

Moon by Simaudio Neo 340i integrated amplifier

By Herb Reichert • Posted: Mar 3, 2016



August 26, 1944: The liberation of Paris. Imagine ranks of tattered Canadian soldiers marching past the Moulin Rouge à Paris. The voice of Édith Piaf singing "Ou sont-ils, mes petits copains?" (Where are my boyfriends?). Maurice Chevalier crooning "Ça sent si bon la France" (It smells so good in France). A Canadian army tank with the words *Kaput* and *Finito* painted in white above the word *Montréal*, motoring past the Eiffel Tower. Remember the fresh, celebratory taste of fine Champagne.

This was the place, the mood, the reverie with which I began my examination of Simaudio's Moon Neo 340i integrated amplifier. Why? Because Canada's contributions to the Allied Forces and to perfectionist audio are underappreciated. Because French is the official language of Boucherville, Quebec, where Simaudio Ltd. has its factory. And because Paris and Canada are two of the places I have most visited, most explored, and most loved—in real life, in memories, and in dreams.

The first song I remember playing through the Moon Neo 340i was "Paris," sung by Piaf on *Edith Piaf* (LP, EMI/Music for Pleasure MFP 5046). The sound of the barrel organ and accordion accompanying The Little Sparrow seemed so tangible and direct that it took my mind immediately to Montmartre: to cobblestones, dancing poodles, and organ grinders. Even before Piaf began singing, I recognized the Neo 340i's exceptional ability to dig straight through to the microphone(s) and recording venue. I knew immediately that listening to the Neo would be like drinking Bollinger Grande Année Brut 2002 (\$120/750ml).

Along with the Neo, I was using a [Pioneer PLX-1000 turntable](#) with Ortofon 2M Black cartridge, and [Magnepan .7](#) loudspeakers. When *la grande* Piaf whispered into the mike as a drum *tap-tap-tapped* in the distance behind her, I locked in completely: In my mind, the dark space between the Édith and the drum was charged—with dim light, dust, and smoke. I could sense the height of the drum from the hard floor.

I was listening to a performance recorded in 1949!

That, my dear readers, is the nature of this vivid French studio recording, the diminutive French songbird, *and* the sparkling *brut* clarity provided by the Moon Neo 340i driving the Magnepan .7s.

Description

One reason the Magnepan .7s played so well with the Simaudio integrated is that Magnepan speakers prefer amplifiers that double their rated output into 8 ohms when presented with a 4-ohm load—as does the Neo 340i, which is specified as producing 100Wpc into 8 ohms or 200Wpc into 4 ohms. The Maggies' infamous hunger for current was satisfied by the 340i's ability to continuously deliver up to 30V at 12 amps, with 22-amp peaks. The Neo 340i uses four bipolar transistors per channel, operated in class-A for the first 5W, and in class-AB for all subsequent joules per second.

I am a slow-working audio reporter. I need months—sometimes a year—to get a proper feel for a product. This is especially true with integrated amplifiers, because today's models can be heavily laden with features, each of which takes time to appreciate. The Moon Neo 340i has been in and out of my system for more than a year—so long that I had to upgrade its DAC and firmware to finish this review. The basic 340i, without phono stage or DAC module, can be had for \$4700. Later, you can add a moving-magnet/moving-coil phono stage (\$400) and/or a DSD DAC (\$900). That's \$6250 for *Lune Ô la carte*. Or you can buy a 340i that includes all of these options—Simaudio calls the package the D3PX—for \$5800. Simaudio sent me the D3PX edition.



The Moon Neo 340i D3PX is a textbook example of a contemporary, top-quality, full-featured integrated amplifier. On its backside are four analog RCA inputs, one of them dedicated to the phono board, and four digital inputs: TosLink, two S/PDIF RCAs, and USB. There are two line-level (RCA) analog outputs: one fixed, the other variable. Standard features on all Neo 340i amps include: SimLink, to provide two-way communication among various Simaudio Moon components, including the [MiND streamer](#); a 12V trigger; a RS-232 port for custom installation, bidirectional feedback, and firmware updates; and an IR port for external control.

On the Neo 340i's classy-looking signature faceplate are a ¼" headphone jack and a 1/8" Media Player (MP) input jack. Just above those are two buttons: Spk Off, which turns off the output signal to the speakers when you're using headphones; and Mute, which switches off the output signal to everything, including the fixed and variable RCA outputs.

To the left of the central, red-lit display is a cluster of five buttons. At the top is Standby, which disengages the input section from the remainder of the 340i's circuitry, though all circuits remain powered up. Just below that are buttons to engage the MP input and to turn the display off and on, and below those are two more, for toggling between input options.

Page 14 of the Neo 340i's manual is dedicated to the operation of its remote control. At the bottom, it states: "NOTE: The buttons labeled don't affect the operation of the 340i." Immediately, I knew: Simaudio has done this only to annoy me. *Boooo! Hiss! Grrrr!*

With speakers: Magnepan .7

The more I use the [Magnepan .7s](#) (\$1400/pair), the more I love them. Their extraordinary imaging, sweetness of tone, and down-to-earth naturalness are the antitheses of all things mechanical and "hi-fi." I believe that they are among the best speakers available today, at any

price. The planar-magnetic, flat-panel .7s do what stand-mounted box speakers don't: They move copious amounts of air. Each speaker has 400 square inches of driving surface—eight times more than an 8" woofer, and more than 16 times as much as a 5.5" mid/woofer like the one in [KEF's LS50](#). Moving that much air energizes a small room like mine in a way that lets me really *feel* the sound. Bass may not go very low, but it's present in the room with me, touching me physically. Little boxes can give the *idea* of bass—a simulacrum—but never bass that touches your skin. The Magnepan sound is always more tactile, more of the senses, than what I experience with little box speakers, whose sound is always more of the mind.

When I used the Moon and the Maggies to listen to my swamp-blues buddy Slim Harpo sing "I'm a King Bee" and "Rainin' in My Heart," from his first album, *Slim Harpo Sings "Raining in My Heart . . ."* (LP, Excello LP-8003), my room felt awash with rich, pulsing molecules of bass and midrange energy. The high frequencies were vaporous, but precise and wonderful. The Simaudio's apparent speed and transparency tamed the Magnepan's inherent sweetness to the point where the .7s began to sound like the high-resolution transducers they are. The reverb added to Harpo's seductive voice in this 1961 recording had an enticing presence of its own. Music emerged with such clarity and ease that I became relaxed and happy. This deeply satisfying amp-speaker pairing reproduced all types of music with charm and authority.

