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Simaudio Moon 700i
integrated amplifier

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Simaudio
Moon Evolution 700i
INTEGRATED AMPLIFIER

FRED KAPLAN

In my review of Krell's FBI integrated amplifier in the July 2007 issue, I noted that $16,500 (it now costs $18,000) seemed an astonishing chunk of change to spend on a product category generally associated with "budget" gear. Now, the 2011 edition of the *Stereophile Buyer's Guide* lists no fewer than 19 companies selling integrated amps for five figures—one goes for $100,000!—which perhaps suggests that economic slumps prod even the well-heeled to alter their habits. There are, after all, advantages to cramming a preamplifier and a power amplifier into a single box: you need one less pair of interconnects, one less power socket, one less cabinet shelf. And if the integrated contains state-of-the-art parts, elegant circuitry, and a hefty power supply, what's the problem?[1]

And so we have Simaudio Ltd., the veteran Canadian high-end electronics firm, leaping into this realm after 30 years of business with the Moon 700i, priced at $12,000—only two-thirds the price of the Krell, but aimed at the same downsizing but still toney demographic.

DESCRIPTION Two-channel, solid-state integrated amplifier. Inputs: 1 pair balanced (XLR), 5 pairs single-ended (RCA). Speaker outputs: 2 on gold-plated binding posts. Preamp output: 1 pair single-ended (RCA). **Preamplifier section:** Frequency response: 10Hz–100kHz, ±3dB. Signal/noise ratio: 120dB, 20Hz–20kHz. **Power amplifier section:** Maximum output power: 175Wpc into 8 ohms (22.43dBW), 300Wpc into 4 ohms (22.43dBW). Maximum output voltage: 45V. Gain: 37dB. Signal/noise: 105dB at full power. THD: <0.015% at 1W, <0.04% at 150W, 20Hz–20kHz. Damping factor: >400. Input sensitivity: 490mV–6.0V RMS. Power consumption: 50W at idle, up to 700W in operation. **DIMENSIONS** 18.8" (480mm) W by 5.4" (140mm) H by 18.1" (465mm) D. Weight: 60 lbs (27kg). **SERIAL NUMBER OF UNIT REVIEWED** K767959. **PRICE** $12,000. Approximate number of dealers: 85. Warranty: 10 years, parts & labor. **MANUFACTURER** Simaudio Ltd., 95 Chemin du Tremblay Street, Unit 3, Boucherville, Quebec J4B 7K4, Canada. US: Simaudio Ltd., 2002 Ridge Road, Champlain, NY 12919. Tel: (877) 980-2400, (450) 449-2212. Web: www.simaudio.com.

Description and Design

The 700i, part of Simaudio's top-of-the-line Moon Evolution series, is a fully differential dual-mono design that pumps 175Wpc into 8 ohms or 350Wpc into 4 ohms. The 700i runs in class-A up to 5W, and in class-A/B thereafter. Its output stages are powered by six bipolar transistors per channel, manufactured and matched to extremely high standards (claims the company's "white paper") for "exceptional gain-linearity," wider bandwidth, and a lower noise floor. Circuits are DC-coupled, which reportedly allows for a flat frequency response throughout, as well as below and beyond, the entire audioband. The 700i's "zero global feedback" design—which Simaudio's Lionel Goodfield, defines as "zero feedback except for just a little bit, locally, at the output stages only"—eliminates the need for signal correction, thus boosting the speed of the signal response, reducing phase errors and tonal colorations, and all but wiping out intermodulation distortion. Individual output devices are decoupled from one another, which is said to expand the power reserves of each, to produce a more effortlessly dynamic sound.

