

Genesis 2.2 Loudspeaker System Update Fact Sheet

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Changes in the Model

The new Genesis 2.2 is the latest iteration of the 2-series from Genesis. This document lists the changes from the previous Genesis 201. A brief history of the Genesis 2-series loudspeakers is also included.

Cabinet Construction

A major change in the construction of both the midrange/tweeter wings as well as the woofer towers contribute to the vast improvement in the sound of the system.

- 1) The midrange/tweeter wings are now made of solid cast acrylic. The high molecular weight cast acrylic material has even better damping and vibration distribution properties than the Corian used in the older Genesis 1.1.* The center section holding the midrange and tweeters is a solid 1.5" piece, and the two side wings are solid 1" pieces. The three pieces are welded together to form a homogeneous acrylic structure that is both immensely strong as well as rigid and heavy. The new wings are over 30lb heavier than the G201

* Density: Acrylic – 1400 kg/m³; mdf – 700 kg/m³; hdf – 900 kg/m³; corian – 1750 kg/m³

acrylic composite wings, and over 50lb heavier than the old G201 mdf wings.

- 2) The rear tweeters are now mounted on a ½” solid cast acrylic panel with cast acrylic rod stand-offs. Acrylic serves to absorb and distribute vibrations better in the high frequencies. This reduces any chance of box resonance inside the old tweeter bracket. The single large panel also provides a more stable platform for the tweeters to perform than individual square brackets. The acrylic rod stand-offs also resist all ringing to eliminate any distortion in the rear wave.
- 3) The geometry in the “sweep” of the wings is revised to better control the rear-wave of the dipole. This further improves the dipole effect resulting in a lower –3dB frequency point on the wings. As a result, coherence and integration between the midrange/tweeter and the woofer towers is improved. It allows for a lower low-pass crossover frequency to be used on the servo-bass amplifier. The deeper wings also look better!
- 4) The crossover box now covers the entire bottom of the rear of the midrange/tweeter wings. It is asymmetrically shaped with non-parallel sides to ensure that the panels and airspace do not resonate and affect the crossover components. The crossover box is also no longer a structural element in the construction of the wings – taking away yet another potential area of vibration.
- 5) The construction and material of the woofer towers are much improved. More rigid joints are used that allows vibrations generated by the opposed woofers to self-cancel. The bracing positions are calculated with the thickness of the acrylic/mdf sandwich used to almost completely eliminate modal vibrations in each panel. This almost completely eliminates boxy coloration inside each woofer chamber, and also completely eliminates cabinet vibration.

There is now almost absolutely zero vibration in the cabinet structure of the G2.2 – either in the midrange/tweeter wings or the woofer towers. Even when playing loud music, vibrations cannot be felt with the fingertips. And this is achieved without resorting to

extreme weight – which would result in a “slow” and “dull” sounding loudspeaker. An intelligent combination of vibration cancelling, absorption, resonance control, and vibration dumping to earth was used to accomplish this.

Acoustic Suspension

One of the lessons that we learnt from the development of the Genesis 5.3 is the use and tuning of an acoustic suspension system. An improved acoustic suspension is integrated to the cabinets of the new G2. This acoustic suspension can be retrofitted to G201 and G200 models, customers with older models have an opportunity to upgrade their systems.



Acoustic Suspension under the midrange/tweeter wings

The acoustic suspension comprises a system of shock absorbers, suspension frame, and spike. It is like the suspension of a race car. It prevents vibrations from the floor from affecting the loudspeaker, and yet “sinks” vibrations from the speaker into the floor. It can be thought of as a one-way vibration gate.

The suspension has a resonance frequency of about 3 Hz – below the audible frequency, and below where it will affect imaging and soundstage. The result of this is that the speaker will actually sway if you push the top of the loudspeaker hard enough.

Different suspension system is used for the midrange/tweeter wings and the woofer towers. This is because with the different weight and frequency response, different tunings are required.

This is like the soft suspension of a luxury car as opposed to the hard suspension of a race car. By being allowed a low resonance frequency, the vibrations borne by the floorboards (present in most homes in the USA) are not transmitted up to the loudspeakers. However, with very hard floors, the loudspeaker is also not allowed to “rattle” against the floors when they vibrate at higher frequencies.

This allows the G2.2 to be placed on all floor surfaces and for it to sound alike – be it deep pile carpet or marble/slate tiles.

Crossover Changes

The crossover for the G2.2 was revised and tweaked to reflect the sonic differences between the acrylic structure and the older versions. Components on the latest crossovers are much more tightly specified and critical elements are hand-matched to 1% tolerance. This resulted in improvements in imaging and soundstage, and also tweeter/midrange coherence.

Servo-Controlled Bass Amplifier

This has been totally revised for the new G2. Instead of a single unit, the new bass amplifier comprises 3 electronic modules, and two transformer modules. As a result of lessons learnt in the continuous evolution of the servo-feedback system over the past 40 years, midrange/bass coherence is vastly improved with the latest iteration of the Genesis servo-bass.



