

A Sonic Hall of Mirrors

A Conversation Between Eva Huttenlauch, Andi Toma, Jan St. Werner, and Michael Akstaller

Eva Huttenlauch: With *Spatial Jitter* in the Kunstbau of the Lenbachhaus, you are undertaking a shift from concert to installation and, above all, to space. This shift has been in the making for several years now, and you continue to rethink it with every project. Why this development and what does it change for you as musicians, since—for a long time—you have primarily done live shows?

Andi Toma: Through the experience we have gained with our live shows, we have become aware that the space in which the sounds are reflected and acoustic signals are distributed has great influence on the music—how it is perceived and how the audience reacts. We also had already used a spatial system to mix our second to last album *Dimensional People* (2018). We now have such a system in the studio and experiment a lot with it. The spatial situation in the Kunstbau is actually rather difficult and therefore challenging for us.

Eva: The Kunstbau is like a tunnel or a long tube that was left as a hollow space during the construction of the Königsplatz subway station in the 1970s and has been used as an exhibition space by the Lenbachhaus since 1994. It is 110 meters long, fifteen meters wide, five meters high, has a long reverberation time, and—because of all the concrete—seems rather unwieldy and harsh.

Andi: Exactly! The enormous length and height and the resulting spatial reverberation reflections seem quite unfavorable at first, but we have tried to turn these “disadvantages” into advantages and to make use of precisely these conditions. For example, the sources of sounds cannot be located well in the Kunstbau because they are diffused by both the sheer size of the space and the reverberation. We thus specifically worked out which frequencies to send on their way, and where we can consciously work with the reflections and resonances of the space, and we tune the musical signals to these. In the compositions, we took care to find points in the space where you can merge its peculiarities with the sound. In other words, we composed a piece or rather many pieces *for* and *with* the space.

Jan Werner: In the conventional world of mixing for stereo, you integrate recordings of instruments in certain spatial situations into a model. This creates a preserved model world that can be quite easily controlled and manipulated, for example, by mixing away difficult sounds or placing artificial spatial effects on sounds to suggest spacing or depth. As a result, when listening to the recording, one automatically imagines the sounds within a space—for example, a concert hall or a recording studio. But it would be more consistent to go back with the music into the actual space of the recording to create an authentic listening experience. And that’s what we’re doing: With the installation at the Lenbachhaus, but also with other projects we’ve conceived spatially, we go back to the origins of how we came to music in the first place: From the beginning, we were interested in finding ways to relate sources of auditorily perceivable moments to each other, in trying to trace these relationships and observe where moments of overlap and communication arise. Of course, there is an unlimited supply of predefined solutions that are consistent—especially in electronic music, there are countless clichés that we know can be used to create a sense of coherence in the listener’s mind. But since it was never these presets that appealed to us, but rather the combinatorics, which for us is not yet so thoroughly worked through and in which we can still discover many movements ourselves, the step back into the space was logical and consistent for us. It was thus always something we wanted to do, but we had our hands full with creating the model worlds described above, the stereo worlds, which, in the public presentation, was mostly achieved through playing live. *Dimensional People* was then an attempt, away from the stage, to project more and more elements out into the space. Away from the stereo concept, which is always the standard at live concerts, because you’re standing on a stage between two large speakers, towards a more open staging, to a kind of mutating, extended band body. Most musical metaphors and musical procedures still play out in the conventional stereo world, perpetuating the myth that two ears necessarily require a stereo mix.

Eva: And what does this step away from the model and into the reality of the space mean conceptually for your installation at the Lenbachhaus?

Andi: The important thing is that we don’t want to impose something on the space, in the sense of a finished composition that we bring with us, that comes out of loudspeakers and then fades away. Rather, we had the luxury of really being able to work with the space—both in preparing the composition and during and with the installation itself. We send signals into the space, we work with the speed of sound, we focus the sounds very strongly in terms of impulse, and we observe how they move along the 110 meters of space. We thus use mobile loudspeakers to shorten or stretch paths, and we work in each case with the impulse coming back from the space itself, as a reflection impulse but also as a resonance impulse. Technically, we try to push these possibilities as far as possible and experiment with them—and yet, in the end, it remains a composition. But the loudspeakers don’t impose the music on the space; instead, the impulses that come out of the loudspeakers are tuned to the space—that’s what I find interesting about it. Because otherwise, in compositions, you usually don’t take the spatial conditions into consideration.

