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Genesis Prime Update Fact Sheet

Version 2016



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Changes in the Model

The new Genesis Prime is the latest iteration of the flagship loudspeaker system from Genesis. The G1 is already often referred to by dealers and owners as “the best loudspeaker in the world”, so how can “the best” be improved upon?

Experience is something you gain five minutes after you needed it most. In the past almost 20 years of production and ownership of the G1, our dealers, customers and we have learned a lot, and most of this learning experience has been incorporated into the latest version of the G1 – the Genesis Prime. What did not need to change has been left well alone, but the changes made have resulted in a much better loudspeaker system.

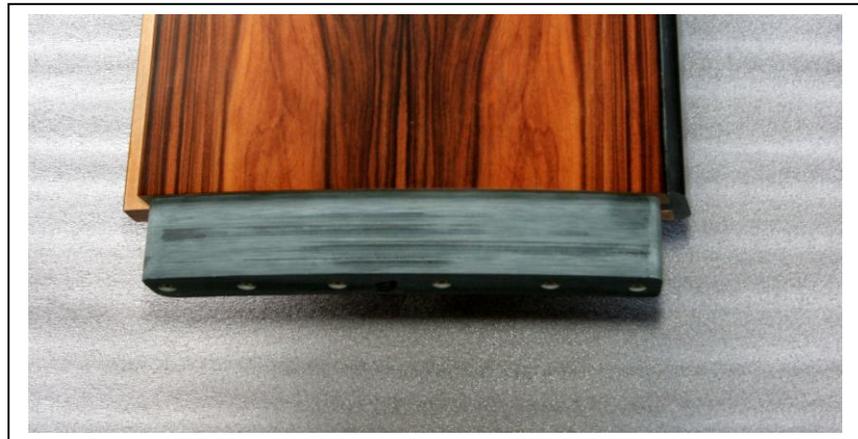
This document lists the changes in the G1 as well as gives a brief history of the Genesis flagship product.

Changes to Midrange/Tweeter Wing

Major changes have been made in the structure of both the midrange/tweeter wings. New materials and construction contribute to the vast improvement in the sound of the system.

- 1) The midrange/tweeter wings are now hot-pressed in shape using individual thin sheets of specific woods, mdf and finish material. Nine layers (including two of finish materials) of five different woods plus two layers of mdf are used, resulting in a constrained-layer damped structure. Each sheet is individually pressed in shape and cured before the next sheet is glued on. The result is that there is no internal tension (unlike plywood that is steamed and then bent) or air pockets created. After the wings are fabricated (which takes two weeks per wing with four wings needed for each pair), they are covered in genuine rosewood veneer or any veneer that the customer specifies. The “Dragon” edition uses the same seven layer construction, plus two sheets of ultra-stiff carbon fiber as the finish layers, providing additional dissipation for even better damping.

- 2) The center section holding the midrange and tweeters is a solid 1" piece using a new high-density version of Corian. This shifts any resonance upwards in frequency, where there is much less power and hence the resonance is less likely to be excited.



- 3) The old wings had a plywood "tongue" that fit into the base foundation. Over time, that tongue had a potential to be deformed and this result in the wings rocking with resulting variation in soundstage. A new CNC-machined Corian "tongue" on the wings now fits precisely into a CNC-machined slot in the new foundation base. A Corian "end cap" on the wing also confers additional stiffening, matching the center Corian panel.
- 4) The foundation base of the midrange/tweeter wings and the woofer towers are made of solid Corian and high molecular weight acrylic (HMWA). This results in a base that is 10% heavier than the concrete foam moulded base previously used, and is much more inert. The addition of the softer HMWA at the top of the base where the hard Corian parts of the center panel and wings mate to the base also makes for a much better interface and lower-impedance path for vibrations to travel. The bases are also machined on a CNC machine, resulting in much tighter tolerances and a better and more precise fit for the wings and center panel.
- 5) The rear tweeters are mounted on a Corian panel to match the front panel and carbon fiber rod stand-offs replaces the acrylic previously used as the material resists ringing from the rear-wave of the midrange much better than the

aluminum rods used in the G1.1, and the acrylic rods used in the original G1.2.

- 6) The hook-up wiring loom is made of Teflon-covered silver-plated OFC copper wire, resulting in better detail and “air” in the high frequencies. The same conductor is used in the jumpers that are used between the crossover-box (as well as internally in the crossover) to ensure the best possible signal transfer. A loudspeaker cable designed and manufactured using the same conductors is also provided to the owner for hooking up the power amplifier to the crossover.
- 7) The new Genesis ring-radiator ribbon tweeter has lower distortion in the critical 3,000Hz to 3,800Hz region and higher frequency extension to 40,000Hz instead of the old 36,000Hz. As a ring radiator the dispersion is also much better in the high frequencies (above 18kHz). These tweeters are then tightly toleranced to ensure precise pinpoint imaging capability.
- 8) The new 75-inch midrange ribbon is an in-house Genesis design using a new, more “musical” film with lower distortion, higher strength and better frequency response.

