

G2jr

GENESIS
ADVANCED TECHNOLOGIES

Owners Manual and Set-up Guide

Genesis 2.2 *Junior* Loudspeaker

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A Message from Genesis

Congratulations! And Thank You!

You are now the owner of one of the finest loudspeakers in the world! The Genesis 2.2 *junior* (or G2jr) is the result of technologies developed and refined over the past 40 years in constant production.

The G2jr loudspeaker is designed to reproduce music (and film) at live listening levels with virtually no restrictions on dynamic range, frequency response, or imaging capabilities in a medium to large room. This is absolute fidelity® the ability to reproduce the musical event faithfully, as was intended by the performer or filmmaker.

However, the G2jr is *not* meant to reproduce music at ear-splitting levels. If you are looking for just **LOUD**, this is the wrong loudspeaker. A Ferrari and a Caterpillar may have the same price and horsepower, but they are very different vehicles and you wouldn't use your Ferrari to move a load of gravel.

While other loudspeakers are designed to reproduce music perfectly for one listener at one precisely located sweet-spot, the G2jr is designed to deliver music to a larger audience, seated or standing. In a typical listening room, the listening sweet-spot extends in width to a couch or loveseat. Vertically, it encompasses any height from approximately 26" (70cm) to 68" (1.7m).

Please read this Owners Manual and Set-up Guide to get the maximum enjoyment out of your purchase. Also, please check back at our website at www.genesisloudspeakers.com. We will put the latest updates, tips and tricks, and support for our owners on our website and in our newsletter.

Please write the purchase details of your Genesis 2.2 *Junior* here for future reference. Remember, send in your registration card to extend the limited warranty on your loudspeakers.

Bought from: _____

Date: _____

Serial Numbers:

Warranty Statement and Extended Registration Card
should be placed here.

Please check with Genesis should they be missing.

Remember – the warranty on your Genesis loudspeakers is
only for 90 days unless the Extended Registration Card
is sent directly to Genesis.

Set-up Guide

Now that you have your new Genesis 2 *junior* loudspeaker, we realize that you can't wait to hook it up and start the music! However, we want you to set it up correctly to derive the greatest enjoyment from your purchase.

So, please read this set up guide (even if your dealer is setting it up for you!) before you proceed.

Planning the Placement

Before you even have the loudspeakers delivered, it would be a good idea to make a plan of where you will place them. You will not need a very large room, but at an absolute minimum the room should be about 15 feet (4.5m) wide where the speakers will be placed.

You should have a minimum of at least 18 inches (0.45m) of space behind the speakers. The listening position should be a minimum of 11 feet (3.3m) from the front of the midrange ribbon to allow for proper integration of the drivers. Since the loudspeakers themselves are 28 inches (0.7m) deep, the room has to have a minimum length of about 18 feet (5.5m) to allow for some space behind the head of the listener.

In a typical placement, the midrange/tweeter wings will be placed so that the two columns of tweeters are on the inside, and between about seven feet to nine feet (2m to 2.7m) apart measured from the centre of the line of tweeters to the centre of the other line of tweeters. The speakers fire straight ahead with no toe-in.

As the room will greatly influence the sound of your system, fine-tuning adjustments in placement will be necessary. Every room will be different, with doorways, furniture, closets, wall construction and covering, etc. all making a significant impact on the sound.

Unpacking

The Genesis 2.2 *junior* will arrive in a two large wooden shipping crates. As the speaker weighs well over 200 lbs each (much more with the shipping crates), we suggest that you enlist the help of a couple of strong friends, or hire some help. *We are **not** liable for*

damage (to either the speakers or your backs!) during unpacking and setting up.

As the speaker tilts up and out of the crate, and it is extremely heavy, we suggest that you position the crate approximately at the final position where you want the loudspeaker to be.

The top, front and one side forms a 3-sided lid to the crate. Once this is removed, the speaker can be easily tilted up and out of the crate.

The box containing the crossover, the servo-bass amplifier and the woofers are decoupled from the midrange/tweeter panel and the base of the loudspeaker with shock absorbing rubber de-couplers. There will be three shipping bolts that secure the woofer box during its journey to your home. Remove these bolts before tilting the loudspeaker out of its crate.

