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KEN MICALLES

Audio Physic Step Plus

LOUDSPEAKER

In the 1990s, while putting together one of my early hi-fi systems, I'd often visit New York City audio retailer Sound by Singer to gawk at their top-tier wares. On one such visit I noticed a serious-looking gentleman listening to Stravinsky's *The Rite of Spring* through a pair of Audio Physic's Step loudspeakers (accompanying electronics long forgotten). Sitting on their dedicated, minimalist-looking metal stands, the pint-size Steps were angled up 22° or so, to create a physical time alignment of the tweeter's and midrange-woofer's wavefronts. The Step looked odd—kind of scrawny. But these petite mini-monitors projected music that seemed to exist entirely free of their cabinets, pulling off a sort of “disappearing” act I'd never before heard.

Introduced in 1994, the original Step consisted of “a ¾” metal-dome tweeter and a tiny (4” plastic-cone) woofer with a chassis just 4” across—and a rear-firing port 1.25” in diameter,” wrote Jack English in the October 1994 issue of *Stereophile*.¹ That first Step was specified as having a sensitivity of 84dB, a nominal impedance of 5 ohms, and a minimum impedance of 3.3 ohms.

“The Steps’ soundstaging presentation was consistent,” wrote Jack: “excellent width and depth, pinpoint placement, and loads of spaciousness. For virtually any musical performance, I felt as if I was sitting at least mid-hall. Performers were never sitting out in the



room or on the plane of the speakers. Rather, they were well behind and around the back. In addition, unless recorded as such, the music was never located in the cabinets. While many people may dislike the Steps’ distant

presentation, I found it quite enjoyable.”

Not long after I'd heard the Steps at Sound by Singer, a pair of Audio Physic's floorstanding Virgo speakers became one of my proudest purchases. On each Virgo's narrow, 6.5"-wide baffle were a ¾" aluminum-dome tweeter and a 4" treated paper-cone midrange drive-unit, and on each side panel was one of two 6" woofers. They made glorious music in my small apartment. The slender baffle made possible these speakers' exceptional imaging, and those side-firing woofers gave me the lowdown goosebumps. Even if the Virgo's midrange was congested, and it didn't offer the last degree of dynamics or resolution, it was an easy speaker to love.

A pair of DeVore Fidelity's similar The Nines (narrow baffle, side-firing woofer) took up residence in my home in the mid-2000s, followed by their Orangutan O/93s. But I've always fondly remembered those original Audio Physic Steps. So when John Atkinson suggested I review that model's latest iteration, the Step Plus, I got (anticipatory) lowdown goosebumps all over again.

Description

Standing 12.6" high by 6.9" wide by 9.8" deep and weighing 12.1 lb, the Audio Physic Step Plus (\$2599/pair) has elegantly curved and tapered side

¹ See www.stereophile.com/content/audio-physic-step-loudspeaker.

SPECIFICATIONS

Description Two-way, ported, stand-mounted loudspeaker. Drive-units (both ceramic-coated aluminum diaphragms): 1.75" (45mm) tweeter, 5.9" (150mm) midrange-woofer. Frequency range: 50Hz–40kHz. Impedance: 8 ohms.

Sensitivity: 87dB. Recommended amplification: 10–120Wpc.

Dimensions 12.6" (320mm) H by 6.9" (175mm) W by 9.8" (250mm) D. Weight: 12.1 lb (5.5kg).

Serial number of units reviewed 8083 (both).

Finishes Cherry, Ebony, Walnut veneers; Black High Gloss; White High Gloss, add \$200/pair.

Price \$2599/pair. Approximate number of dealers: 18. Warranty: 10 years.

Manufacturer Audio Physic GmbH, Almerfeldweg 38,

59929 Brilon, Germany. Tel: (49) 2961-961-70. Fax: (49) 2961-516-40. Web: www.audiophysic.de. US distributor: VANA Ltd., 2845 Middle Country Road, Lake Grove, NY 11755. Tel: (631) 246-4412. Web: www.vanaltd.com.

panels that replace the original model's boxier look. The front of the Step Plus's cabinet is slightly wider than its rear panel, though its MDF walls are uniformly $\frac{3}{4}$ " thick. Whereas the straight-sided Step was designed to be held at an angle, the Step Plus's rearward tilt—the angle is unspecified—is built into the cabinet itself. I imagine the design is both cosmetic and functional, lovely to look at while breaking up the cabinet's internal standing waves and aligning the drivers for optimal time arrival/phase coherence at the listening seat; I put this to Roy Feldstein, chief technology officer of VANA Ltd., Audio Physic's US distributor, who replied via e-mail, "The purpose of the slope was to add stability to the cabinet and create a more attractive form factor."

