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THE JOURNAL OF HIGH-END

OCTOBER 2023



MBL 101 X-Treme MKII Loudspeaker

15 Pages of New Music
Features and Reviews

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THE BEST GETS BETTER

MBL 101 X-TREME MKII LOUDSPEAKER

BY JONATHAN VALIN • PHOTOS BY PETER WESTPHAL



THIS

article marks the third time in a decade and a half that I've reviewed the MBL X-Treme *Radialstrahler* system. On the first two occasions, I evaluated the MKI versions of these gigantic, four-box, omnidirectional loudspeakers—the original and the 10th Anniversary Edition (which incorporated small, audible improvements to the *Radialstrahler* drivers and their tower structure).

This time around, I'm going to talk about the MKII 101 X-Treme, which has new and substantially different subwoofer stacks. It is the first major change to the 101 X-Tremes in 16 years, and MBL's genius designer Jürgen Reis has deemed it a large enough sonic improvement to award the speaker a MKII designation—and justify raising the price of the entire system to a staggering \$398,000. (Current MKI owners can purchase the new subwoofer stacks separately for a paltry \$159,200 or upgrade their MKI subs to MKII status by shipping them to the factory for extensive modifications. Please check with MBL about this possibility.)

Obviously, you have to be made of money to consider buying the X-Treme MKII system or the MKII sub stacks. So, to jump the highest hurdle at the start, is this new MBL flagship worth the fortune being asked for it (assuming, of course, that you have this kind of dough to spend on an audio system without instigating divorce proceedings or involuntary civil commitment)? The answer (or my answer) is an unqualified yes. As I said to Jürgen and MBL's American importer Jeremy Bryan, after they'd finished installing the new MKII sub stacks in my room, and we'd played Drake's synth-poppy "Hold On, We're Going Home" from *Nothing Was the Same*, "I've never heard anything like this before!"

Of course, that wasn't completely true. After all, I'd been living with the 10th Anniversary MKI versions of the *Radialstrahler* system for four years. And yet, in spite of the fact that from 85Hz up the *Radialstrahler* parts of the system are literally the same as those of the MKIs, the MKII isn't just a little different sounding than the originals. It is *astonishingly* different sounding—and astonishingly better.

If all that has been changed are the subwoofers, how is this possible? Well, anyone who has ever played around with subs can take a stab at answering that question. The fact is subwoofers don't just supply missing low bass; they also change the sound of the speaker system they're underpinning—its tonal balance, dynamic range, resolution, staging, imaging, timing, and pace—in ways that are often for the better and sometimes for the worse. On this last point, the trouble with "add-on" subs typically isn't in the bottom octaves proper (though subs can and do excite room nodes that weren't as audible prior to their addition); it's in the midband, where they cross over to the mains and, oftentimes, mask their character to the extent that they no longer sound like the speakers you originally bought.

Of course, "add-on" subwoofers are different critters than MBL's sub stacks, which are engineered as integral parts of a four-way loudspeaker system. Whatever "masking" they may do—and there is none apparent

in the MKI or the MKII—is simply part and parcel of the 101 X-Treme package.

I guess we should revisit that package before talking about what has been changed in the MKII stacks, and I'll begin by rehashing sections of my January 2020 review of the 10th Anniversary 101 X-Treme MKI.

As I wrote back then, there was a time in the late 60s and early 70s when omnidirectional loudspeakers were the audiophile rage. Of course, it was the much-maligned Bose 901s that chiefly spurred this craze, followed by a truckload of three-sided, four-sided, and six-sided imitators. Though the Boses were not true omnis, which is to say they weren't generating equal amounts of sonic energy in *all* directions at all frequencies, they did use the listening room, particularly the wall behind them, in a way that most other loudspeakers of their day did not—and that acoustic instruments in concert halls always *do*.

You see, a large proportion of what we hear at a live event is not direct sound but indirect sound bounced off the walls, floor, and ceiling of the venue—reflected energy that profoundly affects the timbre, the dynamics, the durations, the imaging, the very character of the sonic presentation.

Why hall reflections play such a large part in what we hear has to do with the way instruments make music. A violin, for example, doesn't launch a series of notes in a single plane or in a single direction, as if it were emitting a tightly focused beam of light aimed directly at you, the listener; it radiates its energy throughout 360 degrees, both vertically and horizontally, casting sound into space the way a softly glowing bulb casts light. Of course, that violin isn't generating the same amount of energy at every vector or at every pitch. But it is always radiating in three dimensions, and therefore always merging its direct sound with the indirect sound it is reflecting off the walls, floor, and ceiling of the hall or room in which it is being played. Another way to put this is to say, in Amar Bose's famous phrase, that instruments behave acoustically like "pulsating spheres." They are true point sources, which (because of their spherical wavelaunch) always produce a mix of direct and reflected sound in any room at any listening position.

It is only a small (though not unproblematic) step from observing that if instruments invariably behave like point sources, loudspeakers should, too—that to accurately reproduce what an instrument in a concert hall

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or a studio sounds like speakers should also mimic that instrument's 3-D radiation pattern, which is so intimately tied to our perception of its tonality, dynamics, durations, and presence.

That's the theory, at least. And with the 101 X-Tremes the theory proves out beyond highest expectations. As I wrote 16 years ago in my review of the original version of the X-Tremes, "while we all listen, perforce, blind to stereo, the 101 X's go further towards compensating for our hunger to see what we hear—to fulfilling the definition of the word 'stereo' (which literally means 'three-dimensional' or 'solid')—than anything else I've auditioned."

