

G Seven



GENESIS
ADVANCED TECHNOLOGIES

READ THIS FIRST

Genesis loudspeakers in general are heavy and slippery. This is due to the high gloss finishes that we put on the speakers to make them beautiful and an object of art. They have a luxurious feel as well as an elegant look.

The cabinet is solidly made of high-quality mdf and/or composite material. Transducers have large magnetic assemblies and the crossovers use large, high grade components. All this results in a very heavy object for its size. We always recommend a minimum of two people to unpack, move around, and set up the Genesis 7.2f.

Your speakers will come wrapped in a fabric “sock” inside a double-corrugated cardboard carton. Examine the carton for shipping damage. Dented corners are an indication of something having gone wrong during shipping.

Lift the speaker in its sock out of the shipping carton. Do NOT just grab the sock to lift the loudspeaker. The sock is to protect finish, not a sack to lift the speaker with. It may tear! Be careful that you do not inadvertently put a finger through a driver and dent a cone.

Examine all the foam inserts as the speaker grills may be hidden away in a recess. A power cord is also included with each loudspeaker.

Collapse the shipping carton, and store it in a safe, dry place together with the sock and the foam inserts. You will need this if you need to ship the speakers in the future.

Read this owner’s manual, fill in your warranty registration, and get started.

Owners Manual and Set-up Guide:

Genesis 7.2 floor-standing loudspeaker

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A Message from Genesis

Congratulations! You are now the owner of one of the finest loudspeakers in the world. The first Genesis 7 floor-standing tower loudspeaker, the G7.1f, won the prestigious Best of Innovations Design and Engineering award with the highest scores in its category. This award recognizes outstanding design and engineering in cutting edge consumer electronics products and is sponsored by the Consumer Electronics Association of the USA and endorsed by the Industrial Designers Society of America. The G7.2f that you now own is an evolutionary improvement over its predecessor.

The G7.2f is designed to be as flexible as possible. It can be used as a pair of audiophile stereo loudspeakers or, in a multi-channel system. It features the world's first solid titanium cone mid-woofer from the G7.1f improved for the G7.2f with even lower moving-mass for greater dynamics. The G7f also shares technologies developed for our flagship Genesis 1 loudspeaker system.

So that it will fit into the décor of any home, the cabinet design is a combination of acoustic, furniture, interior design and architectural principles.

Sound structural engineering principles have been applied to make the G7f cabinet rigid and well damped. The construction ensures that the cabinet is the best environment on which to mount the transducers. This results in low cabinet coloration, and excellent soundstaging and imaging. Classic Greek proportions are used for the cabinet so that it would be visually pleasing and elegant.

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

Please write the serial number and purchase details of your Genesis 7f here for future reference.

Purchased from: _____ Date: _____

1 A Quick Start Set-up Guide

Now that you have your new Genesis 7f loudspeaker, we realize that you can't wait to hook it up and start playing! However, please read this quick set-up guide (even if your dealer is setting it up for you) before you proceed.

1.1 Unpacking

Your loudspeakers will come to you in two shipping cartons weighing nearly 100lbs (45 kgs) each. Care must be taken when moving the carton around, and taking the speaker out of the carton. While the speaker is not large, it is slippery and heavy for its size.

We will **not** be held liable for damage to either the speakers or your backs during unpacking and setting up. So, enlist a friend to help!!

Place the carton flat on the floor. It should be obvious which side should be up. Open the flaps, remove the accessible foam panels and lift the speaker with out of the carton. Be careful as you may inadvertently damage the drivers if the cabinet slips and you grab at it and put a finger into the drivers. Do not try to lift the cabinet by the shield or the acoustic suspension frame (it is not a handle!). Hold the speaker cabinet (but be careful not to dent the rear tweeter).



Long spike screws are provided on each corner of the acoustic suspension to make it easy to adjust the height and alignment of the loudspeakers. The provided spikes are screwed in all the way for shipping. Un-screw them up until you can just feel the point at the other end of the threaded hole with your fingertips. This will make positioning of the loudspeaker far easier.

A second set of shorter spikes with hole covers are provided which give you a much better cosmetic appearance. These should be used only after you have completed set-up and fine-tuning.

Flatten the cartons and put them away together with the foam inserts. You will need them if you decide to transport the speakers in future.

1.2 Placement

As a stereo pair of speakers, a good starting position for your G7f is at least 18 inches (45cm) into the room as measured from the front wall (the wall you look at as you are seated listening to the speakers) to the back of the speakers, and about six feet (1.8 metres) apart. Point the loudspeakers straight ahead with no toe-in.

You will want to sit eight to twelve feet (2.5 to 3.5 metres) away from the speakers. When sitting further away, you should place the speakers slightly further apart. When sitting nearer the speakers, move the speakers closer together or toe them in by a tiny bit – 1 to 3 degrees and no more. Once you have the speakers about where you want them, screw the spikes down to “ground” the speakers. You will want to barely lift the speakers off the surface on which they are sitting. There should be only about 1/8” (3mm) between the bottom of the suspension frame and the carpet or floor.



1.3 Connections

The speakers should be connected directly to the speaker-level output of your power amplifiers using high quality speaker cables between the power amplifier and the 5-way binding posts labelled **HIGH LEVEL INPUT**.

The IEC power inlet supplies power to the built-in servo-controlled bass amplifier. This needs to be plugged into a wall outlet using the supplied power cord (or we recommend the Absolute Fidelity Amplifier Power Interface cable). Check that the voltage select switch is correctly set before plugging the power cord in.

If a power conditioner is used, please ensure that it is a high-power, non-current limiting one.

1.4 Adjustments

Don't be too worried with all the knobs and switches on the back of the G7f. A good starting point is to set the tweeter level knob and the bass gain knob to the 12 o'clock position pointing straight up. This is the *nominally flat* position, and it will work well in *most* cases, in *most* rooms.

If you have at least 8 inches (20cm) of space between the back of the speaker and the wall, the rear tweeter should be left ON. Otherwise, turn the rear tweeter off with the tweeter defeat switch on the back panel.

The G7f will sound great, straight out of the box. As you play your system for the next few hundred hours, the speaker will settle down and “break-in” and begin to sound even better. Before the speaker breaks-in, the drivers will be *tight*, and the woofer may clip with very bass heavy music when played loud. If this happens, back off a bit on the volume of your music, or reduce the gain of the built-in bass amplifier until the woofer suspension breaks in (about 400 hours).

