

Simaudio Moon 390 Preamplifier-DAC-Network Player

by Diego Estan

Simaudio, or Moon by Simaudio as they prefer to be called -- or just Moon -- was founded in 1980 in St-Hubert, Québec. As a proud Canadian, I've long admired their products but had never had the opportunity to use one in my system. And ever since I recently became engrossed in HBO's dramatic series *Sharp Objects*, in almost every episode of which a full stack of topflight Moon electronics is prominently displayed, I've had Moon on the brain. Enter the Simaudio Moon 390 DAC, preamplifier, and network player (\$5300 USD). I guess product placements work.



The Moon 390 is a line-level component of fairly standard size and shipping weight: 16.9"W x 3.5"H x 13.1"D and 22 pounds. Some of its key design features include Simaudio's MiND 2 network streaming module, for access to local music libraries and to the music services Tidal, Deezer HiFi, and Qobuz Sublime+; Roon readiness; multiroom synchronized playback; MQA and DSD decoding; a phono stage configurable for moving-magnet or moving-coil cartridges; and an HDMI 2.0 switcher.

I learned a lot more about the Moon 390 when I spoke with Dominique Poupart, Simaudio's product manager. Its power supply is a Moon Hybrid Power (MHP) module, derived from the far costlier Moon 780D V2 streaming DAC. The MHP uses both switch-mode and traditional linear technologies (hence the "Hybrid") to create a DC voltage source both incredibly low in noise and impervious to fluctuations in mains voltage. The 390's MHP has two dedicated outputs: one to feed the digital board, the other the analog

board. To achieve an extremely low noise floor, Moon galvanically isolates the analog and digital boards from each other and from any external device connected to the 390. Poupart also explained that the 390's DAC is based on ESS Technology's Sabre ES9026PRO chipset, optimized with voltage regulators and a high-quality clocking system to, he claims, allow the 390's DAC section to outperform the acclaimed Moon 380D standalone DAC. The 390's circuitry is fully balanced.



Like most Moon products, the 390's faceplate comprises a central panel of brushed aluminum flanked by two slightly convex "cheeks." Unlike their most expensive components, though, these cheeks are made of plastic instead of aluminum. This is available in three styles: all black (the review sample), all gray, and black with gray cheeks. Although I found the 390 pretty to look at, and my review sample exuded quality craftsmanship, with very good fit and finish, I think that \$5300 should get you a faceplate made entirely of brushed aluminum, instead of plastic cheeks. That would have gone a long way toward increasing the 390's curb appeal for me.

Front and center on the 390 is a smallish OLED screen. When the 390 is used as a network streamer, this screen displays the artist name, track and album titles, file type, sample rate, elapsed time, and volume setting -- but not album-cover art. As the volume is being adjusted, the screen displays the level in large numerical characters. Moon includes a screen saver, as OLED displays are prone to burn-in.

To the left of the display are two columns of three identical silver buttons each: Standby, Display, Mute, Speaker Off (for headphone listening), and Input Left and Right. To the right of the display is a row of three buttons (numbered 1, 2, 3) for Internet Radio presets; below these are Setup and OK buttons for navigating the menu, and below those is a 1/4" headphone jack. The rightmost user control is that big volume knob -- turning it raises or lowers the volume in increments of 1dB from 0 to 30dB, and increments of 0.5dB from

30.5 to 80dB. Quickly spinning the knob always yields 1dB changes. The knob's action felt effortlessly fluid, as in Moon's high-end preamps. A difference between the costlier 740P and 850P preamps and the 390 is in the fineness of volume adjustment associated with turning the knob slowly above 30dB: with those higher-priced models, the volume can be fine-tuned in astonishingly precise increments of 0.1dB.



The 390's remote-control handset is plain black plastic with no backlighting, and an array of identical buttons difficult to make out in dim lighting. I tried the 390's remote -- it worked fine, and I never used it again. (In my room, the preamp sits next to my listening chair.) Any remote accompanying a \$5300 audio product should look and feel better.