In addition to their incomparably realistic 3-D presence, omnis have obvious sonic benefits when it comes to soundstaging and imaging—one of which you can demonstrate to yourself by merely abandoning the "sweet spot" midway between those direct-radiating cone loudspeakers currently ensconced in your listening room. As you doubtlessly already know, when you move right or left of center, so does the soundstage, which tends to collapse towards the speaker you're nearing, as if the instruments and vocalists were gradually sliding off a tabletop tilted in the direction you're heading.

This does not happen in real life. If you move from centerstage to a seat at stage left or stage right in a concert hall (or in a rock club, for that matter), the soundstage does not "collapse." Oh, the instruments located in the direction you've moved sound louder and more prominent (because they are, in fact, louder due to your closer proximity to them), but the rest of the orchestra or band still spans the stage in the opposite direction, the soloist/vocalist still sounds roughly centered, the hall's ambience still encompasses all instruments evenly, rather than thinning down in the distant direction and thickening up in the proximate one. With an omni, you get the very same effects you hear in life. Sitting, standing,

shifting your head or your seat (even moving behind the speakers), you experience the same stable imaging and soundstaging.

As a dyed-in-the-wool audiophile, listening alone with your "head in a vise" may be something you've grown used to (I certainly have), but it is not the most natural or relaxing way to enjoy music; nor, when it comes to your non-audiophile visitors, is it the most congenial and inviting. I don't know how many times I've told some bewildered newbie to "sit in the middle"—and if, as is often the case, there is more than one such visitor, to "let so-and-so have the sweet spot." It's rude and embarrassing—and one of the chief reasons, beyond the baffling complexity and absurd expense, that so many neophytes find high-end audio off-putting. While omnis like the 101 X's certainly won't solve the complexity or expense problems, they will go far towards making listening to music the unconditional joy it is (and ought to be).

And then there's the felicitous (and natural) way omnis deal with an audiophile's chief bugaboo—the listening room and its inevitable issues. While some of our writers seem to believe that every room problem can be solved via a good dose of DSP salts, I do not. EQ'ing outboard subs (whose output is inherently omnidirectional) to iron out room nodes in the

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bass is one thing (and generally a salubrious one); DSP'ing an entire system (whose output is *highly* directional) to make it measure flat or rolled or whatever flavor you choose or to doctor the perceived problems in a poor recording is another. In my experience, you may be able to get things close to the way you want them to be at one roughly microphone-sized spot right smack between your loudspeakers (at least, you can until you cave in to the nearly irresistible urge to start fiddling with DSP again), but what is being scanted or ignored here is how much more completely and unavoidably such DSP adjustments lock you into a single listening “sweet spot.” Talk about having your head in a vise! If you move your noggin sufficiently right or left or up or down, or (God forbid) move to a different chair in a DSP'd system, all that painstaking digital manipulation will be audibly compromised. Sometimes, it will go right down the drain—in fact, moving off DSP'd axis may make room problems much worse.

Omnis in general (and the 101 Xes *par excellence*) deal with room modes in an entirely different and wholly acoustic way—by flooding the listening space with full-range sound, coming (because the speakers radiate omnidirectionally both horizontally and vertically) from a nearly infinite number of different elevations

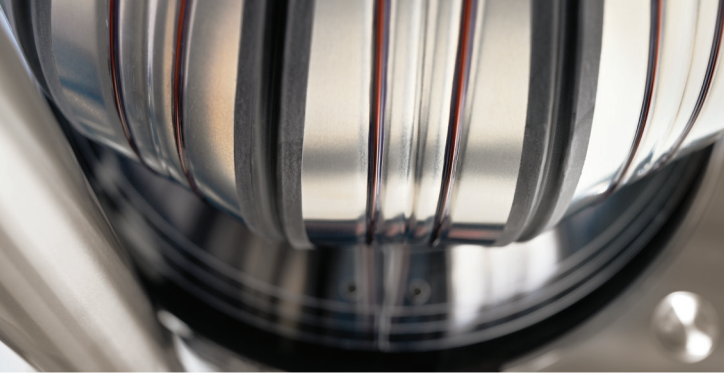
and a nearly infinite number of different angles. You might think that energy being broadcast in equal amounts at all frequencies toward literally every surface of your room would make the sound you end up hearing a confusing, echo-chamber-like mess. That it doesn't has to do with two interrelated phenomena: a true omni's (like the 101 X-Treme MKII's) frequency-independent, constant-directionality dispersion and the Precedence Effect (by which sounds in the first 50ms or so are fused together by the ear/brain and perceived as a single sonic event).

First, unlike conventional loudspeaker drivers (particularly tweeters) that tend to send intense spotlight-like beams of inherently more distorted off-axis sound toward sidewalls, an omni doesn't “selectively” energize specific spots on your walls. As I noted, it doesn't work like a specular flashlight. It works like a glowing ball. It energizes your room *uniformly* at all frequencies, so that any reflections will comprise the *entire* signal and not a small piece of it.

Why is this important? I'll let MBL's Jürgen Reis answer that question: “Though they are often used in loudspeaker development (and print and Web advertisements), anechoic frequency-response measurements taken on-axis only correlate with 2% of what we perceive when we're listening to a loudspeaker in our rooms. Frequency response measurements taken within a larger ‘listening window’ of, say 15–30 degrees up and down and right and left of center improves the correlation to about 12%.