The circuit board has four layers of pure copper tracings—two for the audio signals, one each for the ground and power supplies—which makes possible very short signal paths and low levels of noise. The preamp section is mounted on its own dedicated circuit board, reducing crosstalk. The two very heavy toroidal transformers are precisely rolled from very-high-grade Japanese steel, designed in a proprietary process called Vacuum Pressure Impregnation, which is said to bolster the core's resistance to mechanical vibrations. The chassis—sleek with rounded edges, and remarkably compact for its 60 lbs—is made of thick, ultrarigid aluminum. Small, very sharp thumbscrew cones protrude from four wedge-like pillars to further reduce the effects of vibrations.

1 The one clear advantage of separates over an otherwise identical integrated amp would be the formers' separate internal power supplies and the fact that each would suck current from its own power socket. But one potential, even likely, disadvantage would be the need for a pair of relatively long interconnects to link preamp and power amp—rather than, in an integrated, a short strand of pure copper or silver.

Other nifty tidbits include Simaudio's proprietary M-eVOL2 volume-control circuit, whose 530 steps let you adjust levels in increments of 0.1dB with a variation of less than 0.05dB between the left and right channels across the entire range of volume. A software feature called M-Lock lets you set and save a precise volume for each line input. Each input (one pair balanced XLRs, five pairs single-ended RCAs) can also be configured as "home-theater ready," with the gain section bypassed.

All this sounds good on paper. How does it actually sound?

System and Setup

I did all of my listening through Revel Ultima Studio2 loudspeakers. LPs were played on a VPI Classic turntable with JMW Memorial tonearm, a Lyra Delos moving-coil cartridge, and Nagra's BPS battery-powered phono preamp. Digital discs were spun on a Krell Evolution 505 SACD/CD player. Cables (single-ended from the phono, balanced from the CD player) were all by Nirvana. For a while, I conducted fairly extensive A/B comparisons of the Moon Evolution 700i and the Krell FBI. Setup was identical, except that, for the most part, I used Krell's proprietary CAST cables to link the Evolution 505 and FBI (using their CAST outputs and inputs, respectively).

The volume control is actually a rotary encoder controlling Simaudio's proprietary M-eVOL2 circuit.

The crew at Simaudio broke in the 700i for 200 hours before shipping it to me, but I found it needed to be kept powered up another 10 days before it came into its own. For the first week, the bass was a bit loose, the upper midrange harsh. After the full warmup (perhaps 400 hours, all told), that was no longer the case at all. Lionel Goodfield recommends leaving the 700i on all the time, and notes that if you turn it off for a week to, say, go out of town, it

MEASUREMENTS

I carried out a complete set of tests on the Simaudio Moon 700i, using *Stereophile*'s loan sample of the top-of-the-line Audio Precision SYS2722 system (see the January 2008 "As We See It" and www.ap.com). Before doing the testing, I ran the Simaudio at one-third its rated power for 60 minutes, which thermally is the worst case for an amplifier with a class-A/B output stage. At the end of that period, the chassis was warm, at 40°C (104°F), according my infrared thermometer, but the side-mounted heatsinks were just too hot to keep my hand on, at 63°C (145°F).

The maximum voltage gain into 8 ohms was 36.8dB for the balanced and unbalanced inputs, and both preserved absolute polarity (*ie*, were non-inverting), which means the XLR jacks are wired with pin 2 hot. The maximum gain from the unbalanced preamplifier output was 4.5dB for the unbalanced inputs and 5.5dB for the balanced inputs, sourced from an impedance of 50 ohms at all frequencies. This output was also non-inverting. The unbalanced input impedance at low and midrange frequencies was a little lower than the specified 23.7k ohms, at 18.5k ohms. However, it dropped at the top of the audioband to 5k ohms, which might make some tubed source components with a high source impedance sound a little mellow. The balanced input's impedance was 31k ohms across most of the audioband, dropping to 13k ohms at 20kHz.

