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A Composed Space

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A COMPOSED SPACE

A COMPOSED SPACE

By
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A thesis submitted in partial fulfillment for the requirements for the degree

Master of Fine Arts
Visual Art

from the

Graduate School of Art
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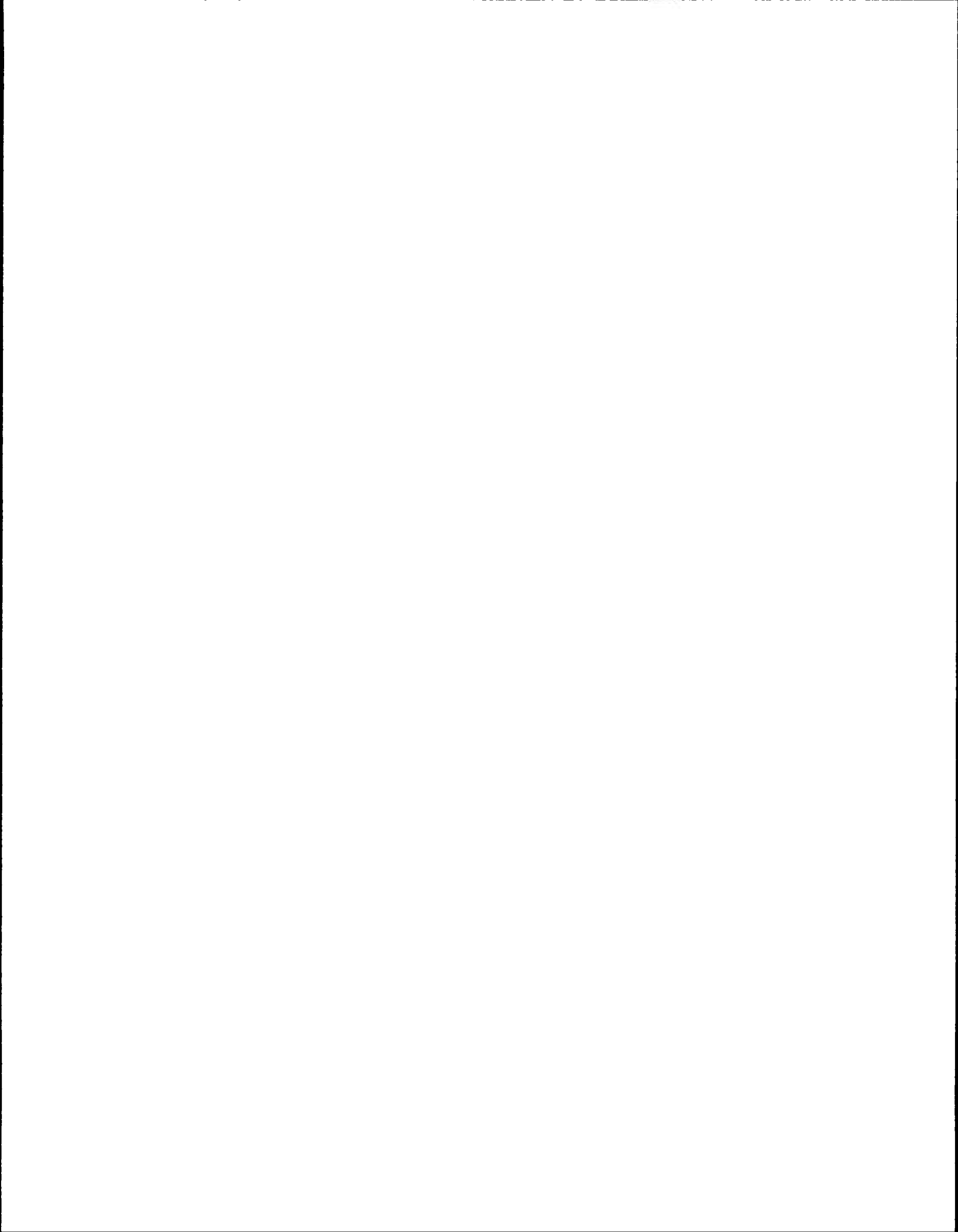
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ABSTRACT

My practice is invested in expanding our conscious scope—revealing phenomena and observations, and presenting the information to the viewer through auxiliary channels. Using the language of minimalism, cinema, and abstraction I create technologically sophisticated systems to produce spaces of contemplation (a meditative space challenging the ephemeral relationships between our sensorial perceptions, space, and time).

Material, space, and technology become instruments for composition manifesting as silent experimental cinema (created and controlled sonically). My work seeks to illuminate our conscious scope through the succession of frames.