“Be this as it may, in the first 3ms what we hear in a hall or at home is direct sound only. Localization—where things are, left, right, center—is determined by this direct sound, and because of its homogeneous output, no matter where you sit with an MBL omni the direct sound and its localization effects will be the same.

“At around 10ms we hear early reflections—sounds that have bounced off walls, floors, or ceilings at least once. If the music was recorded nat-



urally (e.g., the musicians were playing in real rooms, and their sound was picked up by spaced or cross-paired microphones), recordings may include the early reflections of the venue itself. Many studio recordings (e.g., pop or hip-hop tracks) do not include early reflections. Nonetheless, *you* always hear the early reflections of your room when you play these records back at home.

“In a hall or on a recording, these early reflections tell you how big the venue is—where the walls are and where the musicians are vis-à-vis those boundaries. This sense of spaciousness and dimensionality is also keyed to the way early reflections merge with the acoustics of the listening space. When these early reflections have the same tonal characteristic that the direct sound has (as they do with MBL omnis), we perceive the reflected sound as natural; with direct-radiating loudspeakers, the reflected sound has a totally different frequency response than the direct sound, which we hear as unnatural, sometimes annoyingly so. Early reflections are 44% of the sound we hear in a hall or at home, which is part of the reason why omnis, which generate these reflections uniformly and homogeneously in phase, time, intensity, and timbre, can sound so three-dimensionally lifelike and can more fully merge the sound of the recording space with that of your listening space.

“At about 50ms, we get the third part of music heard in a hall or listening room—so-called ‘room energy.’ Each instrument needs a finite amount of time to build up a note’s shape, from starting transient to steady-state tone to decay. The addition of room energy helps fill out the dynamic/harmonic envelope. As with early reflections, room energy is also 44% of the sound that we hear in our homes (or in concert venues). And again, as with early reflections, in order to feel ‘at home’ with a recording and relax into the music, the timbre of the room energy must match the timbre of the direct and reflected energy in your space.

Once again, because of their more homogeneous and uniform reflection of tonal qualities, MBL’s omnis produce room energy in a more natural, thorough, and enjoyable way.”

Far from being more colored by room reflections, drivers, and enclosures, sophisticated (and in the 101 X MKII’s case, boxless) omnis can, in principle, be much less colored by all these things and much more faithful to sources because with proper setup they essentially take speaker-directivity anomalies *out* of the equation and pair with your room in much the same way that instruments do. Thanks to the Precedence Effect and the fact that the speakers are lighting up reflective surfaces uniformly at all frequencies and all angles rather than selectively at specific frequencies and specific angles, your room no longer exists as a separate entity—like a picture frame within which the recorded soundstage is mounted, which is the way soundstaging generally works with a direct-radiating loudspeaker. Instead, the entire listening room merges with the recorded space, producing a wall-to-wall-to-ceiling-to-floor soundfield of astonishing layered depth and uniform ambience.

Despite the brilliance of their design principle and the important things they got right, early omnis, such as the original Bose 901s and

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their multifaceted descendants, were still essentially cones in a box—and liable to all the problems that cones and boxes entail. With the exception of the Walsh driver (an incredibly brilliant concept that suffered from a plethora of practical problems, which limited its viability), it is puzzling that no one thought to make a pulsating spherical driver to imitate all those pulsating spheres in an orchestra or a band. And then along came MBL, which did that very thing, and then, a decade or so later, along came a world-class engineer named Jürgen Reis, who perfected MBL's *Radialstrahler* concept and eventually designed the 101 X-Tremes.

In spite of all the genuine advances that have been made in the materials that cones and enclosures are made of (and don't get me wrong, those materials *have* greatly improved their sound), there isn't anything fundamentally new about moving-coil loudspeakers (or about 'stats or horns, for that matter). They are mature technologies, several of which have been around for almost a hundred years (more than that for horns). Yes, a carbon-fiber woofer is different (and sounds markedly different) than a paper or plastic or woven-fiber or ceramic one. But it's still a cone woofer with a surround and a spider, and it's still sitting in a gigantic box (nowadays made of aluminum or carbon-fiber or acrylic or stone or some mystery-meat material called "X," "Y," or "Z"). A *Radialstrahler*, folks, isn't like that. It's not just another pretty face in the same old beauty pageant.

What is a *Radialstrahler*? It is a free-standing (unenclosed) radial driver with a membrane made of bent segments that are fixed on one side and connected to a voice coil on the other. In MBL's classic 101 E floorstander—the current version of the company's original "radial loudspeaker" (which is what *Radialstrahler* means)—there are three spherical drivers mounted directly atop each other (and a conventional, ported subwoofer mounted directly beneath the radial array). The woofer (the large, bottom-most radial driver) comprises 12 bent segments (or lamella), made of a proprietary alloy of copper, magnesium, and aluminum and arranged in a quasi-spherical (or melon-like) shape. The smaller midrange driver, which sits atop the cap piece of the woofer, also comprises 12 bent segments, made of a woven carbon-fiber material and arranged in a sphere. The even smaller tweeter perched atop the midrange's cap piece has 24 bent segments, made of a proprietary unidirectional carbon material and also arranged in a spherical shape. When the drivers' moving coils move, the segments of the drivers flex, accordion-like, creating sound pressure throughout 360 degrees, horizontally and vertically.

As all drivers share the same central axis, the listener gets, in designer Jürgen Reis' words, the same "timing of the woofer, midrange, and tweeter...[the MBLs'] alignment allows all frequencies to reach the listener's ears at the same moment, just as they do in nature.