The output impedance (including 6' of speaker cable) was a low 0.07 ohm at 20Hz and 1kHz, rising slightly to 0.11 ohm at 20kHz. As a result, the modification of the amplifier's frequency response due to the interaction between this impedance and that of our standard simulated loudspeaker (see www.stereophile.com/content/real-life-measurements) was less than ±0.1dB (fig.1, gray trace). The amplifier's ultrasonic output into 8 ohms dropped by 3dB at 90kHz (fig.1, blue and red traces), and by 3dB at 55kHz into 2 ohms (green trace), this fairly wide bandwidth resulting in a good reproduction of a 10kHz squarewave (fig.2). The fig.1 traces were taken with the volume control at its maximum setting of "80";

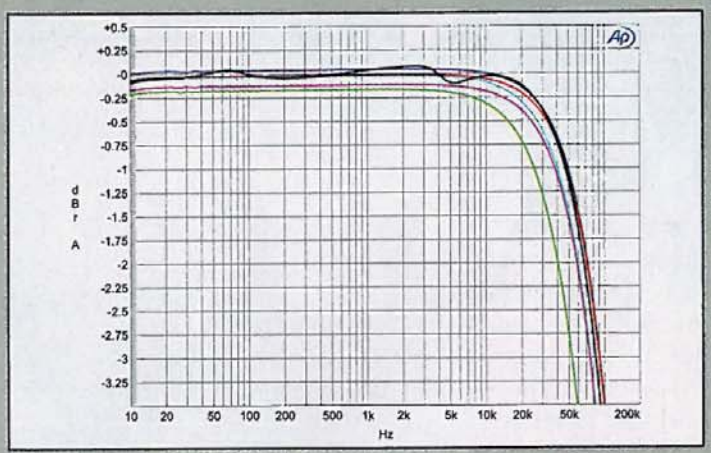


Fig.1 Simaudio Moon Evolution 700i, frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (blue), 4 ohms (magenta), 2 ohms (green). (0.25dB/vertical div.)

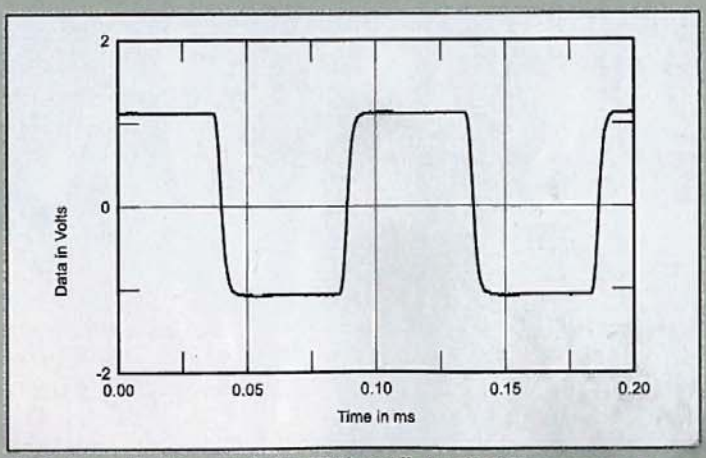


Fig.2 Simaudio Moon Evolution 700i, small-signal 10kHz squarewave into 8 ohms.

will take another three days to come back up to snuff after being turned back on.

Sound

I usually don't go in for comparative reviews. A piece of gear should be appraised on its own terms, or for how it stacks up to the sound of live music or some other audible standard. Pitting Amp X against Amp Y can be esoteric to the point of uselessness, if the reader isn't familiar with either model. But while 19 companies make integrated amps that cost more than ten grand, that's still an exclusive club, even by high-end standards. Given the relative oddity of that category, the Simaudio Moon 700i begged comparison with the Krell FBI, and as both were on hand, I figured I'd comply.