Genesis 2 Servo-Controlled Bass Amplifier
(including amplifier suspension)

Like the Genesis Reference Amplifier, the Servo-Controlled Bass Amplifier is wired throughout with Teflon insulated silver/copper wire. Teflon (or PTFE) is the best insulator for audio cables with excellent dielectric properties, low soakage and fast release. The individual strands are highly-polished silver with a 6N copper core.

However, the strands are wound so tightly together that the soft silver imprints on to each other, and binds together. This result in a wire that has a stiffness between that of stranded and solid, and a sound that has the advantages of both.

The various parts of the amplifier (see picture above) are:

- 1) The electronic crossover and Control Module with left and right balanced inputs and two control outputs. This is supplied with a programmable remote control that uses the same code-set as the old model, but yet can be programmed to control the rest of the customer's system.

- 2) Two Servo-feedback Amplifier Modules with one control input, and two Neutrik 50-amp Speakon™ outputs. The servo-amplifiers are the result of lessons learned in the development of the Genesis Reference Amplifier. Unlike the old G2000 amplifiers, the new amplifiers do not incorporate a compression limiter. The each channel is current limited to 20 amps to protect the woofers. This results in much more dynamic and cleaner bass.
- 3) A pair of Control Interface Cables (CIC): these have 7-pin Neutrik™ connectors at each end and are used to connect between the Control Module and the Servo-Amplifier Modules.
- 4) A pair of Servo-Bass Interconnects (SBI) with XLR connectors at one end and a pair of banana plugs (or optionally spades) at the other end. Using these SBI's result in very much better (and easier) integration between the servo-bass amplifier and the crossover in the midrange/tweeter wings.
- 5) Two pairs of Servo-Bass Cables (SBC) with Neutrik 50-amp Speakon™ plugs at each end.
- 6) A Power Supply transformer module for each Amplifier Module with Neutrik™ 20-amp PowerCon™ outlets.
- 7) A pair of Power Umbilicals with a Neutrik 20-amp Powercon plug at each end (one grey and one blue).
- 8) Amplifier Acoustic Suspension. This is similar to the acoustic suspension on the wings and towers. However, a different sized shock absorber is used as the amp is substantially lighter than the loudspeaker. One can be used for the entire stack, or one suspension can be used for each module, and the amp modules placed close to the woofer towers.
- 9) As an optional upgrade a Maximum Dynamic Headroom Reservoir can be specified for each of the amplifier modules. This was developed for the Genesis Reference Amp and is an extension of the Dynamic Reserve Power Supply (see below).

Dynamic Power Delivery Supply

One of the key improvements to the servo-amplifier is the power supply developed during research for the Genesis Reference Amplifier. Unlike conventional power supplies which are specified into constant current draws, the Dynamic Power Delivery Supply (DPDS) is designed to deliver current into non-linear loads.

A Class A amplifier, and Class AB amplifier at low power, is a constant current linear load. A Class D amplifier on the other hand is a dynamic non-linear current load. It switches current from the power supply to the loudspeaker on and off like a tap (that is why they are also called switching amplifiers).

Like the way that the water pipes will rattle when you turn a tap very quickly on and off, the conventional power supply will distort when delivering current to a Class D amplifier. The DPDS developed by Genesis does not.

In addition, the power supply has to be designed to deliver current at the frequencies of music, and the distribution of the power requirement of music at the different frequencies. The other advantage of the DPDS is that it can power two channels of an amplifier **more efficiently and effectively** than one channel. (It can also be applied to Class AB amplifiers, because when such an amplifier is driven into Class B, the power requirements are similar to a Class D amplifier.)

The Maximum Dynamic Headroom Reservoir (MDHR) is an optional upgrade that extends the DPDS with even more dynamic headroom. It is also able to overcome the effects of poor electrical power supply in homes without dedicated circuits for the servo-amplifier.

Etymology

The history of the Genesis 2-series goes back to the technologies developed for the IRS. However, we restrict the history to the speakers with brand name Genesis. The models are covered going backwards to the release dates:

Genesis Advanced Technologies:

2007: Genesis 2.2 (current model)

2005: Genesis 201 – revision with higher power X-Max woofers

2004: Genesis 201 – revision with acrylic composite cabinet

2003: Genesis 201 – revision with new Servo-Bass Cables

Genesis Technologies:

2000: Genesis 201 – using ribbed aluminium-cone woofers and 48-inch ribbon manufactured by BG Corp; midrange/tweeter wings wider than on G200

1998: Genesis 200 – using poly-kevlar/ aluminium woofers (brown woofers) and 48-inch ribbon manufactured by Carver Corp; introduction of the “folded wing” to enable them to work in smaller rooms

1993: Genesis II – using eight 12-inch aluminium/poly-kevlar woofers (brown woofers), 48-inch ribbon manufactured by Carver Corp, and 4-foot midrange/tweeter wings

There is also the opportunity for customers with older products to upgrade to some of the features of the latest version. Please contact the factory for details.