There are also foam wedges securing the woofer box for shipping. These foam wedges should also be removed at this time.

After unpacking, we strongly suggest that the crates be dismantled, flattened and safely stored away in a cool, dry place. It is expensive to custom build crates strong enough to transport these loudspeakers without damage should you need to relocate or move.

Loudspeaker Connections

Once you have the G2jrs close to where you think they will ultimately be, connect the loudspeaker to your power amplifier using a pair of high quality loudspeaker cables (not supplied) to the 5-way binding posts. We have designed a "*Loudspeaker Interface Cable*" specifically for Genesis loudspeakers for this critical job. More information can be found from the Genesis website or from your dealer. However, any well-designed loudspeaker cable can be used.

A power cord is also needed to power the built-in servo-bass amplifier. A "starter cord" is provided with the loudspeaker, however the bass will improve with a higher-quality power cord. As the G2jr contains *two* 400W bass amplifier modules per side, make sure that any power cord you use is up to this job. An "*Amplifier Power Interface Cable*" is also available from Genesis for this.

Loudspeaker Controls

You will notice four control knobs on the back of the G2jr. These are labelled “BASS GAIN”, “LOW PASS”, “TWEETER” and “MIDRANGE”.



Set them initially pointing straight up – the 12 o’clock position. This is the nominal flat position and will work for the majority of installations. For a minimum-sized room, the bass gain should be set at 3 (the 9 o’clock position).

Servo-Controlled Bass Amplifier Protection

The servo-bass amplifier has numerous protection circuits built in to protect both the amplifier and the woofers. If you over-drive the amplifier, it will self-protect and you will hear clicking or snapping sounds. This is caused by the amplifier limiting current to the woofers (much like the over-rev fuel-cut off in car engines).

If that happens, turn down the volume of your system to protect your hearing and your speakers. The amplifier is designed to be current-limited to 20amps – this is more than enough to supply over 1600W transients to each of the 12” woofers. However, the servo-system in the G2 is not compression or dynamic limited. Hence, it is possible to play the system too loud, and damage the woofers (and also possibly blow out your ribbons).

The amplifier, although it is very efficient, also has a thermal cut-off to protect against over-heating. Should the bass amplifiers turn off and the back plate is very hot to the touch, turn the system off until it cools down again. Additional ventilation might be needed at the back of the speakers should this happen too often.

A Word about Finish

The midrange/tweeter baffle of the G2jr is constructed out of solid high-gloss cast acrylic. Acrylic was picked for its sonic properties as well as its beauty. However, acrylic is a soft material that can scratch easily.

Every G2jr is delivered with a 3-stage acrylic polish system by Novus, and fine micro-fibre polishing cloths. Do not use other cleaners or polish on your G2jr. In particular, DO NOT use paper towels to wipe the surface of your loudspeakers. Paper fibres are extremely abrasive and can introduce fine scratches on the surface that will “cloud” the finish. If dusting is necessary, we recommend a soft feather duster, or a can of compressed air.

Tuning the system

Music is the best way to begin to fine-tune your setup. We suggest that video sources be used only after you have setup the system to properly reproduce music. While we deliver the G2jr after at least 50 hours of running-in, further fine-tuning of your system may be necessary after 800 hours or so. As the loudspeaker system breaks in, it will sound better and better.

A comprehensive Genesis Loudspeaker Set-up Procedure with music suggestions is included with this owner's manual, or the latest version can be downloaded from the Genesis website at www.genesisloudspeakers.com.

Midrange and Tweeter Controls

The knob marked **TWEETER** controls the output of the three rear-firing tweeters. If there is not enough space behind your loudspeaker, the rear tweeter control can be turned down (counter-clockwise or to the left). In large rooms, the tweeter control can be turned up. Use this control if you need a bit more treble or to increase the apparent space of the soundstage. Start with this control at the 12 o'clock position.

The **MIDRANGE** control on the right side is a three-position switch used to adjust the midrange. Start the midrange control at position two (also the 12 o'clock position). Position one will sound fuller in the lower midrange while position three will sound leaner and have more upper midrange.

The less obvious effect (more obvious to some people!!) of the midrange control is to make the soundstage sound more forward, and change the perceived height and position of the performance.

