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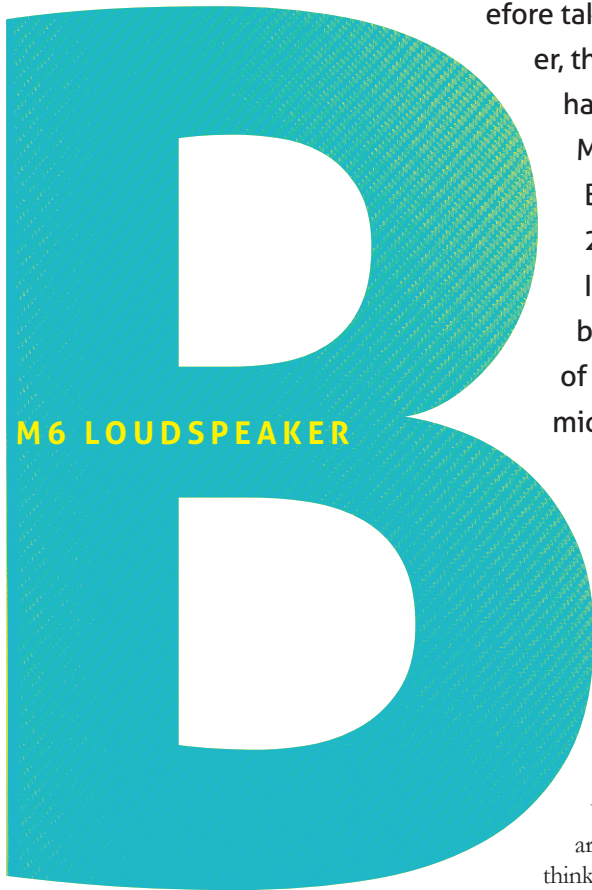
MAGICO M6 LOUDSPEAKER

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BY ROBERT HARLEY

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M6
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MAGICO M6 LOUDSPEAKER



efore taking delivery of Magico's M6 loudspeaker, the three best-sounding speakers I'd had in my home were Magico's own Q7 Mk.II (\$229,000, Issue 256), the Wilson Benesch Eminence (\$235,000, Issue 294) and the Rockport Lyra (\$169,000, Issue 276). The M6 doesn't have the bass extension, power, and muscularity of the mighty Q7, but it's close. The M6's midrange isn't quite as magical as the Eminence's ethereal, electrostat-like transparency. This new Magico also falls a little short of the Rockport in resolving extremely low-level textural detail that reveals the beauty and realism of instrumental timbre.

Yet if given the choice of any of these state-of-the-art contenders to live with for the rest of my life, I think that I would choose the M6.

Why? In a word, *balance*. The M6 is so fully realized in every way that nothing about its sonic presentation reminds me that I'm listening to a loudspeaker. It's not a "top down" or "bottom-up" speaker, and it doesn't compromise any performance aspect to hyper-optimize any other attribute. Although the M6 may be bested slightly in a few specific areas by a very select group of the world's greatest speakers, we don't hear music as "specific areas" of sonic performance. Rather, we experience a holistic, unconscious reaction that either crosses the threshold into believability or doesn't. The M6 allows me to cross that threshold, quickly and completely, every time I play music.

Jonathan Valin wrote a brilliant analysis of this phenomenon in his review of the Acoustic Signature Invictus Jr. turntable in Issue 297: "Though I've struggled for decades with explaining which sonic qualities make for a 'real' or lifelike presentation (beyond, of course, superior LP engineering and mastering), I keep coming back to the fact that I know 'real' when I hear it. Indeed, I know it instantly without rational analysis or reflection (which is part of what makes subsequent rational analysis so difficult). Though I distrust the concept (because it itself is hard to explain), it has come to me that perceiving a recorded copy as the real thing isn't merely a matter of superior parts but of what psychologists call the *gestalt grouping* of those parts, wherein the many variables that we reviewers (and you readers) ascribe to real and recorded sound (i.e., true-to-life timbre, pitch, dynamics, duration, soundstaging, imaging, bloom, dimensionality, etc.) are no longer perceived as separable (or even as outstandingly well-reproduced) ingredients but as a collectively realistic representation of a whole."



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(One reason that Jonathan remains high-end audio's finest writer is that he doesn't just describe in a review how the product sounded. Instead, he thinks deeply about, and then explains with great clarity, fundamental ideas about how we perceive reproduced music.)

Jonathan's insight perfectly explains why the M6 is so compelling musically—it has a singularity of presentation that seems to render moot analysis by dissection.