"[In our speakers] the only active surfaces are the radial drivers, which are 'naked' and exposed with no cabinet enclosures. Conventional loudspeakers have drivers that move and a cabinet that should not move. If you take the relation of the driver size to the cabinet size, the cabinet can be up to ten times larger than the driver in surface area. Even if the driver is of top quality and the cabinet is designed to be perfectly rigid, it still vibrates. And even if the cabinet vibrates only a fraction of a millimeter, this will influence the sound quality.

"With *Radialstrahlers* you have the membranes and nothing else. No cabinets, no surrounds, no spiders—all of which can absorb energy and vibrate afterwards. When the *Radialstrahlers*' moving coils start to move, the membranes start to move; they immediately start to make sound pressure. And when the membranes stop, the music stops immediately. No decay, no wasted energy, nothing. We have no delay or time smear at the

beginning of an impulse and no delay or time smear at the stop of an impulse. *Radialstrahlers* are time coherent, radiating sound with the same phase."

As in the MKI versions, the *Radialstrahler* part of MBL's new flagship 101 X-Treme MKII is essentially two 101 Es without their subwoofers and subwoofer cabinets. One trio of radial drivers (woofer, midrange, tweeter) faces upward and another, immediately above it, downward, in a mirror-image or D'Appolito array. The bottom trio of *Radialstrahlers* is mounted on a massive base constructed of birchwood, brass, and aluminum in a constrained-layer sandwich; the upper set is bolted to a similarly massive top piece, also made of a constrained-layer sandwich of birch, brass, and aluminum, with a high-quality dynamic "ambience tweeter" nestled out of sight on its roof. Struts and cross members provide top-to-bottom and side-to-side structure and support. Outside of these struts and cross members, there is no enclosure. Each speaker weighs a quarter of a ton.

In addition to the gigantic *Radialstrahler* "towers," the 101 X-Tremes come with two six-foot-tall subwoofer towers that weigh better than a quarter of a ton each all by themselves. Each sub array comprises three ported, lacquered birch, brass, and aluminum boxes, fitted on top of each other via heavy-duty precision stainless-steel pegs and sockets, with the sub crossover controls and the MBL Class D LASA 2.0 amplifier that drives the entire array housed in the middle box. Two 12" dual-layer aluminum-cone drivers are mounted in a push-push configuration inside each of the three boxes—one woofer on the right side of the enclosure, one on the left, both stabilized and cross-braced by massive aluminum rods running between them to prevent the drivers from passing resonant energy to each other and to the box itself. That makes a total of six 12" woofers per speaker-side, twelve 12" woofers altogether.

That, my friends, is a lot of bass. And *that* is where all the changes in the MKII have been made.

Now, before delving into these changes, let me say (as Jürgen also does in the sidebar) that the major parameters (frequency response, phase, sensitivity) of the MKII sub stacks are exactly the same as those of the MKI subs. The MKI X-Tremes will still go down to 20Hz and mate with the *Radialstrahler* towers with outstanding seamlessness. What has

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been made different in the MKII sub stacks is the amount of energy the drivers are capable of delivering between 20Hz and 30Hz. Jürgen has also added two entirely new, built-in, completely analog (A-to-D/D-to-A conversion would add delay) parametric equalizers that allow you to tame room nodes below 100Hz (although, as Jürgen tells you, you don't want to completely "flatten" these nodes, lest you lose the sonic characteristics that make your room sound like *your* room).

Why did Jürgen decide to change the sub stacks—and to *only* change the sub stacks, as opposed to changing the *Radialstrahler* array, as well? Because the *Radialstrahlers* didn't need changing, and (as you're about to read) the subs did. Moreover, as Jürgen says (and I've already noted and subwoofer fans can attest), changing the bass changes *everything*.

What was wrong with the sub stacks as they stood that required improvement? As Jürgen tells you in the sidebar interview, the answer has to do with the energy content of current recorded music. When the original X-Tremes were developed about a decade and a half ago, the AES (which keeps a running tally of the average energy-over-time-and-frequency in commercial recordings) recommended a low-end limit of 50Hz for loudspeakers, which the MKIs easily accommodated. In 2017, with the popularity of synth-driven pop, jazz, and hip-hop and fuller-range recording/playback techniques for all kinds of music, the AES' low-end recommendation was reduced to 20Hz.

The MKI subs would certainly go down to 20Hz, but because of restricted dynamic headroom they wouldn't deliver the *full power* of instruments capable of 20–30Hz notes. To remedy this, the MBL subs' drivers, enclosures, crossovers, and inputs had to be re-thought and re-configured.

I'm not going to go through all the physical and electrical advances that Jürgen has made in the MKII sub stacks. For that, you should read the

SPECS & PRICING

Type: 4-way system with double tweeters, midranges, and woofers (D'Appolito arrangement), up-firing silk-dome ambient tweeter, and active subwoofer stack per side

Acoustic center: 100cm/39"

Subwoofer: Active subwoofer, each channel 6x12" (per side) aluminum cone drivers in three cabinets, push-push arrangement, cabinet volume 3x86liters

Woofer: 2x Radial TT100 (per side), copper-aluminum-magnesium

Midrange: 2x Radial MT50 (per side), woven carbon fiber

Tweeter: 2x Radial HT37, unidirectional carbon fiber

Lowest frequency: 24Hz

Crossover frequencies: 85Hz, 600Hz, 3.5kHz

Nominal impedance: 2 ohms each channel; 4 ohms each upper/lower *Radialstrahler* trio

Continuous power handling each channel: 320W @ 4 ohms each *Radialstrahler* trio of drivers (one upper, one lower trio per side)

Dimensions: Radial system: 496 x1854x687mm; subwoofer: 410x1860x670mm

Weight: Radial system: each channel 584lbs.; subwoofer: each channel 500lbs.; total system: 2170lbs.

