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**PRODUCT
OF THE YEAR
AWARDS**

Magico's Q7

A Landmark Achievement

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Overall Product of The Year

Magico Q7 Loudspeaker

\$185,000

Our Overall Product of The Year Award goes to the single component that has most impressed us during the previous year. In a year of many superlative products, Magico's flagship Q7 loudspeaker stands out as the greatest achievement in high-end audio in 2012.

The Q7 is capable of astonishing realism, creating a more tangible and palpable impression of actual instruments and voices appearing in the listening room than RH has heard from any loudspeaker. Remarkably, the Q7 performs this realism trick over a massive dynamic scale, from the most delicate brushes-on-snare-drum work to the startling impact of timpani—and everything in between. Magico has reduced every form of loudspeaker distortion to such a low level that the Q7 simply disappears as a transducer. Instrumental timbre and voices are startlingly lifelike not just in tone color and texture, but in transient speed, lack of overhang, and dynamic shadings. The Q7 starts and stops on a dime over its ultra-wide bandwidth. The bass is visceral and muscular, yet simultaneously richly nuanced in resolution of pitch and timbre.

This remarkable performance is the result of the massive all-aluminum enclosure that houses an intricate lattice structure to prevent vibration, the state-of-the-art custom Nano-Tec drivers and their advanced motor design, the cost-no-object crossover, and a huge dose of passion combined with technical chops that brought this ambitious product to realization.

Magico's new flagship isn't just the most impressive component of 2012, it's the most impressive single product that Robert Harley has encountered in more than 23 years of full-time reviewing. (RH, 229)





A Landmark Achievement

Magico Q7 Loudspeaker

Robert Harley

Let's indulge ourselves for a minute and imagine that we could conjure up the ideal loudspeaker without regard to physics or the limitations of today's technology. Our fantasy allows us to specify the transient speed of a full-range ribbon, but with the weight behind those transients provided by moving-coil drivers. We'll take the transparency of an electrostatic with the dynamic contrasts and "jump factor" of a horn design. Since this is all wishful thinking, we can specify no horn colorations to go with the horn-like sense of immediacy and dynamic verve. We're free to order up the visceral bass weight and body of a large ported enclosure accompanied by the dynamic agility, textural resolution, and pitch definition provided by a small sealed enclosure. And while we're at it, our dream speaker will exhibit no box coloration, have high sensitivity, and be an easy load for a power amplifier.

Although such a speaker is obviously merely a creation of our imaginations, there's one loudspeaker that comes closer to that ideal than I ever thought I would hear. That loudspeaker is the Magico Q7.



Magico Q7 Loudspeaker

Before tackling this ambitious loudspeaker I'd like to settle something. It's been suggested by some that Magico receives a disproportionate amount of coverage from *The Absolute Sound*. After all, how many relatively new loudspeaker companies have had so many positive reviews, awards, and cover stories? None. But how many other new companies have pushed the envelope in loudspeaker design the way Magico has in the past five years? None. It's our job to report on the high-end landscape as we see it and let the chips fall where they may. If another loudspeaker company wants the same amount of attention that Magico has received, let it be as consistently innovative as Magico.

With that addressed, let's first consider the Q7 purely in numerical terms. Five drivers in a four-way configuration. Seven hundred and fifty pounds apiece out of the crates. One hundred and eighty-five thousand dollars a pair. Six hundred and thirty-five bolts in the three-axis internal bracing. One hundred and one machined components. Three continents required to produce the drivers. Ten hours of machining to create the 90-pound baffle (not to mention the 70-pound interior baffle).

In purely physical (and financial) terms the Q7 is obviously a formidable product. But that's not the Q7's most compelling story. What's most interesting about the Q7 is the sophisticated technology underlying the loudspeaker and the passion that brought it to realization. Everything about the Q7 stretches beyond the existing art, from the custom Nano-Tec drivers with diaphragms made of the same material used in helicopter blades, highly advanced new driver motors created especially for the Q7, a massive all-aluminum enclosure with an extensive internal lattice structure to increase rigidity, and state-of-the-art crossovers built from cost-no-object inductors and capacitors.

