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On Music and Spatiality
Spatialization as a vehicle towards a chimærical space

Skriftlig reflektion inom självständigt arbete
Till dokumentationen hör även följande inspelningar:

Entering Heaven Alive, On Beginning and Ending [with regard to music],
What Word Can I Say to Convince You That All My Happiness is in Loving You?
Remember When You Put Your Hands on Mine and Crying You Told Me That You Would Forget Me?
For Duende
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Prologue

It is perfectly true, as the philosophers say, that life must be understood backwards. But they forget the other proposition, that it must be lived forwards.¹

– Søren Kierkegaard

In one of his journals, Søren Kierkegaard (1813–1855) wrote that “… life must be understood backwards.” To my experience, it can be hard to fully understand choices and decisions when one is immersed in the creative process. Why is a particular decision taken? Perhaps following intuition, habit or far too often, just falling back on earlier patterns as a deadline is approaching. I will, in this text, turn around and take a look back, in an attempt to bring clarity and reflect over my work and decision-making process; to reflect both on the path that has led me to where I position myself artistically and also to take a closer look at my most recent compositions. Moreover, I hope to trace my steps and shed some light on my artistic practice. In the same paragraph quoted above, Kierkegaard also wrote that life “must be lived forwards”, hence I will also share some thoughts on my strategies and ambitions regarding moving forward musically and how I try to avoid falling back into earlier patterns. An aspiration that I certainly share with many of my composer colleagues is to write new music. Federico García Lorca (1898–1936) wrote, “especially a young musician who was then engaged in the fight all of us young artists must carry on, the fight for what is new and unforeseen, the treasure hunt, in the sea of thought, for inviolate emotion.”²

I think, however, that this treasure hunt should not be an exclusive privilege of the young. It is an attitude that defies age, as everyone can go on this treasure hunt, independently of their age. I will let others if they choose to do so, comment on if my compositions can be categorized as new music, but I hope that my ambitions to make new music becomes clear through this text. To clarify, when the term new music is used in this text it is not a case of neomania³ as defined by Nassim Nicholas Taleb, but rather it refers to music that explores the boundaries of music itself. Simply that a piece of music has been composed recently in time does not make it “new”. I would already at this point, emphasize that my strategies for creating new music are personal – what works for me, may or may not work for others. However, I want to make clear that these strategies are of course not the only methods for creating new music. Surely, there are as many methods to create new music as there are

composers. Furthermore, not every composer needs to aspire to compose new music. However, I am convinced of the benefits of a method of working that challenges conventional boundaries of contemporary composition.

As I embarked on my studies at the Royal College of Music almost five years ago, I realized I wanted to take the road less travelled. Where do the uncharted territories lie? I evaluated which field I would like to focus my research on, and I came to the conclusion that spatialization was the topic for me to investigate. Between the time that I made that decision and now, Curtis Roads has written: “Indeed, the art of spatialization has emerged as one of the most important topics in composition today.”

I have worked and experimented intensely over the past five years. This, in turn, has had a significant influence on my method of composing. There have also been changes to the Royal College of Music, during the time that has passed since then.

The structure of this text corresponds, on an abstract level, to how I think about my compositions: as a journey through space. To me, there is a direct correlation between composing music and making a map. I equate composing music to map-making. Maps to be explored by the listeners. The journey in this text goes through a house where some of the rooms correspond to ideas and tools that I use when composing while other rooms represent compositions written during my master's studies. All the compositions discussed in this text share the aspect that they take some element of spatiality as a departure point for the composition. This decision was made very consciously. In my way of composing I put particular focus and attention to three areas: moving sounds, moving space and moving the listener. Alternatively, to put it in a slightly different way: by moving sounds, shifting space in an attempt to touch the audience. With the existing tools of today, the task of moving sounds in a virtual space is easy. The task of shifting space is difficult, and to move or to touch the audience I consider a challenge. My ambition is to make music, that can be experienced. For instance, to experience music as maps, which listeners can step into and while doing

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5 The old buildings that housed the Royal College of Music at the start of my studies have been torn down and replaced with a fantastic new building including modern studios, rehearsal rooms and concert venues. The one space that interests me the most in this new building is the wondrous concert space called Lilla Salen with the high-density loudspeaker array (HDLA) called Klangkupolen. This is a mysterious, evolving space which contains any number of virtual spaces and it is in this concert space where all the compositions discussed in this text were premiered, something that I am very grateful of and something I regard as a fantastic opportunity.
6 Not outer space.
that; to have the possibility to imagine, to daydream, to explore inner cognitive landscapes, to go into an imaginary space enticed by sounds. I define this space as a *chimaerial space*.

Works of art are indeed always products of having-been-in-danger, of having-gone-to-the-very-end in an experience, to where no man can go further.\(^8\)  

- Rainer Maria Rilke

According to Kierkegaard it is through our sense of hearing that we can make this journey within, “Gradually, then, hearing became my most cherished sense, for just as the voice is the disclosure of inwardness incommensurable with the exterior, so the ear is the instrument that apprehends this inwardness, hearing the sense by which it is appropriated.”\(^9\) The music is an invitation to all participants to become wanderers. An invitation to step into the music and by doing that, stepping into one’s own imagination on a journey within. This is a double movement similar to what French philosopher Roland Barthes (1915–1980) described: a movement which bears forward and at the same time back to somewhere in oneself.\(^10\) On another note, the Italian writer Italo Calvino (1923–1985) wrote, that “imagination is a world of potentialities that no single work will successfully enact.”\(^11\) Experiences have the potentiality to cause profound changes within a person. In his book *The Poetics of Space*\(^12\) the French philosopher Gaston Bachelard (1884–1962) wrote that to imagine wandering in the desert is to change space, and as a consequence to change oneself; in his words, “for we do not change place. We change our nature.”\(^13\) Before approaching the house, twenty-six sentences on music and spatiality is presented.

Space calls for action, and before action, the imagination is at work.\(^14\)

- Gaston Bachelard

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\(^13\) Ibid., p. 222.

\(^14\) Ibid., p. 34.
Sentences on Music and Spatiality

1) Music consists of sounds. Sounds are vibrations. Everything vibrates.

2) Sounds propagate through a medium, not restricted to but for music, often air.

3) Sounds exist in space. Space can exist in sounds.

4) Many spaces co-exist simultaneously: physical space, virtual space, negative space\textsuperscript{15} and chimerical space, probably more.

5) When several spaces are experienced at the same time, it becomes a multispace.

6) Sounds can occupy negative space. Sounds can entice/evoke chimerical space.

7) Sounds can be perceived as either fixed or moving.

8) The movement of sounds can be internal or external, not exclusively to either one.

9) When sound moves externally, the movement can either be a movement in space or result in a movement of space\textsuperscript{16}.

10) The audience can either be fixed or moving. Listener movement can be both axial movement and locomotor movement; in and throughout the physical space as well as beyond. Some sounds incite listener movement.

11) There exists another movement induced by sounds, a chimerical movement. It is a mysterious, elusive and dreamlike movement going inward, into the chimerical space. It is a perceived movement through space without the change of location.

12) Recorded sounds can contain spatial information.

13) A recording can either be done at a fixed location or done under movement.

14) The sum of all sound movements results in perceived movements for the listener.

15) Active spatial listening is a listening mode, where attention is focused in and on space. Axial movement can change the perspective.

\textsuperscript{15} For a more in-depth discussion on negative space see Josefson, \textit{Flockar och negativa rum}.

\textsuperscript{16} Ibid. 7.
16) Active spatial listening enables navigation through spatialized soundscapes.

17) The members of the audience share perceptual space but occupy individual locations and may have different active spatial listening perspectives. Spatial perception is subjective.

18) Volume is to sound as size is to painting.¹⁷

19) The volume of a sound is not only the amplitude but when it comes to space also its size.

20) In three dimensions the wall of sound¹⁸ unfolds to the space of sound.

21) The combination of spatial envelopment and adequate volume is a vehicle to chimærical space.

22) Through high-density loudspeaker arrays space(s) can be created and altered.

23) Time is not always time and place is not always place.¹⁹ Altering space changes place.

24) Changing place without locomotor movement actuate chimærical movement.


26) By moving sounds, it is possible to shift space and touch the audience.

¹⁸ Made famous through the production techniques of Phil Spector.
¹⁹ In contrast to what T.S. Eliot wrote in his work Ash Wednesday.
A House as Space and Structure of Composition

Our house is a house that moves. – Frans Treichler

The house traversed in this text is not an ordinary physical house. It is a house that moves, that changes, that evolves. Before stepping inside, an overview of the blueprint is in place.

Blueprint

The function of the blueprint is to assist in building a new house. The blueprint could, of course, be used in such a way that results can be repeated, to build the same house over and over again. In this case, however, the idea behind following the blueprint is, in fact, the total opposite. This plan functions as a map over places where one has not yet been. It is to avoid building the same house multiple times, which could happen when either intuition or personal taste is utilized as the guide for making choices. If the same house is built over and over again, the goal to create new music cannot be achieved. This blueprint consists of four elements: a theoretical fundament, spatialization, duende and the building of tools. Each item will be gone through briefly in the following sections and then referred to when discussing the compositions.

Blueprint of a house, example.