What makes the 390 special are its inputs and outputs. On the rear panel, starting at left, are the analog inputs: phono (RCA, MM or MC), analog (RCA), and balanced (XLR). Then come the analog outputs: fixed (RCA), variable (RCA), variable balanced (XLR). Above these are the ground post, a Wi-Fi antenna, mini-jacks for 12V in/out triggers and Simaudio's SimLink in/out connectors, two Network jacks (Ethernet), and a USB Type-A input for a thumb drive (accessible through the MiND streaming app). The digital inputs are: USB Type-B (for connection to a PC or Mac), S/PDIF (coaxial), optical (TosLink), and AES/EBU (XLR). Below the digital inputs are four HDMI 2.0 inputs (one is ARC compliant), one HDMI output, a hidden Bluetooth transceiver (with aptX, if your smartphone supports this codec), and a second Wi-Fi antenna. And at far right are the IEC power inlet and the main power rocker.

It's impressive to see so many inputs and outputs in a dedicated two-channel preamp, but audiophiles are a fickle bunch -- the analog camp may complain about a lack of analog inputs, while digital aficionados may want more digital inputs, those four HDMI's notwithstanding. But what Simaudio has done in the Moon 390 should easily satisfy a third type of audiophile: those with one foot firmly planted in each camp.



Setup

Simaudio's packaging is topnotch, with thick moldings of high-density foam protecting the Moon 390. Also in the box were the owner's manual, and instructions for Windows users about where to download the USB driver. I placed the 390 atop my reference preamp, a McIntosh Laboratory C47, which eased switching back and forth between them for comparisons.

Next, I had to decide what to connect to this Swiss Army knife of a preamp. Wanting to put the 390 through its paces, I connected every one of its input types to a source component: a Pro-Ject Debut Carbon Esprit turntable (phono input), a Rotel RCD-991 CD player (balanced analog), a Bluesound Node streamer (RCA analog), a thumb drive (USB Type-A), a Windows 10 laptop PC (USB Type-B), a Sonos Connect streamer (S/PDIF coax digital), a room-correction DSP device to which the digital outputs of my Bluesound streamer and CD player are connected (TosLink and AES-EBU digital), an Oppo UDP-203 universal BD player (HDMI) -- and, for streaming, my LAN (Ethernet), using the MiND app (see next paragraph). I paired my Samsung S9 smartphone via Bluetooth. I then connected the 390's balanced outputs to my McIntosh Laboratory MC302 power amp, and plugged my Sennheiser HD 800 headphones into the 390's headphone jack.

Then, from the Google Play app store, I downloaded and installed Moon's MiND app on my Samsung S9 smartphone and Samsung Tab S tablet. No problem there -- the app found the 390 on my network straight away, and proceeded to download and install the latest firmware. Using MiND, I also had no difficulty finding my own music library stored on my NAS. The last step before checking to see that everything was working was to download and install Moon's ASIO USB driver on my Windows laptop. This took a bit more fussing (please, no comments from Mac users!), but within five minutes I was passing bit-perfect, high-resolution music files from my laptop using foobar2000 to the 390's USB Type-B input.



I hit Play on all sources and toggled through the inputs. Everything worked flawlessly. A minor caveat: My Oppo UDP-203 BD player usually lives in my home theater, but because the 390 has HDMI inputs, I brought it into my two-channel listening room to try some SACDs. (DSD data were sent to the 390 via HDMI with no problem; more on this later.) I also wanted to test the 390's ability to pass 4K video to the LG C7 OLED display in my home theater, so I schlepped the UDP-203 back there, along with the Moon 390. I ran the Oppo's HDMI output to the 390's HDMI input, and the 390's HDMI output to my C7 OLED, and played 4K Ultra HD BDs with HDR10 (Prometheus) and Dolby Vision (Star Wars Episode VIII: The Last Jedi). The 390 synced and decoded the downmixed two-channel Dolby Digital 48kHz audiostream, and also passed along 4K (2160p) video to the C7 -- but the 390 stripped out the High Dynamic Range (HDR) and Wide Color Gamut (WCG) metadata for both the HDR10 and Dolby Vision discs. The HDMI standby function on the 390 worked well, passing along both 4K video (again with HDR and WCG metadata stripped out) and an unscathed Dolby Atmos audiostream to my C7 when the 390 was in standby. I contacted Dominique Poupart at Moon about this. He confirmed that the HDR and WCG metadata stripping is a known limitation of the 390's HDMI switcher, and that while it might be fixed with a firmware update, there are no immediate plans to do so. This isn't a big deal, but if you want to use the 390 in a home theater with an HDR-capable display, you'll need a 4K video source device with dual HDMI outputs. Still -- an upscale audio product with HDMI input and output released in 2018 should be compliant with HDMI 2.1 or, at the very least, HDMI 2.0a.

