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Metaxas & Sins Emperor Loudspeaker

An Electrostatic *Radialstrahler*

Jonathan Valin

Kostas Metaxas' new top-of-the-line Emperor electrostatic loudspeaker comes closer to the sound of MartinLogan's ultra-transparent, ultra-high-resolution CLS (the first and, IMO, best of ML's curvilinear line-source 'stats) than any other speaker I've reviewed or auditioned. Whether this is a good thing will depend on the kind of listener you are. If you're looking for the thrilling (and quite realistic) bass and midbass sock of a great dynamic speaker, this will not be the transducer for you. Indeed, if you're looking for deep low-end frequency response and bass/midbass linearity, the Emperor will not set your heart aflutter. While Metaxas claims that the Emperor "is able to reproduce low frequencies (–3dB at 25 Hertz when fully broken in) without the addition of a subwoofer," in my room through my electronics (ARC Reference 330M monoblock amplifiers and ARC Reference 10 preamplifier) this is not the case. Though its low end is considerably better than that of the Czar (as it should be seeing that it consists of 15 electrostatic panels compared to the Czar's four), like the Czar it begins to lose efficiency at around 110Hz. Though it keeps making music well below that, once again like the Czar, it doesn't do so with adequate power. This reticence in the bottom octaves is also very CLS-like; however, the problem can be fixed without sacrificing the speaker's electrostatic virtues, where the bass/midbass suck-out of the CLS could not. (More on this shortly.)

Let's first look at what the Emperor is, because what it is is novel for a pure electrostat. The Emperor is or claims to be an omnidirectional loudspeaker. Though Muraudio's PX-1—reviewed quite favorably by REG in our February 2016 issue—was also an omni electrostat, it was a hybrid with built-in cone woofers. The Emperor is not. It has no cones for the bass range, just electrostatic panels.

Once assembled—and, yes, like all Metaxas' 'stats the Emperor has to be assembled piece by piece by you or your dealer—it comprises 15 electrostatic panels arranged to form a rectangle, with four narrower (8"-wide by 20"-tall) panels facing forward (stacked atop each other and fastened together via brackets top and bottom with heavy-duty L-shaped brackets at the sides of each panel to attach them to the panels on their left and right), four larger (14"-wide and 20"-tall) panels facing 90 degrees to the right, four more large panels facing 90 degrees to the left, and three of the narrower panels facing backward 180 degrees to the rear (Metaxas only uses three here to allow access to the wiring). Since each of the electrostatic panels is constructed of precisely the same materials and in precisely the same way, this four-sided column radiates the signal it is fed omnidirectionally, rather in the way that a trio of KLH 9s arranged in a U- or V-shape configuration radiated quasi-omnidirectionally. Because of its rectangular shape, the Emperor's footprint is no wider than that of the Czar (although it is considerably deeper).

Those of you who read my review of the Czars in our September 2025 issue may want to skip the following paragraphs, as they rehash the way electrostats work and how Kostas' 'stats are constructed. But on the off-chance that you don't follow my equipment reviews with the devotion of a true believer, here goes.

As you may already know, unlike every other kind of speaker, electrostats don't use magnetic fields to generate sound; instead, they rely on electrostatic forces that push or pull objects without touching them. An electrostatic loudspeaker consists of a thin, flat, taut, incredibly lightweight diaphragm, usually a sheet of plastic only microns thick, coated with a conductive material and sandwiched between two electrically conductive grids—called stators—with a small air gap (maintained by spacers) between the diaphragm and the grids. The grids and diaphragm are charged with very high voltages, typically several thousand volts. The stators are connected to the audio system's amplifier through a step-up transformer, which

Specs & Pricing

Frequency response: 25Hz–50kHz (–3dB)
Power requirements: Minimum 20W RMS per channel into 8 ohms
Sensitivity: Greater than 90dB/W/m
Slew rate: Greater than 100V/µs, small and large signal
THD: Less than 0.05% 20Hz–20kHz
IMD (SMPTE): Less than 0.05%
Signal/noise: –120dBV
Sensitivity: 90dB/W/m
Input impedance: 100k ohms
Price: $175,000