If "realism" is the single word that best describes the Q7, the best two words that describe it are "right there"

It's natural to look at the Q7 and see it as "merely" a scaled-up Q5, with more and larger drivers and a bigger enclosure. Although the two loudspeakers are obviously based on the same technology platforms, the realization of those technologies is considerably more elaborate and sophisticated in the Q7. (See the sidebar for a detailed technical description and comparison of the Q5 and Q7.)

In practice, the Q7 is large but not nearly as imposing as many flagship-level loudspeakers. The vertical baffle is complemented by slightly angled top and rear panels, chosen for both technical and aesthetic reasons. Seen from the side, you can discern that the enclosure is made from two sections delineated by a copper strip that also adds visual interest. A curved chamfer in the lower side panels softens the appearance, and perhaps not coincidentally, combines with the copper strip to form what could be interpreted as the number "7." No bolts are visible on the front, top, or side panels. Two pairs of binding posts are provided for bi-wiring, although you can order the Q7 with only one pair connected. This option allows you to connect the speaker with single wire without using jumpers.

At 750 pounds each out of the crate, installing and positioning the Q7 requires both thoughtful planning and plenty of muscle power. The shipping crate opens into a ramp, allowing the Q7 to



Magico Q7 Loudspeaker

roll out on its casters. Moving the speaker isn't that difficult until you encounter a step that requires lifting all that weight. Once inside the listening room you insert the supplied jack beneath the speaker to raise the enclosure and remove the casters. Round isolation feet, designed and made by Magico, are supplied in lieu of spikes.

I had expected that installing and setting up the Q7 would take an entire day, but three hours after opening the crate we had found the final placement. It was one of the easiest installations of a major speaker I've experienced.

Listening

The Q7 is exceptional in every way, but there's one area that stands out above all others—realism. The sense of actually hearing instruments rather than a recreation of them—that “fool you” palpability of texture, truth of timbre, vividness of imaging, naturalness of dynamics, and degree of resolution—is the Holy Grail of music reproduction. It's when the sound is no longer perceived as sound but purely as musical expression. Realism is the culmination of all the individual qualities we value in reproduced music; they each contribute in some way to the impression of being in the presence of live music.

If I had to sum up the Q7's sound with one word it would be the elusive “R word.” But unlike some loudspeakers that

deliver this realism occasionally with a few recordings, or over a narrow range frequency range, or only with certain types of music (unaccompanied female vocal, for example), the Q7 summons up this shocking sense of live music on virtually every recording, over the entire frequency range, and with every style of music. There isn't one aspect of reproduced sound in which the Q7 exhibits less than state-of-the-art realism; tone color, low-level resolution, macrodynamics, microdynamics, bottom-end extension, bass pitch definition—the list goes on and on. The result is a total suspension of any thought of listening to a hi-fi system. This quality isn't fleeting and ephemeral the way it is with many great systems—a few passages here and there on select recordings—but rather is concrete and tangible from the first notes of just about any recording. It's as though the Q7's musical realism is pursuing *you* rather than that you are pursuing the realism.

I could name any number of recordings to illustrate this quality, but I'll mention the track “La Barrosa” from Paco de Lucia's *Live in America*. This piece begins with de Lucia playing a beautiful solo figure on his flamenco guitar surrounded by the hall's ambience. You can sense the other musicians on the stage waiting to come in, and the audience at attention. These cues are extremely subtle and low in level, but when they are reproduced the way the Q7 portrays them, the result is electrifying. The guitar is just *right there* in front of you, completely unencumbered by any sense that you





Magico Q7 Loudspeaker



SPECS & PRICING

Type: **Four-way, five-driver dynamic loudspeaker**
Driver complement: **12" woofer (2), 10" mid-bass, 6" midrange, 1" tweeter**
Woofer loading: **Sealed**
Sensitivity: **94dB**
Impedance: **4 ohms**
Frequency response: **20Hz–50kHz**

Dimensions: **15" x 60" x 32"**
Weight: **750 lbs. each, net**
Price: **\$185,000 per pair**
MAGICO, LLC
3170 Corporate Place
Hayward, CA 94545
magico.net

are experiencing an electro-mechanical facsimile of the original musical event. The sound is vivid in a completely natural way, rather than a goosed-up hi-fi vividness.

