

Jutta Ravenna

## Body, Sound and Space

### On the concert installation *Rotation* with Leslie speakers

#### Translation: Elen Flügge

*At their own pace, people quietly traverse a room filled with sound and bathed in reddish light. There's a shimmering in the air. The sonic charge of the air can be felt as vibrations in the body and on the skin. Sound seems to come from everywhere. It ebbs for a moment, only to build up once more and spread out into different sound frequencies. As soon as lower tones emerge, their expanded amplitude is felt as vibration in the stomach region. The body becomes a resonance chamber.*

*Speakers rotate at various points in the space. It is possible to see, to observe how tones beaming out from the speaker's opening change direction as a rotary drum moves around. Visitors circulate, taking individual listening paths through the room, following sonic trails and encountering each other along the way.*

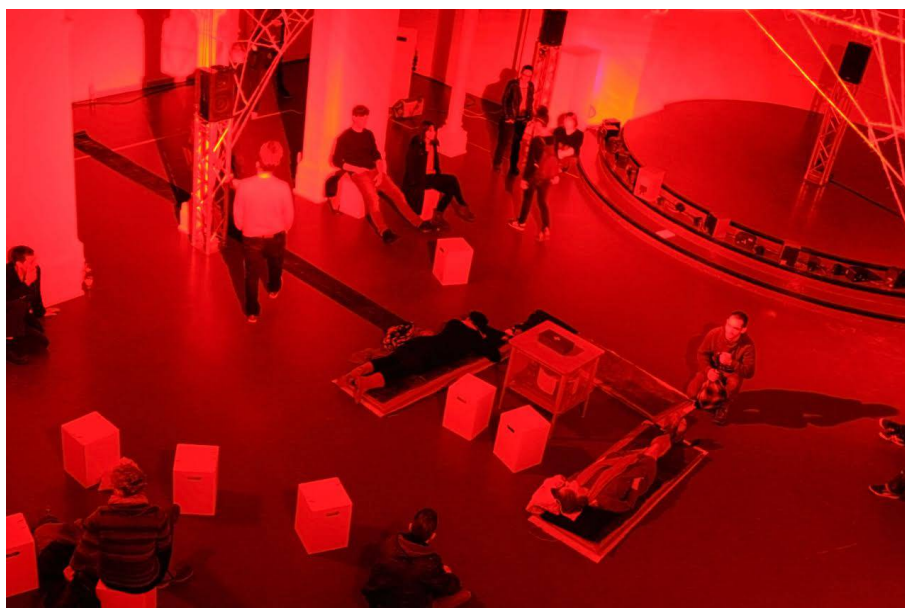
*Felt mats colorfully accentuate the room. Some visitors linger there, sitting and leaning against the wall, others take a reclining position.*

*Multiple reflections form due to the room's architectural features, and myriad sound waves rise successively higher into an ocean of waves. The sound streams, moving slowly with a volume that fills the space and continually changing frequency, seem to have no beginning or end. The few moments of silence allow the room acoustics, visitors' steps, or noise emitted by the old motors, to become audible.*

Above is a description of the exhibition of Jutta Ravenna's *Rotation* in the former chapel of Künstlerhaus Bethanien, Berlin 2015. This concert installation was realized multiple times. Below is a documentation of its emergence, based on various materials from different phases of its generation and exhibitions. This allows a peek into Jutta Ravenna's artistic process, aesthetic, as well as work context.

A video documentation of Jutta Ravenna's concert installation *Rotation* on 08/16/2014 at Ausland Berlin can be accessed online, Video: Conrad Noack, Sound: Jutta Ravenna: <https://vimeo.com/105331167>

Jutta Ravenna, *Rotation* 2015 © Conrad Noack



Due to the binaural audio version for headphones, the spatial listening cannot be reproduced in all the audio samples exactly as you could experience it in the sound installation.

Jutta Ravenna sees her work reflected best in the following quote from Philip Bethge:

At its core, music is pure mathematics – predictable air vibrations whose frequencies are superimposed by the rules of physics. And yet a kind of miracle occurs: mathematics transforms into feeling.<sup>1</sup>

### Concept *Rotation* (2014)

*The complexity of different points of sound observation in a space*

A space is prepared using multiple rotating loudspeakers, so called Leslies, placed on the floor, tables, walls and inverted on the ceiling. The listener is the agent of sonic variation. Walking through the space, sitting, lying, standing straight or in a crooked posture, as well as all kinds of different head and body movements, will foster a diversity of sonic nuances. This highly unusual listening situation is provoked by the positioning of the sound sources on the ceiling, tables or floor. Sound signals originating from different directions are altered by way of electroacoustical processing. Doppler effects caused by the rotation of sound sources cause acoustical beats. Moving away from the listener by rotating its source, a sound will have a lower perceived pitch. At the same time, the sound source nears the opposite wall, which thereby receives a higher pitched sound and reflects this sound in the listener's direction. This is happening all the time in all spatial directions.