Magico's M series began as a research project into building enclosures from carbon fiber and aluminum rather than purely from aluminum. That venture resulted in the M Pro in 2014, which proved the concepts of Magico's new enclosure direction. The goal was to build an enclosure as stiff as aluminum but with greater damping, lighter weight, and most importantly, more rounded surfaces to reduce cabinet diffraction. The M6 reviewed here is the top of the M series that includes the \$56,000 M2 and \$75,000 M3.

The \$172,000-per-pair M6 is a three-way, five-driver dynamic loudspeaker with three 10.5" nano-graphene woofers, a 6" nanographene mid-range, and a diamond-coated beryllium dome tweeter. The enclosure is sealed. The nominal impedance is four ohms, and sensitivity is 91dB. The speakers weigh 400 pounds each, out of the crate, significantly less than the 750-pound net weight of the Q7.

THIS RE-RADIATED SOUND IS SLIGHTLY DELAYED RELATIVE TO THE DIRECT SOUND BECAUSE IT TRAVELS A LONGER PATH BETWEEN THE DRIVER AND YOUR EARS.



The M6's baffle, top and bottom panels, and narrow back plate are machined aluminum, with the tapered side structures made from 1/2"-thick carbon-fiber panels. The tapered carbon-fiber sides are just the visible portion of a single-piece, six-sided monocoque structure made from 1/2"-thick carbon-fiber walls that extend under the aluminum panels on all sides. Cross bracing through the center adds further rigidity. Note that the enclosure sides aren't the typical carbon-fiber skins separated by a core, but half an inch of solid carbon fiber. The M6's shape is radically different from previous Magico products; the ovoid cabinet has no edges anywhere. Even the top and bottom panels, machined from 2"-thick aluminum, feature compound curvatures and smooth surface transitions between the carbon-fiber and aluminum components. The baffle is considerably wider than the rear panel, so much so that the M6 is supported by three feet rather than by four. This shape reportedly nearly eliminates diffraction, and is claimed to be a significant contributor to the M6's sound quality. In fact, reducing diffraction is the M series' *raison d'être*.

Diffraction is a re-radiation of sound when that sound encounters a discontinuity, such as from a cabinet edge (among other phenomena). Think of a soundwave emanating from a driver mounted in a baffle. Some of the sound travels along the baffle's surface from the driver toward the baffle edge. When that portion of the soundwave encounters a sharp boundary, the sound doesn't continue on its path but rather is re-radiated in all directions by the surface discontinuity. (The word "diffraction" comes from the Latin *diffringere*, "to break into pieces.") This re-radiated sound is slightly delayed relative to the direct sound because it travels a longer path between the driver and your ears. When this delayed sound combines with the direct sound from the driver, the two waves interact construc-

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tively and destructively (reinforcement and cancellation), creating a series of very fine ripples in the frequency response at higher frequencies.

Cabinet-induced diffraction creates a mild form of comb filtering, a phenomenon in which the interaction of two identical signals of approximately equal amplitude, one of them delayed relative to the other, combine constructively and destructively to create a uniform pattern of very deep notches in the frequency response. These nulls are so deep, and so regularly spaced, that the frequency response looks like a comb. The frequency response peaks and dips caused by loudspeaker cabinet diffraction are much less severe than full comb filtering because the amplitude of the delayed energy is low relative to that of the direct sound.

I'll give you a vivid example of what comb filtering sounds like. In the Doobie Brothers' hit "Listen to the Music" there's a break in the middle with just the vocal, guitar, and hi-hat. The famous "phasey" swirling effect on the vocal during this break is caused by comb filtering, but with the frequencies of the peaks and nulls sweeping up and down the audioband as the delay between the direct and delayed signals is purposely varied to create the swirling effect. Today such effects are created electronically, but back in the day the effect was called "flanging" because the engineer would vary the pressure of his hand on the flange of a tape reel to slow down the tape to create the continuously variable delay. Although such effects may be employed as artistic expression, we obviously don't want our loudspeakers imposing such distortions on the music.

Every aspect of the M6's enclosure is designed to minimize the deleterious effects that the box has on the drivers' outputs. The mandate to eliminate flat surfaces or sharp transitions even extends to the contact point between the loud-

speaker and the floor. Rather than rest on the floor on spikes, the M6 is suspended above the floor on a tripod arrangement terminated with Magico's MPod feet. The bottom panel is rounded and curved just as the top panel is.

This enclosure design has other benefits. First, the inside of the enclosure is curved, reducing standing waves inside the cabinet. Standing waves are stationary areas of high and low pressure formed by sound waves reflecting from the cabinet interior surfaces and interacting with one another. Second, carbon fiber is extremely light and stiff, allowing thinner cabinet walls without sacrificing rigidity. The speaker's internal volume can thus be substantially larger while keeping the speaker's overall size manageable.