If you play a lot of commercially mixed pop or rock recordings, you may also find that a lot of these have a rising response in the bass because they are not expected to be played on audiophile loudspeakers with a flat frequency response. The mastering or recording engineer puts a boost to the bass frequencies so that they sound good on speakers that roll off the bass frequencies. On the G7f, you may find that these tracks “bottom out” the woofers. If it happens only occasionally, it will not damage the woofers, but long-term exposure will cause the woofer to prematurely break down, and the sound of the amplifier clipping to protect the woofer can be scary on first listen.

If this happens much, you will have to reduce the bass gain on the built-in bass amplifier. Once you familiarize yourself with the G7f's performance, putting a little bit of additional effort into tuning the speaker properly for your room and system will give you great long-term enjoyment and benefits.

1.5 A Word About Grills and Spikes

The grills of the G7f have been engineered to intrude minimally on the sound. Moreover, the tweeter control allows you to almost completely overcome the “sound” of the grills. The cover for the woofer does not affect the sound and should not be removed.

The front grill will “snap” on magnetically, and hence even without the grills on, you are not presented with ugly post holes on the face of the loudspeaker. Nevertheless, we encourage you to listen to the G7f with the grills on. They look better, and at the same time, it will keep little fingers away from the drivers.

The long spike screws provide an easy means to adjust the height and tilt of the G7f. They are also long enough to securely spike the speakers through deep pile carpet. A second set of shorter spikes is also provided together with a hex key for easy adjustment.

Hole covers are supplied for a much neater cosmetic. These need to be pressed on firmly, and this should be done only after all adjustments and fine tuning is completed.



2 Setting up as Stereo Pair

2.1 Positioning

Used as a stereo pair, the G7f should be placed at least 18 inches (0.45m) into the room as measured from the front wall (the wall you look at as you are seated listening to the speakers), to the back of the speaker.

Start with the speakers about six feet (1.8m) apart with the tweeters placed closest together and the woofers firing outwards. Do not toe-in the speaker as they perform best when firing straight ahead.

You will want to sit 8 to 12 feet (2.5 to 3.5 metres) away from the speakers (if you have the space). We will experiment with moving the speakers around later.

As these speakers are dipolar in the high frequencies, they are pretty room-friendly and you are free to move the speakers closer to, or further away from the front and side walls. We do recommend, however, that you give the speakers a little bit of breathing space behind them, so don't push them up too tight against the wall.

If you have the speakers too close to the front wall, you will find that the image depth is not as good - the soundstage becomes a little two-dimensional. If you have the space to move the speakers away from the wall, do so. You will be rewarded with the deep, broad soundstage that this loudspeaker is capable of.

You should be able to "see" the soundstage behind, as well as in front of, the loudspeakers. The sound stage will also extend outside the left and right sides of the speakers when they are properly set-up.

2.2 Loudspeaker Controls

2.2.1 Tweeter Control

The knob marked **TWEETER** on the plate on the back of the speaker tailors the high-frequency response of the G7f. It is a subtle control with only a +/-2.5 dB range, but it can make a great difference in gaining that last bit of additional performance in tuning your speakers for the room in which you are using them. It can turn your system from very good to exceptional, so take the time to work through this process.



Turning this control clockwise will increase the level of the front tweeter. Use this control if you need a bit more treble in a highly absorbent room, or to increase the apparent space of the soundstage. Too high a tweeter level, and you will feel that crashing cymbals are leaping out at you, and nylon-stringed classical guitars sound like steel-stringed acoustic guitars. Start with this control at the “nominal flat” 12 o'clock position.

2.2.2 Bass Gain

The **BASS GAIN** knob is unique to Genesis, and it controls the gain in the built-in servo-controlled bass amplifier. It allows you tune the bass performance of the G7f into your system, and your room. As you rotate the knob clockwise, it will give you more bass.

Again, the 12 o'clock position is the “nominal flat” response and can be used in most rooms. When you move the speakers closer to walls and corners, you will find that you need less gain in the bass. When you move the speakers further out in the room, you will need more gain in the bass.

The sweet spot for this control is about 9 o'clock to 3 o'clock. Go beyond 4 o'clock at your own risk. Some malicious “speaker killer” tracks could damage your woofer as the built-in amplifier is far more powerful than an 8-inch woofer needs in order to give a snappy and dynamic response.

We do this in order to give the speaker the speed and dynamics that is the hallmark of the “Genesis sound”. Just like a sports car with 800 horsepower, if indiscriminately used, having so much power also means that you could do damage to yourself and your neighbors.

We have resisted putting in power limiters or speed limiters in the bass amplifier as we found that speed, dynamics, and transparency are compromised. An over-load current limiter built into the amplifier chops current off to protect the woofer's voicecoil from melt-down but it is still possible to damage the woofer with long, sustained and high levels of bass.

2.2.3 Tweeter Defeat

The optimal way to use these speakers as a stereo pair is to leave the rear tweeters on, and run them as dipole and at least 18-inches from the front wall. However, in some cases, this may not be possible. Should the speakers have to be placed with their backs less than 12 inches from the wall, the rear tweeters should be turned off.

With the rear tweeter turned off, the G7f will also behave as standard, sealed-box point source loudspeakers.

2.3 Tuning the system

Music is the best way to begin your set-up procedure. We suggest that video sources be used only after you have set-up the system to properly reproduce music. There is no “perfect” setting for the G7f. Every listening room is different, and we recommend that you take the time to carefully tune the system for the environment in which it is placed.

Your Genesis loudspeakers should sound great straight out of the box. If you don't like the sound, several hundred hours of breaking-in will not change the sound of your speakers, although it may break-in your ears! Unfortunately, the extreme transparency of the G7f may highlight deficiencies up the reproduction chain.

2.4 One Small Change at a Time

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

When you make adjustments, make only small changes. For example, when locking in the “image” and tonality, move the speakers about $\frac{1}{4}$ ” (5mm) at a time. Changes to the tweeter and bass level should be less than a “notch”.

2.5 Imaging and Soundstage

We suggest that you start with a single vocal with simple instrumental accompaniment because the sound of the human voice is more easily recognizable than many instruments and is a less complex sound to deal with. Use a good recording that you know has atmosphere and low bass content.

