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SoundStage!XTREME

Inevitable: Magico Q7 Loudspeakers

Written by Jeff Fritz
Friday, 01 June 2012 00:00

For the last few years, the Q5 has been the flagship of Magico's line of loudspeakers. This first of the Q models was lauded by a number of reviewers, dealers, and owners as the "best loudspeaker in the world." Still in production,the Q5 costs $65,000 USD per pair;it was followed by the Q3 ($38,950/pair) and the Q1 ($26,500/pair). But if you thought the Q5 would be Alon Wolf and Yair Tammam's magnum opus, think again.

I think the Magico brain trust needed some time to fully get their legs under them: expanding their manufacturing resources and growing their technical knowledge base in order to more fully develop their vision of a flagship loudspeaker. The result is the most ambitious Magico ever: the new Q7 loudspeaker, which retails for $165,000/pair.

It all started when . . .

. . . I toured the Berkeley, California - based Magico facilities in March 2011. After the meet and greet, we began the day by examining a number of the drive-units and subassemblies manufactured by Magico. Among the drivers sitting on the table just outside company president Alon Wolf's office was something that struck me as odd. I knew that the largest driver used in any Magico speaker then current was the Q5's 9" woofer, but this looked much larger and far more robust. When I asked Wolf about it, he said it was a prototype they were testing. He revealed little more,but I did manage to find out that something bigger than the Q5 -- and a lot more ambitious -- was in development.

Fast-forward to summer 2011, when I wrote "The World's Best Audio System 2012: The Selection Process begins." The e-mails and phone calls poured in and poured out as I tried to gauge precisely what my speaker options were. Remembering that big woofer I'd seen outside Wolf's office several months before, I called him. In short, yes: A new flagship model, the Q7, was coming; Wolf felt it would be the very best Magico speaker ever made; and it was still a long way from being finished. I had several other speaker candidates for TWBAS 2012, but my mama di'n't raise no fool -- I asked if I could be kept abreast of the Q7's development process. Wolf promised regular updates.

As the weeks passed . . .

. . . Wolf sent me important little snippets of information. They weren't about building prototypes and listening to them; there was nothing about new and exciting cabinet materials; not a thing about some midnight revelation that had led to a new and unprecedented crossover topology; no bluster, no embellishment. It was all about the engineering process that Magico's chief technical officer, Yair Tammam, was following in developing the drivers that would be the heart of the Q7. And therein lies a major difference between Magico and many other speaker makers. It's one of audio's dirty little secrets: Most loudspeakers -- especially the most expensive ones -- are more piecemeal than you'd think. But unlike most speaker companies, which buy their drivers from specialist original - equipment manufacturers (OEMs) such as Scan-Speak, Magico makes their own. As I kept tabs on the Q7's progress from afar, I learned that the speaker had been conceived as a complete system: Except for their tweeter's beryllium diaphragm, each component was designed exclusively for the Q7, as opposed to the designers wanting to use this or that OEM part, then designing a loudspeaker around it. At no time did Magico go in search of a driver "that would work." Instead, they engineered whatever they needed to make the Q7 what they wanted it to be.

I should explain precisely what "makes their own drivers" means in this case: Magico doesn't make their MB7 tweeter's beryllium diaphragm, nor is its dome profile unique to them. But everything else is theirs: they own the tooling that makes the MB7's voice-coil;the tweeter's chassis and motor system are their designs; and all other parts

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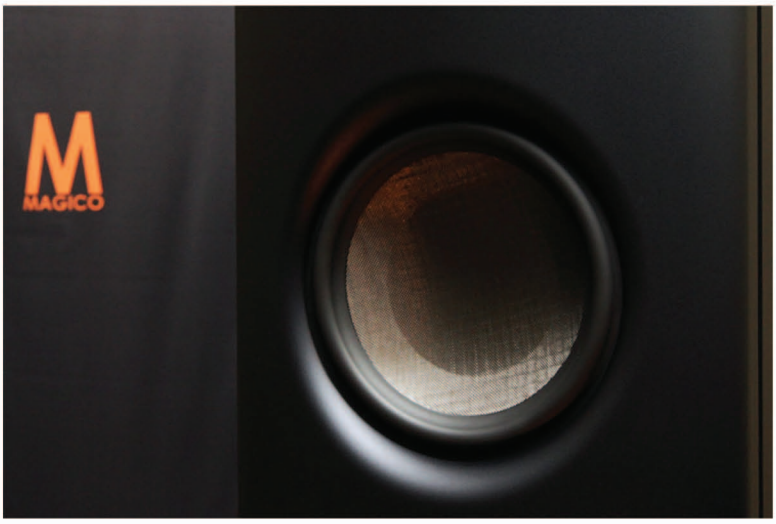
are made directly by Magico in their own facilities, or are made exclusively for them by a subcontractor, then shipped to Magico.