Position two gives you a soundstage perspective of about the middle of the concert hall (in the stalls). Position three is more like the orchestra seats, and position one may be more like the circle seats.

Begin with Bass Tuning

The first thing that needs to be understood is that the G2jr is an unusual loudspeaker with a line-source midrange/tweeter and a point-source woofer. There are great advantages to having a line source (explained in the Technology section). One of the

advantages is that the sound pressure level does not fall as fast with respect to distance as it does for a point source.

Because a line source radiates sound in a cylinder and a point source radiates sound in a cone, with a doubling of distance from the loudspeaker, a line source attenuates by 3dB whereas a point source attenuates by 6dB. Since the midrange and tweeters are a line source, and the bass is a point source, when the distance doubles, you have to increase the bass volume by 3dB.

The G2jr is designed for a listening distance of approximately 12 feet (3.65m) and the **BASS GAIN** when set at level 3 (9 o'clock position). If the listening position is closer than 12 feet, the **BASS GAIN** should be reduced and if the listening position is greater than 12 feet, the **BASS GAIN** should be increased. (The minimum listening distance should really be about 11 feet.) Since there could also be room gain in the bass, this is not a simple linear relationship. Otherwise, we could put a distance scale on the **BASS GAIN** control.

Once this relationship between **BASS GAIN**, listening position and the room is understood, setting the correct bass level should be relatively straightforward.

Start with a single vocal (not a soprano) with simple instrumental accompaniment because the sound of the human voice is more easily recognizable than many instruments and is the least complex sound to deal with.

Leave the **LOW PASS** control alone for the moment, as it should remain set at 92Hz (12 o'clock position). This control will be addressed later. Turn the **BASS GAIN** up or down until the voice sounds correct. Whatever controls you use, turn them up and down only a little at a time. It is easy to turn it up or down too much.

Concentrate on the mid bass regions (as opposed to the very low bass in your recording) to achieve a natural blend. The voice and the music accompaniment should sound as if it were cut from one cloth, not separate.

If the voice sounds "thin" or does not have enough "chest" to its sound, turn the **BASS GAIN** up till it does. If you find that turning the gain up creates too much low bass, then it is time to decrease the **LOW PASS**. The **BASS GAIN** only changes the bass by -3dB/+12dB.

The low-pass control will raise or lower the frequency cutoff point of the woofer (not the crossover frequency between the bass and midrange). Turning the low pass filter up to a higher number will extend the upper bass regions into the midrange without affecting the low bass level. Some rooms may require that you set the low-pass filter to 115Hz or more. Do not be afraid to increase this control to give the sound more body.

In general, you will find that the **BASS GAIN** and the **LOW PASS** are adjusted in opposite directions. When you turn the gain up, the low pass should go down, and vice versa (but with different amounts).

Next, set the woofers using more than just a voice. Select some music that you know to have good deep bass. Adjust the gain of the woofers for a natural and powerful bass sound. Use a symphonic piece of music if you can, or use a natural bass instrument like a stand-up bass for your guide. Try to make it sound real. You may have to return to the vocal to make sure you have not gone too far in one direction.

If, at this point, it does not have enough mid bass, turn the low pass up to a higher position or, alternately, position the speakers closer together in order to achieve better lower midrange coupling between the main speakers. If it sounds too “fat” turn the low pass control down or adjust the gain down. At this point it is suggested to use the low pass filter control until you get to the refinement stage.

Imaging and Soundstage

While imaging and soundstage are controversial subjects (how do you ever know that the soundstage is recorded correctly in the first place??), it is vitally important to our enjoyment of a recorded musical event. The G2jr is able to deliver a realistic soundstage only if the recording contains such realism.

If your vocal selection is a well-recorded audiophile CD or LP, the performer (assuming that he or she is not very close miked) should appear to come from between and behind the loudspeakers and be at the appropriate height and size for a standing person. If it is not, there are several remedies that will address this.

Assuming that the vocal recording is accurate, if the vocalist appears to be larger than life, you should first check the system volume. Is it a volume that would be appropriate for someone

actually singing in your room? If there is too much volume the artist will appear too big and the opposite is true for too little volume. If the volume is set correctly and the image is still too big, toe the speakers in a very slight amount or place them closer together and re-listen. Repeat this process till you have it right.