The performer should appear to be positioned behind the loudspeakers and be at the appropriate height for a standing person. If it is not, there are several remedies that will address this shortfall.

If the vocal 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, place the speakers closer together and re-listen. Place the speakers no less than 5 feet apart. If the image is still too big, toe the speakers in a slight amount.

Conversely, if the image is too small, move the speakers apart. The speakers should be no more than twelve feet apart. Repeat this process until you have it right.

The wider apart you have the speakers, relative to your seating position, the more you will have to toe the speakers in. However, this may result in “audiophile-titis” if you place the speakers too far apart. You get a huge soundstage, but only a tiny sweet spot and you have to sit exactly in between the speakers to enjoy any music, and you cannot move your head. Also, when the speakers are very far apart, you may have to play them louder before you can enjoy a realistic soundstage. The images are more diffuse, and seem larger than life.

If you have the speakers 18 inches into the room, and you are not getting enough front to back depth (the singer not appearing behind the speaker enough), pull the speakers away from the front wall a little bit at a time. However, slightly more than 1/3 of the way into the room is about as far as you want to go. Pulling them halfway into the middle of the room or more than 8 feet from the front wall is unlikely to help.

Find the best compromise for your room, your tastes and your space requirements. If you are not getting proper focus on the voice, you may angle the left and right speaker up to about 5 to 10 degrees (toe-in) towards your listening position until you have a properly defined center image. If the speakers are too far apart, the mid-bass will de-couple and you will lose the side image. If they are too close together you will have too small and congested a center stage.

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. This is normal. Typically, however, the sound should appear to be detached from the loudspeakers in well engineered recordings.

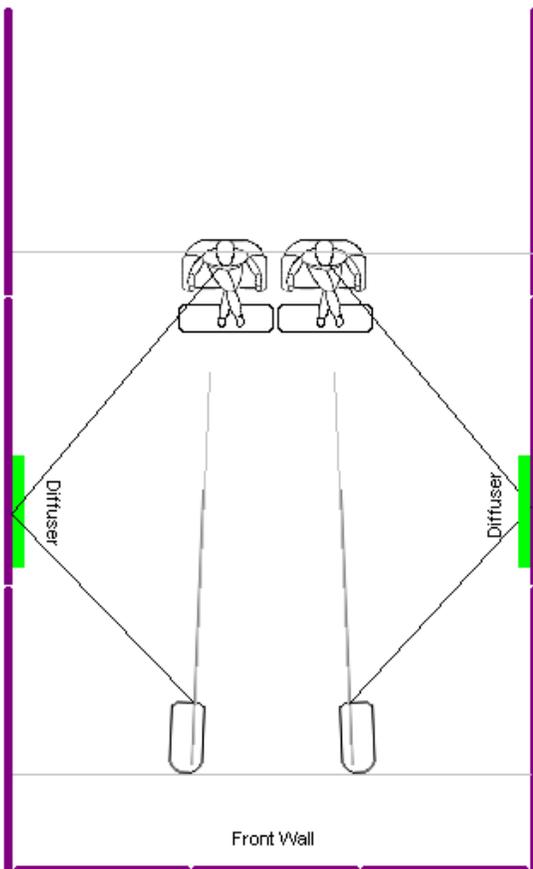
A simple rule of thumb to follow is that focus will be achieved by placing the speakers closer together or farther apart, and front to back depth can be adjusted by the distance from the rear wall. Further, as the system “breaks in”, the depth and width of the soundspace will increase and so will the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

2.6 Defining the Soundstage

A common problem is a tendency to separate the speakers too far from each other. This gives an unnaturally wide soundstage between the two speakers, and creates problems beyond the unnatural width of the center stage. It focuses the soundstage in between the two speakers, and you lose the “space” and “ambience” of the musical performance.

If you find that the sound is not spacious enough, or you are not getting enough front to back depth, pull the speakers away from the front wall. This is typically preferable to separating the 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.

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 is wall-to-wall, with pinpoint focus; the speakers disappearing completely on a recording containing such information.

Ambience of large acoustic spaces is defined by low-bass, and the G7f is capable of adding that critical element when listening to performances recorded in large venues.

2.7 Room Treatment

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

Front walls. This loudspeaker is a dipole and therefore, there is sound coming from both the front and back of the speaker. How the front wall (the wall you face while listening), is treated or not treated is important. Generally speaking, the Genesis loudspeakers prefer a live (hard or reflective) front wall to a dead (soft or absorbent) front wall.

By these terms, we mean the amount of reflection of sound. A typical wall of glass, 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.

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. In some rooms, 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 audio dealer), an absorptive material, a bookcase, or even a piece of furniture can help break up this point of first reflection.

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.

2.8 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.

In some problematic rooms a resonance may develop, at one or more frequencies, that is unnatural to the music. By moving the speakers closer to the front wall or farther from the front wall, the resonance may be reduced at the listener's position. Another solution to try may be to place the speakers asymmetrically in the room. They could be placed closer to one side of the room, or even at an angle to the room.

There are no absolute rules concerning problematic rooms, so do not be afraid to experiment with speaker placement to determine the best position of the speakers in your room. In a perfectly square room, we have even had good results by placing the speakers firing down a diagonal.

One of the best pieces of advice we can offer is that you take advantage of your 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.

A very detailed process of fine-tuning the speaker set-up is given in the white paper on the Genesis loudspeaker set-up procedure available from our website. This paper is attached as an appendix to this owner's manual, and the latest version is always available on the Genesis website.

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

3 Setting up: Multi-channel

3.1 Positioning as Main Left/Right Channel

When positioning the G7f as the main left and right channels of a multi-channel, the same principles as positioning for a stereo system apply. This will ensure that your system can be used for two-channel as well as for multi-channel sources.

However, the inclusion of a screen between the speakers may mean that the speakers have to be put much further apart than ideal. In this case, you can toe the speakers in a little more. However, if the primary source of entertainment is multi-channel, more often than not the center channel will “fill in” the soundstage hole caused by the screen.

On the home theatre processor, the speaker should be set to “LARGE”. However, due to the limitations of a single 8” woofer in the G7f, do not use the speaker for the LFE track. The G7f is designed for music, and not explosions, helicopters, or dinosaur footsteps. You will need either the Genesis 928 or the ServoSub™ 2/12t for that.

3.2 Positioning for Surround Channel

The G7f can also be used as a surround channel loudspeaker. When they are used close to the wall, turn the rear tweeters off with the tweeter defeat switch.

