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EXOTICA:

MAGICO Mini Loudspeaker

A world-class mini-monitor from
perfectionist designer Alon Wolf

JONATHAN VALIN

The Cutting Edge

Israeli-American designer Alon Wolf's MAGICO Mini—the speaker that so impressed me, RH, HP, WG, and just about everyone else who heard it at this past CES—is a compact, stand-mounted, two-way mini-monitor that costs \$22,000. At over 200 pounds per side (including its dedicated stands) the Mini is obviously a perfectionist product. (Wolf makes nothing but—e.g., see Robert Harley's review of the MAGICO Ultimate in Issue 160.) Its beautifully finished sealed enclosure comprises sixteen 1" layers of 17-ply Baltic birch, laminated together and formed into a teardrop shape that tapers towards the rear. Internally, the box is massively braced to reduce standing waves. The drivers themselves aren't directly attached to the birchwood frame because, according to Wolf, the enormous pressure generated by their back waves inside the Mini's sealed box would eventually cause fastening screws to work themselves loose, compromising driver/enclosure integrity. Instead, the drivers are bolted to front and rear plates machined from one-and-a-half-inch-thick 6061T-6 aircraft-grade aluminum billets, ensuring that driver/enclosure coupling always remains perfect. Wolf has also milled the front faceplate into a curve rather than a flat plane—a particularly expensive bit of additional machining that doesn't just look good but also reduces diffraction effects.

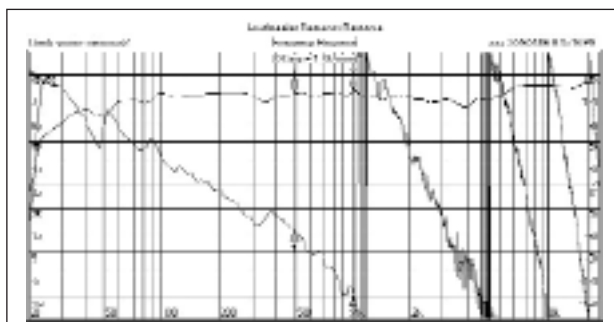
The Mini's 1" ring-radiator tweeter is Scan Speak's top-of-the-line D2904/700000 Revelator; its 7" mid/woofer is an ultra-expensive MAGICO-exclusive design that uses vapor-deposited titanium (the world's stiffest, lightest metal, ideal for linear piston action) in a constrained-layer sandwich. Powered by an outsized neodymium magnet (as is the tweeter), the proprietary titanium mid/woof is said to be capable of linear 1" peak-to-peak excursions (i.e., it has the wallop of a ten-inch driver). All Mini crossover parts are sourced from the Raimund Mundorf Company of Cologne, Germany, maker of the celebrated MCap-Supreme silver/gold capacitors.

Like the speaker, Wolf's one-hundred-and-twenty-pound dedicated stand is a work of applied art, constructed of 6061T-6 billet-aluminum to increase stiffness and lower energy storage, and treated with birch fascia to improve damping. Its mas-

sive bottom plate can be fitted with a variety of spikes or gliders; its top plate is angled at a precise 2.7 degrees to ensure perfect time alignment between tweeter and mid/woofer and is fitted with a unique ball-bearing mounting system to decouple the speaker from the stand.

Wolf has spared no expense to make certain that form maximizes function in his Mini. That said—and for all the cost-no-object parts and fanatical tweaking that have gone into its construction—the Mini on its stand remains a \$22,000 two-way, and the question any reviewer or consumer has to face is: Why spend this kind of money on a mini-monitor?

Well, let me step completely out of a character for a moment and show you one reason why. Below you will see a quasi-anechoic frequency plot taken by me and my friend Bill Waslo—the genius (and I don't use the word lightly) behind



Liberty Instruments' remarkable Praxis suite of loudspeaker-design-and-measurement tools. (For more information on Liberty's Praxis suite, go to www.libinst.com.)