The Step Plus's drivers are the ones used throughout the Audio Physic range: a 1.75" (45mm) tweeter and a 5.9" (150mm) midrange-woofer, both with Hyper-Holographic cones of ceramic-coated aluminum (HHCM-III in the tweeter, HHCM-II in the mid-woofer). These custom-built drivers are made in China by Wavacor, Ltd. Manfred Diestertich, Audio Physic's R&D manager, is involved in every phase of these drivers' development, including the Step Plus's ClarityCap capacitors and its Dual Basket Design—basically two baskets in one, claimed to reduce unwanted mid-woofer resonances. Other Diestertich-enriched Audio Physic technologies include Active Cone Damping (a rubber ring around a driver's circumference) and CCAC ceramic coating of aluminum driver cones to prevent "partial oscillations" ("ceramic coating increases the stiffness of the diaphragms therefore the natural modes of the diaphragms are moved higher in frequency," according to Diestertich).

New to me was the use, in the Step Plus's midrange-woofer, of a flat-faced aluminum phase plug mounted directly on the driver's magnet motor. "The phase plug is made of solid aluminum and acts as a heat sink for the neodymium mag-

net," Diestertich wrote. "The response curve is optimized off axis—as a result the phase plug was designed flat."

The Step Plus's drivers aren't mounted directly on its cabinet. The cabinet's drill holes contain neoprene plugs that tighten when screws are fitted, creating an elastic connection between drivers and cabinet that reportedly further damps resonances. Per Diestertich, Audio Physic also uses "ceramic (open cell) foam which acts as a brace to strengthen the cabinet, and as a diffusor (with a large surface area) to control resonances and standing waves." This silicon-carbide foam, used for filtering molten iron in the aircraft and power industries, looks like a dense gray sponge, and reportedly strengthens the cabinet and thus reduces its tendency to resonate.

The Step Plus's tweeter and midrange drivers, crossed over to each other at 2.8kHz, are mounted close together on its 6.9"-wide baffle. A 1.75"-wide port opens 0.5" below two sturdy WBT NextGen binding posts (the manual calls these "modern connecting terminal[s]" on the rear panel.

Audio Physic's website specifies the Step Plus's frequency range as 50Hz–40kHz. With a specified sensitivity of 87dB at 8 ohms impedance (6.5 ohms minimum), the little Step Pluses played comfortably loud in my smallish listening room at any wattage, assuming I was using the appropriate amplifier (see below).

Setup and System

Finding the optimal positions for the Step Pluses was, generally speaking, a breeze. Placing the speakers too close to the front wall diluted their fine imaging qualities, so no dice. Eventually, what proved ideal placements were with the speakers' rear panels 26" from the wall and their front baffles 65" from my listening seat. I toed them in until their inner side panels were barely visible. And though I'd first placed the speakers in more or less the same spots as my

MEASUREMENTS

I used DRA Labs' MLSSA system and a calibrated DPA 4006 microphone to measure the Audio Physic Step Plus's frequency response in the farfield, and an Earthworks QTC-40 for the nearfield responses. (I didn't use the grilles.) My estimate of the Audio Physic's voltage sensitivity was 84.2dB/2.83V/m, significantly lower than the specified 87dB/2.83V/m. While the specified nominal impedance is 8 ohms, the solid trace in fig.1 shows that the impedance magnitude drops slightly below 8 ohms in the midrange and to 6 ohms at 20kHz. The electrical phase angle (fig.1, dashed trace) never gets extreme, meaning that this speaker is easy for an amplifier to drive.

Discontinuities in the fig.1 traces at 420 and 650Hz imply the presence of cabinet-wall resonances at those frequencies. I did find a mode quite high in level at 650Hz on the sidewalls

(fig.2), and another at 420Hz on the top panel. These modes are high enough in Q and frequency that they might not be excited by music.

The saddle centered on 50Hz in the impedance-magnitude trace in fig.1 suggests that this is the tuning frequency of the reflex port on the rear panel. However, as shown by the blue trace in fig.3, the woofer's minimum-motion notch, which is when the cone is held stationary by the back pressure from the port resonance, occurs a little lower in frequency, at 44Hz. The port's output (red trace) peaks a little more broadly than is usually the case, and its high-frequency rolloff is disturbed by low-level peaks at the same frequencies as the panel resonances noted earlier.