3.3 The Center Channel

The Genesis 7.2c (convertible) plus either the ServoSub™ 4/8 would be the perfect partnering center channel to the G7f as the center channel will then have the same driver complement and the same “voice”. Nevertheless, adding a ServoSub 2/12t corner subwoofer or a Genesis 928 ServoSub will bring into play for LFE a couple of 12-inch woofers. As 8-inch and 12-inch drivers couple differently with the airload of a room, having a mix of bass drivers might be highly beneficial in some rooms and systems.

4 The Technology used

4.1 Dipolar Configuration

What a lot of people don't realize is that the room is as big (if not bigger), a part of their music system as are the loudspeakers. At Genesis, we strive to get the loudspeakers and the room to work well together and hence, design loudspeakers that interact with the room and have enough of adjustment to make them work with most rooms in the world.

All rooms have floors, ceilings and sidewalls that distort sound because of lateral, early-arriving reflections. We aim to suppress undesirable contribution by reflected sound from these four surfaces (which is why a lot of people put sound absorbers or diffusers at the first reflection point of the room). In order to do that with a majority of rooms, we make our loudspeakers dipolar.

Dipoles radiate the same, but out-of-phase, waveform from the front and rear in "push/pull" fashion. Thus, the sound waves from the front and back of the speakers cancel out as they radiate from the sides and tops of the speakers, which means that there is minimum radiation of sound to the sidewalls of the room.

With a rear tweeter, the G7f is a dipole in the high frequencies. Hence, it uses the wall behind the speaker to give more depth to the soundstage and "air" to the speaker without detail robbing room reflections from the sidewalls. Hence, it has the advantages of omni-directional speakers, without the disadvantages.

With fewer spurious reflections to confuse your hearing, the program source emerges more clearly. Imaging is stable, sharply focused, deeper and spacious. Transients are clearer and sharper.

4.2 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 concept of the Genesis servo bass system is an easy one to understand: It employs, an accelerometer mounted on the voice coil as a sensor, to constantly monitor the movement of the woofer cone, and instantaneously and continuously compares it to the input signal. This comparison circuit identifies any deviation from the input and applies a corrective signal to compensate, thus practically eliminating 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 strike), the inertia of the woofer cone makes it slow to start moving, and then after it is moving, the momentum of the cone makes it continue moving even after the signal has stopped. The sonic result is overhang, bloat, 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 detects that the woofer will continue to move when it shouldn't 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 seem effectively 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 within its operating range. It also drives the woofer to constant acceleration, which makes its frequency response totally flat!!

The servo system is a more proactive approach to controlling a loudspeaker than high-damping factor and high current in the normal amplifier. However, this also means that the woofer, the wires attaching the woofer to the amplifier, and the power amplifier has to be designed as an integrated system. Thus, the G7f is designed with its own a built-in 180W Class-D amplifier for the bass section.

In the G7f, the bass amplifier is "generously" specified for the single 8" built-in woofer. The resulting benefits include huge dynamics, speed and micro-tonal detail in the bass. The disadvantage of this is that it is then possible to over-drive the woofer. Like a driver of a 400hp sports car, a heavy right foot might wrap you around a lamp post. Nevertheless, having lots of power gives you tremendous control of the woofer, and judicious use of the bass gain control is advised.

One side benefit of this powered woofer system is that almost any sized amplifier can be used to drive the G7f. 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 generally recommend 45 watts solid-state or 25 watts tube as an absolute minimum.

4.3 The Transducers

The transducers in the 3-way G7f are all proprietary Genesis-designed drivers manufactured to our exacting standards:

4.3.1 The Genesis Ribbon Tweeter

Reviewers in the audiophile press have often remarked that the Genesis tweeter is the world's best. It is a one inch circular planar-magnetic 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 is a 3mm-wide ring that has less mass than the air in front of it! The latest version of the Genesis ring-ribbon tweeter will accurately reproduce frequencies beyond 40 kHz with a true point-source dispersion pattern. (A 1-inch dome tweeter has a true point-source dispersion pattern only up to about 13kHz.)



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.

The G7f uses two of these tweeters per channel. One is front-firing and the other rear-firing; each controlled by a separate crossover with the rear tweeter out of phase to the front tweeter, creating a dipole.

4.3.2 Titanium Mid-Woofer

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. The G7f uses a Genesis-designed proprietary 5.5-inch solid titanium-coned transducer to cover this critical frequency spectrum.

Manufactured out of one of the lightest and stiffest materials known, this low mass cone driver is one of the best midrange transducers ever made, with nearly instantaneous transient response, enabling the G7f to sound lifelike and effortless.

The stiffness of the titanium cone also allows Genesis to use this as a woofer – hence, mid-woofer. It retains its low distortion, even on long throw application needed in delivering the lower frequencies. Hence, the solid titanium cone allows Genesis to develop a driver that is exemplary in the midrange, as well as deliver the heft and impact of a woofer.

We often hear that metal drivers sound “metallic”. To an extent, this is true. Every metal cone, no matter how well designed, will have an *oilcan resonance frequency*. This break-up mode frequency is determined by the material, thickness, shape, and size of the cone, and it is largely well understood.

However, outside of this resonance frequency, the metal cone acts as a perfect piston and has zero distortion. When metal drivers sound “metallic” (or “zingy” in the case of metal tweeters) it is because this oilcan resonance is excited.

Genesis uses exclusively metal drivers because outside the oilcan resonance frequency, the driver never sounds distorted or metallic. Hence, if the oilcan resonance is never excited, the driver has almost zero distortion. We use metal drivers far below their oilcan resonance, and hence are able to achieve a warm, distortion-free sound quality, but with huge macro and micro dynamics.

With metal drivers correctly applied, there is no necessity to place any damping material on the cones. We feel that damping the transducer cone is never a good idea as the damping material would not be able to differentiate between distortion and the micro-details of music. Hence, indiscriminately damping music as well as cone ringing and distortion.

Without damping, Genesis loudspeakers are able to play softly, and yet convey all the richness of the music, without losing any detail when you want to listen quietly in the dead of the night when the rest of the family are asleep.

4.3.3 Aluminium-cone Woofer

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 G7f features a single 8-inch aluminium cone long-throw woofer 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, allowing the servo system to most effectively eliminate the linear distortions.