Diving into the design



The Magico Q7 is a floorstanding, four-way loudspeaker measuring 60"H x 15"W x 32"D and weighing 750 pounds. Each. Its 1" MB7 beryllium - dome tweeter is claimed to be 95dB sensitive, and to operate with extremely low distortion, wide dispersion, and wide bandwidth -- up to 50kHz before its primary breakup mode. The MB7 is also claimed to be able to handle more power than the tweeters in Magico's other Q models. Per Magico, the MB7 "utilizes a fully saturated underhung motor system with near zero inductance" and is powered by a superstrong system of neodymium magnets.
The Q7's other drivers share many characteristics.The cones are all Magico's Nano-Tec designs. These comprise three layers (in two distinct weaves) of carbon fiber -- one on the front side, two on the back side -- separated by a layer of Rohacell foam. The cone is then dipped in a resin infused with carbon nanotubes to further stiffen the sandwich of materials. The purpose of this sort of construction is to push the primary breakup mode -- the frequency at which the cone becomes nonlinear -- as far as possible above the unit's passband. The magnet structures of all of the Q7's drivers use N48 neodymium, a very high - strength grade, to achieve the high sensitivity needed for the Q7. (For comparison, Revel uses N38 neodymium in their Ultima series, and most manufacturers don't use neodymium at all in their woofers and midrange drivers.) Magico specified very high SPL capability for these drivers, and claims that they'll play at 120dB measured at 1m. Last, the drivers' spiders are all made from a composite material that Magico isn't saying much about, but that, they claim, dissipates heat better than other materials they've used.

But also among the individual drivers are many differences. The 6" midrange has a 55mm voice - coil, whereas the two 12" woofers and the single 10" midbass have 127mm coils (all coils are titanium). A driver's maximum linear travel (Xmax) increases with its size: the 6" midrange is capable of 6mm of linear movement, whereas the 10" midbass (9mm Xmax) and 12" woofers (15mm Xmax) need to move considerably more air, to reproduce the longer wavelengths of lower frequencies.

Magico says that they expended huge effort to minimize eddy currents in the iron elements of these drivers' underhung motor systems. An eddy current develops when the voice-coil is exposed to quickly changing magnetic fields. According to Wikipedia, "This can cause a circulating flow of electrons, or current, within the body of the conductor. These circulating eddies of current have inductance and thus induce magnetic fields. These fields can cause repulsive, attractive, propulsion and drag effects." Essentially, as Magico puts it, eddy currents cause chaos. Tammam and his team's solution was to almost completely saturate the iron in the drivers. The extreme flux density that results is accomplished by those hugely powerful neodymium magnets and by the precise machining of all parts. This allows the Magico voice-coils to "move with as little electromagnetic obstruction as possible. " Magico claims that their 10" midbass driver has an inductance of 0.085mH, meaning that the flux modulation -- i.e., chaotic eddy currents -- is extremely low, which in turn means very linear operation, which means very low audible distortion.