The same plan is used for all compositions discussed in this text. Here the goal to create new music can be challenged: if the same plan is followed, how can different, that is to say,

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21 See Lorca, *In search of duende*, New Directions, New York, 2010
22 I chose to not use the term instruments as it sets certain connotations.
new music be written? The answer is that each composition discussed in this text focus on different aspects of spatiality: *multispace*, moving sound, moving space.

**Theoretical fundamtent**

Conceptual artists are mystics rather than rationalists. They leap to conclusions that logic cannot reach.  

– Sol LeWitt

The primary conceptual approach of my artistic research is that each composition starts with a clear idea about spatiality. The initial idea, the seed of the composition, relates to different aspects of spatiality, as will be presented based on the following examples. In the first composition, *What Word Can I Say To Convince You That All My Happiness is in Loving You?* the intention is to create a dichotomy within the sound space: the virtual and the *negative space.* The second composition, *On Beginning and Ending [with regard to music],* explores the sounding *multispace.* The third composition *Remember When You Put Your Hands on Mine and, Crying You Told Me That You Would Forget Me?* focuses on the movement of sound. With the fourth and last composition, *Entering Heaven Alive,* I have the aspiration to move space itself. The first composition was presented at the end of the first year of the master’s studies and composition two, three and four were presented at the master’s exam concert. All of these compositions share the desire to move the listener. Each composition starts as a silent choreography, later to be filled with sounding material. By experience, both through personal practice and from brief insights into other composer’s processes, the spatialization of electroacoustic music is something that often happens towards the end of the composition process, generally as the very last step. What if one would do the opposite and start with the spatialization?  

To start the composition with the spatialization is to challenge this process in an attempt to find new paths and to make new music, to “leap to conclusions that logic cannot reach” as Sol LeWitt (1928–2007) wrote. Brian Eno touched on the same topic when he said, “the important thing about the theoretical positions is that they lead you to decisions that you wouldn’t have taken otherwise, or you wouldn’t have permitted.”  

To start with the spatialization proved to be a significant challenge, requiring a great deal of effort, but as LeWitt wrote, “If the artist changes his mind

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25 Here a brief clarification can be made: the idea to start the composition process with spatialization does not only refer to initial spatial concepts but also to the actual pragmatic work. An example would be a composer working in a Digital Audio Workstation (DAW) on a stereo composition who before any sounds are recorded or added starts the work on the composition by automating panning data and adding reverb.

midway through the execution of the piece he compromises the result and repeats past results.”

These different ideas are presented when the compositions are discussed.

**Spatialization**

As more work is done to refine spatialization concepts and discover new modes of musical thinking in terms of space, it becomes clear that spatialization is our genuinely new contribution to musical art.²⁸

– James Dashow

Roa and Dashow both wrote on the topic and argued that spatialization is essential and a new contribution to electroacoustic music respectively. There is a shift from compositions focusing on time-based structures to compositions focusing on space-based structures as the knowledge of spatiality is becoming more widely spread and techniques and tools become more advanced. As early as 1967 Michel Foucault (1926–1984) stated that: “The present epoch will perhaps be above all the epoch of space.”²⁹ This though would later be deepened and described as the spatial turn³⁰ by several authors³¹, for example by Robert T. Tally Jr. The spatial turn has reached the musical domain. Edgard Varèse (1883–1965) stated: “I refuse to submit to only those sounds that have already been heard.”³² In the spirit of the spatial turn, the statement can be rephrased to: “I refuse to submit to only those spaces that have already been heard.”

It becomes evident that a central preoccupation of this research project is the significance of the spatial turn for music in general and for my personal composition process in particular. Is it possible to fully embrace the spatial turn within music, an inherently time-based medium and therefore to compose music focusing exclusively on space and not on time?

… and if anyone absolutely insists that the qualification of time must be present here, then one must say that it certainly is so but that it is spatially qualified.³³

– Søren Kierkegaard

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²⁷ Ibid. 24.
²⁸ Ibid. 7.
³¹ See De Certeau, Lefebvre, Soja.
³² Ibid. 4, p. 93.
³³ Ibid. 9, p. 68.
Duende

Or, to put this another way, it is new when it possesses duende, “black sounds” as Lorca called them, the dark counterpoise to Apollo’s light: music in which we hear death sing.34

— Jan Zwicky

In her talk on the topic on what makes new music new, Jan Zwicky said, “… it is new when it possesses duende…” One way that Federico García Lorca explains the duende in his text *Play and Theory of the Duende*35 is by paraphrasing Goethe when he wrote that duende is, “A mysterious power which everyone senses and no philosopher explains.”36

Focusing on the detail that ‘everyone senses’ duende one can highlight that it can be present both during the creation of art but more importantly, also during the performance. Duende is one of the possible ways where a musical performance can have an impact on the audience. This in contrast to the muse and the angel whose presence is only possible during the creation of art. As a short side note, it should be pointed out that currently, the presence of the “black sounds” that Lorca refers to, does not automatically guarantee the apparition of duende. Many examples could be given of music that is built entirely around “black sounds” but where duende is absent. This is, in particular, the case when the sounds are part of a constructed concept extended with masks, robes, smokes and mirrors. The duende sees through the assumed poses and forged attitudes. A direct parallel can be drawn to what Mark Rothko (1903–1970) wrote about transcendence, “The romantics were prompted to seek exotic subject and to travel to far off places. They failed to realize that, though the transcendental must involve the strange and unfamiliar, not everything strange and unfamiliar is transcendental.”37

The strange and unfamiliar that Rothko speaks of is tightly coupled with the dark sounds, with the duende. Let us go back to Lorca and his idea of duende as a power that “no philosopher explains.”38 Philosophers work with text as language. Is it perhaps so, that the duende cannot be explained through spoken or written language? Or is it even possible that it is through the music itself that the duende can be explored? Søren Kierkegaard, the philosopher who late in life called himself a poet, wrote “If the various media are ordered according to a specific process of development, language and music must be placed closest to each other, and that is also why it has been said that music is a language, which is more

34 Zwicky, Jan, *TWO PART INVENTION: WHAT MAKES NEW MUSIC NEW?* Excerpt from an unpublished text of a talk, Continuum New Music Symposium, Royal Ontario Museum, Toronto, 12 March 2005; jointly sponsored by the Royal Ontario Museum and the French Embassy. [Text received via email correspondence.]
36 Ibid., p. 57.
38 Ibid. 36.
than a clever observation.”39 Jan Zwicky elaborates in her text, “Duende lives in blue notes, in the break in a singer's voice, in the scrape of resined horsehair on sheep gut. We are more accustomed to its presence in jazz and the blues, and it is typically a feature of music in which performance and composition are not separate acts. However, it is audible in the work of classically-oriented composers who are interested in the physical properties of sound.”40 The physicality of sound was something that already Edgar Varèse worked with as he wrote, “I was not influenced by composers as much as by natural objects and physical phenomena.”41 The duende is elusive as Lorca clarified, “there are neither maps nor exercises to help us find the duende.”42 There is no travel guide, no instructions to follow or steps to trace to conjure up the duende repeatably. On the other hand, some steps can be taken to invite the duende in an attempt to increase the likelihood of its presence. One such thing, drawn from the experiences of researching through composing spatialized electroacoustic music, lies in the “physical properties of sound”43 as Zwicky writes. This is one of the strategies employed when composing the four pieces discussed in this body of work. I aim to compose music emphasizing the physical properties of sound and space, which again has a direct link to the duende.

You need the duende’s help to achieve artistic truth.44

– Federico García Lorca

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39 Ibid. 9, p. 66.
40 Ibid. 34.
41 Ibid. 4, p. 107.
42 Ibid. 2, p. 60.
43 Ibid. 34.
44 Ibid. 2, p. 69.
The building of tools

Even though a formal theory of spatial relations remains to be developed, the compositional organization of sound spatialization is becoming increasingly elaborate, often assisted by sophisticated software.\(^{45}\)

— Curtis Roads

The evolution of electroacoustic music has always been tightly coupled with technological advancements. In the early days of electroacoustic music, tools from other industries were used to create music. These tools were constructed without musical intentions, for example: tape machines and laboratory equipment, such as tone generators. Later on, computers were used to compose and perform music, some two hundred years after Ada Lovelace’s (1815–1852) bold visionary proposition when working on the difference engine.\(^{46}\)

Supposing, for instance, that the fundamental relations of pitched sounds in the science of harmony and of musical composition were susceptible of such expression and adaptations, the engine might compose elaborate and scientific pieces of music of any degree of complexity or extent.\(^{47}\)

— Ada Lovelace

Adopting new tools does not come entirely without risk. An example of this is the overuse of digital reverbs in popular music during the eighties. As a consequence, that music has become fixed in time and as a result thereof, that music sounds out of date. When new tools are introduced, it takes some time for them to mature, both on a collective and individual level. The example above with the digital reverb is an example of how tools mature on a collective level. There are also countless examples of when music is presented when the tools used for its creation and performance had not yet matured for the artist on an individual level. As a result, the tool is overly present in the artwork itself. It is as if the artist chooses the tool first and then decided to create an artwork using that tool. When this is the case, it is, unfortunately, something that becomes very apparent in the artwork itself. Preferably, it should be the other way around – the artwork is conceptualized as the first step and then the most suitable tool to realize the artwork is chosen. Another risk, when adopting new tools, is the collective jumping on the bandwagon. One example of this is, as the laptop computers became more advanced and powerful, an entire genre emerging simply labelled