I chose this example because this disc sounds very good, but it's not by any stretch the most realistic-sounding in my collection. It's a commercial CD—we haven't yet talked about the Q7's reproduction with SACD, high-res PCM, or 45-rpm vinyl spun on the Basis Inspiration. Yes, the Q7 brings this music to life in a way that I have not experienced with any other loudspeaker. Of course, the degree of realism varies tremendously with the recording, but even mediocre recordings are revealed to have previously undiscovered sonic virtues.

If "realism" is the single word that best describes the Q7, the best *two* words that describe it are "right there" because that's exactly how instruments and voices sound in the listening room. The Q7 consistently and unfailingly made all music sound so close that I felt I could reach out and touch the performers. If you want to hear the ultimate in this sense of instruments being "right there," try playing *A Meeting by the River* on SACD through the dCS Vivaldi with the Vivaldi directly driving a pair of Lamm ML2.2 SET power amplifiers (no preamplifier in the signal path), or the Sheffield direct-to-disc *Michael Newman, Classical Guitarist* on the Basis 'table. This configuration was the single most transparent, resolved, neutral, and realistic reproduction of small-scale music I've heard in my life.

This sense of hearing music and not a loudspeaker is the result of several specific attributes that combine synergistically—primarily vanishingly low distortion, very high resolution and transparency, and the way in which the



Q7 reproduces transient information.

The Q7 is so low in coloration and distortion, and so high in transparency, that it sounds like whatever source, cables, and electronics are driving it. I've never encountered a loudspeaker whose character changed so dramatically with ancillary equipment. The Q7 is a colorless, transparent window back through the playback and recording chains, laying bare everything in the signal path back to the original musical creation. Yet, the Q7 isn't analytical or "ruthlessly revealing." Despite the crystal-clear transparency and powerful resolution, the Q7 has a sense of ease and relaxation, of sinking into the listening seat totally absorbed.

Another important factor that contributed to the Q7's stunning sense of realism is its transient speed. No dynamic loudspeaker has, in my experience, approached the Q7 in the fidelity of transient reproduction. The sound of a drumstick hitting the head jumps out of the mix with a lifelike impact and immediacy, making other dynamic loudspeakers sound sluggish by comparison. And just as quickly the transient is gone with no overhang or smearing. The Q7 has a very fast "settling time"—a transient event doesn't perturb the loudspeaker and cause it to sound different in the milliseconds after the transient is over. This quality is related to "self-noise," a term that describes a kind of low-level "chatter" from a loudspeaker that follows the music's dynamic envelope like a shadow. You can hear this self-noise most easily on solo piano as a grunge superimposed on the timbre after the transient attack of the hammer hitting the strings. When reproduced by a loudspeaker with very low self-noise, the piano's timbre has a bell-like clarity. You can also more easily hear the harmonic structure change as the note descends into the hall's ambience. Moreover, low self-noise results in better resolution of that ambience, the miniscule spatial cues that create the sometimes convincing illusion of the recording venue's acoustic replacing that of your listening room.

The Q7's startling reproduction of steep transient attacks imbues the music with a life and vividness that's missing from all but ribbons and electrostats. But unlike those planar designs, the Q7 reproduces transients with the correct weight and impact behind them—the antithesis of drums sounding like pencils striking oatmeal containers. If you want to hear just how realistic drums can sound, listen to Roy Haynes' superbly recorded kit on the SACD *Love*

Letters, or Jeff Porcaro on the Sheffield direct-to-disc LP *James Newton Howard and Friends* through the Q7. The Q7's transient speed conveys the energy and vitality that great drummers bring to the music in a way I have not previously experienced. This loudspeaker can change your musical perception of familiar recordings as you discover new-found rhythmic expression and nuance. I would even call the Q7 horn-like in its dynamic verve, immediacy, and "jump factor." This quality is revelatory on another percussion instrument: piano. So much of the dilution of a reproduced piano's sound is due to this slowing of transient attacks followed by overhang that robs the instrument of its vibrancy.