Like the Q7's drivers, its cabinet was developed using advanced finite-element analysis using software suites like COMSOL Multiphysics. The structure has some 100 parts, each made of aluminum, copper, or stainless steel, and all secured with 650 fasteners -- which begins to explain each speaker's weight of 750 pounds. Think of the Q7's cabinet as a logical extension of the platform first seen in the Q5. Advances made for the Q7 include a "three-axis matrix

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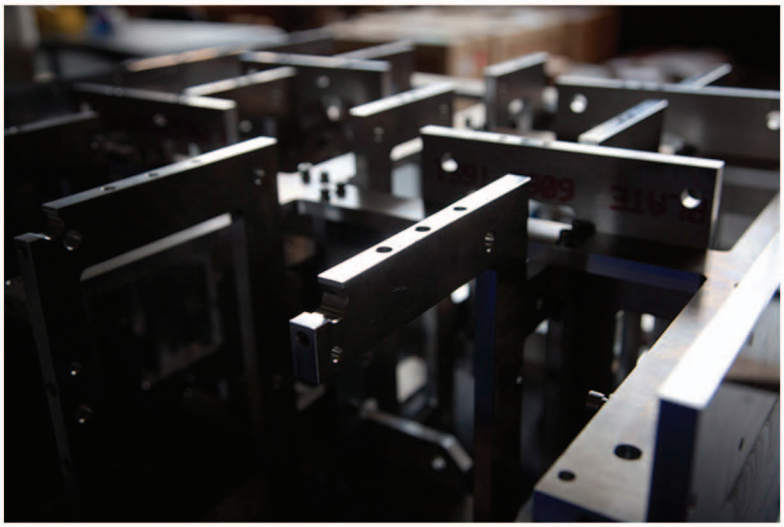
frame." Basically, this means that the internal aluminum bracing attaches to the cabinet walls on more axes than in earlier Q models, binding the entire structure together more completely and thus producing a more inert whole. You'll also notice the copper layer between the enclosure's upper and lower sections. This separator is used to reduce resonances that might otherwise develop in the Q7's broad side panels (Magico's QPod isolation feet work in a similar way). There's more: The midrange compartment floats inside the Q7's enclosure, completely decoupled from the framework within.The tweeter is completely enclosed within the Q7's multilayered front baffle assembly. Magico says that every effort was made to minimize resonances that could interfere with the drivers' outputs.



The Q7 comes with much larger stainless - steel feet than the other Q models, and they're flat on the bottom instead of spiked. This is because the great weight of each Q7 precludes it from being moved at all once its optimal position has been found. The Q7's standard hookup configuration is biwiring, for which two sets of carbon-fiber-encased Furutech binding posts are provided on the upper half of the speaker's backside; on the other side of the panel bearing these posts is the compartment containing the crossover network. Why so high on the back? Well, Magico believes in as little internal wiring - and as few wiring junctions -- as possible, to make for a shorter signal path. Though it would have been easier to build and ship each Q7 as separate modules, the additional wiring junctions that would have required go against a firm Magico tenet: Every time you add a wiring junction, you degrade the fidelity of the signal. It's "just physics," they say.

The Q7 is rated to handle up to 1200W; its claimed frequency response is 20Hz-50kHz, its sensitivity 94dB. Let's examine that last spec a bit more. Many loudspeaker makers base their sensitivity specs on a 2.83V input; others use 1W. The Q7 is a 4-ohm loudspeaker, meaning that, given a 2.83V input, the Q7 will draw 2W, not 1W. When the SoundStage! Network measures a speaker's sensitivity at Canada's National Research Council, we use a 2.83V input and record, at a distance of 1m, the speaker's average output from 300Hz to 3kHz. At 2W, the Q7's spec of 94dB sensitivity might be realistic; were the Q7 fed 1W,the figure would be closer to 91dB. When you're looking at these things, just be sure that you're comparing apples with apples.

Thrilling . . .

Reviewers, me included, often try to find new ways of describing sound. But as I listened to the Q7s and thought about what I needed to write so that readers will "get" their sound, what was most obvious was how they excelled in every area that we all agree is critical. No new terms were needed. When I added up all the individual attributes displayed by the Q7, the net effect was of higher performance across the board. The Q7 sounded more like real

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music precisely because of where it advanced the widely understood performance characteristics audio writers can easily describe. They didn't sound the way they did because they'd been voiced in some odd or unique way that resulted in a "house sound" unique to Magico. They were just better in all the individual ways that matter. Taken in sum, that means they are superior loudspeakers.

