THE CZECH REPUBLIC

SONIC

HORAŽĎOVICE AND PRAHA

SENSE

2008-2009

BARNEY HAYNES | JENNIFER PARKER

WWW.SONICSENSE.NET

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THE CZECH REPUBLIC

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First published in 2009

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Funding and support for sonicSENSE was made possible by Galerie Califia and Galerie Školská 28, the University of California Santa Cruz; the Arts Research Institute at UCSC; the University of California Institute for Research in the Arts (UCiRA); Rosa Computers in Horaždovice; California College of the Arts, Oakland/San Francisco; and the Institut Intermédií and FAMU: Film and TV School Academy of Performing Arts in Prague, Czech Republic.

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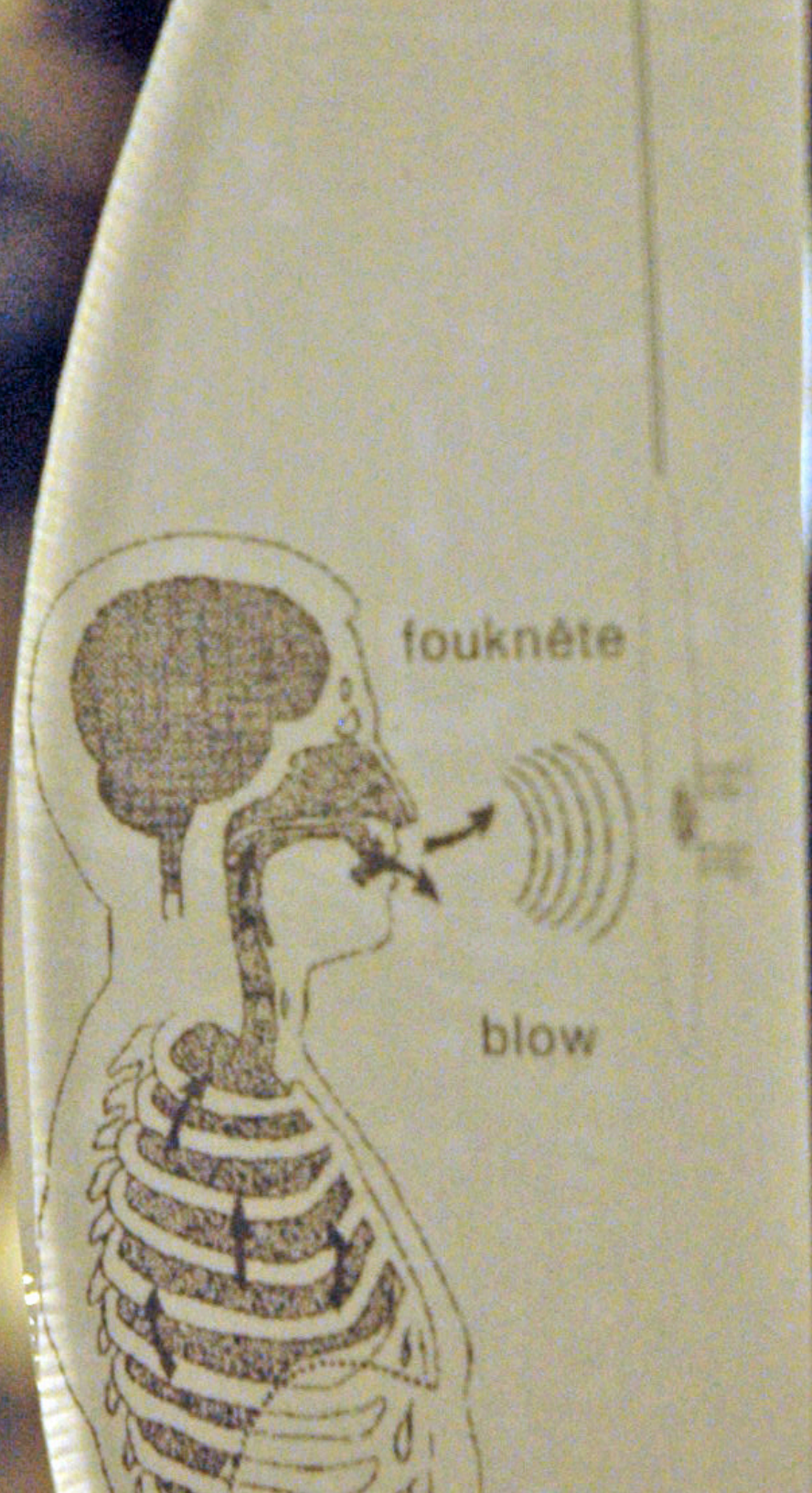
INTRODUCTION

SonicSENSE is a platform for the sonification and visualization of data through collaborative, interactive works created by artists, musicians, and scientists. SonicSENSE uses the creative diversity of computational media with traditional art practices to cultivate space for sharing, questioning, and exploring interdisciplinary frameworks, methodologies and experiences for communal interfaces of collective art-making with new technologies, digital media and participation. Inspired by the open-source movement, the project has been made to be both extensible and flexible in its expansion of hardware and software.

Parker & Haynes have embarked on a series of art exhibitions, university courses, and workshops for artists, scholars, and students to evolve the sonicSENSE platform. One intention of their project is to support and advance the use and understanding of digital tools and methods for research and teaching in the arts. Another is to exhibit a rich variety of projects for the sonicSENSE platform.

The platform, conceived in February 2008, consists of a complex series of robotic speaker sculptures and video projections that employ the viewer's vital signs and breath as one of the interface systems. This interactivity intermittently produces a wide range of audioscapes, data projections, and mechanical noises that build collect and distribute media into the exhibition space. The number of interactions with the robotics increases collectively with the number of components, allowing for many new and subtle types of behavior to emerge.

The first prototype of the platform was released in September 2008 for three months at Galerie Califia in South Bohemia, Czech Republic. Parker & Haynes were the first alpha testers of the platform. A beta version followed shortly thereafter at Galerie Školská 28 in Prague with participating Czech and Slovankian Artists: Michal Kindernay, Ales Zemene, Guy van Belle, Jakub Hybler, and Michal Cáb. University of California Santa Cruz graduate students in the Digital Arts New Media program have been working since April 2009 with Parker and Haynes to expand, program and develop the sonicSENSE platform for the next exhibition at the University of California Santa Barbara in November 2009. This catalog is documentation of the two exhibitions that took place in The Czech Republic.


fouknète
blow

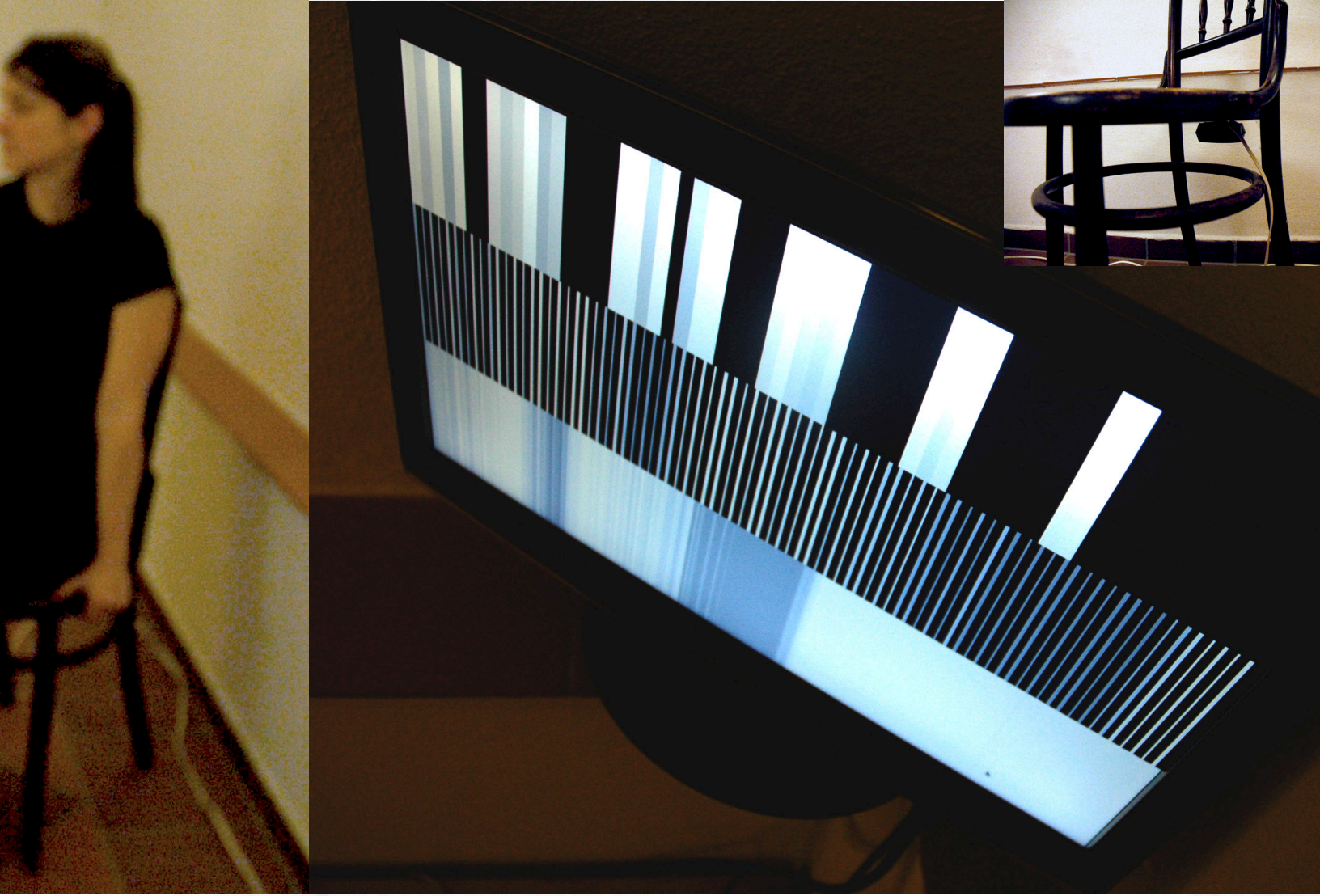
sonicSENSE v. 1.0 24.09.2008 - 20.12.2009

