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SOPHIA INTRODUCTION

SECTION 1.0 SOPHIA[™] INTRODUCTION

We at Wilson Audio Specialties would like to thank you for purchasing the Sophia loudspeaker. The information contained within the pages of this manual will inform and instruct you as to how you may enhance and prolong the enjoyment of your Sophias.

The design objective for Sophia was at once simple and challenging: to build a single cabinet, floor-standing loudspeaker that could provide a level of musical enjoyment comparable to Wilson Audio's multi-cabinet speakers, the Watt/Puppy 6®, the Maxx®, and the X-1 Grand Slamm®.

The result is a loudspeaker both visually and sonically beguiling. Sophia is a full-range, three-way system using specially chosen drivers and Wilson's Group Delay™ technology to achieve a new standard in top-to-bottom coherency and transparency. Every element of a singer's voice, for example—from upper-octave sibilance to chest resonance—is properly aligned and seamlessly joined. The soundstage is reproduced with a holographic clarity singular to Wilson Audio loud-speakers.

Sophia's remarkable tonal coherence is the result of painstakingly selecting drivers and matching them to our proprietary crossovers. The inverted titanium tweeter is similar to the Cub II® and Watch Center® speakers. A seven inch midrange driver lies at the heart of Sophia's sonic alchemy, creating the near perfect balance between beauty and accuracy. And the ported 10" long-throw aluminum woofer is unique to Sophia, crafted to reproduce the bottom octaves with dynamic ease and authority.

Wilson Audio set the benchmark in non-resonant cabinet design through its pioneering use of ultra high-density composites and mineral filled methacrylate polymers. Sophia now joins the rank of Wilson products using this exclusive technology. The benefits are not only audible, but also visual; this highly inert, nonporous material underlies our patented Wilsongloss™ finish.

With Sophia, Wilson Audio determined to introduce not merely a more accessible loudspeaker, but the best compact single cabinet loudspeaker we could build,

and the best loudspeaker in it's price range, period. Once again, Wilson Audio has raised the bar in terms of performance, value, and sheer beauty.



Section 2.0 Care of the Finish

Your Sophia enclosure is hand-painted with Wilsongloss™ paint and hand-polished to a high luster. While the paint seems quite dry to the touch, final curing and complete hardening takes place over a period of several weeks. To protect the finish of Sophia during final manufacturing, shipment, and setup in your listening room, we have applied a removable layer of protective film over the painted surface. We recommend that this film be left in place during the positioning process to prevent damage to the painted surface of your loudspeaker. Once you have determined the Sophia's final position, remove the film by peeling it off. Do not leave this film on indefinitely, as it will leave impressions on the paint.

It is important that the delicate paint finish of 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 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 finger prints and other minor smudges may be removed with a glass cleaner. When cleaning the painted surface of your Sophias, always use the dust cloth. Stronger solvents are not recommended under any circumstances, as they may damage the paint. Consult your dealer for further information if required. Periodic polishing may be desired over the years to maintain the high luster of the finish. We recommend a nonabrasive carnauba-based wax and soft cloth.

Section 2.1 Break In Period

Break In Period

Any piece of audio equipment will sound its best after its components have been broken in for some period of use. Wilson Audio breaks in all woofers and midrange drivers for a 12 hour period. All drivers are then tested, calibrated, and matched for their acoustical properties. In your listening room, expect 25 to 50% of break-in to be complete after two hours of playing music fairly loudly. Ninety percent of break-in is complete after 24 hours of playing. Playing a CD using the "disc repeat" function overnight can accomplish this task quickly. Wilson Audio recommends chamber music for this task.

Section 2.2 Enclosure Technology

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. Even the best materials are not suited to all aspects of enclosure construction. Therefore, like all Wilson loudspeakers, the Sophia is constructed of several exotic materials chosen for their specific performance attributes relevant to different portions of the enclosure.

Sophia is constructed using non-resonant, high-density, composites which are then highly-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 sta-

bility. In the most critical areas of the enclosure, the Sophia uses our proprietary "X" material, a very dense, strong composite, developed for the X-1 Grand SLAMM. The high hardness of these composites not only offers excellent acoustical properties but also provides an ideal surface for painting, ensuring that the high gloss finish will be as durable as it is beautiful.