Eva: Before we speak about the installation more concretely, what does the title *Spatial Jitter* signify?

Jan: *Spatial*, of course, refers to the space, in our case, to understanding and describing the space. During the Renaissance spatial techniques played an important role. Thus multiple listening faculties contributed to the differentiation of perspective experiences in churches. *Jitter* on the other hand is a term used in data signal processing, also in granular synthesis, when sound particles can not be read out regularly. Jittering can be employed to consciously provoke stuttering or rhythmized sound artifacts.

Eva: Could you describe in greater detail what the installation actually looks like—what can be seen and heard, what do you bring into the space in terms of both sounds and objects?

Jan: Our first association with the Kunstbau was the image of a pinball machine, because of its concise shape and design. Taking this as our starting point, we considered how to narrate our image and what questions to ask: How does one imagine sound? How do we experience it? When do acoustic details become sound or vice versa, how can a sound be broken down into its component parts again? How do we define and convey the phenomenon of *hearing*—how do we talk about it? What pieces of information does sound convey, and which of them can we or do we want to perceive? And finally: Can we develop a game out of it? Or how can we release sound once again from its meanings by shifting attention? And then we had the idea that the pinball could represent a

sound, although this is a somewhat trivial image, since a sound wave does not have a single location, it is not defined by spatial coordinates. A sound wave is not like a photon that travels from A to B, but one and the same sound spreads out and can be perceived from different perspectives. You can be standing very close to the source of origin, but you can also be 100 meters away and have a simultaneous perception that leads to completely different aesthetic experiences. Nevertheless, it is exactly the same occurrence. So now in the Kunstbau, a sound embarks on an imaginary journey through this long space and rebounds on these columns or is held between them, goes into a *tilt mode*, so to speak. Then we go into this spectrum, which builds up in the moment of frozen acoustic vibration, zoom in, and find new movements and new structures in this moment, in this imaginarily captured situation. Completely new compositions can appear in this one moment, which could never be captured in reality. If we record this and do a frequency analysis, we can determine that this or that has happened or could have happened at that point. And we wind that up, until it gets bigger and bigger. And when you've worked through all the fragments and all the possibilities, then a journey like this—from the entrance of the Kunstbau to the glass wall at the back—can produce any number of listening experiences. A fragment turns into an entire “compo-struction.”

Eva: How would you describe what can be heard or experienced in these zoomed-in moments?

Jan: We have certain general focalizations, and our brains have preferences for certain frequencies or patterns and models, all of which we integrate into our perception, which we have learned, which we carry around culturally unquestioned, but yet each ear hears differently, and each ear is shaped differently. Some may suffer from tinnitus or have other unintended, uncomfortable preferences that they would like to be rid of. We thus work with a diffuse perceptual audience, which in turn gives us a great deal of freedom. Since there is no unequivocal reality or stringent truth anyway, we don't have to think strictly scientifically or mathematically about how everything would sound to everyone—and we take advantage of that. We have found a way to use spectral sound synthesis to adapt these spectra to certain situations, to modulate them, to rhythmize them, to bring out harmonic aspects more strongly, and to stage micro-movements that also work in opposition to each other. Add to this the dynamics of the loudspeakers, and an inter-reflexive system is thus built up that begins with a movement through the entire length of the space, but also repeatedly shoots back. For example, something has arrived at eighty meters, but meanwhile something else has already piled up again at the very front, and the two thus refer to each other. It's basically like a spider web or a hall of mirrors. A sonic hall of mirrors.

Eva: And then, of course, the subway also runs underneath the Kunstbau.

Andi: But you can't hear it. This is actually madness; one could also reprocess this tonally. No swinging back and forth, but rather linear wave movements corresponding to the energy of the subway through the length of the space...