Introduction: V I B R A T I O N

“Everything in the world has a spirit, and this spirit becomes audible by its being set into vibration.”¹ - Oskar Fischinger

Influenced by my background in music my work considers systems, materials, and spaces as instruments for composition. Through the real physical event, my work unlocks abstract visual motifs, naturally developing into phrases and phrases into sentences. I recently began to experiment with infrasound (sounds that fall below our hearing range, under 20Hz), structuring each short test as a small single movement work, at first through improvisation and later with a compositional structure. Using a nontraditional method of scoring, each work has a score directly informing the visual effects and motifs produced by the sonic activity allowing the motifs to be reproduced, augmented, and duplicated.

My study of the human-centered perception of sound and going beyond its physical sensorial boundaries led me to a system and method of physical experimentation through infrasound producing visual arrays created and controlled sonically.

Our perception and memory are defined by our sensorial limitation. Sound (physically) can transcend these limits—to collapse space and time, and move beyond. The movement of matter has no agenda or hierarchy of relevance, but our conscious

approach to sound can illuminate our perception of the world challenging social, cultural, and physical structures by oscillating between the past and present.

MEMORY OF SPACE

Part I: MEMORY OF SPACE

AURAL ARCHITECTURE

I approach sound as the memory of space; it exposes what is happening and has happened, and in conversation defines spaces and breaks free of them. Sound negotiates space, recounting movement within its resonance.

Sound is the phenomenon that occurs when objects vibrate, causing a disturbance in matter. Carried by longitudinal waves, sound relies on matter in order to exist. Therefore, we cannot perceive sound if there is no medium to carry it. Sound has the ability to challenge, question, converse, and compose through this resonance. It is a movement that penetrates and moves us to our core, brings our emotions to the surface, and has a direct link to our memory.

Sound thus performs with and through space: it navigates geography, reverberates acoustically, and structures socially, for sound amplifies and silences, controls, distorts, and pushes against architecture: it escapes rooms, vibrates walls, disturbs conversation: it expands and contracts space by accumulating reverberation, locating place beyond itself, carrying it in its wave, and inhabiting always more than one place...²

As we approach a space (before we can even see into it), our hearing is informing how we experience the space. Sound reinforces our physical orientation within space and our emotional response to a space. “We may experience a living room as cold or warm independent of its actual temperature, or a train station as lonely and forbidding independent of its actual appearance.”³ Binaural hearing allows us to interpret surface materials and distance, creating an aural architecture and equipping us with the ability to decipher sonic events and their localization within space.

Aural architecture is not limited to our understanding of the physical space we occupy; we can relate physically to a past space or even an imaginary space through the capture of sound. When we put on headphones, we are thrust into a new aural realm. At this moment we occupy two spaces: the space we physically are in and the captured aural space.

Sound can be reproduced, but the aural architecture is constantly oscillating. This sonic profile can be captured creating a spatial memory that transcends time and location. Through recorded sound (and its subsequent reproduction) the conversation becomes repeatable, mobile, and distributable. Recorded sound is divorced from the actual physical event and travels through time by the mechanisms of media, however retains the ability to interact with our psyche. We can engage with time—how it transpired in the past, and as it is simultaneously informed by the present conditions.

Space is constantly changing and informs the recorded conversation, and challenges the relationship that we have with the recorded memory.

One of my works, *The Listening Can* (2013, figure 1) is a wireless binaural transmitter that relays back to a listening hub (in real time) located within the installation space. The listening hub is an empty space with a pair of isolating over-ear headphones plugged directly into an audio jack mounted in the surface of the wall. *The Listening Can* allows the listener to experience two separate spaces: the physical space occupied and due to the binaural design the listener can also interpret aural information from the acoustic space surrounding the listening device. The device is handheld and can be transported (within range of the listening hub) by other participants, collapsing the distance between the spaces in real time exploring the physics and politics of space.

Sound is indubitably a time-based medium, in its physics (a large portion of perception is timbre—a property of sound directly connected to attack, sustain, and decay; physical properties related to how sound waves unfold through time) and the durational aspects of the experience. As a listener enters an audio installation the work is effectively changed; an individual's mass, movement, and activity physically alter the acoustic landscape. Each space has a sonic profile composed of the activity within it and how the space reacts to that activity.

