical diode onto the bolt until it fits snugly against the bottom of the Sophia. Do not overtighten.

3. Screw the spike (with nut) all the way in until it just touches the bolt. Do not tighten the nut at this time.

4. Repeat steps 1 through 4 with the other spikes.

5. Using the 9/16″ combination wrench, tighten the nut snug against the diode to prevent the spike assembly from coming loose.

Section 4.3 – Wiring Attachments

Very high quality binding post connections are provided to facilitate connecting Sophia to your amplifier. Locate the 1/2″ nut driver from your tool kit. Attach the main

output from the amplifier to the binding posts located on the bottom rear of the Sophia. Use the 1/2″ nut driver to tighten the binding posts. Do not overtighten.

Section 4.4 – Removing the Protective Film

To protect the finish of the Sophia during final manufacture, shipment, and setup in your listening room, we have applied a removable layer of protective film over the finish. We recommend that this film be left in place until the speakers are in their final location in your listening room. Once you have determined their final position, remove the film by following this procedure:

6. Ensure the speaker surface is room temperature before removing the protective film. Removing the protective film when the speaker surface is cold can damage the paint surface.

7. Slowly remove the film from the top down, large sections at a time, gently pulling the film downward and outward. Tearing the film aggressively can damage the paint.

8. Take care in removing the protective film near edges and corners to prevent paint damage in these areas.

9. The protective film should not be left on the painted surface for extended periods of time nor exposed to heat sources and direct sunlight.

Figure 5 – The resistors are located under the plate on the rear of the woofer enclosure.

Section 4.5 – Resistors

By removing the aluminum cover on the rear of the woofer module of your Sophia Series 3s, you may gain access to the resistor plate (see Figure 5). These resistors serve several functions.

Note: Only Wilson Audio replacement resistors should be used in your Sophia Series 3s. Changing the value or brand of resistor will have a deleterious affect on the sonic performance of your loudspeakers and will void your Wilson Audio Warranty.

Figure 6 – Mid & Tweeter Resistor are attached to heatsinks with Allen hardware.

Midrange and Tweeter Resistors

The Midrange Level, which consists of two 12.94 ohm resistors in parallel, and Tweeter Level, which consists of two 11.75 ohm resistors in parallel, resistors provide precise level matching for the midrange and tweeter drivers correspondingly. The resistors also act as ultra high quality fuses which open before a driver can be damaged by excess power. See Section 6.0 for details in replacing these resistors in the event one of these resistors is damaged.

Additionally, these resistors can be used to tailor the output of the corresponding driver to overcome tonal balance issues that result from room acoustics.

Woofer Damping (Q) Resistor

The Woofer Damping (Q) resistor affects the way the Sophia's woofers couple to the amplifier. These resistors are pre-installed in the base of the Bass Module and should not be changed.

Section 5 – Care of the Sophia

Section 5.1 – Care of the Finish

The Sophia Series 3 loudspeakers are hand painted with WilsonGloss™ paint and hand polished to a high luster. While the finish seems quite dry to the touch, final curing and complete hardening takes place over a period of several weeks.

Dusting the Sophias

It is important that the delicate paint finish of the Sophia be dusted carefully with the dust cloth, which has been provided. We recommend that the following procedure be observed when dusting the speakers:

- Blow off all loose dust.
- Using the special dust cloth as a brush, gently whisk off any remaining loose dust.
- Shake out the dust cloth.
- Dust the finish, using linear motions in one direction parallel to the floor. Avoid using circular or vertical motions.

Because the paint requires a period of several weeks to fully cure, we recommend that no cleaning fluids, such as glass cleaners, be used during this initial period of time. When the paint is fully cured, heavy fingerprints and other minor smudges may be removed with a glass cleaner. Always use the dust cloth. Stronger solvents are not recommended under any circumstances. Consult your dealer for further information if required. To maintain the high luster of the finish, periodic polishing may be desired. We recommend a nonabrasive carnauba-based wax and a soft cloth.