A variation of this concept uses eight Leslie speakers in various groupings, two, three, four, up to eight at a time, different combinations producing different sonic mixes. The pure sound of the rotating resonance bodies is beautiful in itself, juxtaposing electromechanical (leslie speakers) and digital techniques (digital sound processing) as a work of art and at the same

time showing off a historical piece of technology. Four additional variations exist: rotating with sound, rotating without sound, motionless with sound and motionless without sound. Controlling rotation velocity adds yet more sonic variability. So the application of rotating loudspeakers effectively generates a very complex soundscape for the moving listener.

Named after its inventor, Donald Leslie (1911–2004), the Leslie speaker was originally developed as a sound effect add-on for the Hammond organ and was widely used in 1960s pop music productions.

### First Technical Development Phase

Software for eight sine wave oscillators, envelopes, randomization control and frequency pool (Version 2014).

[Translation of figure below]:

Incidence rate:

- All frequencies above 440 Hertz least common (ca. 15%),
- All frequencies above 160 Hertz second most common (ca. 30%),
- All frequencies below 160 Hertz most common (ca. 55%)

Frequenzpool-2

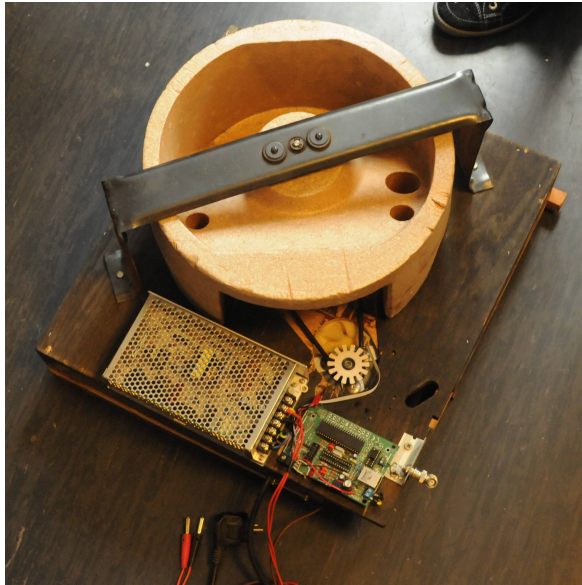
	A	B	C	D	E	F	G	H	I
880	879	739	558	522	466	387	324	275	255
887	710	698	523	390	460	380	298	255	255
623	690	655	519	277	454	369	266	131	131
415	655	622	360	261	416	349	261	106	106
400	493	587	349	195	410	266	139	72	72
391	472	523	260	190	358	274	132	70	70
360	466	520	266	138	329	251	92	69	69
327	415	311	174	130	240	184	87	68	68
220	400	293	138	105	233	175	81	62	62
207	391	230	130	95	208	144			
158	360	155	127	69	170	139			
164	355	146	87	65	164	133			
110	340	143	61		122	126			
107	123	108			105	95			
103	78	77			98	91			
75	61	73			82	86			
79	58				77				
55	52								
52									

Häufigkeit:

- Alle Frequenzen über 440 Hertz am seltensten (ca. 15%)
- Alle Frequenzen über 160 Hertz am zweithäufigsten (ca. 30%)
- Alle Frequenzen unter 160 Hertz am häufigsten (ca. 55%)

© Jutta Ravenna 2013

Equipment: 8-track interface, Max/MSP for sine waves and 8 prepared Leslies, 4 stereo amplifiers, 8 colored felt mats for listening, verbal scores, hardware and software: Jana Debrod, Angermünde.