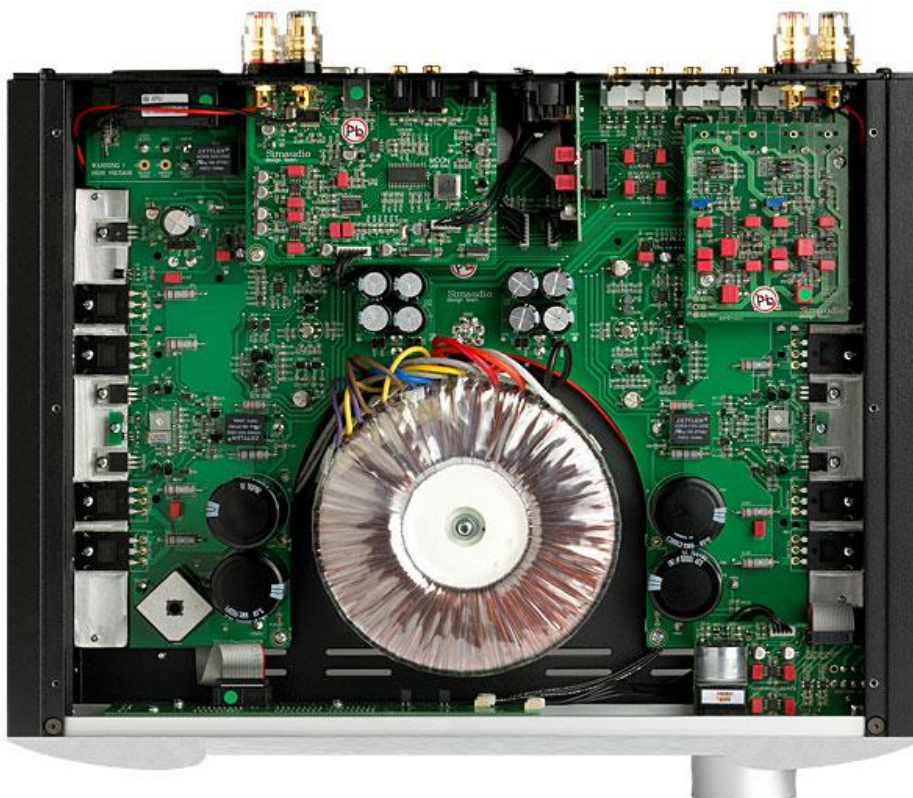
With speakers: Technics SB-C700

The fast, neutral sound of the Moon Neo 340i was enhanced by the low-distortion naturalness of Technics' SB-C700 stand-mounted minimonitors that I [reviewed in January](#). I played Claude Debussy playing Claude Debussy, with soprano Mary Garden, from *Claude Debussy: The Composer as Pianist*. 18 selections recorded for M. Welte & Sons in Paris, in 1904 and 1913 (CD, Pierian 0001). I have revered this disc, and Debussy's unusual pianism, ever since its release, in 2000. The Moon and Technics have now made it my new religion.

This supremely crafted Welte-Mignon piano-roll recording was made using a finely tuned and restored Feurich-Welte piano playing laboriously rerecorded rolls from the collection of Dick and Helena Simonton, recorded in stereo using two Neumann KM 83 microphones. The results of all this love and labor are a stupefyingly real AAD recording that appears to capture every nuance of the French master's touch, pedaling, and expression. Debussy's deliberateness, hesitancy, and eccentric tempos in his *La cathédrale engloutie* seem more flesh-and-blood soulful than most pianists now living can muster on their best day at the keyboard. The Welte-Mignon

recording piano even captured Debussy's *half-pedaling!*

This was another deeply satisfying combination of amplifier and speakers.



Phono Stage: Moving-magnet

If I could revive Josef Hofmann or Ignace Jan Paderewski, how close to their pianos would I like to sit? After a lifetime of wondering, I have concluded that I like close: front-row close. I want to see the pianist's knees move as he works the pedals. I want to hear the felts and keys returning to rest. I enjoy the affective reality of the player working the whole instrument. Which is exactly what I experienced listening to and watching, from the second row, Keith Jarrett at Carnegie Hall. I was staring up at Jarrett's knees and the bottom of the soundboard. I watched his feet stomp from about 30' away. This intimacy let me experience his playing with my entire body. His wayward affectations drew me in much better than if I'd been sitting in a balcony box.

Listening at home, I desire that same intensity and artistic presence. Happily, I received a nice measure of it when listening to Jarrett's [Concerts Bregenz München](#) (3 LPs, ECM-3-1227). I couldn't see Jarrett's knees, but I could hear his head and voice moving above the keyboard. I could hear his shoes on the pedals.

Vicissitudes of Power

The aspect of recorded music that is most affected by preamplifiers and power amplifiers is its viscosity—*ie*, how thick or thin or transparent the music sounds. This in turn affects grain, contrast structure, and, especially, musical *flow*. The perceived viscosity or plasticity of an audio amplifier's sound lies typically in its internal impedances, time constants, bandwidth, and voltage plus current capabilities. Musical viscosity also depends on the designer's choice of resistors, capacitors, regulators, and transformers.

I mention all this because it sounded to me that the Simaudio design team has made some sophisticated viscosity-oriented design choices that have resulted in audio products, like the Moon Neo 340i, of unique transparency and fluidity.

Phono Stage: Moving-coil

I change phono cartridges often. Therefore, I'm always happy when an integrated amplifier includes choices of gain (40 or 60dB) and loading (100 ohms or 47k ohms plus 0pF or 100pF), as does the Moon Neo 340i D3PX. Simaudio uses active circuitry—as opposed to transformers—for the extra gain.

Unlike most phono stages, in which choices of amplifier gain and cartridge loading are made with little switches or buttons, the Neo 340i's phono stage requires that you (or your dealer) remove the amp's top plate and reposition separate right- and left-channel jumper blocks for each choice. I know, it sounds tricky, maybe even dangerous—but it's not. It's simple, almost foolproof, and explained very clearly in the manual. The whole procedure took me less than 10 minutes, and its simplicity gave me the opportunity to experiment and be fickle.

Most important, the results were worth the effort: The sound quality of the 340i's \$400 phono-stage option (less, of course, if it's ordered as part of the entire D3PX package) is so ridiculously good that I doubt most users will ever want further upgrades. If they do, Simaudio's Moon Evolution line offers three standalone phono stages, the 310LP (\$1800), 610LP (\$7500), and 810LP (\$13,000).

My only complaint: My [Zu Denon DL-103](#) cartridge was not perfectly happy with the Neo 340i. The Zu's 40-ohm impedance plays more naturally and in a more relaxed manner into 470 or 1000 ohms than into either of the 340i's choices of 100 ohms or 47k ohms. Into 47k, the Zu was too uptight.

Meanwhile, the 6-ohm internal resistance of my Jasmine Turtle cartridge was more than happy with the Neo 340i's 100-ohm setting. It played stronger, cleaner, and with more detailed bass than it had with any other phono stage I have in the bunker. (My review of the Turtle moves slowly forward . . .)

DSD DAC

Last July, Simaudio introduced an upgrade for the Moon Neo 340i's DAC that improved on what I'd already felt was the 340i's strongest asset. My review sample's original DAC was fast and sure, open and clear, with bass that played exactly as it should. But compared to my reference D/A converter—[Halide's DAC HD](#) (\$495), which always sounds warmly detailed, juicy, and alive—the Neo 340i's original DAC sounded a bit brisk and chilly, like a cloudless November day. The new DSD DAC demonstrated increases in neutrality and materiality, and felt a bit bolder, yet more at ease.

I believe strongly in the importance of high-end audio dealers. The future and quality of our sacred hobby rests squarely on their shoulders. If you buy an amp or speaker on the Internet and it sounds bad in your listening room, you have no one to blame but yourself. Worse, you have no one who cares, or wants to help you. But high-end audio salespersons are there to be exploited as teachers, oracles, lifestyle consultants—and maybe even friends.



I mention this because I did not feel confident in my ability to install the 340i's new DAC board and do the necessary firmware upgrade. So I took my review sample to the charming and knowledgeable Michael Toto, of New York's famous Stereo Exchange. The upgrade process began with his welcoming smile, included a lot of impassioned jabber about headphones, amps, and speakers, and ended with my satisfied grin and a handshake. Dealers rule!

Headphones

Like a hooded monk with an inkwell, I spend my days sitting at a desk, writing and imagining. My hood is a pair of headphones—I listen to Tidal, and play my diverse collection of files downloaded from HDtracks. I enjoy the LSD intensity of listening through high-quality earspeakers. I find that headphones force my ADHD mind to focus—and remain focused—better than do speakers *en l'air ouvert*. For several months now, Simaudio's Moon Neo 230HAD headphone amplifier (\$1500 with DAC) has been firmly ensconced in my desktop reference system. While the 230HAD plays with a tighter, breathier, and punchier authority than the 340i's headphone output, the 340i exhibits a similar (but more softly-focused) clarity that flatters the female voice more than the male.

