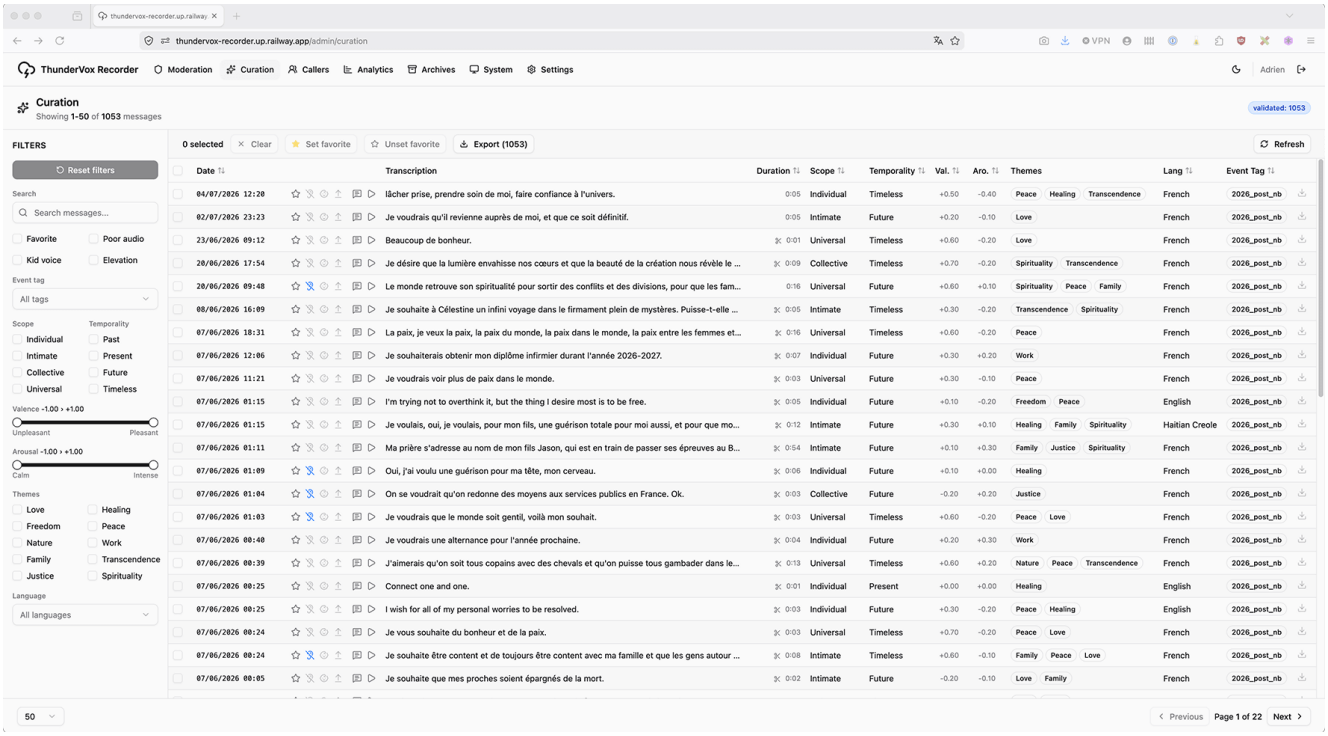
S·O·S, Skin of the Sky: Connecting Voices, Lightning, Sound, and Light Through Rhino and Grasshopper

Inside the Saint-Laurent church in Paris, anonymous voices moved through the architecture like electrical currents.

Some seemed to emerge from above. Others travelled across the nave or dissolved into a wider field of sound. Around them, light and spatial audio transformed the church into an invisible landscape shaped by human wishes and atmospheric activity.

Presented during Nuit Blanche on June 6, 2026, S·O·S, Skin of the Sky (Sous la peau du ciel) is an immersive and participatory installation by artist and researcher Marie-Luce Nadal. Her work explores atmospheric phenomena, including clouds, wind, and lightning, as materials that can be captured, cultivated, and translated into sensory experiences.



ThunderVox, the custom platform used to collect, transcribe, classify, moderate, and curate more than 1,000 wishes