ADHESIVE

The engineers at Wilson have performed extensive research to arrive upon the adhesives used to construct our enclosures. This often overlooked element is crucial to the proper performance and longevity of a loudspeaker. Correct modulus of elasticity, coefficient of thermal expansion and natural frequency response are just a few of the important elements.

A highly cross-linked, thermoset 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.

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 propriety enclosure materials and adhesives are employed to achieve truly exceptional speaker cabinet performance. The use of these materials in Sophia result in an enclosure that is absolutely 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 you will have consistent, repeatable performance, unaffected by the climatic conditions, anywhere in the world. Finally, like all Wilson Products, Sophia is hand-crafted with meticulous attention to detail, with an unwavering commitment to excellence. Thus, Sophia will impart to her owner beauty and pleasure for many years to come.



Note: The following section contains general information on room acoustics and loudspeaker/room interaction. The concepts outlined below are equally relevant when dealing with multichannel 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 Sophias.

Section 3.0 Room Reflections

There are 3 commonly encountered room reflection problems, slap-echo, standing waves, and comb filter effects.

SLAP-ECHO

Probably the most obnoxious form of reflection is called "slap echo". In slap echo, primarily mid-range 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 playback system primarily in two ways:

- Adding harshness to the upper mid-range and treble through energy time storage.
- Destroying the delicate phase relationships which help to establish sound stage and image localization clues.

Nonparallel walls do not support slap echo, but rather allow the sound to diffuse.

SOPHIA OWNER'S MANUAL

Slap echo is a common acoustical problem in the typical domestic listening room, because most of these rooms have walls of a hard, reflective nature, usually being only occasionally interrupted by curtains or furniture. Slap echo can be controlled entirely by the application of absorptive materials to hard surfaces, such as:

- Sonex
- Airduct board
- Cork panels
- Large ceiling to floor drapes
- Carpeting to wall surfaces

In many domestic listening environments, heavy stuffed furnishings are the primary structural control to slap echo. 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", much heavier in bass tonal balance, 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. Diffusers, on the other hand, tend to not change the high frequency tonal balance characteristic of the room. Used properly, they can increase transparency. Used incorrectly, however, diffusers can rob the system of bass richness, and add significant midrange colorations. A combination of absorptive and diffusive treatments is usually the best approach.

STANDING WAVES

Another type of reflection phenomenon is standing waves. Standing waves cause the unnatural boosting of certain frequencies, typically in the bass, at certain discreet locations in the room. A room generating severe standing waves will tend to make a loud-speaker sound one way when placed in one location and entirely different when placed in another. The effects of standing waves on a loudspeaker's performance are primarily as follows:

- Tonal balance- bass too heavy
- Low-level detail- Masked by long reverberation time LF standing waves

Sound staging- LF component of image shifted

Standing waves are more difficult to correct than slap echo because they tend to occur at lower frequencies, whose wave lengths are long enough to be ineffectively controlled by absorbent materials such as Sonex. Moving speakers about slightly in the room is, for most people, their only control over standing waves. Sometimes a change of placement as little as one inch can dramatically alter the tonal balance of a system because of standing wave problems. Fortunately, minor low frequency standing waves are sometimes well controlled by positioning 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 constructed of concrete or brick. This rigid and massive construction method traps the bass in the room, unless it is allowed to leak out of the room, through large window and door areas.

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 very slightly asymmetrically in the listening room so that 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

A special type of standing wave, noticeable primarily in the midrange and lower high frequencies is the so-called "comb filter effect".

Acoustical comb filtering occurs when sound from a single source, such as a loudspeaker, is directed toward a microphone or listener at a distance. The first sound to reach the microphone will be the direct sound, followed by 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 are 180 degrees out of phase. There is augmentation at other frequencies where the direct and the reflected sounds arrive in phase. Because it is a function of wave length, the comb filter effect will notch out portions of the audio spectrum at regular octave-spaced intervals.