Looking next at the drivers, the three 10.5" woofers and single 6" midrange driver are updated versions of the graphene-infused Nano-Tech driver technology that debuted in the Q7. The motor is the same, but the cone benefits from a second-generation implementation of graphene, a wonder material that is extraordinarily strong but adds virtually no weight to the cone. According to *Wikipedia*, graphene is "a two-dimensional, atomic-scale hexagonal lattice in which one atom forms each vertex." That is, this form of carbon isn't a fiber or a nanotube, but a lattice structure just one atom thick. Graphene is 200 times stron-

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ger than steel by weight. To quote from my review of the Q7, which saw the debut of graphene in loudspeaker cones: “The combination of lightness and stiffness is the Holy Grail of driver design; the lightness allows the diaphragm to start and stop quickly by virtue of its low mass, and the stiffness prevents the diaphragm from flexing (and thus introducing distortion) under the stress of being driven by a voice coil attached near the diaphragm’s center. A light diaphragm can also provide superior low-level resolution; music’s very fine details are not obscured by the diaphragm’s inertia. Think about the very low-level components of an audio signal—the most delicate musical details of timbre, microdynamics, and ambience—applied to two drivers, one of them with a high-mass diaphragm and a stiff surround material, and the second with a featherweight cone and very compliant surround. It’s easy to visualize how, with the high-mass cone, music’s very fine structure would fall below the driver’s ability to move in response to the signal. The driver’s mechanical structures set a threshold below which no information can be resolved. But the lighter the diaphragm, the more powerful and sophisticated the motor structure, and the more carefully designed the surround material and shape, the lower that threshold becomes. The result is an increase in low-level detail. Moreover, lighter diaphragms more faithfully reproduce the leading-edge attack of transient signals, which translates to a greater sense of realism and better conveys microdynamic expression.”

The M6’s extremely light and stiff cones are driven by an immensely powerful motor made from neodymium magnets. In the midrange driver, the magnetic field strength in the gap where the voice coil sits is 1.7 Tesla, which is more than twice the field strength of conventional drivers. I had a demonstration of how powerful these magnets are while on a tour of the Magico factory. A 6" driver was placed on a metal table and I was invited to pick it up. The magnetic attraction was so strong that it felt as though the driver were bolted

**THE LIGHTER THE CONE AND
THE MORE POWERFUL
THE MAGNETIC MOTOR, THE
FASTER THAT CONE CAN START,
STOP, AND CHANGE DIRECTION**

SPECS & PRICING

Driver complement: One 1.1" (28mm) diamond-coated beryllium dome tweeter; one 6" graphene midrange; three 10.5" graphene woofers

Sensitivity: 91dB

Impedance: 4 ohms

Frequency response: 24Hz–50kHz

Recommended power: 20–500 watts

Dimensions: 19.93" x 56.25" x 25.67" (including tripod and feet)

Weight: 400 lbs. each

Price: \$172,000 per pair (includes MPod feet)

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magico.net

Associated Equipment

Analog source: Basis Audio A.J. Conti Transcendence turntable with SuperArm 12.5 tonearm; Air Tight Opus cartridge; Moon 810LP phonostage

Digital source: Aurender W20 server, Berkeley Audio Design Alpha DAC Reference Series 3 MQA DAC; Berkeley Alpha USB USB-to-AES/EBU converter; Shunyata Sigma USB cable; AudioQuest Wild Digital AES/EBU cable, T+A SDV 3100HV DAC and PDT 3100HV CD/SACD transport

Amplification: Constellation Altair 2 preamplifier; Constellation Hercules 2 monoblock power amplifiers

AC Power: Shunyata Triton V3, Typhon QR, Sigma power cords; Shunyata AC outlets, five dedicated 20A lines wired with 10AWG

Support: Critical Mass Systems Olympus equipment racks and Olympus amplifier stands; CenterStage2 isolation

Cables: Shunyata Sigma interconnects and loudspeaker cables; AudioQuest WEL Signature interconnects and AudioQuest Dragon Zero loudspeaker cables

Acoustics: Acoustic Geometry Pro Room Pack 12, ASC 16" Full-Round Tube Traps

Room: Acoustic Sciences Corporation Iso-Wall System

LP cleaning: Klaudio KD-CLN-LP200, Levin Design record brush

to the table. Driving very light cones with very powerful magnets is analogous to a sports car with a 700-horsepower engine in a small and light body. Incidentally, reducing weight in a car improves the three main performance goals—it accelerates faster, stops faster, and turns better (because there’s less mass that must change direction). A loudspeaker driver follows the same laws of physics; the lighter the cone and the more powerful the magnetic motor, the faster that cone can start, stop, and change direction, and thus more faithfully reproduce music’s dynamic nature.