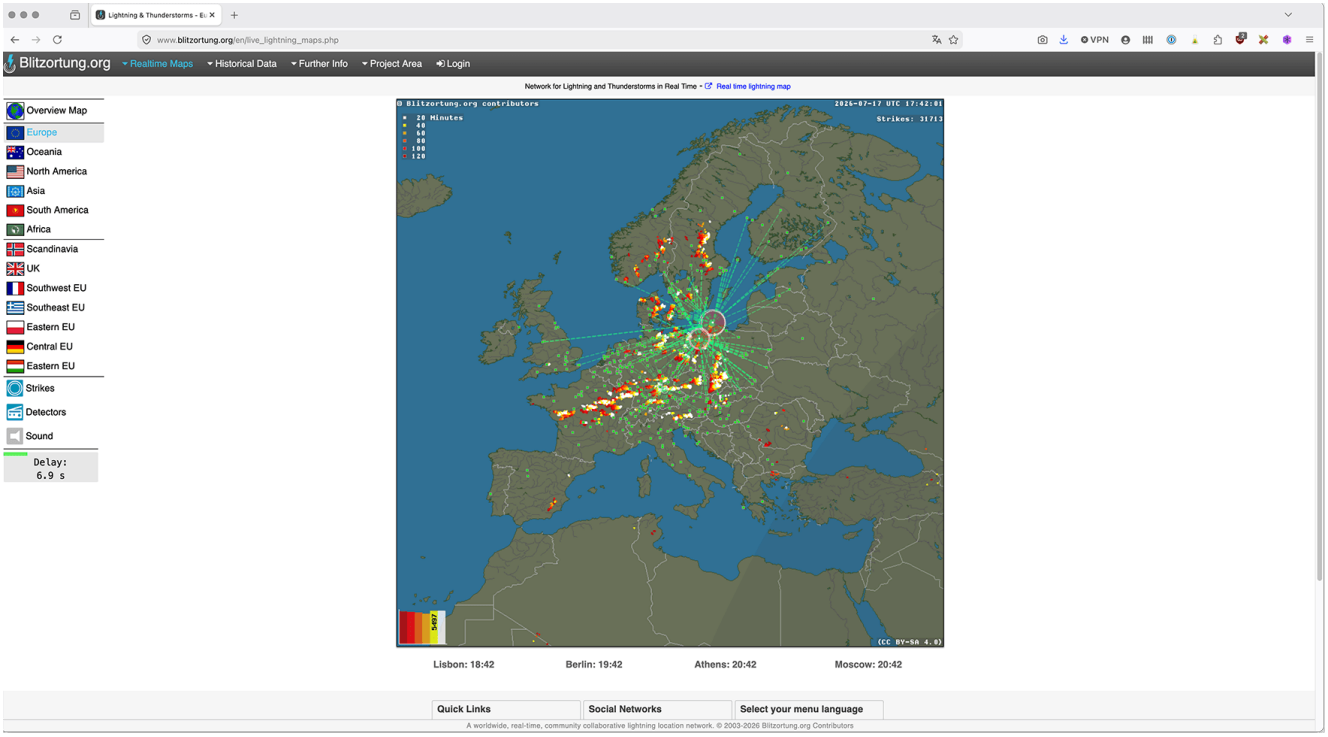
submitted by phone for the installation.

For S·O·S, people from around the world were invited to leave a wish, desire, or prayer through a telephone line. These recordings became part of a collective soundscape connected to real lightning-strike data from the global Blitzortung detection network.

Each voice was placed in relation to the trajectory of a lightning event, creating a constantly changing constellation of intimate messages moving through the church. The result was both collective and deeply personal: a spatial composition in which human desires appeared to circulate through the atmosphere.

Behind this seemingly intangible experience was a highly coordinated technical system developed by AKER, the Montpellier-based design studio founded by architect Adrien Revel. AKER co-produced the installation, while Revel served as technical director and developed much of the software architecture connecting wish collection, audio processing, spatialization, lighting, and the venue itself.

The journey of each voice began with a phone call through Twilio. The recordings were collected, transcribed, classified, and moderated in ThunderVox, a platform developed for the project. Once validated, the audio was batch-processed in Python using Pedalboard.