Care of the Grilles

Periodically, you will want to clean the Sophia's grilles. This is best done by using the round brush attachment on a vacuum cleaner hose. Gently vacuum the front surface of the grille. Be careful not to apply too much pressure. Do not use a hard plastic attachment against the grille. The grille cloth is stretched tightly over the grille frame. Too much pressure or use of a hard plastic attachment could cause the grille material to tear, especially in the corners.

Often Wilson speaker owners desire to change the look of their listening room by changing the color of their speaker grilles. In addition to basic black, Wilson Audio offers a variety of grille colors to match most WilsonGloss finishes. Contact your local dealer for grille cloth samples or to order replacement grilles for your Sophias.

Break-in Period

All audio equipment will sound best after its components have been broken in for some period of use. Wilson Audio breaks in all woofers and mid-range drivers for approximately 12 hours. All drivers are then tested, calibrated, and matched for their acoustical properties. In your listening room, expect 25 to 50 percent of break-in to be complete after two hours of playing music at normal listening levels. Ninety percent of break-in is complete after 24 hours of playing. Playing a CD on repeat overnight can accomplish this task quickly. Wilson Audio recommends chamber music for this task.

Section 5.2 – Enclosure Technology

Materials

Wilson Audio has conducted many hours of research on the impact of materials on speaker enclosure performance. Through this effort, Wilson pioneered the use of non-resonant materials, first with the use of mineral-filled acrylic in the WATT and continuing with the further development of proprietary materials for X-1 Grand SLAMM and

MAXX. S-material, Wilson's latest breakthrough in ultra-low resonant materials, came with the development of Sasha W/P. Even the best materials are not suited to all aspects of enclosure construction. Therefore, like all Wilson loudspeakers, the Sophia is constructed of several proprietary materials chosen for their specific performance attributes relevant to different portions of the enclosure.

The Sophia is constructed using non-resonant, high-density, composites which are then cross-braced to further reduce cabinet resonance. Each of these composites meets and exceeds the highest of ANSI test standards for its use, while offering very tight tolerances, high hardness, uniform density, and dimensional stability.

Adhesive

Wilson Audio has conducted exhaustive research into the best adhesives to permanently bond our speaker enclosures. This is often an overlooked element crucial to the proper performance of a loudspeaker. Correct modulus of elasticity, coefficient of thermal expansion, and natural frequency response are just a few of the important elements of adhesives.

A highly cross-linked, thermo-set adhesive is used for the construction of the enclosure. It was also chosen for its excellent bond strength, solvent resistance, hardness, and optimum vibrational characteristics.

Section 5.3 – Depth of Design

Sophia's compellingly authentic performance and lasting value are achieved through careful implementation of cutting edge design and engineering and then executed using the highest performance materials. Wilson Audio's use of proprietary enclosure materials and adhesives are employed to achieve truly exceptional speaker cabinet performance. The use of these materials in the Sophia results in an enclosure that is inherently inert and non-resonant. All of these structural aspects are combined,

allowing Wilson Audio to deliver a product that maintains the strictest structural tolerances, durability, and reliability. This also means that the Sophias will have consistent, repeatable performance, unaffected by the climatic conditions, anywhere in the world. Finally, like all Wilson products, the Sophia is hand-crafted with meticulous attention to detail, with an unwavering commitment to excellence. Thus, the Sophia will impart to her owner beauty and pleasure for many years to come.

Section 6 – Troubleshooting

One channel is not operating:

Check the interconnects from source.

Check the connections on the speaker cables, both at the amplifier and speaker ends. Watch especially for connectors touching each other.

Imaging is off-center:

This could be a phase problem. When one channel is not working, or is out of phase, the Sophia will not "image" properly. Double check your connections for red-to-red and black-to-black.

Play music at a low level and listen to each driver in each channel. You may have a driver that is not operating correctly. If you find a driver that is silent, please go to the "Driver Out" section of this troubleshooting guide.