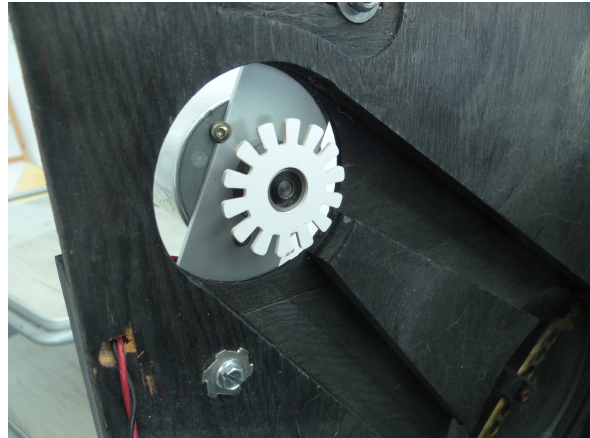
Converted Leslie speaker © Tomsaw 2016

### Further Technical Development

Originally, the rotary drum tempo could only be changed abruptly. You could switch between slow (about 70 r/min) and fast (about 350 r/min) motors. Later I revised the engine control, and since then each motor can be controlled via an interface and continuously varied. Different tempos can be individually programmed on a scale of 24 to 640 r/min using a randomization program with aleatoric elements. Thus, more tonal changes can arise simultaneously at different locations in space, especially during slowing and speeding of the fans.

The continuously variable control of motors and rotational speed is meant to allow for playful use of the Doppler effect. With this possibility, by means of computer control, the work could be enriched by sonic and temporal nuances. In this way, the rotating speakers could generate very complex sonic images for meandering listeners.

A new control circuit allows for precise regulation of tempo. The controller continuously measures the actual speed using an encoder that also includes the cog. Depending on whether the Leslie speaker is rotating a bit faster or slower than desired, the current to the engine is increased or reduced by the controller. According to a scale, each of the eight Leslies receives an individual maximum speed that can be infinitely varied.



Encoder wheel for regulating tempo variations © Tomsaw 2016

In addition to the pure tones, rectangular and sawtooth waves are used, as well as noise.

Expanded Equipment: 8-track interface, Max/MSP, 8 converted Leslies, 4 stereo amplifiers, 8 colored felt mats for listening, verbal scores, hardware and software: Tomsaw, Berlin.

### Prepared Objects

By preparing the objects using tiny bits of cable, plastic strips and millet grains that hit against the rotating drums, the sonic image could be enriched with miniature percussive elements.

### Work Genesis

I like working with sounds that the listener must first discover. In *QuietNoises* (1994) and *Wingbeat* (2004) real and artificial animal sounds are mixed. In the former, extremely quiet high-frequency insect sounds are hidden in a tree trunk found in a meadow, in the latter, soft wing beats are hidden in the thick plants covering a facade. The listener is confused and wonders whether the animal noises come from speakers, or the insect sounds come from the tree trunk or the flapping of birds from the green facade.<sup>2</sup>

With the piece *Noah's Ark* in 1994, I was already focusing on space. "A slowly rising and falling water level is simulated. At first, the area around one's feet is flooded; the ankles are covered slowly with water.

Soon thereafter, the acoustic-water-level rises to one's chest, and continues in shifting waves over one's head: an underwater world emerges."<sup>3</sup>

Looking for circling sounds, I experimented in 2013 with different methods for achieving a rotation effect, i.e. circling sounds. First, I let a sound circulate slowly through space using eight speakers lying in a circle on the ground and later mounted on the ceiling as well. Then I tried to make speakers rotate mechanically, like the plate of a record player. As it became clear how complicated it would be to build a rotating loudspeaker myself, I fell back on existing Leslie technology from the 1950s. First I experimented with a solo Leslie, but soon began using several Leslies to enhance the spatiality of the Leslie effect and achieve more complex sonic results in the space.

At the same time as *Rotation* I was also working on developing another work that uses hand gestures to navigate and modulate sounds in space. Through two-handed gestures such as up, down, forwards, backwards and sideways, I wanted to translate circular, oscillating, and rectangular movements of the human body into sound. The sound would change in direction, pitch and timbre. For example, a parallel motion of hanging arms up and down would result in two pitches shifting like glissandi up or down in frequency. Or stretching out an arm would cause a static sound event, whereas climbing an invisible ladder with alternating hands should elicit isolated sound events in tonal skips. In *Rotation* however, it is more about the space itself, namely the physical appropriation of a specific area. A space is measured with the body, and particularly the ear.

Already in 1979, while studying at the Düsseldorf Art Academy, I learned about the work of former academy professor and sculptor Klaus Rinke, who worked corporally on a visual level with his time-space-body actions, beginning in 1969. In 1969 Rinke (born 1939) utilized his own body optically, staging it through postures or gestures in spatial contexts of floor, wall, corner, and interior and exterior architecture.