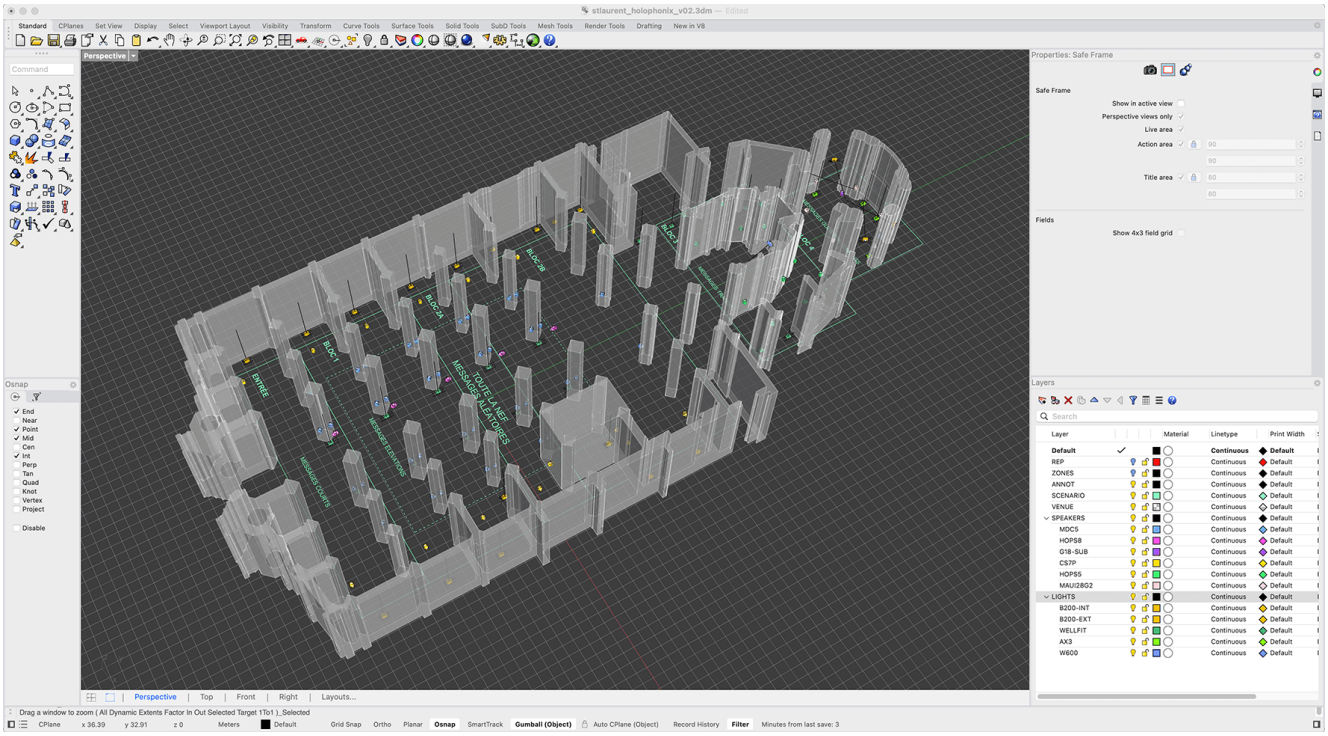
Real-time lightning-strike data from the Blitzortung network

provided the atmospheric events that activated and organized the voices within the installation.

During the performance, a Max patch acted as the central playback system. It organized the soundscape, assigned each recording to a spatial zone, and streamed the trajectories of more than 40 simultaneous audio sources over OSC to the HOLOPHONIX processor. HOLOPHONIX then distributed the material across 80 loudspeakers installed throughout the church.

Operating in parallel, the lighting system consisted of 43 DMX fixtures controlled by the open-source BlinderKitten lighting console and pre-visualized in Blender with BlenderDMX.

Coordinating all these systems required a reliable spatial reference. A speaker, light fixture, diffusion zone, or architectural element could not exist in slightly different positions across separate platforms. Even small discrepancies could affect how a voice appeared to move through the building or how a beam of light aligned with the soundscape.



The Rhino 8 model of the Saint-Laurent church, containing the simplified venue geometry, 80 loudspeakers, 43 lighting fixtures, diffusion zones, and scenographic annotations.