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JV's Reference System
Loudspeakers: MBL 101 X-Treme MKII, Magico S5 2024
Linestage preamps: Soulution 727, Audio Research Corporation Reference 10
Phonostage preamps: Soulution 757, DS Audio Grand Master EQ
Power amplifiers: Audio Research Corporation 330M, Soulution 717
Analog source: Clearaudio Master Innovation, Acoustic Signature Invictus Neo/T-10000 Neo
Tape decks: United Home Audio Ultima Apollo, Metaxas & Sins Tourbillon and Papillon
Phono cartridges: DS Audio Grand Master EX, DS Audio Grand Master, Air Tight Opus 1, Ortofon MC A90
Digital sources: Kalista Mantax and DreamPlay XC, MBL C41'
Cables and interconnects: Crystal Cable Art Series da Vinci, Crystal Cable Ultimate Dream

converts the amp's output into a pair of high-voltage signals of equal strength but opposite polarity. As the charge on one stator grows increasingly positive, the charge on the other grows more negative by the same amount. Because like charges repel and opposite charges attract, the positively charged diaphragm between the stators moves forward and back as polarities shift, producing sound.

The earliest commercially available electrostatics used a sheet of Mylar as a diaphragm, coated with a thin layer of electro-conductive graphite powder or printer's ink to retain the high-voltage charge. Lately, says Kostas, almost all electrostatics have been using polyester membranes covered with a fine metallic film normally employed as solar insulation for windows. Unfortunately, both these approaches are prone to hygroscopy—the absorption of moisture by the water-based adhesives that fasten the layer of electro-conductive material to the diaphragm. The Emperor uses a proprietary 6-micron-thick polyethylene terephthalate (PET) membrane sprayed with fine stainless-steel particles, which are glued to the diaphragm with a *solvent-based* adhesive said to be unaffected by humidity.

The Emperor's stators are manufactured from 6N-copper-plated epoxy composite board (PCB). (Metaxas prefers copper to steel as a stator material because of its sonic purity and excellent conductivity.) The stators are then precision-drilled and etched to remove the copper from the edge boundaries of the holes. (Kostas claims that producing stators in this way avoids the typical insulation problem inherent in electrostats that use perforated-steel stators. Uneven coating at the edges of the stators' holes results in insulation build-up, reducing the available gap space between the stators and the diaphragms and thereby decreasing efficiency and low-frequency response.) There are over 40,000 holes in the Emperor's 15 stators, bored to a tolerance of 1 micron, a procedure that takes a day to complete.

In the finishing process, the copper stators are sealed with a 0.25mm-thick coat of polystyrene epoxy. The frames are bead-blasted and then anodized in any color desired. As noted, the copper-plated stators are supported by the anodized-aluminum frames, precision-CNC-machined to a tolerance of 0.1mm. A small radius is also milled into the aluminum frame, creating a fine arc that gives extra rigidity to the stators. The arc also helps Metaxas cope with the conflicting requirements of stator/diaphragm spacing.

In a 'stat, a small gap (1.6mm) between stators and diaphragm is optimal for treble performance, but a larger gap (3.0mm) is necessary to accommodate the longer excursions of the diaphragms in the bass. By using special ultra-precision CNC machining and automotive-grade double-sided tape and relying on the frame's arc to keep the stators and diaphragm closer together in the vertical middle of the panels (which acts as the treble/midrange transducer) and farther apart at its outer edges (which act as woofers), Metaxas is able to bake his (electrostatic) cake and eat it, too.

As with the Czars, the Emperor's frames are bolted together using CNC-machined aluminum brackets and electrically connected with PCB "bridges." The combination of epoxy stator, special acrylic tapes, and CNC'd aluminum frames is claimed to cancel any ringing.

Each Emperor has its own dual-transformer, designed to allow bi-wiring or bi-amping, with one input and transformer primarily handling mid/treble frequencies (sent to the narrower front and back panels) and the other primarily mid/low frequencies (sent to the wider panels at each side). Although I tried bi-amping with different brands of high-quality monoblocks, it soon became apparent that this kind of setup is best implemented with four of the same amplifiers—otherwise, you may end up with a voicing and efficiency mismatch. Most of my listening was done with a single pair of ARC Ref 330M monoblocks, using short audiophile-grade cables to "bridge" each of the

transformer's mid and low inputs.