During the experiments that I conducted in different spaces while developing *Rotation*, besides the space itself, my body became the most important instrument. Room positions, postures, head movements, turns,

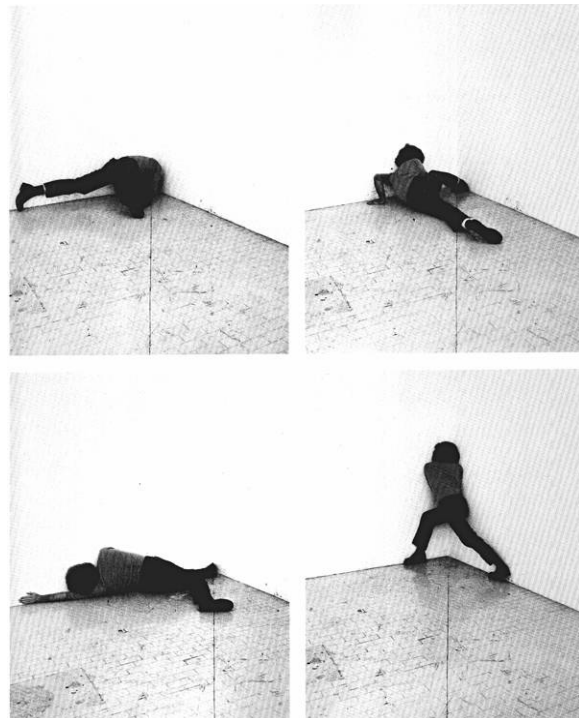
footsteps, and their sonic relevance were important parameters for modulating sound. Localizing sound sources played a significant role for aural orientation in the space. The related perception of sonic phenomena, such as localization and the beating or interference sounds temporarily emerging at particular points in the space, became the subject of the work. These and similar forms of exploratory hearing are already present in some of my earlier work.

I wanted to give these experiences that I had while developing *Rotation*, of the interplay of body and space, over to the listener as well.

In order to provoke new listening situations, listeners can find verbal scores distributed at various points on the walls.

While developing my work *Rotation*, and studying spatial protrusions, curvatures, boundaries, edges and corners through aural experience, I was reminded of Rinke's body work. This led to me to incorporate felt mats in the sound installation as a fixed sculptural element in order to provoke certain listening situations, as well as for optical orientation in the space.

See photos and verbal scores for *Modes* below.



Klaus Rinke, "Zeit-Raum-Körper-Handlungen" (Time-Space-Body-Transformations), in: Götz Adriani (ed.): *Klaus Rinke: Time, Space, Body, Transformations*, catalog Kunsthalle Tübingen, Köln: DuMont, 1972, p. 177 © Klaus Rinke. Courtesy of the artist



Fig. Modulor: Unité d'Habitation in Marseille © photo edited by Jutta Ravenna

In 2011, I attended the building complex Unité d'Habitation of French architect Le Corbusier, built in 1947 in Marseille. Le Corbusier (1887–1965) invented the “Modulor” system, based on the golden ratio and the Fibonacci series. He studied the proportions of the human body to apply them as a human scale in designing his buildings.

After that, I was intensively occupied with surveying space using body scale and its acoustic relevance in terms of direction, proportion and volumes. The visit to Unité d'Habitation encouraged me, two years later, to incorporate walking, sitting, standing or lying down, which can be used for surveying areas, with sound in my work. Generally these actions are so common that you hardly think about them. Thus, filling a room with sound and taking in continually new listening perspectives can lead you to notice and understand completely new aspects of those actions.

Finally, exploring interactions of body and space in my work *Rotation* was inspired by the research of French philosopher Maurice Merleau-Ponty, in particular his description of the relationship of body to space: “And finally, far from my body’s being for me no more

than a fragment of space, there would be no space at all for me if I had no body.”<sup>4</sup>

In connection to *Rotation*, these different influences gave me the idea of using the moving body as an antenna in space, to make the emergence and disappearance of sound phenomena such as Doppler effect, beats and interference, observable. While developing *Rotation*, I became increasingly aware of the inseparability of body and space in human perception.

Since architectural space is a constituent factor of this work, I would like to vary the room (strongly twisted niche-architecture, vaulted tunnel) in order to achieve new sonic results in different contexts.