\(^{45}\) Ibid. 4, p. 281.


laptop music. The categorization of this music was that it was created and performed using a laptop. More recently the laptops have been replaced with the modular synthesizer similarly. This is, of course, tricky, and one should not avoid using a tool or an instrument just because others are using the same tools. However, one should at least use it in a personal way. Wim Wenders said, “Do what nobody else can do except for you.”48 Composers who build their tools, instruments and sounds have an advantage when searching for their unique voice, their unique sound worlds. The strategy to avoid fixing these compositions in a certain age or genre or sound clichés is, apart from building tools, to also use many different types of tools and methods spanning genres and time periods, for example field recordings, contact microphones, modular synthesizers, vintage tone generators, acoustic instruments and then combining and connecting them through different types of networks. There are many sophisticated tools available for spatializing sound built around different spatialization and panning strategies. Today these tools have matured and are advanced in their functionality to position sounds in virtual spaces, accomplishing realistic results. One is, however, not constrained to strive for realistic results. One could argue that just as Roland Barthes did not believe in “… ’lifelike’ photographs”,49 it is not necessarily the realistic spaces that are the most interesting – rather that it is the imaginary spaces that are the interesting ones; they are creative; they are the spaces that are yet to be heard. Many of the spatialization tools available today positions sources by giving three parameters individually. For music composed with a high density of sources to create the space of sound the method of specifying individual positions becomes unmanageable as it does not scale well. A toolkit has been implemented to address this problem by increasing the level of abstraction by operating on control data on top of a spatialization tool.

Three principles are the basis for every composition: inertia, force, and rhythm, with all the contradictions that these contain.50

– Edgard Varèse

The ambition with this tool is to assist and inspire in the process of composing new music, where the spatialization is the starting point of the composition. With this tool, it is possible to start the composition process with spatiality, to compose the silent choreographies, later to be filled with sounds. The intention of the toolkit is also to be able to work with other

49 Ibid. 10, p. 20. The authors quotation marks.
50 Ibid. 4, p. 147.
“physical properties of sounds”\textsuperscript{51} like force, velocity, inertia in an attempt to materialize sound objects and to make creative spaces more plausible. With this, the overview of the blueprint is finished, and the house is approached.

And I came upon a little house, a little house upon a hill.\textsuperscript{52}

\begin{flushright}
– Nick Cave
\end{flushright}

\textsuperscript{51} Ibid. 34.
\textsuperscript{52} Cave, Nick & The Bad Seeds, \textit{Papa Won’t Leave You Henry}, From Album \textit{Henry’s Dream}, Mute, UK, 1992, [record]
The pathway leading up to the house

Just as many pathways are leading up to the little house on the hill, so are there many ways to spatialize audio. To give a few examples of the possibilities to spatialize audio, without the ambition of making a complete summary, vector-based amplitude panning (VBAP), distance-based amplitude panning (DBAP), ambisonics and wave-field synthesis (WFS). The path chosen thus far in the exploration and utilized for all the compositions presented in this text is the ambisonics path. The reason for choosing ambisonics is not that the other methods are not exciting or competent, that is far from the case. The concepts of sound sources and sound planes in WFS is intriguing, and when using tracking software, it is possible to extend sound sources into the negative space in an exciting and convincing way. However, the way that it is possible to envelop the audience in sound, to use distance as a method of mixing and to utilize the height dimension, in particular, led to choosing ambisonics. On the pathway up to the house, there is a garden toolshed.

The garden toolshed

Surprisingly this toolshed does not contain tools for gardening but rather a subset of tools that can be used for spatializing audio. There are both software tools like Ircam Spat, SpatGris, the IEM tools suite, GRM Spaces, Harpex-X, Dolby Atmos, and Flux SpatRevolution, different types of ambisonic microphones from SoundField, Røde and Sennheiser as well as software for recording sounds. Different types of speaker setups and techniques such as the IKO speaker, wavefield synthesis setups and speaker domes. All tools are highly competent and advanced. Some of these tools have been explored under a brief time while others have been evaluated for a more extended period. As we reach the house, we realize that there are three front doors – we open all three and step through them all at the same time.

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53 An in-depth discussion of the different spatialization techniques is not within the scope of this text. The interested reader can find more information for example in the book Immersive sound : the art and science of binaural and multi-channel audio.
54 As presented at HAW Hamburg during the Klingt Gut! Masterclass in Spatialization.
55 https://forum.net.ircam.fr/product/spat-en/
56 https://sourceforge.net/projects/spatgris/
57 https://plugins.iem.at
59 https://harpex.net
61 https://www.flux.audio/project/spat-revolution/
62 https://www.soundfield.com/#/home
63 https://www.rode.com/ntsf1
64 https://sv-se.sennheiser.com/microphone-3d-audio-ambeo-vr-mic
The Hallway

This is the room the start of it all.  
– Ian Curtis

In this first room, the start of it all, one thing that calls for attention is the spatiality of the room, it is the one thing that is of the most importance. It is through this room that one reaches all other rooms, getting deeper into the house. The second thing that is worth noticing is the multiplicities of the room. The three front doors each lead into separate but interacting domains of the room. These domains are recognizable and identifiable in themselves, but they also overlap and interact with each other. There are no barriers between the domains. In one domain one finds the concept of concerts, while in the other the concept of the art installation is present, and in the third one finds that the concept of the lecture is prominent. There are audiences in each domain; in some domains, the audience is seated while in other the audience can move freely. The concept of fixed time with a definite start and end is contradicted by time without start or end. These concepts move over different domains. This room is a space of ever-shifting liminalities. The three domains correspond to three primary perspectives employed when composing; they are the perspective of the artist, the composer and the engineer. This knowledge has been acquired over the years, and they are used to triangulate the artwork during the creative process. These three domains serve as a foundation that the house is built upon.

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67 To put something in the first room, in Swedish “Sätta något i första rummet”, means to put something in the first place.
The Basement

This basement is not a place where old relics are forgotten and left to collect dust. Instead, it is the foundation upon which the entire structure of the house rests. The basement is an archive, referenced when new music is composed. It is a living place, very much connected to the rest of the house. Memories, inspiration and knowledge are to be found here. Much of it has connections to the association and music scene Fylkingen, where many exciting concerts have taken place over the years and fond memories of sharing the musical stage with inspiring colleagues. Another fundamental part of this place is knowledge attained early at Elektronmusikstudion (EMS). These encounters have been inspiring when venturing out to compose music, providing a feeling that anything is possible; the only limit was what can be imagined, what can be dreamt. Materials from the archive have been used, both in the form of the tape loop in the composition Remember When You Put Your Hands On Mine, and Crying You Told Me That You Would Forget Me? and as a recording of an organ in the composition Enter Heaven Alive.

Reality is only a term, based on values and well worn principles, whereas the dream goes on forever.68

– Ian Curtis

68 Ibid. 66, p. xxviii.
The Dining Room

The hallway leads into the dining room where the table is set with an abundance of drinking glasses of different kinds. This table is one of the main components; one could claim the soloist of the composition *What Word Can I Say To Convince You That All My Happiness Is In Loving You?*

*What Word Can I Say To Convince You That All My Happiness Is In Loving You?*

In the spring of 2018, presented with the opportunity of a solo gallery exhibition⁶⁹ and an electroacoustic concert⁷⁰ within a short timeframe, the same work of art, titled *What Word Can I Say To Convince Your That All My Happiness Is In Loving You?* was decided to be exhibited in these two contexts. At the same time, the decision to present the same work as a sound art exhibition and as an electroacoustic concert was also taken as an opportunity to investigate if this specific work could function equally well in both contexts.⁷¹ The work itself consists of a table⁷² that is set to the brim with many different types of drinking glasses. The furniture trembles and shakes and as a result of this motion, the crystals on top, which are placed in such a way that they, make clinking and rattling sound as they collide and hit each other.

*Performance of What Word Can I Say To Convince You That All My Happiness Is In Loving You?* at Verkstad konsthall.

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⁶⁹ Josefson, Fredrik Mathias, *What Word Can I Say to Convince You That All My Happiness is in Loving You?* [solo exhibition], Verkstad konsthall, Norrköping, 2018-03-17–2018-04-01


⁷¹ After these two presentations the artwork was also included in the sound art installation Ljudbänken c/o KMH, a project presented in front of the Royal Opera, Stockholm, 2018-07-25–2018-08-10.