Galerie Califia

ZÁMEK HORAŽĎOVICE, 341 01 HORAŽĎOVICE, CZECH REPUBLIC

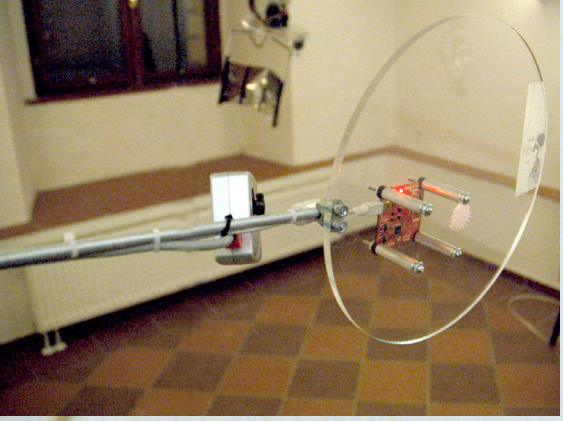
MÍSTNOST 1 [ROOM ONE] VAPOR • HUMIDITY • WIND • VIBRATION

In this room viewers were instructed to blow on a weather sensor and webcam mounted on a clear disc suspended from the wall. This action collected humidity data and sound from the viewer's breath which interrupted the movement of the robotic speaker sculptures hanging from the ceiling. The sculptures emitted sound from piezo speaker film, it looks like very thin metallic paper which literally dances to the sound waves. Data from the viewer's breath was translated to create motion and sound for the hanging robots. When no one blew on the disc, information from wind data stations in the San Francisco Bay Area directed the sound and motion of the sculptures. Parker &



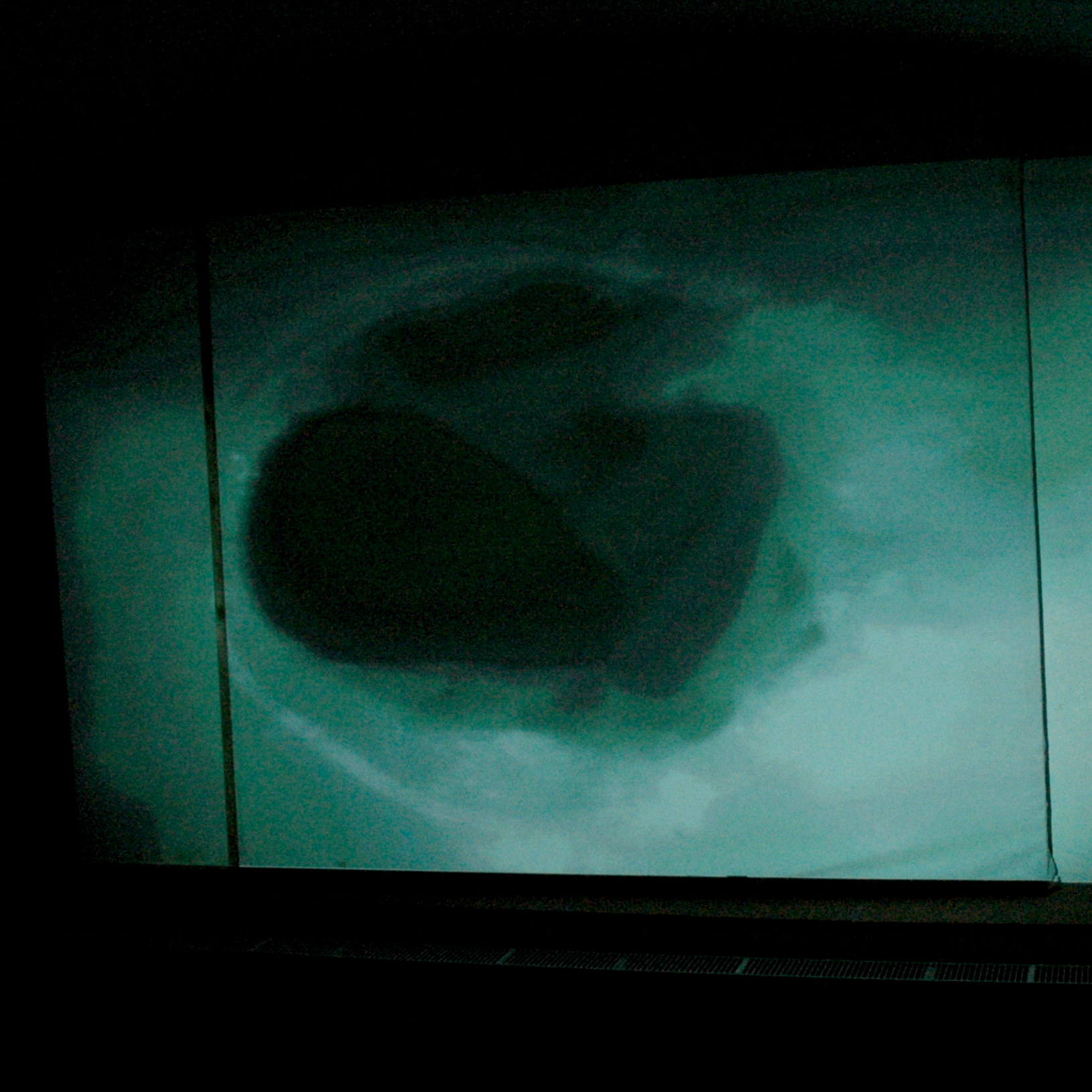
Haynes use the speaker film for a number of reasons. One is because it only outputs high frequencies. Another is the actual materiality and pliability as sculptural skin which is aestheticly desirable, especially with its reflective properties. There was also a transducer mounted to a chair in this room that produced very low sound frequency. So when a viewer sat on the chair they could feel the physical sensations of the sound they were hearing - being absorbed and muted by the body as they sat.

The program for all three rooms at the galerie was designed to interrupt actions of the viewer by generating an assort-



ment of sensory experiences for participants while creating a process akin to erasure and disruption. Reflecting on the proliferation of technology on the societal level, as being much like Attention-Deficit Hyperactivity Disorder. The effect of which created visual and audio chain-reactions of interruptive feedback each time the robotic speakers were activated. Over time, this network of interruptions morphed into less recognizable patterns of reactivity, becoming abstract and non-linear, farther and farther away from the initial interaction. Thematically, the content of the piece was based on water and three different stages that it can exist: as a solid, a liquid, and a vapor tying the work together visually and conceptually.

The water theme was directly linked to the installation configuration and informed the layout of each of the separate rooms in the gallery.

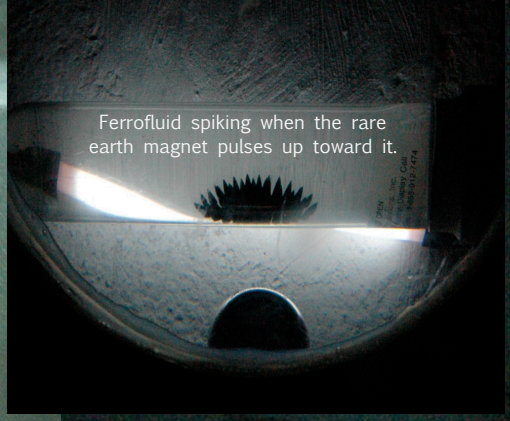


This room featured a wall projection of what appeared at first to be clouds and sky, along with a mechanical contraption mounted on the wall. A diagram next to the device instructed the viewer to put their finger inside a heart-monitor in order to collect their pulse.