### Interaction of People and Space

*In 1915 Bauhaus artist Oskar Schlemmer produced a series of tectonic drawings with a “homo” figure, reflecting the relativity of the human figure to numbers and geometry.*<sup>5</sup>

While one or more people move around or linger in the immersive sound, a temporary fabric is created in the listeners’ minds: a network of signals, echoes and feedback. The routes and lines in space are a part of the piece and a collaborative work of its listeners, which is not directed by anyone and which allows them to drift, following their own impulses through space and physically engaging in the actual room via acoustic experiences.

By localizing sound sources, the ear of the listener follows its own path in the space, encountering a shifting landscape of acoustic phenomena that temporarily build up and vanish again.

The nodes, waves, and valleys of sonic events are often only tangible for a few moments before they disappear, re-emerging elsewhere in the room. At the same time the body becomes a resonating chamber. On the quest for these nodes, waves, and valleys the body becomes a seismic instrument as head movements, turns, steps, varying postures and positions in space cause tonal changes. Used in a targeted way, they become parameters for modulating sounds. If the ear is distanced from the sound by horizontal movements of the head, the sound becomes lower.

See video: Right-left (head movement) below.

When rotating the body around its axis a dance tremolo arises from the rapid succession of loud and quiet in right and left ear. (See video: Rotating on one's own axis below.) The buzzing and whirring air is filtered by the auricle of both ears, such that the timbre changes in the rhythm of rotation. The timbre modulation intensifies depending on rotational speed and location. This becomes especially remarkable when standing at corners and edges.

The spatial-sound installation *Rotation* is concerned with acoustic laws of spatiality and with human scale. Space is manifested in volume, height, length, width and floorplan (form), lighting conditions, surface textures, material and room acoustics. A space is acoustically characterized by features such as reverberation time, absorption, sound diffusion through multiple reflections, sound amplification by volume, room shape and temperature, but also through a space's location and any interfering noise or mechanical vibration from the nearby sonic environment.

*Rotation* aims to make the emergence and disappearance of sound phenomena such as the Doppler effect, beats and interferences, tangible for the listener. The rotational movement of loudspeakers scatters sound waves exponentially in the room. Because of the high diffusion in this work, the arrangement of sound sources in the space plays a subordinate role. The sonic results of pulses from Leslie speakers reflecting on floor, walls and ceiling in the room, and the fixed, coded micro-interval frequencies that are connected to a randomizer, are unpredictable for listeners. They also never sound the same, influenced by the given room acoustics. This happens as a function of various factors such as location, posture, activity or passivity of one's own body. Rather than playing pre-produced sound loops, the sounds are newly generated at any moment using a controlled randomness-based computer program. There is no beginning and no

end, so a listener can immerse themselves in the atmosphere and leave again whenever they like. The time frame of individual sound events is programmed with an unusually long period of 30 to 560 seconds so that a calm timing dominates. The dynamics vary according to the density of sonic events and increases through phase shifts due to multiple reflections in an enclosed space over time. Longer pauses, which are programmed in, allow sound waves to subside and the silence of the room to be heard again. The pure room acoustics becomes audible.

### **Audio and video examples, Modes: verbal scores and exercises for exploratory listening**

Video documentation and audio examples of *Rotation* as well as preparatory studies can be found online. All following internet addresses were last accessed 12/31/2016.

<https://soundcloud.com/jutta-ravenna/rotation-1>

<https://soundcloud.com/jutta-ravenna/rotation-2>

<https://soundcloud.com/jutta-ravenna/rotation-3>

Video study Right–Left (Head Movements):

<https://vimeo.com/197425712>

Video study Rotating on One's Own Axis:

<https://vimeo.com/197544509>

Video study Diagonally:

<https://vimeo.com/197526639>

Video documentation: Jutta Ravenna *Rotation* (Ausland Berlin, 8/16/2014), video: Conrad Noack, sound: Jutta Ravenna: <https://vimeo.com/105331167>

**Modes**

- lying
- sitting
- walking
- standing

- Body and wall**
- Body and floor**
- Body and corner**
- Body and edge**

- stand towards the room
- turn your body to the left
- turn your body to the right

**Corner**



- stand with your face to the corner
- turn with your back to the corner



- stand upside down in the corner
- stand in the corner



**lie in the corner**



**Wall**

**Stand with the face close to the wall.  
Retreat one step from wall.  
Fall forwards the wall  
with your whole weight  
on both outstretched arms.  
Halt the swing shortly  
before the wall.  
Push away from the wall again  
with both hands. Listen.**