⁷² This could literally be furniture music (musique d'ameublement) a term defined by Eric Satie in 1917.
Previous versions (incarnations) of the artwork have been presented both as a live performance\textsuperscript{73} and installation,\textsuperscript{74} then only as the dinner table. For the final work, additional electroacoustic music was composed to accompany the furniture to immerse the listener with sound from a high-density loudspeaker array (HDLA) setup. One can view the furniture as an art object and at the same time as the solo performer and the electroacoustic composition as the accompanying orchestra. Some of the sounds used as the material in the music piece are recordings of the shaking table and glasses. Additionally, there are also sound-objects of abstract and synthesized nature where the frequencies were selected after analyzing the recording of the physical objects. The strategy to compose with both material objects and non-material sound-objects is something that I have been exploring for an extended period of time. It is of importance that the physical objects are unamplified, that the sounds originate from the physical object themselves and not as recordings presented over speakers. The sounds originating from the furniture and glasses occupy another space different from the sounds coming from the speakers. It is a dichotomy of two sound spaces. The sounds from the table and the glasses exist in the negative space of the sounds originating from the speakers. When the artwork was presented at the gallery exhibition, it was initiated with a performance at the vernissage, where the shaking of the furniture was controlled live. For the remaining duration of the exhibition, the table continued to shake under pre-composed control, accompanied by the electroacoustic composition repeated over a quadraphonic speaker setup. The sounds from the composition originate from a different position in the room, but the sound is not immersive to the audience. The concert for the table and fixed media had its premiere at the Royal College of Music, Stockholm, as part of the LjudOLjud festival 2018. It was held in the venue Lilla Salen over the HDLA named Klangkupolen, a speaker dome consisting of twenty-nine speakers.\textsuperscript{75} The speaker dome and design of the venue accommodate the possibilities for a full immersion of the audience with sound. The electroacoustic composition was spatialized using ambisonics and rendered to fixed media and again, just like at the vernissage of the gallery exhibition, the shaking of the furniture was performed live.

\textsuperscript{73} Josefson, Fredrik Mathias, \textit{What Word Can I Say to Convince You That All My Happiness is in Loving You?} [performance], Fylkingen, Stockholm, 2013-01-25
\textsuperscript{74} Josefson, Fredrik Mathias, \textit{What Word Can I Say to Convince You That All My Happiness is in Loving You?} [installation], Abrons Art Center, New York, 2017-06-22–2017-06-26
\textsuperscript{75} At this concert the 29 fixed speakers of the speaker dome were utilized. At the master’s exam concert the dome was extended to a total of 45 speakers.
In his text *Address to Pratt Institute, November 1958*, the American painter Mark Rothko wrote that there are seven ingredients in the recipe for making a work of art: death, sensuality, tension, irony, the ephemeral, hope and wit. Are these ingredients present in *What Word Can I Say To Convince You That All My Happiness Is In Loving You*?

... having that absence-as-presence which constitutes the lure and the fascination of the Sirens.76

– Maurice Blanchot

**On death**

The dinner table is set, but there is nobody present. The chairs remain empty. The absence is present. In this absence – death appears. In his last book *Camera Lucida*,77 Roland Barthes reflects over the presence of death in photography, but also the presence of death in recorded voices.

I can never see or see again in a film certain actors whom I know to be dead without a kind of melancholy: the melancholy of Photography itself (I experience this same emotion listening to the recorded voices of dead singers).78

– Roland Barthes

Already from the start of when it was possible to record sounds, voices have been recorded to different types of media. These early recordings have since then outlived the persons, which voices were recorded. Hence, these are now recordings of voices no longer present. This is something Susan Hiller (1940–2019) approaches in her work.

Do the dead speak through us? This is my voice, unrolling in your present, my past. I am speaking to you from my here-after, the hear-after. 79

– Susan Hiller

It is with vivid memories that I remember sitting at the bench with my back to Susan Hillers work *Monument, 1980-1*80 installed at Tate Britain, London. Next to me on the bench is a tape recorder. I put on the headphones and press play. Susan Hiller’s voice recorded on the tape unrolls in my present; her voice speaks to me, “The Monument is in your past.”81 At the time I sat there on the bench at Tate Britan, *Monument, 1980-1* was, already then in my

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76 Ibid. 10, p. 106.
77 Ibid., p. 1–119.
78 Ibid., p. 79.
80 Hiller, Susan, *Monument, 1980-1*, [41 photographs, each approx. 50 x 100, overall 457.2 x 685.8; park bench with audio component, 14 min 23 sec], Installation at Tate Britain, London, 2011.
81 Ibid. 79.
past. At the time of writing this, my experience of sitting there listening to the tape is now a memory – both Monument, 1980-1 and my experience of the same, now exist in my past. Susan Hiller continued on the tape, “You can think of life after death as a second life which you enter into as a portrait or inscription and in which you remain longer than you do in your actual living life.” Susan Hiller died on the 28th of January 2019 and just as she said on the tape in her artwork Monument, 1980-1, she is now in her hereafter. To me, she is now particularly inscribed into this work. I fondly remember Susan Hillers kind correspondence received last year shortly before her death, and especially now when I listen to the recording from the Monument, and I am particularly struck with the melancholy that Roland Barthes described when listening to the voice of dead singers.

On the tape, Susan Hiller says that “I’m an audible raudive voice.”, and refers to Konstantins Raudive (1909–1974), who worked together with Friedrich Jürgenson (1903–1987) with what is called Electronic Voice Phenomena (EVP), where spirit voices are captured using electronic equipment. However, in the composition What Word Can I Say To Convince You That All My Happiness Is In Loving You? no voices are heard; instead, the communication is established like in a séance, by the shaking of the table; shaking that is done from a distance, from afar, from another side. The absence is present.

Touching from a distance, further all the time.\textsuperscript{82}  
– Ian Curtis

**On sensuality**

Søren Kirkegaard wrote in Either/Or that music expresses the spirit of sensuality.\textsuperscript{83} The presence of the physical table and glasses that shake and rattle invokes an emotional response that is immediate and direct, and the sounds generated from the rattling glasses emphasize and heighten the music to sensual bodily experience. One can almost feel the rattling table as if one would have touched it, much in correspondence to how Kierkegaard defines the first stage of existence. The sheer magnitude of glasses on the table is another trace of the sensuality; the meeting of the world, the collection and intoxication of things. The observation of the table is an outer experience. However, just as there is more than one stage of existence according to Kierkegaard, so are there more layers to the composition. As indicated in the title, there is a love story present in the artwork, something pointing to an inner experience. In the title of the composition a question is posed: what word can I say

\textsuperscript{82} Ibid. 66, p. 59.  
\textsuperscript{83} Ibid. 9, p. 56.
to convince you that all my happiness is in loving you? Here the subject asks the other what word that could be said, not to show, express or prove how much the subject loves the other, but that all happiness of the subject is in loving the other. There is a direct link between the subject's love of the other to the happiness of the subject.

Language addresses itself to the ear. No other medium does this. The ear, in turn, is the most spiritually qualified sense.\textsuperscript{84}

\textemdash Søren Kierkegaard

\textit{On tension}

The table trembles and shakes, the glasses collide and when doing so they move on the table. At any time, the glasses near the edge can move in such a way that they fall, in which case the glass would break.\textsuperscript{85} Even if it does not happen, the observers, the audience, can conclude that it is always close to happening. The glasses dance on the edge of the table, creating tension without release,\textsuperscript{86} continually close to triggering the reflex in the audience, that reflex that is activated when seeing something falling and trying to catch it.

\textit{On irony}

The electroacoustic music was mixed and spatialized during an artist-in-residence at the Atlantic Center of the Arts. There were three residencies in parallel focusing on different artistic practices. One was in the field of electroacoustic composition led by Robert Normandeau.\textsuperscript{87} The other two were focusing on visual art and writing respectively. After giving a presentation of the work in progress, Pam Houston, who led the residency for writing, asked if the title of the work was meant to be ironic. To this, my spontaneous and immediate answer was that the title, \textit{What Word Can I Say To Convince You That All My Happiness Is In Loving You?} was not ironic but seriously meant. This artwork is truly meant to be read as a love song, without any ironic intentions. A love song that is sharing many of the characteristics Nick Cave presented in his lecture about the love song.

\textsuperscript{84} Ibid. 9, p. 68.
\textsuperscript{85} At the very first performance the table was trembling so intensely that it moved across the floor and all glasses fell off the table. During the time of the exhibition, a couple of glasses fell off the table.
\textsuperscript{86} Not until the exhibition or concert is over.
\textsuperscript{87} Normandeau, Robert, \textit{Master Artist Residency #168}, Atlantic Center For the Arts, New Smyrna Beach, Florida, 2018-02-18–2018-03-30, [masterclass]
The love song must be born into the realm of the irrational, absurd, the distracted, the melancholic, the obsessive, the insane, for it is the clamour of love itself, and love is, of course, a form of madness.88

– Nick Cave

The shaking of the table is an irrational, absurd, obsessive, insane action and the title of the artwork contains something deeply melancholic. How many different words have been said already in an attempt to convince the other? There is something ironic and a break from tradition to compose a love song for a shaking table. The irrationality of writing and performing a love song on a shaking table is an attempt to reach new experiences.

Irrational judgements lead to new experience.89

– Sol LeWitt

On hope

It is indeed a demonstration that it is a higher, more spiritual art.90

– Søren Kierkegaard

Focusing on the person called A’s arguments in Kierkegaard’s Either/Or that music is a higher or more spiritual art than language. If this should be the case, one can derive that there can be scenarios when words fail to communicate the intended message, and where music is more successful as a means of communication, in conveying the message as well as reaching to a deeper level. As Kierkegaard writes: “It has already been pointed out that music as a medium does not rank as high as language, and that is why I said that music, understood in a certain way, is a language.”91

On ephemerality

The potential imminence to the destruction of the glasses underlines the fragility and the ephemeral ingredient of the artwork. For some time, the shaking of the table can be experienced and then it stops, at the concert after some minutes and at the gallery after some weeks. It is something that in its materiality is fixed in time and space; then it transitions from the physical domain to the memory domain. The ephemeral is also present in the

88 Cave, Nick, The Secret Life Of The Love Song, King Mob, UK, 2000, [record]
89 Ibid. 24.
90 Ibid. 9, p. 69.
91 Ibid., p. 68.
electroacoustic composition. The ripple of the air pressure will be gone as soon as the music stops. There is an ephemeral shimmer throughout the composition.