Take a look at the horizontal frequency plot. From about 57Hz to above 6kHz it is almost ruler-flat, give or take a dB or two, rising a bit more in the top treble (and extending well beyond the test limits into the ultra-high-frequency range) and rolling off at a gentle 6dB/octave in the bass. This, folks, is almost textbook-perfect frequency response for a two-way in a sealed box. What makes this graph even more remarkable is that, in this case, the Mini sounds almost exactly the way it measures.

By this you may think I mean that from the midbass through the lower treble the Mini's flat frequency response translates uniformly into a more accurate reproduction of instrumental timbres. And this is true to an extent. But only to an extent. A speaker this flat doesn't "create" more accurate tone colors; it *transmits* them more accurately. Since tone colors on sources vary wildly—listen to an RCA, a Mercury, and a Decca recording of, say, the Brahms Violin Concerto, one after the other, and then tell me what "accurate" violin timbre

Cover photo and inside spread courtesy of ELECTORI Co., Ltd., Japan. Detail shots by Todd Tankersley. Special thanks to Music Lover's Audio in San Francisco for the use of its facility.

means—the Mini will only sound as “good” as the source allows it to sound. Indeed, the Mini may be less appealing on some LPs and CDs than a speaker that doesn’t measure as flat as it does, a speaker that tends to plump up the bass or warm the mids or roll off the treble. This is not to say that the Mini

A speaker that measures this flat doesn’t “create” more accurate tone colors; it transmits them more accurately

is one of those measures-well-but-sounds-thin-and-analytical numbers. On the contrary, it sounds as dark or light, focused or bloomy, warm or cool, rich or lean as the record itself, though for all its chameleon-like fidelity it always sounds pleasant.

What the Mini’s frequency response really translates to—what you can hear regardless of the timbre quality of the source, provided your front end is first-rate and your room is properly treated (for which, see below)—is a lot more of the low-level details that tell you where, when, and how an instrument is

being played. From a certain angle, the hills and dales of measured frequency response are like hills and dales in a speaker’s resolution ceiling. A peak tends to increase (sometimes attractively) the perception of musical detail in a narrow band, a dip to reduce it. A large part of a speaker’s characteristic sound really corresponds to the overall effect these artificial emphases and de-emphases make on the ear. By minimizing them, the Mini minimizes its own contributions to the sound, greatly increasing overall transparency to the source. As noted in last issue’s roundtable, being able to hear more clearly when, where, and, particularly, how an instrumentalist is playing his instrument adds enormously to the illusion of realism. From the midbass through the lower treble, the MAGICO Mini is capable of making musicians sound *at least* as “there” as the best loudspeakers I’ve heard.

However, it takes some doing to get the Mini to audibly reproduce all the detail it is capable of resolving. A quasi-anechoic frequency-response plot tells you how well a speaker *can* perform, on-axis, with the room taken out of the equation. It does not tell you what the speaker will sound like in a real-world listening space, when you are sitting in the sweet spot ten or so feet away from it. In a small-to-moderately-sized room like mine, a direct-radiator like the Mini with a relatively wide-dispersion tweeter can and will produce audible early reflections from side and rear walls—reflections that can screw up

A Brief Chat with Alon Wolf

How did you get interested in building loudspeakers?

I was always interested in loudspeaker design. I built my first Peerless kit when I was 12 years old. Through my years as an avid audiophile, I have owned and/or heard just about everything you can imagine. Fifteen years ago, I finally gave up trying to find a loudspeaker I could live with. I got tired of changing one set of compromises for another. Especially since I felt I could do it better. So I gave it my best shot and here we are...

Tell us how you go about designing your speakers.

Although some people will have you believe that it is magic or art, building loudspeakers mainly involves science. It does get complicated very quickly. Look at all the elements that need to be covered: acoustical,

electrical, and mechanical engineering; materials; industrial design; etc. Each one of these disciplines is a world by itself. If there is art involved it is in making all these elements work together.

We have an extremely talented international team of people working together to develop our products. If one segment comes up with an idea that is not agreed upon by others, it gets discarded. Only when all the ideas involved line up do we move forward. Such a collaborative approach, with the right people, leads to phenomenal results.