**- turn your head left**

**- turn your head right**



**Floor**

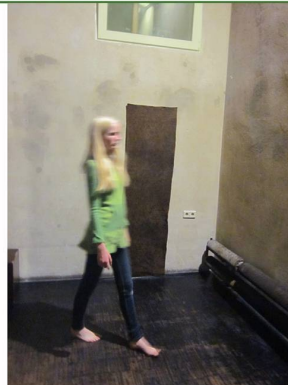
**Where wall and floor meet, lay on your side facing the wall.**



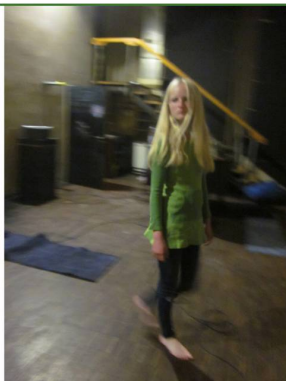
**Turn on your own axis into the room.**

**Point**

**Walk freely through the space. Search for a flattering or beating sound in the space. stand still to listen.**



**Try to remember the location. Leave it and come back to it again, going forwards or backwards.**

**diagonal - parallel**

**Walk through space diagonally or parallel to the walls. Walk while turning your head with movements alternately diagonal or parallel to the walls.**



**Rotation I**

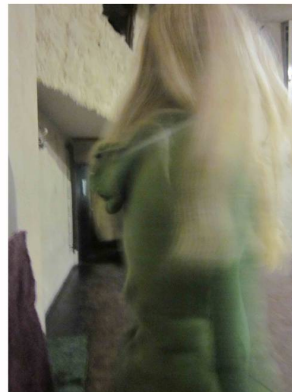
**Look for a listening point  
in the space.  
Stop to listen.  
Turn around your body axis,  
first slowly  
and then increasingly  
faster.**

**Rotation II**

**Walk through the space  
while slowly turning  
around your own  
body axis.**

**Rotation III**

**Walk through the space  
while slowly turning  
around your own  
body axis.  
Stop to listen.  
Change direction  
and keep going.**

**Rotation IV**

**Walk straight through  
space while turning  
your head alternately  
to the right  
and to the left.**

**Voice**

**Walk through the room.  
Perceive the tones in the space.  
While exhaling, sing with minimal deviation  
from the tone in the space.**

## List of Works (selection)

### 1989 *Klangrad* (Sounding Wheel)

Sound object for circling sounds: voice collage with original sound material of Hannah Höch from a letter to Kurt Schwitters

4 audio tracks, samples of vocal fragments and electronically altered voice, homemade miniature sampler

### 1991 *Klangstaub* (Sound Dust)

Concert for 16 vacuum cleaners

Sampler, pressure sensors, 16 audio tracks, homemade miniature sampler and Akai S 1000 sampler

### 1994 *Endlosglissandi* (Perpetual Glissandi)

Concert for seven domed hair dryers

Perpetual glissandi suggest the illusion of limitless tonal space by means of loops with a Risset effect: tones that rise endlessly up.

14 track-CD, loudspeakers in the head area, transducers (sound converters that produce vibrations) are installed under the seats

### 1994 *LeiseLaute* (Feld 1) (QuietNoises, Field 1)

Music for a tree trunk

Miniature speakers are hidden in a tree trunk. A sensor hidden in the object measures a listener's distance and activates extremely soft high-frequency insect sounds. On approaching the tree trunk, insect noises become increasingly dense, only to fall silent just before contact is made with the natural relic.

Sampler, ultrasonic sensors, miniature speakers, 8 audio tracks, interface

### 1994 *LeiseLaute* (Feld 2) (QuietNoises, Field 2)

Floating sound-buoys, installed on Rangsdorfer Lake, near Berlin

Delicate insect noises are emitted by buoys floating on a lake, the sounds were so quiet that they could not be heard from shore but only from boats on the water.

Circularly arranged sound-buoys prepared with speakers, 8 audio track CD

### 1994 *LeiseLaute* (Feld 3) (QuietNoises, Field 3)

Speakers hidden in tall grass, away from noise and clamor in an abandoned gelatin factory on the outskirts of Brandenburg

Loudspeakers, 4 audio track CD

### 1994 *Arche Noah* (Noah's Ark)

(Site specific work) Acoustic simulation of rising water level in a former shipyard

"On the various speed ratios of currents between water surface and ground."