If the voice is too low in height, turn the midrange control to the next highest position and the image of the voice will move upward. There are many solo vocal recordings where the singer is recorded using a microphone hung above head height. In this case, it is correct for the system to portray a singer that seems to be singing from a pit in between your loudspeakers.

If you have the speakers too close the front wall, and you are not getting enough front to back depth (the singer not appearing behind the speaker enough) pull the midrange tweeter panels away from the front wall a little bit at a time. If you do not have them pulled far enough away, you may not have enough front to back depth. If you get the speakers much beyond 1/3 of the way into the room, it is unlikely that pulling them further away is reasonable.

Too much absorption on the wall behind the speakers will also result in less depth in the soundstage. The G2jr requires a relatively "live" front wall.

Find the best compromise for your room, your tastes and your space requirements. If the speakers are too far apart you will lose the side image and the image density in the middle of the soundstage will be too diffuse. If the speakers are too close together you will have too small a center stage, and you may find that the edges of the soundstage collapse inwards.

We recommend you begin somewhere between six to seven feet apart as measured from centreline of tweeter to tweeter. And then move the speakers apart small increments at a time as you tune the system. They seldom work well closer than six feet apart or much more than nine feet apart.

If you are not getting proper focus of the soundstage, you may angle the midrange panels from 1 to 3 degrees (but no more) inwards towards your seating position until you have a properly defined soundstage image. The usual reason that you will want to do this is that you have a "W" soundstage. The sound images are most dense (or focussed) in the middle, and then dense around

where the speakers are, but less dense between the center and the speaker.

When properly set up very little sound should appear to come directly from the speaker, instead, the sound stage should extend far beyond the left and right edge of the loudspeakers and they should have tremendous front to back depth. When the recording is close miked (when the instrument or performer is very close to the recording microphone) the music may appear to come directly from the loudspeaker or projected forward of the loudspeakers. This is normal. Typically, however, the sound should appear to be detached from the loudspeakers.

A simple rule of thumb to follow is that focus will be achieved by placing the speakers closer together or farther apart, and front to back depth can be adjusted by the distance from the front wall and treatment (or lack of) of the front wall. Further, as the system “breaks in”, the depth and width of the soundstage will increase, and so will the “smoothness” of the sound.

Ultimately, it is all about balance. You have a number of controls at hand with which to adjust the bass response, the low-pass filter frequency and woofer volume. You can also move the speakers closer together (for better coupling) or further apart.

The Refinement stage

After following the rough setup guide above, you may not be completely satisfied with the results. We share with you here some of our observations in setting up these loudspeakers.

Make One Change At A Time

One rule of thumb you should always keep in mind. Make one change at a time! Do not, for instance, change position of the speakers and make an adjustment to the amplifier all at once. Make each of these changes separately and note the difference - by listening - with each adjustment, then make the next change.

Each adjustment, in positioning, and in control adjustment will result in a subtle sonic change. Even when you are moving the midrange/tweeter panels further apart, or closer together, move one panel, listen, and then move the other panel. You may also

find an asymmetric placement in-room more accurate and pleasing.

Defining the Soundstage

A common problem we find with many set-ups is a tendency to separate the speakers too far from each other. This gives an unnaturally stretched soundstage between the two speakers, and creates problems with focus. The key problem is a lack of soundstage information beyond the left and right sides of the speakers.

If you find that the sound is not spacious enough or you are not getting enough front to back depth, pull the speaker away from the front wall. This is typically preferable to separating the two speakers too far, and will almost always give you better depth and soundstage information. A word of caution though: if you move the speakers too far from the front wall you may lose the focus of the image.

A problem with the soundstage could also be caused by the recording. Try another recording if you cannot achieve what you are trying to do. The recordings in the Genesis Loudspeaker Set-up Procedure have all been carefully chosen, so those will be the fall-back recordings to use for system set-up.

Appropriate Mid-bass/Low-bass Balance

Yet another problem is a lack of mid bass energy. In order for the appropriate amount of mid bass energy to be present, the speakers should be close enough together to achieve proper "coupling" of the midrange ribbon driver. Coupling is desirable in the lower frequencies from the mid-bass on down. This simply means that the left and right drivers "work together" as opposed to working separately.