Before doing any serious listening, I wanted to run through the setup menu, to be sure I understood the settings and hadn't overlooked anything that might degrade the sound quality. The menu structure is well laid out, and navigation, using the Setup and OK buttons in conjunction with the volume control, is intuitive. The main menu headings include: Inputs, HDMI, Network, Multiroom, Bluetooth, Screen Saver, Power On Volume, Maximum Volume, and Power Settings. Under Inputs, each input can be given a custom

name and its own settings for Offset (-10dB to +10dB; see below), HT Bypass (for the line-level analog inputs), and Enable (to skip any unused inputs). Under Phono/Config/Advanced are adjustments for Gain, Capacitance, Impedance, and RIAA or IEC equalization curves. In fact, the Phono preamp settings can be adjusted on the fly, while listening to a record.

The Multiroom heading offers two options: Synchronized or Original. This is a unique function that I wasn't able to test directly. If you have two or more Moon MiND 2-enabled devices in different rooms, the 390 can be used to select any input, including Phono, through the MiND app, stream it to a different room, and synchronize (i.e., no time delay) the selected input playing in the room where the 390 is located with what's heard in the second room. For example, if you play an LP and select Synchronized, the output of the 390's internal phono preamp is converted to digital by the 390, then broadcast over the local network to a second MiND 2-enabled device. If you select Original, the 390 sends the Phono preamp's unconverted analog signal to the amp it's connected to instead of digitizing it. Neat!



I at first assumed that the Offset function behaved as a trim level, adjusting the volume level for a specific input but not affecting the overall gain. So I changed Offset from its default setting of +6dB to 0dB, but soon realized that I wasn't getting the 10dB of gain advertised by Moon. I found out that by Offset Simaudio actually means gain, with a customizable -10dB to +10dB setting available for each input. Since I wanted to determine that the maximum volume setting of 80dB would actually deliver +10dB of gain for every input, I changed all default settings of +6dB to +10dB.

A related subject is how the Moon 390 deals with balanced outputs. Typically, a preamp's balanced output produces 6dB more gain (i.e., twice the voltage) than its single-ended

output -- or, put another way, the inverted and non-inverted pins of the balanced output would measure the same referenced to ground as the single-ended output. But the 390's balanced output measured the same as its single-ended output; that is, the inverted and non-inverted pins of its balanced output, referenced to ground, measured half of the single-ended output. I discovered this while comparing the measurements I took of the 390 and of my reference McIntosh C47 preamp. Based on the 390's published specifications, I expected it to yield only a 5dB reduction in gain compared to the C47; instead, I measured 11dB. Admittedly, there's no single right way, or industry standard, of implementing balanced outputs in a consumer preamp. Regardless, the 10dB of gain provided by the 390's balanced and single-ended outputs should be plenty for almost any real-world application.

And the Moon 390's headphone amp is no mere afterthought. I connected my laptop running foobar2000 to the 390's USB input and ran a 1kHz, 0dBFS signal. With no load and the volume set to maximum, I measured 12V RMS and over 15dB of gain at the headphone output -- enough voltage swing to get just about any pair of headphones on earth to sing.

