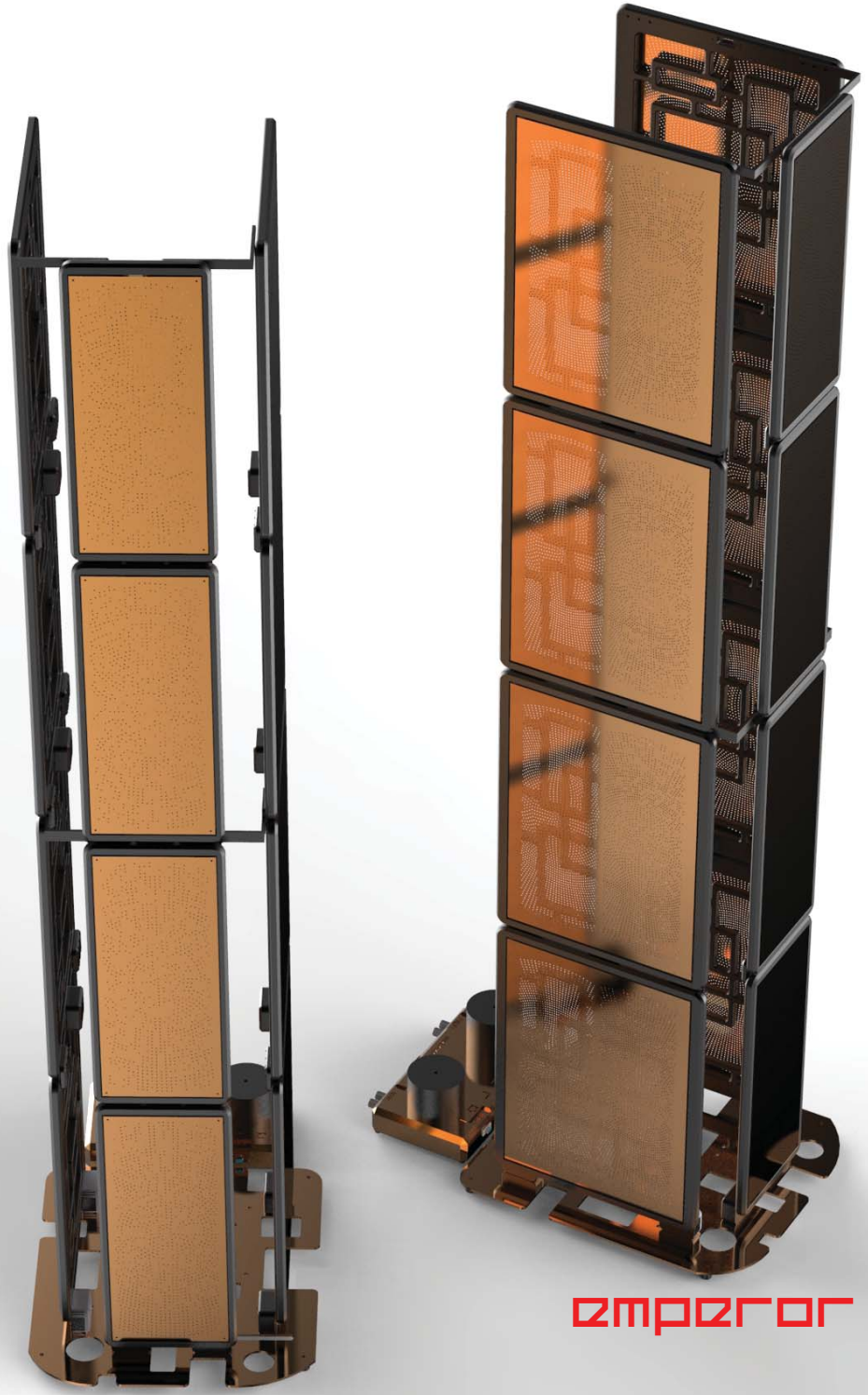
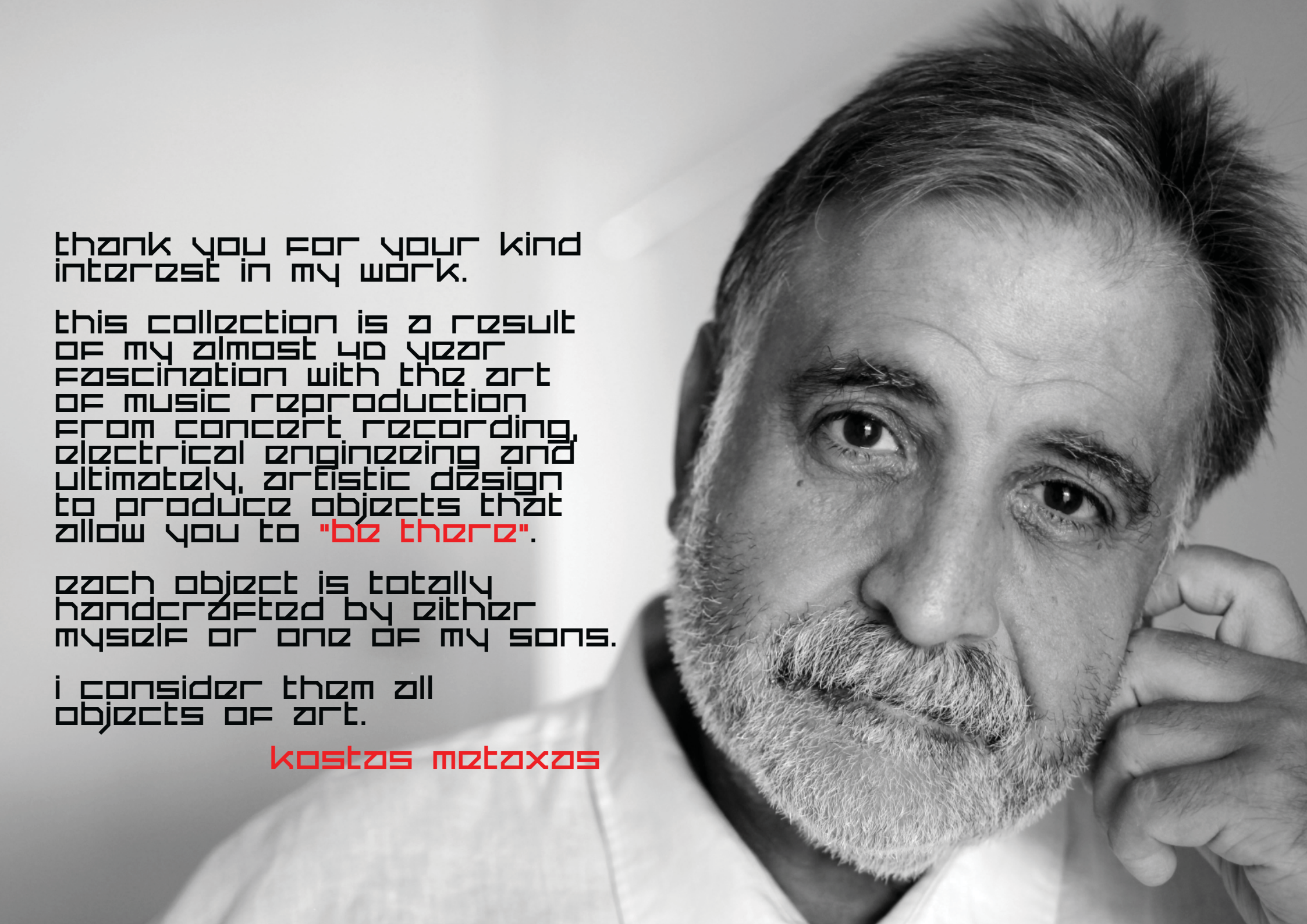


metaxas & sins

since 1981

emperor electrostatic speaker



thank you for your kind interest in my work.

this collection is a result of my almost 40 year fascination with the art of music reproduction from concert recording, electrical engineering and ultimately, artistic design to produce objects that allow you to "be there".

each object is totally handcrafted by either myself or one of my sons.

i consider them all objects of art.

kostas metaxas

K-DESIGN AWARD'18

May 30, 2018

METAXAS

AWARD **WINNER**
TITLE **METAXAS STATEMENT**
COUNTRY **NETHERLANDS**
AFFILIATION **METAXAS & SINS**

This certificate of award is presented in recognition of submission of works with creativity and efforts to the K-DESIGN AWARD 2018.

PROFESSOR **KEN NAH**
PROFESSOR **ANDY LAW**
PROFESSOR **SHINGO ANDO**
PROFESSOR **SUNAH KIM**

2018 WINNERS
PRODUCT DESIGN

Presented to
Metaxas & Sins Bv

Design
Metaxas & Sins Statement
Amsterdam, Netherlands

Client
Metaxas & Sins

Lead Designer
Kostas Metaxas

Metaxas & Sins Statement has been identified as one of the leading product design by the professional jury of APDC*IDA. Kostas Metaxas is a winner of the APDC*IDA 2018 Design Excellence Awards.

*IDA APDC
Design Excellence Awards

Astrid Hebert
Vice President
International Design Awards (IDA)

Hossein Farmani
President
International Design Awards (IDA)

Jason Wang
Secretary-General
Asia Pacific Design Center (APDC)

GOOD DESIGN

GOOD DESIGN AWARD

2018

The Statement

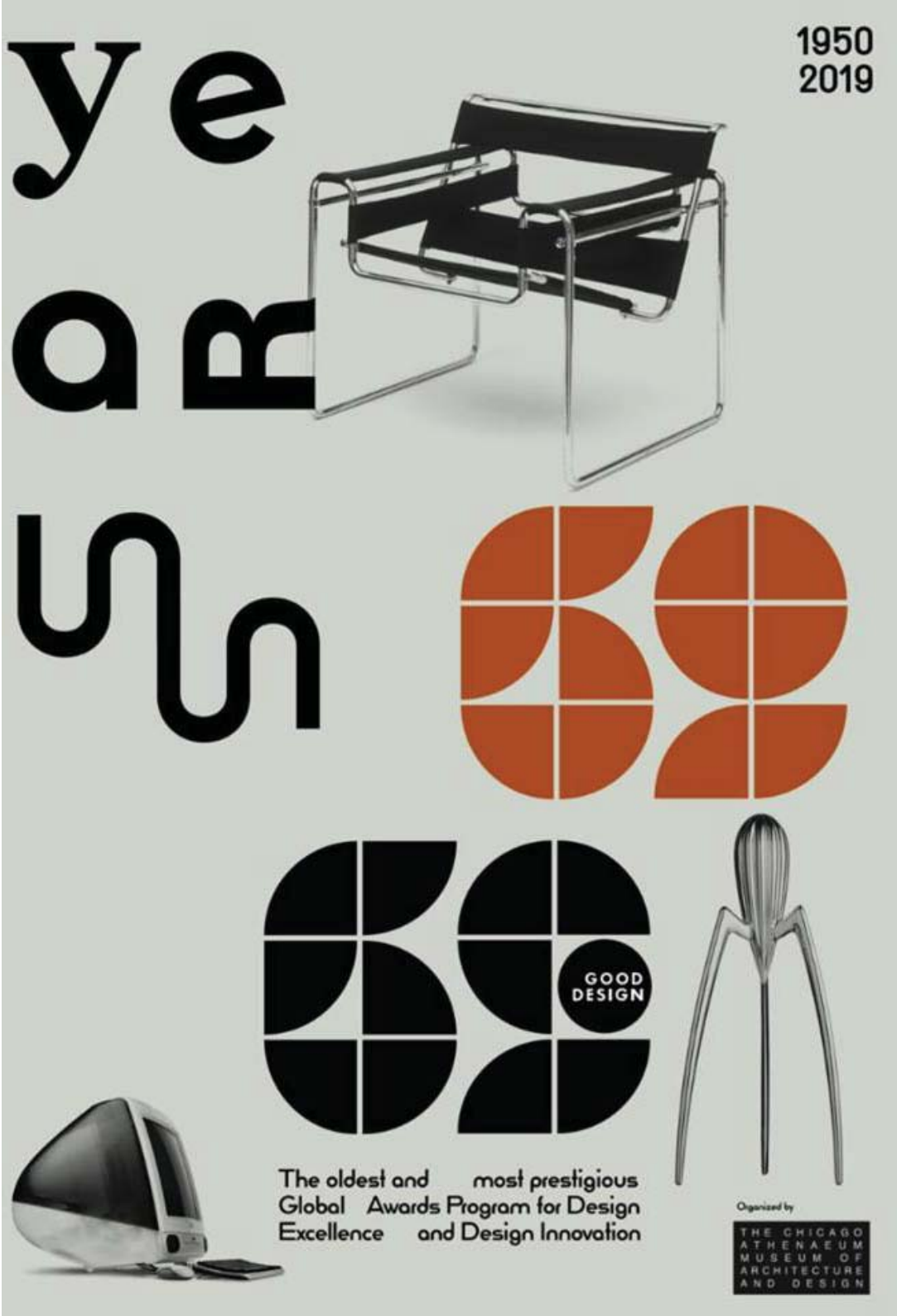
Designed by

Kostas, Andreas and Alessandros Metaxas

Manufacturer

Metaxas & Sins

THE CHICAGO ATHENAEUM
MUSEUM OF ARCHITECTURE AND DESIGN




ASIA DESIGN PRIZE 2019
CERTIFICATE OF APPRECIATION
JURY
KOSTAS METAXAS
FOREMAN OF A JURY
KARIM RASHID
Thank you for your efforts the judge Asia Design Prize 2019.
Officially, This certification certify for your activities as a jury.
29 March 2019, Seoul / Korea
PROFESSOR
HYUNSUN KIM
DIRECTOR
TETSUYA MATSUMOTO
PROFESSOR
BUMKYU KANG
ASIA
DESIG
PRIZE
2019

about

Kostas Metaxas is an articulate and forceful champion of audio without comprise. He is a connoisseur of fine music, a man for whom second best isn't good enough. In September of 1981, Kostas formed the company which bears his name. Known all over the world today simply by its initials, M&S, Metaxas & Sins was founded for several reasons.

The most immediate of these was to begin producing, his first product, the CP-1 preamplifier in commercial quantities. Whilst studying in Heidelberg, West Germany having transferred from the University of Melbourne, Kostas showed several of his prototype amplifiers to an important German Hi Fi Dealer. He was sufficiently impressed with what he heard to give him a little capital in the form of deposits to reserve the finished products. Thus M&S was born. And the rest as the saying goes, is audiophile history.