The M6’s tweeter is a 1.1" beryllium dome coated by a very thin diamond layer applied to the dome through vapor deposition. The diamond further stiffens the already stiff beryllium dome to prevent any non-piston movement. This is the same tweeter in the Q7 Mk.II, replacing the original beryllium tweeter in the first

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generation of the Q7. Having heard the Q7 with the older and then this new tweeter, I can attest that the newer tweeter is significantly smoother than the one it replaced.

The three MPod feet that support the tripod on which the enclosure rests are very sophisticated devices that do more than couple the speaker to the floor. Magico calls the MPod a “noise-channeling support system.” Cones and spikes perform the important function of coupling the speaker to the floor so that the cabinet vibrates less. This anchoring effect makes the cabinet more resistant to moving in response to driver motion. But cones and spikes don’t dissipate vibrational energy. The ideal loudspeaker-to-floor interface would thus provide the anchoring effect of spikes, along with vibration dissipation. That’s the theory behind the MPod. The device employs constrained layer damping that is tuned so that the MPod provides solid coupling to the floor below 300Hz, but attenuates noise and vibration above that frequency. The damping material, which was reportedly developed for NASA, is so thoroughly researched that the designer using it can specify the precise frequency at which the material begins attenuating vibration. Note that the MPod’s lower hemisphere isn’t connected with hardware to the speaker, but rather through the constrained layer damping mechanism. The MPod is usually shipped with a pin inserted through the device that is removed once the MPod is installed. Removing the pin engages the constrained layer damping structure. It is thus possible to hear the effect of the device by pulling the pin. Unfortunately, the review samples had made the rounds of audio shows and weren’t shipped with pins, so I was unable to hear this comparison.

LISTENING

Perhaps the most important thing you need to know about the M6—and certainly the most telling—is that for the first three months of living with this speaker I believed that the tweeter was an all-new design with dramatically lower distortion than the already smooth tweeter in the Q7 Mk.II. I had lived with the Q7 and Q7 Mk.II for many years, and knew their sound intimately. No one told me the tweeter was new, but I had assumed it was because the M6’s treble sounded significantly smoother and more relaxed than what I had heard from the Q7 Mk.II. In fact, one of the M6’s defining characteristics is that you simply don’t hear the tweeter. And I was using the same electronics, the reference-quality Constellation Altair 2 linestage and Hercules 2 monoblocks.



How could the same tweeter sound so different? The enclosure shape. According to designer Alon Wolf, the M6’s smoother treble, more expansive soundstaging, and greater ability to disappear are all the result of lower cabinet diffraction realized by the new enclosure shape.

Disappear is a word that aptly describes the M6, on many levels. Visually, the M6’s rounded shape makes it appear smaller than similarly sized rectangular speakers, allowing the M6 to better blend into its environment. Tonally, the M6 disappears because of its utterly smooth and liquid sound, lack of coloration, and top-to-bottom coherence. And the M6 disappears spatially like no other dynamic speaker I’ve heard, throwing a huge and precise soundstage that gives no indication of the sound’s origin.

But most importantly, the M6 disappears musically. It gets out of the way with a transparency to the source that is utterly beguiling. Although the M6 doesn’t quite have quite the midrange transparency of a good electrostat, it nonetheless has a greater overall transparency to musical expression than a full-range electrostat because it sounds of-a-piece from top to bottom, with no nagging idiosyncrasies that shatter the illusion of hearing live music-making. It goes back to Jonathan’s observation that the sense of realism in reproduced music doesn’t result from an analysis and mental assembly of separate sonic components (regardless of how well each of those individual elements are reproduced) but from our holistic, unconscious reaction to how our minds group those components. That *frisson* of lifelike realism we sometimes experience from a stereo system isn’t the result of analysis of the sound’s component parts, but rather from a more primal response that bypasses critical thinking.