Eva: *Spatial Jitter* is primarily an auditory experience. But the sounds have to come out somewhere—this is why there are loudspeakers in the space that don't play a role as objects, but are used instrumentally; they are, however, your own creations, and correspond to your concerns. You could thus say that you invent and present aesthetic experiences here for which there were no suitable, already existing loudspeakers. How did you come up with these objects, and how do you use them?

Jan: You can see two different types of loudspeakers: a large horn loudspeaker, with which you can direct the sound and send it through the space or direct it to a certain place. The shape of the horn reproduces the shape through which the sound is represented—that is to say, it prefigures the propagation of the sound wave, which can be further imagined as becoming increasingly larger. In addition, there are also several loudspeaker panels built by Michael Akstaller of Dynamic Acoustic Research (DAF). DAF is my class at the Academy of Fine Arts in Nuremberg, which expanded to the Academy in Munich for two semesters in 2020/21. It has since become a collective in its own right. These panels came out of a project with a Berlin-based company that produces wave field synthesis, a sound generation model, which, with the help of several loudspeakers, enables pinpoint construction of sounds at a specific spot within the space. Each loudspeaker contributes its share to building up the sound where the waves meet. And when this company cleared out its basement, it offered DAF the loudspeaker components that we have been experimenting with ever since. Our panels are more like activation machines for the space, and we can shoot sounds across the walls with them in the Kunstbau. A conventional loudspeaker, or rather its membrane, is actually nothing more than a small skin that vibrates and sets air molecules in motion, thereby producing sound; or reproduces sound because a certain source, a certain acoustic signal is translated into an electrical impulse, and this impulse causes the membrane to vibrate in a certain way. Loudspeakers always have a kind of kitsch quality because they are designed to reproduce something true to life that already exists in the original. In addition, there are many tonings, some of them intentional. It thus works in a certain frequency range, in which human attention is known to be particularly sensitive. Loudspeakers suggest a kind of natural representation of the original. This is so differentiated and delicate that it can be used to represent and reproduce the most

complex sound sources. But we step out of this representational model. During the development of the installation, it became clear to us that we do not want to work with conventional techniques, because the decisions made in advance are too strong there. We wanted to escape this and therefore use the loudspeakers we developed as instruments *themselves*.

Eva: The fact that the horn loudspeaker was a Moving Head spotlight in its former life is a mere coincidence; and with this, you refer instead to other historical objects from the early twentieth century. I always find moments of synesthesia interesting, when light and sound come together; this is something that was already experimented with in the eighteenth century. I'm thinking of the ocular harpsichord by Louis-Bertrand Castel from 1725 and the composition *Prométhée. Le Poème du feu* by Alexander Scriabin from 1910, which brings us back to the time of the Blue Rider and to the contemporaries of Wassily Kandinsky, who was also very much concerned with synesthetic issues, which play a role here at the Lenbachhaus. Your spotlight-loudspeaker as an object is a beautiful contemporary synthesis of light and sound. Just like the fact that, in your installation, one always reflexively wants to go to the area of the wall that the sound is directed to, because one thinks the sound is coming from that wall. Similar to light: One is always attracted to light, although there is nothing there at all... Maybe we can talk about these questions of perception later.

Jan: In fact, conceptually it doesn't matter to us that the speaker used to be a spotlight; we were simply looking for a way to rotate a speaker precisely and maximally in all directions, and so we came up with the idea that these Moving Heads would be suitable. Andi bought two huge ones on Ebay in the Netherlands, picked them up in a van, and we converted them in Berlin. Our starting points were actually the *intonarumori* designed by the Futurist Luigi Russolo around 1910/20: sound machines in which chains rattle or wires are pulled. Therein lies our idea that the loudspeaker itself is a resonator, a body of sound. It is perhaps also the theatrical element of the installation, the black, mysterious box. It takes on the role of a narrator. Our Moving Head is so human-gestural through its movements and the horn as a face, which also contains a completely different sound characteristic, and thus also something Dadaist, something absurd.

