

# *Sapphire XL<sup>2</sup>*

Reference Monitor

## Owner's Manual

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## Sapphire XL<sup>2</sup> Guarantee & Warranty

### 20 Day Trial Program:

Many of you will already have heard the Sapphire XLs. Maybe it was at a CES or RMAF show. Perhaps it was at a friend's house or an audio "get together". For you, it's easy to know you want to own these speakers for yourself, you've already heard some of what they can do. But there are many of you who have not had the opportunity to hear the Sapphire XLs, much less the new XL<sup>2</sup>s. For you, we've worked out a way to do a comfortable home audition. Mike Dzurko was one of the first in the industry to understand that for many folks, the best audition is in their own home system. ACI always had a money-back guarantee. Over the course of many years, less than 1% of the speakers purchased were returned under this guarantee! A money-back guarantee works well with a "stock" product. With the XL<sup>2</sup> we're offering a custom pair of speakers at a stock speaker price point. For this, we've worked out a procedure that allows you to audition in home, and still order your special custom set if you should so choose. Here's how it works:

MAG builds and stocks a small number of "stock" speaker pairs. These are in popular finishes, etc. with a set price. You may order a pair of these at the website or by calling Mark at MAG. We will ship these to you and you will have 20 days from delivery to make a decision. You have three choices;

- 1) Keep the stock pair that you have already paid for.
- 2) Pay the return shipping charges and return them for a full refund minus \$30. (Continental U.S.). Talk to us about other destinations.
- 3) Return the stock pair and order your own custom pair. You will pay only the difference between the stock pair and the custom pair that you choose.

### MAG Sapphire XL<sup>2</sup> Warranty:

For **five years** from receipt, Meniscus Audio Group will, at its option, repair or replace factory defective components. This warranty **excludes products that have been abused, modified, or disassembled** in any way. This warranty does not apply to speakers, which have been damaged in shipping. Meniscus Audio Group's liability is limited only to the replacement of defective parts. No other liabilities or obligations are expressed or implied.

The ACI Warranty is fully transferable from the original owner to a secondary owner provided that the original owner notifies ACI by filling out the on-line form: [ACI Warranty Transfer](#). No warranty will be transferred absent this notification.

Simply follow these procedures:

1. **Return Authorization:** Email for a return authorization number. Boldly mark the return authorization number on the outside of the box. Include a brief note with your name, address and a daytime telephone number, along with a short description why the products are being returned.
2. **Returning:** Carefully repack defective merchandise in the original packaging. Ship by best means, (preferably UPS or Fed Ex), and insure the products for their full retail value. The customer is responsible for return shipping. *Please note: MAG can not accept COD or Freight Collect returns.*
3. **Replacement:** MAG will inspect and determine the cause of failure and will pay return shipping on the defective goods replaced or repaired.

### Non-Warranty Repairs

*Examples: Blown drivers, crossover components burned by lightning strike, etc. Contact MAG, we will advise you of what repairs can be made and estimated cost.*

## IMPORTANT NOTICE

All new speakers require a minimum of 60 hours break-in-time before they sound the way they are supposed to. A speaker's performance improves significantly once broken in. It is critical that you have at least 60 hours on your speakers before you evaluate them. Don't worry if your speakers do not sound perfect the first time you play them. This is normal until they are broken in. If you are having difficulty getting enough hours on your speakers and your 20 day trial is running out, call us. We will work with you. Please give us the courtesy of breaking the speakers in before you determine they don't sound right.

Many of our customers break their speakers in by:

- A) Leaving them on at moderate listening levels when they are not home.
- B) Leaving them on at moderate listening levels while they sleep.
- C) Running pink noise through them.

These methods are not convenient for everyone and we understand this. But please know that you are not giving yourself, your speakers or us a fair chance if you do not break them in before critical evaluation.

## THANK YOU!

## *The Sapphire XL<sup>2</sup>*

Thank you for your order and congratulations on becoming the owner of the MAG Sapphire XL<sup>2</sup>. These fine speakers will provide you with many years of listening pleasure!

These speakers are designed to offer extremely high value and performance. Read the rave reviews of the Sapphire series going all the way back to the late 80s. The Sapphire series has the reputation of being the best value, stand-mounted monitors that money can buy and has been frequently compared to the most expensive high-end monitors. By purchasing directly from the factory you eliminate costly markups. You will find that your Sapphire XL<sup>2</sup>s will compare favorably with systems costing *far* more!