Data collected from the viewer's pulse would then activate the wall mounted sculpture to move up and down - according to the persons heart-rate. A rare earth magnet that looks very much like a small metal ball moved up and down toward a glass tube filled with ferrofluid. Ferrofluid is a liquid which becomes strongly polarized in the presence of a magnetic field. The ferrofluid spiked inside the tube visible through a very large magnifying glass.

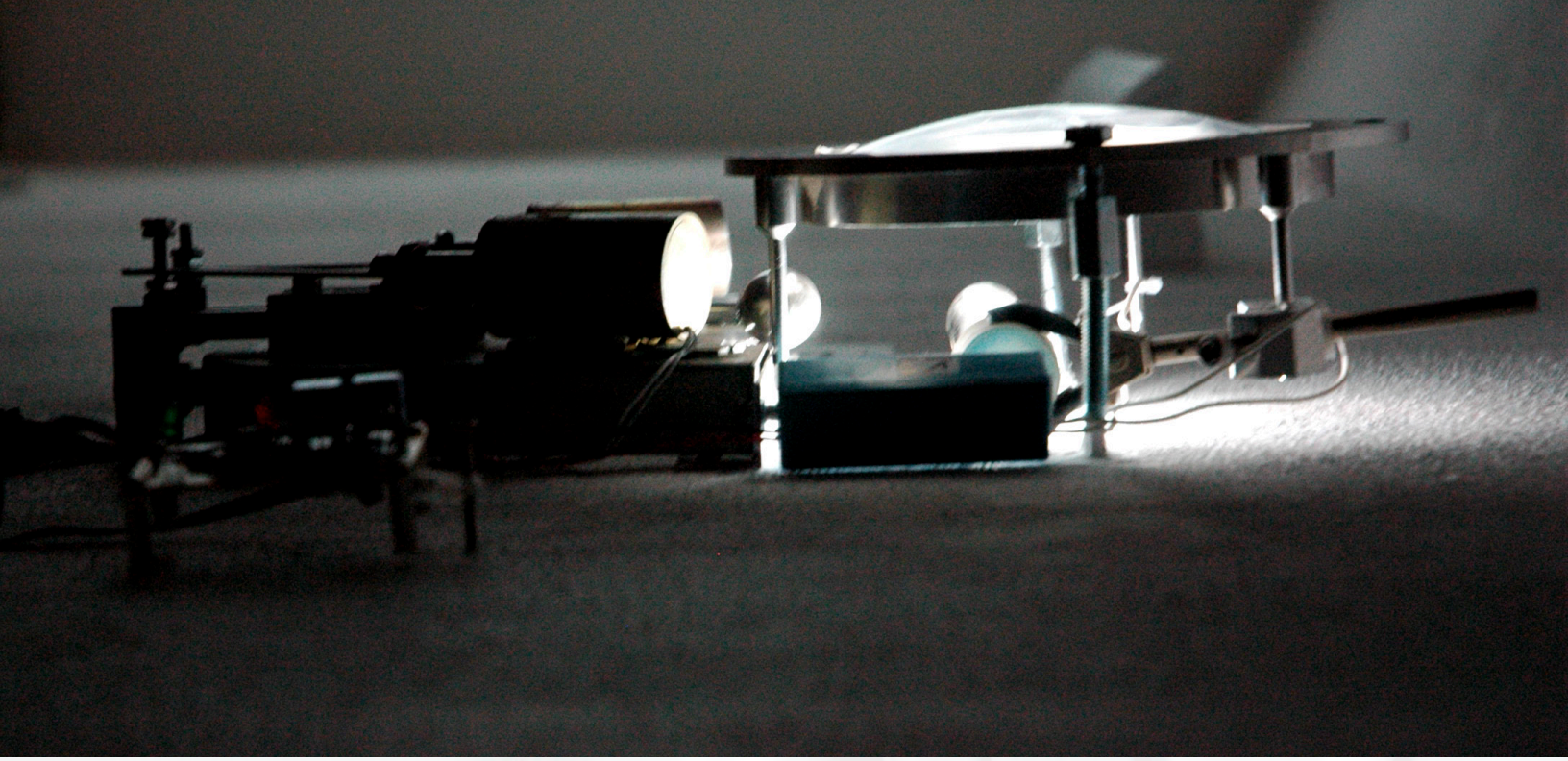
The viewer's pulse was also fed into an algorithm, causing the video projection to loop dynamically. The duration and progression of the loop was timed by the viewer's heart rate. After each loop a new starting point would begin at the previous loop's end point. It is at this point that it becomes clear that the cloud-like image is actually underwater footage of a man doing a cannonball into a swimming pool. The splash and immersion of the diver are also amplified by a speaker system in the room.

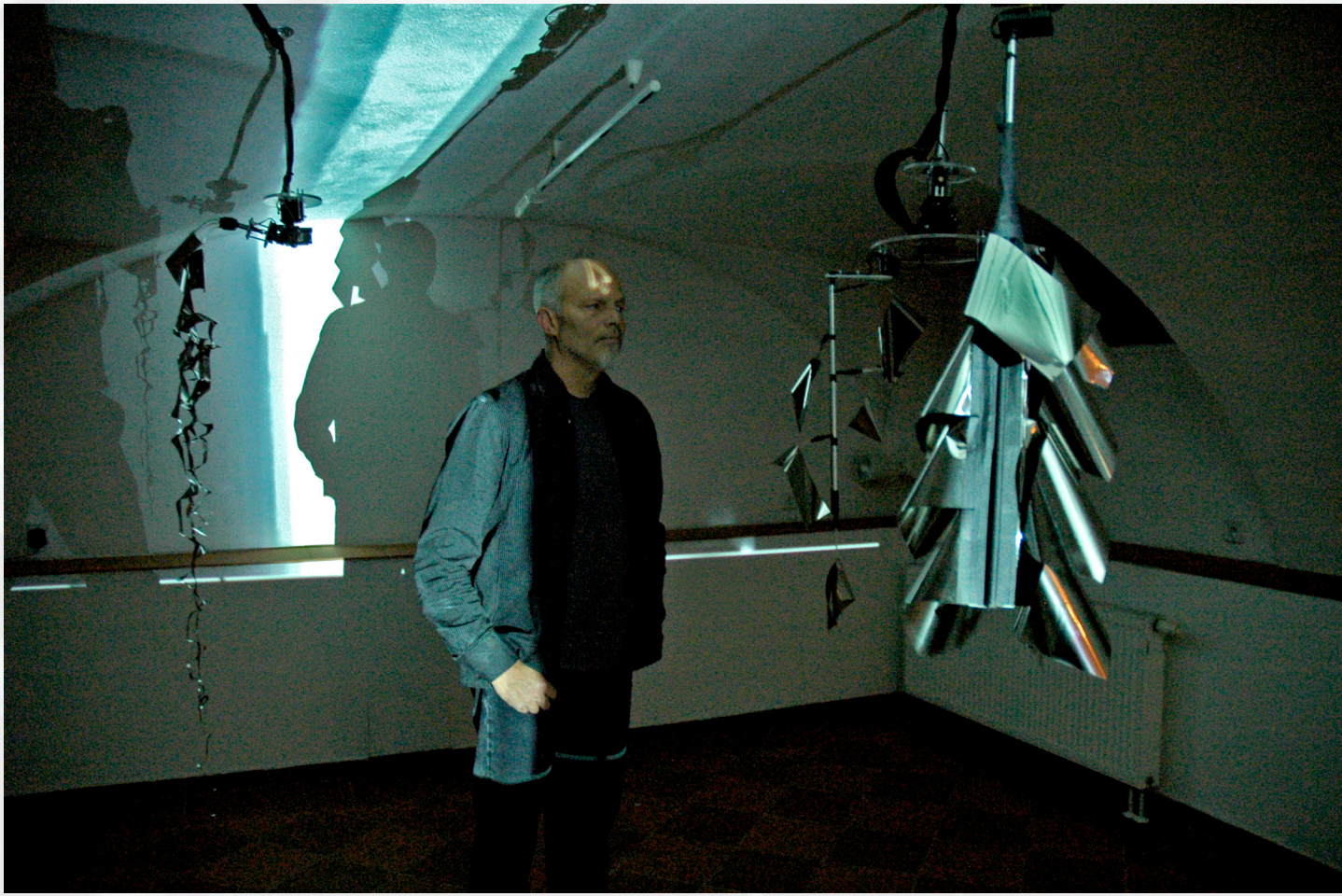
The film projection ends with a 3-D type effect of the diver's body appearing to push out of the screen into the room, before abruptly returning to the first image, which was at the outset perceived as the sky.