If you find there isn't enough deep bass, your first remedy is the **BASS GAIN** on the woofers. This has several limitations. First, turned up too high, you may get some distortion on very low frequencies or you may drive the amplifier into protection. Because of the high efficiency of the amplifier, it is unlikely to overheat.

You may need to trade-off soundstage depth for deep bass by pushing speakers back towards the front wall. This will increase the coupling of the woofers to the room. Do this procedure in small

increments (approximately half an inch at a time) and return often to the recordings you have used to adjust the front to back depth and soundstage properties of your system. It is easy, yet unproductive, to go too far as you will create a boominess in the sound.

Secondly, you may make the mid bass produced by the top of the woofer out of proportion with the mid bass produced by the bottom of the midrange ribbon. This would tend to sound bloated or thick in the mid bass regions.

Another good rule of thumb is to set the **BASS GAIN** for proper midbass rather than low bass. The theory is that if the midbass is correct, then the low bass should be very close to correct. If the midbass is proper and the low bass is still not right, here are some other suggestions.

A good balance between proper low bass extension and a deep and spacious soundstage needs to be established to optimize your new speaker's performance. This is because large space ambience information is largely in the lowest frequencies. The wavelength of a 20Hz soundwave is approximately 52 feet (16m), so if you want to recreate the soundspace of a cathedral, you will need to go lower than even 20Hz.

In order to achieve what the speaker is capable of we suggest you focus your efforts on a proper balance of soundstage elements that includes information beyond the left and right sides of the speakers, front to back depth well behind the speaker, excellent focus of instruments and voices with proper vertical information and mid bass fill.

A Genesis loudspeaker system correctly set up, can and should provide a soundstage that will “melt the walls” and with pinpoint focus, the speakers disappearing completely on a recording containing such information.

Room Treatment

No room is perfect. To optimize your sonic presentation it may be helpful to treat your room. Here are some guidelines:

1. **Front walls.** This loudspeaker is a dipole and therefore there is sound coming from both the front and the back of the speaker. How the front wall is treated or not treated is

important. Generally speaking, the Genesis loudspeakers prefer a live front wall.

By these terms we mean the amount of reflection of sound. A typical wall of glass or, brick, cement or drywall material is a reflective surface. A heavily curtained or sound proofed wall would be considered a "dead wall" or a non-reflective wall. A normal thin curtain across a window causes only a small amount of absorption.

2. **Sidewalls.** Because the speaker is a dipole it is less sensitive to the sidewalls. However, as a rule of thumb, it is a good idea to keep the speaker as far away from the sidewalls as is practical. With this in mind, it may be helpful to add some damping material or diffuser panels to the point of first reflection. This is a point on the sidewalls between the listener and the loudspeaker. It is where the sound from the loudspeaker first hits the sidewall, then bounces to the listener. This reflection is undesirable because it is slightly delayed from the original sound. This point on the sidewall can be easily determined with the help of a second person and a mirror.

Sitting in your listening position have an assistant hold a mirror up on the sidewall. Move the mirror until you can see the tweeter. This is the point of first reflection. A diffuser (see your dealer), an absorptive material or even a CD rack can help break up this point of first reflection.

3. **Rear wall.** In many cases it will be unnecessary to do anything with the wall behind your listening position. However, you may want to experiment with diffusers or absorbers behind you for best sound. Absorption behind the listener is usually beneficial.

Mastering the Refinements of the system

Fine tuning an audio system is an art that will take time and patience. It can be one of the more rewarding learning experiences you will have in the pursuit of music and its enjoyment.

One of the best pieces of advice we can offer is that you take advantage of the ear's ability to identify similarities in sound. This ability is useful in fine tuning your system because if every recording

you listen to has a similarity of sound (too much or too little of a certain frequency for instance) then you can be fairly certain that you have yet to perfect your set-up. Keep at it and remember to enjoy your music as you work on perfecting your set-up.

During the design stage of Genesis loudspeakers, we rely on hundreds and hundreds of hours of critical listening. There are changes we can make to the crossover that we can measure, but can hardly hear the difference. And then there are the changes that we make that we can easily hear, but cannot measure. It is an art form as much as a science! Setting up the audio system is the same.