On wit

During the performance in Klangkupolen,\(^\text{92}\) there were no chairs placed in the room and the audience was free to move around the room. In the middle of the room, under the speaker dome the table was set with all the glasses. A small table with live electronic instruments was arranged outside the area of the dome. It was from these instruments that the shaking of the table was controlled. There was one single cable running from this area to the table. This cable was masked with black tape and in the dim light of the concert it could be hard to detect. As the concert started the table started to shake. During the concert some members of the audience approached the table, knelt down to inspect it closer – was there something hidden under the board? The table moved by itself – will it also defy gravity?

If an artist uses the same form in a group of works, and changes the material, one would assume the artist’s concept involved the material.\(^\text{93}\)

– Sol LeWitt

Lightness, levitation, ascension are aspects that have been explored in other works such as *The History of Levitation*\(^\text{94}\) and *Entering Heaven Alive*.\(^\text{95}\) The lightness is a contrast to the *duende*. However, the strong visual presence of the table, in combination with the mobile audience, fixed the audience to the very time and space of the listening space. The presence of the physical table disturbed chimaerical movement.

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\(^{93}\) Ibid. 24.


The Winter Garden

At the very back of the house is a small winter garden. Through one of the many windows, a small garden can be seen outside. The lawn of the garden is similar to the one around Mr. Palomar's house; it is an artificial object; it is the infinite lawn. The acoustic arena expands beyond the walls of this room, sounds coming from the outside can be heard inside; the rustling of leaves, some crows are calling from the nearby trees. This room possesses a peculiar property that many winter gardens share; it is as if one occupies two spaces at the same time, a multispaces – both inside (a house) and outside at the same time. As Søren Kierkegaard wrote, “the outer is the inner and the inner is the outer”.

Other places share this property for example greenhouses and gazebos. Although Foucault used different examples when describing what he defined as heterotopias, but the term fits well for these spaces, especially with regard to the third principle as he writes, “The heterotopia is capable of juxtaposing in a single real place several spaces, several sites that are in themselves incompatible.” When these type of spaces are used in a composition, they can be called multispaces with the ambition of occupying these spaces simultaneously. To be inside and to be outside and even at different places at the same time, this is the initial spatial idea for the composition On Beginning and Ending [with regard to music].

Here again, is the Winter Garden Photograph. I am alone with it, in front of it. The circle is closed, there is no escape.

– Roland Barthes

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97 Ibid. 9, p. 3.
98 Ibid. 29.
99 Ibid. 10, p. 90.
On Beginning and Ending [with regard to music]

Quick said the bird, find them, find them,
Round the corner. Through the first gate,
Into our first world, shall we follow
The deception of the thrush? Into our first world.
There they were, dignified, invisible,
Moving without pressure, over the dead leaves,
In the autumn heat, through the vibrant air,
And the bird called, in response to
The unheard music hidden in the shrubbery

– T.S. Eliot

Compared to the other compositions presented in this text, where virtual spaces are constructed through spatializing monophonic sources, this composition is based on field recordings, where the spatiality is already present in the recordings. The material was collected in different locations throughout the city of Hamburg. The locations selected for gathering the material was chosen in such a way that they had some connection to Michel Foucault, Roland Barthes and Sol LeWitt, whom all have lived or worked in the city for some time. Also, throughout the process of all the recordings, there was always a search, a treasure hunt for music, that unheard music, which T.S. Eliot (1888–1965) finds hidden in the shrubbery. For the music exists there in the natural sounds. How true it is what Bernie Krause wrote, “You might think I left the world of music behind for that of natural sound. Instead, that is where I truly found it.” Recordings made inside, recordings made outside, recordings made in spaces that share the particularity of the winter garden, the multispaces. Some of the recordings have been made in a fixed location while others have been made under movement – the virtue of walking, as silent as possible, as a meditation. In the process of recording the composer takes the role of the wanderer, walking the cities, a role later to be offered to the listeners. The recordings have been mixed and assembled into multiple layers. In some parts of the composition, the layers are constructed from recordings made at the same fixed location, modified and transformed to change perspectives. Other parts consist of recordings made in different locations and then mixed together to create new virtual spaces that enhance the multispace. In addition to all the spaces brought to the composition through the field recordings, there is also another space, an other-space. A negative

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101 Recording made with the Sennheiser Ambeo VR microphone in Ambisonic A-Format.
space, which is neither outside nor inside, a space that is no-side, a space that cannot be recorded with a microphone. This space is constructed synthetically by recording four separate takes on the same synthesizer and not spatialized through a tool. The four separate takes are uncorrelated but nevertheless treated as if they were the result of an ambisonic recording.\footnote{A recording done in ambisonic A-Format.} This space emerges out of nothing.

O dark dark dark. They all go into the dark,
The vacant interstellar spaces, the vacant into the vacant.\footnote{Ibid. 100, p. 16.}

– T.S. Eliot
The Studio

Next to the winter garden follows three adjacent rooms: the studio, the library and the workshop. There are many idea-based links between these rooms. The work done within each room can be regarded as a connected process based on repetitions and iterations, a process under the constant influence of mutual feedback between the three rooms.

Expedition style

The concept of working in this iterative way, to go back and forth over different nodes in a network can be likened to how a mountain is traversed using expedition style. The expedition sets up multiple stations on different altitudes and moves up and down between them, carrying much equipment on the way to the summit. The key concept when working in the studio with these compositions is that of a rhizomatic network, connecting the equipment on the way to the summit. Various tools and instruments are linked in multiple ways. There are different control networks, both digital and analogue, using MIDI and CV respectively. There are also networks where sounds are distributed, where some instruments are utilized as sources that get routed to other instruments acting as filters and modifiers. Ideally, the setup would be a truly rhizomatic one where everything is interconnected. Sounds are generated through patch programming, both self-playing and those that are modified during recording. Each recording is done multiple times. This process is not designed to select or edit the best take and use one single take. Instead, it is here that the multiplicity of the sounds is constructed as a method to increase the spatial size of the sound objects for the composition. The recorded sounds are edited and processed, possibly treated or modified with effects. Just like “wall of sound” was constructed in the studio, it is here that the “space of sound” is constructed. Surprisingly it is not in the studio where the compositions discussed here are mixed. This part of the composition process is implemented within the virtual domain of the spatialization tool. This method of working can be defined as spatial mixing as it relies strongly on distance. Sounds desired to seem more present are placed closer and sounds intended to be perceived more as distant are placed further away. Again, this process suggests a recursive method of working.

105 The term expedition style is taken from mountaineering and used a metaphor for moving and working in different locations that have a lot of equipment. The term expedition is not meant to be referring to colonialism.
Alpine style

Even when working in a studio intended for multichannel music with a large number of speakers it is improbable that the distribution and number of speakers will match the setup eventually available at future concerts. What strategies can be chosen to make the transition to concert spaces as smooth as possible? In mountaineering, the alpine style is a method to climb mountains where all equipment and tools are carried in the backpack.\(^{106}\) When away from the studio this metaphor has been adopted as a method of working; something that can be called the \textit{electroacoustic alpine style}. All required tools needed for the workflow are carried in a backpack, in particular, a laptop, headphones and a microphone. Using a laptop and headphone makes it possible to work at any location. Crucial for this method of working is the possibility to make binaural encodings of the multichannel compositions. The binaural version of the music gives an insight into how it can sound when presented in different concert venues. Something that improves the experience of the binaural version is to add head-tracking and with this data transform the binaural encoding depending on the movement and position of the head. Special attention should be given when making a binaural or stereo encoding of a multichannel composition, which has been composed with a focus on spatiality, with the intention of its format to be permanent on a commercial format, is a complex matter and a challenge. It is believed to be a challenge to approach a \textit{chimerical space} through listening to these formats, but further research is needed in this field. For documentation and personal use, it is preferred to use ambisonic encodings, particularly in combination with head-tracking.

\(^{106}\) Alpine style gained popularity primarily through Reinhold Messner in the 1970s.
The Library

Read, read, read, read, read, read, read, read, read, read, read, read, read, read, read, read.

– Werner Herzog

In the words of Werner Herzog, it is impossible to become a movie director without reading. The statement is equally true for composing music. Professor Bill Brunson gives the same advice, expanded with that one should not only read but also build up a personal library. The library of this house can be found between the studio and the workshop. Its floor plan is completely round, something like a smaller version of the Stockholm Public Library. It holds many books, mainly non-fictional works on the topics of art, music and philosophy. One of the many books that can be found here is Camera Lucida by Roland Barthes.