We feel that traditional measurements are important. Yet, they do not tell the whole story. For example, we design for symmetry in the impulse response, and for the lowest possible distortion figures. We put much emphasis on using music-like signals to test the distortion and focus on high-order harmonics, not only on the ubiquitous second and third harmonics. We also use custom-made signals and acquisition techniques to test our systems. Finally, we listen. Just

to make sure we have not overlooked anything.

Why are MAGICO speakers so expensive?

We make no compromises when building each of our products. We search constantly for a better way to do things. We use parts and methods that cost six times as much as the industry standard to facilitate both empirical improvements as well as aesthetic ones. When I refer to aesthetics, I mean not just visual but also auditory aesthetics. There is a simple explanation for why a birch-ply enclosure with a 20-pound aluminum face plate will work and sound better than a typical MDF box. Given the quality of the components as well as the craftsmanship that go into each Mini, the speaker is actually a bargain.

What's next for MAGICO?

We are working on developing a four-way full-range floorstanding speaker—a big brother for the Mini. We expect to debut it at the next CES.



imaging and obscure detail. Although the Mini's superb ring-radiator is less problematical than many dome tweeters I can think of (its dispersion narrows as frequency rises above 10kHz), proper speaker placement¹ and judicious room treatment are still musts, though these things will grow progressively less critical as the size of your listening space increases. In my room the Minis didn't show their absolute best until I added Ben Piazza's Hallographs to the rear corners.² After doing this, the soundstage came into perfect focus.

Hearing the Minis at their absolute best is definitely worth the effort. Thanks, undoubtedly to Wolf's inert cabinets, these speakers can "disappear" as sound sources to a greater extent than other direct-radiators I've heard in my home. Instrumental and vocal images simply hang in space like free-standing mobiles, leaving few clues that they are being generated by two gorgeous birchwood boxes.

It isn't just their superbly crafted enclosures that make the MAGICOs disappear so completely; it is the superior blending of their drivers. (The smoothness of the blend can be seen in the

Minis' phenomenal frequency-response plot.) Almost all two-ways tend to sound more "of a piece" than conventional front-firing multiway loudspeakers. After all, they have fewer cones and crossovers and smaller boxes. But even with the best of them you can, with enough time and close listening, begin to hear how the woofer overlaps the tweeter, slightly warming and darkening the midband, thickening textures and slowing down transients—the way a subwoofer does the sound of its satellite, although to a *much* less damaging and obtrusive degree. There just isn't any sense of driver "overlap" with the Minis; they truly sound as if they were single-driver speakers, or as close as two-ways have thus far gotten to that ideal.

This does not mean that you can't hear the Mini's drivers at all, just that you can't hear the woofer and tweeter as separate elements. The slight rise in the Mini's top-most treble, for instance, is audible as a mild addition of

air, bloom, and transient energy, which (provided I'm not sitting directly on the tweeter's axis) I find attractively lifelike in the same way that I find the rising top end of a good moving-coil cartridge attractively lifelike. Nor does the Mini's disappearing act mean that you can't hear its box at all, just, once again, that you don't hear it as a sound source. The speaker's acoustic-suspension enclosure, for example, takes a bit of getting used to if you've been living for several years with the plummier bass of a ported box, as I have.

Part of the reason that the Minis need careful setup is the sheer amount of energy they put into the room. They pack a far more powerful punch than other two-way dynamics I've heard. I'm not sure exactly why this is the case—I'm guessing it's a combination of the MAGICO boxes not "storing" much energy and the drivers themselves having superlative transient response (both starting and stopping) and exceedingly low levels of distortion—but with the right front end (try a London Reference car-

Driving the Mini

Although the MAGICO Mini is a textbook-perfect load (never dipping below 4 ohms and staying about 6 ohms for most of its frequency range), it is relatively low in sensitivity. Though rated at 87dB, it is a nominal 4-ohm speaker, so its sensitivity is actually closer to 84dB. This means that the Mini really soaks up power, and you're going to need a strong amplifier to bring it to fullest life. In solid-state, I'd recommend at least two-hundred high-quality watts. Amps from MBL, Pass Labs, Rowland, Spectral, Edge, or Kharma have all proved excellent combinations. In tubes, you will once again need at least one-hundred-and-fifty high-quality watts. Amps from Audio Research Corporation are particularly good matches.