Sound(s)

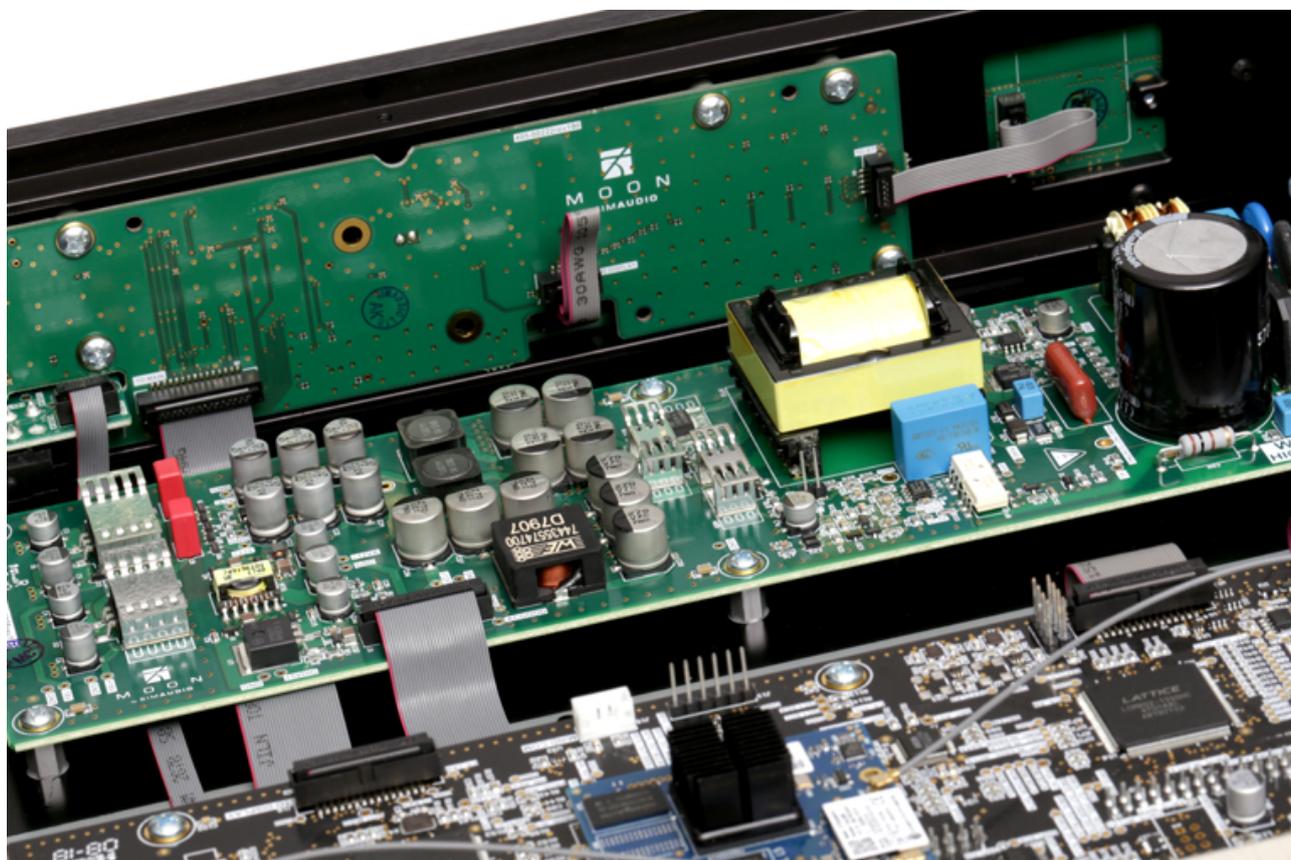
At last I was finished measuring the Simaudio Moon 390's gain and fiddling with its menu settings, and it was time to sit down and listen. I heard, mostly, nothing. First, I tested the Moon 390's headphone amplifier. What I didn't hear was noise. Even with the volume set to the maximum level of 80dB, in my quiet room I heard nothing but silence -- no hint of hiss through my Sennheiser HD 800 headphones. Listening through the Sennheisers to "You Don't Know Me," from Ray Charles's Genius Loves Company (24-bit/192kHz FLAC, Concord Jazz/HDtracks), I heard everything I'm accustomed to hearing with my reference system and through other headphone amps, such as Oppo's HA-1: accurate bass, loads of detail through the midrange with no strain or edginess, and delicacy and sparkle in the top end. With "Thinking Out Loud," from Ed Sheeran's X (16/44.1 FLAC, Asylum), the 390 let the HD 800s' ultrawide soundstage shine, especially when I focused on the backing vocals. The 390's DAC and headphone amp seemed to impose on the music no sonic character of their own, while providing more than enough gain to drive the HD 800s well beyond earsplitting levels.