The woofers are a uniquely designed metal cone driver made for the Genesis servo system. Made of a cone of solid aluminium, the suspension and voice-coil have been maximized for long distortion-free excursion so as to increase dynamic range. Our aluminium cones are a

magnitude stiffer than any plastic or paper cone on the market, and virtually eliminate the problems caused by cone bending and break-up.

The oilcan resonance frequency on the 8-inch aluminium woofer (where there can be any chance of distortion at all) is at 2,000Hz – far above the 16Hz to 120Hz frequency range at which these drivers operate. Therefore, the driver is a perfect piston within the frequencies used. Thus, low cone break-up distortion is inherent in the driver designed for the G7f.

4.4 Crossover

We believe that the crossover is the brain of the loudspeaker. In order to manage and maximize the performance of the extensive complement of transducers used in Genesis loudspeakers, we spend more time and effort on the crossover than many other manufacturers put in their entire speaker.

Each crossover is designed by computer modelling plus years of knowledge and experience. The inductors are custom designed and made for Genesis with OFC copper windings. The capacitors used are also custom made for Genesis, using high-quality polypropylene-film and tin-foil.

More importantly, the crossovers are designed with many, many hours of music listening and constant refining, tuning and tweaking of the circuit. Out of this comes the “magic” that is a Genesis-designed loudspeaker system.

4.5 The Acoustic Suspension

The suspension for the speaker comprises three elements:

- 1) The neoprene vibration absorbers are tuned to isolate and decouple the loudspeaker cabinet for optimal bass response no matter what surface the loudspeaker sits on. The result is that the loudspeaker sways like a skyscraper in an earthquake so that it is rigid in the frequencies that enhance clarity, imaging and dynamics, and yet passing the frequencies that detract from the bass.
- 2) The skeletal frame acts as a tuned absorber. Made of a sandwich of Baltic birch ply with a constrained vibration absorbent material, 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. (If using a US penny, make sure that it was issued prior to 1982 when pennies were actually made of copper. New pennies are copper-plated zinc and does not sound as good!!)

A pin-point suspension system is designed to pass *all* frequencies. Using a spike cup under the spike will defeat this system. 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.

4.6 Vibration-free Cabinet

The cabinet was designed for aesthetics, but with an obsession to sonic quality, vibration control, structural strength and rigidity.

In some parts of the cabinet where vibration would have been the greatest, 1 ¾ inches (45mm) of multi-layer bonded MDF was used to provide damping, structural integrity and a rigid platform for the drivers to be located. For other parts, a thinner 18mm MDF was used that allowed induced vibrations to dissipate faster. Incidentally, MDF was chosen as the material of choice for its damping properties and its consistency in hardness, density and rigidity.

In the G7f, the cabinet is asymmetrically braced to reduce standing waves inside the cabinet, as well as in the panels. Innovative thinking reduces the amount of flex and sway caused by the side-firing woofer, resulting in a stable soundstage and image that would not have been possible otherwise.

4.7 Class D Bass Amplification

While the servo-bass system and aluminium woofers bring great advantages, it they require an amplification system with enormous amounts of current to make the woofer follow the input signal faithfully.

In the G7f, the built-in amplifier was specifically designed and tuned for low frequencies in order to produce “floorshakingly musical” bass to power the servo woofer. The G7f also uses the Dynamic Power Delivery

System and the Silent Running Voltage Supply technologies developed for the Genesis Reference Amplifiers to deliver quick, clean power to the servo-control preamplifier and Class D bass power amplifier.

One side benefit of this powered woofer system is that almost any sized amplifier can be used to drive the G7f. 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.

5 Specifications

- Frequency Response: 22Hz to 40kHz, \pm 3dB
- Sensitivity: 89 dB, 1 watt 1 meter
- Min/Max Power (Tube): 25/250 watts per side
- Min/Max Power (Solid State): 45/800 watts per side
- Input Impedance: 8 ohms (Nominal)
- HF Transducers: Two Genesis 1" Ring-Ribbon Tweeters (front & rear)
- Mid/LF Transducers: Two Genesis 5.5" titanium Cone
- Servo-Subwoofer Transducer: One Genesis 8" aluminium cone
- Controls: Front Tweeter Level
Rear Tweeter Defeat
Bass Gain
- Built-in Bass Amplification: 180W Class D
- Input: High-level with 5-way binding posts
- Dimensions: H 48 " x W 12 " x D 14"
- Weight: 82 lbs (37 kg)
- Finishes: High gloss automotive paint

The Genesis Loudspeaker Setup Procedure

Introduction

This paper describes the procedure used to set up Genesis (or any other) loudspeakers in *a living room*. It describes a repeatable and replicable procedure that can be used by anyone – not just a “Golden Ear’ed” expert. Certain pieces of music are suggested for the various steps, but these are only suggestions – other similar pieces of well-recorded music that are familiar to the reader can just as easily be substituted. Please use this paper as a living document, and feel free to change the tracks to your preferred choice of music.

When listening, trust your instinct as millions of years of evolution has conferred the human hearing with an acuteness that cannot yet be replicated by measurement devices. Many readers will not believe the instructions to move the loudspeaker by 2mm (less than 0.1”). However, the loudspeaker set-up procedure has its roots in the physics of sound, and the physiology of hearing. If you don’t believe it, try this:

Have a friend stand 10 feet in front of you and speak to you. Now, close your eyes, have him move sideways a couple of inches and speak again. Point at him. You will find that you will be uncannily close. With some practice, you will find that at about 10 feet, you can detect a move as small as 4 inches.

Now, let’s say that your friend is a point source, and your head is 6 inches wide, standing left of center, he is 120.004” from your left ear, and 120.104” from your right ear. Standing right of center, he is 120.104” from your left ear, and 120.004” from your right ear. Physically, that is a 1.9 degree angle and a 0.1” distance displacement. (Do the math as an exercise for yourself.)

The phase difference between the left and right ear at middle C (256Hz and wavelength 52 inches) is about 0.7deg. Hence, by moving one speaker forward by 0.1” or 2.5mm, you will be able to shift the image of a singer by about 4 inches towards the speaker that is being moved if the speaker is 10 feet away from the listening position.

If you still do not believe that it is the phase of sound that gives your brain the imaging clue, close your eyes, and get your friend to speak. Now point at him and open your eyes to see how accurate you were. Close your eyes again, and fold one ear towards your friend. Get him to speak and point at him. Because you’ve deformed your outer ear, and hence changed the phase relationship of the echos in the fold in your outer ear, you will be less accurate at pointing to him.