Price: \$398,000 MKII system; \$159,200 for MKII subwoofer stacks. (Upgrade from MKI subs to MKII subs is possible, check with MBL for terms and conditions.)

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JV'S REFERENCE SYSTEM

Loudspeakers: MBL 101 X-Treme MKII, Stenheim Alumine Five SE, Estelon X Diamond Mk II, Magico M3, Voxativ 9.87, Avantgarde Zero 1, Magnepan LRS+, MG 1.7, and MG 30.7

Subwoofers: JL Audio Gotham (pair)
Linestage preamps: Soulution 725, MBL 6010 D, Siltech SAGA System C1, Air Tight ATE-2001 Reference

Phonostage preamps: Soulution 755, Constellation Audio Perseus, DS Audio Grand Master

Power amplifiers: Soulution 711, MBL 9008 A, Air Tight 3211, Air Tight ATM-2001, Zanden Audio Systems Model 9600, Siltech SAGA System V1/P1, Odyssey Audio Stratos, Voxativ Integrated 805

Analog source: Clearaudio Master Innovation, Acoustic Signature Invictus Jr./T-9000, Walker Audio Proscenium Black Diamond Mk V, TW Acoustic Black Knight/TW Raven 10.5, AMG Viella 12
Tape deck: Metaxas & Sins Tourbillon T-RX, United Home Audio Ultima 5 OPS-DC

Phono cartridges: DS Audio Grandmaster, DS Audio Master1, DS Audio DS-W3 Clearaudio Goldfinger Statement II, Air Tight Opus 1, Ortofon MC Anna, Ortofon MC A90

Digital source: MSB Reference DAC, Soulution 760, Berkeley Alpha DAC 2, Kalista DreamPlay X

Cable and interconnect: Crystal Cable Art Series Da Vinci, Crystal Cable Ultimate Dream, Synergistic Research SRX
Power cords: CrystalConnect Art Series Da Vinci, Crystal Cable Ultimate Dream, Synergistic Research SRX

Power conditioner: AudioQuest Niagara 5000, Synergistic Research Galileo Power Cell SX, Technical Brain

Support systems: Critical Mass Systems MAXXUM and QXK equipment racks and amp stands and Center Stage 2M footers

Room Treatments: Stein Music H2 Harmonizer system, Synergistic Research UEF Acoustic Panels/UEF Acoustic Dot system, Synergistic Research Vibratron SX, Shakti Hallographs (6), A/V Room Services Metu acoustic panels and traps, ASC Tube Traps

Accessories: DS Audio ION-001, Stein-Music Pi Carbon Signature record mat, Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Walker Prologue Reference equipment and amp stands, Clearaudio Double Matrix Professional Sonic record cleaner, Synergistic Research RED Quantum fuses, HiFi-Tuning silver/gold fuses

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sidebar interview, where everything (including set-up adjustments) is explained in detail. What I am going to discuss is how those improvements have changed the MBL X-Treme's already sterling sound.

To begin where it is logical to start, the very bottom octave (in my room from below 20Hz to 30Hz) is reproduced with a power, color, clarity, and completeness that I've never before experienced from a loudspeaker, even a loudspeaker coupled to a giant, multi-driver "add-on" sub. I hate to repeat this cliché, but this is something you really do need to hear for yourself to believe. Oh, I've had subs that will rattle the floors and walls, even some speakers that can do this horripilating trick on their own. But in my room, the X-Treme MKIIs clearly and measurably reproduce 16Hz at the same level as they reproduce 1kHz! In my experience, that, folks, is unparalleled low-bass response.

The sonic results, as I started this review by saying, are amazing. It is not often in audio that you hear *entire octaves* that you haven't heard before. With Drake's Rhodes synth on "Hold On, We're Going Home" from Cash Money Records' *Nothing Was the Same* (the very first cut I listened to, as noted), or Howie B's synth and Hammond organ (with Tone Wheel #1) on Robbie Robertson's "I Hear You Paint Houses" from *Sinematic* (UMe), or Jack Antonoff's Moog Model D, Roland Model 6, Yamaha D7, Mellotron M4000D keyboards, and Yamaha F1 upright piano on "NFR" from the Lana Del Rey (whose kinda like the lyrical version of Sarah Silverman) album of the same name (Polydor/Interscope), the 20Hz–60Hz range was reproduced with a power that made my pantlegs flap, my cheeks quiver, my chest thump, and the cushions of the couch I was sitting on flex in and out. It was like having a subway train roar through my room.

However, it wasn't just the pure low-bass sock the MKII stacks were delivering that astonished me; it was also the clarity of pitches in octaves where pitches are almost always blotted, blurred, or outright missing, the uncannily lifelike buildup of timbre and decay, the three-dimensional roundedness, the toe-tapping excitement of rhythm and pace, the resolution of previously unheard instrumental and performance details on things like Pete Warren's plucked and bowed double bass from Jack DeJohnette's *Special Edition* (ECM), or the tam-tam and bass drum from Leon Kirchner's Concerto for Violin, Cello, Ten Winds, and Percussion (Epic).