Eva: The loudspeaker as an instrument: I'd like to stay here for a moment, because that's the essence of the installation. How does that work exactly, that you don't use the loudspeakers in a conventional way, but rather adapt them to your needs?

Jan: What we are doing in the Kunstbau primarily is to make use of the distances and to shoot the sounds across bands, that is, across the walls. As you just said: There are these moments when you look at a wall and

think the sound is coming out of that wall, and you see an image, an acoustic image, but you *don't* see a loudspeaker. We thus use the loudspeakers in such a way that you don't intercept the sound conventionally at an ideal distance, catch it as early as possible and experience it as unadulteratedly as possible, by way of the loudspeaker. Instead, we explicitly compose and stage the various distances, refractions, reflections, and perspectives that are possible in connection with this sound signal. And the Kunstbau is very well suited for this. I'll take up the pinball idea again: We shoot a ball into space, as a metaphor for a sound, and we describe the metamorphosis of its original form, which adapts more and more to the space, activates it, so that it also vibrates itself, but is also deformed by the space. How does this journey present itself over this entire length, and how differently can it be perceived?

Andi: We want to make the source as unimportant as possible. This means that we fade out the loudspeaker vibrations as a sound source as much as possible and instead concentrate on the reflection that comes back from the wall. Or, in other words: The loudspeakers bundle many small sound sources and distribute the frequencies on the wall. Thus, *one* loudspeaker source creates a *multiple* image.

Eva: And what do these sounds from invisible or indirect sources trigger in our perception? The movement of sounds, also in connection with light, is, after all, an unusual phenomenon for the human brain.

Michael Akstaller: Here, we also make use of dynamization, which is very exciting with light and has always been exciting with sound. The dynamic movement of both comes from the same primordial pot; the lighting designer and the sound designer are thus interested in the same thing. Only with sound, the question of how it can move has not yet arisen. Also, the idea that light moves only became modern and present at some point.

Jan: That's true—because with sound, you simply don't want or need it. Sound is designed to stage our psychically perceived world in a maximally stable way. And we take this aspect out of the space, we re-sound it. This is also a conceptual component of *Spatial Jitter*, that even if you hear the same piece a hundred times, depending on where you're standing in the space or what overlays result from the movement of the speakers, you can always hear something new. In fact, you always hear something different because there is no one stringent truth about how the space should sound.

Andi: The movement of sounds is an important aspect—and at the same time, it is difficult to follow. This is also something you have to get used to. Normally, you listen to the recording of music through stereo speakers, and everything is focused on one point. In contrast, movement tends to happen

in nature or one's surroundings. In traffic, for example, when a car is approaching and you hear it so you can get out of the way, hearing also works as a protective mechanism. In our installation, you have a sound event without the circumstance of having to protect yourself from something; instead, you are asked to keep your senses open and to try to follow the sound movement. I noticed that myself when we were experimenting with it: I was so distracted, or tried to categorize or limit the movement in my "interface brain." And as soon as you really get into it and close your eyes, you hear the whole thing much more highly resolved or agitated. Perception and consciousness are already pretty much trained to fixate on events.

Jan: Human perception is inherently lazy. As soon as you recognize something, you classify it and file it away. In contrast, in our installation we try to maintain the not yet classified, the oscillating state of suspension, for as long as possible, so that the whole space vibrates and remains restless. The relationship to the image is interesting, because most of the time, you are actually presented with sound as though in a cinema. You're offered an ideal position in relation to a narration, for example in front of the concert stage, and you naturally look for the point where you can hear both speakers in the most balanced way; or in the concert hall, the place from which you can hear the orchestra best. But you don't sit in or walk about in the orchestra; you're firmly positioned in a frontal spatial relationship. Staying with this metaphor and applying it to a resonating body, it would ideally be the case, in our thinking, that you're not just walking about in the orchestra, you also manage to wander into the violin or zoom in on certain frequencies or certain strings and listen to them more closely. Or you have a sound event like the subway train passing through, and then you zoom in and go down to the wheels and hear how they vibrate across the tracks and how resonances form there. Composing something like that is a utopia, but it's still our aspiration with this installation in the Kunstbau to let inner and outer perception converge. Our brain is quite capable of dealing with changes, additions, or omissions, and of working with very unusual realities if they present themselves with a coherent intention.