Back in Australia, new designs flowed from Kostas' workshop. The PP-1, a moving coil preamplifier appeared early in 1982. Reviewed by Klaus Renner in Das Ohr, the German audiophile publication, it was praised as the finest preamplifier available at the time. Accordingly, a flood of orders from the German audiophile who are known to purchase only the number 1 product in its class, firmly established M&S as a manufacturer of only the highest quality audio equipment.

In February 1988, the GERMAN 'Stereoplay' magazine rated the OPULENCE [Opus] PREAMPLIFIER its absolute reference against amplifiers from the US, Japan and Europe.

The OPUS preamplifier is a unique audio product. Apart from its outstanding musicality it combines the state-of-the-art in high-technology with an incredible array of options which would excite a Recording Engineer.

Kostas is also a familiar sight at local jazz and classical concerts with his prized Stellavox tape recorders in tow. Built with the exacting precision of a PATEK watch, these state-of-the-art models are indeed rarities and are normally the exclusive province of the professional recording studio. The recordings Kostas makes using Stellavox serve as reference for the design of future M&S systems.

M&S products embody not simply audio excellence but a stylistic design sense that would not be out of place in the Museum of Modern Art. M&S products are not meant to be hidden away like traditional sound systems. They are meant to be appreciated both stylistically as well as musically. Science approaches art for the sheer love of music and for that M&S make no apology.

Similarly, Kostas is unapologetic about the market he serves. He aims, quite simply, to provide the "finest objects money can buy." And what sort of people are M &S customers? Generally they view audio as a well-deserved indulgence. But no matter what their occupation, their preoccupation is to know and appreciate the difference between better and best , to listen with their heart and ears and blissfully "get lost in the music".

Each amplifier is entirely handmade by the Master and his sons [sins] in a similar manner to the meticulous assembly of historic Bugatti automobiles.

To put it mildly, Metaxas & Sins is unlike any other audio business.

"Flagwaving? Why Not?" wrote Ralph Neill reviewing the MAS PP1 in Australian Hi-Fi in the early eighties. "Australia II proved in a big way that Australian technology can take on the world and win. M&S is doing just the same – on a smaller scale, to be sure, but it's doing it!"

emperor electrostatic speaker

The EMPEROR speaker was designed from its inception to be the finest, reference class, full range electrostatic loudspeaker in the world.

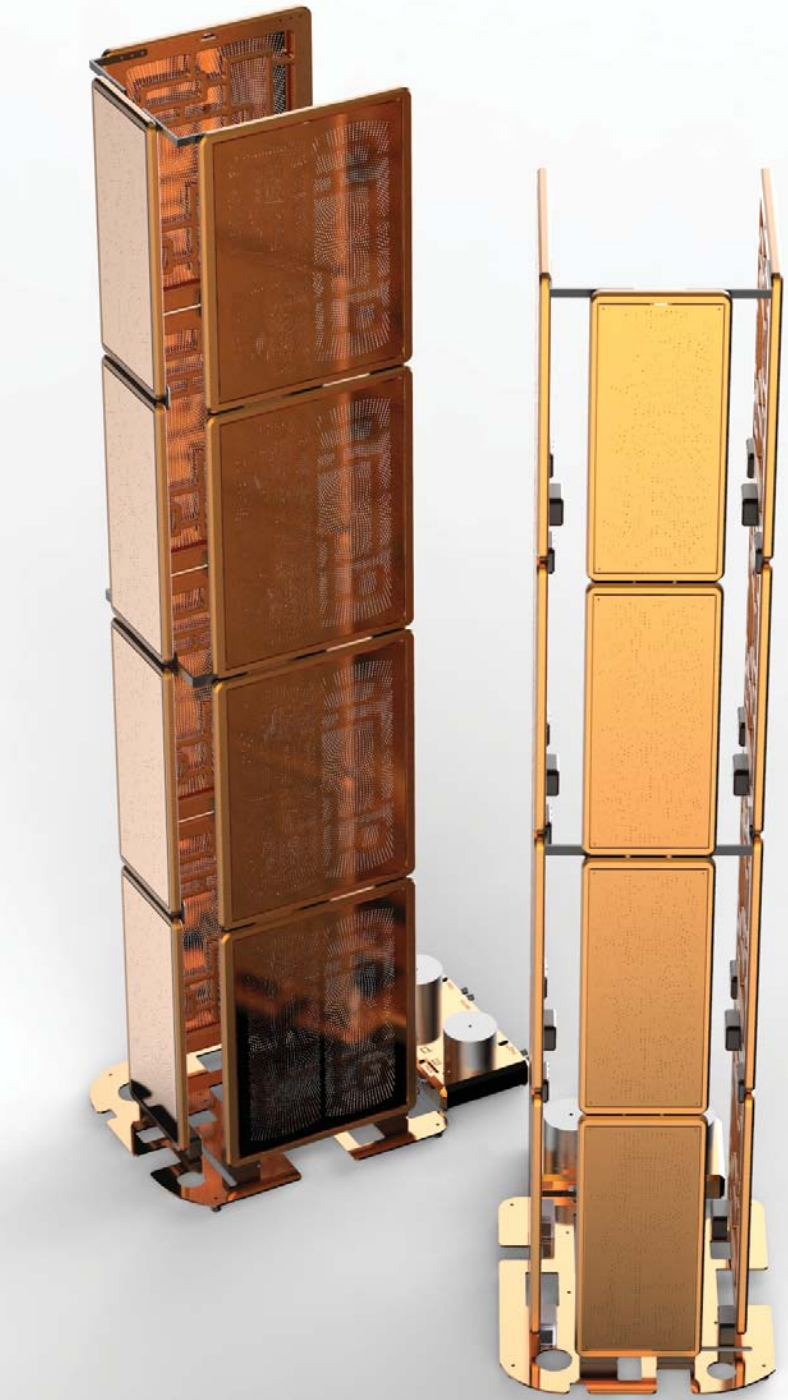
It takes advantage of the improvements in electrostatic technology since Edward Kellogg at General Electric patented his electrostatic loudspeaker in 1929 .
This principle was again taken up by Peter Walker in his Quad ESL in 1957.

1. FUTURE PROOF: The EMPEROR'S modular construction allows for easy future upgrades in panel technology , High Voltage Power Supply technology and audio transformer technology.

2. HIGH EFFICIENCY: THE EMPEROR is the first electrostatic "reference speaker" which can easily be powered by SET amplifiers with as little as 10 watts of power or solid state amplifiers with 50 watts of power.

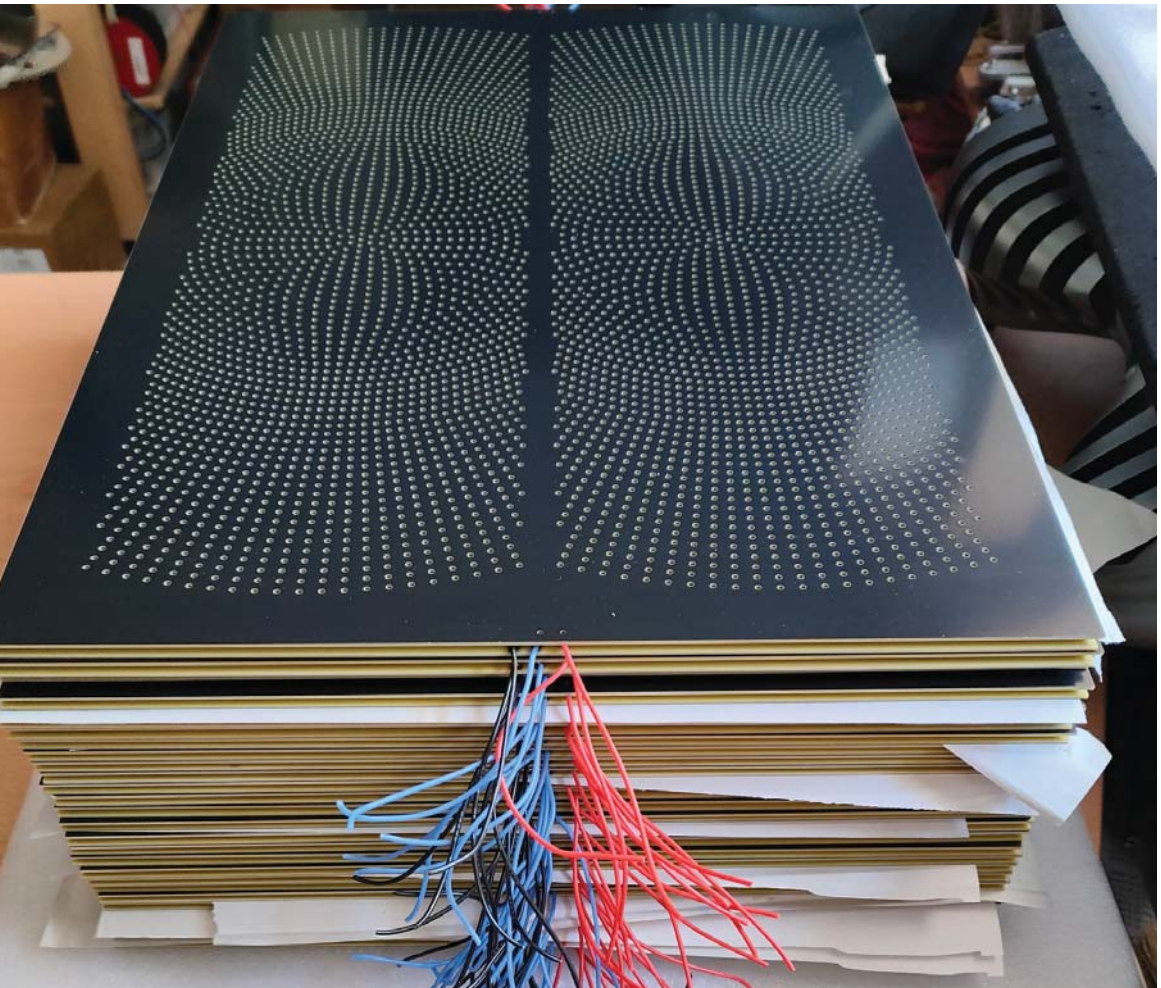
4. FULL RANGE: Unlike other 'reference' speakers which require satellite subwoofer sytems, the EMPEROR is able to reproduce low frequencies (-3dB point 25 Hertz when fully broken in) without any sonic sacrifice. The sound is consistant in quality from 25 Hertz up to 35 kiloHertz because we use the same 6 micron polyester film for 360mm and 240mm[HF] panels.

For even deeper bass response, more than 20 bass panels can be added to virtually create a solid 'wall of electrostatic' bass panels.

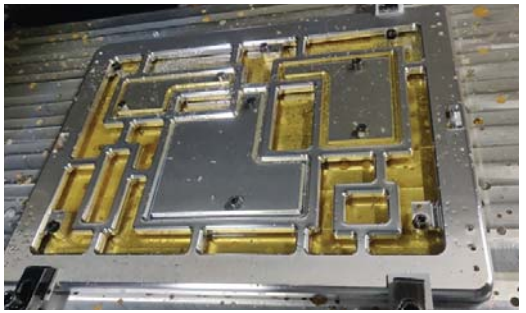


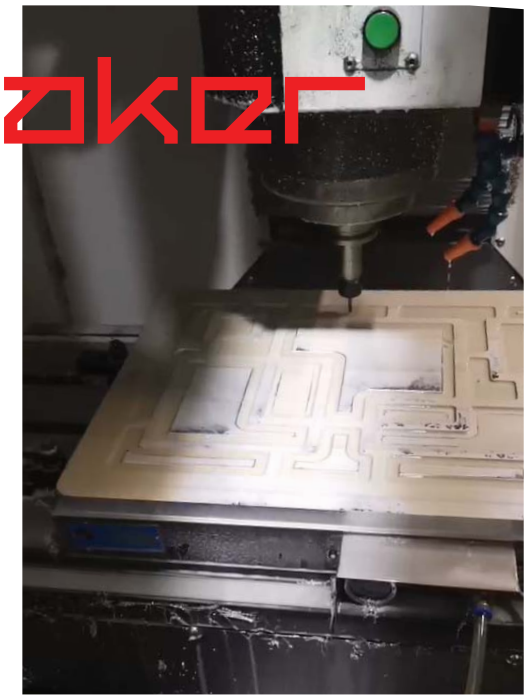
in each emperor speaker

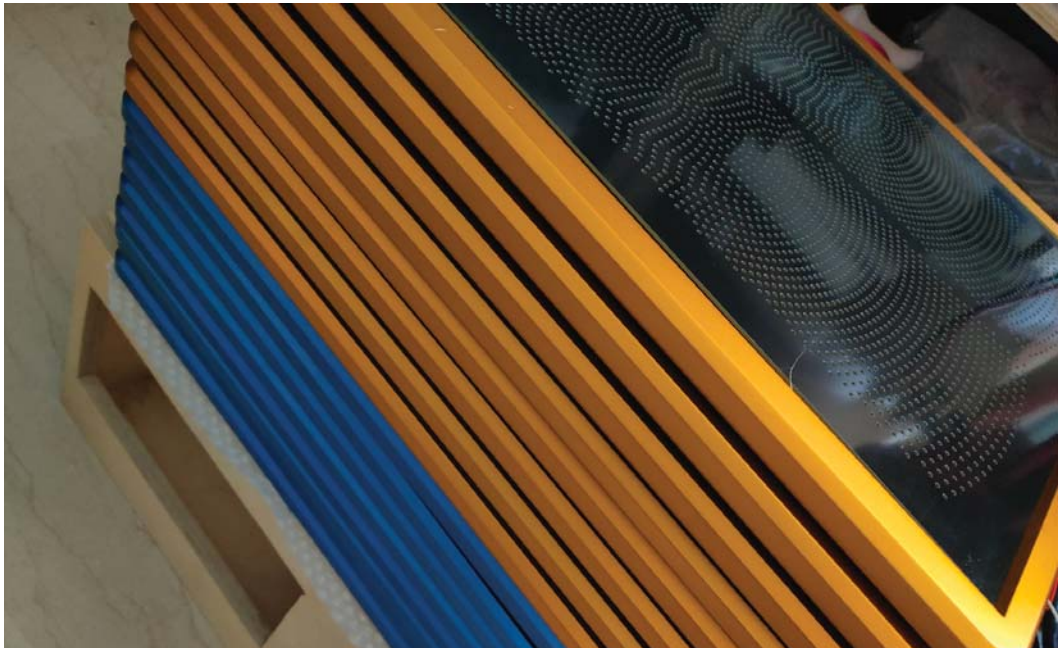
52 drilled pre-pegged PCB
Panels with over 100,000 holes