Through the 340i and [AudioQuest NightHawk](#) headphones, I'm now listening to "High on a Mountain," from the New Appalachians' *From the Mountaintop* (24-bit/192kHz, Chesky). This bluegrass standard by Ola Belle Reed is such a mournful lament—"High on a mountain standing all alone / wondering where the years of my life have gone"—that it chokes me up every time I play it. The luminous recording of this group—which features the girl I want to run away with, singer Noah Wall—is a potent mix of musical and recording artistry. With the 340i

headphone stage, I felt like Noah Wall was standing directly in front of me; I could have reached out and touched the mandolin and violin players with my left and right hands respectively. Chesky's binaural imaging was accurately described, but the roadhouse punch was missing.

With the [Audeze EL-8s](#), the plucked bass was soft and overly warm. Wall's vocals were nicely textured but less "in-the-room" than with the 230HD. The highs were sometimes quite attractive and non-fatiguing—but neither precise nor extended.

Unlike the 340i's phono stage and DAC, which are extraordinary enough to satisfy over the long haul, I suspect most high-end headphone junkies will feel the need for a better-quality headphone stage. If so, Simaudio is ready: the 230HD (\$1500 w/DAC) and 430HA (\$3500–\$4300) would be natural choices.

Comparison: Rogue Audio Sphinx

As I have with the Magnepan .7s, I've been constantly rediscovering how just how much I love Rogue Audio's Sphinx integrated amplifier, the very first product I reviewed for *Stereophile* in [August 2014](#). Folks, this baby jumps, thumps, and sings as it has no right to for \$1295. But the Moon Neo 340i showed me exactly what I should expect for not quite four times the Sphinx's price: The Neo 340i delivered levels of microdetail, refined transparency, and mercuric nimbleness the Rogue can only hint at. The Moon described a recorded soundspace with the kind of tactile precision delivered by only the most expensive amplifiers. While the Sphinx plays the lowest octaves with masterful ease, the Neo showed me bass notes in full—unblurred and ungeneralized, from start to finish.

Comparison: Hegel Music Systems H160 and Line Magnetic LM-518IA

The [Hegel Music Systems H160](#) (\$3500) is a bold mountain climber of an integrated amplifier. Well trained and strong, it conquers your speakers with adolescent eagerness. But! The H160 plays music with a kind of bourgeois moderation that makes me yearn for a more bohemian libidinousness. Similarly, the Simaudio Moon Neo 340i's well-manicured precision made me wish for an occasional taste of slutty voluptuousness. On those days, I switched to the [Line Magnetic LM-518 IA](#) (\$4400). Neither the Hegel nor the Simaudio could match my Line Magnetic for brilliant Van Gogh colors, verdant textures, or riotous debauchery.

60% pinot noir, 40% chardonnay

While it plays music beautifully, it's unlikely that the Simaudio Moon Neo 340i integrated amplifier was created for the inexperienced audiophile. Its virtues are substantial and varied, but much of its wonderfulness is subtler than my descriptions suggest. The character of its lively sound was strong—but a *quiet* strength. None of its charms jumped out and mugged me. It danced and sang well, but at its core, the Neo 340i was really about refinement and consistency. Through it, music sounded fresh and subtly articulated, always in good balance and proportion. Like Marantz's classic tube gear, which it resembled in sound and appearance, this integrated amplifier was created for audio cognoscenti—those who know how rare a really well-engineered amp actually is. For these reasons, I believe the Moon by Simaudio Neo 340i will hold its value: The way it satisfied this listener with its Champagne Brut audio aesthetic should never go out of fashion. Confidently recommended.

Description: Solid-state integrated amplifier. Analog inputs: 1 XLR, 4 RCA, 3.5mm Media Player. Optional digital inputs: optical, 2 coaxial, USB. Optional phono inputs: 47k ohms input impedance (moving-magnet), 100 ohms or 47k ohms input impedance (moving-coil). Analog outputs: fixed, variable (both RCA). 1 pair speaker outputs. Headphone output: 0.25" phone plug. Rated output power: 100Wpc into 8 ohms (20dBW), 200Wpc into 4 ohms (17dBW).

Dimensions: 16.7" (429mm) W by 3.5" (89mm) H by 14.7" (376mm) D. Shipping weight: 28.6

lbs (13kg).

Finishes: Black standard; Silver, Two-Tone available via special order.

Serial number of unit reviewed: 07022324.

Price: \$4950. Options: MM/MC phono stage, \$400; DSD DAC, \$900; D3PX edition (all options included), \$5800. Approximate number of dealers: 80. Warranty: 10 years.

Manufacturer: Simaudio Ltd., 1345 Newton Road, Boucherville, Quebec J4B 5H2, Canada.

Tel: (450) 449-2212. US: Simaudio Ltd., 2002 Ridge Road, Champlain, NY 12919.

Web: www.simaudio.com.

Associated Equipment

Analog Sources: [Pioneer PLX-1000](#) turntable, Ortofon 2M Black cartridge; [Thorens TD 124 Mk.I](#) turntable, [Abis SA 1.2](#) tonearm, [Zu Denon DL-103](#) or Jasmine Turtle cartridge; Technics SL1200 Mk.2 tonearm, SME M2-9 tonearm, [Soundsmith Carmen](#) or [Shure SC35](#) cartridge; [VPI Scout Jr.](#) turntable, [Ortofon 2M Red](#) cartridge.

Digital Sources: Onkyo Integra DPS-7.2 disc player, [Halide DAC HD](#) DAC.

Preamplification: Intact Audio step-up transformer; [Blue Horizon Ideas Profono](#), [Schiit Audio Mani](#) phono stages.

Integrated Amplifiers: [Hegel Music Systems H160](#), [Line Magnetic LM-518 IA](#), PrimaLuna ProLogue Premium, [Rogue Audio Sphinx](#).

Headphone Amplifiers: Audeze Deckard, Linear Tube Audio microZOTL, Schiit Audio Asgard, Simaudio Moon Neo 230HAD.

Headphones: AKG K812, [Audeze EL-8](#), [AudioQuest NightHawk](#).

Loudspeakers: [Dynaudio Excite X14](#), [Falcon Acoustics LS3/5a](#), [KEF LS50](#), [Magnepan .7](#), [Technics SB-C700](#).

Cables: Speaker: AudioQuest Type 4, Auditorium 23, Kimber Kable 8TC. Interconnect: AudioQuest Big Sur & Cinnamon & Golden Gate, Auditorium 23, Kimber Kable Silver Streak.

Accessories: Sound Anchor stands, Moongel stylus cleaner, Dr. Feickert Analogue cartridge-alignment protractor.—**Herb Reichert**

Measurements

I performed a full set of measurements on the Simaudio Moon Neo 340i using my Audio Precision SYS2722 system (see the January 2008 [As We See It](#)"). I looked first at the behavior of the optional digital-input board, using either S/PDIF data sourced from the Audio Precision via optical or coaxial links, or USB data from my Mac Book Pro running on battery power. To avoid overloading the power-amplifier section, I switched the loudspeakers off and looked at the signals at the fixed line-output jacks. The TosLink input locked to data with sample rates up to 96kHz, the coaxial inputs to data sampled at all rates up to 192kHz. Apple's AudioMIDI app revealed that the Neo 340i operated with 32-bit integer data at all sample rates from 32 to 384kHz. The USB Prober utility identified the Simaudio as the "MOON USB DSD HD Audio" from "Simaudio Ltd.," and confirmed that its USB input operated in the optimal isochronous asynchronous mode.