Some readers may recall that I went a bit wild for the FBI, and my view hasn't changed. (That review can be read at www.stereophile.com/content/krell-fbi-inte

A full complement of inputs and outputs.

grated-amplifier.) The 700i is in the same ballparks of price and quality, so I thought it might be useful—not just for the sake of comparing them, but as a way of taking the Moon's measure—to examine how they differed. These differences, in the scheme of things, are fairly minor, but they were noticeable—the sorts of variations that we audiophiles focus on, become attached to, even develop fetishes over. And they're *differences*; though the graphs of JA's measurements may ultimately argue otherwise, there's little to justify a pronouncement that one of these amps is *better overall* than the other. Even more than usual, a contest between them will, or should, be decided less by my verdict (which, as you'll see, is not entirely decided) than by your listening preferences.

The bottom line: The Krell has a slight edge in deep bass, dynamics, and capturing the forward edge of transients—the initial whack of a drum, the pluck of a string, the *sss* of a sibilant—while the Moon had a slight edge in getting the tonal colors of an instrument

repeating the measurement with the control set to "43.2" resulted in an 8 ohm response that was identical to that in fig.1. The amplifier's bandwidth is thus not affected by the volume-control setting. The control operated with accurate 0.1dB steps above "30," and with 1dB steps below that level.

Channel separation was excellent, at >110dB in both directions below 1kHz and still 100dB at 20kHz (not shown). The unweighted, wideband signal/noise ratio, measured with the input shorted but the volume control set to its maximum, was good rather than great, at 71.5dB ref. 2.83V into 8 ohms. Restricting the measurement bandwidth improved this figure to 78.5dB; switching an A-weighting filter in-circuit gave 81dB. These figures were for the right channel; the left channel was very slightly noisier.

Fig.3 plots the THD+noise percentage in the Simaudio's output against power into 8, 4, and 2 ohms. The downward slope of the traces below a few tens of watts suggests that the measured percentage is dominated by noise at low powers; the gentle rise in the percentage with increasing power once the actual distortion appears suggests that only a modest amount of global negative feedback is used. The amplifier exceeds its specified output power of 175Wpc (22.43dBW) into 8 ohms, delivering 190Wpc (22.8dBW) at clipping (defined as 1% THD+N), but with both channels driven it falls slightly short of the specified 350Wpc into 4 ohms, clipping at 305Wpc (21.8dBW). Running at this power level for more a couple of seconds blew the 6A rear-panel fuse. With one channel driven, the Moon 700i clipped at 590W into 2 ohms (21.7dBW).

I plotted how the THD+N percentage varied with frequency (fig.4) at a high enough output voltage, 20V, to be sure I was measuring distortion rather than noise. The right channel (red and magenta traces) is not quite as linear as the left. More important, while the THD rises only a little when the load impedance is halved, there is a considerably greater rise in the top two audio octaves.

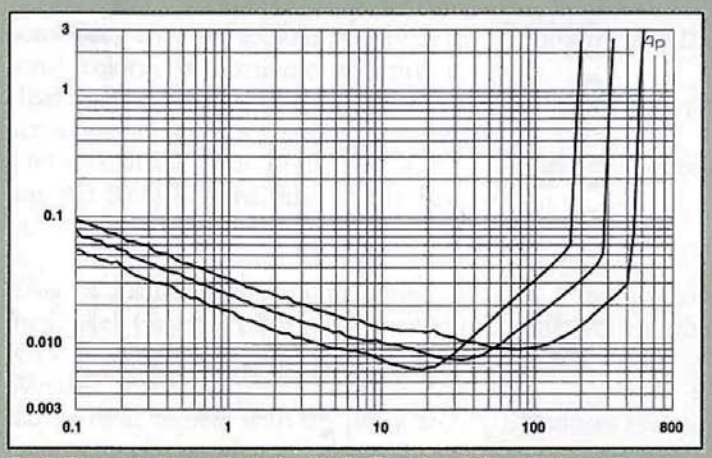


Fig.3 Simaudio Moon Evolution 700i, distortion (%) *vs* 1kHz continuous output power into (from bottom to top at 10W): 8, 4, 2 ohms.