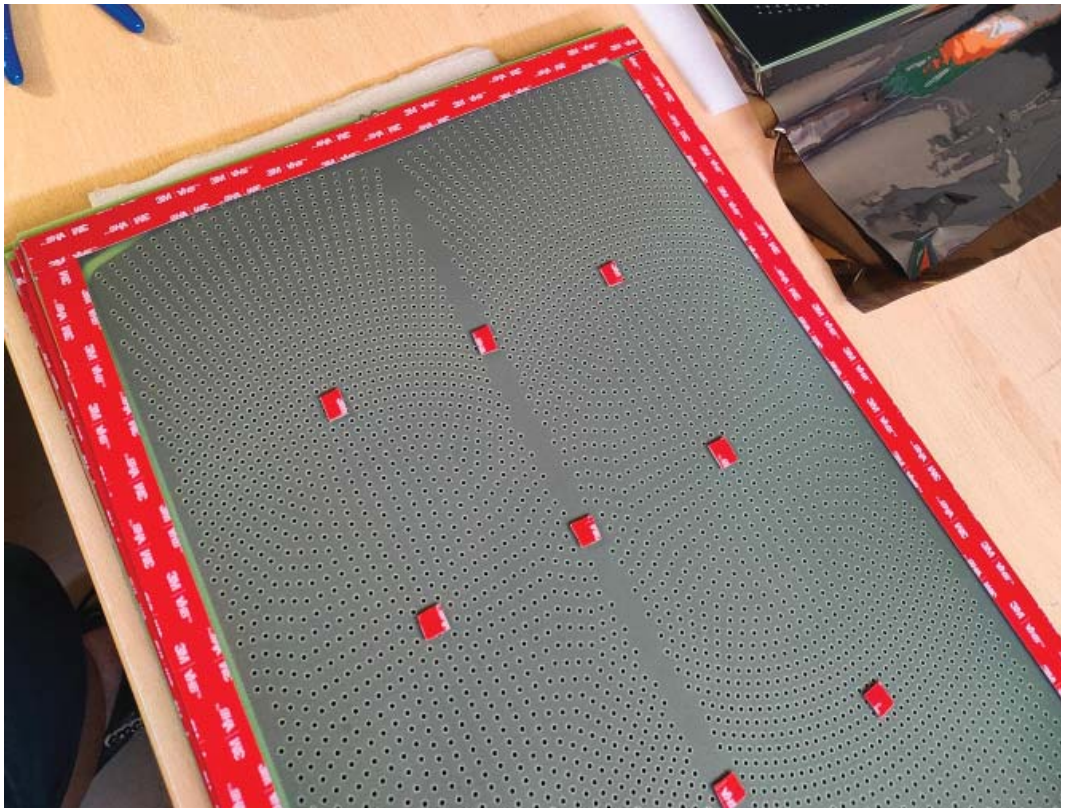
28 CNC Machined
Aluminium Parts





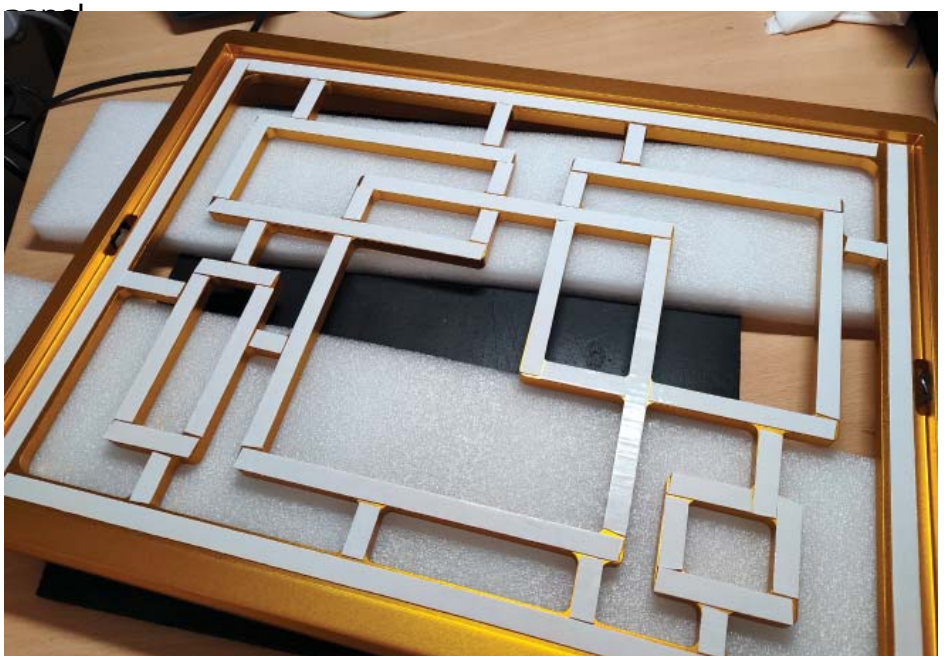


assembling an emperor electrostatic speaker



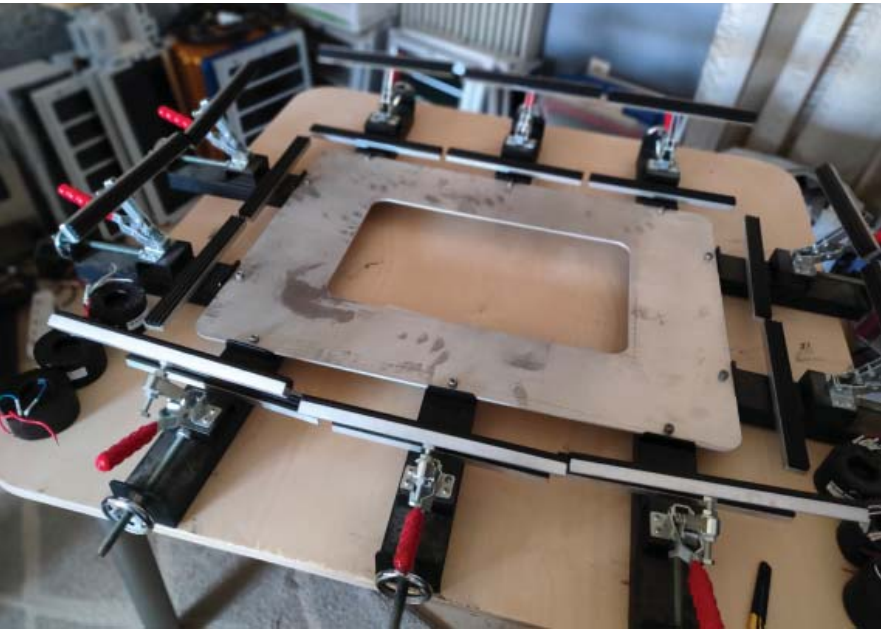
STEP 1

Adding the 3M VHB Automotive-Grade tapes to the stator back



STEP 2

Adding the special tapes to the sculpted frames to receive the stator panels.



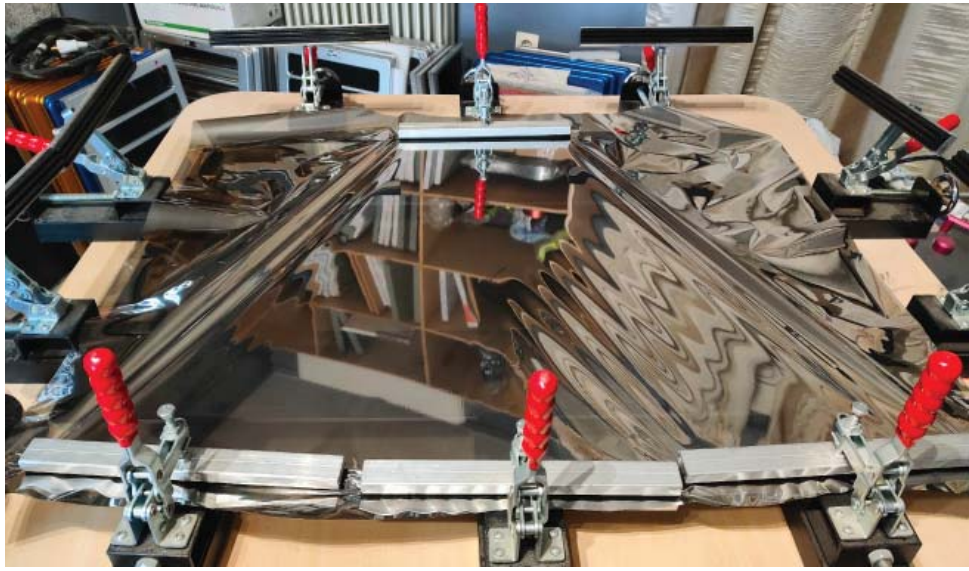
STEP 3

The most critical part of producing an electrostatic speaker is the stretching of the film. This needs to be a certain tightness but also an EXACT consistency. After years of stretching films, we developed our own unique table to yield consistent results.

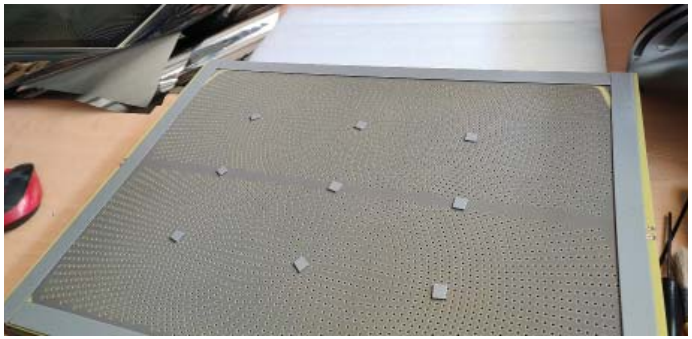
Preparing the proprietory film stretch table to receive the film. The stretching dials need to be in full relaxed position.

STEP 4

Clamping the film.
Stretching the film evenly.



STEP 5



Removing the tape protection layer to reveal the adhesive.

STEP 6

Carefully positioning the stator back panels on the stretched film.

POLYESTER FILM

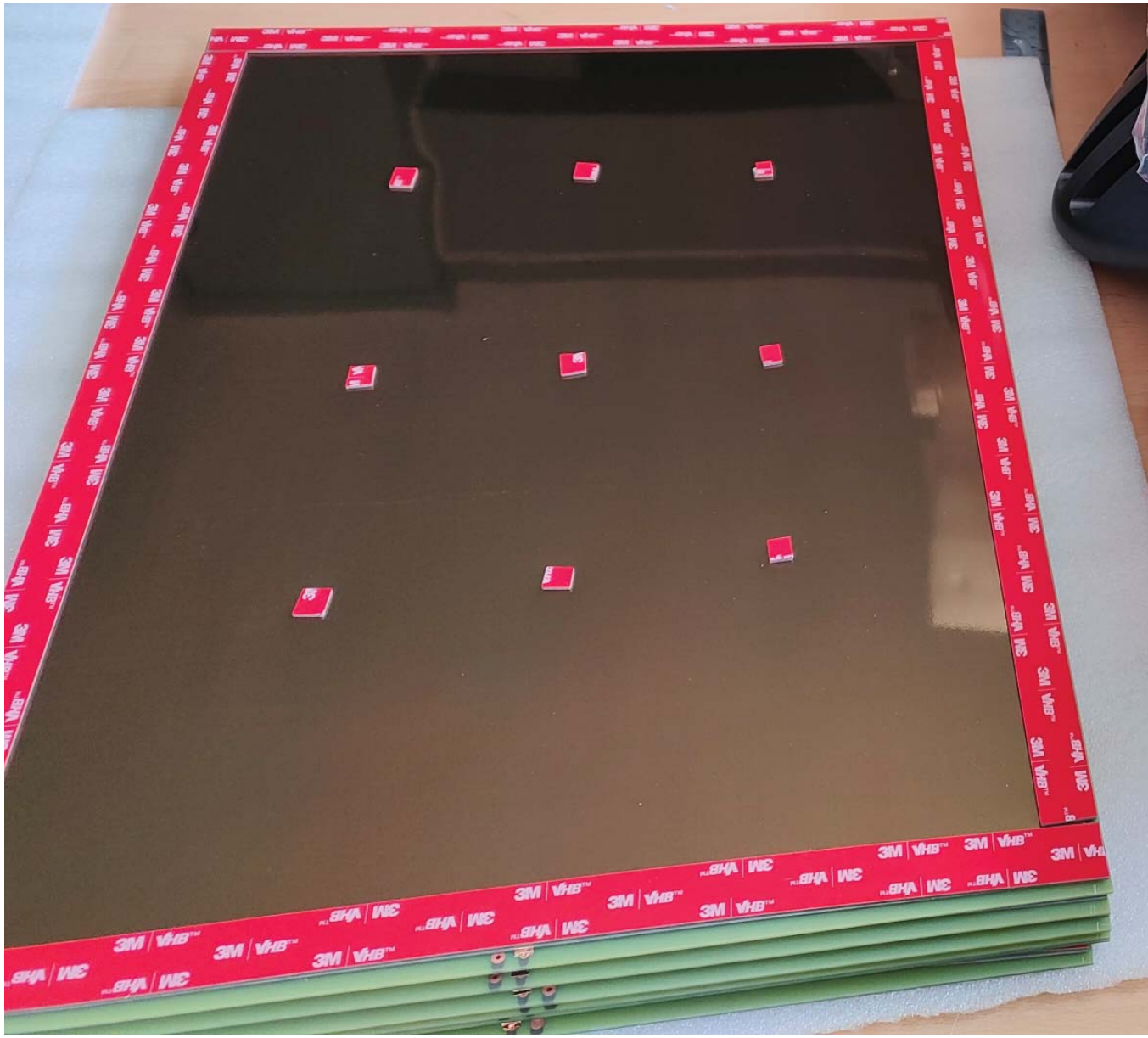
Our Polyester film was sourced in the early 1980s after 5 years of experimentation with various types and grades of films available at the time.
Typical electrostatic speakers used mylar with a rubbed on graphite powder to retain the high voltage charge (QUAD).
This was replaced with conductive printer's ink (original MARTIN LOGAN CLS).

