

Forget Everything you Know About Integrated Amplifiers

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Source: The Absolute Sound



I've long admired the approach Simaudio takes toward building integrated amplifiers. Rather than treat the integrated amplifier as a budget-oriented product unworthy of its best technology, the Canadian firm has instead strived to create truly exceptional products that are simply scaled down in size from their flagship efforts. This path has resulted in a long and unbroken string of great-sounding integrations, including the Moon i-7 I found so beguiling when I lived with it for a few months nearly 5 years ago. The i-7 stands out in my mind today as being a notch above the competition in build-quality, features, and most importantly, musical performance. I greatly enjoyed my time with the i-7; it had a certain magic that just sounded musically "right."

When I learned that the 30-year-old Canadian firm had replaced the i-7 with the Moon 600i, I jumped at the chance to review it. There's something compelling about a compact piece of electronics that is beautifully built and rivals or exceeds the sound quality of separate preamplifiers and power amplifiers. Would the new 600i live up to the high standards established by its predecessor?

Priced at \$8000, the 125Wpc 600i will never win the "most-watts-per-dollar" contest, but it would win just about any other contest that judges design, build-quality, and fit 'n' finish. The 600i is impeccably made in every way, from its fully balanced, dual-mono architecture (unusual in an integrated amplifier) down to the feel of its remote control. The unit exudes a sense of luxury and refinement that overlays some serious hardware inside the chassis (see sidebar for the technical details).

The 600i is software-controlled, imbuing the amplifier with a host of convenience features. You can adjust the gain of each input independently so that there are no volume jumps when switching sources, select any input as a "theater bypass" when using the i600 with a multichannel controller, name each input for viewing on the large front-panel LED display, and set the maximum volume for any input. The software can be updated via an RS232 port. A SimLink port allows you to connect other Simaudio components for integrated control and operation.

Four unbalanced inputs and one balanced input are provided. The line-output jacks allow the 600i to be used as a preamplifier to drive an external amplifier. These single-ended jacks can be configured as fixed-level or variable-level outputs. A large display (dimmable) shows the selected input, volume, or balance setting. Output terminals are high-quality WBT binding posts. The remote control, machined from a solid block of aluminum, offers direct selection of inputs, volume and balance controls, mute, and power buttons. The remote's lower section includes controls for Simaudio's CD players. The remote is gracefully curved and fits nicely in the hand, unlike some aluminum remotes that feel chunky and awkward.

Listening



Before getting to the listening impressions, I should note that the unit we photographed for the cover is the 30th Anniversary edition of the 600i, but the unit I auditioned is the standard black chassis with brushed-aluminum faceplate. We just couldn't resist the visual impact of the Anniversary edition's chrome faceplate and Ferrari red paint. The 30th Anniversary edition, which features some parts upgrades, carries a \$6000 price premium. Only 30 Anniversary edition 600i's will be built.

I had high expectations for the 600i based on my previous experience with Simaudio's integrated amplifiers, but that didn't prepare me for just how great this amplifier sounded. Dropping the 600i into a world-class, reference-quality system (including the \$97,500 Rockport Altair loudspeakers), I was startled not just by the 600i's specific sonic attributes, but by its sheer ability to communicate musical expression. And this was with the 600i replacing \$145k worth of BAlabo preamplifier and amplifier—a tough act to follow if ever there was one. The 600i never failed to involve me in the performances, encouraged long listening sessions, and continued to reveal strengths over the weeks the amplifier was in my system—all signs of a great product.

The 600i sounded like expensive separates, not an integrated amplifier. The first thing that struck me was how resolved and dimensional the music sounded. The soundstage was richly layered, with depth portrayed along a continuum and a real sense of bloom around images. More importantly, the 600i resolved individual instruments and musical lines anywhere along that depth continuum, creating a sense of musical vividness. This paid dividends in the 600i's ability to communicate the composer or performers' intentions. Many amplifiers—even some expensive ones—tend to obscure the timbres (and thus musical contributions) of quiet instruments when in the presence of louder ones, diluting musical expression. The 600i's resolution of low-level instruments, along with the outstanding clarity of timbre, fostered the impression of a richer and denser canvas, and along with it, a greater sense of life and vibrancy.