Ferrofluid spiking when the rare earth magnet pulses up toward it.

place finger in sensor
vložte ukazováček do senzoru





MÍSTNOST 3 [ROOM THREE] SOLID • SURFACE • MIDI • DRIPS

The third and final room was divided into two separate spaces that were connected by an archway. Several robotic speaker sculptures hung from the ceiling of the larger space. Projected onto the robotics was a video

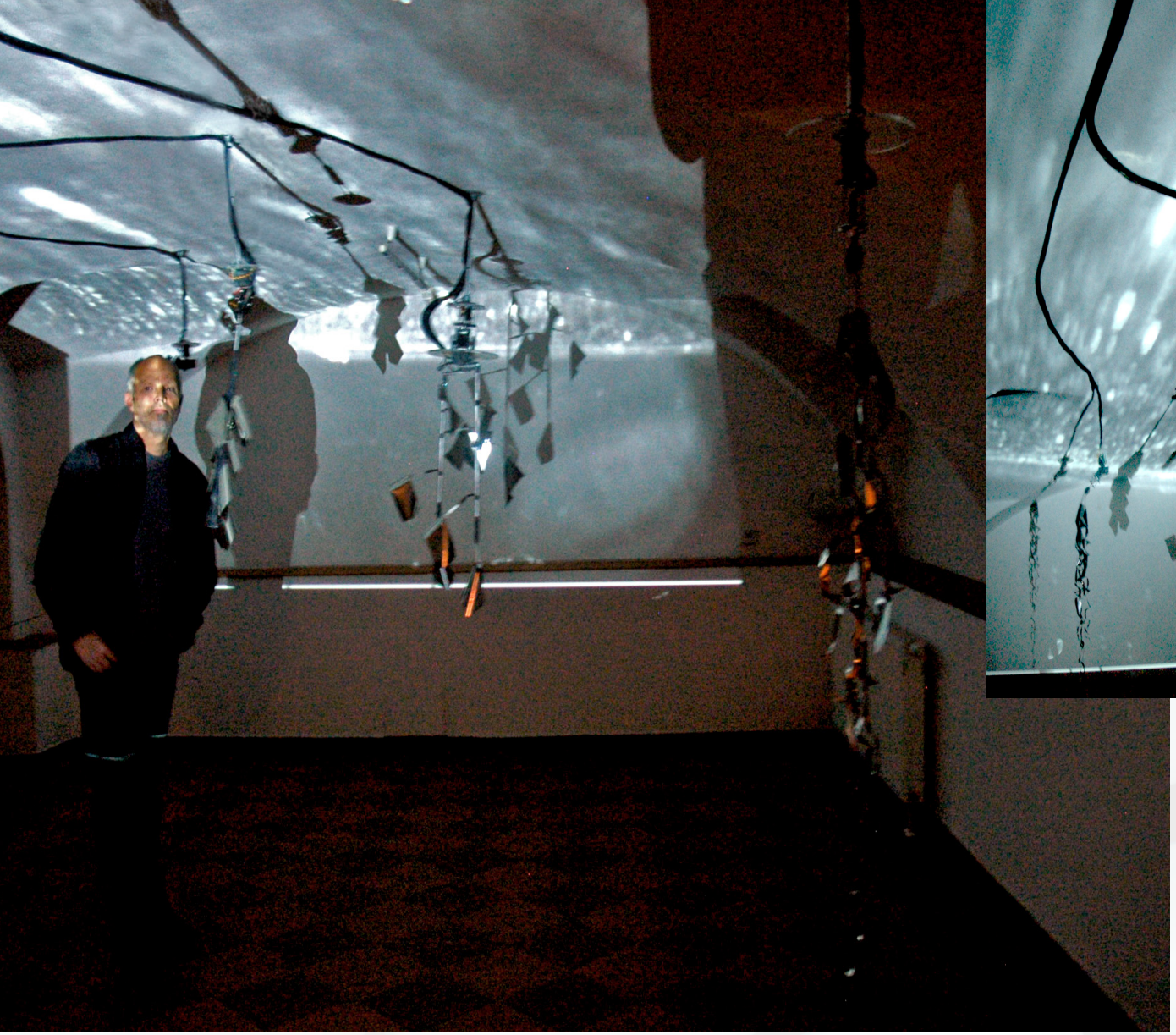
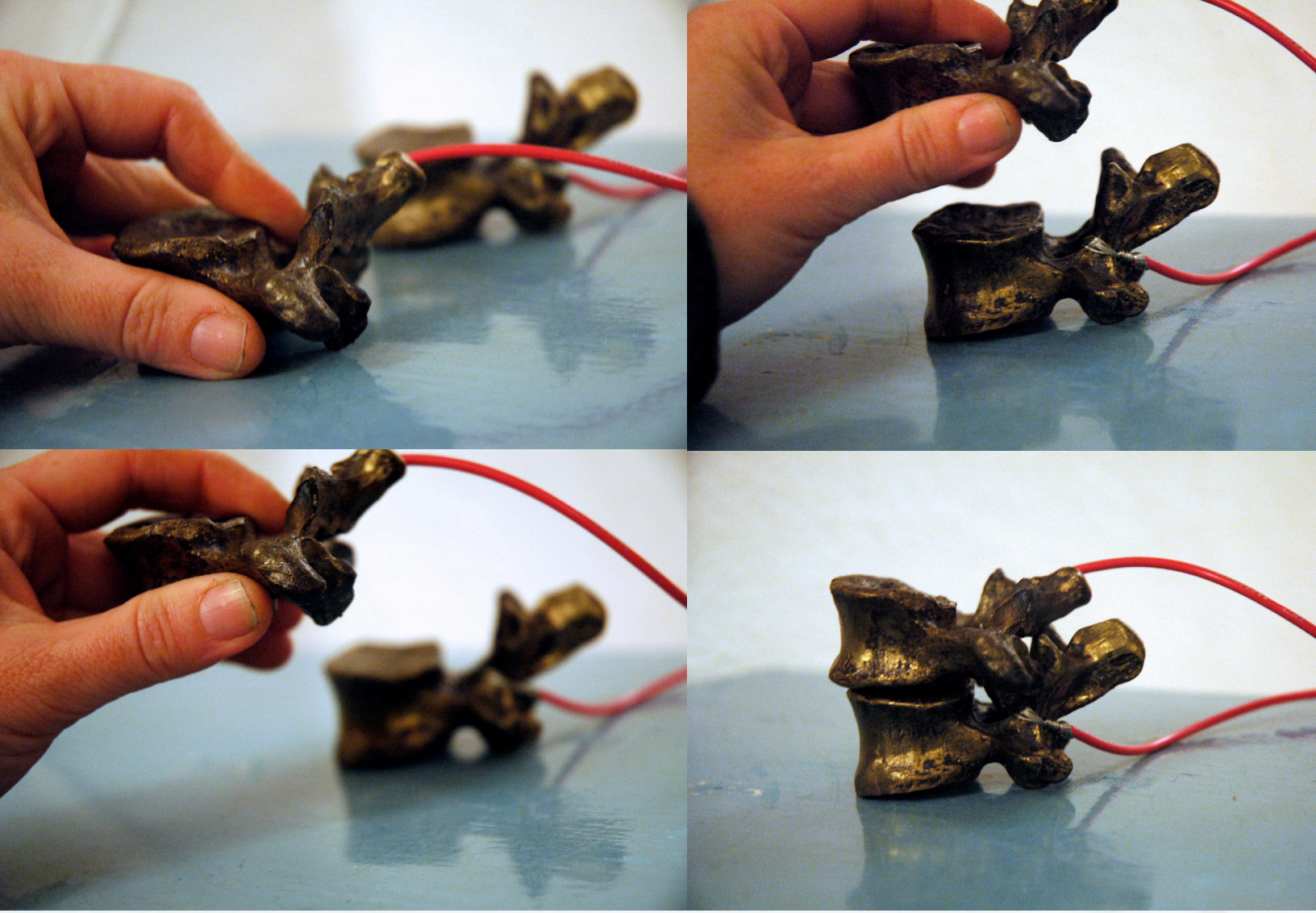


