

Infinity Primus 360

Robert J. Reina

LOUDSPEAKER

DESCRIPTION Three-way, reflex-loaded, floorstanding loudspeaker. Drive-units: ¾" (19mm) MMD tweeter, 4" (100mm) MMD-cone midrange unit, two 6½" (165mm) MMD-cone woofers. Crossover frequencies: 350Hz, 3.3kHz. Crossover slopes: 24dB/octave. Frequency response: 38Hz–20kHz, ±3dB. Sensitivity: 93dB/2.83V/m. Nominal impedance: 8 ohms. Recommended amplification: 10–200W.

DIMENSIONS 39" (990mm) H by 8⅞" (208mm) W by 13⅞" (330mm) D. Weight: 48.5 lbs (22kg).

FINISH Black wood-grain, black grille-cloth.

SERIAL NUMBERS OF UNITS REVIEWED ME02681.07499 & 706.

PRICE \$658/pair. Approximate number of dealers: 100.

MANUFACTURER Infinity Systems, 250 Crossways Park Drive, Woodbury, NY 11797. Tel: (516)674-4INF. Web: www.infinitysystems.com.

When I reviewed Infinity's Primus 150 loudspeaker in the April 2004 *Stereophile*, I was very impressed with its overall performance. To this day, I continue to be amazed at the level of realism this \$198/pair loudspeaker can reproduce, and I've kept the review pair to serve as a benchmark for an entry-level audiophile speaker. When I'd completed that review, my first thought was: *Now—what can Infinity do within the affordable Primus series for more money?* So I requested a review sample of the Primus series' flagship, the three-way Primus 360 floorstanding speaker. After all, how could I resist listening to a speaker that claims 38Hz bass extension for only \$658/pair?

MMD technology

All of the speakers in Infinity's entry-level Primus series feature the company's Metal Matrix Diaphragm (MMD) technology, derived from their Ceramic Metal Matrix Diaphragm (CMMD) technology. MMD drivers are made by anodizing both sides of an aluminum core to a specific thickness. This is intended to produce low-mass, highly rigid cone diaphragms designed to operate with reduced distortion and breakup compared with those made of such conventional materials as paper and plastic. Each tweeter, midrange, and woofer driver is optimized for its particular application, its internal resonances (according to Infinity) virtually eliminated within the driver's frequency range to achieve maximum sonic clarity. All tweeters are mounted in a specially shaped recessed waveguide designed to provide precise imaging, even frequency response, and controlled directivity over a wide listening area.

The front-ported, magnetically shielded Primus 360 has a ¾" MMD tweeter, a 4" MMD midrange driver, and two 6½" MMD woofers. I tested the speakers with their grilles both on and off, and heard slightly better resolution of details with the grilles off, while the speaker's timbral signature remained unchanged.

Listening: cut from the same cloth?

The midrange was the Primus 360's greatest strength. On all recordings, the speaker's midrange reproduction was dead neutral; it resolved significant layers of inner detail as well as ambience and soundstaging cues. This, combined with its delicate, subtle, linear renderings of low-level dynamic articulations, made the 360 an extraordinary reproducer of vocals and acoustic instruments with significant midrange energy. High frequencies were natural and extended, but not as detailed, sophisticated, or free of grain as I've heard from more expensive speakers. However, the 360's reproduction of transients was beyond



Infinity Primus 360 loudspeaker

reproach. On every recording, transients were lightning-fast but without a trace of unnatural sharpness. This quality, combined with the speaker's overall neutrality in the midrange and highs, made the 360 well matched for recordings of percussion and plucked strings.

The Primus 360's subjective bass extension was quite impressive; the speaker's single significant deviation from neutrality was an overall warmth or ripeness in the midbass. Whether this character added some euphonic benefits or subtracted from the speaker's realism varied with the recording. Furthermore, the 360's bass extension and superb resolution of high-level dynamics meant that it performed well when required to reproduce blasts and bombast. (The Primus 360 is fitted with cylindrical plastic feet and does not accommodate built-in spikes. I wonder if spiked feet would have altered its bass performance.)

Moving up in price within a speaker line can

produce surprising results. Sometimes the more expensive speaker sounds merely like a louder, bassier version of the little guy, but without a corresponding increase in overall quality. At other times, the more expensive speaker can emphasize the strong points and soft-pedal the weaknesses of the original, resulting in even greater value per dollar. At still other times, the higher-priced speaker and its little brother present completely different sonic personae.