It wasn't just drums and other percussive instruments that benefited from the Q7's ability to start and stop on a dime; trumpets, for example, came to life and soared as though let out of a cage. There's a transient component in a trumpet's initial attack that, when smeared, dilutes the sense of presence. The Q7 revealed so much more of Roy Hargrove's dynamic expression on the fabulous SACD *Jazz in the Key of Blue* [Chesky]. This album also showcased the Q7's resolution of microdynamic detail in drummer Jimmy Cobb's gentle brush work and delicate cymbal strikes. The Q7 revealed to me just how important transient reproduction is to the gestalt of music listening, and why reproduced music often falls so short of the sound of live instruments.

Astonishingly, this transient fidelity wasn't confined to the midrange and treble but extended into the very lowest bass. The bottom-end impact of bass drum and timpani was startling, both in the suddenness in which the sound begins and the suddenness with which it stops. I've never heard a loudspeaker that combined such dynamic agility with deep extension and weight. The new Reference Recordings disc *Playing with Fire* contains some interesting music spectacularly recorded; the huge bass-drum whacks on the opening track will lift you out of your seat. Moreover, the Q7 was completely unperturbed by deep bass, massive bottom-end impacts, complex passages, and high playback levels—all at the same time. Even with the most demanding music at the highest playback levels the Q7 remained perfectly composed in a way that most loudspeakers do not. There wasn't a hint of congestion, hardening of timbre, or reduction in dynamics. And the Q7 goes low, with organ pedal points pressurizing the room.

Magico is a proponent of sealed enclosures, which exhibit superior transient behavior and a more gentle roll-off below resonance (12dB per octave vs. the 24dB per octave rolloff of reflex-loading). The trade-off is reflex-loading's lowering of the cutoff frequency, increased sensitivity, and greater ability to play loudly. (Technically, the acoustic gain of reflex loading can be used to either increase sensitivity or extend the cutoff frequency, but not both.) Magico has somehow managed to create an infinite baffle loudspeaker that combines deep extension, high sensitivity, and the ability to play loudly along with the traditional virtues of sealed enclosures such as pitch definition and ideal transient behavior. It's been argued that the standard measure of bass extension, the -3dB point, doesn't convey the subjective impression of bass fullness because it doesn't take into account the rolloff's steepness. Some have suggested that the -10dB point better reflects the listener's perception of bass extension. No matter the specs or wording, I can say that I've never heard deeper extension in my listening room than from the Q7.

The Q7's bass is revelatory not just in extension, but more importantly in texture, pitch definition, dynamic nuance, and clarity. I discovered so much bass-range musical information in CDs and LPs I've been listening to for years that it was like opening up an entirely new vista. The entire bass region was taut, muscular, and visceral, yet at the same time delicately nuanced and resolved. Take jazz organist Joey DeFrancesco's *Take III*, in which he plays the bass lines on the Hammond B3's pedals. I've never heard the bass lines reproduced with such clarity of pitch and dynamic articulation. It's almost like a different record through the Q7. I gained a newfound appreciation for his virtuosity when I could hear each pedal note's pitch, starts, and stops. Plucked acoustic bass greatly benefited from the Q7's combination of body, resolution of timbre, pitch definition, and most importantly, ability to convey subtle dynamic shadings.