The subjective effect of comb filter effects, (such as is shown in Figure 3.1) is as follows:

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

Comb filter effects are often caused by side wall reflections. They are best controlled by very careful speaker placement and by the judicious placement of Sonex or air duct panels applied to that part of the wall where the reflection occurs.

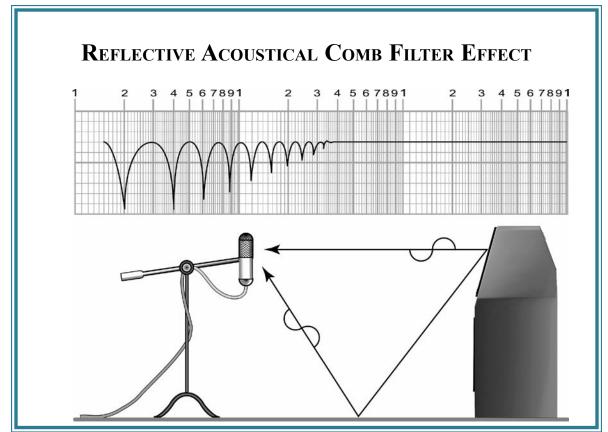


FIGURE 3.1 COMB FILTER EFFECT

Section 3.1 Resonance

Resonance in listening rooms are generally caused by two sources:

- The structures within the listening room
- The volume of the air itself in 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 heel of your hand or stomping on the floor. If it is a wooden floor, this is done to detect the primary spectral center of the resonance. 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 tonal balance fullness to any system played in that room. 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. Short of actually adding additional layers of sheet rock or book shelves, to flimsy walls, however, there is little that can be done to eliminate wall resonances.

AIR VOLUME RESONANCE

The volume of air in a room will also resonate at a frequency determined by the size of the room. Larger rooms will resonate at a lower frequency than will smaller rooms. Air volume resonances, wall panel resonances, and low frequency standing waves, together, 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. Tube traps manufactured by the ASC corporation have been found to be effective in reducing some of these low frequency room colorations. While custom designed and constructed bass traps, such as perforated Helmholtz resonators, provide the greatest degree of low frequency control.

INITIAL SETUP INFORMATION

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You are surely excited about setting up your Sophias 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.

Section 4.0 Final Listening Room Setup (voicing)

Your Sophia's will give you many years of musical satisfaction. However, their high performance characteristics and abilities can only be fully appreciated with the proper acoustical setup.

The following section will present some guidelines on room acoustics and their interactions with loudspeakers. We will also offer some detailed suggestions on the setup of Sophia, but we strongly suggest that you have your local Wilson Audio dealer perform the final speaker "voicing" for you. They are specially trained in setting up Wilson loudspeakers and will ensure that you realize the full value of your purchase.

ZONE OF NEUTRALITY

The zone of neutrality is a location 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 move your Sophia's away from the placement area during this process. We also recommend that you wait to spike your speakers until the final system setup is completed.

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

- Stand against the wall BEHIND the location where you intend placing your Sophias. Speaking in a moderately loud voice and a constant volume, project your voice out into the room.
- As you slowly walk out from the wall, (it is helpful to have another listener seated in the listening position to aid you in the evaluation) listen to how the voice "frees up" from the added bass energy and diffuseness imparted by the rear wall boundary.
- When you hear the voice "free up" from this artifact, place a piece of tape on the floor to mark this location. You will now be entering the outer edge of the "zone of neutrality". Although this can vary from room to room, this is usually between 2 and 3 1/2 feet from the rear wall
- 4 Continue to walk slowly away from the wall. After some distance, usually one to two feet, you will hear the beginning of a new artifact the interaction with the opposite wall. This will manifest itself when you hear your voice again lose focus and it appears to reflect or echo in front of you.
- When you begin to hear this artifact, place a piece of tape on the floor and mark this location. This is the inner edge of the "Zone of Neutrality."
- Repeat the procedure with the side walls, positioning yourself with the zone you have established above. Continue to listen for the point in the room where your voice loses the added bass energy from the wall behind you, and continuing until there is an obvious interaction with the opposite wall in front of you. Do each side or speaker location individually. 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 extend the inner and outer boundaries of the Zone for the side walls and the front wall (behind the speakers), they will intersect. You will now have two rectangles on the floor on either side of the room, which is your Zone of Neutrality for each channel.