The melancholy of the tape loop

In Camera Lucida Roland Barthes investigates the nature of photography. One of his particularly interesting reflections is the one regarding “the melancholy of Photography itself.” According to Barthes, this melancholy arises when looking at a photograph of someone deceased, but it also lays in the fact that “…it is without future (this is its pathos, it's melancholy); …” There are similarities between photographs and tape loops. For example, they both repeat moments in time. In Barthes words: “What the Photograph reproduces to infinity has occurred only once: the Photograph mechanically repeats what could never be repeated existentially.” The tape loop mechanically repeats a small fraction of time. A tape loop is just like a photograph also without future – there is no forward motion; just a repetition of the past. The repetition is not infinite – it is almost as one can hear the tape deteriorate with each repeated loop – this is the melancholia of the tape loop. The punctum that Barthes finds in some photographs can also be found in a tape loop. The sting, the cut, ever present when the tape loop folds back onto itself.

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108 Ibid. 77.
109 One should remember that when Barthes wrote Camera Lucida digital photography was not yet commercially available, and all the photographs he investigated were analogue.
110 Ibid. 10, p. 79.
111 Ibid., p. 90.
112 This discourse is with regard to analogue vintage photography as presented in Camera Lucida and analogue tape loops. The comparison between digital photography and digitally sampled loops is out of scope for this text.
113 Ibid. 10, p. 4.
Language has its element in time; all other media have space as their element. Only music also occurs in time. But its occurrence in time is in turn a negation of the feelings dependent upon the senses.  

— Søren Kierkegaard

The time captured on a tape loop is linear. The circular time perceived when experiencing the loop has never occurred — it is constructed. This is one of the fundamental differences between a photograph, “that has been”\textsuperscript{115} and a tape loop, “that has never been.” In photography, the exposure time is the duration of the film\textsuperscript{116} has been exposed to light, often with the length of fractions of a second.\textsuperscript{117} The result is experienced as a moment captured or frozen in time. Barthes highlights however that there is a movement\textsuperscript{118} of the Photograph itself. I read this as a relative movement travelling further back in time.

The Photograph then becomes a bizarre medium, a new form of hallucination: false on the level of perception, true on the level of time: a temporal hallucination, so to speak, a modest, shared hallucination…\textsuperscript{119}

— Roland Barthes

For tape loops, on the other hand, there is no equivalent to the exposure time of a photograph. Instead, the duration of the tape loop depends on the length of the loop and the speed of the tape, both the speed that the tape had during the recording and during the playback. The moment in time appears, once the tape loop has been created by cutting the tape, fixing the end of the tape to the beginning of the tape, and playing it back.\textsuperscript{120} As a result of how tape recorders are constructed there is a minimum duration a tape loop can have. But the tape loop does not have the same movement as a photograph going back in time. Considering the construction of the loop, there is a (short) movement back in time, but then there is a jump in time; a jump back to the present caused by the cut in the tape. Barthes states

\textsuperscript{114} Ibid. 9, p. 68.
\textsuperscript{115} Ibid. 10, p. 115.
\textsuperscript{116} Historically it was always film, but with digital photography it is a sensor.
\textsuperscript{117} It can be longer when used artistically.
\textsuperscript{118} Ibid. 10, p. 71.
\textsuperscript{119} Ibid. p. 115.
\textsuperscript{120} The playback speed also influences the duration and experience of the tape loop.
that the Photograph is a testimony that we today\textsuperscript{121} are “no longer able to conceive duration.”\textsuperscript{122} Experiencing a tape loop is fundamentally different – the tape loop is, in fact, one of the most appropriate ways to conceive duration.

The Photograph is flat, platitudinous in the true sense of the word, that is what I must acknowledge.\textsuperscript{123}

– Roland Barthes

There are also further differences between photographs and tape loops. Photographs are experienced visually, and their effect is immediate. Tape loops are experienced aurally within a time component.\textsuperscript{124} A photograph as an object appears flat while a tape loop, in essence, is round. Just as the old age of a photograph is indicated through a sepia tone, so there are markers of the old age of tape: the hi-cut filtering, the hiss, the flutter. The photograph is without future. The tape loop is without future, but also without a past. I claim that there is an inherent melancholy in tape loops. William Basinski deals specifically with it in The Disintegration Loops;\textsuperscript{125} it cannot be ignored in Discreet Music\textsuperscript{126} by Brian Eno and it is equally present in Remember When You Put Your Hands On Mine And Crying You Told Me That You Would Forget Me?\textsuperscript{127} There is a degree of melancholy within the tape loop itself.

\textsuperscript{121} When Barthes wrote “today” it would refer to 1980, but the statement is still valid when this text is written (2019).
\textsuperscript{122} Ibid. 10, p. 93.
\textsuperscript{123} Ibid., p. 106.
\textsuperscript{124} At least double the duration of the time of the tape loop.
\textsuperscript{125} Basinski, William, The Disintegration Loops, 2062, US, 2002, [record]
\textsuperscript{126} Eno, Brian, Discreet Music, Island Records, UK, 1975, [record]
\textsuperscript{127} Josefson, Fredrik Mathias, Remember When You Put Your Hands On Mine, And Crying You Told Me That You Would Forget Me? [as part of exam concert], Kungl. Musikhögskolan, Stockholm, 2019-04-08
The Workshop

It is an inspiring time to work in the field of spatial audio. The tools have become more advanced and at the same time more easily accessible. There is also an increasing number of concert venues apt for spatialized music. Throughout the past years, I have further developed my methodology of composing electroacoustic music. During this process, I have identified a discrepancy, a distance, a gap between the spatialization tools and my compositional process. An opportunity has materialized for developing new software; a toolkit to bridge this gap. The intention in creating this particular toolkit is to assist when composing electroacoustic music that has a focus on spatialized music with a high density of sound sources and additionally, to inspire in the process of composition. An initial clarification is in place; the toolkit does not have the intention to address how sounds are spatialized acoustically as any of the already existing tools provide this functionality and purpose. After evaluating different options, the choice was made to utilize Ircam Spat as the tool for this task. Instead of working with the acoustic spatialization, the niche for this toolkit is to operate on the control data with instructions of the positions of the sounds in virtual space. The toolkit is placed one layer above the spatialization tool in the compositional tool stack. Many of the spatialization frameworks, for example, Spat Revolution, Dolby Atmos and SpatServer, work according to the client-server paradigm where the spatialization software fits the role of the server, and the Digital Audio Workstations (DAW) that of the client software. The data flowing is not only sounds routed from the client to the server, where they are spatialized but must often so are the control data mentioned earlier. The control data are usually sent using the OpenSoundControl (OSC) protocol over IP networks. This place on the network, between the client and the server, provides for an ideal location for the toolkit to intercept the flow of control data and to here transform, mediate and adjust the data before passing it on to the server. Ircam Spat is well suited in the client-server paradigm, and as of Spat5, the message format corresponds to the OSC format. Some of the available spatialization tools provide functionality for movement on trajectories, for example, SpatGris and GRM Tools Spaces, and also the Tracer tool where trajectories are drawn in a virtual space. However, the tools currently available do not address the same type of question that this toolkit intends to answer. As things are now, and as a result of the investigations made, there is currently no tool capable of serving to solve the questions presented in this work. The purpose of creating this toolkit is to address this issue.
Furthermore, the decision to build a toolkit stems from two main reasons. One reason is practical and the other is theoretical. The practical reason originates from the fact that friction appears within the workflow when following an implied suggestion of sending streams of sound and control data from a DAW to a spatialization engine as the number of sound sources increase, that is to say, the implied workflow does not scale well. Three coordinates are required to position one sound source in a 3D space. To introduce movement to the sounds the values for the three coordinates need to be modified, often by automation. As the number of sources increases the amount of automation data grow non-linearly.\textsuperscript{128} When there is a high density of sound sources to be spatialized the complexity of the many automation curves quickly increased making it not only hard to get an overview and understanding where each source is located in the virtual space, but it also made the composition process cumbersome. One could facilitate this process by changing from using positions, distances and automation of position changes, and instead, use the first and second derivative of distance – velocities and accelerations.

The second more theoretical reason is to counteract the quite common approach among electroacoustic composers, which seems to be the implicit method of working, where the spatialization occurs as the last part of the compositional process.\textsuperscript{129} Inspired by Gaston Bachelard who in his book \textit{The Poetics of Space}, wrote that “space calls for action, and before action, the imagination is at work”,\textsuperscript{130} support can be found in challenging the method of composing where spatialization is done last. Would it be possible to start with the spatialization when composing electroacoustic music? To let imagination be at work, before action, to let the work of spatiality be the very first part of the compositional process,

\textsuperscript{128} Some tools, for example SpatGris, have addressed the problem by joining sources into groups.

\textsuperscript{129} Ibid. 25.

\textsuperscript{130} Ibid. 12, p. 34.
unrestricted by sounding material. Starting with spatialization as a strategy is part of my approach to work conceptually in the hope to achieve the “leap to conclusions that logic cannot reach”, as Sol LeWitt wrote. It can be very inspiring for the creative process to change perspective and to start with something that is usually done towards the end of the process. At the same time, it can be challenging should there exist some dependencies internal to the process itself. The attempt to start a composition with spatialization by drawing automation curves in a DAW seems rather impractical, approaching the impossible as the number of sound sources increases. To make this fruitful the level of abstraction needs to be raised. Another brief clarification is in place; designing and building the toolkit can be regarded as research through art as Christopher Frayling defined the term. That is to say; the primary personal purpose is to make art using this toolkit.