The digital input preserved absolute polarity (*ie*, was non-inverting) at both the line and speaker outputs. A 1kHz tone at 0dBFS gave rise to a level of 1.89V at the line output, though with the volume control set to its maximum, digital data at -12dBFS resulted in a level just below clipping. The impulse response with 44.1kHz data (fig.1) revealed that the Neo 340i's reconstruction filter was a conventional FIR type with a sharp rolloff above 20kHz with 44.1kHz

data (fig.2, red and magenta traces). The aliasing product of a full-scale tone at 19.1kHz at 25kHz (blue and cyan traces) is suppressed by 85dB, and the harmonics of the fundamental tone are all very low in level.

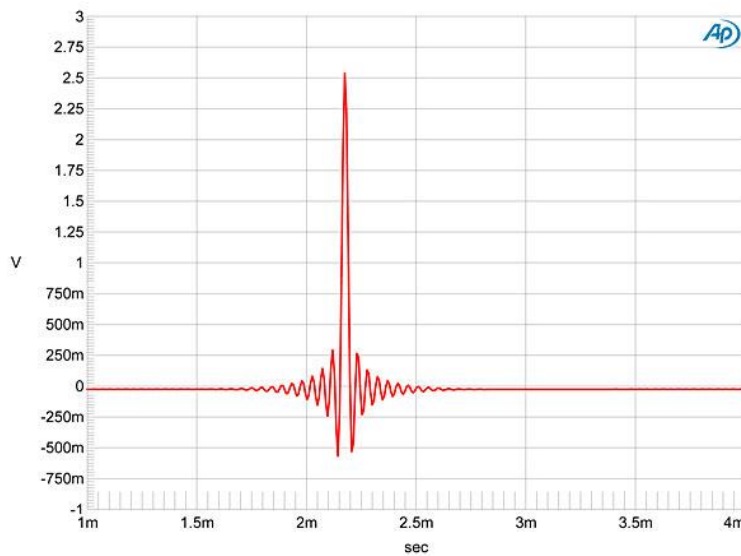


Fig.1 Simaudio Moon Neo 340i, S/PDIF input, impulse response, 44.1kHz data.

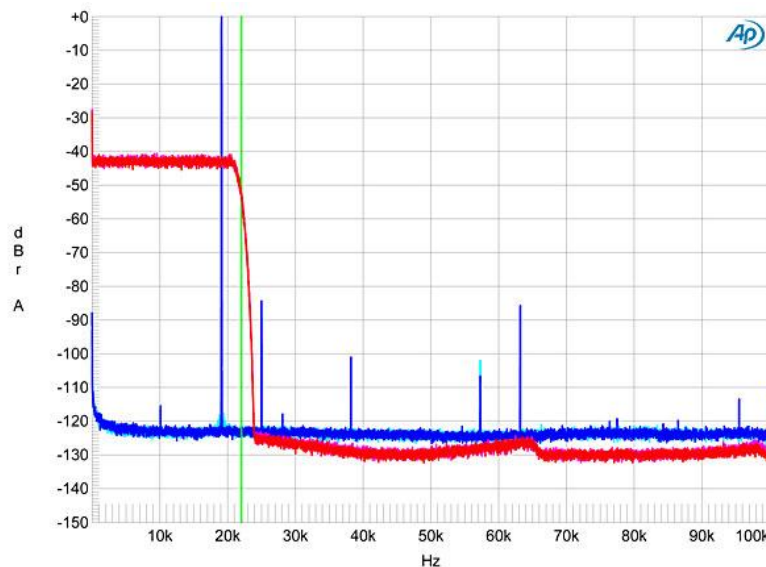


Fig.2 Simaudio Moon Neo 340i, S/PDIF input, wideband spectrum of white noise at -4 dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan), with data sampled at 44.1kHz (20dB/vertical div.).

Fig.3 shows the digital module's frequency response with data sampled at 44.1, 96, and 192kHz. There is a slight imbalance between the channels, but the responses follow the same basic shape, with a sharp rolloff just below half of each sample rate. With 384kHz data, the response followed the same shape as the 192kHz traces, but with extended output above 96kHz, reaching -10 dB at 160kHz. Channel separation via the digital inputs was excellent, at 105dB below 1kHz and still 85dB at the top of the audio band. Noise levels were also low for digital input signals, so that increasing the bit depth from 16 to 24 with dithered data representing a 1kHz tone at -90 dBFS dropped the noise floor by almost 20dB (fig.4), implying resolution of at least 19 bits. Some low-level, supply-related spurious are visible in this graph, but overall the noise floor is sufficiently low that the Simaudio's reproduction of an undithered 16-bit sinewave at exactly -90.31 dBFS was essentially perfect (fig.5). With undithered 24-bit data, the result was a well-formed sinewave (fig.6).

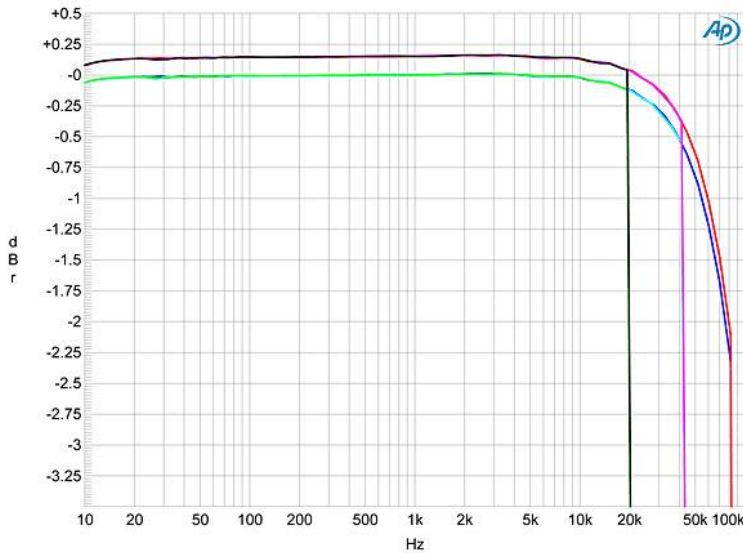


Fig.3 Simaudio Moon Neo 340i, S/PDIF input, frequency response at -12dBFS into 100k ohms with data sampled at: 44.1kHz (left channel gray, right green), 96kHz (left cyan, right magenta), 192kHz (left blue, right red) (0.5dB/vertical

Fig.4 Simaudio Moon Neo 340i, S/PDIF input, 44.1kHz data, spectrum with noise and spuriae of dithered 1kHz tone at -90dBFS with: 16-bit data (left channel cyan, right magenta), 24-bit data (left blue, right red) (20dB/vertical div.).