Woofers Tower Changes

- 1) The same seven layer construction (plus a finish layer) of the mid-tweet wings are used for the woofers. Solid 1-inch mdf is used for internal bracing and additional strength is added with Corian corners. In the Dragon edition, the mdf cabinet is further strengthened using sheets of ultra-stiff carbon fiber as the finish material.
- 2) There are twenty-four 12” woofers in each woofer tower – twice as many as the G1.1. A total of 12 opposing woofers (six firing front and six firing back) per tower are used so that the vibration generated by one woofer is cancelled by the opposing woofer. Having two opposing woofers in each cavity also allows us to almost completely eliminate boxy coloration inside each cavity. The result is better bass, and a more complete coupling of the woofers to the air load in the listening room.

Having twenty-four 12-inch woofers allow each woofer to move very little and be used in the most linear part of the operating range. That, plus the servo-control brings distortion even further down.

Crossover Changes

- 1) The crossover has been further improved for the Genesis Prime, ensuring greater transparency, dynamics and speed. Individual components in the crossover are hand-matched to within less than 0.1% tolerance – often using multiple paralleled components to achieve this. The coherence between tweeter and midrange, and midrange and bass has been elevated to a seamlessness that has not been experienced before. Point-to-point wiring is optimised for minimal interaction between the various component parts of the crossover. Eliminating the PCB allows us to design the layout in 3-dimensions to shorten wiring paths and eliminate yet another interface between components.
- 2) The current crossover design keeps the size of the larger external crossover box in version 1.2. The latest film-and-foil capacitors and the new inductors used that can handle much more power than the older ones without saturation are also much larger.
- 3) Each pair of crossovers is meticulously hand-built and measured at every step of the way to ensure that each pair is absolutely matched. Internal components are “bedded” in soft, vibration-absorbing silicon rubber within a solid Corian box. Pairs of components are tightly toleranced by hand and closely matched between left and right loudspeakers.
- 4) Each external crossover has a pair of input binding posts for midrange and high frequencies as standard and requires only a single high-quality power amplifier. The latest WBT low-metal binding posts are used as these present less of an impediment to the signal transfer. A custom pair of loudspeaker cables is provided for hooking-up to an amplifier.

Customers who want to tri-amp (or bi-amp) the system may request that the external crossover be *specified* to be bi-amp or tri-amp ready. However, such customers will be

warned that the amplifiers used have to be absolutely IDENTICAL – not just from the same manufacturer – because of phase and group delay inherent in amplification. If the amplifiers used are not identical, all the work done in crossover component matching will be defeated by manufacturing tolerance and design differences in the amplification.

We spend many, many hours ensuring the perfect phase and response crossover between the tweeters and midrange drivers, and would hate for this work to be negated by users who may use a lower-powered amplifier in the high frequency and a higher-powered amplifier in the midrange. Hence we ask customers who request this option to sign an undertaking not to use non-identical amplifiers for the bi-amp or tri-amp duties.

Wiring Changes

- 1) The speaker is completely internally wired using a military-spec aerospace hook-up wire. The wire is made of highly polished silver-plated OFC copper strands. The strands are wound so tight that the silver “imprints” from one strand to the next. This confers the qualities of solid-core wire to the stranded wire, without the disadvantage of extreme stiffness. The wire used is stiffer than normal stranded copper wire but not as stiff as solid-core.

The wire is then jacketed in the best possible dielectric material – Teflon – as the insulation. Teflon (or PTFE) is the best insulator for audio cables with excellent dielectric properties, low soakage and fast release. The end result is a great increase in resolution and transparency in the high- and mid- frequencies as compared to using just copper, but without the brightness and leanness associated with pure silver wires.

- 2) The jumper wires between the external crossover and the midrange/tweeter panels are Genesis-manufactured and of the same wire that is used internally. This is preferable to using an externally sourced wire for a more coherent sonic presentation. Using different brands of jumpers can change the sound, but we do not advocate using wire as “tone

controls” because different does not equate to better. Using the same wire results in the greatest transparency between crossover and driver.

Genesis also supplies a pair of speaker cables using the same material as standard with the Genesis Prime and the “Dragon”. This will result in the greatest transparency all the way from the output terminals of the power amplifier to the crossover, to each individual driver on the loudspeaker.

New Servo-Controlled Bass Amplifier

One of the complaints encountered with the old G1.1 was that it was “not fast enough for rock music”. We found that this was due to the phase lag in the bass caused by the hook-up scheme and crosstalk between the servo-signal and the woofer signal in the original 15m long servo-bass cable supplied.