If all the MKII subs did was supply the bottom octaves with pitch, intensity, timbre, and duration never before experienced, it would be a neat trick to wow the folks in the cheap seats. But, of course, that is not all the MKII sub stacks do. It is not just the lowest bass that is greatly improved in the MKII; it is the entire bass range, including the crossover region between the subs and the *Radialstrahler* woofers, which in radiating area are equivalent to about two 12" woofers per driver (and there are two of them *per side*!).

The smoothness of MBL's sub/radial transition was always impressive, but in the MKII it is audibly more so. Thanks to the woofers' greatly im-

proved dynamic headroom and the analog parametric equalization (as opposed to the outboard digital EQ I had been using with the MKI's sub stacks), there is a continuousness of sonic character between the low end, the midbass, and the lower midrange that makes the entire system sound more "of a piece." The newfound power and superior blend of the subs doesn't just add more "floor" to the presentation (though it does do that); it also adds richer tone color, greater three-dimensionality, and broader, deeper, more room-filling soundstaging to every instrumental or vocal recording right through the midband. Your space and that of the recording venue truly do "unite" in a wall-to-wall-to-floor-to-ceiling fashion that no other speaker, in my experience, is capable of equaling. It is, as I said earlier, as if the ambience and structure of the recording space and that of your listening room are so completely blended that what you hear isn't like a rectangular sonic picture situated between, slightly to the sides, and behind the speakers (beyond which your room and its boundaries are still visible and audible) but an entirely new, all-encompassing, large-scale diorama in which your room's boundaries and your speakers utterly disappear.

Within this unexampled soundstage, instruments are imaged with stunningly lifelike timbre, power, and dimensionality. Thanks to the woofers and the *Radialstrahler* omnidirectional output, not only is the low, dark timbre of something like David Murray's bass clarinet on *Special Edition* reproduced realistically from starting transient through steady-state tone to decay, so is its hollow columnar shape, which you can very nearly see as well as hear. As I said earlier, this ability to conjure near-visible 3-D images of instruments and instrumentalists replete with lifelike color and power in a soundstage of unmatched size is the chief thing that sets the MBL 101 X-Treme MKII apart from *every* other loudspeaker I've heard. It is what makes them so magical. For months, I've been writing about how gestalt shifts can suddenly turn a collection of musical parts into a near-visible instrumental whole. With the 101 X-Treme MKIIs, that gestalt shift comes as part of the package. You get magical three-dimensionality of image and stage with every recording—and you get it continuously, not on a moment-by-moment basis.

Downsides? Well, first, the MBL 101 X-Treme MKIIs cost a fortune.

Second, though stunning-looking, they are so large and heavy that they will test the

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construction of your floors, even more so now, given the incredible floor-pounding power they deliver on those 20–30Hz tones.

Third, as with all *Radialstrablers*, they don't image at centerstage with the sharp-edged definition of direct-radiating loudspeakers. Their images are a bit larger and more rounded at the edges (because more three-dimensional) than those projected by cones in a box. Of course, instruments and voices in life also have this same softer-edged, more voluminous kind of projection—it is one of the chief reasons why music recorded on microphones and played back on stereos sounds different than music heard in a concert hall.

Fourth, because of their imaging, the X-Treme MKIIs may not seem, at first, as minutely detailed as electrostats, planars, or very-high-resolution dynamics. This, however, is an illusion owed to several factors. Because the MBLs deliver the entire dynamic/harmonic envelope with more accurate timbre and duration, starting transients aren't overly emphasized the way they are with cone speakers, whose excess of direct sound, spotlight-like sidewall reflections, and the diffraction, reflection, and ringing of their enclosures in the upper mids and treble tend to goose transients up. This, of course, is not to say that the X-Tremes MKIIs want for speed—just listen to the strings of Hans Theessink's slide guitar on his fabulous cover of "Sympathy for the Devil" from *Jedermann Remixed* (Blue Groove) if you want to experience realistic transient response. What it *does* say is that the X-Treme MKIIs won't give you transients only or predominantly; they will give you the whole note in three dimensions, without laying an extra finger on the pitch, timbre, duration, or intensity of each phase. You're not losing detail with X-Treme MKIIs; on the contrary, you're gaining it. What you're losing are unnatural emphases.

However, this situation is complicated by another factor. In addition to low-bass parameters, MBL follows AES' strictures when it comes to rolling off the upper midrange and treble. The engineering organization recommends a gradual (1.5dB/octave) slope in the top end—to duplicate the way frictional losses affect the highs in musical performances. This deliberately engineered downward-tilting frequency-response curve means that transients in the upper mids and lower treble are, *ipso facto*, going to sound a little less aggressive (and quite a bit more natural) than they do through "flat-on-axis-to-20kHz" dynamic loudspeakers.

Fifth, like their earlier iterations, the 101 X-Treme MKII *Radialstrahler* sections are tough to drive. With a roughly 4-ohm impedance (when bi-amped as MBL recommends) and a conventional anechoic sensitivity in the very low 80s, they are rather like latter-day Apogeos. While MBL's superb Reference Series monoblocks (the 9008 A and the 9011) have no problems controlling them, you do need two amps per speaker side to drive the *Radialstrahler* columns (one for the top trio of radial drivers, and another for the bottom). That amounts to four pricey monoblocks (and associated cabling) for the entire system, almost doubling the price of the 101 X-Treme MKIIs. Of course, all pricey speakers are going to require pricey amps; they're just not going to require two sets of pricey amps per speaker side, unless you bi-amp. (I haven't yet tried non-MBL amps with the X-Treme MKIIs, but I'm planning on it. I'll let you know in a follow-up how amplifiers from Soulution and Vitus fare with the MKIIs.)