The complex sum of the nearfield woofer and port responses is shown as the black trace below 300Hz in fig.3. The usual nearfield bump in output in the upper bass is minimal, which, in

conjunction with the depressed level of the farfield response (black trace above 300Hz), suggests that the Step Plus is intended to be used close to the wall behind it, in order for its balance to gain the benefit of some boundary reinforcement. However, as Ken Micallef noted, this will diminish the speakers' imaging performance. I must admit to some puzzlement at KM's finding that

Stereophile AudioPhysic Step Impedance (ohms) & Phase (deg) vs Frequency (Hz)

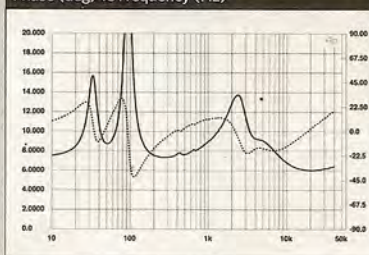


Fig.1 Audio Physic Step Plus, electrical impedance (solid) and phase (dashed) (2 ohms/vertical div.).

go-to DeVore O/93 Orangutans, moving the Step Pluses a bit farther apart than that—91" between their outer sidewalls—increased their already fantastic soundstaging. That didn't work with every recording, but when it did, the Step Pluses created a *very* wide soundstage with large, precise images.

I did all of my listening with the Steps' grilles off. I also switched out my usual Auditorium A23 speaker cables for Triode Wire Labs American cables, which improved focus from top to bottom. AudioQuest's Castle Rock speaker cables sounded rather hot at the frequency extremes, Tellurium Q Black somewhat lightweight.

I evaluated the Step Plus using LPs, CDs, and four different amplifiers: the Heed Elixir and Parasound Halo Integrated integrated amps, and the Mytek Brooklyn and Shindo Haut-Brion power amps.

Listening with Parasound's Halo Integrated

With rumors circulating in Beatles Internet groups that Eric Clapton played the guitar solos on the Beatles' *Abbey Road* (LP, Apple PCS 7088), I played side 2 of the Fabs' final masterpiece with an ear toward plectrums, tones, tactile qualities, and soundstaging.

Spinning vinyl on my Thorens TD 124 Mk.I turntable with Jelco 350S tonearm and Ortofon Quintet Bronze



cartridge, into Luxman's fine 500-EQ phono stage and the Parasound Halo (\$2195, 180Wpc into 8 ohms, 270Wpc into 4 ohms), *Abbey Road* sounded crisp, vivid, and wide, if panned hard left and right. The Parasound occasionally imbued the sensitive Step Plus with a coolish quality that highlighted leading edges of notes, but not to a detrimental degree. With voices, that quality was a plus, John Lennon's serene, layered vocals in "Because" sounding spookily palpable and well defined. Here and elsewhere, the Step Pluses pulled a brilliant "disappearing" act, colorful images coming fully alive in my small listening space.

Paul McCartney plays many exceptional bass parts on *Abbey Road*, and the Audio Phys-

ics generated a decent sense of warmth and grip from his (Rickenbacker?) electric bass. Macca's glowing whole notes in "Because" rang out with excellent color, a palpable sense of touch, and more than respectable weight for such small speakers. As I learned, the Step Plus could produce serious lower-register heft for such a small speaker.

Also a delight through the Step Pluses was *Ella Swings Brightly with Nelson* (LP, Verve V/V6-4054). Front and center on a spacious soundstage, Ella Fitzgerald's voice sounded massive, with her every enunciation, elongation of note or phrase, and rhythmic cadence beautifully portrayed. There was enough reverb on her voice to challenge Phil Spector,

the Step Plus offered "first-rate bass-frequency reproduction," as the port tuning suggests that it won't be able to fully deliver the lowest note of the four-string double bass and bass guitar in the correct balance with the upper harmonics.

Of greater concern in fig.3 is the major suckout in the crossover region in the farfield response on the tweeter axis (black trace). This suckout

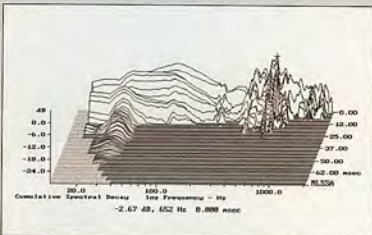


Fig.2 Audio Physic Step Plus, cumulative spectral-decay plot calculated from output of accelerometer fastened to center of sidewall (MLS driving voltage to speaker, 7.55V; measurement bandwidth, 2kHz).

negatively affected my sensitivity estimate and will make the speaker sound lacking in life if the ear interprets the midrange level as being correct, or midrange-forward if the presence region is taken as the reference. This will depend on the music being played.