We'll put the Sapphire XL<sup>2</sup> against any speaker in the world for overall balance and musicality. The Sapphire XL<sup>2</sup> has phenomenal detail and resolution yet it does not have the somewhat harsh quality that many detailed sounding speakers have. It is extremely coherent from top to bottom and the dynamic range of the XL has been significantly improved from its predecessors.

The bass response of the XL is truly amazing. The response is tight, deep and tuneful. Those who wish to have a truly full-range system may consider the addition of high quality subwoofers.

The Sapphire XL<sup>2</sup> is the result of ongoing research and development by the ACI design team.

## *Specifications*

**Frequency response:** 48-20kHz  $\pm$  3db anechoic, 60-20kHz  $\pm$  1.5db (usable in-room response extends cleanly to 38-40Hz)

**Nominal impedance:** 6 ohms, minimum impedance 4.5 ohms, low reactance

**Sensitivity:** 85.5db 1 watt/1 meter

**Bass-loading:** 4<sup>th</sup> order, low Q, rear ported system

**Recommended RMS Power:** 35 to 200 watts per channel

**Tweeter:** 1" hand-damped silk dome with aperiodic rear chamber, cast faceplate and ferro-fluid

**Bass-mid:** 5 1/2" cast-frame with paper cone, rubber surround; long throw, low distortion motor system with vented pole piece

**Cabinet:** Variable wall thickness; 1" MDF front baffle, 3/4"- 1 1/2" MDF side and rear panels, extensive interlocking bracing structure. Internal walls are mass loaded with metal plates. Internally damped with dacron and acoustic foam.

**Finish:** Maple and Cherry with satin black baffles as well as optional finishes

**Inputs:** Gold plated binding posts

**Dimensions:** 12" H x 8 1/2" W x 12 1/2" D

**Weight:** 22 lbs each

## *Design Philosophy for the Sapphire XL<sup>2</sup>*

Modern speaker design is a combination of science, art and sweat. A successful design such as the Sapphire XL<sup>2</sup> requires thousands of hours utilizing computer modeling, several generations of prototypes, precision testing, critical listening and many "fine tunings".

Our design goals for the Sapphire XL<sup>2</sup> were to produce a compact, attractive speaker with smooth, uncolored, wide-range response, holographic stereo imaging, good sensitivity, high power handling, and long term enjoyability. This Sapphire XL<sup>2</sup> is the most advanced model of a speaker family first produced in 1988. The Sapphire XL<sup>2</sup> had to be a true "monitor" with nearly full-range response that could be optionally used with subwoofers. And, as an ACI product it had to sell for far less than the state-of-the-art monitors it would compete with. We are pleased to have achieved and in some areas exceeded our goals by systematically engineering and refining the Sapphire XL<sup>2</sup> to optimize performance. Please note the following factors:

**Frequency Response:**

For a speaker to be considered “accurate” it must have a smooth frequency response that is free of major dips, peaks, troughs or plateaus. The Sapphire XL<sup>2</sup>s exhibit exceptionally flat response throughout the range from below 48Hz to 20kHz. In fact, from 60-20Khz the variance is less than 1.5db! The cast-frame woofer provides excellent bass performance at all but subwoofer frequencies.

Of nearly equal importance is the off-axis response of the speaker. This response from 15 to 45 degrees off the axis of the speaker determines the smoothness of the early reflections from the wall surfaces. In most domestic listening situations this energy is nearly equal to the on-axis response in determining the balance of the system. The off-axis response should show a gradual decrease in output with increased frequency but should not show major dips or peaks which will color the overall sound. Again, the Sapphire XL<sup>2</sup> gives an exemplary off-axis dispersion pattern.

Tight quality control procedures are necessary to assure that *your* Sapphire XL<sup>2</sup>s sound every bit as good as our lab samples. Incoming shipments of raw parts including cabinet materials, drivers and crossover components are subject to extensive testing to verify that they meet our exacting standards. Precise quality control is critical for the best stereo imaging. Drivers are selected to closely match the standard, and crossover components are hand selected to better than 1% tolerance.