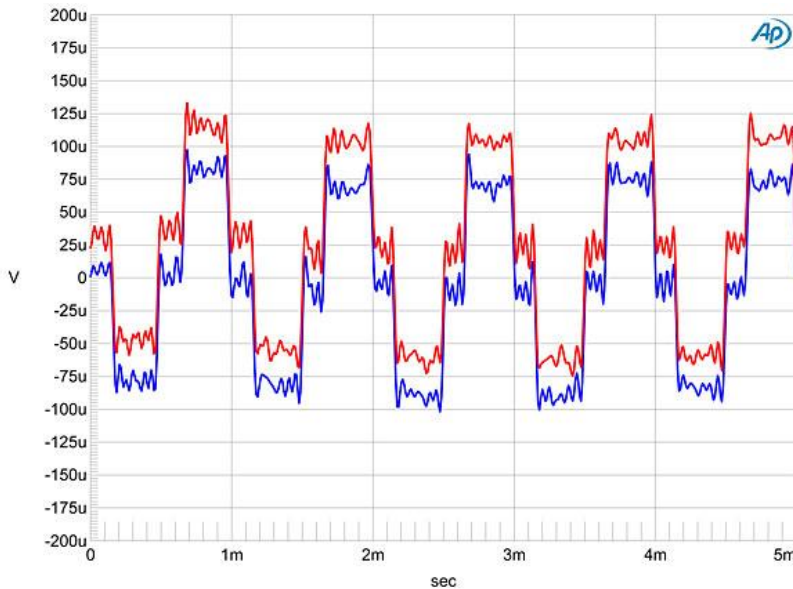
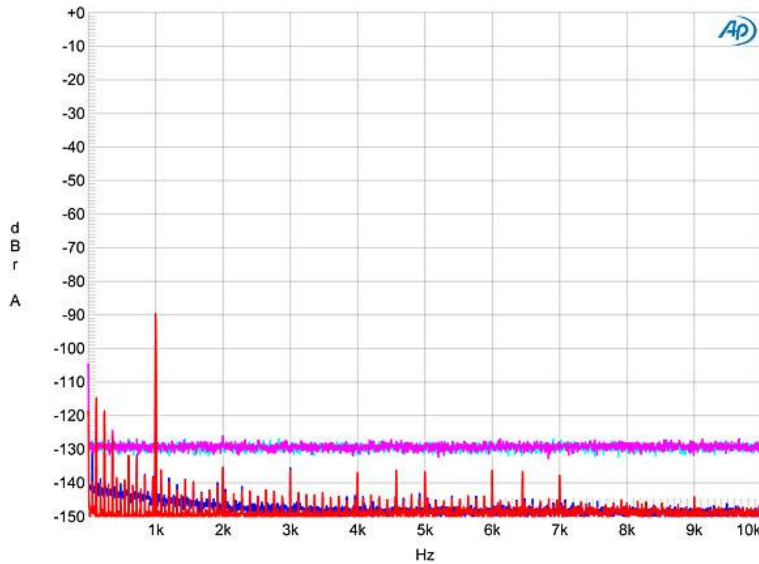


Fig.5 Simaudio Moon Neo 340i, S/PDIF input, waveform of undithered 1kHz sinewave at -90.31dBFS , 16-bit data (left channel blue, right red).

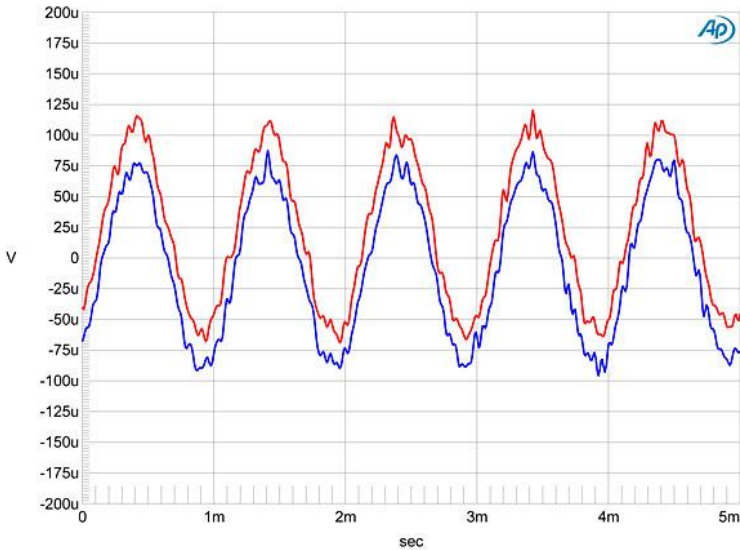


Fig.6 Simaudio Moon Neo 340i, S/PDIF input, waveform of undithered 1kHz sinewave at -90.31dBFS , 16-bit data (left channel blue, right red).

As implied by the blue and cyan traces in fig.2, the Simaudio's digital module produced very low levels of harmonic distortion, with the third harmonic the highest in level, at just -106dB (0.0005%, fig.7). Intermodulation distortion was similarly low, and the digital module offered superb rejection of word-clock jitter via both

its TosLink (fig.8) and USB inputs (fig.9).

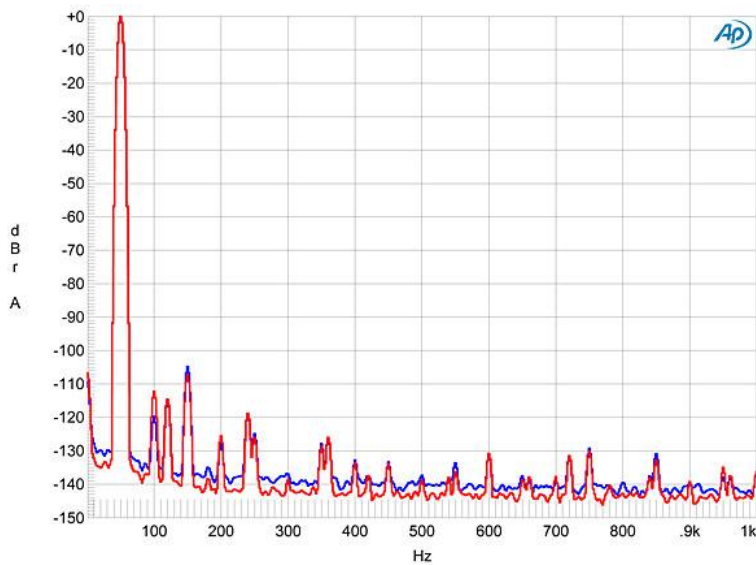


Fig.7 Simaudio Moon Neo 340i, S/PDIF input, spectrum of 50Hz sinewave, DC–1kHz, at 0dBFS (linear frequency scale).

Fig.8 Simaudio Moon Neo 340i, S/PDIF input, high-resolution jitter spectrum of analog output signal, 11.025kHz at -6dBFS , sampled at 44.1kHz with LSB toggled at 229Hz: 16-bit data (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, $\pm 3.5\text{kHz}$.

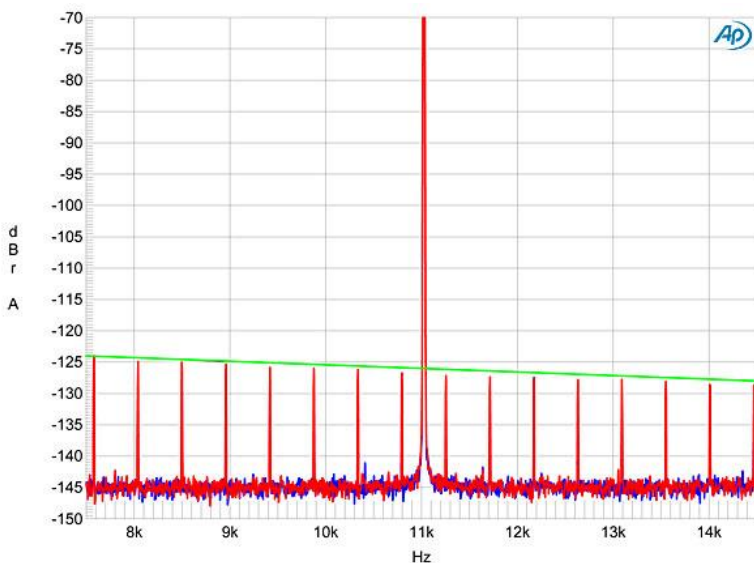
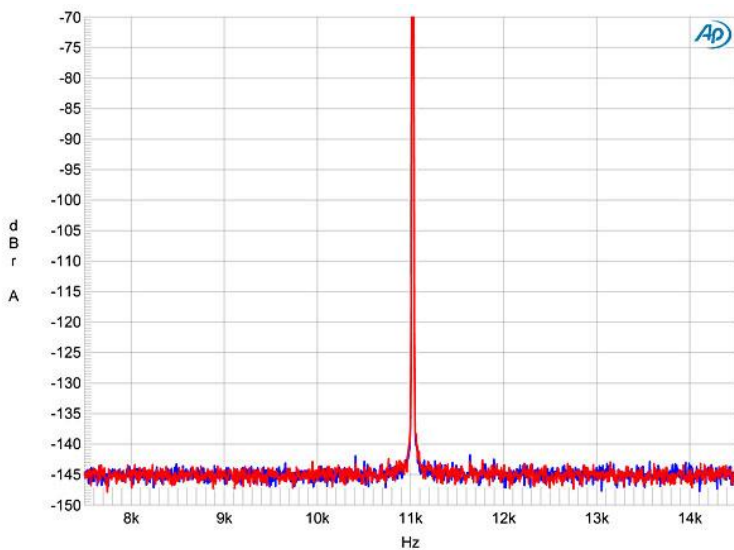