As I listened to the Primus 360 and recalled the last time I'd heard the Primus 150, I concluded that their relationship didn't neatly fit any of those categories. If you com-

pare the comments above to those in my review of the Primus 150, you might conclude that I think the 360 sounded like a louder 150, with deeper bass (although the bass did have a somewhat different character). That would accurately describe how the 360 affected my brain, but it would not address how the larger Primus impacted my heart and soul. To explain that, I need to drag my colleague Art Dudley into this.

At the Home Entertainment 2004 show in New York City last May, Art and I sat on the panel of a "Meet the Editors—*Stereophile*" session. Art was gushing about the performance of a vintage horn speaker he'd just heard at

the New York Hilton. He was urging everyone to listen to how the sound from this speaker gently emerged and rolled over the listener, as does live music but as do very few speakers, most of which, according to Art, sound as if music is being "squirted at you."

How Art described good horn speaker sound pretty much sums up how the Primus 360 affected me. With every recording, there was a sense of high-level dynamic linearity and ease that did not vary by recording or loudness level. At no time did I feel that the 360 was straining or working hard to produce music, which enhanced realism with most recordings. The conclu-

MEASUREMENTS

The Infinity Primus 360 was significantly more sensitive than average, at an estimated 91.5dB(B)/2.83V/m. Though this is slightly lower than the specified 93dB, the 360 will still play very loudly with only a few watts of input power. However, with an impedance magnitude that drops below 4 ohms in the lower midrange and high treble and an electrical phase angle that is extreme in the upper bass (fig.1), the speaker needs to be partnered with an amplifier or receiver that can drive low impedances with aplomb. (The combination of 5.2 ohms and -45° phase angle at 93Hz will tax amplifiers rated at 8 ohms.)

There are some wrinkles in the impedance traces between 150Hz and 400Hz that imply the presence of cabinet resonances of some kind. Using a simple plastic-tape accelerometer to investigate

the cabinet's vibrational behavior, I found strong resonant modes present at 180Hz, 240Hz, and 490Hz on all surfaces. The last was the strongest (fig.2), but this will be too high in level to have serious subjective consequences. The lower-frequency modes are in a region where they are more likely to have an effect; I wonder if they contributed to Bob Reina's finding the speaker to have some "warmth or ripeness in the midbass."

The saddle at 42Hz in the impedance-magnitude trace suggest that this is the tuning frequency of the front-mounted port, and nearfield analysis indeed shows that the port's acoustic output peaks between 30Hz and 60Hz (not shown). The minimum-motion frequencies of the two woofers were a little different, however, at 30Hz (lower) and 40Hz (upper). The port's output suffered from a peak at 330Hz; though this was well down in level, the nearfield woofer outputs did show a discontinuity at this frequency, suggesting the presence of an internal air-space resonance. This is too high in frequency to add warmth, but it might obscure midrange clarity.

The crossover between the woofers and the midrange is specified as occurring at 350Hz, but there actually appeared to be a broad overlap between the three drive-units. Even so, the Primus 360's farfield response, averaged across a 30° horizontal window on the tweeter axis (fig.3), shows good drive-unit integration. It is also extraordinarily flat, especially when you take the Infinity's low price into consideration! Most of the peak in the upper bass will be due to the nearfield measurement technique, but the Infinity's lows will be on

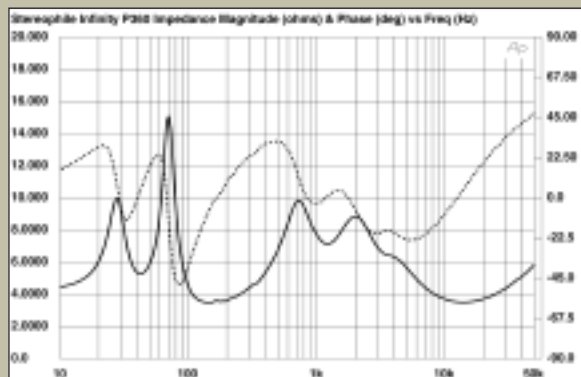


Fig.1 Infinity Primus 360, electrical impedance (solid) and phase (dashed). (2 ohms/vertical div.)