A chronic lack of bass energy:

Check the cable connections on your loudspeaker. If one channel is out of phase (connections reversed), bass will be cancelled. Note: Turn off your amplifier and unplug it from the wall.

This could also be a room problem. Make sure your system is set up via the Wilson Audio Setup Procedure as decribed in Section 2.

Driver out or not playing after connections have been verified:

If you have found a driver with no output, turn off your amp and disconnect the speaker cable. Remove the access panel on the rear of the enclosure. **Note: The enclosures are quite heavy. Please use two strong adults and take care when moving.**

	Using the appropriate Allen key, open the X-material door on the bottom.
	You will find some resistor connections. Replace the resistor with the matching resistor (contact your dealer for details). Tighten the new resistor in the old one's place.
	Note: Use only Wilson Audio replacement resistors in your Sophia. These resistors were carefully chosen for the overall sonic and thermal performance.
	Plug your amplifier into the wall and turn it on.
	Listen to the channel at a low level. The driver should now be operating correctly.
Amplifier shuts off as soon as it is turned on:	Check to see if your speaker cables are properly connected to the binding posts. Look for frayed ends, loose connections, or a conductor contacting the amplifier chassis.
	Turn the amplifier off and disconnect it from the AC wall outlet. Disconnect the preamplifier leads to the amplifier. Now turn on the amplifier.
If the problem is solved:	There is likely something wrong with your preamplifier or interconnect. Contact your dealer.
If the problem persists:	Leave the preamp leads disconnected and continue to the next step.

Turn the amplifier off. Disconnect the speaker leads at the main input to the speaker. Now turn on the amplifier.

If the problem is solved:

Call your Wilson Audio dealer. There may be a problem with the crossover or the speaker's internal wiring.

If the problem persists:

Continue to the next step.

Turn the amplifier off and disconnect it from the AC wall outlet. Disconnect the speaker cable leads to the amplifier and turn the amplifier on again.

If the problem is solved:

You have a short in your speaker cables. Check for frayed ends, holes (from spike feet), or make sure that your spade lug is not touching the chassis while it is connected to the binding post.