I next tried the Moon 390 in my two-channel system, connecting the Bluesound Node's digital optical output to the miniDSP DDRC-22D equalizer (with Dirac Live room correction), which in turn fed the 390's digital optical input. An analog balanced interconnect ran from the Simaudio to my McIntosh MC302 amp driving a pair of Bowers & Wilkins 705 S2 speakers, and to my SVS SB-4000 subwoofer. The extremely quiet MC302 lets me hear any noise contributed by any analog device upstream of it. Powering up the 390 only slightly increased the perceived hiss from the tweeters at the 390's maximum level of 80dB. The 390 was superquiet; in fact, quieter than my already very quiet C47 preamp. This is especially impressive when you consider all of the modern digital wizardry stuffed into the 390.

My dedicated listening room measures 15'L x 12'W and is acoustically well treated; the speakers and listening chair form a 9' equilateral triangle. Here, again, I heard no sonic signature from the Moon 390. My first and my last impressions of the 390 were the same: transparent sound from a silent background. High praise indeed.

When I listened to an audiophile favorite, the title track of Jennifer Warnes's Famous Blue Raincoat: The Songs of Leonard Cohen (16/44.1 FLAC, Attic/Private), the 390 again got out of the music's way. I heard all the inner detail in Warren's voice, and the brassiness in the saxophones, with no hint of strain. The soundstage was wide and deep, with no artifacts I could attribute to the 390. Turning again to Ray Charles's performance of "You Don't Know Me," I heard the familiar soundstage placement of his voice to the left, and Diana Krall's at the center, with every nuance in every keystroke of the piano laid bare -- the 390 hid nothing. I also checked out "I'm Not the Only One," from Sam Smith's In the Lonely Hour (16/44.1 FLAC, Capitol), to hear if the 390 would remove from or add anything to the lower octaves. Nope -- the bass thump came through with aplomb, and the sustained low-frequency notes gently but authoritatively pulsed through my chair and body -- exactly as I expect them to sound from this track I know well.



I next wanted to try the 390 as a network streamer-DAC, with Tidal and my own library of CDs (ripped to a NAS) as sources. Before describing what I heard, a few thoughts on Simaudio's phenomenal Moon MiND app: I'm still amazed that a relatively small, boutique high-end audio company has managed to create an app with almost as much polish as the apps from Sonos and Bluesound. The user experience is just as enjoyable, with one feature particularly worth highlighting: With the Sonos or Bluesound app, each track selected is played, which is fine -- but if you want to add it to the play queue, that must be done by pulling down a dropdown menu for each track. Building a queue in MiND is far more efficient: You tap as many tracks as desired, which highlights all tracks selected; then you tap Queue or Play Now. The highlighted tracks move to the queue displayed at the left of the screen. Genius. And, as with Sonos and Bluesound, a MiND queue or playlist can be built with tracks from multiple sources.

When the 390 is last put in standby mode with an input other than MiND selected, launching the app and making a track selection wakes up the 390 (provided it's connected via Ethernet to a LAN) and automatically switches to the MiND input. And assuming you connect your amp to the 390's 12V output trigger, this means that your music is always within arm's reach -- after all, these days almost everyone is always within arm's reach of their smartphone. Also, unlike when using an external streamer, using the MiND app with the 390 provides full IP control -- this includes input switching and the knowledge that, when the volume is adjusted through the app, it's actually the 390's internal digitally controlled analog volume control that's being manipulated, and not a cheaply implemented digital-attenuation scheme. Using the MiND app, I was also able to play high-resolution music files -- 24/96, 24/192, DSD64 -- from a USB drive connected to the 390; very convenient, if you have guests who've brought their own tracks to play.