SPATIALITY

In my work, *4 by 6* (an audio installation completed in 2012, figure 2), the listener walks into an empty space with white walls, a low white ceiling, and four speakers on the ground; the sound of his or her own footsteps masks the subtle sound produced by the installation. After a moment, auditory reflexes force the body to orient itself toward the source of the footsteps produced in the installation. The recognizable sound of footsteps cues the listener to assign a human presence to the moving sonic event and gives the sound a physical space to occupy due to the cultural rules defining personal space, effectively distinguishing an architectural space for the sound to exist within. As the listener experiences the installation one tends to watch the sound move, pivoting as the footsteps move around them in the space; some individuals will even jump out of the sound's way to avoid contact. The pace of the steps combined with the localized sound challenges how we relate to the physical presence of sound and its connection to our body.

The physical relation to sound, space, and time plays an important role in the work of Janet Cardiff. Specifically, she uses binaural recordings to create her "audio walks" (figure 3). "For her audio walks, Cardiff provides participants with headphones... and guides them through a site (such as London's East End or New York's Central Park) via her recording narration."⁴ To produce the experience, Cardiff uses dummy head recording (binaural recording) to capture the events taking place as she completes the

original walk. Cardiff becomes our guide and companion. With this “Cardiff layers sounds over the real perceptions one experiences while walking in a specific environment.”⁵

Janet Cardiff’s works rely on and explore our relationship to sound and its spatial qualities, as well as how perception and memory relate to the experience as it unfolds in time and space.

In Cardiff’s works, *Whisper Room* (1991, figure 4) and *The Forty Part Motet* (2001, figure 5) she explores the relationship between audio reproduction and the space in which it exists. In both pieces, Cardiff uses independent speakers placed strategically in the exhibition space. In *Whisper Room* “The tall speakers take on the presence of bodies, each one whispering a different version of an elusive truth.”⁶ As the listener walks through the installation space, multiple narratives exist within the same time. In *The Forty Part Motet*, Cardiff recorded a choir of forty performers and reproduced each voice by isolating them independently in speakers that were placed at the perimeter of the exhibition space. “This allows the listeners to make their own mix as they walk through the space and to hear the voices in ways that could not be possible in a performance.”⁷

The acoustic landscape and spatial memory shape the way social institutions are created, molding the design of architecture. Sound shapes how we build buildings,

design spaces, and understand objects. Sound indicates life, or aliveness. "Sound also connotes companionship... Likewise ambient sounds remind the listener of his own presence in a living world."⁸ If sound is movement and movement represents life, then sound breathes life into space through its oscillation; it is the living pulse of architecture and landscape.

CONSCIOUS SOUNDSCAPE

From the standpoint of audio engineering, sound can be divided into two main categories, auditory information and noise. Auditory information can be defined as a level of sonic activity that is decipherable and cognitively engaging (what should be amplified/captured). In comparison, noise is a high level of sonic activity conclusively removing the ability to interpret one sonic event from another (what should be suppressed). The onset at which sound becomes noise is individual and cultural.

It is apparent that we have the ability to prioritize our focus on certain sonic events and suppress others. Conscious, or active, listening allows us to understand conversations that take place in a space that has other sounds and activities happening simultaneously. We can actively listen to music or a lecture; contrarily we can tune those things out to focus on other sonic events or even our own thoughts, our emotional state high-jacking our ability to cognitively engage our hearing.

The ability to passively listen is a product of our auditory reflexes. The human auditory reflexes are well tuned; if we are otherwise cognitively engaged, small exposure to stimuli will still trigger our startle response forcing the human body to react. As a sense, hearing is never shut off. We are constantly monitoring sonic activity (even in sleep we are listening to the environment).

Culturally, we tend to tune out most sounds and consciously engage with only those we deem important or interesting enough to hold our attention; our bias constructing the sonic hierarchy. We often focus on the human-centered experience, sensorially aware of our definition of reality ignoring what lies outside this narrow scope.

Quite clearly man is in the paradoxical position of existing in a state of consciousness without being able to understand it. Man does not comprehend his relationship to the universe, either physical or metaphysical. He insists on doing “his thing” without the slightest notion of what his “thing” might be.⁹

In my work *Soundscape* (2012, figure 6), an audio installation presenting the viewer with a large-band visualizer of 20,000 frequencies (low to high/left to right, 1Hz to 20kHz), I explore this relationship between consciousness and acoustics. The digitally produced image reflects the real time sonic events within the installation space. The viewer is able to see one’s activity, and the aural architecture of the space: high frequency interference, low frequency standing waves, and all the frequencies in the

human hearing range. The auxiliary channel to experience an energy that is always with us, yet out of our reach piloted my investigation of phenomena outside the human-centered experience.