**Dynamic range:**

Dynamic range in a speaker requires;

- Adequate sensitivity so that it may be driven to realistic levels with available amplification. The C-weighted sensitivity for the Sapphire XL<sup>2</sup> is 85.5db. This is a very reasonable rating considering the size and bass response of this speaker.
- An easy load for the amplifier. A speaker can have a high sensitivity number but may present a difficult load for the driving amplifier. The Sapphire XL<sup>2</sup> has a nominal impedance of 6 ohms. The minimum impedance is 4.5 ohms and the maximum impedance is 26 ohms. Some speakers have wildly varying impedance phase curves that can cause problems for amplifiers. The phase of the Sapphire XL<sup>2</sup>s impedance helps make the Sapphire XL<sup>2</sup> an easy load for any amplifier.
- Low distortion drive units are necessary to keep the music from becoming edgy or gritty as the volume is turned up. The drive units used in the Sapphire XL<sup>2</sup> have very linear suspensions, which reduce distortion components to inaudible levels and contribute to the excellent sense of “clarity”. The crossover used keeps low frequencies out of the tweeter and protects it from over-exursion at resonance, which would otherwise cause increased distortion.

Good power handling is a requirement if musical peaks are to be reproduced cleanly and without damage to the speaker. The drive units in the Sapphire XL<sup>2</sup> are extremely rugged and will cleanly reproduce the dynamics of live music.

**Delayed Resonance Control:**

The ultimate control of delayed resonance required extensive use of Cumulative Spectral Decay analysis coupled with accelerometer testing of the cabinet wall surfaces. This extensive testing allowed us to develop the most cost-effective internal bracing to create the vault like solidity of the Sapphire XL<sup>2</sup>. The entire cabinet is formed of an incredibly inert and well-damped medium density fiberboard (MDF) specified at 49.3 pounds per cubic foot density. For the XL<sup>2</sup> we have added constrained layer dampening with the addition of heavy metal plates bonded to the internal walls. All drive units were designed with effective resonance control in mind.

*We've attempted to show you some of the important design considerations that go into the Sapphire XL<sup>2</sup> system. To fully document the design process would require many hundreds of pages. We haven't even discussed the extremely high level of quality control that must be exercised in the drivers, crossovers and enclosure to maintain the design standards. But the most important point is that the Sapphire XL<sup>2</sup>s are designed and built by and for music lovers. You must hear the Sapphire XL<sup>2</sup> system reproduce your favorite music over a period of time to appreciate how fine these speakers are.*

## *Using Your Speakers*

If the rest of your system does not work properly or is not correctly connected you will not get the best performance from your system. To eliminate problems we recommend the following:

- I. Use the finest associated components you can afford. Turntable, cartridges, pre-amps, amplifiers, (receivers) and cables all have profound impact on the sound of your system. Accurate speakers let more detail through. You will hear more of the beauty of the music, but flaws in your system and or source material may be more obvious.

Any good audio system is made up of matched components. You wouldn't use bargain recap tires on a new Porsche, and you shouldn't use inferior components with a high quality speaker. Your Sapphire XL<sup>2</sup>s perform like speakers costing two to four times their price. Keep this in mind when selecting the rest of your system.

Your Sapphire XL<sup>2</sup>s will work in systems with as little as 20 watts per channel. But for optimum sound we recommend high-quality amplification of 35 - 200 watts per channel.

- II. Know your source material. People often blame their audio gear for poor recordings. A great number of popular recordings are of inferior sound quality. Unfortunately this applies to records, DVDs and CDs. Commonly poor recordings are rolled off in the low bass, and harsh and constricted in the mids and highs. Good stereo image is rare. Many recordings are still done on old studio monitor speakers that are grossly inaccurate. Consider that some producers still mix recordings to sound best on cheap table and car radios! This doesn't mean you can't enjoy these recordings, but you should try a few of the best audiophile recordings just to see how terrific your system can be when fed a good signal.
- III. Work at getting the best placement of your speakers in their environment. It is not unusual to be able to get a 25 to 50 percent improvement in sound by careful placement of speakers and furniture. It may not be practical to go all out, but the more you can "tune" your room, the better your system will sound. Refer to the section on placement and room treatment later in this section.

## *Avoiding Damage*

ACI speakers are designed for the purpose of accurate reproduction of music in the home. We do our best to make our speakers rugged and reliable. However, ANY speaker or system may be damaged under certain conditions:

- Excessive power, particularly at certain frequencies or for prolonged periods of time
- Excessive distortion often caused by under-powered amplifiers or receivers
- Defective amplification
- Excessive subsonic energy

Our systems are tested at high volume levels with a variety of amplifiers and receivers before a design is approved. With many years of testing, we know it is virtually impossible to damage a component without the system first giving audible warning in the form of distortion. We also know that true factory defects are extremely rare, less than one in 10,000 drivers.