However, if you keep your ear folded, and have him speak to you with your eyes open for a few minutes, your brain will learn the sonic distortion, and when you do it again, you will be much more accurate.

Preliminaries

Set the loudspeakers up at the minimum distance to the front wall and at the minimum distance apart (as suggested in the owner's manual). You don't want the speakers to be too far out and to intrude into the living space. Too far from the wall, and you have the possibility of people walking behind the speakers and tripping over the speaker cables.

Point the speakers straight ahead. Genesis loudspeakers are designed to give the correct tonality when NOT pointed at the listener's ear. They define a "window" into the soundstage, and thus accommodate a much larger sweet spot – it means that you can have a couch or love seat at the listening spot. If space allows, position the listening seat at a spot that is about 0.618 of the length of the room. Further from the front wall behind the speaker, then the back wall behind the head of the listener. If there is not enough space, the listening seat can also be at a position that is 0.382 of the length of the room. Start with the suspension spikes inserted but retracted so that it is easier to slide the speakers around.

On the Genesis loudspeakers, also set all the controls to 12 o'clock (pointing straight up) position. On the models with the external servo-bass amplifiers, start with the recommended settings in the Owner's Manual.

Step 1 – define the image

A Song for You, Jacintha/J. Monteiro Trio, First Impression Music

The plane of the loudspeakers defines a "window" into the musical event. This means that you should be able to "see" the individual musical performers with your ears.

First, make sure that the balance control of your preamp is exactly in the center. Sonic image is defined more by phase than by loudness, so while this is not critical, a small difference in balance can make this more difficult.

The sonic image of the singer on this track should be exactly between the two loudspeakers. If the image is too far to the left, move the *right* loudspeaker forward by 2mm (1/10th of an inch). If the image is still too far to the left, move the right loudspeaker forward by another 2mm. If the image now moves too far to the right, move the speaker back by 1mm.

If the image is to the right, move the *left* loudspeaker forward. We find this easier than moving the left speaker back if the image is too far to the left. Make tiny increments. This is because if you make large movements, the image could swing wildly left and right.

Sometimes, you will also find that you cannot get the image to properly center. If you move your head side to side, the image should still be stable. If the image swings wildly,



it is because the two speakers are at different planes. In this case, you may have to find that you have to move one speaker forwards or backwards by 100mm (about 4 inches), and then re-center the image.

If the image is centered, is the image also the size of what you would imagine a female singer would be in your room? If the image is too large, is the volume higher than a female singer could be singing in the room? If the volume seems appropriate for a singer in the room, and the singer is still too large, move the speakers further *apart* by 12mm (1/2 inch).

Again, make small increments. You will find that the image shrinks in size, and then begins to grow again as you push the speakers apart. This is normal. The positioning when the transition happens is probably the correct positioning of the speakers.

Is the depth of the image appropriate? The singer should be at a spot about on level with the speakers. If the singer is too far forward, you will have to pull the speakers further from the front wall. Pull both speakers forward by 5cm (2 inches). If the singer now seems too far back, push it backwards halfway (2.5cm or 1 inch). You will probably have to re-center the image again. Then, again check for image size, and depth. Repeat this until you are satisfied. Screw down the suspension spikes to lock the speakers down to the floor. If necessary, put a small *copper* coin under each spike to protect hardwood floors.

On this track, you will find that the image of the singer is very low in relation to the rest of the band. It sounds almost like she is standing in a pit with the band members arrayed around her. This is correct. During the recording session, we think that the microphone for the vocalist was hung, and the singer facing down when singing (may be reading her lyrics). From the perspective of the microphone (reproduced by your speakers) it will seem that the singer is very low.

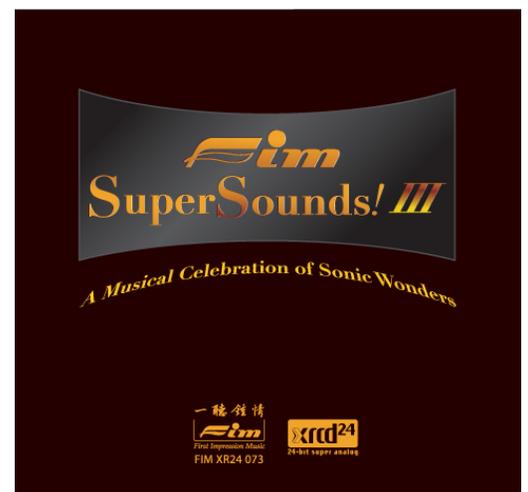
When the speakers are optimally set-up, you will also hear the singer shift her weight from one leg to the other during the first two or three lines of the song!

Step 2 – defining the height of the soundstage

Peace in the Heart, FIM SuperSounds! III, First Impression Music

The loudspeakers define the window to the musical performance. Hence, not only should individual performers have sonic images, the entire performance should have a realistic 3-dimensionality with height, width and depth.

In the first few seconds of this track, there is a shaker that starts off mid-height and stage left (out to the left side of the



left loudspeaker), comes forward towards the listener and down as it flies between the speakers, then goes away to the right, and disappears off into the top right corner of the room – like a bird swooping in and flying away.

If the shaker goes away from the listener as it flies stage center, the system is inverting phase. In this case, reverse the polarity of the speaker cables on both channels either at the loudspeaker or at the output of the power amplifier (or use the phase invert on your CD player or preamp if you have this ability).

Use the front-back tilt (caster angle) of the loudspeaker to define the height of the soundstage. If the shaker does not fly off into the top right rear corner of the room, raise the back of the right loudspeaker by giving the two spikes at the rear a 180deg twist clockwise. Because the suspension spikes on Genesis loudspeakers use a #3/8-16 screw thread, a 180deg twist raises it by 1/32 of an inch (about 0.8mm). Hence, you may need to make several adjustments.

It may seem counterintuitive that to *raise* the soundstage you need to raise the *back* of the loudspeaker. However, if you think of the plane of the loudspeakers being a window into the soundstage, if you want to look up, the window will need to be pointing up – hence the top of the window is leaning towards you. Imagine looking up, and you see that you will be leaning backward to look up.

To lower the soundstage, you raise the *front* of the loudspeaker – which would be like if you leaned forward to look down a downward-facing window.