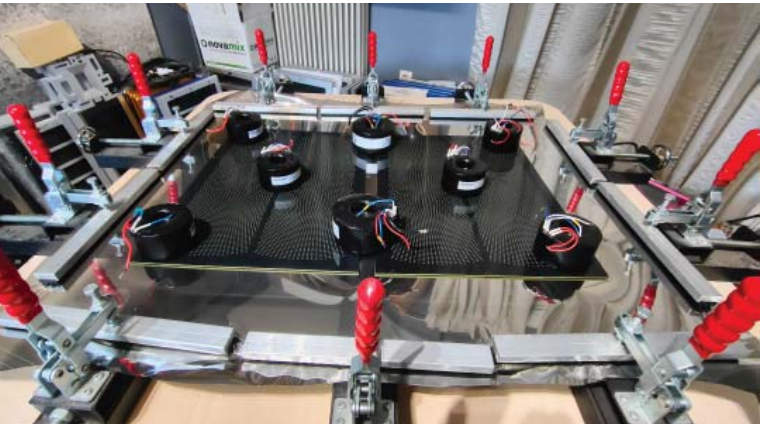
Most current electrostatics use polyester which is covered with a fine metallic film (normally used as solar insulation for windows). All these methods are still prone to absorbing moisture because the conductive particles are glued with water base adhesives to the surface.

For over 40 years, the EMPEROR uses the same proprietory film which uses a fine stainless steel spray of particles using a solvent based adhesive which is not affected by humidity. If it is forced to arc, a small area of the film coating is sacrificed to avoid any further damage . Even with 90% of the panel sacrificed, it would still function with a minor loss of efficiency.

The fact that we still use rolls of the same film from 45 years ago means it will not deteriorate over time.

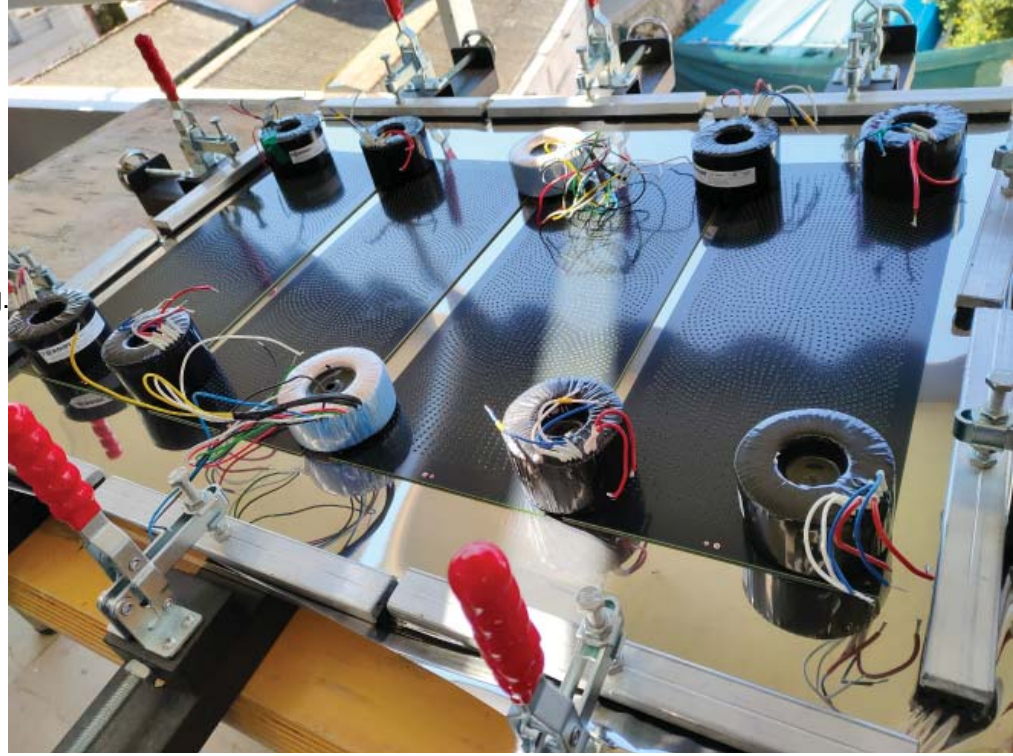
A special high conductivity adhesive is used to connect the copper strip to the polyester film coating to allow the best long term electrical contact which cannot be dislodged over time.

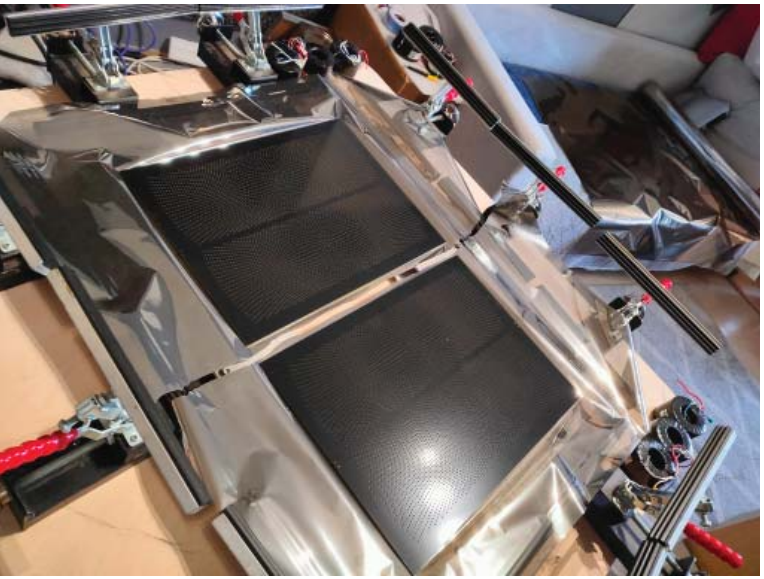




STEP 7

Add weights to the corners and centre of the stators to ensure good adhesive bonding. Leave for 30 minutes.





STEP 8

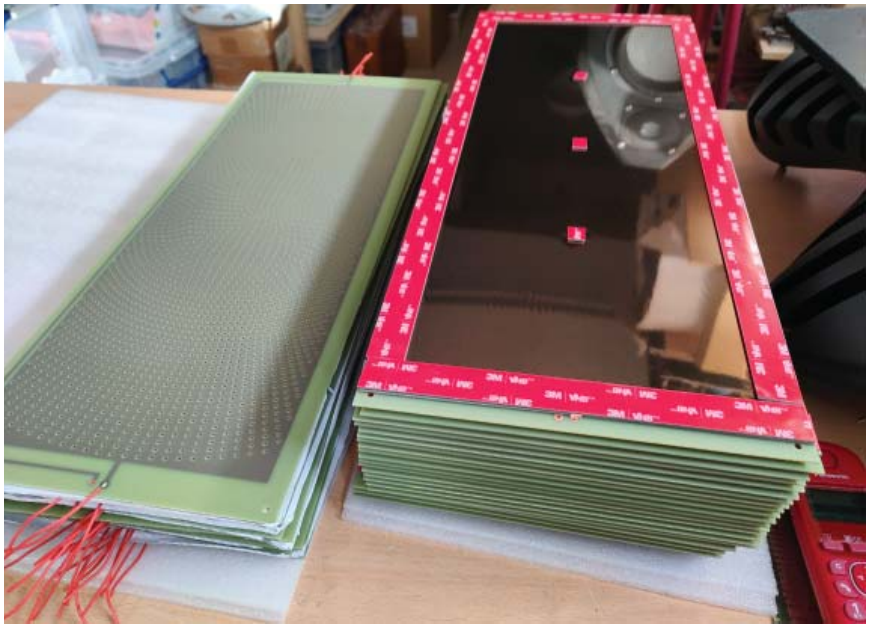
Cut the film between stators and loosen the film clamps to remove the panels.

STEP 9

Trim the edges of the film.

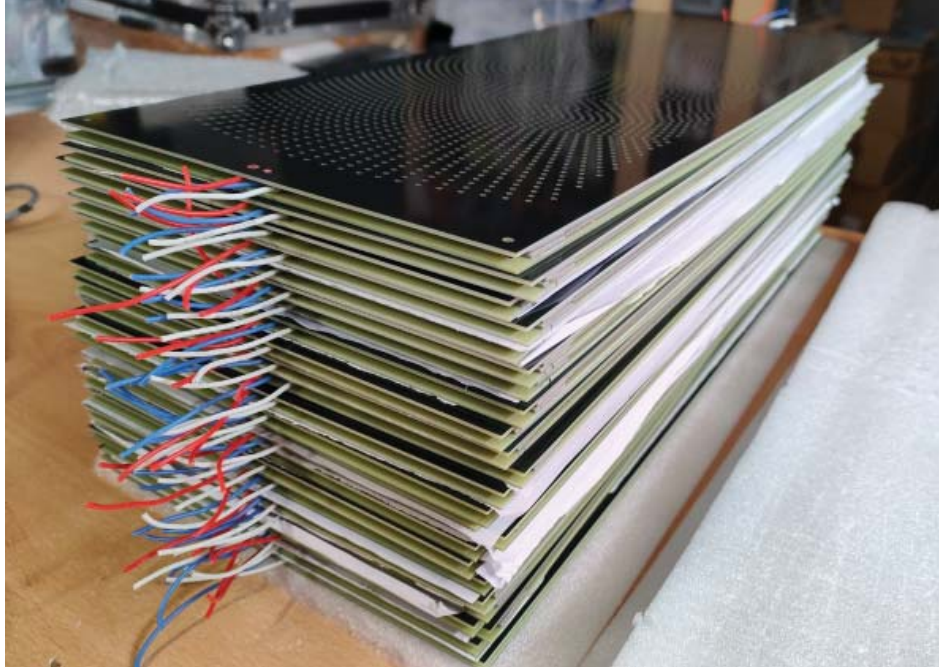
STEP 10

Solder the HV wires to the stators rear and front panels.



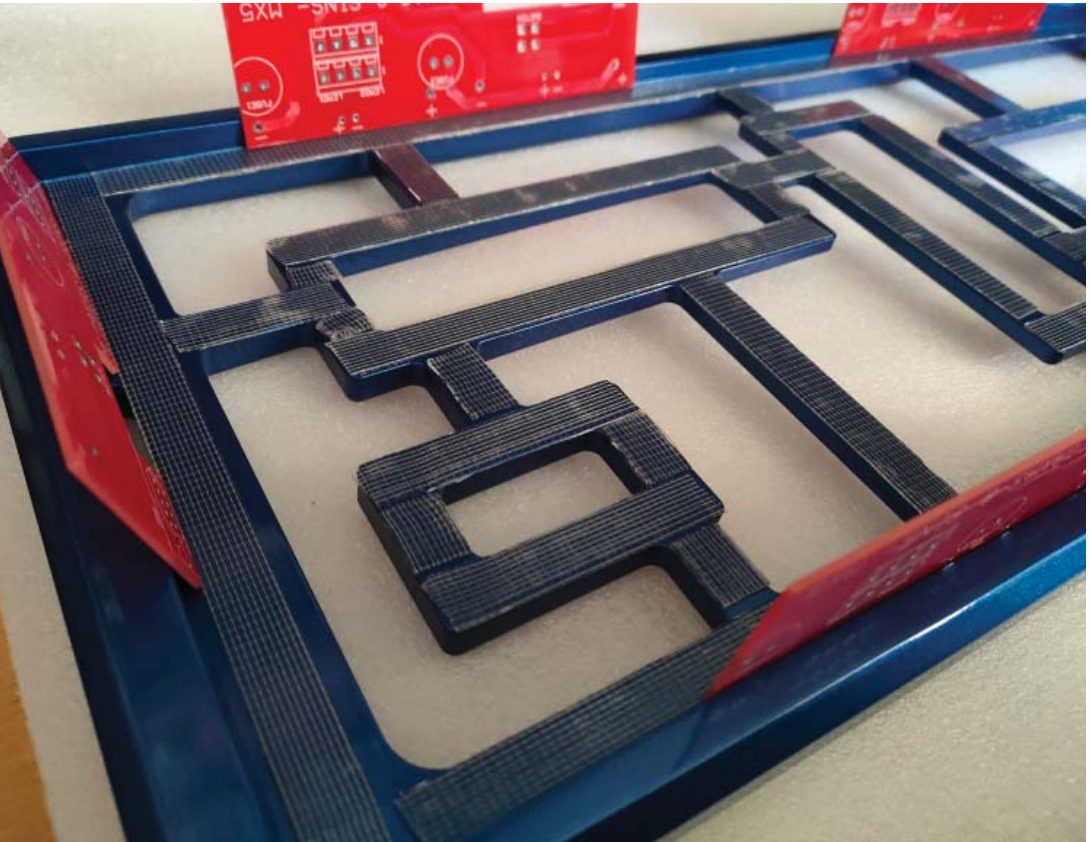
STEP 11

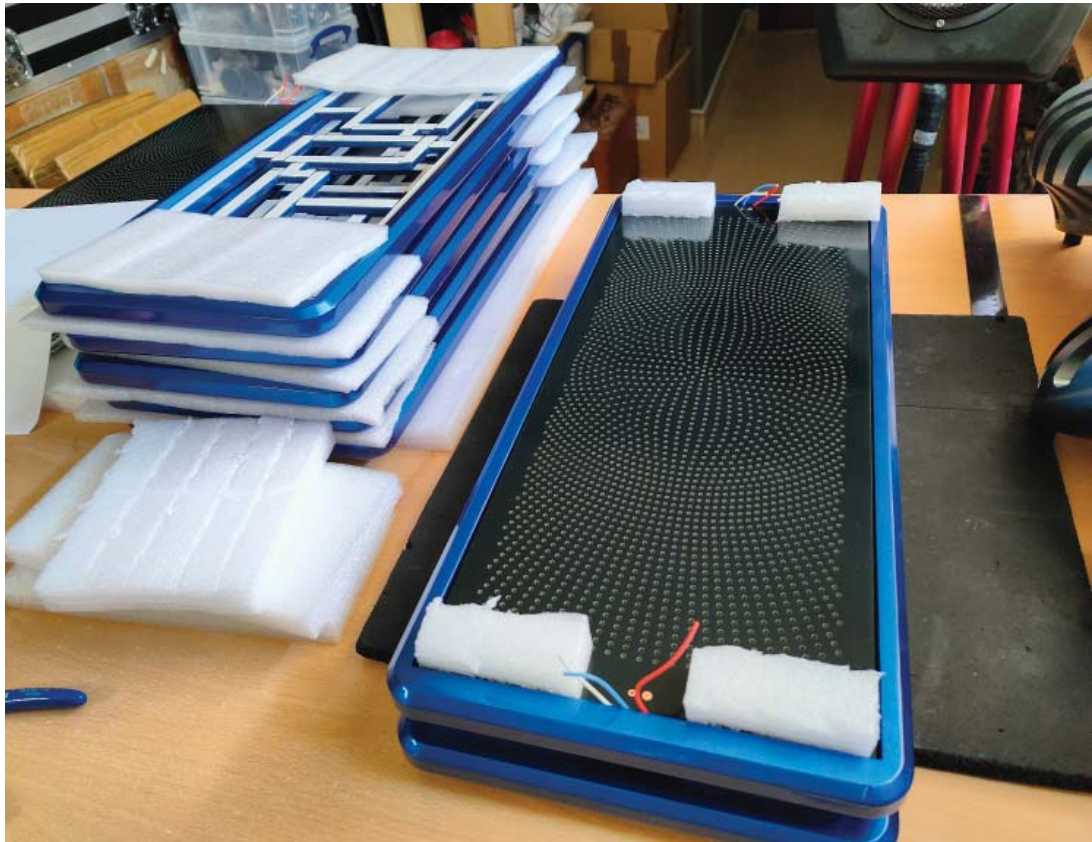
Add another layer of 3M VHB tapes to adhere to the front stator panel.
After 24 hours under weights, the stator “Sandwiches” are now ready to be inserted into their frames. Color-coding - RED=front, BLUE=HV, WHITE/BLACK=rear stator.