So, what does an omnidirectional electrostat sound like? Well, consider Frank Sinatra's voice on his classic *In The Wee Small Hours* album (recently reissued by Blue Note in its Tone Poets Series, produced by Joe Harley and mastered by Kevin Gray of Cohearent Audio). Often considered the first "concept" album, from its lonesome blue cover to its playlist of forlorn ballads (the so-called "Ava Songs," named for Ava Gardner, who had left her marriage to Sinatra in 1953) it is a litany of heartbreak, albeit with a touch of hope at its close. The album, which stayed high on the *Billboard* Top Ten for 18 weeks (those were the days, my friends), is widely acknowledged to be a masterpiece.

As every Sinatra fan knows, Ol' Blue Eyes' voice had matured by the time he recorded this album in 1955. But it isn't the darkening of timbre that matters most. It is the change in the expressiveness with which he sings that is new and memorable. Though Sinatra nurtured the image of a tough guy throughout his career, the vulnerability and heartache he freely chose to show in his heartfelt phrasing and intonation not only make the Ava Songs more genuinely affective; for men (and women) of the war generation, they also challenge the code of machismo. Tough guys may not dance, but they can hurt without hiding that hurt.

It has long been recognized that Sinatra's "technical imperfections" (to quote from *Wikipedia*) are also there. Whether owing to the inherent brightness of the U 47 microphone or the small confines of the Hollywood's KHJ Studio C (which was intended for modest ensembles rather than the orchestral forces that arranger Nelson Riddle assembled), there are occasional mic preamp overloads on vocal fortissimos, and Sinatra (who took the art of singing very seriously) occasionally lands a little off-key, but (as *Wikipedia* also notes) it matters not because of the newfound sincerity and vulnerability of his delivery.

A great speaker should clearly show you all these things about Sinatra's performance. And an electrostat like the CLS would do so with near-matchless detail. What it wouldn't do—and what the Emperor will—is supply that third dimension, that depth and roundedness of image that makes Sinatra sound less like a flat etched spot in front of an orchestra and more like a flesh-and-blood human being. The Emperor literally embodies Sinatra, allowing us to hear the soon-to-be-characteristic way he uses chest, throat, and palate to add emotional nuance to his delivery by, well, giving us chest, throat, and palate as distinctly audible parts of his instrument.

I attribute this three-dimensionality to the Emperor's omnidirectional dispersion, whereby broadband room reflections serve to inflate the soundstage and the vocal and instrumental images within it. No, the Emperor doesn't fully "take possession" of the listening space the way MBL 101 X-Treme MKIIs do. On a mono recording like *In The Wee Small Hours*, they have better-than-adequate spread, but they don't erase the room. However, they do do something that the MBLs don't. Perhaps because of the lightness of their bass and power range (the polar opposite of the mighty X-Tremes with their dual stacks of twelve 12" woofers), they have a midband neutrality that extends beyond the absence of tonal coloration to a kind of free-standing presence. Sinatra and Riddle's assemblage are just there without any sense of being projected from a box or having any boxiness clinging to their sound, and as noted, they are there in three dimensions. This boxless openness (though not the three-dimensionality) is characteristic of line-source speakers, be they electrostatic, ribbon, or planar. And once experienced, it rather poisons the well when it comes to listening to cones in an enclosure.

What isn't there with the Emperor (or the Czar) is the bottom end. At least, it isn't there with adequate power. With some recordings this bass shyness actually works to the album's advantage. For instance, on something like Holly Cole's Tom Waits tribute album, *Temptation*, David Piltch's bass, which generally sounds grotesquely overblown, seems as if it has been taking Ozempic. Through the Emperor, it is there (in three dimensions) with far more realistic size and timbre and with a CLS-like resolution that makes Piltch's performance style, fingered or plucked, legato or pizzicato, much, much easier to hear.

But such successes are exceptions. With something like Eric Dolphy's alto sax and Booker Little's trumpet on their great, highly dissonant, very Ornette-like performance of "The Prophet" (from *Eric Dolphy at the Five Spot* [Acoustic Sounds/Prestige]), both instruments sound as "there" as Piltch's double bass. However, in their lower octaves, Mal Waldron's piano, Richard Davis' bass, and Ed Blackwell's drum kit are thinned down in body and color, not skeletal presences (as they would have been through the CLSes) but neither as fully rich, powerful, and present as the two higher-pitched wind and brass instruments.