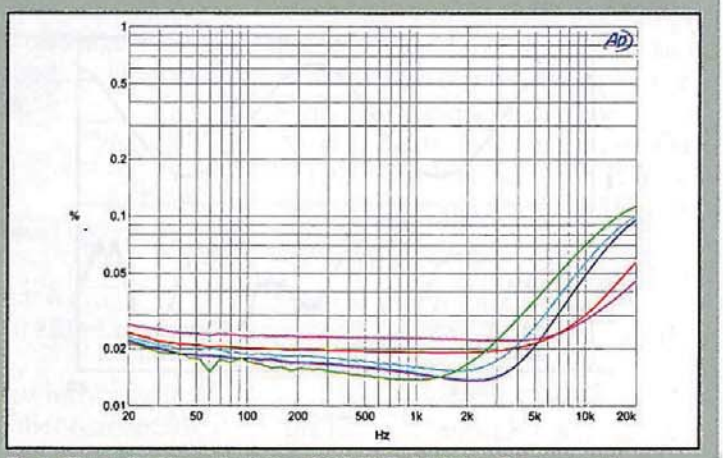
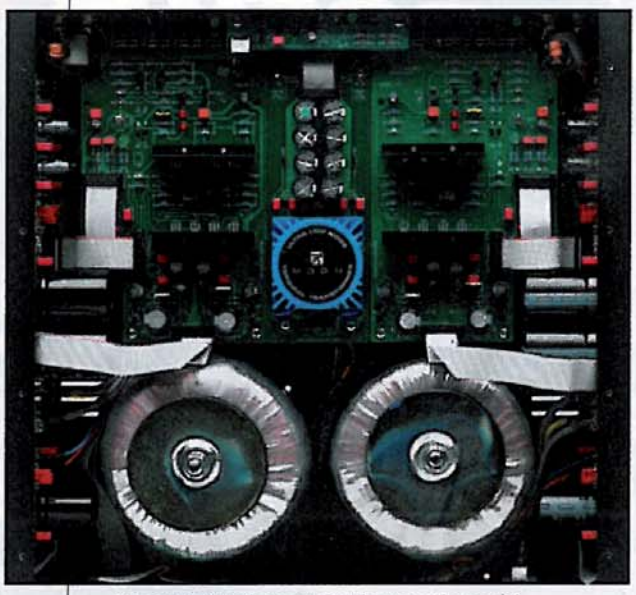


Fig.4 Simaudio Moon Evolution 700i, THD+N (%) *vs* frequency at 20V into: 8 ohms (left channel blue, right red), 4 ohms (left cyan, right magenta), 2 ohms (green).

Carter's tribute to Django Reinhardt, *Chasin' the Gypsy* (CD, Atlantic 83304-2), there are lots of percussive sounds bursting in the background—bells, triangles, woodblocks, as well as the trapset and a big bass drum. I could hear all of it with both amps, but only with the Krell could I clearly hear the counter-rhythm quietly tapped out (the forward edges of those transients again) on the triangle. Only the Krell could fully capture the hair-raisingly fast guitar fingerwork in *Andy Irvine/Paul Brady* (CD, Green Linnet GLCD3006). And in Michael Tilson Thomas's rendering of Mahler's Symphony 9 (2 SACD/CDs, San Francisco Symphony Orchestra 821936-0007-2), only the Krell unleashed the first movement's crescendo with utter effortlessness (due perhaps to its 300Wpc, compared with the Simaudio's 175Wpc)—though I wouldn't at all describe the Moon's effort as "strained." Compared with other amps in its power class that I've heard, the Moon sounded full-blooded. In fact, it sounded more dynamic—seemed to have more capacious *reserves* of power—than its rating might suggest.

One way to sum up this exercise: If you like listening to music from a front-row seat, preferably right up against the instruments, the Krell FBI is your integrated amp; if you don't mind sitting a few rows back—not the rear balcony, just *a few rows* from the stage—and if you value overall balance over zest (though without *losing* zest), then you might prefer the Moon 700i. You'd probably be very happy with either; again, I'm talking differences on the margin.

