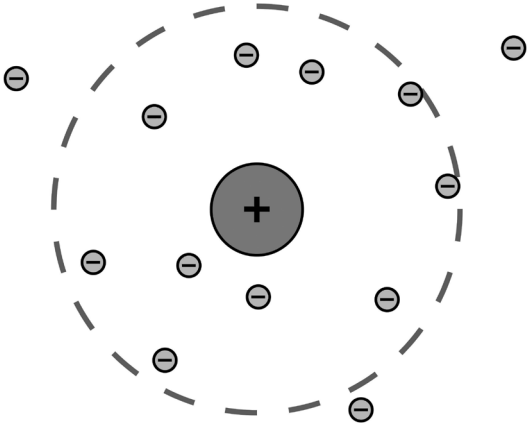
KUNSTHALLE EXNERGASSE | WUK

SCHALLWIRKUNGEN AUF MENSCH UND TIER



Schallwirkungen auf Mensch und Tier

An exhibition by Ingrid Cogne, Jonatan Habib Engqvist, Corina Oprea, Tobias Pilz, Elske Rosenfeld, Klaus Schafler in collaboration with Peter Böhm – Kunsthalle Exnergasse 6 July – 21 July 2016.

The physical effects of sound on humans and animals have been fairly well studied. Whenever discussing matters relating to sound and sonic experience, it is however clear that one always must make a distinction between airborne acoustics or sound waves and ultrasonic noise that travels through matter or a given environment.

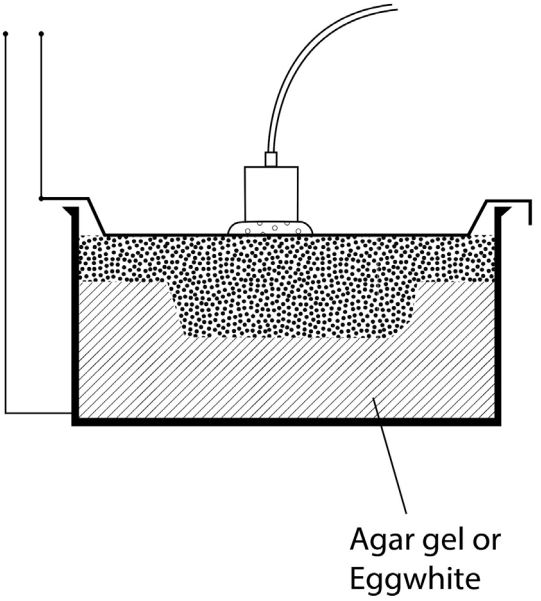
Following the human hearing curve, one can note that with sounds above a frequency range of 16 kHz the threshold level of hearing is dramatically increased and sound is neither perceptible nor harmful to the hearing organ. Several animals, such as bats, whales and dolphins, can however "hear" the register known as ultrasound. Not much research has been conducted on the physical and psychological effects on human bodies of sound that the human ear cannot perceive. Some theories claim that intensified exposure to high-pitched frequencies can affect internal organs, breathing rate and pulse. There are also suggestions that this is even more apparent in "sensitive" animals. As an example, sonic radar experiments in the Bay of Bengal have recently been proposed as plausibly connected to the increase of beached short-finned pilot whales off the coast of India. What clearly is problematic in these more speculative accounts is, however, that the actual deterrence and expulsion of ultrasound is disputed.

It is technically difficult to transmit this register of sound. A few years ago we made experiments with rats that failed. We also failed when we tried the experiments with pigeons. The economic benefits of a successful procedure could have been massive. We have thus considered other strategies, such as encoding warning cries and transmitting them through ultrasound, but have not yet followed up on these ideas. One can however assume that the rats would be tactically superior to humans in this regard.

One of the main problems of ultrasound is that of dissemination. The physical resistance of air concentration makes it difficult to conduct the sound waves. The second physical hurdle is material sound absorption, which increases with the heightening of frequencies, and in turn makes the transmittable range of airborne ultrasound relatively limited. One approach to overcoming this problem is to modulate ultrasound together with audible, lower-frequency sounds. Simply put, this entails the use of suitable amplifiers that transmit loud and quiet ultrasound embedded within a pulse of audible sound. This way one can create a wave of audible sound, "sitting" on top of an ultrasonic wave delivering a clearer focus. Nonetheless, there is a complex physical mechanism called acoustic radiation pressure that also has

to be taken into consideration. The effect of this mechanism is impressive. We once experienced sound emission of ultrasound modulated with birdsong from an acoustic parabolic antenna. One could focus and hear the bird as if it was very near by. In this way one might be able to create a placebo effect by using the illusion of 'audio-presence'. Furthermore, the exposure to acoustics emitted by ultrasound devices can provoke both hearing and "non-hearing" physical effects (such as thermal effects, subjective symptoms and functional changes).