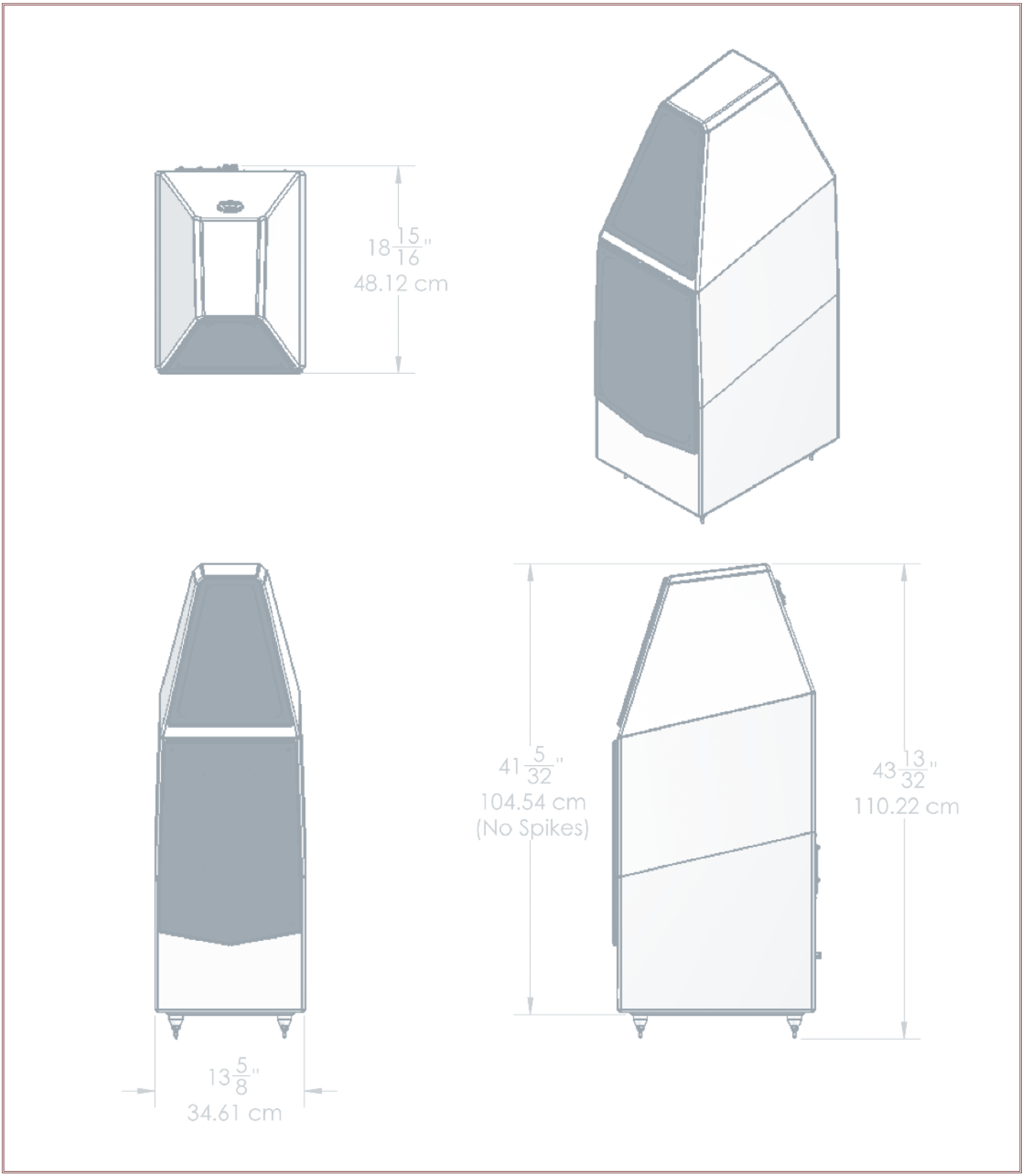
If the problem persists:

Call the dealer where you bought your amplifier. You appear to have a problem with this component.

Section 7 – System Specifications

Enclosure Type Sophia:	Rear Ported
Woofer:	One – 10 inch {25.4 cm} aluminum cone
Tweeter:	One – 1 inch {2.54 cm} inverted titanium dome
Midrange:	One – 7 inch {17.78 cm} Cellulose/Paper Pulp
Sensitivity:	87 dB @ 1 watt @ 1 m @ 1 kHz
Nominal Impedance:	4 ohms / 3.1 ohms minimum @ 98 Hz
Minimum Amplifier Power:	25 Watts per channel
Frequency Response:	20 Hz – 22.5 kHz +/- 3 dB
	Room Average Response [RAR]
Overall Dimensions:	Height: 41 5/32 inches (104.54 cm)
With Spikes:	43 13/32 inches (110.22 cm)
	Width: 13 5/8 inches (34.61 cm)
	Depth: 18 15/16 inches (48.12 cm)
System Weight Per Channel:	165 lbs (74.84 kg)
System Shipping Weight (approx.):	485 lbs (219.99 kg)