In other respects, the Moon gave me no grounds for complaint or reservation, either on its own terms or compared with something else. I've spoken already of its tonal colors, its harmonic integrity, its rhythmic sway, its balance and extension across the octaves, but I want to elaborate a bit on that last point. In my A/B listening, the Krell had the edge in the bass, but the Simaudio was hardly bass-shy. In "Mood Indigo," from *Masterpieces from Ellington*, a stunning DSD remastering of the Duke's very first LP, recorded in 1950 (CD, Columbia/Legacy CK 87143), Wendell Marshall's *rubato* bass line was clarion clear, replete with the pluck and, even more, the ensuing wood vibration—such a cool, casual cadence. In the London Sinfonietta's recording of Górecki's Symphony 3 (CD, Elektra/Nonesuch 79282-2), conducted by David Zinman, the contrapuntal bass lines about three minutes into the first movement—which I'd never heard until plugging in the Krell FBI a few years ago—were no less audible. Ditto the *deep* bass line under the funky bass line that opens the title track of Donald Fagen's *Morph the Cat* (CD, Reprise 49975-2; 2 LPs, Reprise 49975-1).



Separate transformers for the two channels' output stages, with a separate power supply for the preamp section.

As for the very high frequencies, the fizzy harmonics of the guitar strums in "Tangled Up in Blue," from Bob Dylan's *Blood on the Tracks* (SACD/CD, Columbia CH 90323); the stadium ambience throughout Miles Davis's posthumous *Live Around the World* (CD, Warner Bros. 46032-2; or, better yet, the 2 LPs of Warner Bros. 9362-46032-1), especially in "Human Nature"; the natural reverberation of the concert hall in any well-recorded classical release—in every case, the recording space, the air around the musicians, filled the rear of my living room from wall to wall, up to the ceiling, and out the window into the street.

Speaking of spatial matters: The soundstage was as wide and deep as the recording and the rest of the system allowed. Imaging was tightly focused but not Etch-a-Sketch-y, which is to say that voices and instruments had a rounded palpability; they didn't simply emit the sounds that the musicians were playing and singing, they radiated them.

More to the point, no single aspect of the music drew untoward attention to itself. To a degree that has been rarer in my 25 years of reviewing than you might think (though it also happened while listening to such exceptional speakers as the Verity Audio Sarastro IIs or, currently, the Revel Ultima Studio2s), I found myself drawn deeper into the music, reacting to a particularly awesome passage not by thinking "Wow, listen to how 3D that trumpet is!" but rather "Wow, listen to how great that trumpeter is!" This, I think, is the hallmark of a high-end component that you can live with over the long haul, after you've grown accustomed to any initially thrilling novelties of its sound.

Conclusion

Each of us, even the most seasoned reviewer, has listening biases; that's why, occasionally, we explicitly point them out. But what usually goes unrecognized is that these biases are often a product of the equipment we've heard, liked, and bought over the years. At some point, you hear a terrific amp (or pair of speakers, or whatever) that's especially brilliant at, say, capturing fast transients or painting a precise image. You conclude that you prefer gear that does those things, and you tend to sniff a bit at gear that doesn't. Once in a while, you come across a component that doesn't quite meet the highest standard of that particular trait but comes close, while setting new standards (at least compared with other gear you've heard) for traits that you value highly but have taken pretty much for granted until now.

That's what happened with me and Simaudio's Moon Evolution 700i. Will I toss aside the Krell FBI and install the 700i full-time instead? I don't know; I'm still a bit up in the air about that. The fact that I'm even considering such a step is significant; it's a sound of surprise.