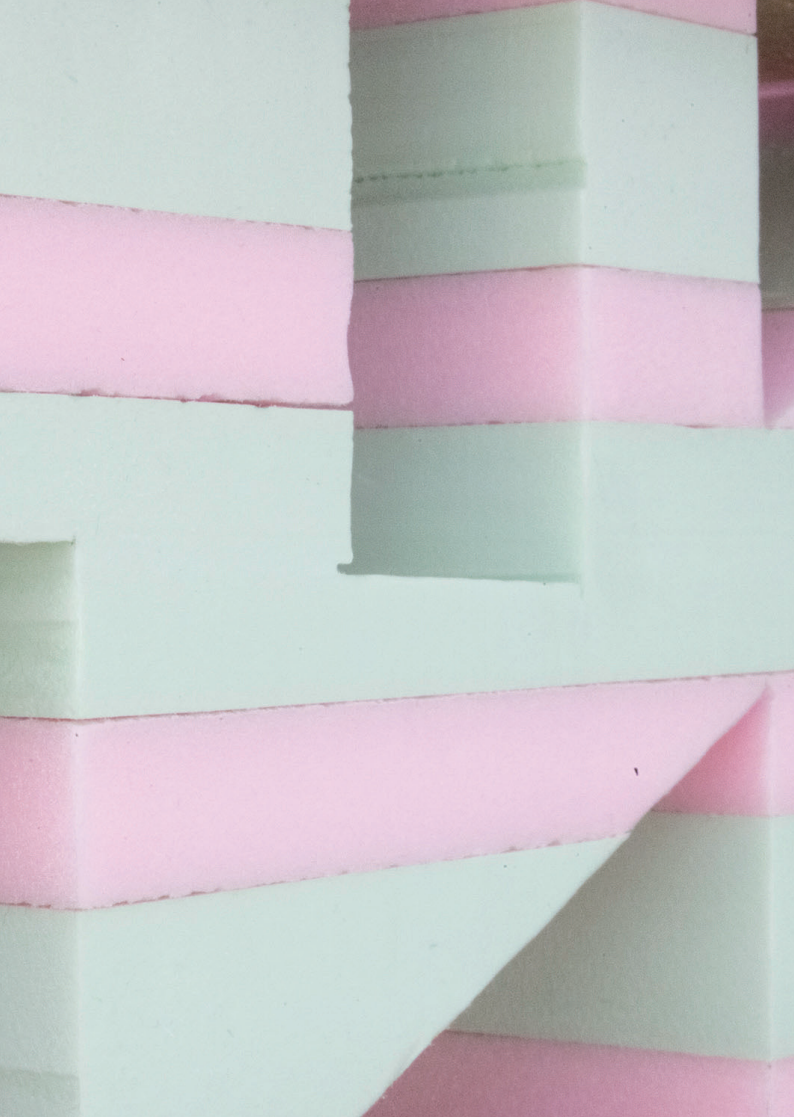
Shockwaves – a form of sound pulse that encompasses a higher pitched frequency - are also related to ultrasound. Americans were planning to build weapons based on this technology during the Vietnam War. Fortunately the attempts failed. This research has, however, led to technology like lithotripsy: a noninvasive device that pulverizes stones by focusing shock waves on a patient immersed in a water bath. Sound spreads much better in liquids than solids and therefore the effects are, so to speak, more efficient.The direct ultrasonic effects of air-borne ultrasound in humans and animals (including vermin such as rodents and insects) are widely disputed. As ultrasound falls within the range of non-ionizing radiation, the German Federal Office for Radiation Protection is currently investigating it.


Agar gel or
Eggwhite

In 2006 two spatial, architectural adaptations were made in the exhibition space of Kunsthalle Exnergasse (KEX).

One long sidewall, of approximately 26 meters length and with five windows, was revealed after removing panels which had concealed the entire wall and windows for many years enabling the hanging of artworks there. Instead, KEX acquired several mobile wall elements that could function as flexible spatial dividers, display elements and architectural features – or, once again, cover the windows when required. When standing next to each other, the elements have the same overall length (26 meters) as the wall where the panels had been removed.

These two major spatial changes and adaptations were also questioned in an accompanying exhibition project called UDAR-P [umbau display ausstellen re-position]. The exhibition responded to Kunsthalle Exnergasse's ongoing (re-)positioning and programme strategy debate regarding its role of being a space and platform for artistic production, presentation and communication in Vienna and beyond. In the framework of that exhibition, artists and architects investigated, installed an showed different room constellations, displays, manoeuvres and alternative architectures in the space by using these new wall elements.



Knowledge of the primary uses of the room is required. Decision making regarding acoustic concepts and interventions rely on the frequency, time responses of acoustic sources, and fadeout of the sonic field.