¹ I recommend an equilateral triangle between speakers and listening seat, with the Minis at *least* three-to-four feet from sidewalls and four-to-five from rear ones. The amount of toe-in may depend on how close you are to the speakers. If you're sitting relatively close (8'-10' away), you probably won't want to be directly on axis or the slight (+3dB referenced to 1kHz) rise in the tweeter above 7kHz may bother you a bit on aggressive recordings. However, you will lose too much treble if you aim the speakers directly ahead, parallel to the wall behind your listening seat. In my 17' x 15.5' x 10.5' room, I have them aimed a bit outside either ear (when I'm sitting in the sweet spot), so that I'm listening slightly off the tweeter's axis (which is the way the Revelator was designed to be heard).

² These floor-standing, tuning-fork-shaped, wooden objects (you get two in a set) are said to "clarify the soundfield" through some sort of magic that "reduce(s) the audibility of the chaotic reflections from the walls of the listening room so they won't overpower and interfere with the direct sound from the speakers." Though I couldn't get the Hallographs to clarify anything with the omnidirectional MBL 101 Es, they did *precisely* what Piazza claimed they would do with the conventional direct-radiating Minis—vastly improving soundstaging and the resolution of inner detail, seemingly without touching timbres, durations, or intensities. Though not inexpensive at \$999/pair and an utter mystery when it comes to the way they do that voodoo they do so well, the Hallographs are one room treatment I highly recommend, *if* you have a small-to-moderate-sized room and are using direct-radiating loudspeakers. (For more on the Hallographs, go to www.shakti-innovations.com/hallograph.htm.)

tridge with a Lamm LP2 Deluxe or a Clearaudio Titanium with an ARC PH-7 phonostage) these beauts can sound close to life-like on things like rim shots, plucked or crisply bowed strings, or piano played *staccato* or *sforzando*. For instance, in the second movement of the Kalabis Sonata for Violin and Piano [Panton], when Milan Langer repeatedly jabs his Steinway hard to sharply punctuate the lyrical line of the violin, through the Minis these *sforzandos* literally make you jump, as they would in life—they are that fast, clear, hard-hitting, and immediate, though not at all harsh-sounding. Again, when all four instruments of the Madison Quartet sound the opening notes of Marc Neikrug's String Quartet [MHS] in a unison *fortississimo* played *sul ponticello*—signaling the start of what Neikrug himself calls a “maniacal” piece of music—you'll not only hear the stop-you-dead-in-your-tracks “zing” of the open strings, you'll hear the incredible weight and speed of the *sforzando* bowing. (What a sound effect!)

Likewise, when Nadia Salerno-Sonnenberg plays pizzicatos at the close of the Allegro of the Prokofiev First Violin Sonata [MusicMakers], the snap of the strings is uncannily realistic, without any of the defocusing blur that makes most plucked strings sound (via stereo systems) either the slightest bit too “slow-motion,” too played out over time, or too fast, too condensed in duration. Ditto, for the upper octave runs of Sandra Rivers' grand on this same disc. Reviewers often talk about every note of a trill or a run being distinct; here they genuinely are—and they are without any losses of color, slurring of pace, or diminution of touch. When you can literally count the individual quavers or semiquavers of a speedy arpeggio, *that*, folks, is phenomenal transient response and phenomenal clarity. And, once again, this speed and resolution comes without any sacrifice in warmth or delicacy.