Section 7.2 – Sophia Dimensions



Section 7.3 – Impedance Curve

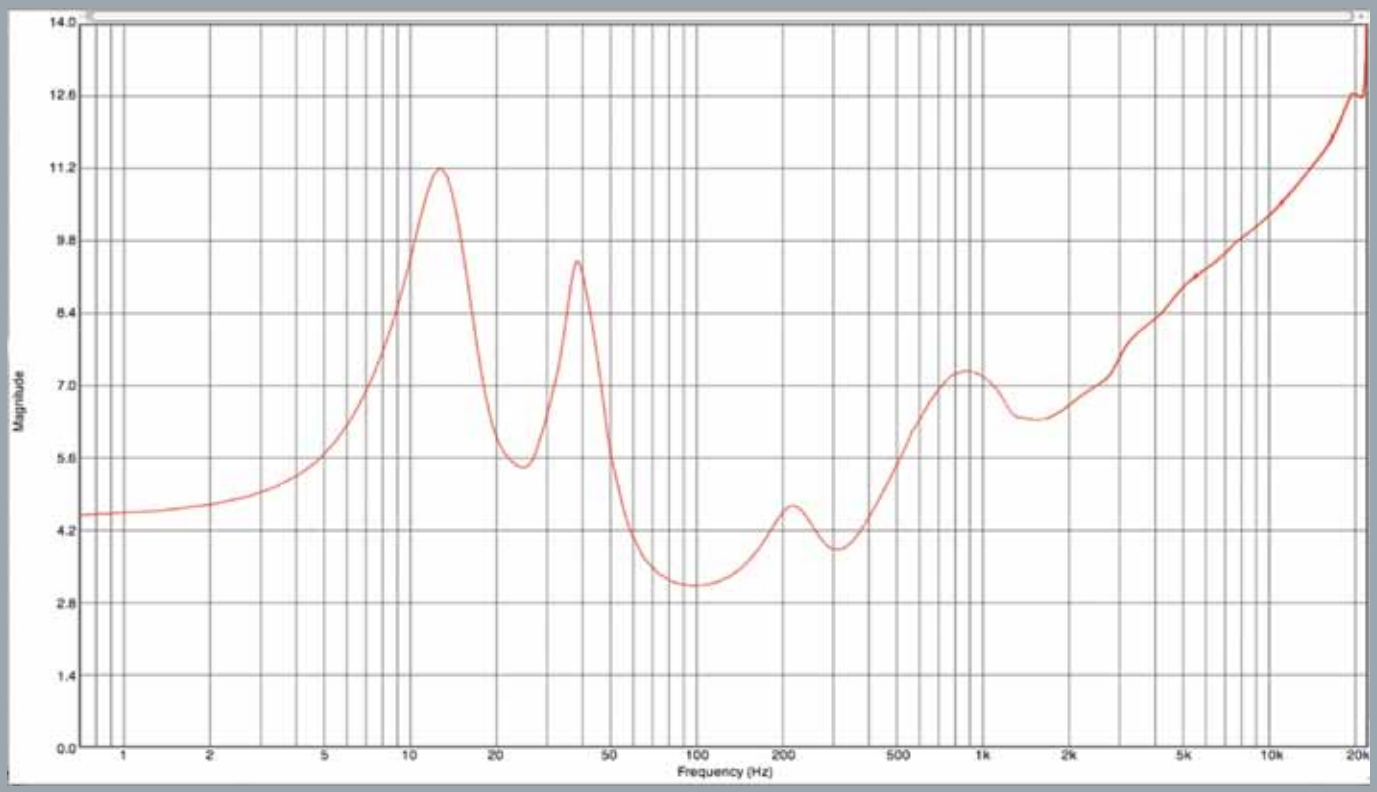
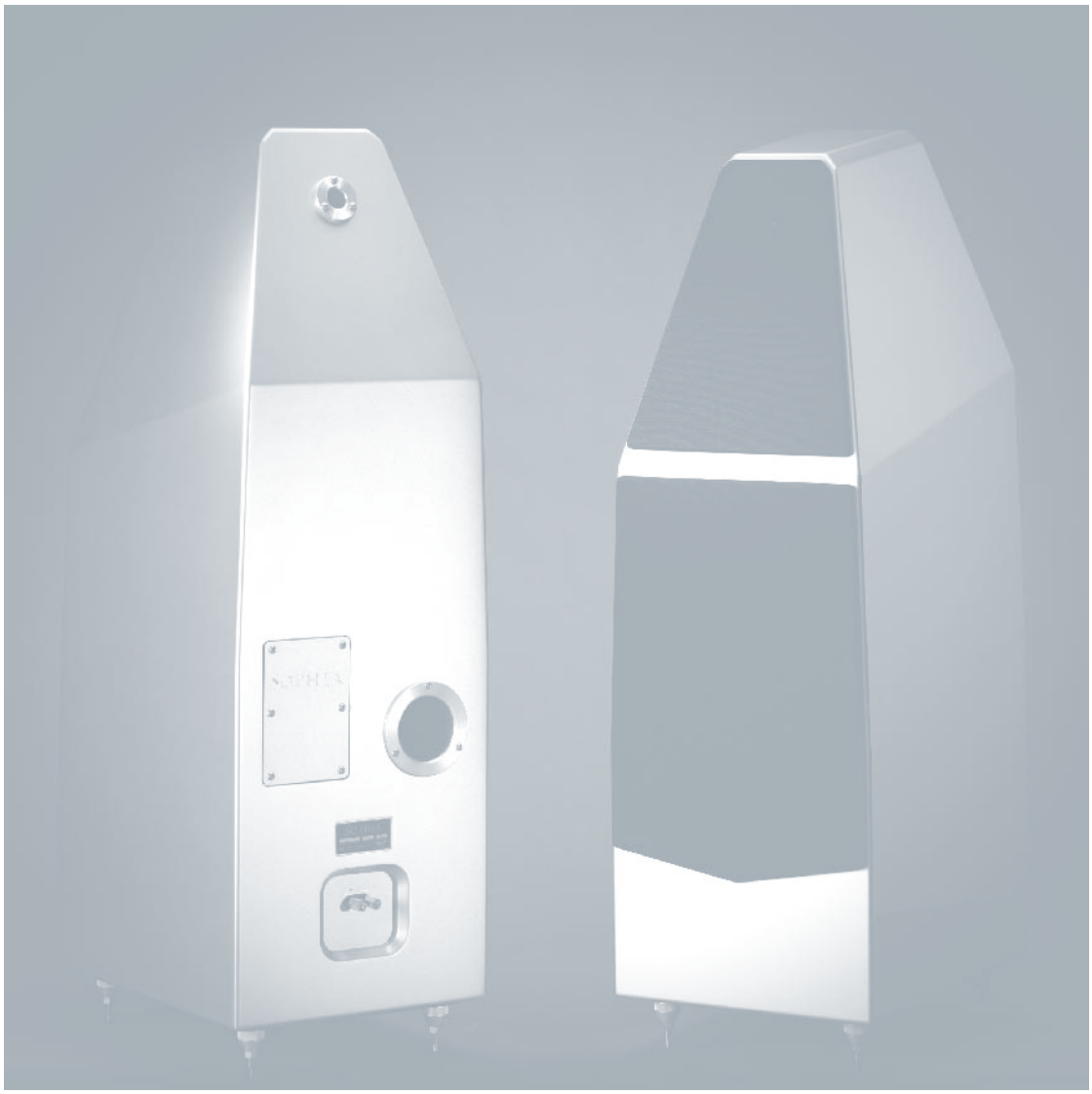