Fig.9 Simaudio Moon Neo 340i, S/PDIF input, high-resolution jitter spectrum of analog output



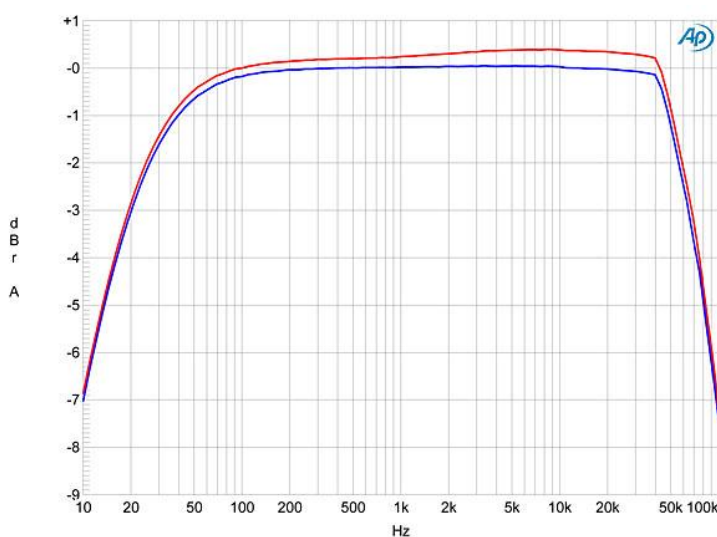
signal, 11.025kHz at -6dBFS , sampled at 44.1kHz with LSB toggled at 229Hz: 24-bit data (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, $\pm 3.5\text{kHz}$.

The optional phono stage offered 39.65dB of gain measured at the fixed line-output jacks when set to MM (moving magnet), 57.65dB of gain when set to MC (moving coil). With the volume control set to its maximum and the phono stage set to MC, a 1kHz tone at 1mV resulted in a level of 4.56V at the speaker outputs; *ie*, a total gain of 73.2dB. The phono module

preserved absolute polarity in both MM and MC modes, and the input impedance at 1kHz was 46k ohms at 1kHz when set to "47k," or 101 ohms when set to "100." The input impedance at the frequency extremes was not appreciably different from that at 1kHz. (For these measurements, the input capacitance was set to "0pF" for both modes.)

The RIAA error was very small (fig.10), though the right channel was very slightly higher in level than the left. Both channels featured a low-frequency response that was down by 3dB at 20Hz. Channel separation via the phono inputs was good, at $>60\text{dB}$, and the unweighted, wideband signal/noise ratios were also good, at 78dB (MM, ref.1kHz at 5mV) and 61dB (MC, ref. 1kHz at 500 μV), both measured with the input shorted. The A-weighted ratios were even better, at a respective 86.5 and 75.3dB. (All figures are the average of the two channels.)

Fig.10 Simaudio Moon Neo 340i, phono input, response with RIAA correction (left channel blue, right red) (1dB/vertical div.).



At normal levels, the 340i's phono module offered very low levels of harmonic distortion (fig.11) and intermodulation distortion (fig.12). However, while the overload margins were very high at low and middle frequencies, at at least 25dB (MM) and 29dB (MC), these dropped at 20kHz to just 7dB (MM) and 11dB (MC). (All figures referred to 1kHz at

Fig.11 Simaudio Moon Neo 340i, phono input, spectrum of 1kHz sinewave, DC–10kHz, at 1V into 100k ohms (linear frequency scale).

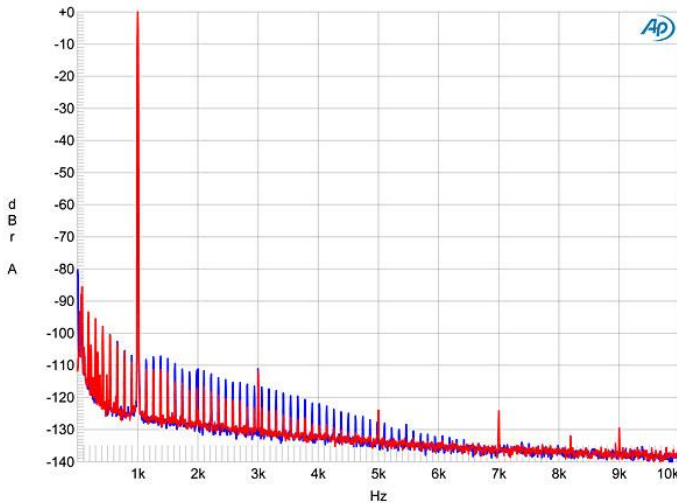
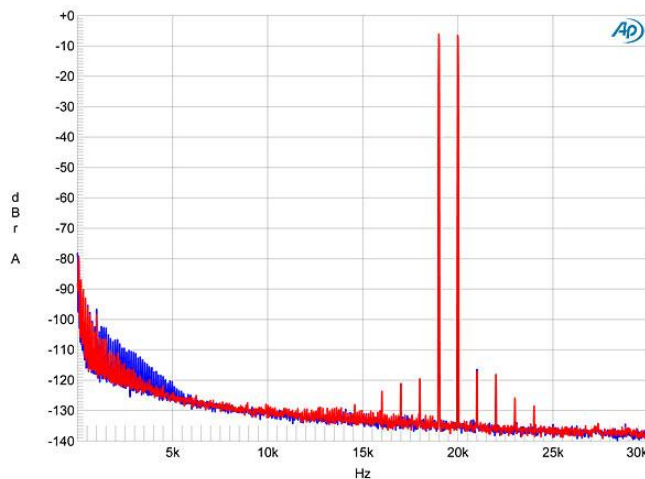


Fig.12 Simaudio Moon Neo 340i, phono input, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 1V peak into 100k ohms (linear frequency scale).

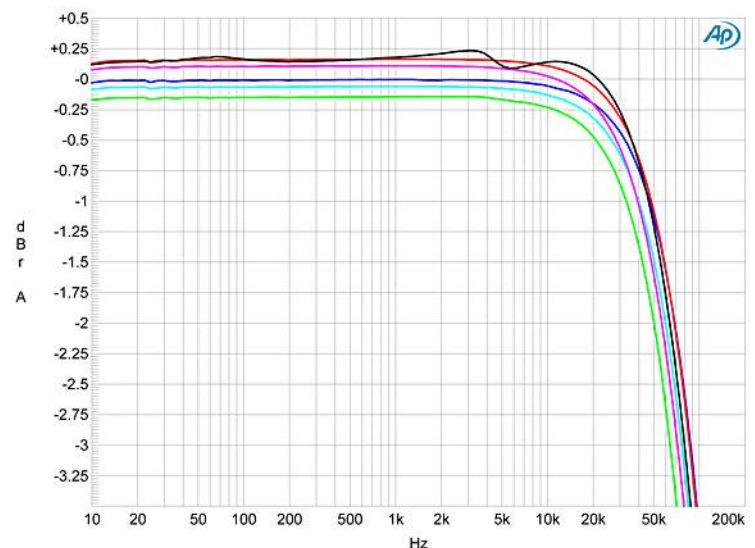


The amplifier as a whole offered a moderate 35.2dB of gain at 1kHz into 8 ohms for both its balanced and unbalanced line-level inputs, and both sets of inputs preserved absolute polarity. While the balanced input impedance was high, at 44k ohms at all audio frequencies, the unbalanced input impedance was relatively low, at 7200 ohms at 20Hz and 1kHz, dropping to just 5200 ohms at 20kHz. (The input impedance was specified as 11k ohms in the online version of the manual, but 22k ohms in the printed manual that accompanied the review sample.) As a result, a tubed source with a high output impedance at low frequencies might sound a little lean.