The room is stimulated with sine waves. The chromatically rising sine waves have frequency ranges between 34 Hz and 12.543 Hz. Impulses with an average length of two seconds are sent from the center of the room. The fade out process is measured in five positions. The room is stimulated with "pink noise". The frequency ranges from 28Hz to 18.000 Hz. The fade out process is measured in the same five positions.The room is stimulated with a bobby pistol. The fadeout is measured in 10 positions and reveals pronounced reflections.

The median reverberation time of the project room is ~3.800 milliseconds. It is too long for most types of usage. Within the frequency ranges 560 Hz - 690 Hz and 160 Hz - 190 Hz, reverberation times exceed 4 seconds.
The additional absorption surface of the audience present in the room is not enough to reduce these results and is not improving the reverberation time.

One can find the most annoying reflections,
superior to 80 milliseconds, alongside the longitudinal
central axis of the room, in front of the wall
of the entrance areas, and next to the dividing
wall that separates the exhibition space from the office.
These characteristics lead to bad speech
intelligibility and worse perceptive qualities
when the room is stimulated rhythmically.

+ E-Field

+ Friction

– Relaxation Time

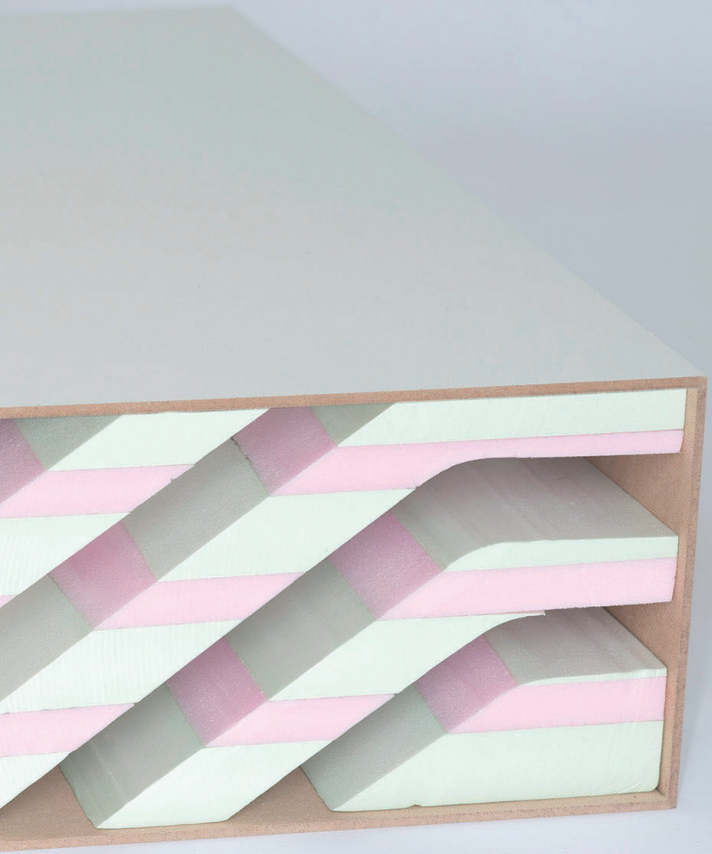
The public access system is combined with an alarm system. It has to be proven that all the loudspeakers are working. Each of them is connected to a lamp that you light up with an invisible light that has too high a frequency to be perceived. Let's say you use X-rays and you get an impulse response from the lamp telling you: "I am working". Then you are sure that in case of an emergency all the system is operational.
This is a major thing.
The other thing is that it should of course never fail. If it fails, it should reboot quickly, and so on.

+ Pressure

– Diffusion

– Electro-P

In the exhibition space, all the loudspeakers
are functioning – proofed with ultrasonic sounds,
because you do not want to hear such things.
But be careful. Once, a dog visited the exhibition
space. It was a little too much for the dog.
The barking was running wild.
This led to two possibilities: "Dogs are not allowed,
they would ruin the show" or
"Bring your pets at your own risk".



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Schallwirkungen auf Mensch und Tier is the line between impact and disappearance. It is the diagonal in between. The exhibition works with and against the walls. It is the suspension of a temporary non-ephemeral process. The European soccer championship takes place. The exhibition is the shadow.
Visitors merge with mass celebration. Schallwirkungen auf Mensch und Tier is a facilitator focusing on presence more than on the physicality of its proposition.
How to hide the shadows without switching on the light? It is also a summer show. Light energy is sucked by a black hole, which in turn disappears.
2006, 2016, 2026? Backward. Working the space is the research. Long discussions about the height of the walls, no time to watch, words remove thinking. The 3rd eye is an editor. It is more than a two-week process. The exhibition is not the artwork. The space answers the exhibition.
It is violent, intimate, and generous at the same time.
Moods change the light. The new moon is on the 5th of July. The exhibition is not about light.
Schallwirkungen auf Mensch und Tier is on display.