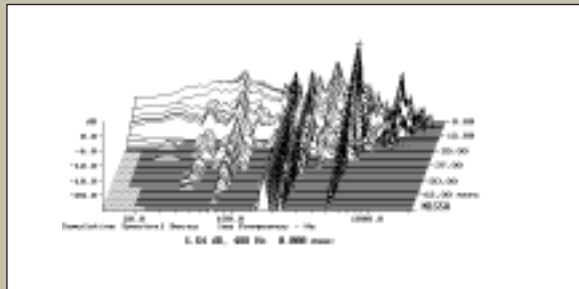


Fig.2 Infinity Primus 360, cumulative spectral-decay plot calculated from the output of an accelerometer fastened to the cabinet's side panel level with the port (MLS driving voltage to speaker, 7.55V; measurement bandwidth, 2kHz).

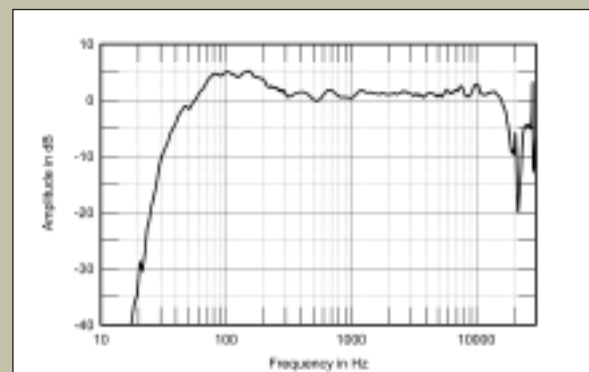


Fig.3 Infinity Primus 360, anechoic response on tweeter axis at 50° , averaged across 30° horizontal window and corrected for microphone response, with the complex sum of the nearfield woofer, midrange unit, and port responses, taking into account acoustic phase and distance from the nominal farfield point, plotted below 300Hz.

sion here, I believe, is that no matter how well a small two-way bookshelf speaker can play music, there are certain parameters of musical reproduction that are best achieved by putting more and larger drivers into a bigger cabinet. But how well this captivating feature of the Primus 360 interacted with the speaker's overall strengths and weaknesses depended on the genre of music being reproduced.

The folk, the jazz, the classical, the rock!

The Primus 360's midrange, detail resolution, and transient capabilities made it the speaker

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to die for for fans of the singers with acoustic guitars. Joni Mitchell's vocal and overdubbed acoustic guitars on "Urge for Going," from *Hits* (CD, Reprise 46436-2), were as natural and involving as I've ever heard from that disc. Ditto for Madeline Peyroux's silky vocals on "Hey, Sweet Man," from *Dreamland* (CD, Atlantic 82946), accompanied by Marc Ribot's articulate dobro. Jazz vocal recordings fared equally well. On Diana Krall's *The Girl in the Other Room* (CD, Verve B0001826-12), the slightly warm string bass presented an attractively warm backdrop for Krall's seductive vocal articulations. Her piano and the percussion were realistic across all frequency ranges.

the rich side compared with, for example, the Canton Vento 809 DC (reviewed by Wes Phillips elsewhere in this issue). The lows are 6dB down from their peak level at the port tuning of 42Hz, the lowest note of the four-string double bass and electric bass.

The ultrasonic peak at the metal-dome tweeter's resonant frequency of 21kHz is suppressed on-axis but develops to the speaker's sides (fig.4). More important, note how evenly spaced the contour lines are in this graph, and how consistently the Infinity maintains its off-axis response across the audioband up to 9kHz or so. This means that the reverberant field generated by the speaker in a room will be as uncolored as the on-axis response. Again, this is impressive speaker engineering, even if you don't take the Primus 360's price into account. In the vertical plane (fig.5), the Infinity maintains its flat response over quite a wide listening window. Only if the listener stands will he perceive a suckout at the upper crossover frequency.

The Primus 360's step response (fig.6) indicates that the tweeter and midrange unit are connected in positive acoustic polarity and the woofers in negative polarity, which, in conjunction with the phase shift associated with the crossover filters, ensures good frequency-domain integration between the units. Note how the overshoot of each unit's step smoothly hands over to that of the next lower in frequency—again, something that correlates with good integration in the frequency domain.

Finally, the Primus 360's waterfall or cumulative spectral-decay plot (fig.7) is among the best I have measured, with a very clean initial decay and almost no ridges of delayed energy apparent. This Infinity may be bargain-priced, but it demonstrates extraordinarily competent loudspeaker engineering. I was a little bothered by its lively cabinet but overall the Primus 360 raises the bar for designs that compete at more than twice its price.