ASSOCIATED EQUIPMENT

ANALOG SOURCE VPI Classic turntable with VPI JMW Memorial tonearm, Lyra Delos cartridge.
DIGITAL SOURCE Krell Evolution 505 SACD/CD player.
PHONO PREAMPLIFIER Nagra BPS (battery-powered).
INTEGRATED AMPLIFIER Krell FBI.
LOUDSPEAKERS Revel Ultima Studio2.
CABLES Interconnect: Nirvana, Krell CAST (with Krell FBI). Speaker: Nirvana.
ACCESSORIES Bybee Technologies Signature Power Purifier (except for amps), Black Diamond Mk.4 Racing Cones, VPI HW-19 record-cleaning machine.

—Fred Kaplan

or ensemble, the flow of a rhythm, and a seamlessness across the audioband, from bass to midrange to airiest highs. A crude and perhaps overdramatic way of summarizing it: The Krell is a bit more lively, the Moon a bit more lifelike.

Notice my qualifiers: "a *slight* edge" in this or that, "a *bit* more" lively or lifelike. The Moon is also quite lively, and the Krell is also quite lifelike; I'm talking differences of degree, not of kind, and just a few degrees at that. It's not that the 700i is warm but not fast, or that the Krell is fast but not warm (like the difference, a few decades ago, between tubes and transistors); *both* are warm *and* fast. In most respects, their sonic signatures are remarkably similar. And where those signatures diverge, it's usually to achieve the same musical ends along slightly differing paths.

Take, for instance, the first track of trumpeter Dave Douglas's *Charms of the Night Sky* (CD, Winter & Winter 910 015-2), when Douglas and violinist Mark Feldman, both at center stage, play the melody in unison. With the Krell, I could tell them apart because I heard Douglas's mouthpiece and Feldman's bowing. With the Moon, those initial transient attacks weren't quite as clear, but I could still tell the two instruments apart by their distinctive harmonic overtones and the way that brass vibrations sound different from wood vibrations. And, I should point out, the Moon also let me hear more of Feldman's control of his violin, his subtle alterations of tone and phrasing. (And when he opens up, boy, does it sound silky!)

Similarly, I wrote in my review of the Krell FBI that, listening to Miles Davis's *Cookin'* (SACD, Analogue Productions LAPJ 7094 SA), when the band breaks into a faster tempo in "My Funny Valentine," I could hear Philly Joe Jones *let up* on the hi-hat cymbal after tapping it with his stick, an effect that added an extra layer of rhythm and cool that I hadn't noticed the previous hundred or so times I'd heard this album through other amps. With the Moon 700i, I didn't hear (not as clearly, anyway) the sudden release of the hi-hat—the forward edge of that very subtle transient—but I did hear, very clearly, the cymbal's change in volume and tonality, which produced the same rhythmic effect, if a bit less pronouncedly.

Another example: During Frank Kimbrough's opening piano solo in track 1 of the Maria Schneider Jazz Orchestra's *Sky Blue* (CD, ArtistShare AS0065), I could hear the keys hit the soundboard through the Krell—a nice you-are-there touch. The Moon 700i didn't let me hear that contact so clearly, but I got a slightly fuller sense of the entire piano's sound: its tonal colors, its harmonic bloom, even its size.

Not all the tradeoffs were compensatory. In "Nuages," track 1 of James

measurements, *continued*

This is presumably due to the circuit's relatively limited open-loop bandwidth not allowing the negative-feedback loop to operate with full efficiency above 3kHz or so. Fortunately, this behavior is mitigated by the low level of distortion and the fact that it consists primarily of the subjectively innocuous second and third harmonics (figs. 5 and 6). Fig.6 also reveals that, even at very high power, the power-supply–related components at 60 and 120Hz are both well suppressed.

Finally, the circuit's decreasing linearity in the top octaves results in a regular series of intermodulation products when the 700i is asked to drive an equal mix of 19 and 20kHz tones at a level just below visible waveform clipping on an oscilloscope (fig.7). Even at this high power, however, the lowest-order products, at 1, 18, and 21kHz, all lie at –74dB (0.02%), with the higher-order products lower in level. This behavior was not appreciably different into lower impedances.