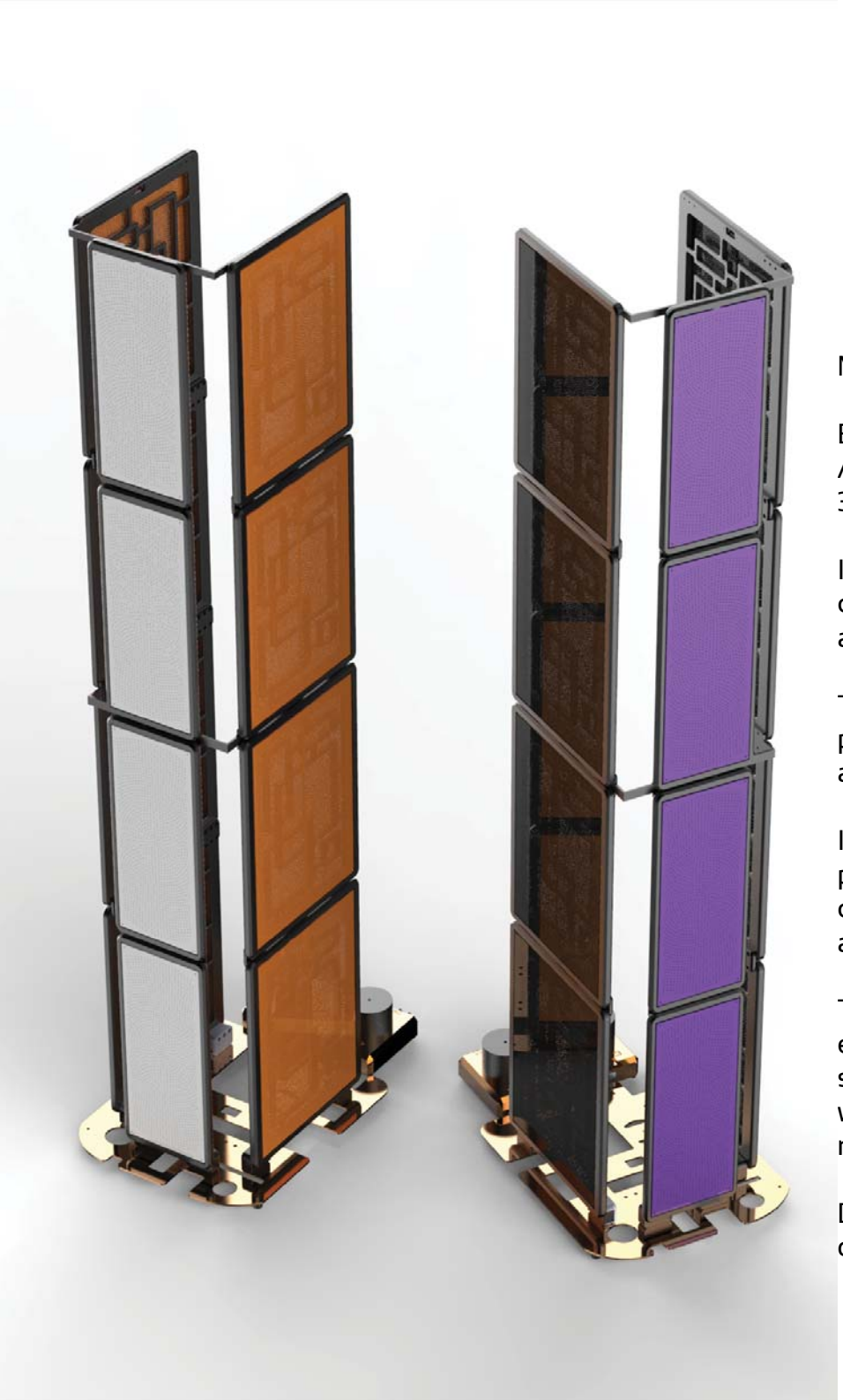


STEP 12

The double-sided tape covers are removed on the frames to reveal their adhesive and using 6 PCB spacers, stator “sandwiches” are inserted into their frames.







MODULAR ELECTROSTATIC PANELS

Each Emperor speaker is made up of a 12 precision 15mm thick CNC machined 6061 Aluminium frames - Four narrow , central 200mm [8" Mid/treble] and Eight wide 360mm [14" full range] bolted on either side of the 200mm frames.

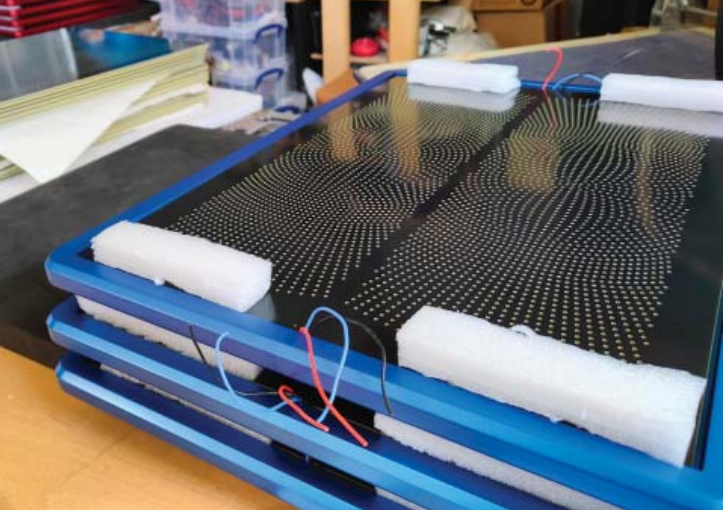
Inserted into these stiff, non-flexing frames are stators screens manufactured from copper-plated (6N) epoxy composite board [PCB] laminate which is precision drilled and etched to remove the copper from the edge boundaries of the holes.

There are over 10,000 holes drilled perfectly, to within 1 micron. The panels are then polystyrene 0.25mm "prepeg" [Milspec] coated to 100% seal the copper and prevent arcing.

It is only by producing the stators in this way that we avoid the typical insulation problem inherent in electrostatics using perforated metal [The uneven insulation coating at the hole edges which requires more insulation build up, reducing the available gap spacing].

The frames are bolted together using CNC machined aluminium brackets and electrically connected vertically with PCB "bridges" . The combination of epoxy stator, special acrylic tapes and CNC aluminium frames cancel any ringing - that would otherwise be present. If you simply tap the frames you will hear a dull thud rather than a 'ring'.

Both aluminium frames and epoxy composite stators can be offered in a wide range of finishes.

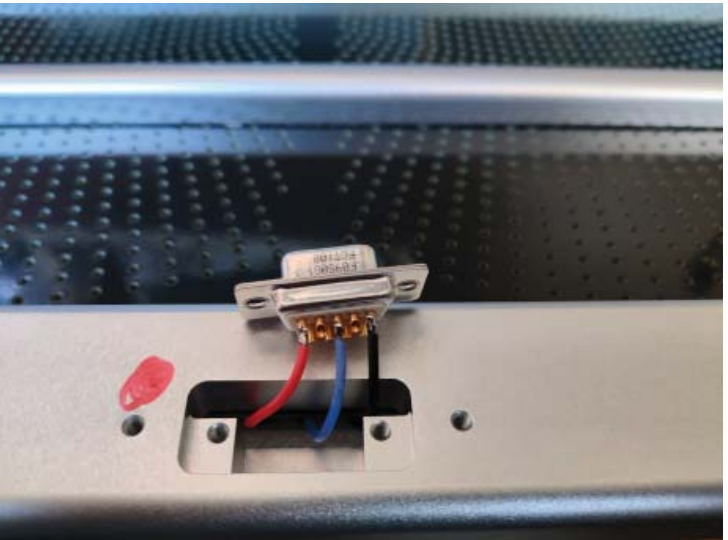


STEP 13

Once the stators are inserted, the 3 connecting wires on either end need to be carefully pushed through to the underside.

STEP 14

The 3 wires are carefully soldered to the 9 pin D-connector.

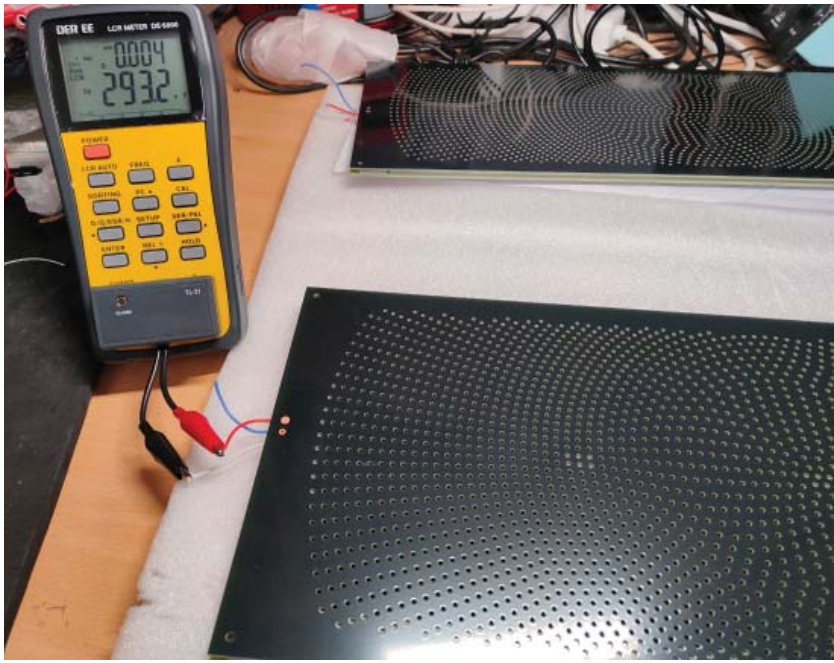


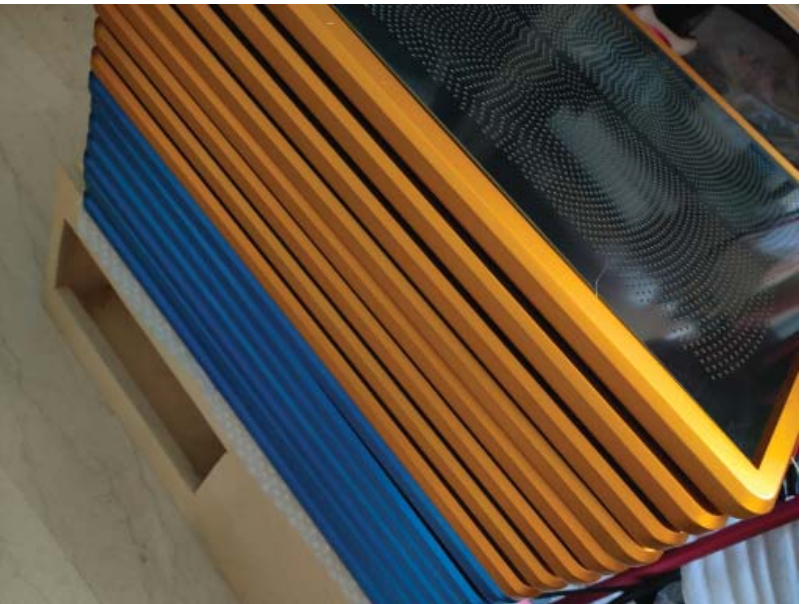
STEP 15

The Wires are now ready for insulative wrapping and the D-Connector bolted to the frames. Note that a RED mark shows the polarity of the panel.

STEP 16

The final test before listening is measuring the capacitance of the panels [between top and bottom stators] to check for continuity and consistency. The 360mm panels normally measure around 520pf and 200mm panels around 300pF.





STEP 17

The final step before assembling the speaker for listening tests is to stack the panels with foam padding between the panels to make sure the double sided tapes are firmly adhering.