If you have any questions, feel free to contact us at Genesis. Our website is the first place that you should look to for more information, but you are welcome to either send us an email, or just give us a call!

The Technology

The Genesis 2.2 *junior* loudspeaker integrates a line-source midrange/tweeter with point-source bass. Each speaker is over 6 feet tall, and the cabinet structured is designed to manage vibrations and resonance. The tweeters and midrange ribbon are mounted on a 1.5-inch slab of high-molecular weight cast acrylic, and are isolated from the box containing two horizontally opposed 12" woofers.

Design Philosophy

Nothing has changed in theoretical acoustics since Lord Rayleigh's original book on acoustics published in 1877. There are still only two proper ways for a transducer to propagate sound in a room: a point source and a line source. Anything else, or everything in between, is a compromise.



John William Strutt Lord Rayleigh (1842 – 1919)

In order for all frequencies of sound from the loudspeaker to reach the listener at exactly the same time, a coherent wave front is important - not just "time-alignment" of drivers. The ideal is either an infinitely small pulsating point or a pulsating line with a size on the order of the room dimension.

Obviously, a line-source is much easier to mechanize than the ideal point source. The line-source (if large enough), can approximate the ideal, and in doing so, provide sufficient radiating area for dynamically and spatially realistic sound reproduction.

The G2*jr* is a line-source that is 4 feet long (nearly the half the room's entire height) from 120Hz upwards. Very importantly, the line source has no vertical dispersion at any frequency. Hence, there is no sound bouncing from either the floor or the ceiling. No deleterious interference from these surfaces is created (as in virtually all other kinds of speakers).

A second great advantage of the line source is that the vertical spectral content of music is virtually the same throughout the length of the line source. Hence, the seating height does not matter with this speaker; unlike point source speakers where it is important for the ears to be aligned in relationship with the tweeter.

The third important advantage of a line source is that it attenuates at -3dB with a doubling of distance whereas a point source attenuates at -6dB with a doubling of distance.

For example, with a sensitivity of 91dB/watt at 1m , the *G2jr* is about average for large loudspeakers. At 2m , the *G2jr* line source can deliver 89dB/watt , at 4m 86dB/watt , and at 8m 83dB/watt . For the equivalent point source loudspeaker, it will be 85dB/watt at 2m , 79dB/watt at 4m , and 73dB/watt at 8m . (And for this reason, the **BASS GAIN** for the *G2jr* has a control range of $-3\text{dB}/+12\text{dB}$)

Hence, for a listening distance of 5m (about 15ft) the line source will appear to be more than twice as loud as a point source loudspeaker. This is the great advantage that a line source loudspeaker will have over a point source loudspeaker in a large room.

As a result the change in loudness of the line source is much less over a small change in distance. Hence, it results in a much larger sweet spot as small side-to-side changes in seating position result in less of a sonic change than with the point source loudspeaker.

The *G2jr* is also a dipole radiator. The midrange and tweeter drivers are mounted on a rigid acrylic panel with no enclosure. This has two advantages: firstly, it eliminates any enclosure or boxy colorations caused by cabinet vibrations or resonance.

Secondly, the dipole creates a cardioid radiation pattern (like a figure-eight), which has its maximum output at the listening position and behind the speaker itself, and minimum output to the sides in the plane of the loudspeakers. This very effectively minimizes the bounce from the sidewalls.

Hence, in conjunction with the line source, the *G2jr* has no first reflection from the floor, ceiling or sidewalls. The net result is that there are far fewer detail-robbing room reflections from the room than other types of loudspeakers. With fewer spurious reflections to

confuse your hearing, the program source emerges more clearly. Imaging is deeper, yet more focused.

This results in a loudspeaker system that is virtually room-independent. Also, because there are no phase and frequency distorting reflections created, one can be transported into the audience of the actual concert hall where the music was recorded.

The Genesis Ribbon Tweeter

Reviewers in the Audiophile press have often remarked that the Genesis circular ribbon tweeter is the world's best. It is a one inch circular planar ribbon design crafted from an extremely thin membrane of Kapton with a photo-etched aluminium "voice coil" that is a mere 0.0005 inch thick. The entire radiating structure has less mass than the air in front of it! That is why it will accurately reproduce frequencies to 40 kHz.