**Here are some considerations to keep in mind to avoid damaging your drivers:**

- Even though a system may be rated for 100 watts or more it is very easy to damage it with a low power receiver. When an amplifier runs out of power, it "clips". This clipping produces large amounts of

distortion which sends excessive energy particularly to the midrange and tweeter. This clipping distortion accounts for more than 75% of all tweeter failures. How do you know if the amplifier is clipping? Volume knob placement does NOT indicate much. Some receivers reach full output well before 12:00 on the dial. Use of the loudness button, bass boost and treble boost can all drive the receiver and then the speaker into distortion at fairly low levels.

- Many of today's recordings including DVDs and CDs contain extremely powerful low bass. This low bass can easily drive woofers into over-excursion or cause the amplifier to run out of power and clip, potentially causing damage.
- Our systems are designed for accurate sound. Our rate of damage or failure is extremely low. We could make the systems even more rugged if we were to compromise sound quality. Moving the crossover points upward would protect midrange and tweeters better while causing a loss of detail, clarity and imaging. The cabinets and woofers could be designed to roll-off the low bass which would protect the woofers but this would lessen the low bass response and clarity. Protection devices could be added in the crossovers which would shut the system down when damaging power or distortion was present but every one of these devices audibly degrades the sound!

**You can protect your speakers by following a couple of very simple guidelines:**

- If it sounds distorted, turn it down. Distortion is a warning sign that should not be ignored.
- Don't use tone controls or equalizers if possible. IF you must use them, monitor the system carefully.
- Beware the party damage epidemic. Speakers are more often damaged during parties. All those bodies soak up sound, requiring more output to sound as loud, bass and treble controls are sometimes cranked up and nobody is listening for distortion.
- Watch out for energy put out by the amplifier in the range below 20Hz which is not music. Examples include record warps, DC current and subsonic noise in the recording. These signals can take up a lot of amplifier power which means the amplifier runs out of steam very early. These signals can also overload a speaker even though you can't hear them. If you have ever watched a cone "flap" you know just what we mean.
- Vented speakers are particularly sensitive to signals below their  $F_3$  point. The average vented box that can handle 100 watts at 50Hz may handle less than 5-10 watts below 25Hz! Sealed box speakers with low Qts. numbers have a similar characteristic although not as severe. Low organ or synthesizer notes may cause an otherwise excellent woofer to bottom out at relatively low input levels.
- Keep an eye out for excessive cone movement that is not producing music. Find the source of the problem and eliminate it, play at low levels, or use a subsonic filter (usually in your pre-amp) which will filter out energy below 20Hz. However, use of a subsonic filter may take away from the naturalness of bass sounds. We don't recommend it for extremely critical listening.

In over thirty years of daily evaluation of all types of speakers on everything from 10 to 1000 watts with all kinds of music, we have never damaged a driver without first hearing audible distortion. If it sounds bad, turn it down and you will never damage a speaker. Refer to the break-in recommendations at the end of this manual.

## ***Hookup***

Your Sapphire XL<sup>2</sup>s are furnished with five-way type binding posts. You may choose to utilize spade lugs, banana jacks, pins, or bare wire. It is important that the positive and negative leads do not touch. If you use bare leads, be sure to twist them tightly and insert through holes in such a manner that they do not fray or short out against each other. Good connections are important, so make sure any ends are tightly crimped and preferably soldered to the wire ends. Speaker wires should be kept as short as possible, (long wires add excessive resistance and color the sound.) The use of quality wire is recommended.

Make sure you hookup the speakers in the correct polarity. The red (positive) terminal on your amp should hook up to the red binding post, and the black terminal should be connected to the black binding post. Keep this the same for both speakers in a stereo pair. A way to check the correct polarity is to play

music with a lot of bass. The correct hookup will yield the greatest amount of bass.

## ***Speaker Grills***

Your Sapphire XL<sup>2</sup>s are supplied with cloth covered grills which enhance the appearance of your speakers and provide some protection for the drive units. To protect the drivers we recommend leaving the grills in place most of the time. However, for the most critical listening we suggest removing the grills.