Outside the human-centered perception, infrasound is a sound that lies below our hearing range, sound waves that move with us and around us continuously. Infrasound is a frequency lower than 20Hz (Hertz, cycles per second). We cannot hear it, but we feel its presence. Infrasound produced by industry can disrupt bird navigation and some mammal communication, and have adverse effects on humans. Science monitors earthquakes, and other seismic and volcanic activity through these ephemeral waves. In comparison to sound within our hearing range, infrasound can travel far greater distances and pass through objects with little dissipation or distortion.

Infrasound and its ability to travel great distances and escape spaces, to push against the architecture and landscape that tries to feebly control it, develops a conversation between space and memory.

* NASA's portable infrasonic detection system detected a 1.5Hz infrasonic disturbance caused by the 2002 shuttle launch at Kennedy Space Center from the Langley Research Center over 660 miles away with a 51 minute delay. Qamar A. Shams, Cecil G. Burkett, Allan J. Zuckerwar, Christopher C. Lawrenson, and Michael Masterman, *A Portable Infrasonic Detection System*, (NTRS, 2008).

COMPOSITION

HOGAN 12

Part II: COMPOSITION

CAGE AND COMPOSITION

“Cage himself redefined music as “an organization of sound” rather than a composition of melody and harmony.”¹⁰

John Cage is responsible for revolutionizing the way we relate to sound, music, and composition integrating sonic phenomena as tools for the composer and flattening the hierarchical structures that governed music composition. Cage is one of the most impactful radical minds of the twentieth century; his influence changed the course of a wide array of media and disciplines.

Cage’s works spanned discipline and definition to create innovative ways to approach the medium of music, and sound itself. Cage as a composer and artist challenged the classical notions about musical composition, sound, and conscious listening. He was interested in ambient sound (the natural sounds of a space) and its indeterminacy, and its relation to composition. The Cagean philosophy heightened our awareness of the aural landscape and awoke our conscience to the melodic and rhythmic influences in the environment.

One radical artistic idea that Cage pushed beyond its previous provinces is the work of art as primarily an esthetic illustration. The illustration point of 4’33”

(1952) is that all the unintentional, random sounds framed within that auditorium and within that period of time can be considered music. "Doing nothing," as the critic Jill Johnston put it, is clearly "distinct from expressing nothing." By investing a situation where sophisticated contemporary music is expected with nothing intentionally audible, Cage implied that in the silence was "music" that could be heard. This polemical illustration exemplifies the principle of "art by subtraction" to the point that negation produces addition.¹¹

Cage succeeded in challenging the audience's notions about the natural sound of a space and its relation to composition and time. *4'33"* marked the complete integration of noise into a musical composition, effectively eliminating the sonic hierarchy.

He [Cage], noticed how, on a canvas of nearly nothing, notably absent of the expressive outpourings characteristic of the time, another plenitude replaced the effusiveness in the complex and changing play of light and shadow and the presence of dust. Correspondingly, environmental sounds rushed in to fill the absence of music sound in *4'33"*.¹²

This revolutionary approach to sound changed music, and more importantly changed how we relate to sound (noise) and our awareness of the acoustic landscape surrounding us. The thought of the acoustic landscape being as important as the composition made the listener conscious of his or her own involvement within a space.

“In retrospect, the primary significance of 4’33” lies precisely in its inferences, which gave Cage and others “reason” or permission to create eventually a musical theater that is indeterminate not only in its composition but in performance too.”¹³

Cage gave the composer “permission” to explore music with sounds that had never been voiced and radically changed the way a composition was created; how the written composition was approached, produced, and performed. Cage maintained that all sounds we can hear are music and all events are theater. Currently, I am exploring the sonic vibrations that lie outside our reach, sounds we cannot hear but are moving throughout space.

SOUND AND CONTEMPORAY ART

The Museum of Modern Art’s first major exhibition of sound art, *Soundings: A Contemporary Score*, presents work by 16 of the most innovative contemporary artists working with sound. While the artists in *Soundings* approach sound from a variety of angles—the visual arts, architecture, performance, computer programming, and music—they share an interest in working with, rather than against or independent of, a given situation or environment. These artistic responses range from architectural interventions to visualizations of otherwise inaudible sound to an exploration of how sound ricochets within a gallery to a range of field recordings including bats,

abandoned buildings in Chernobyl, 59 bells in New York City, and a factory in Taiwan. *Soundings* is organized by Barbara London, Associate Curator, with Leora Morinis, Curatorial Assistant, Department of Media and Performance Art, MoMA.¹⁴

The major institutional exhibition presented a multitude of approaches to sound and the subsequent work produced by these investigations. Two of the artists involved with the *Soundings* exhibition, looking through the contemporary lens at my work, have particular relevance. Carsten Nicolai and Richard Garet are interdisciplinary artists incorporating a wide range of digital processes in their work to examine complex systems of perception, human relation to mediation through technology, and composition.