Andi: In perception, however, the link to a physical movement is, of course, missing. And that's what I meant—that you try to completely free yourself from the connection with a sound source like you have in the urban environment or in nature. For example, you hear a bird singing or the beat of its wings, and you automatically look in its direction. You don't necessarily see it, but you have it in your mind's eye because of the experiences you call up.

Jan: An interesting phenomenon is that we also see with our ears and hear with our eyes. This means that there is a synchronization of certain perceptual events at particular moments. The human

brain is extremely good at this, but also extremely corruptible. Film and theater are based primarily on these magic tricks. The moment a hard object is placed on a table and someone lets something click on something else or makes a synchronous sound in the dubbing, it is quite clear that a bottle was placed on a table, that a certain action was performed. Antonin Artaud spoke out vehemently against these tricks of synchronicity in theater and film. He couldn't stand it when images were shown in the cinema whose soundtrack was played over loudspeakers next to the screen. For him, image and sound thus no longer had anything to do with each other, whereas in the theater they were still authentically intertwined. This criticism makes sense, but our approach is instead to emphasize these separations even more in order to further open up the space between the sensory impressions.

Andi: Exactly. You see something, and it gets ticked off. It is stored and, if necessary, recalled later with another acoustic experience. In any case, we don't think about it anymore. Visual and auditory events often work quite well together, but I think that also hinders certain experiences.

Eva: This brings us back to synesthesia—that is to say, the erroneous coupling of separate perceptual areas in the brain. Classically, for a synesthete, seeing certain colors is coupled with hearing certain sounds and vice versa. One automatically evokes the other. In its extreme form, this is certainly a difficult to bear and stressful interplay of sensory stimuli.

Jan: And at the same time, there are also critics who claim that synesthesia cannot be proven physiologically or neurologically, but that it is a kind of hypersensitization that virtually overwhelms you at certain moments. If it's sensory connections you establish because you learned them or because they were there early on, then you could theoretically establish them within any number of perceptual levels. Synesthesia refers primarily to sound and color. But it can also be noises or dizziness, tension, hallucination, hunger. Actually, we are all synesthetes, all the time. Smells that trigger memories, sounds that give you goosebumps or cause pain. We have to fight our way through a jungle of sensory synchronicities. This is perhaps exactly what art can do—what the imaginary pinball in *Spatial Jitter* does: to simply capture this one moment and zoom in to see what else is contained in it; and thereby throw the regularity out of kilter and reconfigure familiar synchronizations.

Michael: In any case, the question arises as to whether our idea of separate senses makes any sense at all—whether there is a sense of hearing and a sense of sight and a sense of taste and a sense of touch, or whether this is not simply a networked whole, and we only put categories on it to maintain control of it.

Jan: We move about on the basis of social agreements that are constantly being made anew or that have existed for a very long time and continue to be handed down. But this basis is not always stable. It is clear, for example, that the ear is sent many signals from the brain, including about what it *should* hear; and the eye is also deceiving itself or *being deceived* all the time. It is constantly taking “snapshots,” like in a film: instead of twenty-four frames per second, exorbitantly more. When you turn, and we are constantly moving, you don’t have a continuous image, but rather many small shots that follow one another, divided into sequences. On a microsecond scale, you could continuously completely rearrange this room we’re sitting in, but you’d think: That makes sense, that’s exactly how the room looks.

Eva: This also brings us to the realm of psychoacoustics. Much of what we perceive is produced by our brain itself. It makes completions and constructs a tolerable reality, so that not too many impressions hit us unfiltered, otherwise we would not be able to cope with everything that happens around us. The brain deceives us and, in doing so, protects us from overstimulation.