The space slowly fills with water, starting at the feet and washing around the ankles. Soon the auditory water level climbs to chest height and continues into oscillating streams above the head: An underwater world emerges. 8 audio tracks, in the floor and walls arranged at various levels, hidden speakers

### 1995 *Daten-Klangfenster* (Feld 1) (Data-Sound-Window, Field 1)

Assemblage of translucent circuit-boards. integrated in the architecture of the church

Environmental Installation, location-dependent work  
Circuit boards, plexiglas, speakers, 4-track-CD

### 1996 *Daten-Klangfenster* (Feld 2)

see above

### 1996 *Daten-Klangfenster* (Feld 3) (Data-Sound-Window, Field 3)

Sonification of daylight

Daylight, shining through a church window, activates components of an installed data-window of green computer motherboards through photosensors. The sounds increase at various times of day, according to the intensity of light.

Circuit boards, plexiglas, loudspeakers, light sensors, reanimated electromechanical components, 8-channel-sampler

### 1996 *10<sup>n</sup> Operationen in 10 Stunden für die Sicherheit einer Stadt* (10<sup>n</sup> Operations in 10 Hours for the Security of a City)

Several electromechanical components on the boards are activated in regard to the distance of a listener and made audible as different fields of sound. By approaching the window, the visitor triggers sounds that overlay, becoming denser and then breaking off at the point of maximum intensity, emphasizing the stillness of the space.

Location-dependent densification 2

10 reanimated computer circuit boards, loudspeakers, 2 ultrasonic distance sensors

1997 *Chipmusic* (wall object)

Data-sound-wall with percussive, playable drum pads  
7 pressure sensors, 4 audio-tracks, sampler with 8 audio-channels, reanimated pieces

1998 *Hommage à Satie*

Sound column for the exterior space of the sculpture symposium in Berlin-Hellersdorf  
Motion sensors, EPROM memory

1998 *Daten-Hörweg*, Feld 1–3 (Data-Listening-Path, Field 1–3)

3 sound sculptures in interior and exterior space of the mathematics building of the Technical University of Berlin lead ever deeper into the "mystery" of the computer. Entrance situation towards exterior space. Transitory space in foyer. Mathematics building.

Translucent circuit-boards, plexiglas, loudspeakers, live feed sounds of students working in the computation hall on site, as well as 4-track CD with a mechanical synthetic concert on computer keyboard

Polyrhythmic, preprogrammed relay loops

1998 *Daten-Klangfenster* (Feld 4) (Data-Sound-Window, Field 4)

Permanently installed sound-sculpture, integrated into the architecture of the electronic studio of the Technical University Berlin

1999 *Die Neunte Säule* (*The Ninth Column*)

Interactive data-sound-column

Electro-mechanically generated percussive structures traverse the length of the object in rapid successions. Lines of sound run along the side of the column facing the listener: from base to top and down again. A com-

plex computer program varies the impulse density of the sound lines, their start and end points, as well as their speed and spatial distribution.

Circuit boards, plexiglas, loudspeakers, 4 motion sensors, 47 computer run electro-mechanical components (relays), 8-track interface

1999 *Binär* (Binary)

Interactive data-sound-sphere with photo cells, integrated in the architecture of the soundtower St. Pölten  
Circuit boards, plexiglas, loudspeakers, photo cells

2000 *Sonifikationsprojekt* (Sonification Project)

Sonification of photosynthesis data of living plants, data-sound-sculpture in a plant cocoon in cooperation with Fraunhofer Institute Berlin

Computer motherboards, plexiglass, speakers controlled by photo cells and motion sensors, realtime computational processes evaluating the shadow of visitors on a plant with sounding fluorescence-data during the photosynthesis process of a plants.

Motherboards overgrown with larger than life ivy

2001 *Nagelmusik* (Nail-Music)

Film-soundtrack for "Kollision" by Antal Lux

2002 *Emphatic Chairs*

4 sonic domes hair dryers with speakers at head height and vibrating seats

8 audio tracks, speakers at head height, transducers under the seat, CD

2004 *Flügelschlag* (Wing Beat)

Loudspeakers hidden in dense vegetation of the façade of the Märkische Museum

16 loudspeakers, hidden in vegetation, 16 audio channels

2010 *Speakers Corner*, Feld 1 und 2 (Speakers' Corner, Field 1 and 2)

Sound sculpture for a park

Speakers' Corner, one of the earliest phenomena of public democracy, thematized through sound art