Going back to the soundstage size, the 600i's portrayal of bloom around individual instruments, layering, and sheer depth approached the best electronics I've heard in this regard, the Spectral DMA-360 amplifiers. The 600i easily had the biggest, best defined, and most realistic soundstaging of any integrated amplifier I've heard. It wasn't just the soundstage size that was impressive; it was the resolution of fine spatial cues. For example, on the acoustic-trio recording *The Rite of Strings* (Stanley Clarke, Jean-Luc Ponty, and Al DiMeola), when Ponty comes back in for a solo after playing the melody, I could hear a tangible sense of the studio's acoustic around the violin, not a flat cut-out image. I've never heard electronics anywhere near this price resolve so much low-level detail that contributes to placing the instruments in real space. The spatial presentation was a bit more forward and upfront that I'm used to hearing, but not in a pushy or overbearing way. Rather, the 600i had a strong sense of presence fostered by the tendency to put vocalists and lead instruments just a bit more forward in the stage. In this regard, it was similar to the sound of, say, Audio Research than to the character of, for example, the BAlabo electronics.

In addition to these qualities, a big part of the 600i's immensely compelling musical performance was no doubt the result of the amplifier's timbral purity. The upper mids and treble had no grain and edge, giving the entire presentation an inviting warmth and drew me into the music—and I had this perception even after listening to the champs in timbral liquidity, the BAlabo electronics. The 600i's reproduction of brass and woodwinds was sensational; listen to the marvelous interplay between trumpeter Arturo Sandoval and clarinetist Eddie Daniels on Sandoval's *Swingin'*. The 600i rendered Sandoval's famously warm and rich tone with no hint of glare, and Daniel's woody clarinet had a palpability of timbre, even during the unison phrases.

Throughout the auditioning, a defining characteristic was the 600i's extremely tuneful and dynamic bass. Bass guitar lines were rock-solid, with visceral grip accompanied by propulsive power. I got the impression that the 600i took authoritative control over the Rockport Altair's 15" woofer as well as the B&W 802D's dual 8" drivers. The Altair has tremendously weighty, yet nuanced and detailed bass and mid-bass that the 600i served well. The 600i's ability to deliver current to a loudspeaker (as indicated by its ability to double its power output into 4 ohms relative to the 8-ohm rating), along with its very low output impedance (0.03 ohms), no doubt contributed to the sense of control and authority in the bottom octaves.

When it was driving the B&W 802D or Rockport Altair, I never reached the 600i's dynamic limits. Even on the most demanding music, the Simaudio didn't exhibit the tell-tale signs of an amplifier running out of power—a sense of strain on peaks, diminished dynamic contrasts, soft bass, soggy kick drum, or hard treble. As I kept turning up the volume, the 600i maintained its composure, tonal purity, and dynamic impact. The fabulous *Swingin' for the Fences* by Gordon Goodwin's Big Phat Band (an 18-piece swing band with a modern feel) was reproduced in all its glory at realistic sound-pressure levels, with no dynamic compression or any sensation that the amplifier was leaving its comfort zone. (This disc's compositions, arrangements, musicianship, and recording quality are all phenomenal, by the way.)

Conclusion

The Simaudio 600i is simply a great product in every way—design, execution, tactile feel, ergonomics, and musical expressiveness. The sonic presentation hit all the audiophile criteria—outstanding dynamics and bass, low levels of timbral coloration, spectacular soundstaging—but the 600i went beyond these specific performance attributes to deliver a truly compelling music experience. I was particularly struck by the 600i's ability to “rise to the occasion” when placed in a system of world-class source components and loudspeakers. Switching from the B&W 802D to the nearly six-figure Rockport Altairs, the 600i showed me more of the amplifier's strengths rather than exposing its limitations.

If you want the sound quality of a separate preamplifier and power amplifier in a compact, beautifully engineered package, I can't think of a better choice than the Simaudio 600i.

Sidebar: Inside the 600i

The 600i features innovative circuits, many custom parts, and absolutely first-class execution. Starting with the metalwork, the chassis is both beefy and elegant. The front panel is flanked by curved aluminum “cheeks” that soften the chassis's appearance so that it doesn't look like a box. Insets in the chassis' four corners provide room for rounded triangular pillars. These pillars, machined from solid aluminum extrusions, are threaded to accept sharply pointed cones. The 600i can be ordered in a range of finish options for the front panel, cheeks, and pillars (independently), allowing you to customize the amplifier's look. The volume control is a large knob, again machined from aluminum. The casework is absolutely first-rate, structurally and visually. The entire chassis is machined and built in-house in Simaudio's factory.