Despite everything I've said about the Q7's ability to play "big" on orchestral music and full-on rock, this loudspeaker has the ability to sound small and intimate when the music is small and intimate. Some large loudspeakers sound big on everything. The Q7 could sound like a mini-monitor on, for example, solo acoustic guitar or unaccompanied

voice. On the Arturo Delmoni LP *Songs My Mother Taught Me* the Q7 got the perspective between the violin and piano just right, not to mention the ravishingly beautiful sound of Delmoni's violin.

I auditioned the Q7 with three amplifiers: the Rowland 725 (330W), Lamm ML2.2 (18W single-ended triode), and briefly at the end of the review period, the Constellation Centaur monoblocks (500W). All were significantly different from each other. The Lamm's 18W drove the Q7 surprisingly well, although it didn't come close to exploiting the Q7's dynamic potential or bass performance as did the Rowland 725 and Constellation Centaur monoblocks. Nonetheless, the Lamm was nothing short of magical in its reproduction of timbre, space, low-level detail, and other qualities that greatly contributed to the overall sense of realism. The Rowland showed me just how smooth the Q7 could sound, coupled with the combination's tremendous bass weight, warmth, and articulation. When driving the Q7 with the Constellation Centaur (and MIT's Constellation-optimized interconnects) I heard just transparent and high in resolution this loudspeaker can sound.

I should also mention the role the new DCS Vivaldi digital playback system (review pending) played in getting the performance I described. This is an extraordinary system that allows the Q7 to really shine. And as big a fan as I am of the Basis Inspiration turntable and Air Tight PC-1

Supreme cartridge, I became an even bigger fan after hearing them through such a transparent and colorless transducer.

Conclusion

The Magico Q7 was not just revelatory as a loudspeaker, it also showed me that our music libraries contain so much more information, and sound potentially more realistic, than I thought possible. That's how revolutionary the Q7 is.

If you've heard the Q7 in one setting it's hard to say that you've really heard the loudspeaker. That's because this loudspeaker is such a transparent window that it takes on the character of whatever you are driving it with. Selecting the right sources, amplification, cables, and AC conditioning is vital to achieving the sound I've described. If you are fortunate enough to consider owning the Q7, don't scrimp on the rest of the system—the Q7 gives other components nowhere to hide.

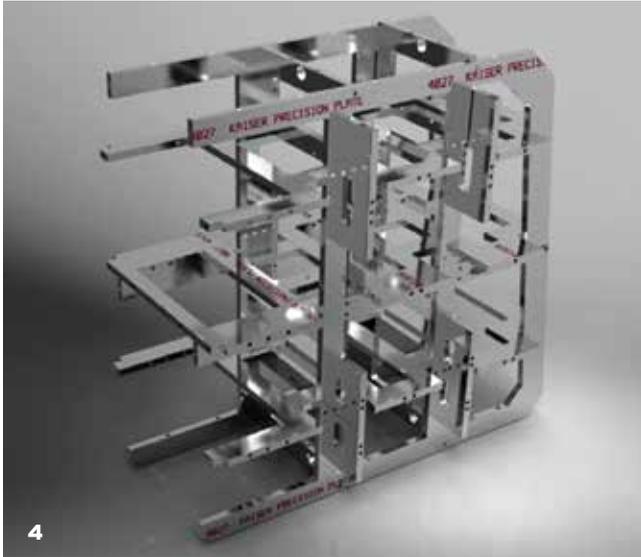
Elsewhere in this issue we have given the Q7 our Overall Product of the Year award for 2012. This honor goes to the single most impressive product we've encountered in the previous year. I'll take that several steps further to say the Q7 is the single most impressive product—in any category—that I've come across in more than 23 years of full-time reviewing. Even for those of us who can never afford the Q7, it's inspiring and gratifying to know that the state of the art in loudspeaker technology has been moved so far forward. **tas**

Building the Q7

In late May I visited the Magico factory in Berkeley, California, to see firsthand how the Q7 is built. Today's Magico factory is a far cry from the modest facility I visited in October, 2005. Back then, it was Magico co-founder Alon Wolf assembling the Mini from birch-ply cabinets and drivers sourced from Europe—and not much else. On my recent visit to Magico the company occupied a 6000-square-foot industrial area of Berkeley, with a second 6000-square-foot factory in nearby San Jose that machines the loudspeakers' aluminum enclosures. Since then Magico has consolidated the machine shop with the other operations in a new state-of-the-art factory in nearby Hayward, California.