8-track, 2 ring modulators, 3 microphones, old public address loudspeakers

2010 *Speakers Corner*, Feld 2 (Speakers' Corner, Field 2)

Embedded in the park, and later the Heinrich-Böll-Foundation grounds in Berlin, the sculpture invited chance passers-by to interfere in the sonic happenings by giving their own speech in the built-in microphones: actively transforming the auditory environment by superimposing their own vocal interventions

8-track-interface, Max/MSP, 3 microphones, old public address loudspeakers

2012 *Cluster*

Clusters of public address loudspeakers installed so that they seemed to have grown organically on the architecture in the courtyard of the historic alleyway district of Hamburg. Various continually-changing sound clusters emerged from the speakers, consisting of microtonally-layered pitches in flux. These microtonal intervals between pitches caused interference and beating. Site specific work

8 track interface, computer, old public address loudspeakers

2014 *Vox Humana*

Soundperformance for amplified solo voice from a subterranean speaker

1 Solo-loudspeaker, CD, soil

2014 *Rotation*

"The complexity of different points of sound observation in a space"

A room is prepared using multiple rotating loudspeakers (Leslie speakers), placed on the floor, tables, walls, and ceiling. The listener himself is the agent of sonic variation. Walking through the space, sitting, lying, standing straight or in crooked posture, also all kinds of different head and body movements will foster a diversity of sonic nuances.

8 Leslie-loudspeakers, verbal scores, felt mats, interface, Max/MSP

2015 *Pulsating Patio (Field 1 + 2)*

Soundfield, soundspace and soundline from decontextualized sonic spheres of two contrasting neighborhoods in the urban space of Berlin.

Interface, 16 loudspeakers, 16 audio channels

## Endnotes

1. Philip Bethge, "Die Musik-Formel" [The Music Formula], in: *Der Spiegel* (31/2003), p.130f., 136, translated from the original German by Elen Flügge.
2. Jutta Ravenna, *LeiseLaute*, cf.: <http://www.jutta-ravenna.com/installationen/leiselaute-feld-1> (Accessed: 8/29/2016).
3. Jutta Ravenna, *Flügel Schlag (Feld 1)* Installation at Märkisches Museum in Berlin, in: Catalog: Tilman Küntzel (ed.), *Stare über Berlin: Ästhetische Analogien des Vogelsangs*, Saarbrücken: Pfau Verlag, 2004; and Website: "Stare über Berlin. Ästhetische Analogien des Vogelsangs – Symposium, Ausstellungen, Konzerte", ed. by Tilman Küntzel (3–24 September 2004): <http://stare.info/katalog/jutta-ravenna-3/> (Accessed: 8/29/2016).
4. Jutta Ravenna, *Arche Noah*, text, in: <http://www.jutta-ravenna.com/installationen/arche-noah> (Accessed: 8/29/2016).
5. Maurice Merleau-Ponty. *Phenomenology of Perception*, trans. Colin Smith, Routledge: London 2005, p.117.
6. Friederike Zimmermann, *Mensch und Kunstfigur* [Man and Art Figure], Freiburg i. Breisgau: Rombach-Verlag, 2007, p. 267.

## Abstract

Actions like walking, sitting, standing or lying down are so common that you hardly think about them. Thus, filling a room with sound and taking in continually new listening perspectives can lead you to notice and understand completely new aspects of those actions.

In Jutta Ravenna's sound installation *Rotation* (2014) with circling sounds it is more about the space itself, namely the physical appropriation of a specific area. A space is measured with the body, and particularly the ear. The work allows studying spatial protrusions, curvatures, boundaries, edges and corners through aural experience.

## Author

Born 1960 in Düsseldorf, Germany, Jutta Ravenna studied visual arts and music in Düsseldorf and Berlin. As sound-artist, she works with visual and acoustical objets trouvés. On the border between visual art and music, she researches intermodal perceptual qualities between acoustics and visual themes, mostly with site-specific installations. Since 1994 examples of works in lakes, abandoned shipyards, a gelatine-factory, old churches and monasteries, radio stations and universities. Several shows in Germany and abroad, among others: Filmfestival Sao Paulo, Soundtower St. Pölten, Festival for Music and Light Berlin, singuhr audio-gallery Berlin, Villa Contarini Padua, Deutsche Telekom Berlin, Akademie der Künste Berlin. Ravenna is co-founder of the events "Klangkunst im Dialog" at Berlin Society of New Music.

<http://www.jutta-ravenna.com/en>

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