Note: The more reflective or "live" sounding the room is, the more difficult it will be to detect the changes in your voice, thus you may have to repeat this process until

SPEAKER PLACEMENT VS. LISTENING POSITION

The location of your listening position is as important as the careful setup placement of your speakers in your room. The listening position should ideally be no more than 1.1 to 1.25 times the distance between the left and right channel 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 about halfway down the long axis of the room. Experiment carefully for best low frequency response.

Some people place the speakers on one end and sit at the other end of the room. Needless to say, this will not yield the finest sound. Carefully consider your listening position for optimal performance. Our experience has shown that any listening position which places your head closer than 14" to 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 minimize the influence of the side walls on the sound of your system. Speakers placed too close to the side walls 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. A good place to start is with the speakers

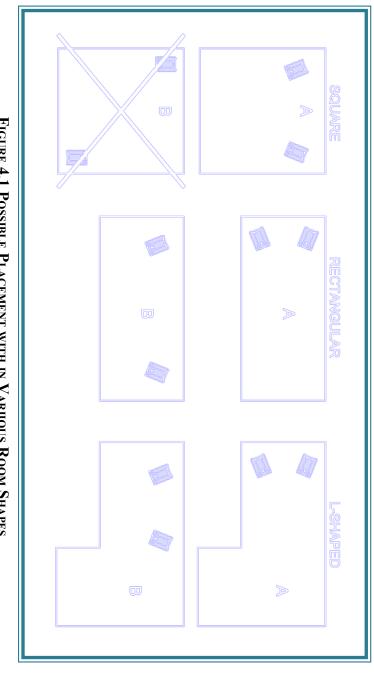


FIGURE 4.1 POSSIBLE PLACEMENT WITH IN VARIOUS ROOM SHAPES

about 18" from each wall and, if you need to move them relative to the side wall, move them away from the wall, not closer.



SOPHIA FINAL SETUP

Note: Before setting up Sophia study carefully the previous sections on room acoustics and initial setup information. They provide valuable information on determining the ideal room locations for your Sophia.

SECTION 5.0 PREPARATION

You will need the following items:

- Supplied hardware kit
- Tape measure
- Known listening position
- Electric Screw driver
- Phillips head drive bit

UNCRATING SOPHIA

A minimum of two strong adults are required to set up Sophia. The Sophia is very heavy, and care should be taken to prevent injury.

- 1. With the crate lid facing up, unscrew the wood screws securing the lid. Remove the lid and remove the foam packing material beneath the bottom of the Sophia.
 - 2. Set the crate so that the bottom of Sophia is towards the floor.
- 3. While one person holds the crate, the other person should gently slide the Sophia out of the crate. Be careful not to scratch the sides of the painted enclosure.
 - 4. Move the **Sophia** into the desired location.

Section 5.1 Wiring Attachments

Very high quality binding post connections are provided to facilitate connecting Sophia to your amplifier. Locate the 1/2" Hex Head tool from your took kit to tighten spade connectors of your speaker cable to attach the main output from the amplifier to the Input terminals located on the bottom module in the rear.

Please follow the setup instructions outlined in Section 4 to find the posistion for your Sophias in your room. It is recommended that you place your Sophia's in their final position before you install the spikes.

SECTION 5.2 SOPHIA SPIKES

The Sophia comes with a set of heavy duty spikes. These spikes also provide a secure mechanical reference point as well as optimal height placement for your 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 Sophia position, assemble the spikes as follows:

ASSEMBLY

- 1. Insert threaded bolts into the bolt holes located on the bottom of your Sophia with the Allen head facing out.
- 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 a bubble level, adjust the spikes so that the Sophia is level and so that all of the spikes are making equal contact to the hard surface beneath.
- 6. Once your Sophia's are level, tighten the nut on the spike to the diode using the 9/16" wrench provided in the Sophia tool kit. DO NOT OVERTIGHTEN!