Changing the caster angle of the loudspeaker will also change the tonality of the loudspeaker. This is because angling the midrange/tweeter towards the ear of the listener will make it more forward. After you have correctly adjusted the height of the soundstage, adjust the midrange/tweeter controls until the children's choir in this track sounds like they are about 8 to 12 years old. If the choir sounds too young (5 to 8 years old), lower the midrange level by turning the control anti-clockwise.

Step 3 – horizontal leveling of the soundstage

La Campanella, FIM SuperSounds! III, First Impression Music

The piece used for this is a close-miked piano. The low notes should be on the left of the soundstage, and the high notes should be on the right of the soundstage. The piano should sound leveled, and each higher note should be on the right of the last note. Imagine looking at a piano keyboard, and each key emitting the note that it plays. However, as the microphone was placed very close, the piano will sound slightly larger than the entire space between the two loudspeakers.

If the right side of the keyboard seems to be tilted up (like a hockey stick), raise the left side of the right loudspeaker (azimuth angle) by giving the two spikes on the left side a

90deg clockwise twist. If the entire keyboard seems to be tilted up from left to right, raise the left side of both the right and left loudspeaker by giving the two spikes on the left side a 90deg clockwise twist. Repeat until the keyboard sounds level.

If it is the left side of the keyboard that seems tilted up, raise the right side of the speaker.

On some systems, this seems to be impossible to do. The piano seems to be concentrated in the middle, and the low notes closer to the listener, and the high notes further away. Or, the note-to-note relationship seems to be confused. Some lower notes are further to the right of higher notes while the overall relationship of low notes to the left and high notes to the right seem to be correct. In general, we have found this to be caused by some network-type cables, and/or CD players/DACs that shift phase at various frequencies.

Step 4 – depth relationship in the soundstage

Canon in D, This is K2HD Sound! First Impression Music

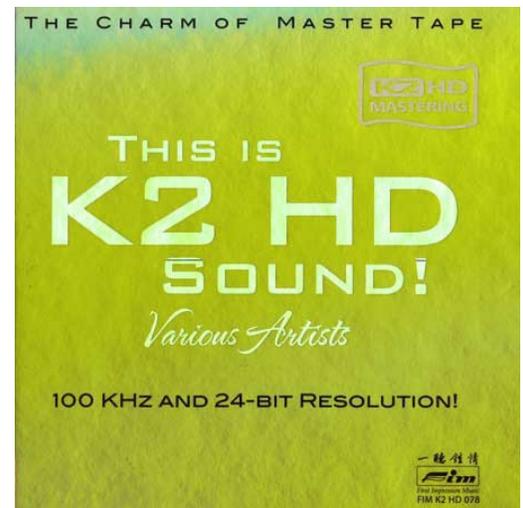
This piece is a percussion band with tympanis behind and triangles, marimba, chimes, and other percussion instruments. When correctly set-up, the tympanis can be heard to be behind, each bar or key of the marimba is distinct, and each rod of the chimes can also be heard.

When the high frequency instruments seem to be jumbled up and confused, the bass level is mis-matched. It may sound counter-intuitive, but bass is the foundation of music and a problem at 50Hz will affect all harmonics above it – 100Kz, 150Hz, 200Hz, etc. Getting the bass level correct fixes small problems with smearing of high-frequency information.

Turn the bass gain and crossover frequency up and down by very small increments, first on the left speaker, and then on the right speaker until you can hear each bar or the chimes and marimba. Once you have the bass level and crossover frequency correct, concentrate on the relative positioning between the instruments.

If the tympanis sound forward of the triangles, move the seating position forward or back in 5cm increments (assuming that you have the phase of the system correct in the first place). If that does not work, move both loudspeakers forward or backward until the bass depth is correct, in which case it may be necessary to re-adjust the image starting from Step 1 again.

With some *non-Genesis* loudspeakers, it may not be possible to achieve this depth relationship of bass and high-frequency instruments. This is due to the bass being out of phase with the mids and highs. In general, these are ported loudspeakers. When listening



to a jazz quarter, you might find that the double bass is always in front of the piano player on some of these speakers.



Step 5 – midrange attack and dynamics

Vivaldi Concerti con molto Strumenti RV560, Ensemble Matheus

The string quartet can be one of the most difficult sounds for a pair of loudspeakers to reproduce correctly. Bowed string instruments, when heard live, have a roughness and grain. Good string performers are able to impart energy and nuance into their playing by their bowing technique.

In this piece, the players “attack” the first note of each phrase. When the attack is missing, the piece sounds boring. Lots of energy is generated as the string players lean into the strings with the bow.

With many Genesis loudspeakers, the midrange dynamics and forwardness of the loudspeaker can be adjusted with the midrange control. If the piece sounds laid back and boring, raise the midrange level control. At the right setting, you can hear each player attacking the piece to give it excitement.

If the tweeter control is too high, the sound becomes too glassy. Much too high, and the strings are grainy due to distortion creeping in. Adjust the tweeter control until the sound of the strings is correct. Imagine the rough hair of a horse’s tail on the bow being drawn across the smooth string of a violin to make it vibrate.

If adjusting the midrange and tweeter does not give you the sound you want, it is also possible to raise or lower the entire loudspeaker by adjusting all four spikes the same amount. This has the effect of raising the midrange/tweeter level in relation to the ear level of the seated listener. If the midrange/ear level is closer, the speaker will be more forward. It is also possible to adjust the caster angle (front/back tilt) of the loudspeaker to effect the same tonality change, but that will also affect the soundstage height. Adjusting the height of the loudspeaker makes less of a change to soundstage height.

On *non-Genesis* loudspeakers without midrange and tweeter controls, it is sometimes possible to adjust the midrange attack and dynamics with changes in the toe-in of the loudspeaker. If the loudspeaker is directly pointed to the listener’s ears and the midrange is too searing, toe the speakers in more so that the speakers point at a spot further in front of the listener, or toe the speakers in less so that the speakers point at a spot behind the listener. In this case, a compromise between tonality and image/soundstage will have to be made.