## ***Positioning the Sapphire XL<sup>2</sup>s***

As mentioned, the proper placement of speakers in your room will easily improve the sound. Because all of our rooms and tastes are different, it is impossible to specify a "correct" placement. Instead, let us present you with some acoustical facts, then you can optimize placement in your room.

It helps to visualize sound waves as behaving very much like water waves. The sound we hear is made up of two types of waves. Direct sound waves come right from the speaker and are not changed in any way. Reflected waves come to us after bouncing (diffracting) off the speaker enclosure itself, or walls, ceiling, floor or furniture. If you want to see how much these reflected waves affect the sound, move your speakers outside and hear the difference.

Sound waves come in different lengths; the lower the note, the longer the wave. Extreme low frequencies such as the lowest organ pedal notes are over 60 feet long! If your room is not big enough, the wave can't develop fully. But the biggest problem with bass notes is the phenomenon we call standing waves. In effect the waves more or less "pile up". This creates big peaks and dips in the bass response. If you put a certain frequency through the speakers, you can usually walk around the room and find places where it is very loud, and places where you perceive virtually nothing.

Just as the room affects the bass response, so it affects the mid-treble sound of the system. In the mid-treble range, the sound waves are shorter and have peaks and dips, most of the affects (peaks and dips) occur from enclosure edges, furniture, walls, or the floor. Sapphire XLs exhibit the deepest image when placed away from walls and furniture. The shorter wavelengths of the mids and highs are more easily absorbed than the longer wavelengths of low frequencies. This is why a bare room sounds so harsh compared to a room with a lot of stuffed furniture, carpets, drapes, etc.

### ***An ideal setup for sound would be achieved if you could:***

- Choose a room with width, height and length dimensions that are not multiples of each other. (A cube would be the worst!) Good numbers might be something like, height = 8 feet, width = 15 feet, and length = 26 feet.
- Choose a room that has an irregular shape, non-parallel walls cut down on standing waves.
- Place the speakers so that the woofer cones are at irregular distances to the floor, walls and ceiling. This can be difficult. Use a tape to measure the distance from the center of the woofer to the room boundaries. Move the woofers around till you have cut down on the number of related distances. (You don't want distances like 12 and 24", but more like 12 and 22"). Use the distance from the woofer to the boundaries to increase or decrease bass output. Sticking the speaker in the corner or close to walls will give more bass output than putting the speaker out into the room. You can use this to get the best balance between bass output and upper range output.
- Use absorbent materials to help smooth upper-range response and improve transient response and clarity. Why? Let's take the sound of a bell for example. First you will hear the direct sound from the speaker. But some of that sound bounces from wall-to-wall, ceiling-to-floor, off furniture, etc. before it reaches your ears milliseconds later. Because the time difference is short, you don't hear an echo, but the sound of the bell is stretched out from something like a "ding" to a "ddiinngg". Some speaker engineers have begun to realize this and are addressing the problem in their latest designs. This is why

we are now seeing very directional designs. This controlled directionality increases the amount of direct sound in proportion to reflected sound.

- Place speakers as far as possible from other furniture and room boundaries. Keeping the mids and tweeters away from the floor is particularly important. For stereo use the Sapphire XL<sup>2</sup>s are designed to sound best when mounted on 24-26" stands.
- Use padded furniture and drapery when possible to cut down on reflections. Furniture has the added bonus of helping to break up standing wave patterns in the bass.
- Use a symmetrical placement of the speakers in the room. Of course the distance between the speakers is also important. In general, the further back your listening position, the farther apart should be your speakers. In most rooms you will want the Sapphire XL<sup>2</sup>s placed between five and eight feet apart. Experiment! Too much distance will smear the image and it will seem like there is a hole in the middle. Too small a distance will compress the image.
- Experiment with facing the speakers straight into the room or toed in slightly toward the listener. For video applications the left and right speakers should be close to the edges of the screen.

### **Left – Right Speaker Placement:**

Your Sapphire XL<sup>2</sup>s are constructed in mirror-imaged pairs. Best stereo imaging and smoothest response is usually attained with the speakers placed so the tweeters are mounted to the outside. However, depending on your room setup and system, your Sapphire XL<sup>2</sup>s may sound better with the tweeters mounted to the inside. Try the Sapphire XL<sup>2</sup>s both ways to determine which placement provides the best response in your application.