This elaborate approach extends to the 600i's electronic design and execution. The unit is dual mono, meaning that the left and right channels are completely separate from one another. Some "dual-mono" amplifiers have separate left- and right-channel audio circuits, but share a power supply. Not the 600i; it features two massive toroidal transformers, one for each channel. The heart of any power amplifier is the power transformer, and here the 600i cuts no corners. The generously rated transformers are custom-designed specifically for Simaudio. Once you see these transformers, it will come as no surprise that the 600i can double its four-ohm power rating compared to the eight-ohm rating. This ability to double the power as the impedance is halved suggests that the amplifier has robust current delivery, a quality that requires a substantial power supply (as well as current capacity of the output transistors and sufficient heatsinking).



Speaking of output transistors, Simaudio doesn't use off-the-shelf devices. Instead, it has contracted with a semiconductor manufacturer to make a custom transistor designed specifically for audio. These custom transistors reportedly are designed for greater gain linearity; that is, their gain stays constant regardless of the amount of current flowing through the transistor. The transistors also

have tighter gain tolerances from unit to unit, resulting in better matching between all the transistors in the output stage. The output stage, which comprises four output transistors per channel, is biased to deliver up to 5Wpc of Class A power before switching to Class AB operation.

In addition to being dual mono in overall architecture, the 600i is also fully differential (balanced), meaning that there are two audio signal paths for each channel. Each of these signal paths carries one half of a balanced signal. This approach requires double the number of parts compared with a conventional design. Moreover, the parts in the two halves of a balanced circuit must be precisely matched to each other, which adds further expense to the technique. The advantages include lower noise and greater headroom.

The 600i's front-panel volume control doesn't adjust the volume directly. Rather, it is connected to an optical encoder that sends a digital signal to an MDAC (Multiplying Digital-to-Analog Converter). The MDAC is a chip incorporating resistor "ladders" just as in a PCM DAC. The optical encoder sends a digital "word" to the MDAC that represents the volume control's setting. This digital data determines which of the precision resistors in the MDAC are engaged, which, in turn, determines the signal level. It's like a discrete switched-resistor volume control, but with the resistors in an integrated circuit and under digital, rather than mechanical, control. Note that the audio signal remains in the analog domain; the digital aspect of the volume control simply controls which resistors are engaged. Simaudio's implementation is based on the Texas Instruments DAC8812 which provides 530 discrete volume levels as well as differential operation. Each channel is controlled by its own DAC8812s. The volume resolution is 1.0dB at volume settings below 30 (as indicated on the front-panel display) and 0.1dB at setting above 30. Simaudio calls this circuit M-eVOL2. The M-eVOL2 replaces the original M-eVOL volume control, and reportedly offers a 10dB improvement in signal-to-noise ratio, better matching between left and right channels, wider bandwidth, and the ability to provide volume steps of 0.1dB (rather than 0.5dB). The M-eVOL2 is an attempt to approach the performance of Simaudio's M-Ray discrete switched-resistor network volume control in a more cost-effective implementation.

The circuit boards are four-layer for shorter signal paths and lower noise. In a four-layer board, one of the layers is typically ground, one carries DC power to the circuit, and two are for signal. This is a more expensive approach than a conventional two-layer board, which requires more complex signal paths on the board. Moreover, the ground plane of a four-layer board acts as a shield for the audio circuitry.

The entire circuit is direct-coupled (no DC-blocking capacitors in the signal path). Finally, the 600i employs no global feedback. Despite the lack of global feedback, the 600i has a very low output impedance (0.03 ohms) and high damping factor.

SPECS & PRICING

Configuration: Fully balanced, dual-mono

Output power: 125Wpc into 8 ohms, 250Wpc into 4 ohms

Inputs: Four unbalanced on RCA jacks, one balanced on XLR jacks

Volume steps: 1.0dB from 0-30 and 0.1dB from 30-80

Dimensions: 18.75" x 4" x 18.1

Weight: 48 lbs.

Price: \$8000

Associated Components

DALI Minuet, B&W 802D, and Rockport Altair loudspeakers; Meridian 808.3 and Meridian Sooloos system, dCS Puccini/U-Clock, and Berkeley Audio Design Alpha DAC, custom fanless and driveless PC server with Lynx AES-16 card digital front-ends; Basis Inspiration turntable with Basis Vector 4 tonearm, Air Tight PC-1 Supreme cartridge; Aesthetix Rhea Signature phonostage; Shunyata V-Ray V2 and Audience aR12t power conditioners; Shunyata CX-series AC cords; AudioQuest WEL Signature and Wild interconnects, Transparent XL Reference interconnects; AudioQuest Wild and Transparent XL Reference loudspeaker cables; Billy Bags equipment racks.