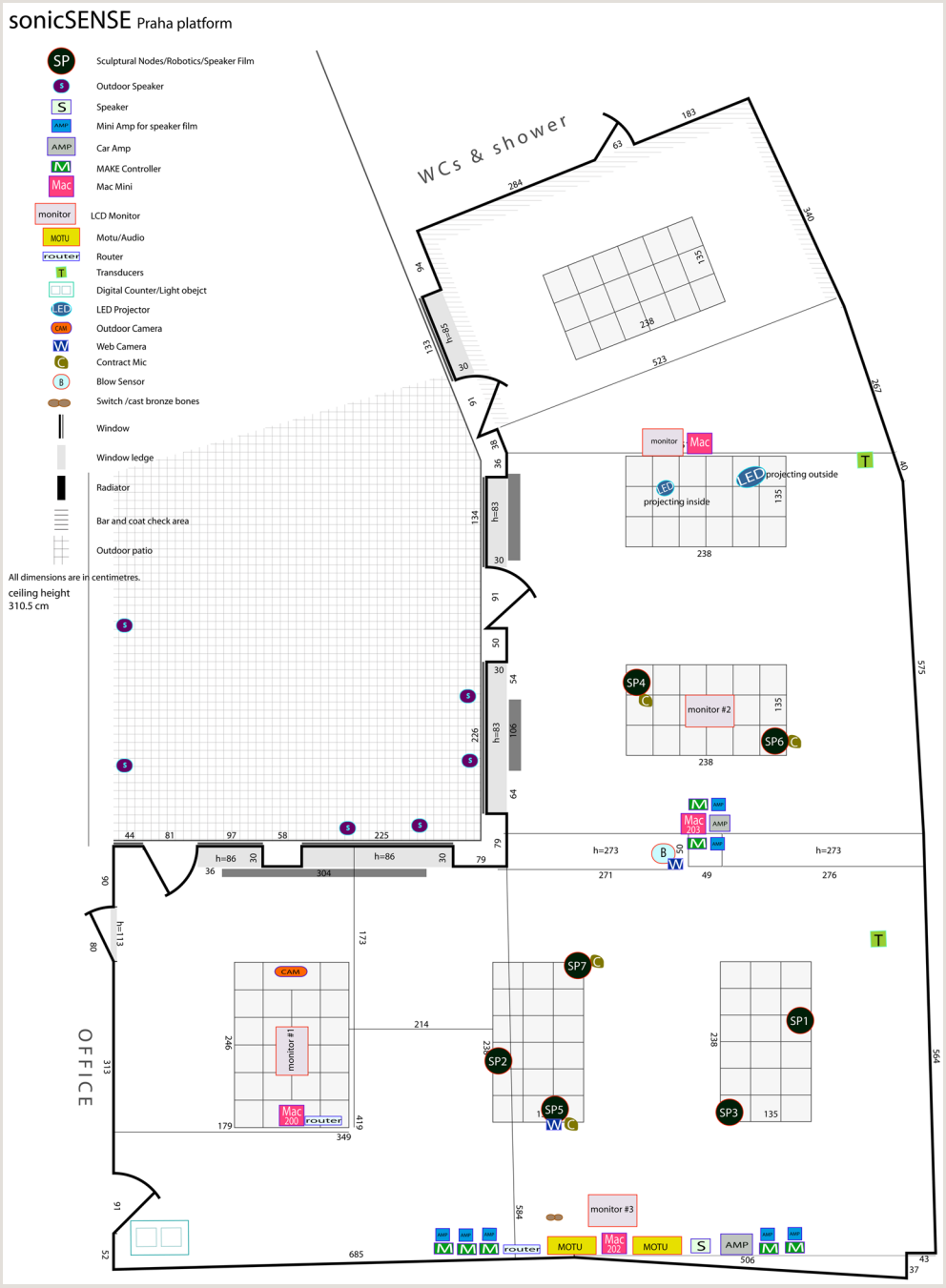
image of water filmed at the very surface level to expose a horizon line of water. The projection was reflected off of the hanging robotics which bounced the light around the room. In the smaller space was a water drip



system activated by the viewer placing two cast bronze vertebra on-top of one-another. When the viewer did this, a series of drips were released into buckets below. These drips were triggered with MIDI sound files to choreograph the motion of the robotic speaker sculptures hanging from the ceiling in the larger room. While also delivering a note from the MIDI file for each drop dripped.

SONICSENSE V. 1.2 POLLUTEDSENSE 20.03.2009 - 03.04.2009

GALERIE ŠKOLSKÁ 28 ŠKOLSKÁ 28 110 00 PRAGUE 1, CZECH REPUBLIC



right,
Floorplan of sonicSENSE components at Galerie Školská 28, Praha

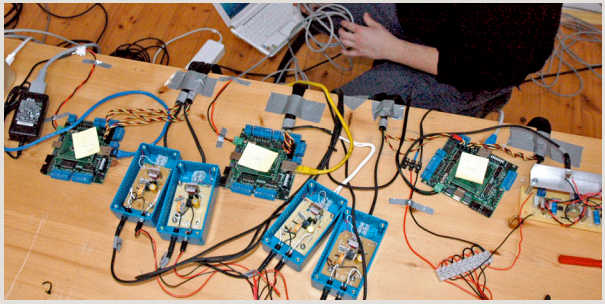
opposite lower,
meeting with participating artists Michal Kindernay, Ales Zemene, Guy van Belle, Jakub Hybler, and Michal Cáb. and galerie director Milos Vojtěchovsky

opposite upper,
Mini Amps for robotic speaker sculptures and MAKE boards

Školská 28 Galerie director, Milos Vojtěchovsky visited the sonicSENSE exhibition at Galerie Califia after inviting Parker & Haynes to speak about their project at FAMU: Film and TV School Academy of Performing Arts in Prague, Czech Republic. Consequently Mr. Vojtěchovsky invited Parker & Haynes to exhibit sonicSENSE at Galerie Školská 28 in March 2009.

The sonicSENSE exhibition opening was scheduled to coincide with the *COOP conference for Intermedia Research & Study Network: Physical Computing, etc* at the Institut Intermédií in Prague. This permitted Parker & Haynes the opportunity to collaborate with conference participates and open the sonicSENSE platform to other users. Mr. Vojtěchovsky created a sonicSENSE workshop wiki on-line for students and participating artists to collaborate with Parker & Haynes to create a new version for the Školská 28 exhibition. The the site-specific theme of *pollution* was chosen after a series of conversations and discussions between the artists.

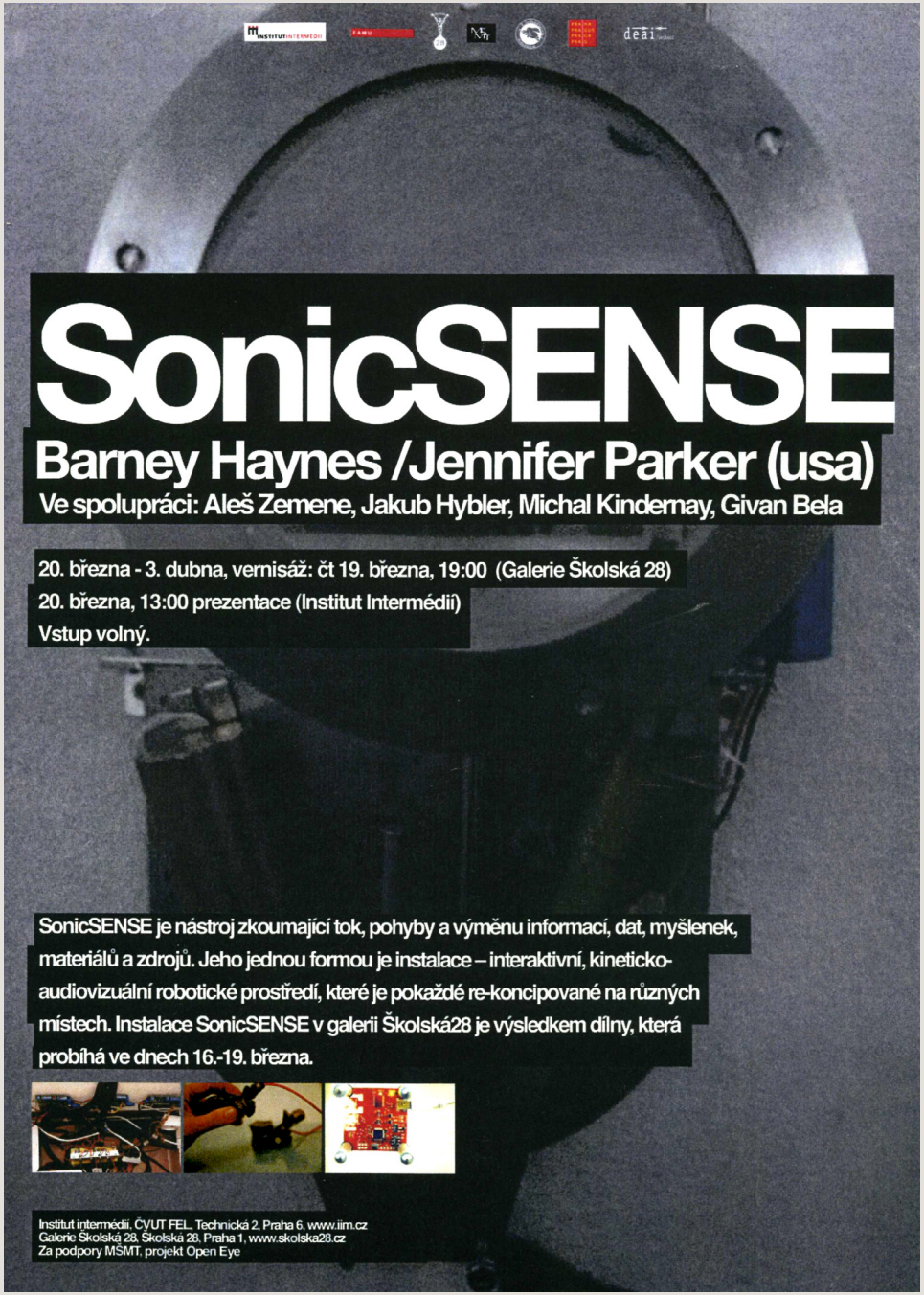
Choosing one theme for the platform that was both broad and site-specific permitted the possibility of



unification by the contributing artists visually, programmatically, and conceptually. More ideas and suggestions were thrown around on the wiki but it become clear that meeting in-person to coalesce our individual concepts and ideas was essential. So for four days prior to the opening the collaborating artists: Michal Kindernay, Ales Zemene, Guy van Belle, Jakub Hybler, and Michal Cáb brainstormed with Parker & Haynes to develop physical components and programming ideas for sonicSENSE. The concepts that emerged were *air pollution*, *noise pollution, light pollution* and *wifi pollution*. These were arrived at as suitable problems to solve both visually and programmatically for the platform. Parker & Haynes at this junction acted more as facilitators or conductors focusing on the contributing artists abilities to physically and programmatically *play* sonicSENSE. Parker dealt with the installation and connectivity of the physical components as well as the aesthetics of the overall installation while Haynes worked to unify and assemble the software programming so that the physical components could respond to the programming and interactions of the viewers.