### **Port Plugs:**

Normally, the Sapphire XL<sup>2</sup>'s rear ports are an important part of their sound quality and bass response. In some situations, it may be beneficial to plug these ports with the supplied foam plugs. Plugging the ports will reduce the bass output. Plugging the ports will change the Sapphire XL<sup>2</sup>s into an aperiodic system with a more gradual low-frequency roll off that begins at a higher frequency. We suggest experimentation in the following situations:

1. If using the Sapphire XL<sup>2</sup> with a quality subwoofer. Installing the foam plugs may result in a smoother transition between the subwoofer and the Sapphire XL<sup>2</sup>.
2. If you have a room-setup situation in which the bass seems to be too prominent. This might occur if the Sapphire XL<sup>2</sup>s are pushed right up to the walls. It will depend on room dimensions and other equipment used.

Install the foam plugs by inserting so they are fully in the port. They may easily be removed using tweezers, pliers or something similar.

## ***Care & Cleaning***

The finish can be easily cleaned by gently rubbing with a recommended MicroFiber Polishing Cloth. These soft, plush, microfiber cloths provide superior cleaning results. They contain no chemicals and are ideal for any fine musical instrument, furniture or speaker system. With the MicroFiber cloth your Sapphire XL<sup>2</sup>s will polish perfectly without the need of chemical cleaners. Sometimes it helps to "fog" the area with your breath like you were cleaning a pair of glasses.

### Taking care of Optional Piano Gloss finish:

- The Piano Gloss finish is essentially an automotive finish and can be cleaned and “repaired” in a similar manner.
- If there are rub marks, fingerprints, etc. that aren’t coming out with just the cloth, try Meguiar’s Quick Detailer Mist & Wipe. This product can be purchased at just about any place that sells automotive wax and such.
- If the finish has been dulled by something rubbing against it, or finely scratched it can be repaired using other Meguiar’s products. Meguiar’s Mirror Glaze, Show Car Glaze #7 is a good place to start. It is very gentle. If #7 isn’t aggressive enough, start with the #4 version, then follow-up with #7 (the lower the number the more abrasive it is). After rubbing out by hand you can remove any residue using a clean cloth.

### ***Speaker Break-In \*\*\*\*\*Important!!!***

Allow at least 60 to 70 hours of playing time before your new MAG speakers will sound their best. The adhesives and materials used in manufacturing must stretch and flex properly before a speaker will sound its best. After break-in the bass will be tighter and go lower, imaging and transparency will improve and the midrange and highs will sound smoother and more natural.

#### **A couple suggestions for quicker break-in:**

- Play the Sapphire XL<sup>2</sup>s at medium volume while away from home. A CD player on repeat or FM radio works fine.
- Place the Sapphire XL<sup>2</sup>s grill-to-grill and reverse the polarity on ONE of the speakers. Wiring them out-of-phase like this will cancel much of the sound and allow you to break them in when the sound would otherwise be obtrusive.

### ***Troubleshooting***

Occasionally we get a call or Email from someone who feels there is a problem with his or her speakers. At least a couple of times a year we will get a call or letter that goes something like this: “Speakers are not working properly, can’t get enough sound even with the volume turned way up.” The problem may be different, but with this little information to go on it is almost impossible to trouble shoot the problem “long distance”.

#### **The following troubleshooting checklist may help:**

- 1) Are all system hookups properly connected, not partial shorted wires, or reversed connections, etc?
- 2) Did you try the rest of your system with other speakers to determine if the problem exists with the speakers?
- 3) Please be realistic in your expectations. Our speakers offer excellent value but we can’t beat the laws of physics. For instance, a compact speaker like the Sapphire XL<sup>2</sup>s will amaze you with its clean output, but may not play as loudly as a very large speaker.

IF for any reason you aren’t satisfied with the sound you’re getting from your speakers we want to know about it. Make sure the speakers have had adequate break-in time. Before you call, write or email please try to narrow down the problem and eliminate other factors. If you contact us we will need to know:

- The size of your room

- Where you have the speakers placed
- What other equipment is in your system
- Have you tried other speakers (which ones, and did they eliminate the problem)
- Any other specific symptoms or information you can provide

*Our Customers are #1 with us, and we want you to be completely happy with your MAG speakers!*

Specifications and design are subject to change without notice due to our continuous research and development program.

Designed, built, and tested with pride in the U.S.A.

**Official MAG - ACI Forum at: [www.audiocircle.com](http://www.audiocircle.com)**

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