The spikes, installed properly, isolate the Sophia from the floor surface, reducing resonances. They also provide a stable platform for the Sophia to launch bass energy. The result is cleaner, faster, more dynamic bass, with improved extension and linearity.

SOPHIA SPIKE ASSEMBLY DIAGRAM

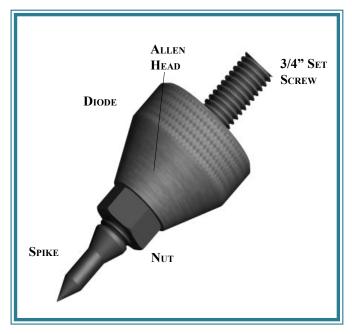


FIGURE 6.1 SPIKE ASSEMBLY

SYSTEM SPECIFICATIONS

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SECTION 6.0 SOPHIA SPECIFICATIONS

Specifications:

Woofers: 1 - 10 inch aluminum cone **Tweeter:** 1 - 1 inch inverted titanium dome

Midrange: 7 inch

Sensitivity: 89 dB, 2.83 volts at 1 meter

Nominal Impedance: 4 ohms 3 ohms minimal Minimum Amplifier Power: 12 Watts per channel

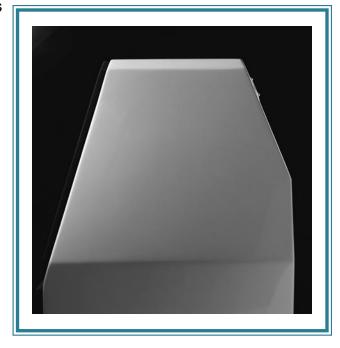
Frequency Response (with port contribution): 29 Hz - 22 kHz (-3dB)

Demensions:

Height: 41 inches (without spikes)

Width: 12 inches **Depth:** 18 inches

Weight: 180 lbs



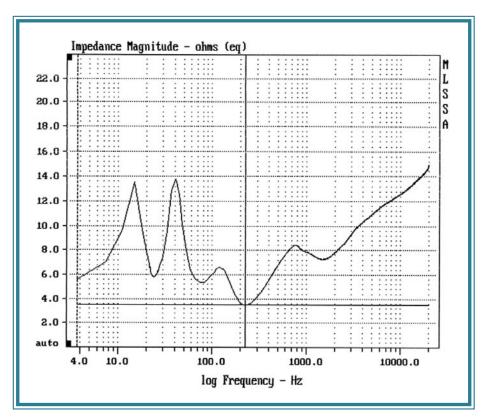


FIGURE 6.1 SOPHIA IMPEDANCE CURVE

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WARRANTY INFORMATION

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WILSON AUDIO LOUDSPEAKER

LIMITED WARRANTY

TERMS AND CONDITIONS

LIMITED WARRANTY

Wilson Audio warrants its loudspeakers to be free of manufacturing defects in material and workmanship, subject to the conditions hereinafter set forth for a period of 90 days from the date of purchase by the original purchaser, of five (5) years. If a Warranty Registration Form has been correctly filed at Wilson Audio, no later than 30 days after product delivery to the customer.

CONDITIONS

This warranty is subject to the following conditions and limitations. The 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, abused or misused, damaged by accident or neglect or in being transported or the defect is due to the product being repaired or tampered with by anyone other than Wilson Audio, or an authorized repair center. Most repairs can be made in the field by an authorized Wilson Audio agent. In instances when return to Wilson Audio's factory is required, a return authorization must first be obtained by the dealer or customer. Wilson Audio will pay return freight of its choice. 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 above product fails to meet the above Warranty and the above

LIMITED TO ORIGINAL PURCHASER

This 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. Any subsequent purchaser should contact a Wilson Audio dealer to request a new warranty.

DEMONSTRATION EQUIPMENT

Equipment 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 his 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 retain 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 warrantied for a period of 90 Days, unless extended to 5 years by return of completed Warranty Registration.

MISCELLANEOUS

ANY IMPLIED WARRANTIES RELATING TO THE ABOVE PRODUCT SHALL BE LIMITED TO THE DURATION OF THIS WARRANTY. THE 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

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