Images left to right: Barney Haynes, *plugging in electronics* | Guy van Belle, Michal Cáb & Jakub Hybler *programming/sitting in chairs* | Ales Zemene, *programming in the office* | Barney Haynes & Michal Kindernay *sitting & programming* | Jennifer Parker, *assembling speaker sculptures* | Ales

Loziaktists, *standing on ladder adding finishing details* | Michal Cáb, *sitting & programming* | | Jennifer Parker, *solding electronics* | Barney Haynes, *programming* & Jakub Hybler, *gathering supplies* | Michal Cáb, Michal Kindernay & Guy van Belle, *programming at table* | Ales Zemene, *programming*

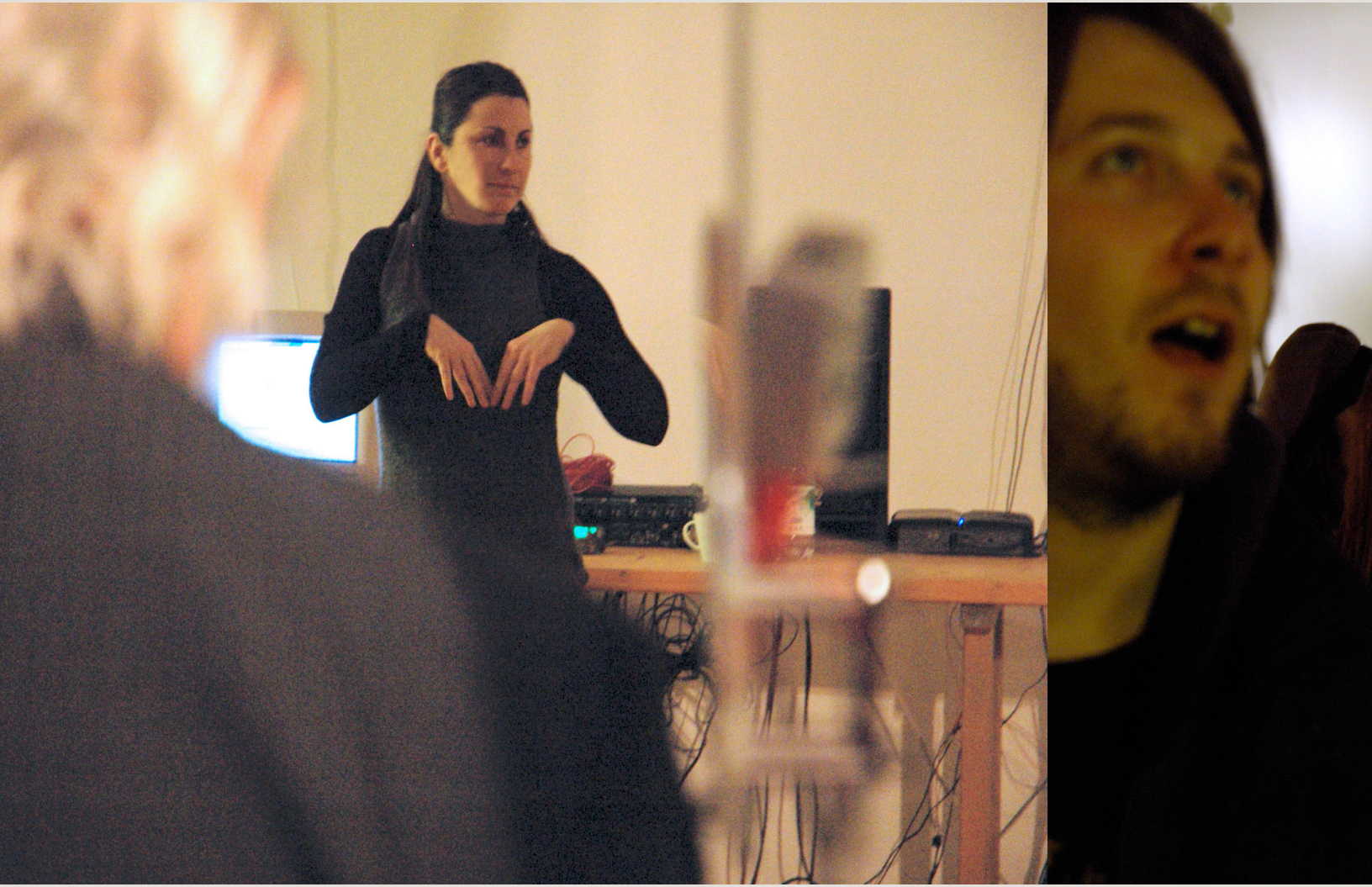


left,
Poster announcement
for the exhibition at
Galerie Školská 28

This is an image of the exterior view of Školská 28 Galerie at the opening reception of the sonicSENSE exhibition. Jakub Hybler's *Illuminated light* projected through the interior galerie skylight on to the adjacent building. The color of the light shifted in accordance to visual and audio data collected in the interior and exterior spaces around the gallery via webcams.

In this image, Školská 28 Galerie director Milos Vojtěchovsky introduces the sonicSENSE exhibition & platform concept to visitors gathered at the opening reception. Ales Zemene's *Digital Counter/Light Box* (in upper left-hand corner) displayed the number of wifi signals or wifi pollution picked-up in the space. It had been

determined early on that there were never more than 9 wifi signals at one time. The buckets that had previously collected water drops in the Galerie Califia exhibition were turned upside down to pick-up the sound of the viewers footsteps from contact microphones glued to the bottom. This sound was then digitized and