The first attribute I noticed -- and noticed anew every time I heard the Q7s in my Music Vault -- was one so common that I suspect even many non-audiophiles would describe it as I do. The Q7 sounded strikingly clear with any source material, at any volume level from very loud to very soft, as they scaled any dynamic passage, or as they reproduced the most brazen transient attack. Just clear, always. This made the speaker resolving in the extreme. The Allegro of Mozart's Violin Concerto No.4 in D Major, K.218, performed by Marianne Thorsen and the Trondheim Soloists on the 2L-TWBAS 2012 Sampler (24/176.4 FLAC, 2L/SoundStageRecordings.com), sounded as if a hazy film had been wiped away, leaving only the crystal-clear music behind. It was an odd feeling to listen to this track through the Q7s; although that haze is a sonic artifact that most speakers exhibit to one degree or another, its complete absence in the Q7s was manifested in an almost visual way: More than with any other speakers, I had the sensation that I could see the performers almost clearly enough to reach out and touch them, peer around them, wander among them. This clarity -- and all the good things that come along with it -- was perhaps the Q7's overriding sonic characteristic.

I can speculate that the reason for this clarity might have been the Q7's extremely low level of distortion or perhaps the apparently perfect matching of my review samples, which resulted in the most stable imaging I've ever heard. But whatever the technical reason - and it's almost surely the cumulative effect of all factors simultaneously at work -- the net effect was that every recording I played sounded more like what it was, and less like what the equipment playing it was adding. It was like the difference between listening to a band being amplified by a good sound system and one playing unamplified in front of you. They both sound "live" in the sense that both are playing live, but the unamplified version clearly sounds as if the electronic impediments have been removed -- because they have been. But even this analogy is imperfect, because the amplified performance could very well be in a larger venue than the unamplified one. My point is that the Q7s just sounded less "electronic" more pure, if you will and more like unamplified music being played right in front of me.

The Q7s' soundstage was tremendous -- not in the sense of being much wider and/or deeper than anything else I've heard (though it equaled the best in that respect), but tremendous because the images within the soundstage were more stable and more fully developed t han with any other speakers of my experience. From front to back, left to right, high to low, there was no image wander, no wondering about precisely where a performer was onstage. I could immediately map the soundstage of each musical selection, and clearly "see" singers and players before me with -- here's that word again -- far more clarity than ever before. This was as true of complex musical arrangements as of unaccompanied solo voices. The hi-rez version of Rebecca Pidgeon's Four Marys (24/96 FLAC, Chesky/HDtracks) brought the singer closer to sounding live in my room than I'd ever heard, precisely because I could almost see her before me as never before. My ears were convinced, and my mind's eyes followed suit. There was excellent depth to the soundstage, and the space around Pidgeon was clearly audible, but it was that perfectly formed central image that made this performance sound so much better than what I'm used to. The precision of the Q7s' imaging didn't sound contrived or artificial in any way; on the contrary, the reproduction sounded flawless, even if the performance and the recording of that performance had flaws that I could easily hear.

During the run-up to TWBAS 2012 in March, the Q7s were placed 65" from the front wall of my room, a fair bit forward of where speakers normally sit, and closer to the sidewalls than I'm used to. This fairly extreme placement led to a very immediate sound -- SoundStage! Network writer Kevin East described it as "savage" -- in the way that only nearfield listening can produce. In the weeks that followed TWBAS 2012, I experimented with placement and learned some things about the Q7.

First, the Q7s didn't sound wrong or bad with any reasonable placement, but with large or even slight shifts in their positions I could tailor their sound for more soundstage focus, or greater depth, or greater perspective, or for a slightly different bass balance. I'm not an accomplished photographer, but this aspect of setup seemed similar to

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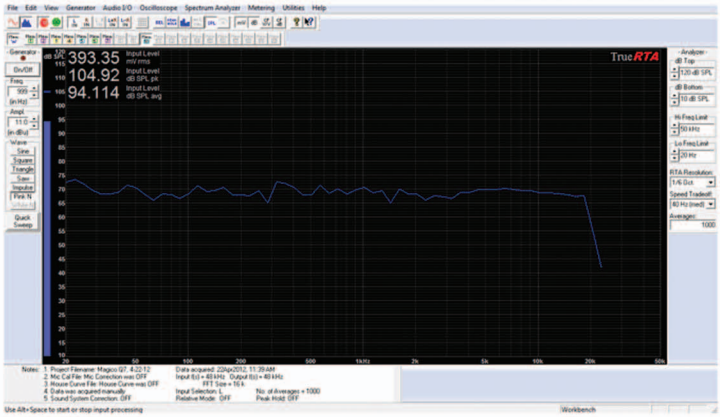
focusing a camera's lens after you've chosen the precise perspective on and distance from your subject. Two snapshots of the same subject taken from different angles can both be technically "right" and equally valid renderings, but each offers a slightly different perspective on the subject.