The result of this design is a driver that has a rapid and uniform response to high frequencies, and has the speed of the best ribbon/electrostatic designs without the high distortion and poor dispersion that is typically associated with them.

The G2jr uses twelve of these tweeters configured as a vertical line source. Because the output is distributed over many drivers, each works at very low-stress. This dramatically lowers the distortions in the high frequencies.

The G2jr also use three rear-firing tweeters per channel wired to the crossover out of phase to the front tweeters creating a dipole.

48inch midrange ribbon

We sometimes say that the midrange is a window into the mind of a composer or a singer. And indeed, the midrange is where the "magic" is in a well-recorded musical event. This is why the G2jr loudspeaker system uses a single 48inch-long ribbon per channel as a dipolar line-source to reproduce these critical frequencies.

The midrange ribbon used in the G2jr is manufactured to Genesis' exacting specifications. The ribbon itself is made of a very thin layer of aluminium laminated to a substrate of mylar that is 0.001inch thick. The ribbon is then suspended in the magnetic field created by over 24 feet of barium ferrite magnets.

This results in a perfect line-source ribbon generating a continuous and perfectly coupled wave front. The benefit of this to the listener is a wide and even horizontal dispersion yielding a large and highly stable sweet spot.

As a line-source dipole, the midrange ribbon has a vertical dispersion pattern identical to that of the line array of tweeters. Thus further insulating the listener from the room's negative effects, and enhancing the sense of spaciousness and depth.

The Servo-bass Advantage

Very few loudspeakers use servo drive, either because most designers think that it is too difficult to design, too expensive, or because of the extraordinary demands a servo system makes on the amplifier and the transducer. The history of the Genesis servo-system started from the first introduced in the legendary Infinity Servo Statik One in 1968(!) – so we know how to design and build servo systems. The technology has been constantly updated and refined over the past 40 years.

The concept of our servo bass system is an easy one to understand: It employs an accelerometer as a sensor to constantly monitor the movement of the woofer cone and continuously compares it to the input signal. This comparison circuit instantly identifies any deviation from the input and applies a corrective signal to compensate for any deviation, resulting in the virtual elimination of the inherent distortion of the woofer.

As an example, when you have a high-impact, low-bass signal that starts and stops suddenly (for example a tympani), the inertia of the woofer cone makes it slow to start moving, and then after it has started moving, the momentum of the cone makes it continue to move after the signal has stopped. The sonic result is softness, overhang, and bloat in the bass. This results in a perceived lack of tautness and definition, and a blurring of dynamic impact.

With the servo system, the circuit senses that the woofer is not moving as fast as it should, and it instantaneously applies much more current to make it move faster. When the signal stops, it senses that the woofer is continuing to move when it shouldn't be moving and applies a counter-signal to stop the woofer faster and more effectively than an open loop woofer could possibly respond.

Thus, the servo-drive reduces distortion and improves transient response by making the woofer appear to be massless. Typical non-servo woofer systems have distortion levels that exceed 10% at even moderate levels. The Genesis servo bass system reduces this distortion to below one percent at almost any output level. The system also drives the woofer to constant acceleration, which makes the frequency response of the woofer anechoically flat to the lowest frequencies.

The Servo-controlled Woofers

The transducer used in a servo system must be strong enough to withstand the high current approach of the servo, and yet delicate and light enough to react extremely quickly. The G2jr features two side-firing 12-inch woofers per channel.

While the servo system is able to ensure that the driver works linearly as a perfect piston, it is unable to correct for distortion caused by cone wobble, bending, and break-up. Hence, the drivers were designed to minimize these non-linear distortions.

The woofers are a uniquely designed metal cone driver made for the Genesis servo system. Made with a cone of solid aluminium, the suspension and voicecoil have been maximized for long distortion-free excursion so as to increase dynamic range. Our aluminium cones are a magnitude stiffer than any plastic cone on the market, and virtually eliminate the problems caused by cone bending and break-up.

The lowest break-up mode in the woofer (where there can be any chance of distortion at all) is at 4,000Hz – far above the 16Hz to 120Hz frequency range that these drivers operate at. Therefore, the driver is a perfect piston within the frequencies used. Thus, extremely low cone break-up distortion is inherent in the driver that is designed for the Genesis servo-bass system.