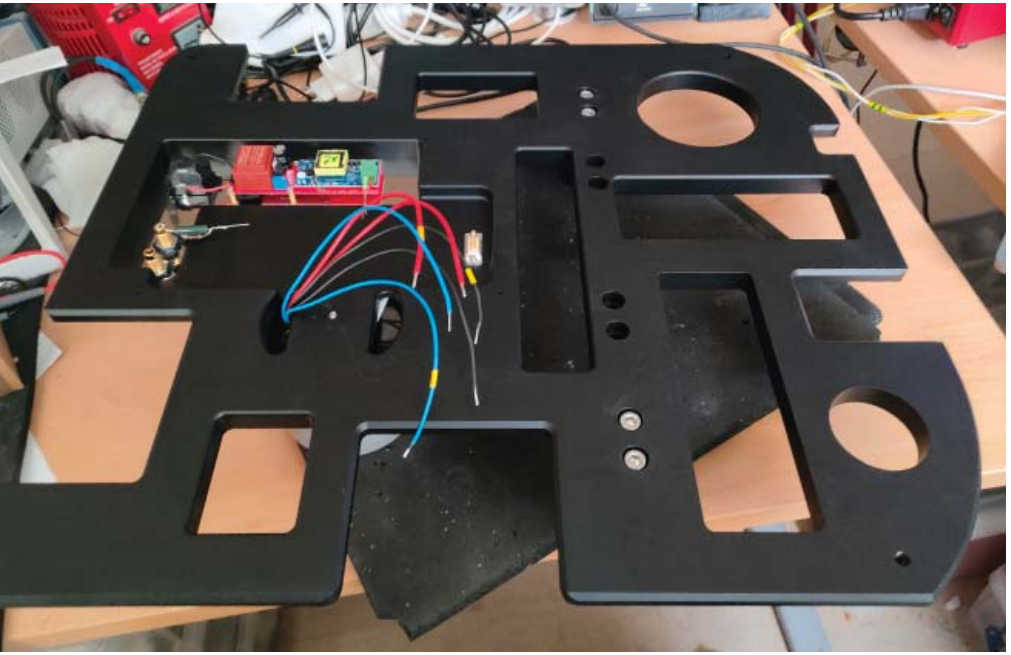
AUDIO TRANSFORMERS

The art of winding Audio Transformers for electrostatic speakers is missing from today's mainstream transformer manufacturers. The transformer used in the EMPEROR are very special proprietory devices, totally handwound ,designed and manufactured in consultation with leading European manufacturers.

There are essentially three major factors which are interrelated when designing audio transformers. Unfortunately, all are conflicting and therefore require compromise. For example, to increase the bass response one must add more windings, which increases the capacitance and inductance and hence decreases the treble response.

After coming up with the best compromise for impedance, capacitance, inductance and gain, we set about experimenting with various transformer metals to increase the power transfer before saturation. By using very expensive low loss metal in our transformer toroidal core, we are able to minimise the typical dynamic compression of electrostatics. Because of this, the EMPEROR'S speed and attack is reminiscent of horn type studio loudspeakers.

We use 5 strands of Litzen wire for our Primary and 3 strands of Litzen wire for our Secondary windings. The inductance is minimised by our 'heroic' use of 18 sections of windings to cancel out any stray inductance. Stray capacitance and voltage breakdown is avoided by using 'double-insulated' polyurethane coatings on OFC copper. This enables us to produce a transformer which is PHASE PERFECT to well over 20KHz into a capacitive load of over 2000pF. Without the load, the frequency response is flat to beyond 200KHz.

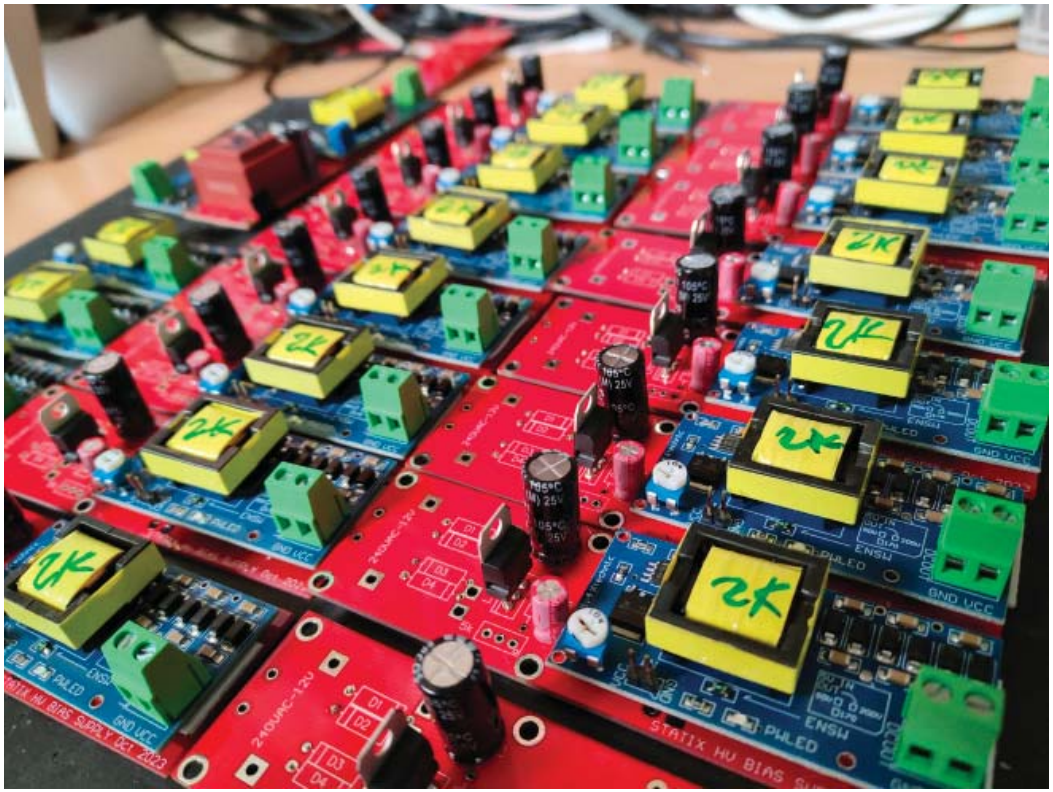


STEP 18

Shown here is the foot of the Czar speaker. It needs to be wired up - transformer connections to the speaker terminals and secondary connections to the High Voltage Output.

The Mains Powered HV [2.3K] charge for the film is also installed and tested

With the EMPEROR, this base is only a support for all 12 panels. The Transformers and HV supply is in a separate enclosure [shown below]



STEP 18

Latest in high voltage technology comprising a low voltage regulator a flyback transformer and a switch mode power supply to generate the 2.3K “ultra-low ripple” voltages

ASSEMBLY

All METAXAS Electrostatics are assembled from the basic 200mm X 500mm [PRINZ] or 360mm X 500mm [CZAR] wide panels. The assembly of these 2 speakers and EMPEROR is identical.

Each CZAR/PRINZ is shipped in 2 cartons. The larger Carton houses the 8 modular electrostatic panels [4 panels per side] in an EVA FOAM lined flightcase. Each panel is wrapped in clear film to avoid dust and moisture damage during shipping.

STEP 1

Carefully remove one panel from the Flight case.

Inside the second smaller carton are the 2 “feet” of bases of the electrostatics as well as all the necessary brackets, bolts, cable assemblies and other parts shown below:

12 pieces of CONNECTING BRACKETS with
72 pieces of M5 x 12mm long bolts

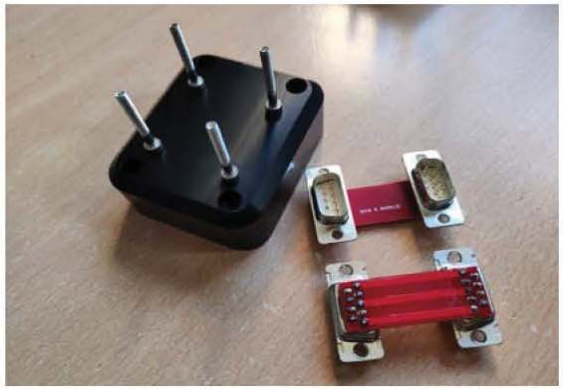
4 pieces of BOTTOM BRACKETS with
12 pieces of M5 x 35mm bolts and
8 pieces of M8 X 35mm bolts

6 pieces of DELRIN HV COVERS with 24 pieces of M3 x 25mm bolts and

6 pieces of 9 pin HV BRIDGES[red PCB]

12 pieces of CONNECTING BRACKETS with 72 pieces of M5 x 10mm long bolts

4 pieces of BOTTOM BRACKETS with 12 pieces of M5 x 35mm bolts and 8 pieces of M8 X 35mm bolts



6 pieces of DELRIN HV COVERS with 24 pieces of M3 x 25mm bolts and 6 pieces of 9 pin HV BRIDGES[red PCB]

STEP 2

For each tower of 4 panels [one tower for Czar and Prinz and 3 towers for Emperor] Connect the BOTTOM BRACKETS to the BASE panel [Foot] using the 4 x M8 bolts.

DO NOT TIGHTEN.

Leave it slightly loose so that you can easily connect the 6 pieces of M5 x 35mm bolts to the first attached PANEL.

VERY IMPORTANT- Make sure that the RED DOTS [which indicate the POLARITY of the panel] are on the right side as you view the speaker [As shown].

It is critical that every PANEL is connected with the RED DOTS on the right side to avoid PHASE CANCELLATION between panels.

The RED DOT signifies the FRONT STATOR. So All FRONT STATORS are “IN PHASE”.

STEP 3

a. Once you have connected the first PANEL to the SPEAKER BASE and the screws are still loose [with one turn to tighten], NOW TIGHTEN ALL THE BOLTS – the 4 pieces of M8 and the 6 pieces of M5 x 35mm.
This now secures the first panel.

b. Carefully add the CONNECTING BRACKETS to the top of the panel , then add the Second panel, remembering NOT TO TIGHTEN until all 12 M5 x 10mm bolts have been screwed to within a turn of tightening.

Allow the gravity/weight of the brackets holding the panel to settle before final tightening.

VERY IMPORTANT – Don't overtighten – aluminium is quite soft and you might strip the thread.

c. With the help of a friend, add the 3rd and 4th panels – remember NOT TO TIGHTEN until all 12 bolts are inserted and are within a few turns of tightening. Once all the bolts are within one turn of tightening, allow gravity to close the gap between the panels and then tighten.

VERY IMPORTANT: Make sure the RED dot is to the right of the 9 pin connector to ensure correct POLARITY.

STEP 4

Once all 4 panels have been bolted together with the 6 CONNECTING BRACKETS, you need to carefully
plug in the HV Bridges to electrically connect the 4 panels together.

Carefully add the 3 pieces of DELRIN HV COVERS [per tower] to avoid accidentally touching the HV with your fingers and receiving a mild electric shock.

Only 2 bolts are necessary to hold it on [as shown].

STEP 5:

Once all 4 panels have been bolted together with the 6 CONNECTING BRACKETS, you need to carefully plug in the HV Bridges to electrically connect the 4 panels together.

STEP 6:

Carefully add the 3 pieces of DELRIN HV COVERS to avoid accidentally touching the HV with your fingers. 2 bolts are fine.

STEP 5

Connect the 9 pin supplied cable from the SPEAKER BASE/FOOT to the first panel.

This 3 wire cable connects the transformer secondary to the FRONT and BACK STATORS as well as the HV Voltage [2.3kV] to the face of the film.

Please use the photo on the right as a GUIDE to connect the AC power to the IEC MAINS, and the speaker cable to the two WBT connectors and of course the 9 PIN connectors between the BASE and first panel.

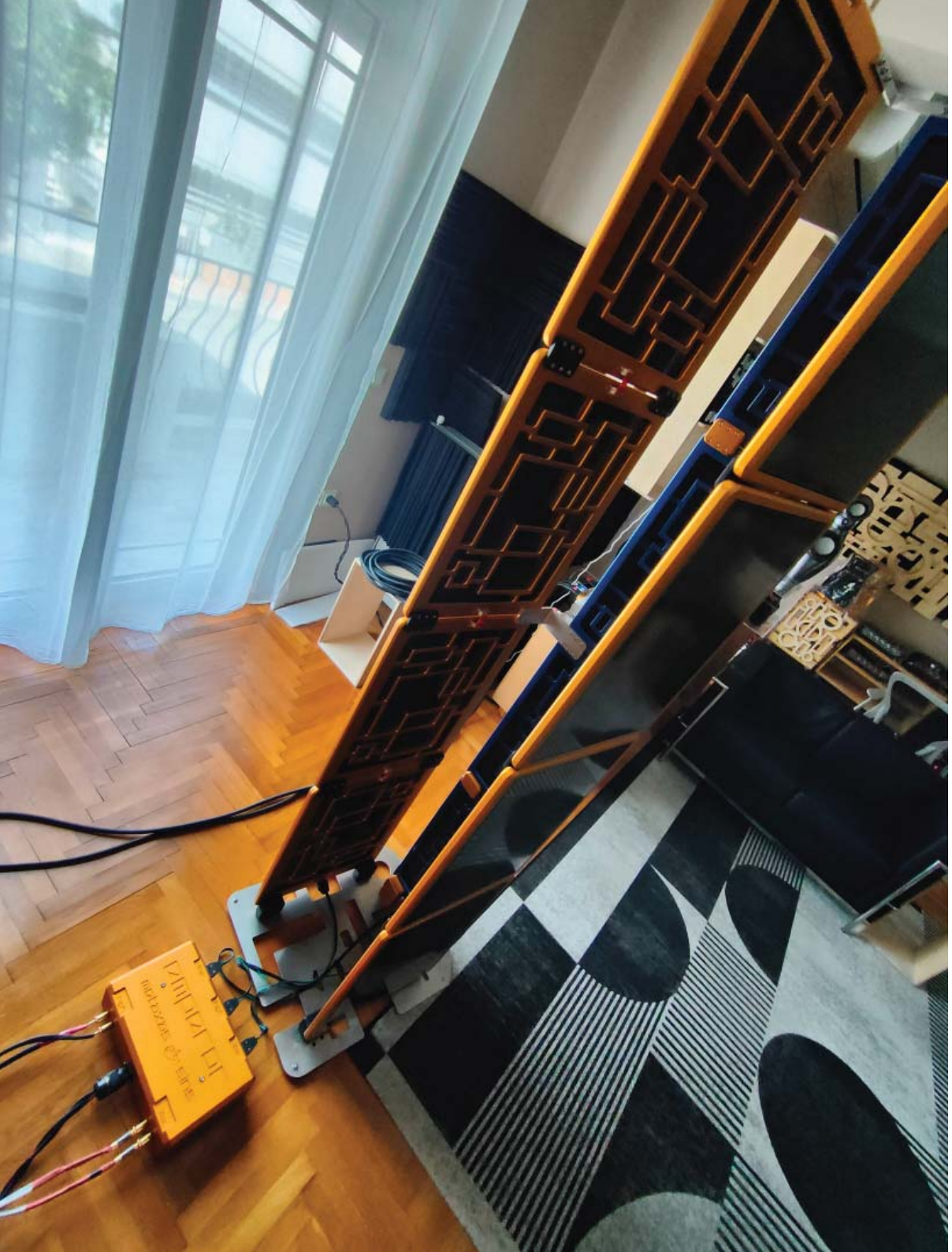
The EMPEROR uses a separate box to connect to the three towers. See next page...