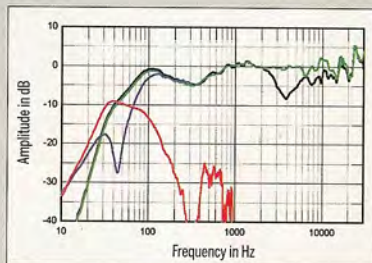


Fig.3 Audio Physic Step Plus, anechoic response averaged across 30° horizontal window on tweeter axis at 50° (black), averaged across 30° horizontal window centered 10° above tweeter axis (green), both corrected for microphone response, with nearfield responses of port (red), woofer (blue), and their complex sum, respectively plotted below 925, 310, and 310Hz.

This suckout does tend to fill in to the speaker's sides (fig.4)—I note that KM ended up with the Steps wide apart and with their sidewalls barely visible—but, more important, it disappears when a listener sits with his ears well above the tweeter, as can be seen both from the graph of the speaker's vertical dispersion (fig.5) and from the green trace in fig.3. If the Steps are placed on stands

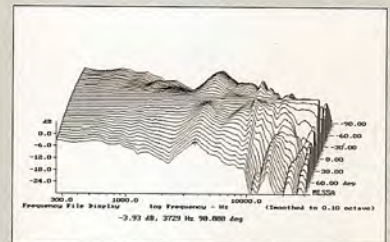


Fig.4 Audio Physic Step Plus, lateral response family at 50°, normalized to response on tweeter axis, from back to front: differences in response 90-5° off axis, reference response, differences in response 5-90° off axis.

but that only added to the feeling of jubilation throughout this album of arrangements by Nelson Riddle.

A recent addition to my collection is Ernest Ansermet conducting the Swiss Romande Orchestra in Stravinsky's *The Rite of Spring* (LP, London CS 6031). This beloved warhorse found favor with the Audio Physics' deep, spatially rich soundstage. Instrumental tone was excellent, and when the oboes, bassoons, and various strings begin swirling together in an early section of this work, the Step Plus never lost the plot, never strained, never ran out of steam. I easily followed the melody of each well-proportioned instrument, the music deeply focused on this excellent mono recording. When timpani were smacked hard, the Step Plus resolved all the force of the attacks that was needed to make them sound fully convincing. And, once again, these speakers "disappeared" as the sources of the sound, leaving only the instruments in space before me. Pure delight.

Rafael Anton Irisarri's *The Unintentional Sea* (LP, Room40 RM445) ultimately proved that, with the right LP, the Step Plus could replicate bass weight of epic proportions. The Step Plus recreated the totality of this beautiful, menacing, dirge-like music, which conjures up images of a frigate crossing the ocean as odd metal objects are dragged past



its side, sea spray pummels your face, and the ominous sea churns below. As a replicator of distinct soundfields and spatial relationships within those fields, the Step Plus could shock me with its ability to completely vanish.

Digitally sourced music gave further evidence of the Step Plus's prowess. As I played CDs through an ATC CDA2 Mk.II CD player into the Parasound Halo Integrated, the Steps

reproduced quality bass tonnage that was extraordinary. I'm not talking a merely passable low end, but deep, round frequencies. The best example of this was *Forq*, from the scrappy funk-jazz quartet of that name (CD, groundUP 8829514692). *Forq* includes members of Snarky Puppy, and their organ-generated robo funk sounds as if recorded inside a bass drum. Every ounce of bass-drum air—most plentifully produced by jazz drummers who don't mute the drum—is present on this bass-grip-of-doom CD. Imagine Chic by way of the Meters and Tower of Power: *Forq* is that lowdown and dirty.

"The Halo Integrated played with generous measures of that afore-defined *neutrality*," Herb Reichert wrote in his review of the Parasound (\$2495) in the November 2015 issue. "What little personality it had remained hidden, like a cat in the bushes—which made it easy to hear the sonic qualities of

measurements, continued

low enough that the tweeter is around 8" below the listener's ears, the treble balance will then be even and flat. But with the speakers on stands that place the tweeters higher than the listener's ears, the suckout will be even deeper.