In much the same way, the Q7s let me fine-tune the sound to suit my taste: With a little experimentation, I could get the sound I wanted. In my room I could listen to the Q7s in the nearfield because their drivers' outputs integrated very quickly off the front baffle. This gave a very immediate, forceful, up-close sound. But I could also back them up a touch to create a more dimensional soundstage, with a greater sense of spaciousness and an overall wider perspective. The upshot: I don't know that you can get truly bad sound from the Q7 (not that I tried), but you can alter the sound enough with shifts in speaker position to get varying degrees of this or that performance characteristic. I finally settled on having the speakers 4' 2.5" from the front wall, 5' 1.75" from each sidewall, 12' apart, and 13' from the listening position. Toe-in was fairly extreme: the tweeter axes crossed just a foot behind my head.



Frequency response in Jeff Fritz's Music Vault listening room (smoothed to 1/6th octave).

The Q7's frequency extension was remarkable in the Music Vault -- this wide-bandwidth device left no corner of the musical experience unexplored. No aspect of the audioband was overpowered or stood out, no area was spotlit or uneven -- the Q7's sound was simply balanced, from the lowest lows to the highest highs. This is another way of saying that its sound was tonally neutral, with no boom, overhang, etch -- none of the negatives of "voiced" or

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fnonlinear designs. The Q7 didn't have "great highs" or "big bass" at least, that wasn't the impression I was left with at the end of long listening sessions. I remember thinking, as I listened to the solo-piano tracks by Ola Gjeilo on the 2L-TWBAS 2012 Sampler, how absolutely balanced and seamless the sound was. The Q7s' drivers seemed to operate as a single, giant, full-bandwidth driver -- the kind that doesn't exist. Gjeilo's piano sounded tonally dense and weighty through the Q7s, yet lithe when called for, just as a piano should.

The Q7 could play down to 20Hz with effortless power. One fantastic torture test for speakers is "Why So Serious," from Hans Zimmer and James Newton Howard's music for the film The Dark Knight (16/44.1 AIFF, Reprise). About 3:25 into the track, if you're listening through earbuds or small speakers, the music stops -- nothing, nada, complete silence. But if you're listening through big speakers, you'll realize that this is not the case: Sustained, very-low-frequency bass waves explode, almost machine-gun-like, into the room. Zimmer created these sounds electronically, and nothing else can be heard as they begin -- you can carry on a conversation at normal volume during this part of the track. Still, the level was about 92dB, and the Music Vault began to flex; the room felt almost fully pressurized. I got the sense that the room was shifting slightly, but I heard no untoward noises coming from the Q7s' drivers or cabinets: no rattles, vibrations, chuffing, etc. In fact, I couldn't hear anything at all coming directly from the Q7s - I just felt the air around me "bunching up." Then my German Shepherd, who was downstairs at the time, started barking, as if it were time to protect the hous e from an invading horde. I stopped the test at 100dB -- I was feeling the bass in my heart, and I don't need to risk any problems there just to write a speaker review. Bottom line: I heard nothing. I felt everything.

There was no question that the Q7s could play low. To test how much physical punch they could produce at low frequencies, I pulled out a track with some killer kick drum: "The 3 R's," from Sing-A-Longs and Lullabies for the Film Curious George (16/44.1 AIFF, Universal), from Jack Johnson and Friends. The song begins with a series of powerful, distinct kick-drum strokes that, at an average sound-pressure level of 85dB, I could feel as solid punches to the chest. Let's crank it up, I thought. At 93dB, I felt the strokes more in my chest than to it. The Q7s scaled perfectly with the increase in volume setting, and the drum began to invade my space. Got any more? I wondered. At 98dB, the sound was just as clean and precise as at 85dB, but the impact was now even more literally visceral, and the drum began to pressurize the room in a way that, usually, only sustained bass notes can. At 104dB, things got uncomfortable. I listened at this level -- far louder than I would ever listen to for pleasure -- for only a few moments, but as best I could tell, the sound was still clean and free of distortion. At this point, Adam Topol's drums sounded much as a full rock drum kit would had it been there in the room with me, and its impact affected my entire body. When Johnson started singing, I had to instantly turn it down -- it sounded as if a giant man were singing right in front of me, and I didn't like it!