Sixth, there is the question of (and a misunderstanding about) room size. You might think that an exceedingly large, extremely heavy, six-foot-tall, four-tower, 26-driver loudspeaker would have to be housed and played in a correspondingly huge space, but you'd be wrong. Because they radiate omnidirectionally in both their *Radialstrahler* sections and their sub-bass sections, the 101 X-Tremes MKIIs (like their MKI predecessors) *need* to "see"

walls to function in the way they are designed to function. Though you're going to get more of a "nearfield" presentation in smaller spaces (just as you would with a direct radiator), you're not going to cause the Xes any problems when it comes to "driver blend" or room nodes. In fact, I rather prefer the sound of the X-Tremes in rooms (like mine) where the walls are "closer in," as their omni design seems to work more effectively in such spaces. So long as you can seat yourself around ten feet from the *Radialstrahler* towers, the X-Tremes will work exceedingly well in any size room.

Seventh, perhaps more than any other hi-fi component loudspeakers are matters of personal preference (as well as pocketbook). A surprising number of other speakers play—and play extraordinarily well—in the 101 X-Tremes MKIIs' ballpark. For roughly the same money, you can get a Wilson Audio Chronosonic XVX, a Kharmas Exquisite Extreme Grand Signature, an AlsyVox Michelangelo, a Stenheim Reference Ultime Three, or an Estelon Extreme Mk II, and, for considerably less, you can get a Magico M6, a Rockport Lyra, a Magneplanar 30.7, a Sound Lab Ultimate-1, and many others. All of which is to say that what I prefer may not be what you prefer. On the other hand, if you're in the market for a speaker that will make Frank Sinatra, Harry Belafonte, Louis Armstrong, Ella Fitzgerald, Diana Krall, Julie London, Miles Davis, Chet Baker, John Coltrane, Ornette Coleman, The Beatles, The Doors, The Band, Drake, Bruno Mars, Janet Baker, Dietrich Fischer-Dieskau, Glenn Gould, Helmut Walcha, the Cleveland Symphony Orchestra, the Juilliard Quartet, and the halls and studios they were recorded in not just fully audible but almost fully visible in three dimensions, you're going to have to audition the 101 X-Treme MKIIs.

Bottom line? I think you already know. The MKI X-Treme was the most realistic-sounding and musically enjoyable loudspeaker I'd heard in my listening room (or anyone else's listening room, for that matter). The MKII version is better. Indeed, it is better enough to more than justify its added cost (and the additional expense of amplifiers and cabling). As I said when I first auditioned it, "I've never heard anything like this before." I'll bet that you haven't, either. This is a phenomenally good loudspeaker. Obviously, it will be my nominee for TAS' annual Overall Product of the Year Award. Had we such an honor, it would be my nominee for Product of the Millennium.

MBL 101 X-TREME MKII LOUDSPEAKER

JV TALKS BASS WITH MBL'S JÜRGEN REIS

Are the subwoofers the only things that have changed in the MKII version of the 101 X? I mean the system sounds so different (and so much better) you'd think a great deal else had been improved.

The only change to the MKII is the bass stack, but as you can hear, if you change the bass, *everything* is changed.

What are the differences between the MKI and MKII sub stacks? And why did you make these modifications?

We developed the MKII sub stack because sonic standards have changed. The AES regularly releases recommendations about the energy content in recorded music, and this graph of energy-over-time-and-frequency changes every decade. When I began with MBL there was nearly no recorded energy below 80Hz, so the first MBL 100 only went down to 85Hz, which was sufficient. When the X-Treme was developed in 2007, the AES recorded energy-content graph had been extended to 50Hz. Ten years later, the recommendation for low-bass limits was 20Hz.

Where the maximum low-bass SPLs of the MKI tower was sufficient for recorded music a decade ago, nowadays we have mixes with much more energy in the very low end. So, even though the new subwoofers have the same sensitivity, the same frequency response, and the same phase response as those in the MKI, the new MKII sub stacks can now handle and deliver higher SPLs in the 20–30Hz region. The sub stacks also have much higher dynamic headroom and, of course, the built-in ability to tailor output to your room.

To effect these changes, the drivers had to be redesigned. Though the MKI woofers measure the same at 60 or 80Hz, in the MKIIs there is a difference at 20 to 30Hz. The new woofers have deeper baskets to house bigger magnets and permit the woofer diaphragms to move greater distances (+/-16mm, where the older setup allowed +/-11mm); the ferrite/ceramic magnets (not neodymium which changes its properties with temperature) are also stronger and larger to power this greater range of motion; and, most importantly, the rubber surrounds have been made thicker, heavier, and more stable to allow higher excursions and higher air pressures without deformation. We still have internal force-canceling aluminum rods between the baskets to reduce the transmission of vibration to the cabinet, and we still have Sorbothane damping between the magnets. But the damping mechanism has been improved (since the larger magnets are seated closer to each other, the Sorbothane works more effectively to reduce vibration). The Class D LASA 2.0 amplifier is slightly improved and more powerful (620W versus the original's 480W) and has a switching power supply.