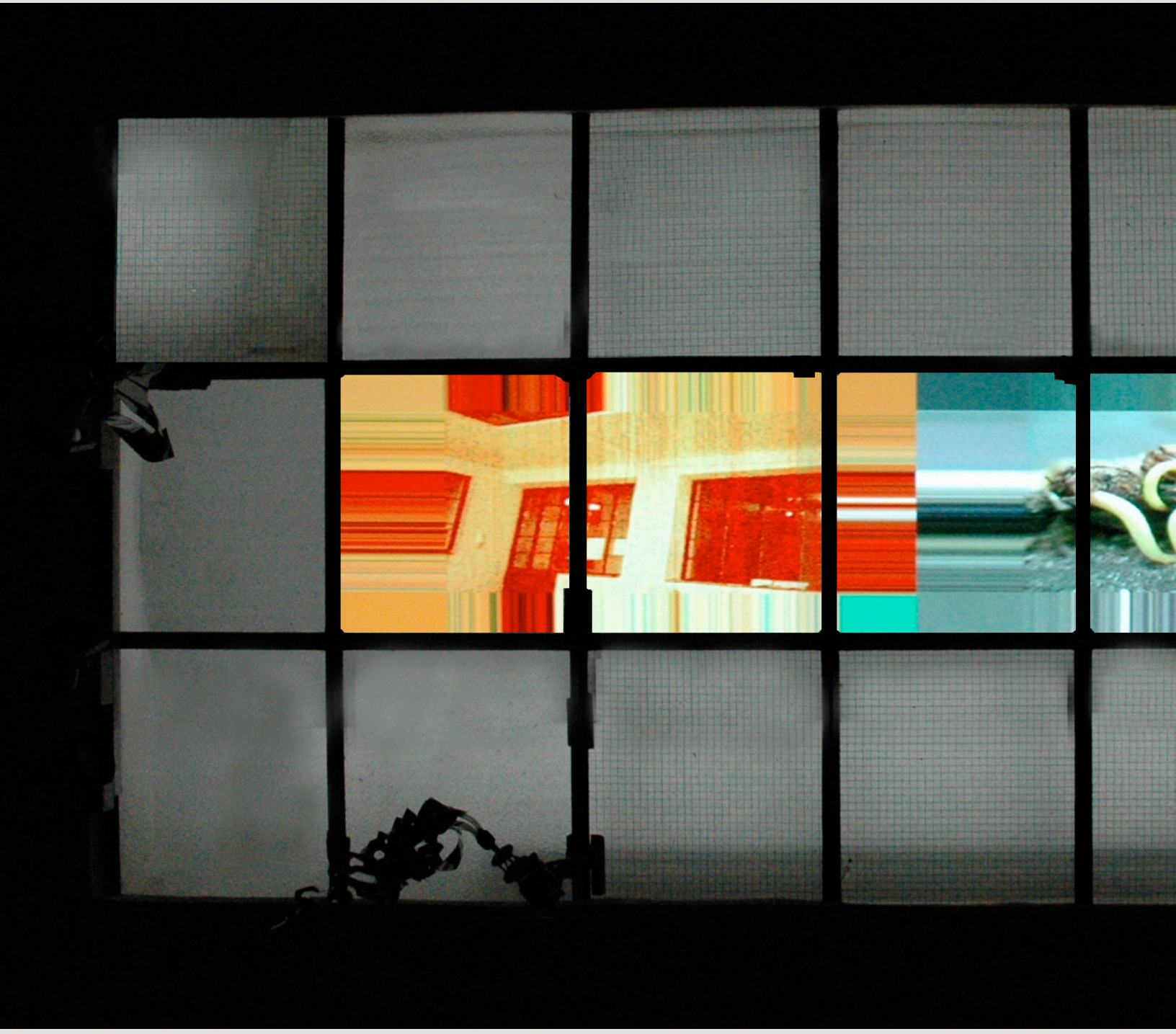


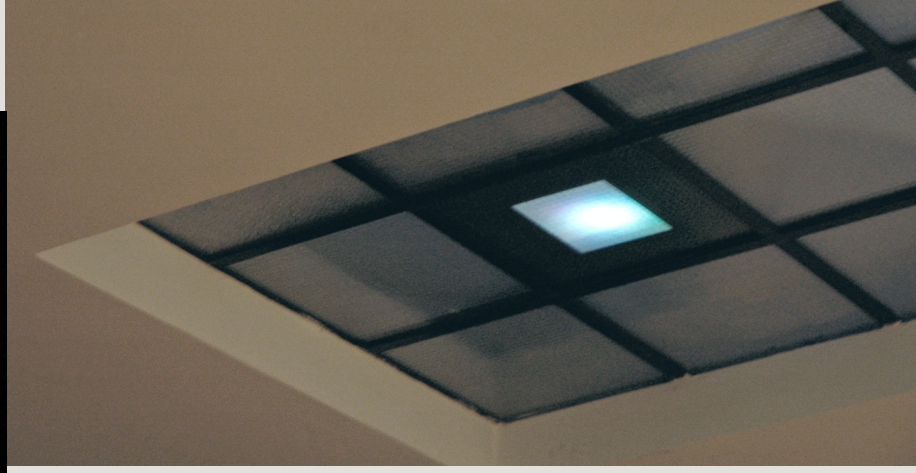
combined with local air pollution data mined from a Czech Republic government web site by Barney Haynes. This sound patch was one of several patches driving the hanging robotic speaker sculptures to generate both sound and movement. When gallery visitors realized that they where interacting with the robotics when walk

ing around the space they would often tap or kick the buckets to accentuate the robotics sound and rhythms. Jennifer Parker (far left) and Barney Haynes (right) explain the process of their collaboration and the theoretical construct of the installation to viewers at the opening.

Guy van Belle, a contributing artist from Belgium, created sound patches for the robotics using digital bells and chimes with statistical analysis of noise pollution data collected from inside and outside of the gallery. These sound patches played intermittently with sound patches developed by Barney Haynes from the Prague air pollution data and the contact microphones placed directly on the hanging speaker robotics. The parameters of the sound patches changed when viewers interacted with the installation.

When a viewer blew on the the breath sensor for instance, one of the robotics would stop playing and move and generate new sound according to the humidity data collected in their breath. The cast bronze vertebra switch and movement of viewers in the space also shifted the movement and sound of the robotics depending on the image and sound data collected.





With so much natural light coming in from the beautiful galerie windows and skylights it made more sense to use flat screen monitors to display visual data. instead of the data projectors used in the pervious installaiotn.

Parker replaced glass panes in two of the skylights with flat screen monitors to highlight the skylights and emphasis them as the “divisional space” separating the interior from the exterior. The image on the left was created by Michal Kindernay. Michal placed one webcam on the roof of the gallery next to a tiny seed that had recently sprouted and one webcam at the entrance of the gallery. These live-image-feeds were juxtaposed one another and processed with software to create a relationship on the flat screen monitor mirroring the exterior image data with the interior image data collected inside the gallery.

The above image is Jakub Hybler‘s *Illuminated light* brought back into the gallery for viewers to watch the projection on the adjacent building.

right, Galerie viewers visiting the exhibition.

opposite; The sonicSENSE platform plyaing on its own.

SonicSENSE Material Resource Links & Information

Max/MSP/Jitter http://processing.org
Authoring Application used to program the installation

Processing http://www.cycling74.com/
Authoring Application used to program the sonicSENSE index page. In the not so distant future it will be used as a web interface to the installation.

MakingThings http://www.makingthings.com
Interface controllers used to actuate the robotic speaker sculptures and acquire sensor data.

SparkFun http://www.sparkfun.com/commerce/categories.php
Many Sensors were purchased here including the weather station used to control the blow room.

Heart Monitor Schematic http://www.sparkfun.com/commerce/categories.php
We ended up just building the heart monitor section and connecting it the Make Controller. We used the 5 volt supply from the board. Make sure you use a highly regulated power supply to power the Make board.

The heart monitor is one of the many elements that mines data in sonicSENSE. In this case its bio-data originating from the viewers rather then the internet. We did this so we could interweave realtime vital signs with data that is distant and abstract. In V1.the beat it detects is used as percussion. The sound of it can be heard throughout the entire installation. In other rooms it is perceived as muted sycopation. In the liquid room it is almost overwhelming reminder of personalized mortality. We also wanted to visualize each heart beat but wanted to achieve this sculpturally rather then digitally. We decided to use ferrofluid and a rare earth magnet mounted on a piston. The ferrofluid is modulated and shaped by the magnet as it is oscillated by the solenoids.

Allied Electronics http://www.sparkfun.com/commerce/categories.php
If your interested in making the heart monitor this is where we found the equivalent of the Orp 12.

Al Lashers Electronics http://www.allashers.com
Great Electronics store in Berkeley with an knowledge and exceptional staff. They will help you with your projects rather then meting out the usual hazing.

Electronics Plus http://www.electronicplus.com
Another good electronics store in San Rafael. We found the transformers needed for the speaker film there.

HSC Halted Electronics http://www.halted.com
Yet another gem in the Bay Area for electronic supplies. They traffic in surplus and new components. The solenoids used in the ferrofluid sculpture were found here.

Educational Innovations http://www.teachersource.com
Source for ferrofluid used to visualize the action of the heart monitor in conjunction with the data projector in the water room.

K&J Magnetics http://www.kjmagnetics.com
Source for Rare Earth Magnets activates the ferrofluid.

Measurement Specialties http://www.meas-spec.com
We used the speaker film for a number of reasons. Two of them pertain to this project. One, because it only outputs high frequencies. Two, because of it's materiality and pliability as sculptural skin, especially its reflective properties.

Transducers http://www.baudline.com/erik/bass/tactile_report.html
This is a link to a Tactile Transducer Comparison site. We are using the Rolen Star Audio Transducers to emit sound that can be felt but not heard. We also purchased the ButtKickers but they and the power amp were too heavy to bring to the shows in the Czech Republic. They will be integrated in the project when the piece returns to California.

The intent behind using the speaker film and the transducers was to create sound nodes that

exclude almost the entire range of audible frequencies delineating an aural penumbra. By isolating these frequencies the sounds become tangible with the transducers and more visual with the speaker film. Thereby amplifying the meaning of the title for this project, sonicSENSE.

ServoCity http://www.servocity.com
Pan and Tilt hobby servo motors and mechanisms that actuate the sound nodes. They also have a good selection of gears, and small mechanical parts. They also make linear actuators that we can't wait to get our hands on.

We mechanically animated the robotic nodes to accentuate the speaker film's unique qualities. When we received the first sample we proceed to bend, cut, and mutilate the material exploring how the sound could be physically altered. A Doppler effect could be created by bending and folding it into itself. Cutting it into interesting shapes seems to diffuse the source of the sound. These experiments led to the current design.

Boss Robot Hobby http://www.bossrobot.com
This is a convenient source for hobby servos the East Bay. If they don't have something you want they can order it and have it there the next day.

Wind Data Stations Site that is parsed extracting wind speed and direction. This data drives the movement of the sound nodes in the vapor room. http://sfports.wr.usgs.gov/wind/Stations.