For this reason, the team placed the entire spatial design inside a

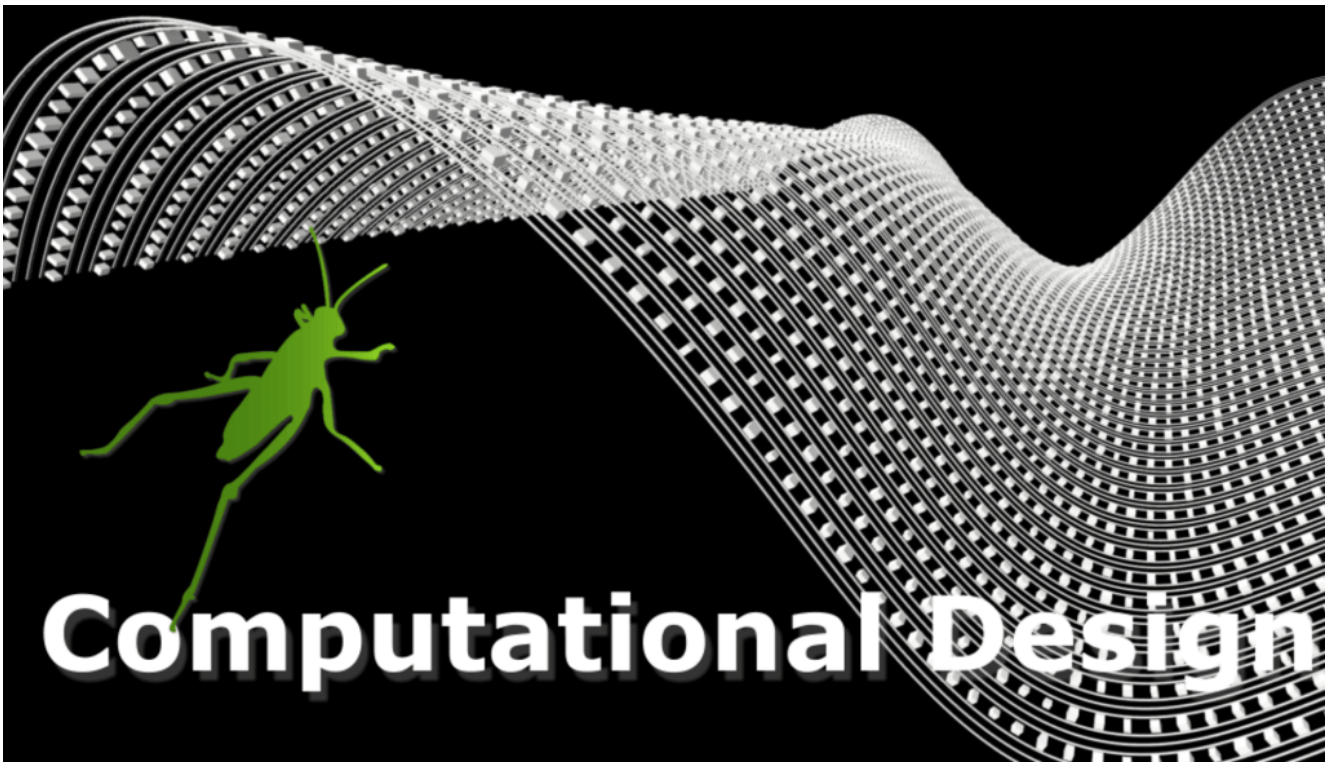
single Rhino 8 model.

The simplified church geometry, loudspeakers, lighting fixtures, diffusion zones, and technical annotations were all maintained within the same file. Rhino became the project's single source of truth, connecting architecture, scenography, sound, and light through a shared three-dimensional environment.

Speakers and fixtures were inserted as block instances and organized through a strict layer hierarchy. Their technical information was embedded directly into the model as user attributes.

For the audio system, the Rhino layer color determined how each speaker appeared in HOLOPHONIX, while optional identifiers prepared the routing structure. Lighting blocks carried information including fixture identifiers, GDTF profiles, operating modes, and channel counts.

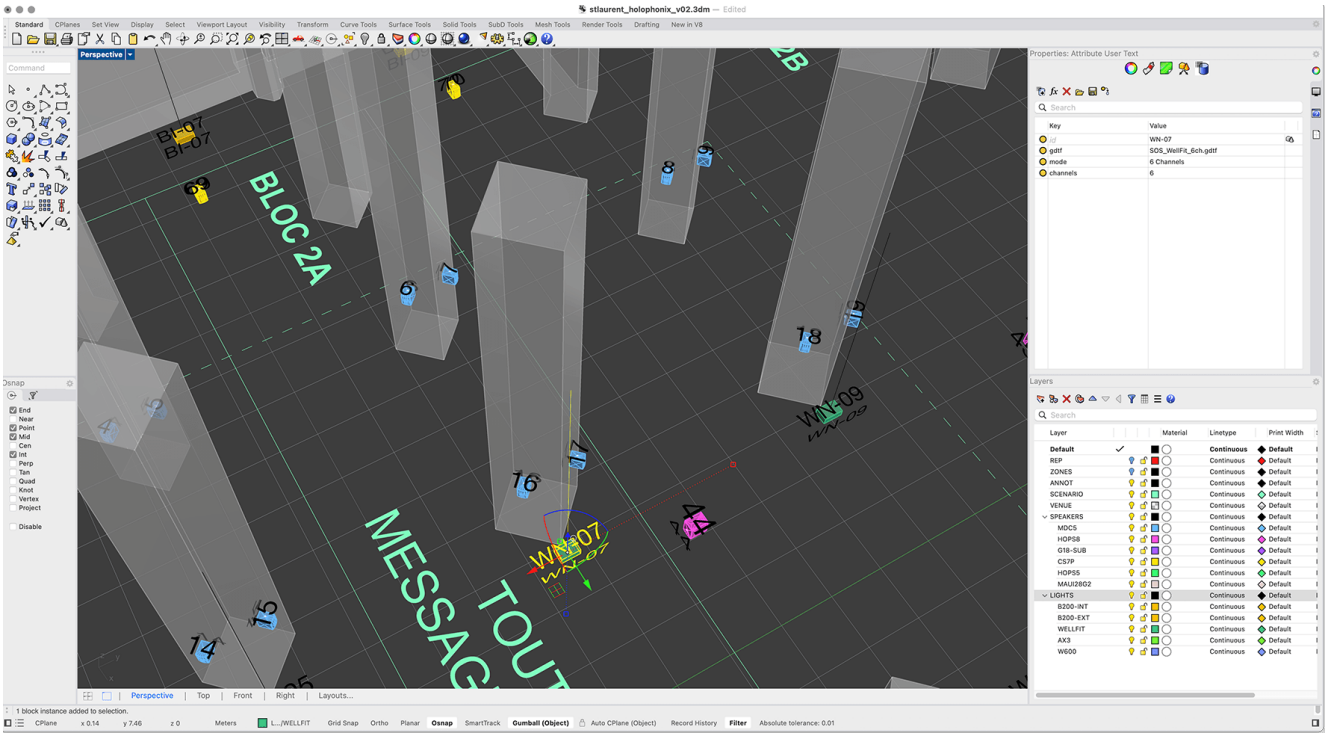
Two custom Grasshopper tools translated this spatial information into the formats required by the performance systems. Each definition was built around a GhPython component and designed to automate a specific part of the workflow.