The output impedance at the line-output jacks was a low 100 ohms at all audio frequencies. Measured at the speaker outputs, it was a very low 0.05 ohm at low and middle frequencies (including the series

resistance of 10' of speaker cable), rising inconsequentially to 0.08 ohm at the top of the audioband. As a result, the modulation of the Neo 340i's frequency response by the Ohm's law interaction between this impedance and that of our standard [simulated loudspeaker](#) was just $\pm 0.09\text{dB}$ (fig.13, gray trace). The output was down by 3dB at a high 90kHz, meaning that a 10kHz squarewave was reproduced with short risetimes (fig.14), and there was no overshoot or ringing. The 340i's frequency response was the same at all volume-control settings and for both balanced and unbalanced inputs.

Fig.13 Simaudio Moon Neo 340i, unbalanced frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (left channel blue, right red), 4 ohms (left cyan, right magenta), 2 ohms (red) (0.5dB/vertical div.).



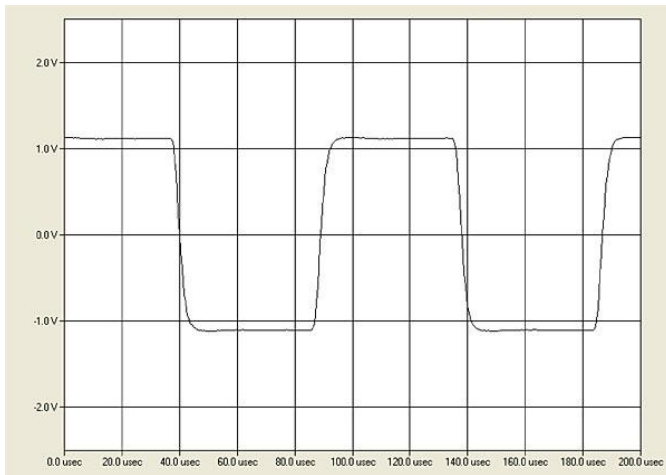


Fig.14 Simaudio Moon Neo 340i, small-signal, 10kHz squarewave into 8 ohms.

Channel separation for the line-level inputs was an even 74dB R–L, but lower at high frequencies in the other direction. The unweighted, wideband S/N ratio, measured with the inputs shorted to ground but the volume control set to its maximum, was a modest 71.2dB ref. 2.83V into 8 ohms, improving to 87.4dB when the measurement bandwidth was limited to the audioband, and to 90.2dB

when A-weighted. These figures were for the left channel; the right channel's ratios were all 2–3dB smaller, due to there being a higher level of spurious at 60Hz and its harmonics in that channel (fig.15). These ratios and graph were taken with an unbalanced input; with a balanced input, these spurious were all up to 12dB higher in level, which I suspect is due to the fact that these inputs are carried on a small board connected to the main board with flying leads.

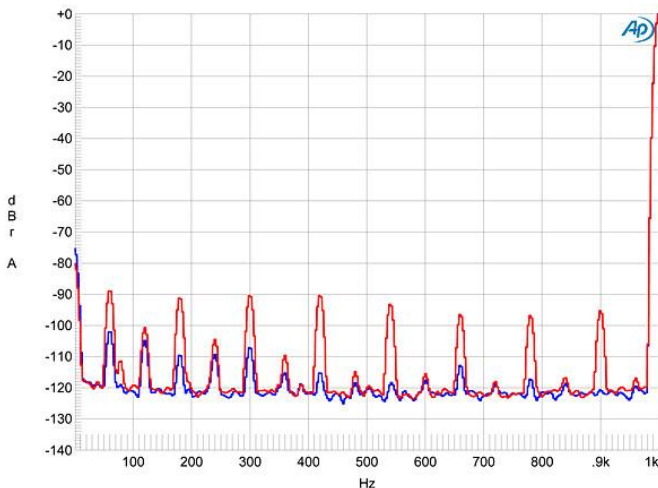
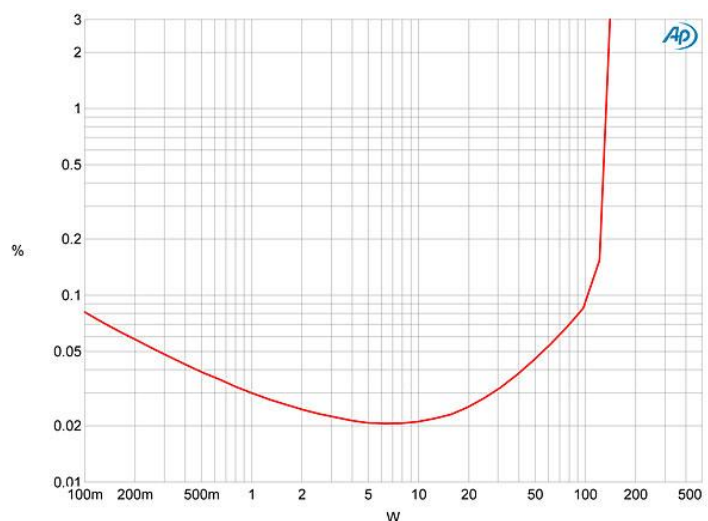


Fig.15 Simaudio Moon Neo 340i, unbalanced input, spectrum of 1kHz sinewave, DC–1kHz, at 1W into 8 ohms (linear frequency scale).

The Neo 340i's maximum power is specified as 100Wpc into 8 ohms (20dBW) or 200W into 4 ohms (17dBW). Figs. 16 and 17 reveal that, with both channels driven, the amplifier clipped at 130Wpc into 8 ohms (21.1dBW) and 200Wpc into 4 ohms, with low levels of

distortion at output powers of a few tens of watts. To be sure I was looking at true distortion, I tested (fig.18) how the THD+noise percentage changed with frequency at 12.7V (equivalent to 20W into 8 ohms, 40W into 4 ohms, or 80W into 2 ohms). Other than into 2 ohms (gray trace), there was only a slight rise in THD toward the top of the audioband, and very little increase into lower impedances.

Fig.16 Simaudio Moon Neo 340i, THD+N (%) vs 1kHz continuous output power into 8 ohms.



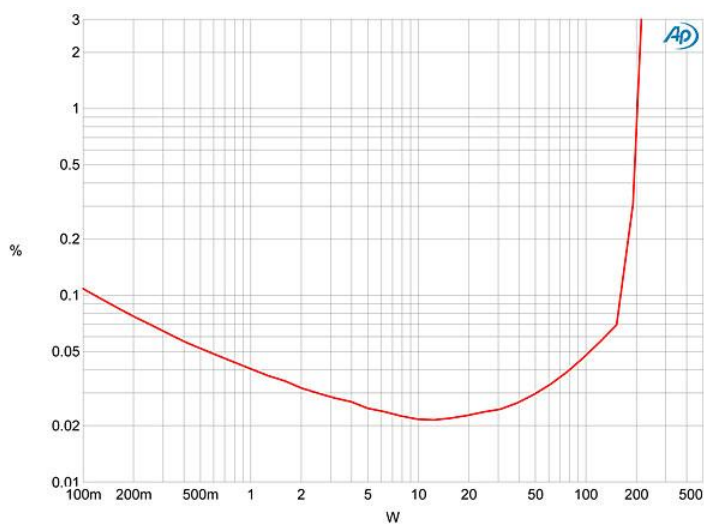


Fig.17 Simaudio Moon Neo 340i, THD+N (%) vs 1kHz continuous output power into 4 ohms.