In the time domain, the Audio Physic's step response on the tweeter axis (fig.6) indicates the cause of this suckout: the drive-units are out of phase in the crossover region. While both drive-units are connected in positive acoustic polarity and, as

usual, the tweeter's output arrives at the microphone before the woofer's, the decay of the tweeter's step overlaps the start of the woofer's step but is in opposite polarity. This could have been solved by inverting the polarity either of the tweeter or of the woofer, so that one unit's output smoothly blends with the other's. Alternatively, by moving the microphone significantly above the tweeter axis, the woofer's output is pushed back in time until its step smoothly blends with

the decay of the tweeter's step. As a result, the outputs of the two drivers, instead of canceling, now correctly sum in the crossover region—again, compare the green with the black trace in fig.3. The cumulative spectral-decay plot on the tweeter axis (fig.7) is pretty clean, however.

I note that KM enjoyed his time with the Audio Physic Step Plus. However, its measured performance suggests it must be used on a low stand.

—John Atkinson

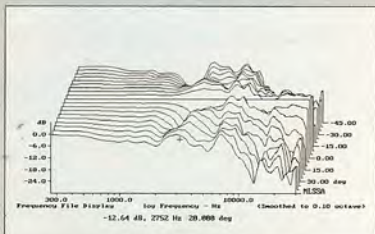


Fig.5 Audio Physic Step Plus, vertical response family at 50°, normalized to response on tweeter axis, from back to front: differences in response 45-5° above axis, reference response, differences in response 5-45° below axis

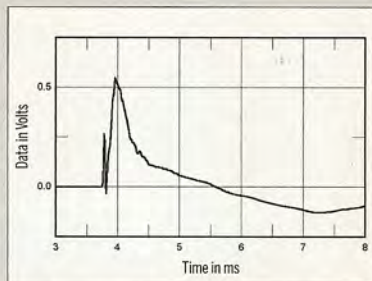


Fig.6 Audio Physic Step Plus, step response on tweeter axis at 50° (5ms time window, 30kHz bandwidth).

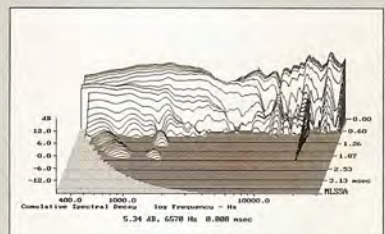


Fig.7 Audio Physic Step Plus, cumulative spectral-decay plot on tweeter axis at 50° (0.15ms risetime).

every associated component I used with it.² While I largely agree with Herb's conclusion, it made me all the more curious about how the Step Plus would boogie with my faithful Everyman integrated, the Heed Elixir.

Listening with Heed Audio's Elixir

When I played CDs in the ATC CDA2 Mk.II driving the Heed Elixir (\$1195), instruments danced before me, suspended in space and fully corporeal; at times, it was downright spooky. The Step Pluses "disappeared" like no other speaker I've had in my three-room Greenwich Village pad. As I keep saying,

The Elixir's 50Wpc into 8 ohms (17dBW) or 65Wpc into 4 ohms (15.1dBW) are enough to drive any speakers, and its sound is essentially dark-toned and warmish. When I played a reissue of Fritz Reiner and the Chicago Symphony Orchestra's recording of Rimsky-Korsakov's *Scheherazade* (2 LPs, 200gm, 45rpm, RCA Living Stereo/Analogue Productions AAPC 2446-45), the Elixir/Step Plus combo nearly blew the walls off my apartment and the ears off my head. So much orchestral power and dynamics emanate from these LPs that it's a virtual torture test for your hi-fi. Rimsky-Korsakov's music flew from the Step Pluses with force, potency, and exhilaration, even if the Elixir didn't provide the last bit of resolution or tonal purity. I think of the Heed as lush but not lazy, and the Step Plus as clearheaded, capable, and quick enough to match well with any amplifier. Almost.

Listening with Shindo Laboratory's Haut-Brion

My beloved Shindo Haut-Brion power amp (20Wpc, \$11,000 when purchased) is one of the finest music/electrical-signal-amplifying machines I've ever heard. Its tonal saturation, palpable and immediate re-creation of space, and unerring naturalness are, in my opinion, unparalleled. The late Ken Shindo imbued each of his products with a unique soul that makes possible a more emotional listening experience. But the Haut-Brion couldn't drive the Step Pluses—no matter the medium, music sounded weak. Could *any* amplifier drive the Step Plus? Not with less than 35Wpc. Any less than that, and you're looking for trouble.