See Also

The first tool, **holophonix_export**, reads the speaker block instances stored under the relevant Rhino layers. It extracts each speaker's transformation, converts its position into meters, and derives its orientation, azimuth, elevation, and distance.

Grasshopper then exports a CSV file in HOLOPHONIX's native format, together with a GLB model of the venue. The church geometry and all 80 speakers can therefore be imported into the spatial-audio environment from the same Rhino source.

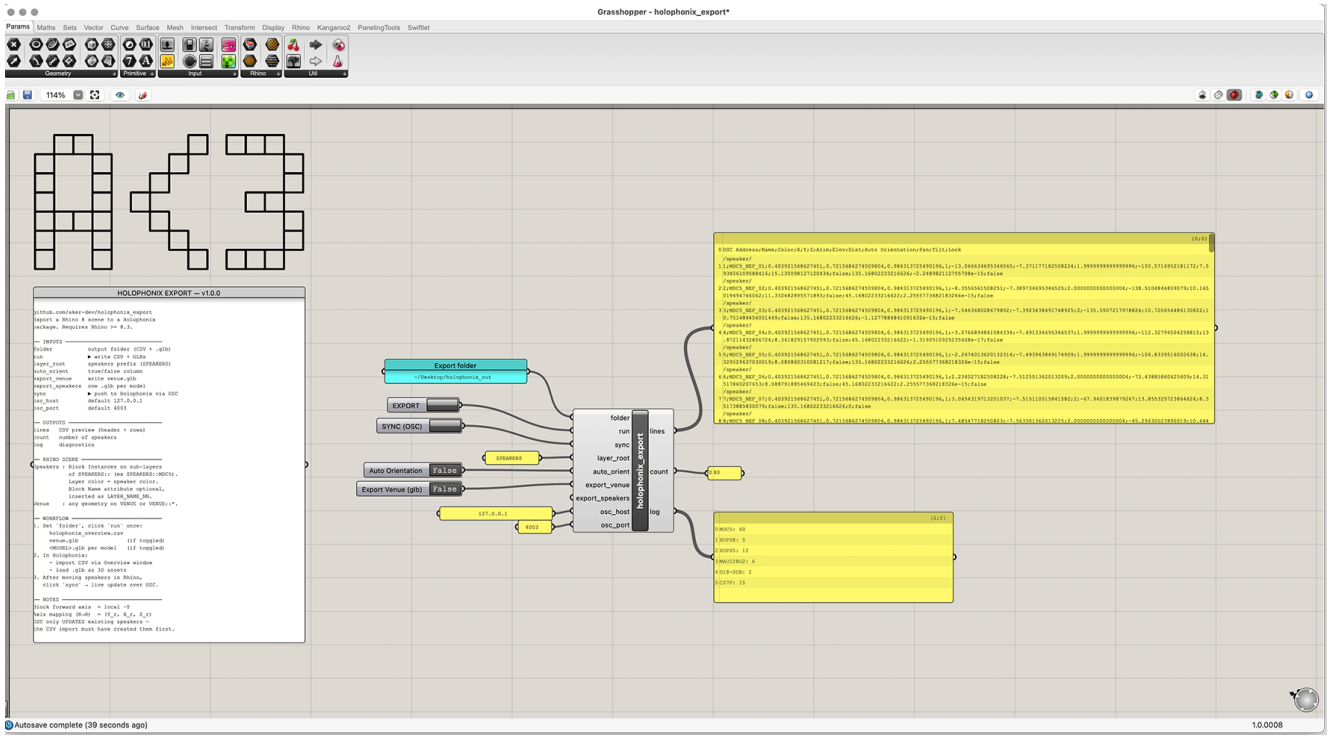


A lighting fixture stored as a Rhino block instance, with user attributes defining its identifier, GDTF profile, operating mode, and channel count.