MIDI music files http://www.mididb.com/
Midi files are used to choreograph the motion of the sound nodes in the Icicle Room. We are using MSP's detonate object to "play" the midi files. Each note is triggered, one by one, by the sound of the drips. Contact mics are affixed to the bottom of the pitch to kinetic distance. The note values are also sent to a MSP object that converts them to frequency values. These are sent to a tone generator to create crunchy, fuzzy beeps and pops. The duration data in the midi files is ignored. Each note lasts 30 milliseconds or less. This to emulate urban soundscapes where ring tones, activating car alarms, and assorted chirps of personal electronics interrupt and punctuate cognition.

If the drips are close together one can almost recognize the song, but that is not the intent. The idea is to use the inherent structure of the music to provide deterministic patterns within the movement of the nodes rather then producing random gestures. The idea of using dripping water was inspired by Fluxus performances. We wanted the timing and rhythm of the nodes to be caused by a physical phenomena rather then digital techniques. The digital in this case correlating with precision beats and measures found in most forms of music.

Audio I/O We are using the Motu 8pre Firewire and the Motu 828 mk3 for audio input and output. To capture the sound of the drips we use the 8pre. The 828 is used to output to the icicle nodes. This may seem like overkill since contact mics and severely attenuated speakers don't fully maximize the Motu's capabilities. When purchasing these we decided that we wanted to maintain flexibility in the design of the sound platform for future iterations. As the maxim goes its better to start off with too much than too little.

Mac Mini So far these computers have worked great. They were especially easy to integrate into the installation. In other words they don't have an overwhelming presence.

Bowlin Equipment in Berkeley is a great source for metric and exotic fasteners.

Lots of hardware was purchased at Orchard Supply in Berkeley, Pastime Hardware and Tap Plastics in El Cerrito, California, USA.

Open Source

The sonicSense project deviates from the standard definition of open source in that it uses proprietary hardware and software. It does coincide in the following ways:

We are going to publish all code written for the project for other artists, scientists or musicians to elaborate on or use as a model for their iteration of the platform. We are also divulging all sources of materials and all the technology involved including electronic schematics to facilitate development.

While we prefer working with Max/MSP/Jitter and Apple computers we are not limiting development to these technologies. For instance, Open Source projects such as Processing, PD, Arduinos, and CPUs using Linux were used in the Prague version of sonicSENSE.

We are inviting artists to use the platform as they see fit. The hardware and software are modular and can be re-configured according to the aesthetic or technical criteria of the user.

Towards opening the platform the first step will be to develop a system where software can be uploaded into the sonicSENSE platform while it is displayed in galleries or conferences. In this way the installation will function like a wiki. Earlier versions will be archived and available so that visitors to the gallery can explore how the piece is developing over time. This process will be difficult but we are committed to working this out

During discussions with the next set of developers we outline the various aspects or bugs that we don't feel are fully resolved with the goal that they will improve or fix these issues.

When the platform is fully developed we are going to cede all components including the hardware and software licenses to the developers who have successfully contributed to the platform. The one caveat will be that they do the same when they are finished. In this way the platform will evolve in ways unimagined by Parker and Haynes. This method is more akin to the scientific model of publishing and sharing discoveries. We are deeply interested in furthering interactive work in general and the sonicSENSE platform in particular.

Furthermore, it would be disingenuous to claim that we are free of the desire for recognition and authorship. However that is the ultimate goal to shed those trappings in order to foster research and development rather then cling to notions of authorship and proprietary art work.

In conclusion the sonicSENSE platform is redefining what open source can be by applying it to art which is traditionally, with a few exceptions, a secretive enterprise where techniques are guarded in the interest of self aggrandizement and fame, not to mention profit.

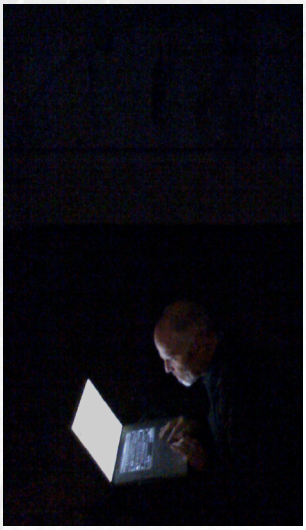
About the Artists: Barney Haynes | Jennifer Parker

Barney Haynes and Jennifer Parker have been working corroboratively on the research and creation of the sonicSENSE project since January 2008.

Barney Haynes is an artist and Media Arts Chair at California College of the Arts in San Francisco/ Oakland. Jennifer Parker is a sculptor and Art Professor at the University of California Santa Cruz.

Haynes and Parker each take an interdisciplinary approach toward their art making process.

Similar to Fluxus artists, Haynes and Parker are interested in what transpires when different media intersect. Each use found and everyday objects, sounds, images, and video merged with new media and performance to create innovative, often durational artwork. SonicSENSE employs a similar methodology only in this instance it is coupled with the desire to create an open source, communally interactive and reactive project that cultivates space for sharing, questioning, and exploring cross-disciplinary frameworks, methodologies, and experiences.



More information about Parker & Haynes can be found at their website:

Barney Haynes http://www.ultrafuzz.net
Jennifer Parker http://www.jenniferparker.net

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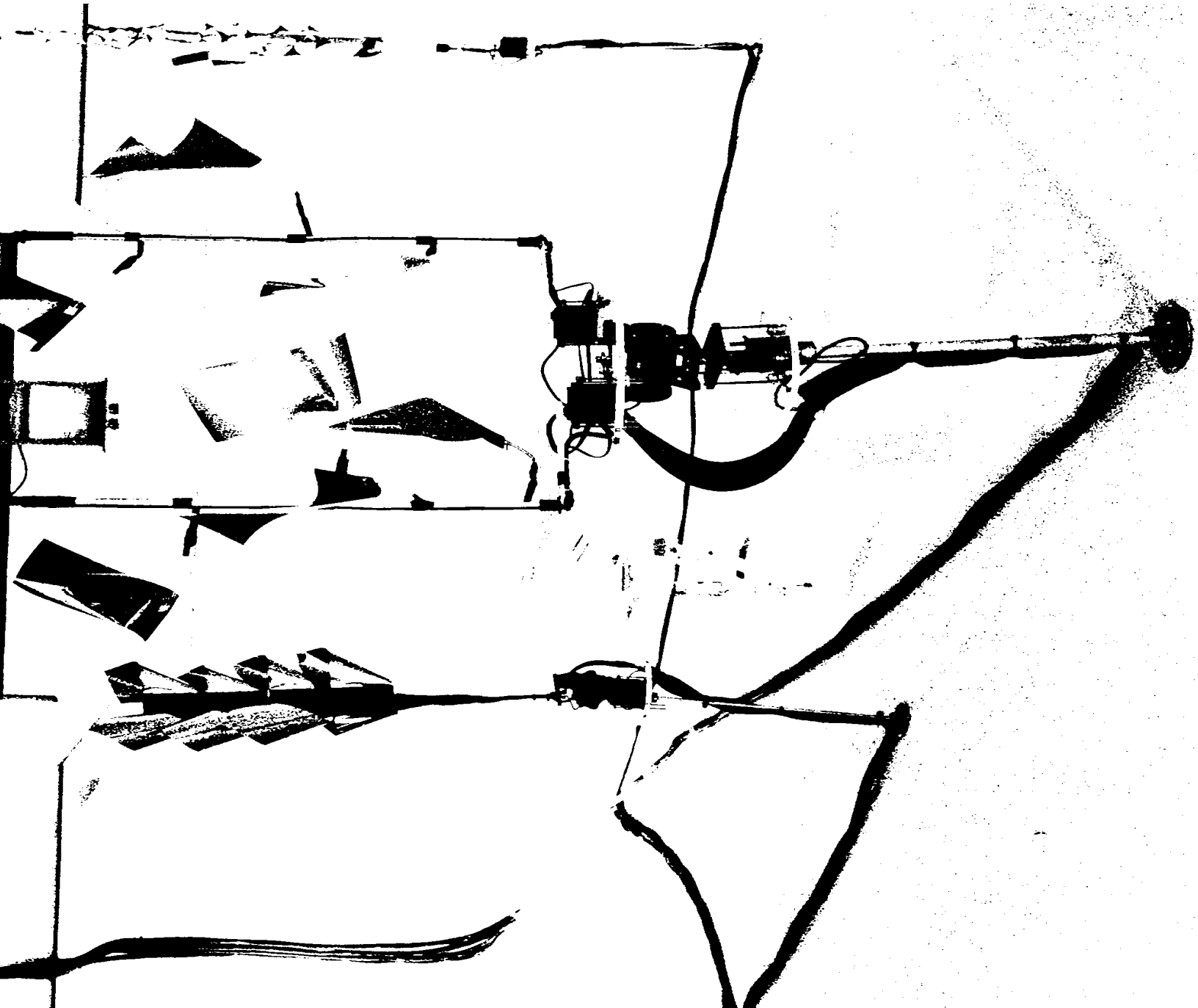

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