Much of the phase lag was eliminated with the development of the Servo-Bass Interconnect Cable and the new Servo-Bass Cable that have been made available in the past few years as upgrades to owners of older Genesis speaker systems.

The completely new Servo-Controlled Bass Amplifier for the Genesis Prime eliminates the residual bass “slowness” caused by the old G3000 servo-bass amplifier. Instead of a single piece with



Genesis Prime Crossover and Servo-Controlled Bass Amplifier
(one side shown with six channels of amplification)

crossover and amplification in the same chassis, the new bass

amplifier separates the control, servo-amplifier and power supply. Each stack of electronics sits on a Genesis acoustic suspension system, ensuring optimal performance of the amplification. Using the new SCamp, the 12-in aluminum woofers are now as “fast” as the ribbon midrange – resulting in a seamless transition between the lower midrange and the upper bass.

For the Genesis Prime, the technology improvement continues with a redesigned power Dynamic Power Delivery Supply, and Silent Running Voltage Supply. Like the Genesis Statement Amplifier, the Servo-Controlled Bass Amplifier is wired with Teflon insulated silver/ copper wire.

Full dual-mono operation in the bass is ensured with totally separate left and right amplifiers. This allows the left and right woofer towers to be set-up and tuned differently. A total of six power cords are needed just for the bass amplification of the Genesis Prime. We also recommend that at least 40amps at 230V be supplied to the amplification system.

The various parts of the amplifier are:

- 1) Two units of Control module with inputs for the servo-bass interconnects and two control outputs – one is used per side so that the left and right woofer towers can be individually tuned. This comes with a remote control with three memory settings.
- 2) A total of four units of Servo-feedback Amplifier modules (two with attached acoustic suspension) each with one control input, and three 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 G3000 amplifiers used with the G1.1, the new amplifiers do not incorporate a compression limiter. Each amplifier module (total of twelve available) delivers 1,000W to the 2-ohm load of paralleled 12-inch woofers. The amplifier is current limited to 20 amps to protect the woofers resulting in much faster and more dynamic bass.

- 3) Each amplifier module has its own 2kVA Power Transformer (total four) connected with Neutrik™ 20-amp PowerCon™ outlets.

The result is that the left and right bass channels are completely separated and independently controlled. A total of 3 power outlets are required per side.

The accessories for the Servo-Bass Amplifier comprise:

- 1) A pair of 3m 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 amplifier used for the midrange/tweeter wings. The Control Module can still be driven by a balanced preamp-level input if the customer desires, but the supplied SBI is a much better interface.
- 2) Two pairs of Control Interface Cables (CIC): these cables have 7-pin Neutrik™ connectors at each end and are used to connect between the Control Module and the Servo-Amplifier Module.
- 3) Four sets of 3-channel Servo-Bass Cables (SBC) with Neutrik 50-amp Speakon™ plugs at each end.
- 4) Four Power Umbilical cords with a Neutrik 20-amp Powercon plug at each end (one grey and one blue).

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 – not digital!)

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 improved DPDS derived from developments made during the design of the Series II Genesis Reference Amplifier have been incorporated into the latest servo-controlled amplifier.

The sonic result is a faster, snappier bass response that is so critical to rock, swing, Latin and Jazz music.

Etymology

The history of the Genesis 1-series goes back to the technologies developed for the IRS (Infinity™ Reference Standard) – in reverse chronological order:

Genesis Advanced Technologies:

2016: Genesis Prime: New cabinet construction, new Genesis designed 75-inch midrange ribbon, improved crossover, further improvements to the SCamp

2015: Improved crossover, improved 75-inch midrange ribbon; upgrades to DPDS in the SCamp Series II, additional structural improvements

2012: Genesis “Dragon” and upgrades to Genesis 1.2 – new improved Genesis ring ribbon tweeter, silver-teflon internal wiring, upgrades to Servo-Controlled bass amplifier, cabinet upgrades and crossover upgrades

2009: Genesis 1.2 – new cabinet construction, 12 x high-excursion X-Max woofers per side, new servo-bass amplifier

2006: Genesis 1.1 – revision with 6 x high-excursion X-Max woofers and Servo-Bass Interconnects

2003: Genesis 1.1 – re-issue and revision with new Servo-Bass Cables

Genesis Technologies:

1998: Genesis 1.1 – 6 x new ribbed-aluminium woofers and new 75-inch ribbon; G3000 servo-bass amplifier included

1993: Genesis I – 26 x Genesis ribbon tweeters, 60-inch ribbon midrange, 6 x poly-kevlar/aluminium woofers per side

Infinity Systems, Inc.:

1988: Infinity Reference Standard V – using newer bass driver from Kappa series, included servo-bass amplification system

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1978: Infinity Reference Standard – originally developed as an internal reference system. 36 x EMIT, 12 x EMIM, 6 x 12” woofers, external bass amplifiers required – servo-controller supplied