The tool also includes a live synchronization function. During installation and calibration, changes to a speaker's position, orientation, or display color could be sent directly from Rhino to HOLOPHONIX over OSC. Moving a speaker in the model immediately updated its corresponding position in the audio system, avoiding repeated manual entry.

The second tool, **dmx_export**, applies a similar workflow to lighting fixtures. Fixture blocks are sorted according to their Rhino layer and identifier, while Grasshopper automatically assigns DMX addresses based on each fixture's channel count.

This means the complete lighting rig can be repatched simply by changing the layer order in Rhino and rerunning the definition.



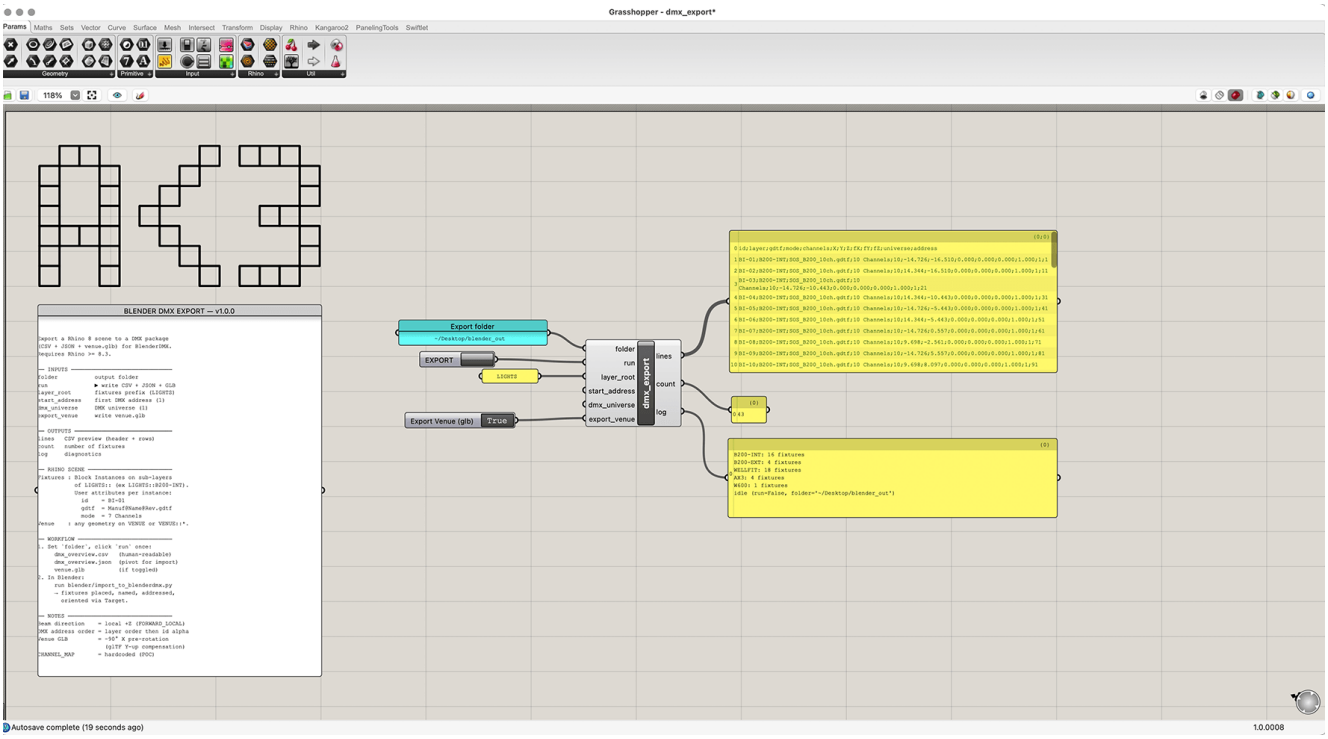
The open-source holophonix_export Grasshopper definition extracts speaker positions and orientations from Rhino, generates the required CSV and GLB files, and enables live synchronization over OSC.

The tool exports a CSV patch table, a JSON file containing fixture positions and pivot directions, and a GLB representation of the venue. Inside Blender, a companion script reads this information. It recreates each fixture through BlenderDMX, automatically assigning its GDTF profile, mode, universe, and DMX address before positioning and aiming it in the scene.

BlenderDMX was then connected to BlinderKitten through live sACN input, allowing the team to previsualize the same lighting states that would later be sent to the physical fixtures.

The pipeline required several coordinate systems to work together. Rhino uses a Z-up convention; glTF uses Y-up; HOLOPHONIX uses Y-

forward, and Blender returns to Z-up. These transformations were implemented directly within the scripts, ensuring that geometry, speaker directions, and fixture beams remained consistent between platforms.