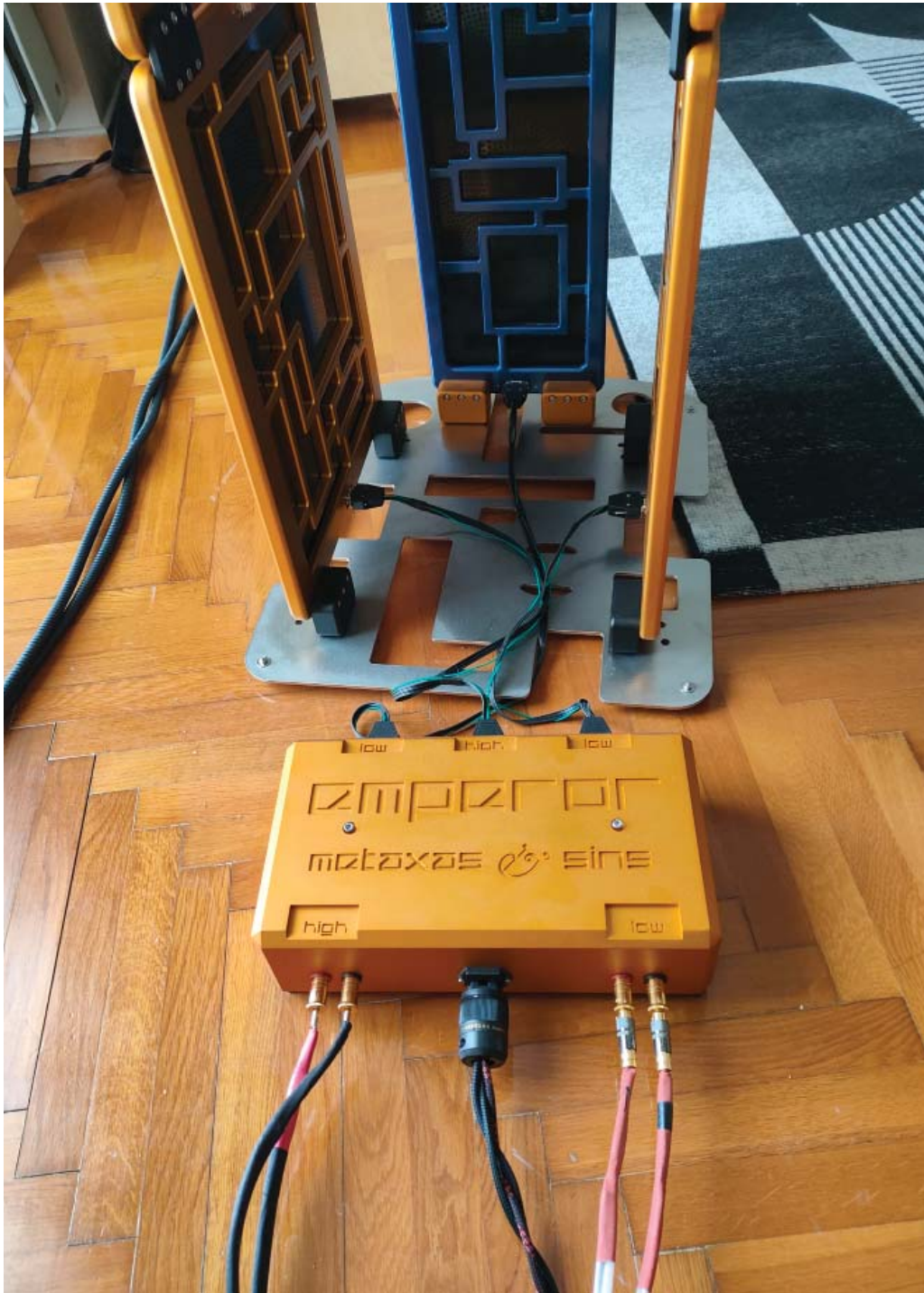
STEP 7:

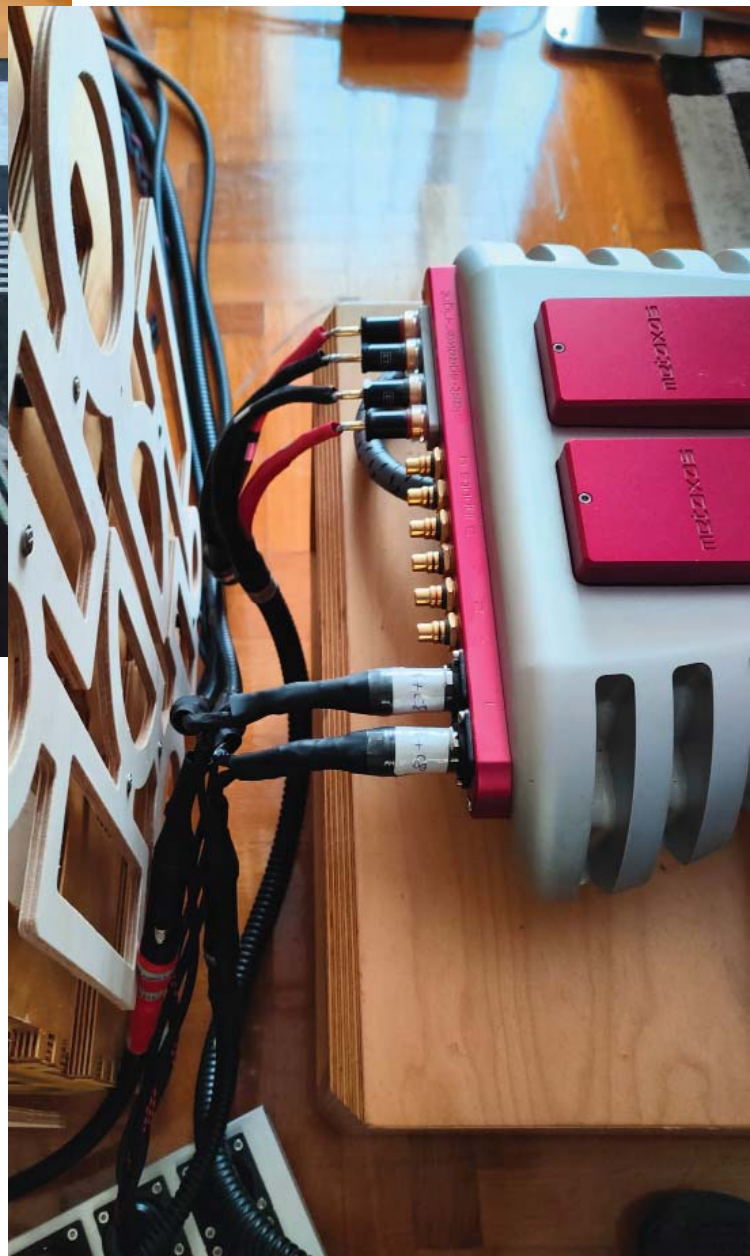
Connect the 9 pin supplied cable from the SPEAKER BASE/FOOT to the first panel. This 3 wire cable connects the transformer secondary to the FRONT and BACK STATORS as well as the HV Voltage [2.3kV] to the face of the film.

STEP 8:

Please use the above photo as a GUIDE to connect the AC power to the IEC MAINS, the speaker cable to the two WBT connectors and of course the 9 PIN connectors between the BASE and first panel.




low
high
low
emperor
metaxas sine
high
low



EMPEROR OPERATION

We can supply an adapter cable which will allow you to use 2 x stereo power amplifiers connected in parallel.

Since all panels are run in "full range mode", [omni-directional electrostatic speaker] there is no need for any crossover. You just need to be able to decrease the levels to the 360mm panels. So one stereo amplifier will need to have some sort of gain control.

EMPEROR Biamplifying adapters available at no extra cost including attenuator pots on request.

Contents

ISSUE 359

the absolute sound
THE JOURNAL OF HIGH-END AUDIO

Metaxas & Sins Czar Full-Range Electrostatic Loudspeaker

Back to the Future

Jonathan Valin

Since the day I first heard a double pair of KLH Model Nines many, many years ago, I've had a love/hate relationship with electrostatic loudspeakers. Their virtues have always been plain—superb transient response; incomparably low levels of driver coloration (and zero enclosure coloration); unbeatable openness, transparency, and inner detail; and a top-to-bottom coherence, a "single-driver" sound, that no other type of drive system quite matches.

Alas, their flaws have also always been plain—chiefly and typically, a lack of power and extension in the low bass and midbass that robs lower-pitched instruments of color, body, and impact, thinning their textures and the textures of large ensembles; beaming in the treble that can make 'stats sound dark and closed-in off-axis and rather too hot and shouty on-axis; a tendency, due to driver-excursion limitations, to clip extremely hard transients, limiting the dynamic scaling of many instruments in the *ff* to *fff* range; and "difficult" loads that make picking the right amp a tricky proposition.

Over the years, I've tried many kinds of electrostats (KLHs, Quads, Acoustats, MartinLogans, Sound Labs), hoping to find that magic one that "does it all," that gives me the full measure of electrostatic virtues while eliminating (or nearly so) the flaws. But the quest has been fruitless. For every octave of bass I've gained with certain designs, I've lost a significant measure of speed, transparency, neutrality, and inner detail. For every gain in speed, transparency, neutrality, and inner detail, I've lost instrumental color, body, and foundation.

Comes now a brand-new 'stat from the fertile imagination of Kostas Metaxas (a long-time electrostat devotee and the author of several of the finest reel-to-reel tape decks extant). It is called the Czar, and it is a 16"-wide, 96"-tall, ¾"-deep, tower-like agglomeration of four 16" x 24" x ¾" full-range electrostatic panels that—and this is a first in my experience—you (or your dealer) have to assemble into a column.

Yep, the Czar panels arrive individually packaged in a substantial and extremely well-damped rectangular flight case. You must remove each of the four panels (per side) from the case, bolt the bottommost one to the heavy anodized-aluminum baseplate (packed separately), fasten the bottom panel to a second panel situated above it (and a third panel to the sec-

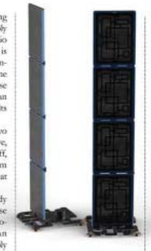
ond and the topmost fourth to the third), then connect the wiring of each panel (in proper phase) to the high-voltage power supply seated on the baseplate. All this may sound a bit like the audio equivalent of building your own computer, but—trust me—it is much easier to do than to describe. Every connection on the panels is carefully labeled; assembly instructions are clearcut; and the tools you need are supplied. Just be sure you have someone else around to help you, as putting the columns together is a two-man job (one person must situate the panels, while the other bolts them to the base or to each other).

Once stacked and fastened together, the panels make up two tall skinny towers, rather like the Acoustat 2+2s of yore, save, as noted, that the panels of these 'stats are housed in ultra-stiff, non-resonant, precision-CNC-machined, anodized-aluminum frames. Rest assured: These housings aren't the only things that are different about the Czars.

First, there are the drivers in each panel. 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 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 Czar 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 Czar's stators are manufactured from 6N-copper-plated epoxy composite board. (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 7000 holes in the Czar's stators, bored to a tolerance of 1 micron, a procedure that takes hours to complete.



In the finishing process, the copper stators are sealed with a 0.2mm-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.

Finally, the Czar's power supplies are said to use the latest in high-voltage technology, comprising a low-voltage regulator, a flyback transformer, and a switch-mode power supply to generate the 2.3kV polarizing voltage. This topology reportedly allows the use of parts superior to those found in conventional electrostatic HV supplies that operate at 6kV. The result is that the supply doesn't limit the dynamic range and sonic resolution of the speaker by running short of juice.

The hand-wound toroidal transformers that convert the amplifier's wattage to very high voltages are proprietary devices that employ costly low-loss copper wire. Their "heroic" build (18 sections of windings to cancel out stray inductance) is said to minimize the typical dynamic compression of electrostatics, "giving the Czar a speed and attack that are reminiscent of horn-type studio loudspeakers."

As you will see in the Specs & Pricing box, what all these technical innovations add up is a 'stat that is high enough in sensitivity (94dB/1W/1m) to be driven by low-powered

tubes or solid-state, is said to be capable (once fully broken in) of 25Hz bass extension (–3dB) without a subwoofer, is able (when optional bass panels are added) to generate 115dB SPLs from 50Hz to 45kHz (100dB peaks from 15Hz to 40Hz), is consistent in sonic quality (single-driver sound) from 30Hz to 45kHz, is easily upgraded (the additional bass panels I just mentioned are only a phone call away), and is priced at $37,000.

Sounds like high-end-audio heaven, doesn't it?

Well, it would be if the Czars lived up to Metaxas' claims. Do they? Uh…maybe.

Sorry to sound indecisive, but one of the problems I'm having is a simple matter of time. Kostas says it takes six months to fully break-in the Czars' diaphragms, and I haven't had the speakers for 6 months. I've had them for 6 weeks. So, why review them now rather than 5 months from now? Because what they do do, even at this early stage, is quite remarkable.

If you've never heard a full-range electrostat—and nowadays it's more likely that you haven't than have—you really ought to audition the Czars. Even if you have heard or owned 'stats (like me and many other old coots), you still ought to audition them. Sonically, they're a step into an entirely different world, like that trip from black-and-white Kansas to Technicolored Oz. To put this plainly, from the upper bass to the top treble the Czars are among the highest-resolution loudspeakers I've heard. I'm not sure that the MartinLogan CLXes, which were the highest-res transducers I'd auditioned prior to the Czars, were more finely detailed than this.