Happily, there is an answer to this problem. While I repeatedly tried to mate CLSes with cone subwoofers, all my efforts went for naught. The problem wasn't just that the subs and mains consistently sounded like two different speakers; the subs, even when crossed over very low with steep filtration, robbed the electrostat's of their transparency, resolution, and neutrality—turning them into some sort of hybrid creature, a conestat, without the distinctive sonic character that I'd chosen the CLSes for in the first place.

Enter the JL Audio e110, a compact subwoofer with a 10" driver, a built-in analog amplifier capable of 1200W in short bursts, a 24dB/octave crossover, a rotary phase control (0–280°), a polarity switch, and a rotary volume control. I reviewed this little number over a decade ago, and now priced at $2400, it is still available on the market.

Why did I pick this tiny sub rather than something larger? Precisely because of its diminutive size and fast 10" cone. I didn't want something big, obstructive, and overwhelming in my smallish digs. And with 'stats, I didn't want a "slower," potentially boomier, 12" or 15" driver in a huge, noisy box. Since I had successfully mated the e110 with a superb two-way standmount many years back (a first), I figured a pair of them might do the same trick with the Emperors.

Of course, after long experience with the CLSes (and

various Maggies), I didn't really think the combo would work. But with a little help from my pal Andre Jennings, who tweaked the crossover, it did. I attribute this unexpected success to the Emperors' omni dispersion, which mates with the sub's inherent omni dispersion more seamlessly and far less destructively than the narrower, more directional dispersion of a line-source like the CLS.

Yeah, with an electrostat, adding a cone, even a small one in a small, quiet box, still comes at a cost. But to my ear (and believe me, I'm critical about this), the trade-off is negligible. Indeed, with the door to my room closed (so the Emperors "see" walls on all four sides), the e110s made Kostas' 'stats sound as if they'd suddenly filled out several power-range and bass octaves on their own, without any significant losses in lower midrange, midrange, and treble transparency, resolution, neutrality, and dimensionality. The Emperors still sounded like the Emperors but with more natural bass extension and power. No, they still didn't hit you in the gut like cones can. But on album after album, from classical warhorses like Stokowski's *Rhapsodies* to intimate acoustic rock duos like Mary McAvoy and Nicole Gauthier's wonderful cover of Springsteen's "Dancing in the Dark," they sounded unusually lifelike.

I can't in all honesty conclude this review without mentioning the problem I experienced with a couple of the Emperor's electrostatic panels. While no reliability issues cropped up with the less complex Czars, two of the Emperor's 15 electrostatic panels began arcing noisily soon after installation. The fix was simple enough. Kostas' U.S. distributor, Jeff Garshon, came down with replacement panels, and all has been well since. I don't know why this problem occurred, although it wasn't as annoying as the failures I experienced with the CLSes, the entire panels of which (on both sides) repeatedly stopped making sound and had to be replaced due to hygroscopy, or the treble panels on Quad 57s, which blew up with the regularity of clockwork. Let's face it: Electrostats can be touchy.

That said, do I recommend the Emperors (with the e110 tweak)? Yes, enthusiastically. They are very nearly ideal for absolute-sound and fidelity-to-source listeners (like me). For musicality-first listeners, who tend to like their rock 'n' roll and like it LOUD, no, I don't recommend the Emperors or any other full-range electrostat or dipole. These speakers are simply remarkable on classical music, large-scale or small, on jazz, and on acoustic rock, blues, folk, what-have-you. On heavy metal, electronica, rap, or hip-hop, there are better options. tas

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Thank you, Jonathan, for your very kind review of my Emperor speaker. For those seeking more bass, we also offer an electrostatic subwoofer identical to the Emperor using only the wider Emperor panels with dedicated "bass-only" transformers. I grew up with QUAD 57s and MartinLogan CLSes, so it's a compliment to be favorably compared. The Emperor is only made possible because of current technologies—3D CAD, 3D CNC, and modelling [COMSOL]. I'm particularly pleased that you understood very clearly the incredible three-dimensionality that the omnidirectional construction gives compared to single-plane planar speakers (traditional ribbons and electrostatics). It is hard to go back to a flat panel afterwards.

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