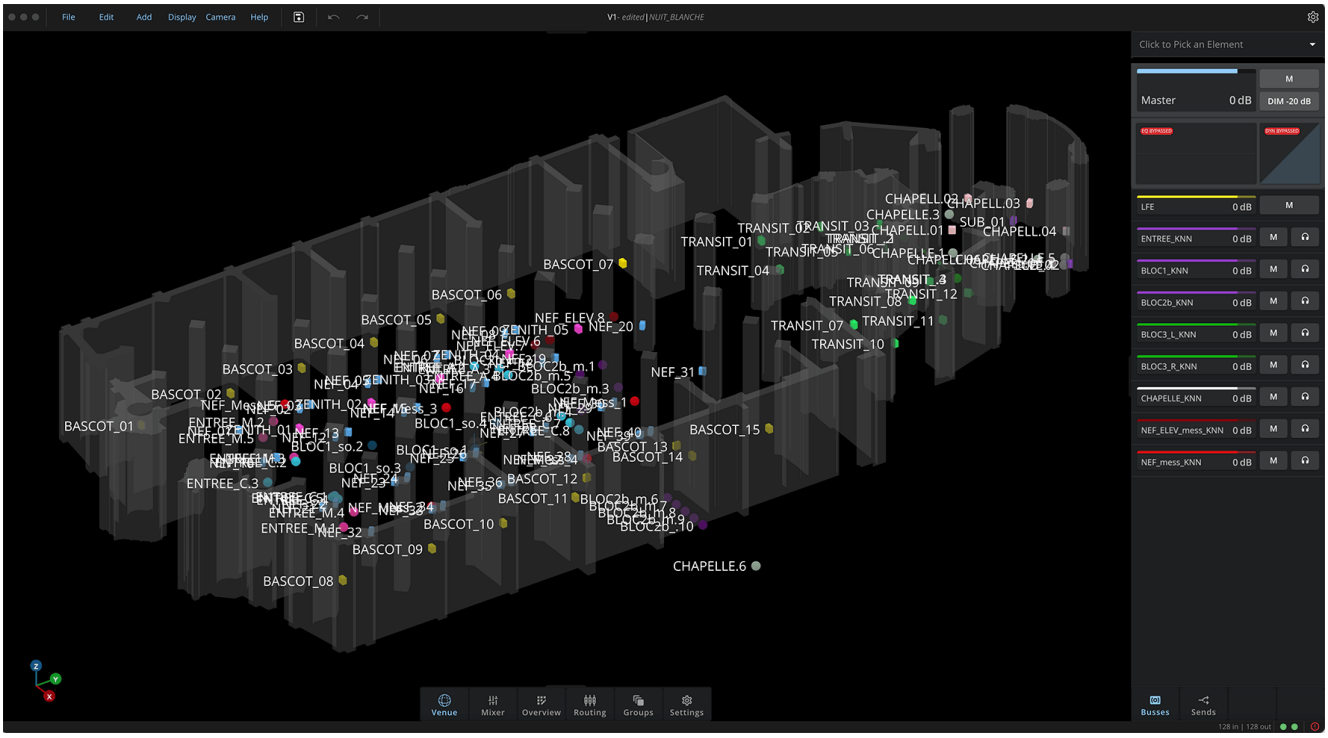


The dmx_export Grasshopper definition automatically assigns DMX addresses and exports the fixture patch, pivot data, and venue geometry required by BlenderDMX.

This preparation was essential because the physical installation operated under an extremely compressed schedule. The team had only one day for load-in, setup, and testing, followed by a single evening of operation and an immediate load-out.

The Rhino model and its connected simulations enabled testing of speaker layouts, lighting directions, DMX addressing, spatial zones, and software communication before arriving on site. During calibration, live OSC synchronization helped the team make final adjustments without disrupting the relationship between the digital model and the installed system.

Using Rhino and Grasshopper as the central coordination environment did more than reduce setup time. It allowed the work's technical structure to support the artistic intention.