Figure 7: Sophia Impedance Curve

Section 8 – Warranty Information



Section 8 – Warranty Details

Limited Warranty

Subject to the conditions set forth herein, Wilson Audio warrants its electronics to be free of manufacturing defects in material and workmanship for the Warranty Period. The Warranty Period is a period of 90 days from the date of purchase by the original purchaser, or if both of the following two requirements are met, the Warranty Period is a period of five (5) years from the date of purchase by the original purchaser:

Requirement No. 1. No later than 30 days after product delivery to the customer, the customer must have returned the Warranty Registration Form to Wilson Audio;

Requirement No. 2. The product must have been professionally installed by the Wilson Audio dealer that sold the product to the customer.

FAILURE TO COMPLY WITH EITHER REQUIREMENT NO. 1 OR REQUIREMENT NO. 2 WILL RESULT IN THE WARRANTY PERIOD BEING LIMITED TO A PERIOD OF 90 DAYS ONLY.

Conditions

This Limited Warranty is also subject to the following conditions and limitations. The Limited Warranty is void and inapplicable if the product has been used or handled other than in accordance with the instructions in the owner's manual, or has been abused or misused, damaged by accident or neglect or in being transported, or if the product has been tampered with or service or repair of the product has been attempted or performed by anyone other than Wilson Audio, an authorized Wilson Audio Dealer Technician or a service or repair center authorized by Wilson Audio to service or repair the product. Contact Wilson Audio at (801) 377-2233 for information on location of Wilson Audio Dealers and authorized service and repair centers. Most repairs can

be made in the field. In instances where return to Wilson Audio's factory is required, the dealer or customer must first obtain a return authorization. Purchaser must pay for shipping to Wilson Audio, and Wilson Audio will pay for shipping of its choice to return the product to purchaser. **A RETURNED PRODUCT MUST BE ACCOMPANIED BY A WRITTEN DESCRIPTION OF THE DEFECT.** Wilson Audio reserves the right to modify the design of any product without obligation to purchasers of previously manufactured products and to change the prices or specifications of any product without notice or obligation to any person.

Remedy

In the event that the product fails to meet the above Limited Warranty and the conditions set forth herein have been met, the purchaser's sole remedy under this Limited Warranty shall be to: (1) contact an authorized Wilson Audio Dealer within the Warranty Period for service or repair of the product without charge for parts or labor, which service or repair, at the Dealer's option, shall take place either at the location where the product is installed or at the Dealer's place of business; or (2) if purchaser has timely sought service or repair and the product cannot be serviced or repaired by the Dealer, then purchaser may obtain a return authorization from Wilson Audio and at purchaser's expense return the product to Wilson Audio where the defect will be rectified without charge for parts or labor.

Warranty Limited to Original Purchaser

This Limited Warranty is for the sole benefit of the original purchaser of the covered product and shall not be transferred to a subsequent purchaser of the product, unless the product is purchased by the subsequent purchaser from an authorized Wilson Audio Dealer who has certified the product in accordance with Wilson Audio standards and requirements and the certification has been accepted by Wilson Audio, in which event the Limited Warranty for the product so purchased and certified shall expire at

the end of the original Warranty Period applicable to the product.

Demonstration Equipment

Equipment, while used by an authorized dealer for demonstration purposes, is warranted to be free of manufacturing defects in materials and workmanship for a period of five (5) years from the date of shipment to the dealer. Demo equipment needing warranty service may be repaired on-site or, if necessary, correctly packed and returned to Wilson Audio by the dealer at dealer's sole expense. Wilson Audio will pay return freight of its choice. A returned product must be accompanied by a written description of the defect. Dealer owned demonstration equipment sold at retail within two (2) years of date of shipment to the dealer is warranted to the first retail customer to be free of manufacturing defects in materials and workmanship for the same time periods as if the product had originally been bought for immediate resale to the retail customer. Wilson Audio products are warranted for a period of 90 days, unless extended to 5 years, as provided above, by return and filing of completed Warranty Registration at Wilson Audio within 30 days after product delivery to customer and the product was professionally installed by the Wilson Audio Dealer that sold the product to the customer.

Miscellaneous

ALL EXPRESS AND IMPLIED WARRANTIES NOT PROVIDED FOR HEREIN ARE HEREBY EXPRESSLY DISCLAIMED. ANY LEGALLY IMPOSED IMPLIED WARRANTIES RELATING TO THE PRODUCT SHALL BE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. THIS LIMITED WARRANTY DOES NOT EXTEND TO ANY INCIDENTAL OR CONSEQUENTIAL COSTS OR DAMAGES TO THE PURCHASER.

Some states do not allow limitations on how long an implied warranty lasts or an exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This Limited Warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.