Listening with Mytek's Brooklyn

Powered by Mytek's class-D Brooklyn (300Wpc, \$2495), the center fill of the Step Pluses' image with mono LPs became much broader, each instrument imbued with greater focus and clarity. More so than with any of my other amps, each instrumental line was more discernible with the Brooklyn driving the Audio Physics—*The Rite of Spring* became a hi-rez canvas of swirling sounds in which I could follow each aural brushstroke with ease. The Mytek lacks the low-end richness of the Parasound or Heed, instead offering deeper, exceedingly well-sorted soundstages with laser-like resolution of instruments.

Ella Swings Brightly with Nelson sounded drier, yet its soundstage was larger and deeper, no longer panned hard left and right—those larger images made the entire sound better fleshed out, and Fitzgerald's voice had decay trails to die for. The Step Pluses' already remarkable imaging only grew with the Mytek, as did their spatial cues, speed, resolution, overall soundstage depth, and retrieval of spatial information.

Everything But the Girl's *Amplified Heart* (CD, Atlantic 82605) revealed even stronger bass frequencies and sonic sorting through the Mytek and Audio Physics. Perhaps it

ASSOCIATED EQUIPMENT

Analog Sources Kuzma Stabi S turntable & Stogi tonearm; Thorens TD 124 Mk.I turntable, Jelco 350S tonearm; Denon DL-103, Hana EL, Ortofon Quintet Bronze cartridges.

Digital Sources Apple MacBook computer running Audirvana Plus, Qobuz; ATC CDA2 Mk.II CD player, LG BD550 BD player (as transport); Halide DAC HD, Mytek Brooklyn, PS Audio NuWave DACs; Western Digital T2 Mirror Drives (2).

Preamplification Auditorium 23 A23 MC step-up transformer; Heed Audio Quasar, Luxman EQ-500 phono preamplifiers; Shindo Laboratory Allegro preamplifier.

Power Amplifiers Mytek Brooklyn (2), Shindo Laboratory Haut-Brion.

Integrated Amplifiers Heed Audio Elixir, Parasound Halo Integrated.

Loudspeakers DeVore Fidelity Orangutan O/93, Elac Debut B6, Klipsch Heresy III, Quad S2.

Headphones Master & Dynamic MH40.

Cables Interconnect: AudioQuest Chicago & Water & Yukon, Morrow Audio MA-1, Shindo Laboratory, Triode Wire Labs American single-ended RCA. Speaker: AudioQuest Castle Rock, Auditorium 23, Tellurium Q Black, Triode Wire Labs American. AC: manufacturers' own.

Accessories IsoTek IVO3 Aquarius power conditioner; Music Hall Aztec Blue & Mooo record mats; Spec AD-UP1 Analog Disc Sheet; Salamander five-tier rack; IKEA Aptitlig bamboo chopping boards, Mapleshade maple platform (15" by 12" by 2") under turntable; 3"-thick studio-treatment foam damping (ceiling, walls).

Listening Room 12' L by 10' W by 12' H, system set up along short wall; suspended wood floor, 6"-thick walls (plaster over 2x4), wood-beamed ceiling.—Ken Micallef

was the overall lighter sound of my analog setup, but CDs generally have more force and low-end gravitas, even with the Step Plus's energy focus lying between its midrange and treble frequencies. Danny Thompson's double bass is brilliantly recorded on this album, and the Step Plus dug deep for his every bowed slide and plucked accent. Bass notes were tactile and deep, with precise transparency.

Conclusions

Whew! The Audio Physic Step Pluses proved overachievers to the nth degree. Their imaging and soundstaging were consistently top notch, but this mighty mite was just getting started. Offering first-rate bass-frequency reproduction, particularly from CDs (in my system), the Step Plus was clear, well-focused, and generally got out of the way, letting not only upstream components sing, but every disc I played, LP or CD. Compared to the similarly sized Quad S2 standmount (\$1000/pair), the Step Plus offered cleaner, more extended frequency extremes at both ends of the audioband, with a fast, crystal-clear sound that was never fatiguing, always revealing. If you're in the market for a soundstaging and imaging champ that produces clear upper-range frequencies and solid bass fundamentals with *almost* any amplifier, the Audio Physic Step Plus should be *numero uno* on your list. ■

² See www.stereophile.com/content/parasound-halo-integrated-integrated-amplifier.