—John Atkinson

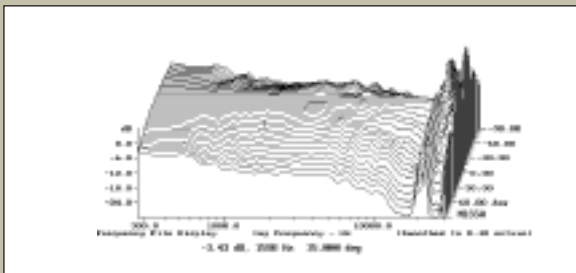


Fig.4 Infinity Primus 360, lateral response family at 50°, normalized to response on tweeter axis, from back to front: differences in response 90–5° off-axis, reference response, differences in response 5–90° off-axis.

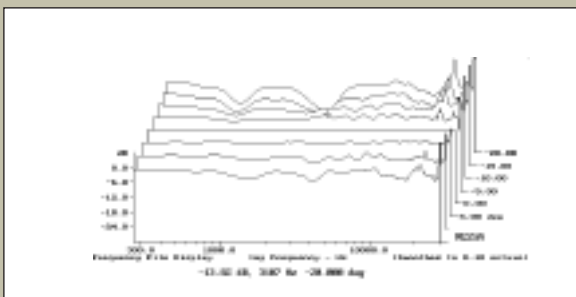


Fig.5 Infinity Primus 360, vertical response family at 50°, normalized to response on tweeter axis, from back to front: differences in response 20–5° above axis, reference response, differences in response 5–15° below axis.

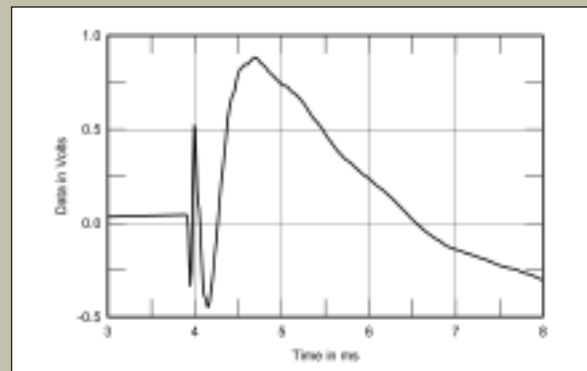


Fig.6 Infinity Primus 360, step response on tweeter axis at 50° (5ms time window, 30kHz bandwidth).

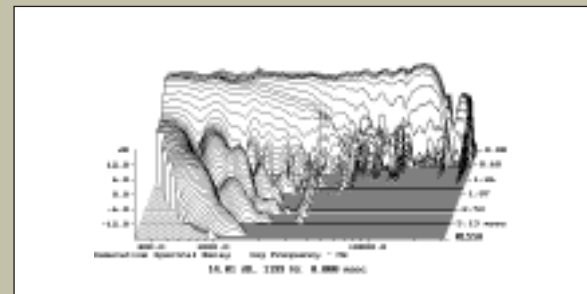


Fig.7 Infinity Primus 360, cumulative spectral-decay plot at 50° (0.15ms risetime).

Most jazz recordings fared well on the Primus 360. My listening notes from Sonny Rollins' *Way Out West* (CD, JVC XRCD VICJ-60088) read "burnished, natural, velvety and breathy Rollins" and "Wow, that's a ride cymbal!" Ray Brown's bass solo on "I'm an Old Cowhand" was woody and natural, presented with added warmth only in the instrument's lower regions. Miles Davis' *Seven Steps to Heaven* (LP, Columbia CL 2051) was the best example of Art Dudley's Gently Emerge and Roll Effect. The string bass was warm and involving as Davis' trumpet floated out to fill the room during a dinner party I was hosting. The Primus 360's dynamics and transient pacing gave a wailing, cooking, driving character to Ornette Coleman's *Live at the Golden Circle, Vol. I* (LP, Blue Note 4224), but the upper register of Coleman's alto sax was a bit tense during the highly modulated passages.