My one criticism of the MiND app is that the phone version is far less polished than the tablet version. For example, the MiND app on my phone could be displayed only in portrait mode. This is a minor quibble; overall, I enjoyed the MiND app enough that, if I had the money, I'd replace my Sonos whole-house setup with Moon MiND products in a heartbeat.



Now familiar with the MiND app, I queued up an MQA stream of a song I've heard a million times. In summer 1991, my friends and I almost wore out my copy of Guns N' Roses' Appetite for Destruction in the tape deck of my buddy's old Monte Carlo as we experienced, for the first time, the freedom of driving without adult supervision -- ah, the good ol' days. (I stand by my assertion that Appetite is the greatest hard-rock album ever released.) I carefully compared "Sweet Child O' Mine" (24/96 MQA, Tidal Masters) to the standard CD version ripped to my NAS (16/44.1 FLAC, Geffen). The 390 let me hear differences in the layering of the rhythm and lead guitars -- both were portrayed with more detail, presence, and bite in the MQA version. Axl Rose's voice never sounded better. A real treat. How about using the Moon 390 as a straight-up, line-level analog preamp? With my trusty Rotel RCD-991 CD player's balanced analog outputs connected to the 390's balanced inputs, I cued up "If You Could Read My Mind," from Gordon Lightfoot's Complete Greatest Hits (16/44.1, CD, Rhino/Warner Bros. R2 78287) -- arguably, one of the finest songs ever written in Canada. Once again, the 390 got out of the way, letting me hear the tape hiss at the beginning of the track, the delicacy of the acoustic guitars to Lightfoot's left and right, and his beautifully rendered voice, with no obscuring of any of Lightfoot's inhalations, exhalations, and inflections. In fact, the 390 was so transparent that it let me hear the differences in the Rotel's user-adjustable dither settings. I heard a slight hardness in Lightfoot's voice with the dither switched Off; at my usual setting of 6, the smoothness of his voice returned. In my two-channel system, I made sure to set my Oppo UDP-203 universal disc player to send to the Moon 390, via HDMI, the stereo DSD tracks of SACDs. I cued up an SACD sampler, Mark Levinson's Live Recordings from Red Rose Music, Volume 1, and chose "Goin' Back to Louisiana," by Bill Sims (SACD/CD, Red Rose Music RRM 01). Right away, the 390's screen displayed "DSD 2.8 MHz." I wasn't familiar with the music -- I don't typically listen to SACDs -- but boy, did it sound great. The degree of realism was spooky -- it felt as if the guitar and tenor saxophone were in the room with me, respectively imaged to left and right of Sims's voice. Every intonation of his singing, every vibration of the saxophonist's reed, were reproduced in exquisite detail, with no hint of a veil between me and the music. Once again: utter transparency from the Moon 390.



Last but not least, I listened to the Moon 390's phono stage. I connected the output of my Pro-Ject Debut Carbon Esprit turntable to the 390's phono input, made sure to connect the two products' chassis ground posts to each other, and adjusted the 390 to the same settings I use in my McIntosh C47 preamp: 40dB of gain, 100pF of capacitance, and an impedance of 47k ohms. In "Thinking Out Loud," from Ed Sheeran's X (45rpm LP, Warner Music UK Ltd. 825646285877), I heard space between and around Sheeran's voice, the backing singers, and the accompanying guitars. Sheeran's voice floated dead center and above the speakers, with lovely presence, no hint of strain, and the organic smoothness so often heard from vinyl. The bass was deep and tight. The soundstage was wide, extending slightly beyond the speakers to right and left, with plenty of depth. Next I tried "Blow at High Dough," from the Tragically Hip's Up to Here (LP, MCA MOVLP848). The 390's phono preamp let my speakers-sub combo really boogie, with great pace and rhythm, bass slam from the kick drum, and all the detail in the structure and layering from the lead and rhythm guitars.