Jan: At the Center for Imaging Science in Rochester, New York, tests were made where you see a before and an after image, and in between a separation flash, which briefly clears your perception cache. And you think you see the same image twice, but fundamental components have been changed without you noticing it. To make the link to our project: That’s exactly what *Spatial Jitter* is. Putting together a space from numerous impressions or many coordinates and reading certain coordinates of this construction over and over again in a different way and creating new relationships. This is basically our way of composing, highlighting possible relationships that can be confirmed or completed in the brain. For us, it’s not just about hearing, but about a total sensory, syn-aesthetic work—simply because we assume that all perceptible elements work together. Not all visitors experience this the same way. Some reject it, some find it too atonal or dissonant, some may even feel nauseous from the, in some cases, very intense sounds. Others may even be a bit euphoric and can relate to this place and to their perceptual experiences. And the *glitch*, the interference pulse, the distortion, this gap—these are exactly the areas that we feel responsible for. We didn’t choose it consciously, it’s rather what was left for us by our musical predecessors. In the field in which we work, you come across important figures such as Iannis Xenakis, Karlheinz Stockhausen, Maryanne Amacher, La Monte Young, Bernhard Leitner, and Christina Kubisch, who made the invisible audible. We do not want to compete with these positions, but rather offer our own model. This state of oscillation between possibilities and simultaneities, in which the territories of perception are not demarcated, but in which you find yourself in an ultra-

relational system or a highly networked state, is where we believe we can orient ourselves best. This precludes certain determinations that you would expect from a classical composition or from what you would call a sculptural installation. Of course, a loudspeaker like our *intonarumore* somewhat counteracts this concern, because it is sculptural and visually very strong, and thus represents a certain demarcation. But it also has its glitchy aspect, its elusiveness and absurdity.

Eva: I mentioned earlier that the synesthetic and above all the cross-genre considerations of Kandinsky and other members of the Blue Rider play a role for us at the Lenbachhaus—the conceptual intercourse between the various arts: visual art, performing art, music. In my curatorial work, I try to find links in contemporary cultural practice to the considerations of the avant-garde of the early twentieth century, and to zoom in on precisely that. Your installation also takes place within the framework of this agenda, and there have already been a few projects in recent years that pick up on this. Jan, you suggested a beautiful image earlier that I would like to pick up on again briefly, namely the orchestra and the feeling of being in the orchestra and looking into the violin. To a certain extent, that was what Ari Benjamin Meyers did with his orchestral installation *Symphony 80* at the Lenbachhaus in 2017. He placed eighty orchestral musicians throughout all the museum’s galleries, where they played their instruments and repeatedly changed position, with the audience walking around between them, getting very close to each of them and watching them play: How does the violinist move his bow, how does the trumpeter blow into her instrument? Here, it was not about questions of cognitive perception as with you, but about the social space between audience and orchestra coming into focus and above all—that’s why I mention this—the frontal situation with the imaginary partition was lifted, similar to your acoustic events with the loudspeakers and your desire to enter into the sound. These are moments that we can offer our visitors as a new situation, and it’s truly delightful to observe what experiences or insights arise from this.

Jan: We could cooperate with Ari and, from our perspective, all visitors would then have a recording device or microphone with them in order to get as close as possible to the instrument, and the next step would then be to look at the frequency images with an oscilloscope and to enlarge and modulate certain spectra with a Fourier transformation. At that moment, however, you leave the social and cultural space and immerse yourself in something which is perhaps not a pure soundscape but rather a non-hierarchical materiality of sounds. That would be an intense psychological staging. And that, again, harks back to the beginning of the conversation when we were talking about *Dimensional People*: the psychological

narrative that can be derived from sounds. Or instead of narration, simply what you feel or see, or that you yourself co-oscillate. You don’t always have to think or feel something, you can just be enriched and resonate. An eardrum is, after all, also merely a wall on which the sound is refracted.

Eva Huttenlauch is Head of Collections, Art after 1945, at the Lenbachhaus, Munich and curator of *Spatial Jitter*.

Andi Toma and Jan Werner have been collaborating as the electronic music duo Mouse on Mars since 1993.

Michael Akstaller is a member of the collective Dynamic Acoustic Research (DAF).