It's kind of amazing to hear things that you didn't know (or notice) were there on record after record after record. And I don't just mean a clarification of who's playing what in large ensembles or choirs (although the Czars do that kind of parsing supremely well). Even small combos benefit from the Czars' sonic acuity. From the buzz of a performer's spit in the reed of his clarinet on RCA's *Venice* to the long slow sizzling decay of Louie Bellson's cymbals on *Duke's Big Four* (Pablo/Acoustic Sounds) to the snap of a thick E-string against the fingerboard of Ray Brown's stand-up bass on *This One's For Blanton* (Pablo/Acoustic Sounds) to the up-front phlegmy rasp of Louis Armstrong's vocals and the more distant (because farther from the mikes) backup singing (make that moaning) and

Specs & Pricing

Midrange and Treble Specifications
Sensitivity: 94dB/1W/1 meter
Power handling: 100W
Frequency response: 80Hz–35kHz +/-3dB
Dynamic range: 115dB
Step-up transformer: 100:1 ratio, 18 individual sections wound clockwise/anticlockwise to reduce overall capacitance, 6-ohm primary impedance, 300-ohm secondary impedance

Subwoofer Specifications
Sensitivity: 90dB/1W/1 meter
Power handling: 100 W
Dynamic range: 100dB,20Hz–100Hz
Price: $37,000, $40,000 in gloss finish

REEL SOUND DISTRIBUTION (U.S. Distributor)
133 Isle of Venice Dr.
Fort Lauderdale, FL 33301
(954) 648-3550
reelsoundaudio.com

JV's Reference System
Loudspeakers: MBL 101 X-Treme MKII, Magico S3 2023, Metaxas & Sins Czar, Magnepan LRS+, 1.7i, and 30.7
Subwoofers: JL Audio Gotham (pair), Magico S Sub (pair)
Linestage preamps: Soulution 727, MBL 6010 D, Siltech SAGA System C1, Vitus Audio SL-103, JMF Audio PRS 1.5
Phonostage preamps: Soulution 757, DS Audio Grand Master EQ
Power amplifiers: Vitus Audio SM-103 Mk.II, JMF Audio HQS 7001, Soulution 711, MBL 9008 A, Siltech SAGA System V1/P1, Odyssey Audio Stratos
Analog source: Acoustic Signature Invictus Neo/T-10000 Neo, Clearaudio Master Innovation, TW Acustic Black Knight/TW Raven 10.5
Tape deck: United Home Audio Ultima Apollo, Metaxas & Sins Tourbillon and Papillon, Analog Audio Design TP-1000
Phono cartridges: DS Audio Grand Master EX, DS Audio Grand Master, DS Audio DS-W3, Clearaudio Goldfinger Statement v2.1, Air Tight Opus 1, Ortofon MC Anna, Ortofon MC A90
Digital source: MSB Reference DAC, Soulution 760, Berkeley Alpha DAC 2, Kalista Dream Play XC
Cable and interconnect: Synergistic Research Galileo SRX (2023), Crystal Cable Art Series da Vinci, Crystal Cable Ultimate Dream
Power cords: Crystal Cable Art Series da Vinci, Crystal Cable Ultimate Dream, Synergistic Research Galileo SRX 2023, Crystal Cable Infinity
Power conditioner: AudioQuest Niagara 5000 (two), Synergistic Research Galileo SX
Support systems: Critical Mass Systems MAXXUM and QXK equipment racks and amp stands
Room Treatments: Synergistic Research Vibratron SX, Stein Music H2 Harmonizer system, Synergistic Research UEF Acoustic Panels/Atmosphere XL4/UEF Acoustic Dot system, Shakti Hallographs (6), Zanden Acoustic panels, A/V Room Services Metu acoustic panels and traps, ASC Tube Traps
Accessories: Audio Realignment Technologies (A.R.T.) electro-magnetic treatments, DS Audio ES-001, DS Audio ION-001, Stein Music Pi Carbon Signature record mat, Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Clearaudio Double Matrix Professional Sonic record cleaner

funereal wail of Trummy Young's trombone on "St. James Infirmary" from *Satchmo Plays King Oliver* (Audio Fidelity/Acoustic Sounds) to the ways Alfons and Aloys Kontarski alter their touch and pedaling of twin grand pianos to create dynamics from *fortississimo* to *pianissimo* in the "Monument" section of Ligeti's *Three Pieces for Two Pianos* (DG)—a serial composition using identical intervals that depends entirely on the preservation of layered variations in loudness and pitch to generate the three-dimensional soundscape it is aiming for—to the gorgeous timbre of Jascha Heifetz's "David" Guarnerius and the simply nonpareil virtuosity of his playing on Vieuxtemps' Concerto No. 5 (RCA), where in the cadenza connecting the first and second movements Heifetz's phenomenal double-stopping creates the illusion of two violins being played by four hands, the Czars reproduce timbral, dynamic, pitch-related, and durational details with a vivid, lifelike completeness that I've rarely experienced with other transducers.

You'll note that I haven't yet complained about the way this electrostat thins down timbre to achieve its astonishing resolution, sharpening attack at the cost of steady-state tone and decay. That's because the Czars don't work like that. Indeed, they are as neutral and natural in timbre as any transducer I've heard—on a par with something like the supremely neutral Magico M3 or M6 in this regard. As a result (and as I just noted), the timbre of Heifetz's "David" violin (or the Kontarskis' pianos, for that matter) has never sounded more beautiful or realistic—not darkened or brightened or thinned or thickened by driver/enclosure coloration but transmitted as recorded by Kenneth Wilkinson at Walthamstow Hall, without addition or subtraction, as if you were listening to that fiddle and fiddler through monitor headphones at the recording session.

Indeed, the Czars are so high in resolution that you can hear that the microphones are picking up the inner workings of instruments. For one astonishing example, on the Kontarski recording, the mikes are set up so close by the pianos that they not only capture the transient sounds of the keys and pedals being depressed; they also capture the way individual strings are being hammered and how their vibrations excite the soundboard, resonating through the grand pianos' cases and from their lids to create waves of reverberant energy that hit your ears (and body) with tactile force. This is an almost magical level of resolution that tells you not just how the instrument and instrumentalists are making music but also how those musical sounds are being cre-

ated within the instrument and then transmitted to the microphones on their journey from a long-ago time and space to the here-and-now of your room.

I could fill pages with examples of previously unheard musical, instrumental, and performance details, but I think you've got the picture. Save for the bottom end, you will hear everything there is to hear through the Czars.

Where do these speakers fall down? Well, it's too early to say for sure, but their low bass and midbass are currently reduced in loudness vis-à-vis their upper bass, midrange, and treble. It's not that they lack for low-end extension or detail—the Czars shook my room like a temblor on those monumental 40Hz piano *sforzandos* from the Ligeti piece, and on massive tuttis, like the marvelous *Doina* from Enescu's *Romanian Rhapsody No. 1* (RCA), where the entire orchestra swoops down into its lowest octaves in a glissando that has a delightful Romani/Klezmer-like flavor, the Czars again reach into the 40Hz range with clarity and diminished but still thrilling power. They just don't evince this sock at normal volumes. At the moment, I'd guess they're linear to about 65Hz.

My second quibble has to do with imaging and staging. Unlike the incomparable (and better than 12 times as expensive) MBL 101 X-Treme MKIIs, the Czars, though di-polar, don't fully "merge" your room and speakers in an encompassing soundfield. When they are substantially toed in, the stage they project in my moderately sized listening space sounds rather as if it's cupped between the Czars' hands (or diaphragms). What is there is quite remarkable—an entire, slightly miniaturized world of exquisite detail, like a three-masted schooner in a bottle. Ambience, concert hall or studio walls, performance and instrumental detail are all compacted into this space. If you stand up and come close to the panels, you can look down on a shockingly complete stage laid out beneath you. When toe-in is reduced, however, the soundstage expands beyond panel boundaries, and the Czars themselves disappear as sources within this nearly wall-to-wall stage, at the price of a slight reduction in the size of images and a recession of their positions in space..

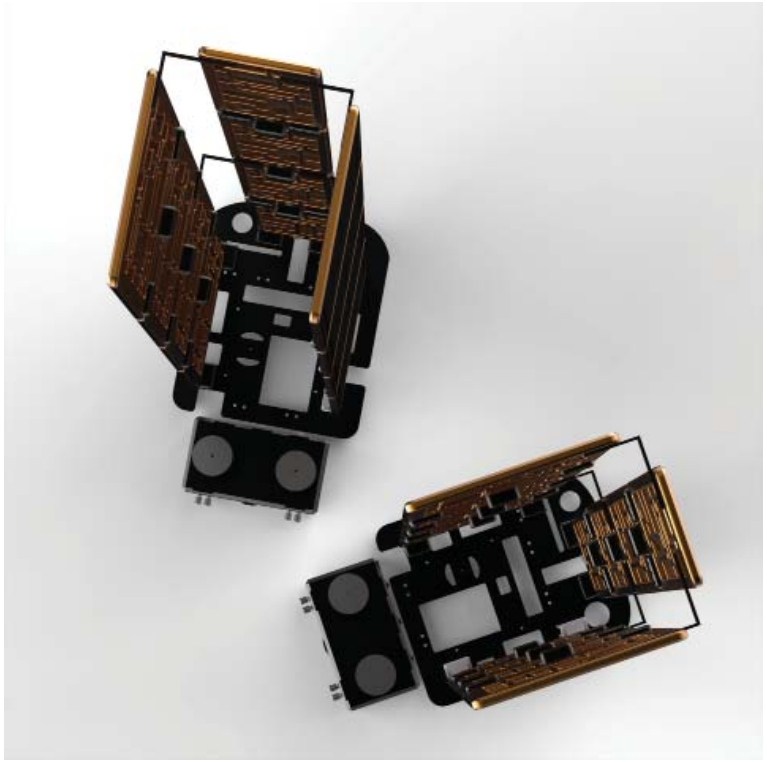
Third, once again in my digs with nearfield seating, the Czars tend toward beaming in the upper mids and treble if they are toed in overly much (on the order of 30–45 degrees). Tuttis, *sforzandos*, etc. can be a bit searing. With less toe-in (about 15–25 degrees), this issue vanishes, and it goes away with little of the usual darkening or deadening of the treble (and with the clear gains in stage width and depth I just discussed).

Fourth, there is the question of dimensionality. Perhaps it's because I've grown used to MBL's 3-D Radialstrahlers, but I kinda miss the solidly dimensional images they create (in addition to the subterranean bass they generate). That said, the Czars are anything but flat-sounding. They have considerably more body than 'stats had back in the day (or any day), and their astonishing speed, neutral timbre, and horn-like dynamic wallop (yup, Kostas wasn't whistling "Dixie" about this) more than make up for their less-than-MBL-level imaging. They sure can reproduce ambience to beat the band. Like every other thing they resolve, the sound of the hall or studio is more "there"—more audible, uniformly present, and identifiable—with them than it is with just about any other transducer I've heard (save for the X-Tremes).

Fifth, like all dipoles the Czars are touchy about setup. You need to precisely align them with each other vis-à-vis your listening seat to get the image focus and precision soundstaging they are capable of. As with all line-source 'stats and planars, their distance from the walls behind them and to their sides needs to be played with to reduce the effects of comb-filtering and phase cancellation. As for amplifiers, although I have just begun to play them with tubes, I can already tell you that the Czars fare exceptionally well with the ARC REF 330Ms, which—spoiler alert—are the best-sounding Class AB tube amplifier I've heard. They also sound wonderful with high-quality solid-state.

Bottom line (at the moment): Despite their current volume-limits in the bottom octaves, these are remarkable loudspeakers, capable of outstanding resolution—not just of transient detail but also of tonal colors, dynamic shifts (and leaps), and changes in pitch and duration. From the upper bass through the treble, they are incredibly precise, natural, and alive-sounding transducers that make it easier to visualize what you're listening to than just about any cones-in-a-box. In fact, given their limits, they are faster, more finely detailed, and higher in fidelity to sources than almost any loudspeaker I've auditioned. Sonically, they are also more "of a piece" than cones, multi-driver planars, and, yes, omnis. They sound like what they are: true single-driver line sources. If their bass fills in as promised, they will be reference quality. If it doesn't…well, there's always the option of subwoofing, though that route may cost you the exquisite low-end detail and single-driver continuousness already on offer.

As noted, I will report back in five months, and let you know where the Czars stand. For now, I encourage you to give them a long listen with familiar music. I think you'll find, as I did, that you don't know those old-standby LPs, tapes, and streams as well as you thought you did. ■



FULL-RANGE SPECIFICATIONS:

Efficiency: 96- 105dB/W/metre,depending on amount of panels used.

POWER HANDLING: 100 WATTS music power.(depending on panels)

FREQUENCY RESPONSE: 20Hz-55kHz +/- 3dB.

DYNAMIC RANGE: 120dB.

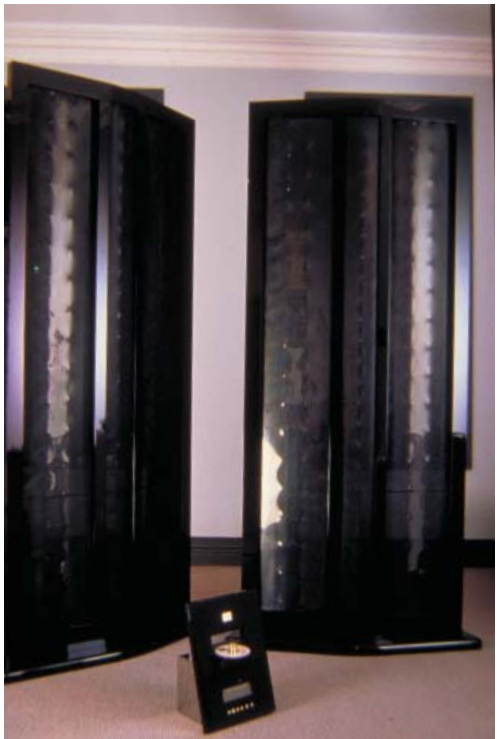
STEP-UP TRANSFORMER: 100:1 ratio. 18 individual sections wound clockwise/anti-clockwise to reduce overall capacitance. Six (6) Ohm primary impedance. 300 Ohm secondary impedance. Bifilar wound with double-polyurethane coated AUSTRALIAN COPPER wire Litzen. Totally handmade, wound and assembled.

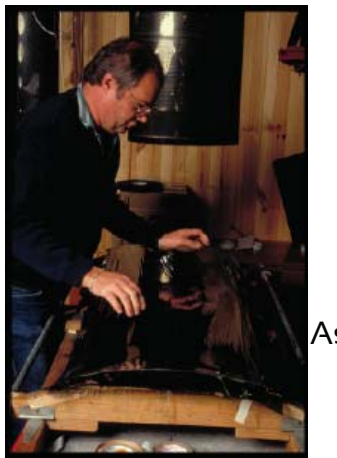
45 years ago...

My first Electrostatic Reference - Quad 57's from 1975 till 1983

Emperor and Empress from 1985

Martin Logan CLS in 1984





Assembling an Empress

Steel Frame Construction in the 1990s

In France - “Double Emperor” from the 1990s still in use today!


be there

recordings

With over 40 years of concert recording experience we are able to produce amplifiers with unparalleled transparency and effortless realism which enable you to be there.

Reference Recordings [with videos]:
http://metaxas.com/recordings.html

Seminal recordings [downloadable wavs]
http://metaxas.com/concerts.html

Munich Hi End in 2012 about recording concerts:
https://vimeo.com/144719554

www.metaxas.com