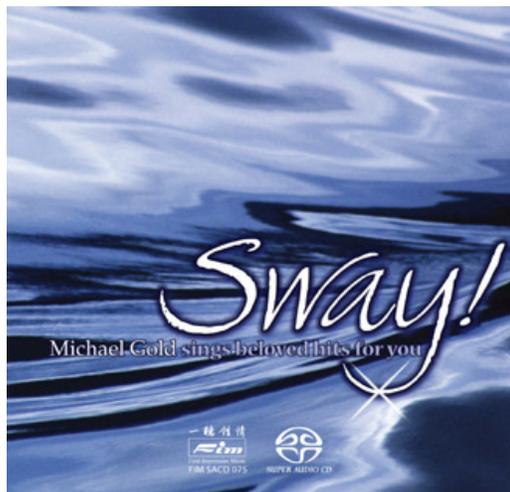
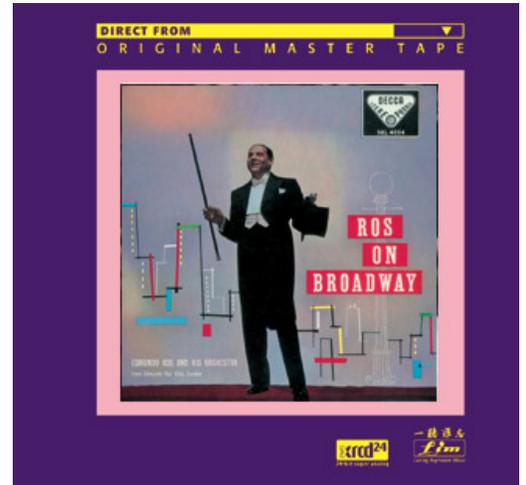
Step 6 – brass, rhythm and pacing

Hernando’s Hideaway, Ros on Broadway, First Impression Music

Assuming that the first 5 steps are correctly carried out, this piece of music will make your foot tap and your body sway to the music. If rhythm and pace are a problem by now, it may be necessary to try different cables and electronics.

As this recording was done in 1958, you may find that some instruments are panned hard left and hard right. Nevertheless, the dynamics of the piece are quite astonishing and you may jump when the trumpets first come on.

The trumpets should sound golden and brassy, but they should be forward and almost hurt as the sound hits you. If they sound hard, harsh and steely or glassy, turn UP the tweeter level. It may sound counter-intuitive, but the tweeter works only at 3500Hz and above. The major harmonics of the brass is below this level. Turning up the tweeter will bring more of the upper harmonics into play, and give the brasses more “body” and more brassiness.



Step 7 – bass balance and crossover frequency

Sway, Michael Gold, First Impression Music

Deep male voices will tend to sway away from the speaker with the lower bass level. Hence, listen to Michael Gold sing, and if he seems to lean away from one side at the end of each line, raise the bass gain on that side by a hair. If that does not make a difference, raise the crossover frequency by a hair.

If that gives you too much bass, turn down the bass gain at the side that he is leaning towards.

Step 8 – punch and bass dynamics

Don’t Crash the Ambulance, Shangri-La, Mark Knopfler

The mid-bass/woofer crossover point defines the amount of “punch” you will get from rock music. If you feel a *hollowness* between the vocals and bass guitar/drums, raise

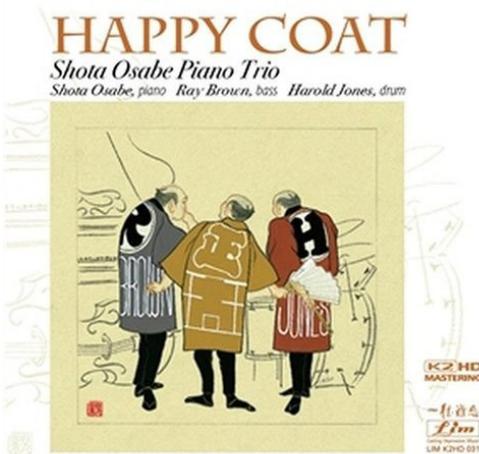


the crossover frequency. If there is a *fatness* in the male voice, and/or a slowness in the bass guitar, lower the crossover frequency.

On non-Genesis loudspeakers, you can sometimes increase the mid-bass punch by moving the speakers closer to a wall, or move them closer together in order to increase mid-bass coupling between the two loudspeakers.

Step 9 – bass balance and syncopation

Moonglow, Happy Coat, Shota Osabe Piano Trio, First Impression Music



This track is used to fine tune positioning and integration of a subwoofer into a system that is not really full-range (like the G7.1p or G6.1e), or the positioning of the bass towers in the line source models (G1.2 or G2.2).

The relationship of the individual bass notes played by Ray Brown helps you position the sub in relation to the side-walls. Due to reflections with the long wavelengths of the bass, small changes in the distance of the subwoofer to the sidewall will change Ray Brown's syncopated rhythm. It must sound natural, and at the speed that two fingers can be used to pluck a single string.

Move the subwoofer left and right in 5mm (1/5 inch) increments until the bass rhythm sounds right.

The position of the sub in the vertical plane of the loudspeakers will change the way that the bass frequencies waveform's foundation relates to the high frequency waveforms. Listen to Harold Jones' play of the cymbals. If the relationship is correct, the cymbals will sound like they are made of brass. If incorrect, the cymbals will sound like they are made of steel or glass. This is a great illustration of how bass is the foundation of music.

Move the subwoofer forwards and backwards in 5mm (1/5 inch) increments until the cymbals and high-hat sounds right.

This track can be used to fine-tune positioning of the full-range Genesis loudspeakers in the room if necessary. There is considerable effort in doing this, as any change made here will completely obliterate the image, soundstage, and tonality. In some difficult rooms, it may be necessary to position the speakers asymmetrically. That is, the center line between the two speakers and the listening seat is not down the center of the room.

Step 10 – maximum deep artificial bass levels

No Sanctuary Here, Roadhouses and Automobiles, Chris Jones, Stockfisch Records

Deep bass must have power and articulation. Unfortunately, with much music (especially pop), the sound engineers have equalized for speakers that are not truly full-range. Hence, the bass levels are often tweaked so that the bass level goes up as the frequency goes down. This can work pretty well with loudspeakers that do not really have the full bass frequencies to make them sound larger than they actually are.

With Genesis loudspeakers that have an amplified bass section (often with up to 500W of power), such music can often cause the woofers to bottom out and distort. This is one such track. For the most powerful bass, raise the bass gain until the woofer starts to distort, then turn it down a bit. This setting should result in more than enough bass for most listeners, while keeping things sane and safe to protect the woofers and amplifiers.