The objective for building this toolkit is to simplify the process of composing spatialized music. Music, which has the aim to: by moving sounds, to move or shift spaces, and by doing so, to move the audience, that is to say, to touch the listener. The phrase to move the audience is a conscious choice. By using sound as a vehicle with the intent to displace the audience, that is to say, that at least some members of the audience imagine being somewhere else is an endeavor. With the spatialization tools available today it is trivial to position sound sources in space. However, it requires a bit more effort to move sounds, an increasing effort as the number of instances grows. When it comes to the movement of space, it becomes even more difficult, as James Dashow highlights in A letter on spatialization. To move, to touch the audience can be even harder to accomplish but well worth pursuing. Gaston Bachelard wrote that to imagine wandering in the desert is to change space, and as a consequence to change oneself; in his words, “for we do not change place. We change our nature.” The goal with the toolkit is not necessarily to recreate realistically, lifelike sounding spaces, but rather to venture for the creative spaces.

The photograph itself is in no way animated (I do not believe in “lifelike” photographs), but it animates me: this is what creates every adventure.

– Roland Barthes

131 Ibid. 24.
133 Ibid. 7.
134 Ibid. 12, p. 222.
135 Ibid. 10, p. 20.
A creative space – but still plausible. When sound objects behave according to familiar patterns, creative spaces become more plausible. The plausibility of space is independent of whether the presented sound material is unfamiliar or not. The sounds need to adhere to some rules of logic and physics. If they do, then it becomes easier for the listener to enter the creative space, which possibly can lead to a *chimerical space*. Edgard Varèse, who was inspired by natural objects and physical phenomena, said that there were three basic principles for every composition: inertia, force and rhythm. Inertia, force to which velocity, size and friction also can be added – all physical properties, these are the attributes that the *toolkit* works with, in an attempt to give both materiality and familiarity to sound objects.

The *toolkit* is implemented in Java, and the initial version is executed within the Max/MSP environment. One design goal when implementing the *toolkit* is to make a flexible, dynamic and modular framework. As a consequence of this, different characteristics or behaviors are grouped in objects handling that specific property, for example, velocity or bounce. These different object or tools can be chosen to be deployed by the user. All the objects share the same interface, which means that they can be piped together independent of order. The interface is implemented using the DSP connectors in Max/MSP; all calculations are done in the DSP domain. This provides flexibility as the number of sources can change without any re-patching.

![Diagram of the toolkit implemented by Fredrik Mathias Josefson](image)

*Toolkit implemented by Fredrik Mathias Josefson*

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136 Ibid. 4, p. 147.
Remember When You Put Your Hands on Mine, and Crying You Told Me That You Would Forget Me?

An example of how the toolkit is used will be given through the composition *Remember When You Put Your Hands On Mine, And Crying You Told Me That You Would Forget Me?* This composition had its premiere at the symposium November Space 2018 held at the Royal College of Music in Stockholm in the high-density loudspeaker array Klangkupolen with a 45 loudspeaker dome structured in three circles above the listeners, one circle surrounding the audience and with an addition of four subs. Starting with an example for a practical reason for the toolkit; earlier the high density of sound sources was mentioned, without giving any detailed reason as to why; but the reason is concerning the volume and size of sounds. The volume of the sound is not a linear function of the amplitude, but when it comes to space, the size of the sound must also be considered. To increase the size of a sound the multiplicity is introduced, in particular, but not exclusively to increasing the instances of sound sources extensively. A sound expanded through multiplicity corresponds to how individual violins are multiplied in a string section. However, by introducing multiplicity, it does not automatically result in that the sounds are perceived to be part of a whole. For a group of sounds to be perceived as such, they must be unified in a similar way to how John Chowning handled filters when he synthesized choir sounds.  

One way to accomplish this is by applying agent behavior to the sound sources such as cohesion and alignment first implemented in the Boids algorithm. It must be possible to assign sound sources to groups with the toolkit and to manipulate the group as a unit. Extrapolating from the work of the Stockholm Research Institute who with their piece highlighted that, “*Volume is to sound as size is to painting*”, a comparison can be made to the paintings of Mark Rothko. He stated that the ideal distance from which to view his paintings is from forty-five centimeters. What impact does it have to view a Rothko painting from this distance? Recalling the experience of viewing the arts in the Rothko Chapel at this distance; the artworks were enveloping. The paintings in the Rothko Chapel are seven and a half meters wide. Looking straight at the paintings from the ideal distance has the result that they cover eighty-eight percent of the field of view and even one hundred and thirty-nine percent for the binocular vision. It is no surprise that it feels as if one has stepped into the artwork. The term immersive music and to be enveloped by the music have been overused in the past few years, but never the less; there is an allure to the concept of stepping

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138 Ibid. 17.
into the artwork and searching for the equivalency in sound to viewing art from the distance of forty-five centimeters. Because there is something else that happens at this distance; forty-five centimeters lies just within the border of intimate space. The audience shares an experience in the listening space, but at the same time, everyone experience sounds that are within their own intimate, personal space. It is here, in this personal space that it is possible to perceive to be inside the music and at the same time to follow the music on an inward journey to explore internal cognitive maps; it is in this space where the possibility exists to entice movement of the listeners. As Rainer Maria Rilke wrote: “The world is large, but in us, it is deep as the sea.”139 The challenge arises as the volume is used to approach the intimate space. In the intimate space of the whisper, it could be somewhat counterproductive to introduce loud amplitudes perceived as the equivalent of shouting. The assumption is that it is possible to approach the intimate space through spatial music and that the answer lies within the multiplicity, the size, and the volume. Here the toolkit is used to address this challenge pragmatically.

Shifting to the second example that in a theoretical way reinforces the reason for building the toolkit, the desire to start the composition process from a spatial perspective. A hypothesis was formed, as the focus on spatialization was emphasized during the composition process and with the desire, that for this focus to be perceivable by the audience as well, then the spatial events, actions and material should be kept rather basic. Inspired by Bachelard’s text on The Phenomenology of Roundness140 a decision was made on most basic of configurations, the round shape. Perhaps it is not a coincidence, but an interesting fact, the shape of the speaker dome is in essence round. This silent and spatial choreography was composed with the toolkit, before any sounding material was created, by only giving a limited number of instructions.

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139 Ibid. 12, p. 201.
140 Ibid., pp. 247–255.
Instructions to toolkit for composition Remember When You Put Your Hands On Mine, And Crying You Told Me That You Would Forget Me?

However, some conceptual ideas linked to how the material would possibly sound were outlined already at the start of the composition. With a desire to use a material that in essence is round; the choice fell on the tape loop. Brian Eno reflected over the tape and identified that “tape turned music from being a phenomenon in time to be a phenomenon in space. As soon as the sound is put on tape, it becomes a plastic medium. You can do things with tape, you can cut it, you can shift the order of things, you can play it backwards, you can slow it down, you can speed it up, and you can feed it through further electronics to treat it.” These are statements about space concerning the composition process. With this composition, the aim is to bring the tape loop as a spatial sounding phenomenon into the listening space. Could it be possible to shift the primary attribute of a sound object from being an object primarily existing in time, to instead exist primarily in space; to assay the statement of Pierre Schaeffer: “Sound object, unlike visual objects, exists in duration, not space: their physical medium is essentially an energetic event occurring in time.”

142 Ibid. 4, p. 190.
loop is introduced in front of the audience, but it does not take long until it starts a circular movement around the audience. The toolkit creates this round, circular movement of the tape loop by specifying velocities. At the start of the composition is it impossible to hear that the tape loop is divided into twenty-four separate sound sources grouped as a unit, position in one shared location. The defragmentation of the tape loop in the frequency domain is done according to the Bark scale. As the tape loop circles around the listeners, individual velocity differences are given to the sound sources causing them to spread out, first similar to a fan over the elevation and later to phase shift over the azimuth, creating a spiral-like formation. Here the compositional and spatial question raised are: is it possible to stretch one sound object in space to envelop an audience? Instead of enveloping the audience in sounds, is it possible to envelop the audience in one single sound? The transformation is continuous, from the state where the tape loop can be perceived as one single unified sound object in one location, to when the tape loop is defragmented over both the frequency and spatial domains. Can the audience observe this continuous transformation process? Once the tape loop was created, by cutting in a physical reel-to-reel tape, from a recording of an earlier original composition, the sounding material of that tape loop set the direction for the other sounding material of the composition.