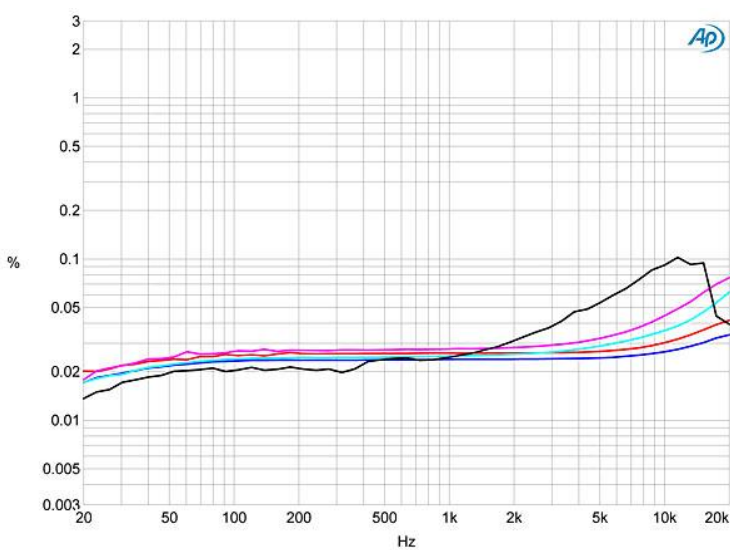


Fig.18 Simaudio Moon Neo 340i, THD+N (%) vs frequency at 12.7V into: 8 ohms (left channel blue, right red), 4 ohms (left cyan, right magenta), 2 ohms (left, gray).

The distortion signature was predominantly the subjectively innocuous third harmonic (fig.19), though there was also some second harmonic about 12dB lower in level when the output power was 3dB below clipping into 4 ohms (fig.20), as well as some lower-level, higher-order harmonics and some supply-related spurious.

When I tested the 340i with an equal mix of 19 and 20kHz tones at a level a few dB below visual clipping on an oscilloscope, the second-order intermodulation product at 1kHz lay at just -96dB (0.0015%), though the higher-order products at 18 and 21kHz lay at -74dB (fig.21).

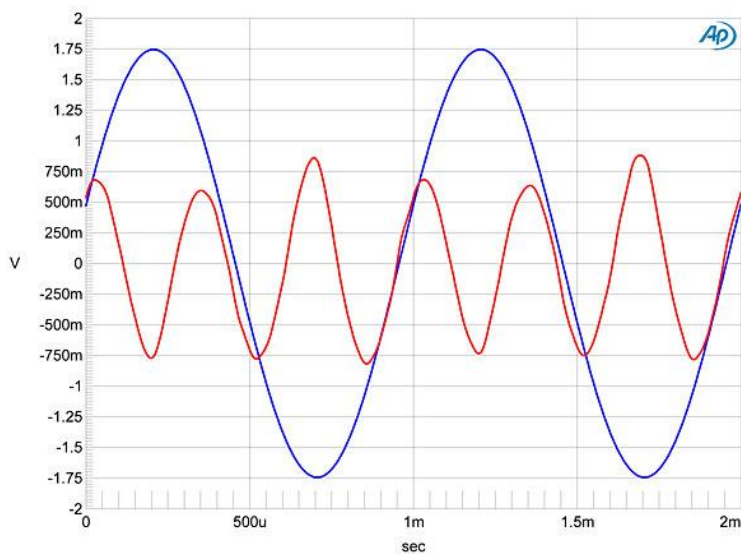


Fig.19 Simaudio Moon Neo 340i, 1kHz waveform at 50W into 8 ohms, 0.042% THD+N (blue); distortion and noise waveform with fundamental notched out (red, not to scale).

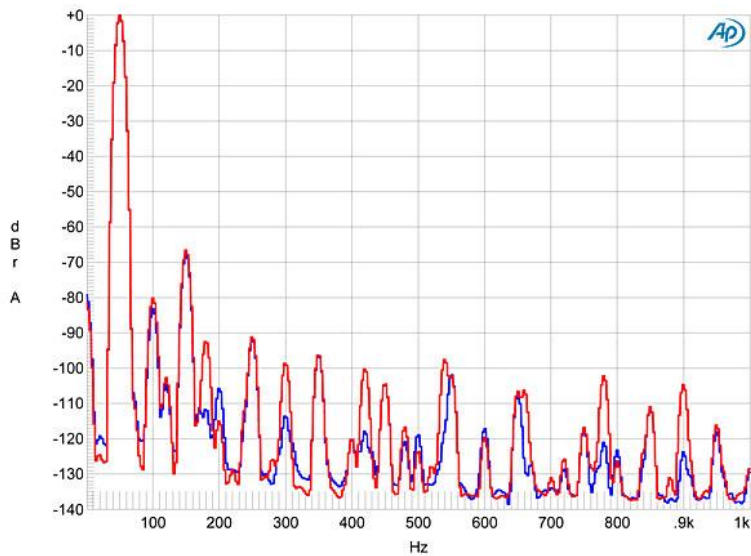


Fig.20 Simaudio Moon Neo 340i, spectrum of 50Hz sine wave, DC–1kHz, at 100W into 4 ohms (linear frequency scale).

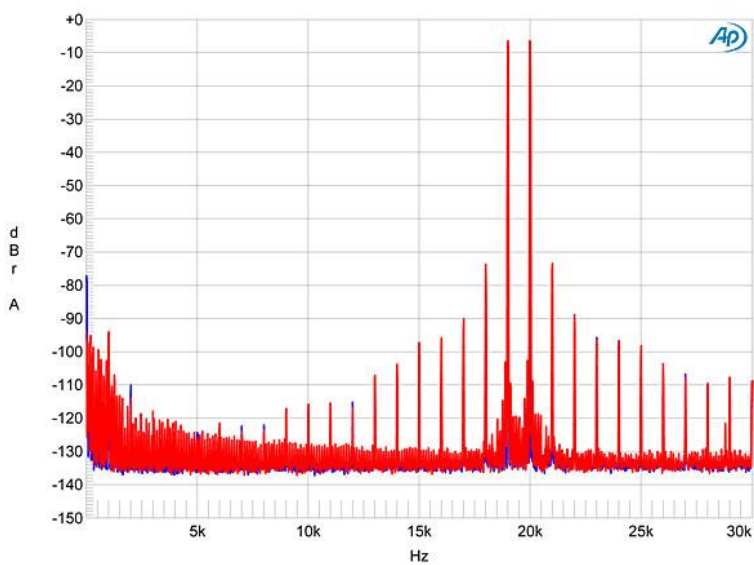


Fig.21 Simaudio Moon Neo 340i, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 100W peak into 4 ohms (linear frequency scale).

Finally, looking at the headphone output, this offered the same maximum gain as the speaker outputs and was non-inverting. However, as its source impedance was a high 300 ohms, the headphone output should be regarded as utilitarian.

Overall, Simaudio's Moon Neo

340i offers excellent measured performance; I was particularly impressed by its affordably priced phono and digital modules. One point should be noted, however: The 340i's heatsinking isn't adequate for sustained use at high powers. Before the testing, when I preconditioned the amplifier by running it at one-third power into 8 ohms with both channels driven—the worst case for an amplifier with a class-B or -A/B output stage—its side-mounted heatsinks became too hot to touch after 30 minutes, measuring 160.6°F (71.6°C). Even the top panel was hot, at 111.6°F (41.1°C). This amplifier needs to be used in a well-ventilated location.—**John Atkinson**