- 1 One of the CNC machines that mills the Q7's 101 aluminum enclosure components
- 2 The two baffle components (flat on the left, curved on the far right) before polishing and anodizing. Only the tweeter is mounted to the 85-pound outer curved baffle. The woofers and mid-bass units are mounted to the 70-pound flat inner baffle (the midrange floats independently of either baffle)
- 3 The flat inner baffle after anodizing
- 4 The bracing structure is constructed outside the enclosure
- 5 The bracing structure inside a partial enclosure
- 6 The custom Nano-Tec raw drivers ready for assembly
- 7 The crossover features massive and expensive inductors and capacitors





The Technology Behind the Q7

Although the Q7's woofers, midrange driver, and tweeter look identical to those of the Q5 (except that the woofers are bigger and there are more of them) the Q7's drivers are actually quite a bit more sophisticated. The tweeter is a third-generation beryllium design (the Q5's tweeter was a first generation) with several key improvements. This new tweeter features a fully under-hung motor structure with a more powerful neodymium magnet to increase sensitivity (to a whopping 95dB). The term "under-hung" describes a short voice-coil mounted in a long gap. This design results in more linear operation because the voice coil remains within the gap's magnetic field regardless of the voice-coil's position or excursion.

The 6" midrange is an all-new design with a massive 55mm voice coil driving the Magico Nano-Tec cone. This cone is woven from a carbon-nanotube material originally designed for helicopter blades where light weight and stiffness are absolute requirements. The under-hung motor uses a massive magnet (5" in diameter) made from N48H-grade neodymium (the higher the number in the grade the stronger—and more expensive—the magnet). The magnetic field strength in the gap is a stunning 1.7 Tesla, a value seen only in field-coil drivers (in which the magnetic field is created by an electro-magnet rather than a fixed magnet). The voice coil is a vented titanium design and is mated to a new composite spider material that allows +/-6mm of excursion. The driver, which was designed specifically for the Q7, can reportedly produce 120dB SPL at 1m distortion-free within its passband. Incidentally, while visiting the Magico factory (see sidebar) I visually compared the Q5's midrange driver with

this new Q7 midrange unit. Although the look the same when mounted in an enclosure the Q7's midrange was considerably more massive and elaborate. I was able to lift the Q5's midrange driver from a metal table, but not the Q7's midrange, which felt like 100 pounds because of the magnet's strength.

Looking next at the 10" mid/bass unit that's mounted at the top of the enclosure, the driver is again all-new for the Q7. Its design is very similar to that of the midrange, with a massive motor structure and top-grade neodymium magnets for high magnetic field strength in the gap. The voice coil is a whopping 127mm, half the cone diameter. (An engineering textbook in my library shows a photo of a 15" subwoofer driver with a "large" 3" voice coil.) Again, the cone is Magico's Nano-Tec material. Magico claims that this 10" mid/bass driver has the lowest inductance of any driver extant (0.085mH at 10kHz).

The dual 12" woofers are again all-new for the Q7. They use the same 127mm voice coil and underhung motor as the 10" mid/bass. These drivers have an excursion of +/-15mm and can reportedly produce 120dB SPL at 1m at 50Hz.

The drivers were designed using a state-of-the-art finite-element analysis software package that allowed Magico Chief Technical Officer Yair Tammam to model the driver behavior in the thermal, magnetic, mechanical, and electrical domains simultaneously. Previously, Tammam told me, he had to model each of these domains separately in different software.