The toolkit is an ongoing project currently under development as a vehicle for research through art focusing on music composed starting from a spatial perspective, where the ambition is to create compositions as maps, allowing the listeners to explore them and to approach a chimerical space where reality and imagination intertwine.
The Staircase

Here, says the painter, is of what my world is composed: a quantity of sky, a quantity of earth, and a quantity of animation.\textsuperscript{143}

– Mark Rothko

The staircase leading up to the second floor of the house is a mysterious construction. The staircase is round, and the steps leading upwards are on the outer wall of the room. Letting the gaze follow the stairs upwards it is clear that it has qualities in common with the Penrose stairs.\textsuperscript{144} The stairs resemble the turning pole found outside of barbershops as well as a continuously rising Shepard’s tone. The stairs appear infinite on their way leading upwards. The composition \textit{Entering Heaven Alive} is an attempt to follow these stairs upwards, striving to reach for the sky in an endeavor to examine the properties of lightness; to levitate from the weight of the world. A direct parallel can be drawn between composing and writing as Calvino phrase it: “literature as an existential function, the search for lightness as a reaction to the weight of living.”\textsuperscript{145}

Entering Heaven Alive

The imagination is a place in which it rains.\textsuperscript{146}

– Italo Calvino

The composition \textit{Entering Heaven Alive} has the intention to move space itself through the movement of sounds written about by Dashow.\textsuperscript{147} This movement is not a rotational movement of space as that explored in the composition \textit{Remember When You Put Your Hands On Mine, and Crying You Told Me That You Would Forget Me}? instead, it is something even more challenging to achieve, a \textit{translational movement of space}. The ambition is to entice a \textit{chimerical} upward movement for the audience, a movement into a \textit{chimerical space}, by moving the virtual space downwards. All sounding material “rains” down over the audience. In order to bring focus to spatiality the temporal elements are diminished, by employing multiple time modalities: “the Mercurial time”, that is adventurous and ever-evolving, “the Vulcan time”, which is concentrated and patient and the “punctual time”, which is the absolute subjective present.\textsuperscript{148} Toward the very end of the composition, there

\textsuperscript{143} Ibid. 37, p. 112.
\textsuperscript{144} An optical illusion made famous by M.C. Escher.
\textsuperscript{145} Ibid. 11, p. 32.
\textsuperscript{146} Ibid., p. 99.
\textsuperscript{147} Ibid. 7.
\textsuperscript{148} As Calvino explains in \textit{Six memos} the punctual time is an absolute subjective present.
is a short passage where time is stopped completely. During this passage all sounds are frozen in the frequency spectrum; they have no internal movement or time. The sounds do however have a spatial movement in an endeavor to compose music from a spatial perspective, after the spatial turn, to step into the same stream as Kierkegaard.

Time passes, life is a stream, etc., so people say. That is not what I find: time stands still, and so do I.\textsuperscript{149}

\hspace{1em} – Søren Kierkegaard.

\textsuperscript{149} Ibid. 9, p. 26.
The Concert Hall

On the second floor of the house, there is a concert hall. This concert hall is intended for electroacoustic music and hosts a high-density loudspeaker array. The concert hall is an enigmatic space, a space that shifts shape. All the music in this text is composed for this type of concert hall. This space is a dark room. However, different from the darkroom used in the development process of photography, this room is dark during the presentation of the work. Thomas Lund\textsuperscript{150} gave an inspiring lecture at the November Space symposium, where he pointed out that it is possible to take in as much information through hearing as through sight. However, he also pointed out that as in terms of cognition there is a threshold concerning the amount of information or content that one may perceive. As a consequence, in certain instances, it may not be possible to simultaneously perceive all sounding and visual content fully. Therefore, it is desirable to lower the lights and by doing so to bring attention to the sound material and to remove focus from the visual perception.

Little by little, hearing became my favorite sense…\textsuperscript{151} – Søren Kierkegaard

The camera obscura of sound

Many artists have chosen to work with a concert space as dark as possible. For instance, the British music group Autechre implemented this at Kampnagel, Hamburg, by turning off all the lights at the venue.\textsuperscript{152} Throughout the concert, the audience could question if the artists were still on stage. The amusing response came abruptly as someone, seemingly by accident, turned on all lights. Yes, Autechre were still on the stage. Another example is the performance of Spanish composer Francisco López at Fylkingen, Stockholm.\textsuperscript{153} He employed another method, not completely free of complications, providing the audience with blindfolds. Both strategies bring much attention to achieving darkness. Another less obtrusive strategy would be to listen with closed eyes. All music can benefit from being listened to with closed eyes.

The power to bring visions into focus with our eyes closed, to cause colors and shapes to spring forth…\textsuperscript{154} – Italo Calvino

\textsuperscript{150} Senior Technologist at Genelec Oy.
\textsuperscript{151} Ibid. 9, preface: 2.
\textsuperscript{152} Autechre, \textit{Live Concert}, Kampnagel, Hamburg, 2016-11-20, [concert]
\textsuperscript{153} López, Francisco, \textit{Live Concert}, Fylkingen, Stockholm, 2004-01-25, [concert]
\textsuperscript{154} Ibid. 11, p. 113.
For electroacoustic music, especially when using fixed media, it is acceptable not to have any visual content. However, it is quite common to add visual video content. This addition of visual material can be questioned, in particular when the performance is a collaboration with a division of responsibilities between these two. There is a clear risk for the visual content to take over and for the audience to stop listening to the music as a result. As Kierkegaard wrote “It is said that our Lord satisfies the stomach before the eyes. That is not what I find: my eyes are surfeited and bored with everything, and yet I hunger.” Calvino writes the following about images: “We live beneath a continuous rain of images; the most powerful media do nothing but turn the world into images and multiply it with the kaleidoscopic play of mirrors – images that are largely void of the internal necessity that ought to distinguish every image, as form and as meaning, as a force that lays claim to our attention, as a wealth of possible meanings. Much of this cloud imagery dissolves immediately, like dreams that leave no trace in memory, but a sense or irrelevance and uneasiness remains.” Roland Barthes writes similarly, “Ultimately – or at the limit – in order to see a photograph well, it is best to look away or close your eyes.” Susan Hiller used sounds instead of images because of what sounds can do. She wrote: “I use sound because it has more direct effect than images, because of its physicality. There’s something archaic, regressive about sound.” To focus solely on sound is vital as the presence of visual content has direct counteracting results when it comes to attempting the movement of space with regard to a chimærical movement. As Barry Blasser and Linda-Ruth Salter explain “A physical boundary is essentially a visual concept.” Moreover, in order to experience the chimærical space, one’s sense of hearing must be brought into a perceptive mode. The state in which the chimærical space can be approached is very fragile, as it is easy to break the illusion.

155 Ibid. 9, p. 25.
156 Ibid. 11, p. 69.
157 Ibid. 10, p. 53.
159 As discussed earlier in the case of the concert version of What Word Can I Say To Convince You That All My Happiness Is In Loving You?
Epilogue

My stories are a way of shutting my eyes.161

– Franz Kafka

As shown with this text, I have reflected over my most recent compositions and by doing so shared some insight into my method of working and to provide a general definition of my composition process. I have written about the concept of stepping into the work something similar to what Nick Cave writes about when he writes about the concept of “hiding songs”162 also, what Calvino points to with the example from Carlo Levi who wrote: “…perhaps time will lose its way, perhaps we'll be able to remain concealed in our ever-changing hiding place.”163

I have also written about how I work with spatialized sounds to entice the imagination of the audience to approach a space of shared spatial hallucinations, which I have defined as the chimerical space. The fragile approach to the chimerical space can easily be disrupted, for example through the presence of a sounding installation object as exemplified in the composition What Word Can I Say To Convince You That All My Happiness Is In Loving You?

…it takes the spectator outside its frame, and it is there that I animate this photograph and that it animates me. The punctum, then, is a kind of subtle beyond – as if the image launched desire beyond what it permits us to see…164

– Roland Barthes

161 Ibid. 10, p. 53.
163 Ibid. 11, p. 57.
164 Ibid. 10, p. 59.
It is in the *chimaerical space*, that subtle beyond the concert space, in that space behind the veils of sounding material, where the punctum that pricks Barthes can be found, where the *duende* can appear and where that intimate space can be experienced similar to as when viewing a Rothko painting from 45 centimeters. I want to expand the current terminology and instead of using the word imagination, which is closely connected to that of the image and visual perception, take the opportunity to add to the terminology. I introduce the word *canetination*, defined as a corresponding word to imagination, but instead using the root *cantis*, which is the Latin word for sound. *Canetination* is the vehicle to approach the *chimaerical space*. I will continue to explore this shimmering, mysterious space through spatialized electroacoustic music.

We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time\(^{165}\)

– T.S. Eliot

\(^{165}\) Ibid. 100, p. 43.
Glossary

Canetination: is corresponds to imagination but enticed by sound and not image

Chimærical movement | space: a movement induced by sounds. It is a mysterious, elusive and dreamlike movement going inward, into the chimærical space. It is a perceived movement through space without the change of location.

Electroacoustic alpine style: composing electroacoustic music using only the lightweight tools that can be carried in a backpack

Multispace: electroacoustic music composed by combining multiple distinguished spaces. Comparable and corresponding to the multiform.

Toolkit: used throughout this text as meaning the particular toolkit currently under development by Fredrik Mathias Josefson for composing spatialized electroacoustic music.

Translational movement of space: the most elusive and difficult movement of space to achieve by the movement of sounds. Compare to the move easily achievable rotational movement of space.
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Appendix

Appendix 1: Recording of exam concert *The Melancholy of the Tape Loop*

As attachment to this text there is a binaural stereo version of the multichannel composition presented as the exam concert *The Melancholy of the Tape Loop.* The stereo version is recorded with a dummy head microphone.

Appendix 2: Recording of concert *What Word Can I Say To Convince You That All My Happiness Is In Loving You?*

As attachment to this text there is a binaural stereo version of the multichannel composition presented as the concert *What Word Can I Say To Convince You That All My Happiness Is In Loving You?* The stereo version is a binaural render of the multichannel composition.

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