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The M6's overall character is another step in the same directional path that Magico has been following since I reviewed the company's V2 back in Issue 202 (a hundred issues ago!). That direction is toward increased tonal warmth, denser and more saturated tonal colors, a greater sense of ease, and a smoother and gentler treble. Earlier-generation Magico speakers seemed willing to sacrifice relaxation in favor of resolution, two qualities that are often mutually exclusive. The M6's great achievement is delivering all the harmonic beauty, tonal richness, warmth of tone color, and overall ease of actual music while simultaneously *increasing* resolution. The M6 reveals a wealth of fine timbral, dynamic, and spatial cues, but in a relaxed context that encourages you to lean into the music to hear more deeply. I could cite any number of instruments or recordings to illustrate this, but I'll choose three recordings with acoustic guitar that were revelatory for me. The first is the all-acoustic trio album *The Rite of Strings* with Jean-Luc Ponty, Al DiMeola, and Stanley Clarke. I've heard this album on a wide range of systems, but never before has DiMeola's guitar been so free from glare, hardness, and mechanical character. His instrument sounded more organic with the metallic patina stripped away. The second guitar recording is Paco de Lucia's *Live in America*, the rapid-fire virtuoso flamenco playing perfectly articulated and vivid, yet without edginess. At the other end of the spectrum was the extremely subtle and gentle guitar work during the piano solo on "Harpo's Blues" from Phoebe Snow's eponymous album (Analogue Productions 45rpm vinyl). Through lesser speakers, the guitar tends to get lost in the mix, its understated contribution to the almost hypnotic rhythm diluted. The M6 perfectly portrayed the guitar's gentle character and the way it was played, yet fully revealed its important musical contribution. In recording after recording, I was struck by the way

MAGICO'S M SERIES RAISES THE PERFORMANCE BAR ON WHAT WAS ALREADY INDUSTRY-LEADING SOUND QUALITY.

the M6 immediately put me at ease with its smoothness and liquidity, and then proceeded to infuse the presentation with very finely filigreed information that reveals so much about the instruments, performances, and venues. It's a rare ability, and one that allows the M6 to consistently cross the threshold from great sound to a completely immersive musical experience.

The M6 has the second-best bass performance I've heard from a loudspeaker (the best is Magico's Q7). The three 10.5" woofers in the sealed enclosure deliver exceptional pitch definition, clarity, dynamic agility, and resolution of inner timbral detail. Some loudspeakers with these qualities can sound a little thin and light in the bottom end, realizing speed and articulation at the expense of weight and authority. The M6 manages to provide an enormously rewarding power, body, and muscularity through the bottom octaves without sounding overly ripe. Brian Bromberg's remarkable bass playing on his new album *Thicker than Water* (Qobuz 96/24) perfectly illustrated everything what's so right about the M6's bottom end. His instrument had color, body, texture, and weight on the one hand, and tremendous dynamic expression and agility on the other. The M6 locked into the deep, funky grooves laid down by this great band in a visceral way. It helped that the extreme bottom end was quick and tight, starting and stopping with terrific speed and precision. No slop, no overhang, and no bloat. The Q7 moves more air, extends deeper, and has greater dynamic impact, but the M6 is close behind.

A little higher up, the M6's power range was immensely satisfying. The upper bass had a full-bodied warmth, texture, and saturation of tone color that set the stage for the entire speaker's character. What was so satisfying is that this body and fullness didn't come at the expense of sounding thick or overly ripe. The quality was particularly rewarding on piano. The thin, threadbare character we often hear on left hand lines was replaced by a richness and power that conveyed the instrument's size and authority. The beautiful performances of Schumann and Debussy by Constantino Catena on *The Sound of the Concert Grand*, Fazioli F278 (MQA) were simply sensational through the M6. The instrument's sound was full bodied, robust, and richly detailed, yet it never exhibited a trace of thickness or bloat. The M6's utterly smooth treble and lack of glassy glare on transient leading edges, totally seamless integration with the upper midrange, and powerful dynamic expression combined with the rich midbass to present the most realistic reproduction of piano I've ever heard. If a speaker can get a piano so right, it should be able to reproduce any instrument.

The icing on the cake is that all this tonal beauty, coherence, clarity, and resolution is presented within a soundstage that is simply breathtaking. The two M6's completely disappear as sound sources, replaced by a huge three-dimensional space completely detached from the speakers. The sense of depth was staggering, no doubt aided by the M6's resolution of very low-level spatial cues.

CONCLUSION

Magico's M series raises the performance bar on what was already industry-leading sound quality. This new carbon-fiber cabinet, with its diffraction-reducing aerodynamic shape, takes the Magico sound to the next level. In addition to the more relaxed treble and expansive soundstaging realized by the new cabinet design, the M6 also skews toward a warmer and richer balance, with greater tone color density. It manages to do this without sounding overly ripe or thick, and significantly, while simultaneously increasing resolution.

Best of all, the M6 simply doesn't have any shortcomings that one must consciously or unconsciously listen past. And that, more than any specific area of performance, is what allows the M6 to consistently cross the threshold from great sound into delivering an extraordinary musical experience. **tas**