The drivers are designed for maximum magnetic field strength in the gap, low moving mass, and minimal inductance. In addition, Magico has also gone to extreme lengths to minimize eddy currents in the drivers. Eddy currents impede the motion of the voice coil by creating magnetic forces that oppose the voice-coil's motion. Eddy currents are so effective in slowing down moving objects that train brakes are based on the phenomenon. One way of reducing eddy currents is by fully saturating the iron in the motor. If the iron is saturated, magnetic flux cannot be induced in the iron, and thus no opposing magnetic force is generated. Magico found just one facility in the world that could saturate the iron in the driver motors to their specification, and it happened to be in England. The drivers start life in Israel, are shipped to England, back to Israel, and then to the US. Magico's Web site shows a pair of plots comparing the saturation of its 10" woofer with a "high-end" woofer.

I once witnessed a dramatic demonstration of eddy currents in which a steel ball-bearing was dropped through a steel tube not much bigger than the ball-bearing itself. The ball-bearing fell through the tube just as quickly as if it were falling through free air. But when the same size bearing, this one magnetized, was dropped through the tube, it took about ten times longer to traverse the tube than the unmagnetized ball-bearing. Looking into the tube from above with a flashlight, I could see the ball-bearing floating slowly downward. Why? The ball-bearing's magnetism (and its movement through the tube) induced eddy currents in the tube, with those eddy currents creating their own magnetic field in opposition to the ball-bearing's magnetic field, slowing the ball-bearing's motion. The same thing happens in a loudspeaker motor; the induced eddy currents create a magnetic field that opposes the voice-coil motion. Reducing eddy currents has obvious benefits for a driver's transient



performance. This is particularly true when you consider that the faster the voice coil moves, the stronger the eddy currents and the greater the opposition to the voice coil's motion.

Think of the voice coil sitting in a magnetic field with no current flowing through the voice coil. When alternating current from the power amplifier—the audio signal—flows through the coil, a magnetic field is temporarily created around that coil that varies in strength and polarity as an analog of the music. This varying magnetic field interacts with the driver's fixed magnetic field, pushing and pulling the voice coil back and forth, and with it, the cone. It's easy to see how the more powerful the fixed magnetic field, the lighter the voice coil and cone, and the lower the eddy currents, the faster and more easily the cone will respond to the musical signal. This not only results in superior transient behavior (the cone starts and stops more quickly) and better control over the cone motion by the amplifier, but also increases efficiency. It's like a lightweight sports car outfitted with a huge-displacement engine that can instantly deliver high torque to the wheels when you depress the accelerator.

Turning to the enclosure, the Q7 is constructed like no other loudspeaker extant. The enclosure is built entirely from machined aluminum pieces—101 of them to be exact—held together with 635 bolts. Most of these pieces form an intricate internal matrix that creates a rigid, inert structure that reduces enclosure vibration to an absolute minimum. The idea is to create a heavy, dense,

resonance-free platform that is neither put in motion by energy from the drivers nor stores and then releases energy. The Q7's enclosure is perhaps the most heroic design ever attempted. Note that the Q7's enclosure features three-axis bracing compared with the Q5's two axis bracing. That is, the Q7 has front-to-rear internal bracing in addition to the side-to-side and top-to-bottom reinforcement used in the Q5.

The curved baffle you see on the loudspeaker's front is only part of the baffle structure. Behind the 85-pound curved baffle is a thick 70-pound slab of aluminum to which the two 12" woofers and 10" mid-bass driver are mounted. You can see this structure when looking closely at the enclosure from the side. The flat slab is bolted to the matrix structure and forms the front structural member. The midrange driver floats in its own sub-structure rather than being attached to either baffle. Only the tweeter is mounted to the curved outer baffle. This arrangement keeps resonance to a minimum and prevents energy imparted by one driver from being transmitted to the other drivers.

The four-way crossover is a 24dB Linkwitz-Reilly design incorporating Magico's "elliptical" techniques that control specific resonances. The crossover parts are over-the-top; the 10-gauge inductors are bigger than the power transformers in some power amplifiers. The inductors aren't wound with wire but instead are made from flat copper-film. The custom capacitors reportedly have half the parasitic inductance of the previous state of the art.