The point of this exercise was to determine if the Q7s could produce concussive impact; in this respect, they were as good as any speaker I've heard. But their wide-bandwidth output also scaled perfectly with the volume level. I never heard any compression or audible distortion at either frequency extreme. At 104dB, I could clearly see the two 12" woofers moving in and out -- the excursions weren't extreme, but were easily visible -- but could see no movement in the 10" midbass driver. This makes me think that the 12-inchers play into the midbass a fair bit. Also at 104dB, I felt the cabinets with my hands, and they were as calm as could be. I wasn't calm -- the sound was just too loud. I'm sure a measurement device would more accurately reveal the presence and magnitude of any cabinet resonances; still, I was impressed that the Q7s' cabinets seemed to be at rest, even as the rest of the Music Vault strained to contain the high volume levels they produced.

Was the Magico Q7 everything that anyone could want in a loudspeaker? Of course not. The Q7 didn't sound inherently big, in the way horn speakers can. It isn't voiced to gloss over poor recordings. Its development wasn't inspired by Tibetan monks. But for a superspeaker, the sound of the Q7 is surprisingly approachable. Its high sensitivity did seem to translate into an effortlessness that made listening for long periods nonfatiguing and, with the right music, very relaxing. But with a quick shift of program material, the Q7 could also rev up like a great sports car and take me on a thrill ride.

The tweeter and midrange drivers sounded neutral, clean, effortless, unfazed. If you're a fan of a certain tweeter type,

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perhaps that means you're hearing the tweeter in your speaker in some way. When I listened to the Q7, the highs were just there -- not warm, not hyperdetailed, just that part of the music reproduced as it should be reproduced. In that sense, I found the sound of the Q7 hard to dissect. The characters of the bass, midrange, and highs are all the same: clear.

Conclusions

The Magico Q7 is currently the best loudspeaker in the world.

That statement will upset some, make others question my credibility, inspire someone somewhere to hate Magico, and maybe push a wealthy audiophile or two to buy something else, just to be contrarian.

I'm OK with all of that.

From a full-range, low-distortion, massively built, thoroughly engineered package, the Magico Q7 delivers music with unmatched clarity, resolution, and transparency. In my room, it handled with ease every dynamic challenge I threw at it, tracking the musical signal perfectly, regardless of bandwidth or the abruptness of transients. And with beautiful music, it sounded . . . beautiful.

For right now, we all have to live with these facts: The Q7 is very expensive. It's very big. It comes only in black. And it's the best loudspeaker available today.

. . . Jeff Fritz
jeff@soundstagenetwork.comThis e-mail address is being protected from spambots. You need JavaScript enabled to view it

The World's Best Audio System, June 2012

•Speakers -- Raidho Acoustics C2.1, Sonus Faber Amati Futura
•Amplifier -- McIntosh Labs MC452 (stereo), Vitus Audio MP-M201 (monoblocks)
•Preamplifier -- Ayre Acoustics KX-R, Vitus Audio MP-L201
•Sources -- Apple MacBook running OS X Snow Leopard, iTunes, Amarra 2.1, Audirvana; dCS Debussy and Esoteric D-02 DACs; Esoteric P-02 transport; WideaLab Aurender S-10 music server
•Cables -- AudioQuest WEL Signature speaker cables and interconnects, Nordost Valhalla speaker cables and interconnects
Magico Q7 Loudspeakers
Price: $165,000 USD per pair.
Warranty: Three years parts and labor.

Magico LLC
932 Parker Street, #2
Berkeley, CA 94710
Phone: (510) 649-9700

Website: www.magico.net