Perhaps because box and drivers are elevated off the floor on Wolf's super-duper stands, the Minis also tend to throw bigger, more three-dimensional, more life-sized images than their floorstanding two-way competition. Indeed, sitting in a centered seat you would be hard put to tell the difference between the Minis and my reference four-way omnidirectional MBL 101 Es solely on the basis of image or soundstage size. (Off-axis nothing beats the imaging and staging of the MBLs.) Here is one two-way that truly does sound almost as wide and deep and tall as the Big Boys. Anyone looking for large-speaker sound in a space too small to accommodate large-speaker bulk ought to keep this in mind.

When you add the Mini's invisibility, resolution, transparency, and dynamics to its huge soundstage and life-sized three-dimensional images, you end up, on the right recordings,

with vocalists and instrumentalists who sound closer to being there in the room with you. On Joan Baez's eponymous first album, for instance, the Minis will conjure up the then-nineteen-year-old girl with astonishing completeness. Any decent speaker can tell you that Baez is belting the opening lines of “Rake and Rambling Boy” *fortissimo* to capture the élan of the folk song's bandit-hero or spinning out her sweet, wide vibrato *pianissimo* to add just the right hushed charm to the “surprise” ending of the touching love ballad “John Riley.” What the Minis do is add harmonic and dynamic subtleties that even the finest speakers often miss—levels of *fortissimo* within *fortissimos*, levels of *pianissimo* within *pianissimos*, the precise way Baez embellishes the pitch, color, intensity, and duration of each note (what in an opera singer would be called her *fioritura*). The Minis don't just give you a beautiful voice; they give you Baez,

feeling and thinking the song's delivery, using her gorgeous instrument to shape the drama of what she feels and thinks. It is really quite an amazingly lifelike presentation.

I could say exactly the same things about Henryk Szeryng and his Guarnerius on the Szymanowski Second Violin concerto [Philips], Milan Langer and his Steinway on the aforementioned Kalabis Sonata for Violin and Piano [Panton], the big battery of percussionists and their various drums on the superb recording of Manuel Enriquez's *Ritual* [Forlane], or the Swingle Singers *a cappella* on Luciano Berio's *Cries of London* [Decca Head 15]. With the right recordings the Minis not only deliver the instruments; they deliver the artists and their artistry.

So if *Joan Baez* and these various others are the right recordings with the Minis, which are the wrong ones? Well, here we come up against the immutable.

The Minis are two-ways, which means for all their other virtues they will not reproduce the 20–40Hz range with the life-like power and impact of, say, the MBL 101 Es. Oh, they're nothing short of superb where they do play in the bass—down to 40Hz or so (room-lift tends to fill in the gradual 40–60Hz roll-off shown in the frequency plot). Through them you will still hear—perhaps more clearly than ever, given the Minis' incredibly low distortion—the thick strings of Alicia de Larrocha's Steinway ring when she sustains those deep bass notes in the first movement cadenza of the Montsalvatge Concerto Breve, or Miklós Perényi's cello growl in its bottom register in the lyrical first movement of András Mihály's gorgeous Cello Concerto [Hungaroton], or the big bass drum in Hugh Wood's exceptionally well-crafted Cello Concerto [Unicorn] set off a floor-shaking



temblor. That said, acoustic-suspension (sealed-box) bass isn't as punched-up as ported bass; it is altogether smoother, tighter, more controlled. In principle these are very good and lifelike things to be; in practice, though the Minis actually go deeper

With the right recordings the Minis not only deliver the instruments; they deliver the artists and their artistry


than many ported two-ways and roll-off much more gradually in the bottom octaves (with "useable response" extending rather astonishingly into the mid-thirties),³ they may not always *sound* as plush and powerful as a ported two-way, simply because they don't add the energy of a port around 35–40Hz. To put this a different way, you won't lose pitch definition with the Minis in the 40–60Hz region, or, Lord knows, tone color, size, pace, transient speed, or low-level resolution. You will, in fact, gain in all of these areas. What you may lose, depending on the recording, is a bit of midbass excitement, though Wolf would claim that it is false excitement added by the port.