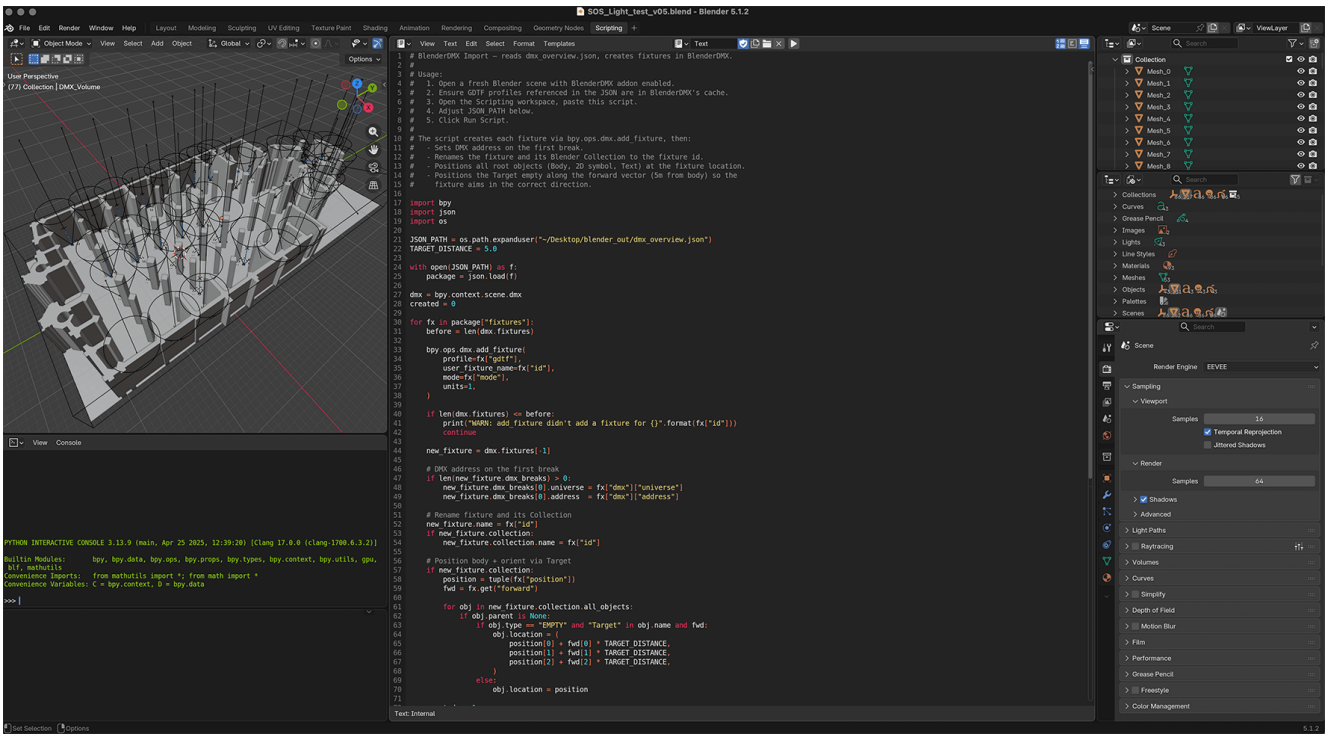


The Rhino venue geometry and speaker layout imported into HOLOPHONIX, creating a shared spatial reference for the installation’s 80-channel loudspeaker system.

Because sound and light originated from the same spatial model, a recorded wish could move through the architecture with precision while remaining connected to the surrounding visual atmosphere. Rather than functioning as an independent layer, the technology shaped how the project’s invisible material became perceptible.

The same data-driven approach also makes the installation adaptable rather than tied to a single venue, allowing its spatial configuration to be regenerated for new architectural and technical conditions.

The workflow produced the 80-speaker version presented at Saint-Laurent church and was later adapted to a 12-speaker configuration shown in Le Soler, near Perpignan, in July 2026.



A companion Blender script reads the files generated by Grasshopper and automatically creates, positions, aims, and assigns GDTF profiles to the lighting fixtures in BlenderDMX.

Both Grasshopper tools—**holophonix_export** and **dmx_export**—have been released as open-source projects under the MIT license. AKER plans to continue using and developing them for future versions of S·O·S, with features such as MVR support among the possible next steps.

By modeling the space once and allowing Grasshopper to translate it across audio, lighting, and visualization systems, the project maintained a continuous relationship between physical architecture and digital information.

In S·O·S, this precision ultimately served something deliberately intangible: thousands of private voices, carried through a church as if moving beneath the surface of the sky.



On-site operation and calibration during Nuit Blanche 2026, connecting the digital spatial model with the audio and lighting systems installed inside the church.

CREDITS

Artist: Marie-Luce Nadal
Work: S·O·S, Skin of the Sky (Sous la peau du ciel), 2026
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Soundscape: Arthur Doué, composer; Alexander Maxwell, sound engineer
Spatialization and Max development: Matteo Bonnasse
Audio processing: Raphaël Revault
Production partners: AKER, Manifestation Station, Racine du Ciel
Technical partners: Holophonix, Twilio, blitzortung.org

With the support of: DiCRéAM and Fulcrum Arts
Photography: © Brice Pelleschi / ADAGP, 2026

Special thanks to Dr. Nadia Guerouaou, Paroisse Saint-Laurent (Paris 10e), Dorothée Barba, Marie Vasconi and the Conservatoire Charles Munch