A pair of matched woofers is horizontally mounted on a cabinet that is de-coupled from the rest of the structure of the loudspeaker. This ensures that any vibration generated by the woofers are not transmitted to the midrange and tweeters. The woofers are also horizontally opposed and in phase with one another. This means that the vibrations generated by one woofer cancels out the vibrations generated by the other woofer – further reducing any image-distorting vibrations in the loudspeaker.

The isolation, plus vibration-cancellation results in a stable, solid image even when there is heavy bass content in the music.

Servo-controlled Bass Amplifier

One problem, however, of metal cones, is that of greater mass – even ones as light as the ones used by Genesis. To overcome this, we had to build an amplification system of great power, and high damping factor. The servo-system also places extraordinary demands on the amplifier because the system uses enormous amounts of current to make the woofer follow the input signal. This means that the amplifier used must efficiently deliver extraordinarily large amounts of clean power into low impedances.

The servo-controlled bass is a holistic system of woofers, acceleration sensors, servo-feedback circuits, crossover circuitry and amplifiers. Two separate Class D amplifier modules are used in each of the left and right loudspeakers (a total of four!).

Specially designed and tuned Dynamic Power Delivery System (DPDS) power supplies are used – one for each speaker with two channels – to deliver balanced dynamics which are critical to bass accuracy. This improves the power factor of the power supply in delivering the bass frequencies, resulting in “floorshakingly musical” bass to power the servo woofers.

One side benefit of this powered woofer system is that almost “any” sized amplifier can be used to drive the mid/tweeter section of the Genesis 2 *junior*. No longer must one choose between having an amplifier with enough power to drive the woofers, and a smaller amplifier having better spatial and tonal characters. Nevertheless, we do recommend no less than 100 watts as a minimum for the midrange/tweeter sections.

The Acoustic Suspension

The suspension for each loudspeaker comprises three elements:

- 1) The neoprene vibration absorbers are tuned to isolate and decouple the loudspeaker cabinet for optimal imaging and bass response no matter what surface the loudspeaker sits on. More neoprene vibration absorbers are tuned to isolate the woofer cabinet from the rest of the loudspeaker structure.

- 2) The skeletal frame acts as a tuned absorber. Made of an inch of solid acrylic, no two parts of the frame will resonate at the same frequencies. This ensures that all midrange frequencies are “dumped” below the base of the cabinet so that floor-borne vibrations do not affect the imaging and soundstage of the loudspeaker.
- 3) The spikes rigidly couple the suspension system to the floor. If you have hardwood floors and do not want to make holes in the wood, use a copper penny (instead of expensive “spike cups”) under the spike.

A pin-point suspension system is designed to pass **all** frequencies. Using a spike cup under the spike will defeat this system. The spike passes all frequencies to the spike cup, and then depending on the diameter of the spike cup, it passes only frequencies below a particular frequency.

A copper penny gets deformed – the spike making an indentation where it meets the penny, and a little “nipple” on the other side. This still performs the same function as a pin-point suspension system, but at the same time protects your hardwood floor.

Nevertheless, despite the acoustic suspension, if you have a extremely light and resonant floorboards, the acoustic suspension may still transmit sufficient vibrations to make your floor resonate and hence muddy up the bass and the imaging. In that case, it may be necessary to place heavy marble, slate, or granite slabs (at least 200lbs per slab) under the speakers. This slab serves as a foundation on which the acoustic suspension will work.

Specifications

- Dimensions: H 75" x W 22" x D 28"
- Weight: 220 lbs (100kg) each
- Frequency Response: 16Hz to 40kHz, +/- 3dB
- Controls: Rear Tweeters (+/- 1.5 dB)
Midrange (+/- 0.75 dB)
Bass Gain (+12dB/-3dB)
Low Pass (71Hz to 135Hz)
- Input Impedance: 4 ohms (nominal)
- Sensitivity: 91 dB/watt @ 1 meter
- Amplifier Power Rating: 400W X 2 each
- Inputs: 5-way binding posts
- Finish: High Gloss Black Acrylic
with Matt black base