Other than its behavior with the high-frequency intermodulation test, the Simaudio Moon 700i offered respectable measured performance. **–John Atkinson**

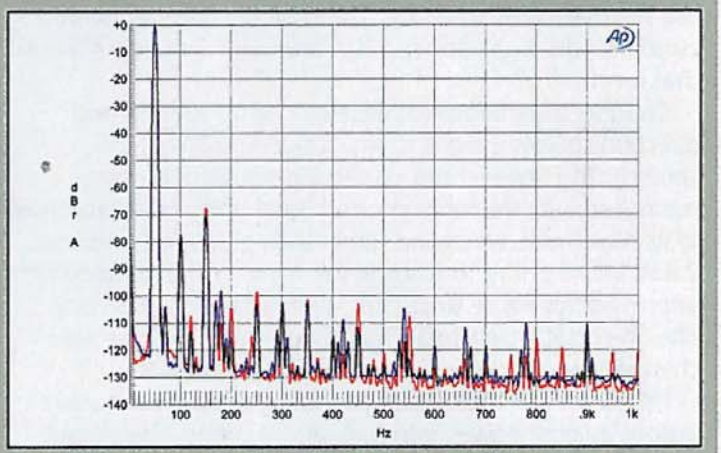


Fig.6 Simaudio Moon Evolution 700i, spectrum of 50Hz sinewave, DC–1kHz, at 200Wpc into 4 ohms (linear frequency scale).

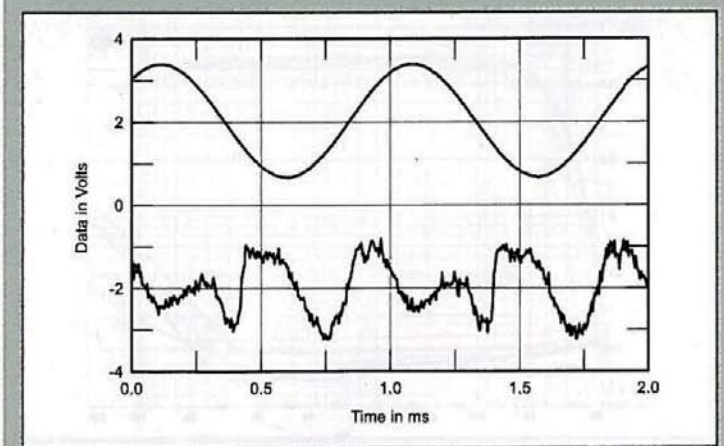


Fig.5 Simaudio Moon Evolution 700i, 1kHz waveform at 12W into 8 ohms (top), 0.0075% THD+N; distortion and noise waveform with fundamental notched out (bottom, not to scale).

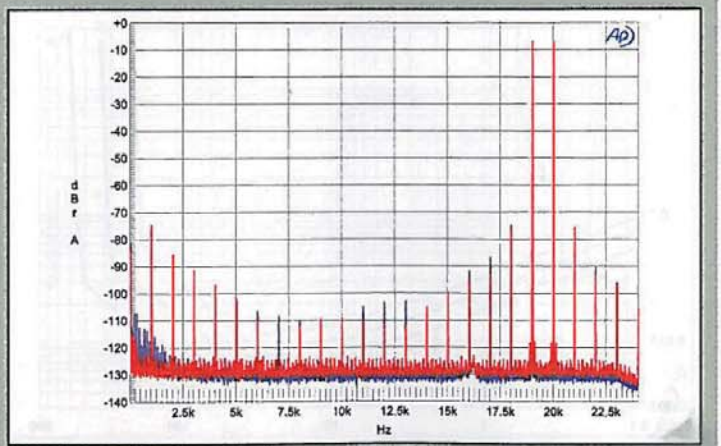


Fig.7 Simaudio Moon Evolution 700i, HF intermodulation spectrum, DC–24kHz, 19+20kHz at 100W peak into 8 ohms (linear frequency scale).