Chamber music, such as George Crumb's *Quest* (CD, Bridge 9069), shone on the 360. Abundances of detail, air, definition, and decay surrounded the guitar and every percussion instrument with consistent, dynamic linearity. Top-octave partials of bells were extended and natural, although the lower range of the string bass was warm and somewhat indistinct. Large orchestral works, such as Stravinsky's *The Firebird* (LP, Mercury Living Presence/Classic SR 90226) filled the room with air and vibrancy, the dramatic and well-defined bass drums shaking the room without interfering with the unraveling of inner orchestral detail. The Primus 360's low-bass capabilities were quite noticeable on John Rutter's *Requiem* (CD, Reference Recordings RR-57CD), the speaker reproducing organ-pedal notes with more realism than I've heard from any other speaker costing less than \$1000/pair.

Rock was a mixed bag, particularly in the area of bass realism; it depended on the mix. Aimee Mann's *Bachelor No. 2 or The Last Remains of the Dodo* (CD, Super Ego SE002) rocked with good pace and slam under Mann's processed but silky vocals, but the overly ripe bass guitar was a bit too rumbly. Conversely, the added midbass ripeness added a sense of drama to the all-electronic continuo of bass synth and drum machine on Sade's *Love Deluxe* (CD, Epic EK 53178).

And the Primus 360 had a bonus: It proved to be a superior home-theater speaker. For movie buffs who don't want a full-blown 5.1- or 7.1-channel surround system, the 360's bass extension and high-level dynamic slam provided a very engaging two-channel home theater experience. Moreover, the midrange clarity and detail resolution made dialog and Foley tracks seem realistic and easy to follow.

INFINITY'S PRIMUS 360 PRESENTS LEVELS OF DYNAMIC DRAMA AND EFFORTLESSNESS THAT ARE UNHEARD OF AT ITS PRICE.

Comparisons

I compared the Infinity Primus 360 (\$658/pair) with two speakers that are its direct competitors in price: the NHT SB3 (\$600/pair) and the Nola (previously Alón) Li'l Rascal Mk.II (\$600/pair). I also compared the 360 to its little brother, the Primus 150 (\$198/pair).

Particularly with piano and vocal recordings, and especially in the detailed midrange, the Primus 360 and 150 behaved nearly identically. With more demanding works, however, the 150 could not approach the 360's high-level dynamic capabilities. When pushed hard, the 150's sound coagulated and compressed a bit. Moreover, the 150 lacked the 360's extended lower bass, although I felt its mid- and upper-bass articulation was cleaner, if more restrained.

The NHT SB3 was more liquid and less detailed, with less extended highs than the Primus 360. It sounded more romantic and more forgiving than the Infinity, but its midbass was also rather warm—less extended but more defined than the Primus. The SB3's high-level dynamics were very good, but the Primus 360's were superior. The NHT's

ASSOCIATED EQUIPMENT

ANALOG SOURCES VPI TNT IV turntable, Immedia RPM tonearm, Koetsu Urushi cartridge; Rega Planar 3 turntable, Syrinx PU-3 tonearm, Clearaudio Virtuoso Wood, Aurum Beta S cartridges.

DIGITAL SOURCES California Audio Labs Icon Mk.II Power Boss, Creek CD53 Mk.II CD players; Pioneer DV-333 DVD player.

PREAMPLIFICATION Vendetta Research SCP-2D phono stage, Audio Valve Eclipse line stage.

POWER AMPLIFIER Audio Research VT100 Mk.II.

INTEGRATED AMPLIFIER Creek 5350SE.

CABLES Interconnect: MIT MI-350 CVTwin Terminator, MI-330SG, Terminator. Speaker: Acarian Systems Black Orpheus.

ACCESSORIES Various by ASC, Bright Star, Celestion, Echo Busters, Salamander Designs, Simply Physics, Sound Anchor, VPI.

—Robert J. Reina

transients were not as articulate, however.

The Nola Li'l Rascal Mk.II was more open, airy, and detailed than the Infinity, with a richer, more holographic midrange. Although the Li'l Rascal's high frequencies were detailed, extended, and a bit rough, they were still more delicate than the Primus 360's. The midbass was cleaner through the Nola, but the Infinity had more extended and more dramatic lower bass.

Payoff

Any speaker in the \$500–\$600/pair range will have some sonic tradeoffs, and the Infinity Primus 360 is no exception. It has an attractive combination of strengths and weaknesses, and presents levels of high-level dynamic drama and effortlessness that are unheard of at the price. If your tastes in sound and music balance well with the speaker's character, the Primus 360 should provide you with long-term, plug-and-play, trouble-free enjoyment of music and home theater programming. Another well-thought-out design from Harman International. ■



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