We've also remodeled the cabinets to handle the increased air turbulence caused by the new woofers. Where one 11mm port was more than sufficient for the MKI drivers and for music recorded 10 years ago, in the MKII we have doubled the ports, which are now tuned to 25Hz and driven by dynamically controlled, dual-layer aluminum drivers with Qs of 0.37 (very high control) that are boosted by an auxiliary filter which raises output at 25Hz by 6dB. With rounded throats on the inside and outside, the new dual-port setup optimizes the box for larger air movements, reduces internal turbulence, and converts more energy into music at lower frequencies, audibly increasing dynamic headroom and dynamic ease and allowing the new subs to accommodate the greater number of recordings with 20-to-30Hz content.

Of course, if you want to deliver more deep bass, you must also be able to control this bass. To this end, we use a 1:1 Jensen isolation transformer at the sub stack inputs (both RCA and XLR), which electrically separates the signal path of the subwoofer from the signal path to the *Radialstrahler* woof-

ers. When the subs are tasked with heavy work, the transformer ensures that none of this signal is transmitted or reflected back into the *Radialstrahler* "melons." In addition, the transformer is designed to produce a tape-like harmonic richness in the bottom octaves. The iron core between its first and second windings behaves in a manner similar to the iron oxide coating on tape, which is not optimized for perfect linearity but for highest musicality (technically, it has a little more hysteresis); the transformer gives you the same, enriched, *very* slightly non-linear low-end color, power, texture, rhythms, control, and definition of reel-to-reel tape. (Psychoacoustically, without the transformer the sound would not be as rich and "pacey.")

In addition, our new built-in parametric analog equalization allows the subwoofer to be adjusted to two main frequencies in the Schroeder area (the area below about 200Hz, determined by room size and reverberation time, where your room starts acting like a resonator rather than a reflector), and this helps the subs integrate with the *Radialstrahlers* in the room more seamlessly. Though it's not absolutely necessary to use this feature (a lot depends on the room), it can often be very useful.

Equalization can be set by ear or by measurement, but having this ability does not mean that the bass should be made perfectly flat. In the low end, music typically puts higher energy into any (rectangular) room below the Schroeder frequency than it does above the Schroeder frequency. If, for example, you are listening to a piece with a synth or a five-string bass or an organ or a piano, those instruments may put 6dB more 20–80Hz energy into your room. It would sound musically unnatural to reduce that bass energy by 3dB or to flatten it to 0dB. It will only sound natural (and the speakers will only disappear) if the equalized response of instruments have the same SPLs as any natural source would have *in your room*. (If you have a trapezoidal space with a very low reverberation time, then a flat response in the bass might sound natural.)

In theory, if you improve the bass, you improve the sound of an entire system (even if there is no physical connection between the bass drivers and the mains). Of course, our sub stack is not an "add-on." It was designed as an essential part of a four-way system.

Tell us about the controls on the new sub stacks.
We have retained the Level control found on the

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MKI, which allows you to adjust the output to your taste or to adjust the gain to match different amps powering the *Radialstrahler* stack. (The twelve o'clock position works neutrally with our 9008 and 9011 amps.) The main Q factor control adjusts the speed or the fullness of the low bass via the auxiliary boost filter. When the Q filter is at the 12 o'clock position, the Q is -3dB (anechoically) at 25Hz; with the control turned all the way up, the Q is 0dB; with it is turned down all the way, the Q is -6dB. The Delay control changes the phase/timing of the subwoofers +/-8ms. In the middle position, the delay is 0ms (equal to the output timing of the *Radialstrahler* melon), but you can electronically "move" the subs forward or backward, depending on the dimensions and structure of your room. If, for instance, you have rigid walls, the sub signal can come in too early, so you can "move" the stack back electrically by adding delay. In a room with flexible walls, the bass can come in too late, so you can "move" it forward by reducing delay. Ideally, you want all the sound to seem to be coming from the melons.

We've had these three main controls before, but we have now added two two-way parametric equalizers. In most domestic listening rooms, you end up with standing waves at one or two frequencies, which

can be disturbing. With the two parametric EQ control, you can reduce resonances from 80Hz down by as much as 10dB, thus improving the overall coherence of the system. (What you don't want to do is try to boost notches, which can never be fully "filled in" no matter how much power you feed them, which is why we've limited the boost to 5dB.)

When reducing resonances, it is important to leave a little of their original resonant energy untouched. Otherwise, the sound won't be natural. If, for instance, you have an 8dB bass note and EQ it to be flat, it will sound unnatural because your room still has this 8dB room node, which you hear when you talk or clap or play any kind of music. Completely removing this node will mean that your room no longer sounds like your room. So, I recommend that you leave one-third of a resonance alone. If, for example, you have an 8dB hump, I would reduce it to 2.5dB. Canceling out all resonances to achieve a "flat-line" EQ kills the life of the music.

Both EQ controls also have Q factor adjustments, which let you fine-tune the bandwidth of the cuts. (Rooms with flexible walls need a broader bandwidth; rooms with rigid walls a narrower one.)

For determining EQ parameters, I recommend testing via a microphone in nine different positions around your listening seat and then making an average of the results to decide on adjustments. (Testing from one position simply won't work.) Even if you still have a notch or boost at your listening seat after adjustment, the sound will be much more natural if you average these nine readings. For instance, following these guidelines, in your room I achieved an output level at 16Hz that was exactly equal to the level at 1kHz (0dB difference). Of course, the inherent low-bass room boost of your room was a factor. **tbs**