How much the Mini's flatter, less punched-up bass response and lack of true 20Hz extension matters to you will depend on what kind of music you listen to. For small-scale classical, jazz, pop, or folk, the Minis will be hard to beat. On large-scale classical or big-band acoustic jazz, they will (minus an organ concerto or two) remain hard to beat. But with electronica or arena rock or drum-and-bass or techno-pop, no two-way is going to be the right choice, unless you plan on adding two (extremely good) subwoofers.

I'll confess to being old school when it comes to subs. The way I see it, if you wanted a three-way, you should've bought a three-way—and not a two-way like the Minis. You simply can't add a sub to a speaker system this remarkable without paying some audible price in opacity in the upper bass and lower midrange. And the Mini's upper bass and lower midrange are two of its defining glories.

If you've spent any time measuring the frequency response of loudspeakers, you'll find the Mini's nearly ruler-flat plot in the 100–500Hz range nothing short of remarkable. This is the power range, and most speakers suck it out. Not these little sticks of dynamite. Adding a subwoofer is bound to lump this amazingly flat response up. On the other hand, if something like David Bowie's *Earthling* is your thing or you want to hear the lava-flow synth on Paula Cole's "Tiger Lily" running under your feet, then you'll have to bite the bullet and add two subs.

³ The Minis are down about 8dB at 35Hz referenced to 1kHz—and that is anechoic response, which does not take room-lift into consideration. That said, they cannot deliver a 35Hz-or-lower note with lifelike power and impact. There is, after all, only so much that a 7" mid/woofer is capable of doing, even the extraordinary one designed and built by Alon Wolf.

There isn't much left to say about Alon Wolf's masterpieces. I've heard better (and deeper) deep bass; I've heard better treble (but only from the \$46k MBL 101 Es). In between, I have *not* heard better. Without doubt, the MAGICO Minis are the most thoroughly, knowledgeably, and successfully engineered mini-monitors the high end has yet seen and one of the small handful of truly great speakers that (a lot of) money can buy. For their near-textbook frequency response, their transparency to the source, their single-driver coherence, resolution, invisibility, starting and stopping transients, dynamic range and scale, soundstaging and imaging, they are wonderful reviewer tools; for what they did with Joan Baez's voice and Miklós Perényi's cello and Milan Langer's Steinway and Henryk Szeryng's Guarnerius, they are just plain wonderful. 

SPECIFICATIONS

Type: Two-way, acoustic-suspension, stand-mounted mini-monitor
Drivers: One 1" ring-radiator tweeter, one 7" titanium-composite woofer
Frequency response: 40Hz–40kHz ±3dB
Sensitivity: 87dB
Impedance: 4 ohms
Recommended amplifier power: 200W
Dimensions: Mini, 16" x 12" x 17"; MAGICO stand, 26" x 15" x 18"
Weight: Mini, 80 lbs.; MAGICO stand, 120 lbs.

JV'S EXOTICA REFERENCE SYSTEM

Analog source: Walker Proscenium Gold record playing system
Moving-coil phono cartridge: Clearaudio Titanium
Moving-iron phono cartridge: London Reference
Digital source: MBL 1611 E transport/1621 A digital-to-analog converter
Solid-state linestage preamp: MBL 6010 D
Tube linestage preamp: Audio Research Reference 3
Phonostage preamp: Lamm LP2 Deluxe, Audio Research PH-7
Solid-state amp: MBL 9011 monoblock
Tube amp: Audio Research Reference 200, Lamm ML2
Large speaker: MBL 101 E
Small speaker: MAGICO Mini
Connection: Tara Labs "The Zero" interconnect, Tara Labs Omega speaker cable, Tara Labs "The One" power cords
Accessories: Shakti Hallographs, Winds Arm Load meter, Clearaudio Matrix record cleaning machine, Cable Elevators, Walker Audio Velocitors, Walker Audio Valid Points, Walker Custom Equipment Stand, Richard Gray Power Company 600S/Pole Pig

MANUFACTURER INFORMATION

MAGICO LOUDSPEAKER SYSTEMS

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Oakland, California 94608

(510) 653-8802

magico.net

Price: Mini, \$16,500; MAGICO stands, \$5500