Genesis Forte Loudspeaker Update Fact Sheet

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Changes in the Model

The Genesis Forte is the latest iteration of the hybrid line-source/point-source loudspeaker from Genesis. It was developed partly as a result of demand from customers who desire the advantages of the line-source loudspeakers, but do not have the space for the four-tower loudspeaker.

This document gives a brief history of the Genesis Forte from the Genesis II.5 to the present.

New Transducers

The Genesis ribbon tweeter was re-designed in 2012 to be a ring-radiator in order to deliver a better dispersion pattern so that the sweetspot for Genesis loudspeakers would be even larger. The Genesis Ring-Radiator Ribbon Tweeter is a 26mm diameter ring that is 4mm wide. This gives it a frequency response up to 40kHz.

The GR3T, introduced with the Genesis 2 Junior, has become one of the most sought-after upgrades for owners of the older loudspeakers. While the measured improvements have been “modest”, the sonic advantages have made our customers extremely happy. Suffice to say, at the behest of our customers, we no longer say that improvements are “slight”.

The Genesis Forte is the first model to feature the newly designed Genesis Midrange Ribbon. No longer using a modified version of an off-the-shelf mid/high driver, we were able to design a driver specifically for use in the midrange from 120Hz to 3.5kHz. This resulted in even lower distortion and better clarity in the midrange.

New Cabinet Features

A major change in the cabinet construction contribute to the vast improvement in the sound of the system.

1) The cabinet panels are now hot-pressed using individual thin sheets of specific woods, mdf and finish material. Seven layers of different woods, two layers of carbon fiber plus two layers of mdf are used, resulting in a constrained-layer damped structure. Each sheet is individually pressed and cured before the next sheet is glued on. The result is that there is no internal tension or air pockets created. After the panels are fabricated (which takes up to two weeks per panel), they are covered in carbon fiber or HMWA (high molecular weight acrylic), genuine rosewood veneer or any veneer or combination of finish that the customer specifies.

   The center section holding the midrange and tweeters is a solid 1.5” thick, and the two side wings are 1” thick. The three pieces are held together with Corian™ corners which impart additional strength as well weight and rigidity. The new composition of the wings make the Forte a little lighter than the previous iteration with solid acrylic wings but heavier than the old G201 mdf wings and much heavier than the particleboard used by the previous company.

2) The rear tweeters are mounted on a new ½” solid Corian™ panel with carbon fiber tube stand-offs. Carbon fiber resists ringing from the rear-wave of the midrange better than the acrylic rods previously used and much better than aluminium rods. The single large panel provides a more stable platform for the tweeters to perform than the individual square brackets used in previous iterations of the G1 and G2 model speaker. The carbon fiber tube stand-offs also resist all ringing to eliminate any distortion in the rear wave.

3) The box containing the crossover, 12-inch woofers and amplifier is completely de-coupled from the midrange/ tweeter wings. It stands independent on neoprene couplers which provide isolation and damping. The woofers are mounted horizontally opposing in phase which also reduces vibration in the woofer cabinet. This improves the imaging and soundstage solidity.

4) The new 48-inch midrange ribbon is an in-house Genesis design using a new, more "musical" film with lower distortion, higher strength and better frequency response.

There is now almost absolutely zero vibration in the cabinet structure of the Forte – 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 in our opinion 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 early in the development of new Genesis loudspeakers is the great benefit from the use and tuning of an acoustic suspension system. Compared to the older designs with a "foot", the Genesis Acoustic Suspension resulted in better clarity at all frequencies, and pin-point images and higher resolution sonic picture in the soundstage. An improved acoustic suspension is integrated into the cabinets of the new Forte.

Acoustic Suspension under the Genesis Forte

The acoustic suspension comprises a system of shock absorbers, suspension frame, and spikes. 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.

The suspension system 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.*

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.

The suspension allows the Forte 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 Forte was re-designed to reflect the sonic differences between the new constrained-layer damped structure and the new midrange ribbons. Components on the latest crossovers are tightly specified and critical elements are hand-matched to 1% tolerance. This results in improvements in imaging and soundstage, and also even better tweeter/midrange coherence.

Wiring Changes

As an option, the tweeters of the Forte can be wired 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 copper core.

However, the strands are wound tightly together so 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. This imparts even more clarity and "sparkle" to the high frequencies.

Servo-Controlled Bass Amplifier

The Genesis Forte features an integrated servo-controlled bass amplifier built into the woofer cabinet. A new design with dual servos and dual amplifier modules (one for each woofer) providing

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* The suspension is derived from technology for building skyscrapers in earthquake zone. How well this works was proven during the 2010 magnitude 8.8 earthquake in Chile. While other smaller, shorter speakers fell over, a pair of G2.2 installed there stood tall and were undamaged.

twice the power of the original debuted for the G2Jr. 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.

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 does not.

In addition, the power supply has to be designed to deliver current at the frequencies of music, and at 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 alone. This is taken advantage of especially in the Genesis Forte to make the two independently amplified woofers operate even more efficiently.

Etymology

The history of the Genesis 2-series goes back to 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:
2016: Genesis Forte – Current model.

2011: Genesis 2.2jr – Redesign of cabinet structure with independent suspension of woofer cabinet, two 12-inch X-Max servo-controlled woofers and HMWA midrange/tweeter wing.

2002: Genesis 350SE (continuation of 2000 Genesis Technologies model)

Genesis Technologies:
2000: Genesis 350SE – using four ribbed 8-inch aluminium-cone woofers, 48-inch ribbon midrange manufactured by BGCorp with twelve 1-inch tweeters (line-source tweeters) and three rear-firing tweeters

1998: Genesis 350 – using four 8-inch poly-kevlar/ aluminium woofers (brown woofers) and 48-inch ribbon midrange manufactured by Carver Corp with three 1-inch tweeters (point source tweeters) and one rear-firing tweeter

1996: Genesis 300 – using six 8-inch poly-kevlar/ aluminium woofers (brown woofers) and 48-inch ribbon midrange manufactured by Carver Corp with three 1-inch tweeters (point source tweeters) and one rear-firing tweeter. Introduction of folded wing to enable speakers to work in smaller room.

1993: Genesis II.5 – using two 12-inch aluminium/poly-kevlar woofers (brown woofers), 48-inch ribbon manufactured by Carver Corp, with three 1-inch tweeters and one rear-firing tweeter. 4-foot wide midrange/tweeter wings