Simaudio Moon 390 vs. McIntosh Laboratory C47

Both of these solid-state preamps have DACs based on ESS Technology's Sabre DAC chipsets: an ES9026PRO in the Simaudio Moon 390 (\$5300), and an ES9018S in the McIntosh Laboratory C47 (\$4500). Both have digitally controlled, resistor-ladder analog volume controls, and they're similarly priced. The C47 is closer to a traditional analog preamp, offering more analog inputs and outputs than the 390, but only the 390 is fully balanced. Both offer the same number of digital inputs, HDMI notwithstanding: two optical, one coax, and one USB -- but no AES/EBU on the C47. The biggest differences are the C47's lack of HDMI, Bluetooth, and network streaming. I suppose you could say that the 390 is far richer in features, and so will appeal more to the modern audio enthusiast.

Performing level-matched listening comparisons over a period of about two weeks, I heard no differences between these products except through their phono inputs. At modest listening levels (70-80dB SPL) it was difficult to tell them apart, but when I turned up the volume to ~90dB, the differences clearly revealed themselves. The C47's phono preamp was definitely quieter than the 390's -- there was less hiss. Here I don't mean hiss that I could hear only with an ear pressed against a tweeter, but hiss audible at my listening position 9' away. In the quiet passages at the beginning of "Thinking Out Loud" and "Blow at High Dough," hiss was audible from both preamps at high volumes, but there was clearly less from the C47. However, the hiss became imperceptible through both preamps as these tracks grew more musically complex.

The other difference was in the middle and upper registers. The C47 sounded a bit brighter than the 390, providing slightly more presence in the upper midrange and treble -- a difference particularly obvious with voices. The sound of the 390's phono section was arguably more suited to my B&Ws' hot tweeters -- sibilant musical passages were reproduced with more grace and smoothness than by the C47. I wouldn't want to declare a winner here -- your choice will depend on your preference in sound, and, of course, on the mastering of the LPs played.

Conclusion

The Simaudio Moon 390 preamplifier-DAC-network player retails for \$5300 -- not exactly an entry-level price for a preamp. Is it worth it? My criticisms of the 390 are minor. I would have preferred an all-brushed-aluminum faceplate, a fancier remote control, support of HDMI 2.1 (or 2.0a) to pass HDR-encoded 4K video, and a smartphone version of the

MiND app with the same level of polish as the tablet version. The last two criticisms can potentially be addressed with firmware/software improvements; the first two could also be addressed, but I suspect only with an increase in price. Could I ask for more? If I were asked to envision a preamp that does truly everything, I'd add integrated room correction and configurable line-level single-ended and balanced subwoofer outputs. But these are pie-in-the-sky musings.



What did I like about the 390? Everything else. Its feature set and input/output options seem almost limitless. I can't think of another high-end preamp that offers a fully configurable phono input, single-ended and balanced analog line-level inputs and outputs, at least one of every type of digital input anyone might need, HDMI inputs and output, Bluetooth, and a built-in network streamer with a very polished mobile app -- all implemented in a fully balanced design. The 390 is not only capable of competently assuming the role of control center for your high-end stereo, it can also serve as the backbone of a multiroom system. And lest we forget: All of this functionality comes in a package that delivers on Moon's promise of superlative sound and build quality, and is warranted for ten years -- exceptionally long in high-end audio. Printed on the 390's carton is a promise of "The Performance of a Lifetime," and I can't disagree. My listening told me that the Moon 390 is an utterly transparent DAC-preamp with a noise floor so low it's difficult to believe -- especially when you consider all the digital activity going on inside the case. My McIntosh C47, which I love, retails for \$4500. The Simaudio Moon 390, effectively its sonic equal, brings so much more functionality to the table that it easily justifies costing \$800 more. Is it worth it? Unquestionably.

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