Carsten Nicolai seeks to develop his own language for acoustic and visual signals, and is invested in electronic music. His practice spans club performances and installations, museums, festivals, and biennials. Nicolai “seeks to overcome a separation of art forms and genres for an integrated artistic approach, influenced by scientific reference systems, nicolai often engages mathematical patterns such as grids and codes, as well as error, random and self-organising structures.”¹⁵

The work that represented Nicolai in *Soundings* was his work, *weelenwanne lfo* (below is an excerpt from MoMA’s description of the work, figure 7).

In this work the artist demonstrates the impossibility of achieving true silence. Rippling through the piece are visualizations of inaudible, low-frequency sound waves. Through the shifting, concentric patterns on the water's surface, the piece renders visible what would otherwise exist beyond our range of perception. Nicolai is interested in exploring if and how these frequencies might affect us, despite their inaudibility.¹⁶

Nicolai enlisted the use of optic structures to examine the acoustic phenomenon he refers to as sub-frequency sounds. He built a "water pond" to carry the waves and projected the corresponding ripples onto a rear-projection screen via a stroboscope and mirror. The ripples are produced by metal exciters physically blowing air on the surface of the water, the subsequent vibrations result in this visual disturbance. Nicolai refers to this as a demonstration of "the polarity of the elements of chaos and order, movement and stagnancy."¹⁷

Nicolai does produce a beautiful and meditative visualization, however I would argue that Nicolai is contradicting himself within the framing of this work. Science suggests low frequency sound can be perceived and does have physical and psychological ramifications, even though it does not reach us through our hearing. Furthermore by using a two-channel composition of "sub-frequency" (infrasound) he does not produce "chaos." Nicolai produces interference patterns, even when it produces

irregular patterns physics dictates a repeatable physical and visual effect. Mathematically and physically waves, sounds, and movements interact within a controlling structure. Precisely this structure makes the exploration of the physical and perceptual events through composition (and the durational experiences and relationships that are produced as a result of the composition) vital and at the core of my own work.

Another artist in the *Soundings* exhibition, Richard Garett produces “electrified color-rich moving image “paintings,” created through sound then silenced,”¹⁸ and multimedia performances. The works take form of installation, screenings, immersive situations, and intimate spaces. Garett (in his words) produces “situations that draw attention to the processes of perception and cognition, and which activate sensorial, physical, psychological phenomena that reflect on the nature of the experience of time.”¹⁹ Garett uses digital technology to produce his visually assaulting images from his interest in mathematical systems and formulas using the well-established mass media culture as a backdrop. (Below is a description of one of Garett’s performances at SF MoMA, figure 8)

The material for this piece emerges from the radio arena while utilizing AM/FM and SW radios as a fabric source. The sonic field will be established by utilizing the real time feeds from the radios to activate a series of piezos, sound exciters, motors, and modified speakers, to resonate objects, filter its frequency range,

and mask its origin. Additionally, a series of extended techniques will be applied to disrupt the radio signals and establish an electromagnetic field for further disturbance and audio feedback of the source material. Photoresistors, connected to the sonic system, and flickering image projections will be utilized to interrupt the sound further, once the intensity of the emitted colored-and-flickering light, from the imagery, touches the photoresistors.²⁰

Garet's performance visually and sonically oscillates between moments of "subtle sonic movements to more abrupt and physical noises."²¹

One can draw parallels between Garet's visual effects and the projected image of my experimental films. My work explores a meta-sensorial phenomenon voicing through light sound lost to our ears, and exposing our limitations. Garet uses magnets, motors, and digital technology to produce his self-referential images. Images created solely to be easily devoured by our senses. I strive to challenge the sensorial limitation by capturing the manifestation of sound caught dancing through a physical medium with the interplay of light and shadow. Thirty times in every second the digital cinema camera captures this complex interaction.

THE CINEMA APPARATUS

My work manifests in digital cinema as the direct translation of the physical event, consciously creating films with no cuts or digital manipulation. The subsequent effects are produced through sonic composition—an abstraction, through the real (unmolested by editing), producing a reduction through high-resolution and repositioning the sensorial experience of sounds we cannot hear.

Movement represents life and produces ephemeral traces in space, challenged and informed through time. Sound is the memory of space, within its reverberation echoes movement. My experimental films explore, expose, and challenge this memory to capture a small glimpse into a relationship with space and time reverberating outside the human scope. A subversion of our sensorial channels produced by the composing of proceeding and succeeding frames.

The Movement of People Working (figure 9) by minimalist composer and filmmaker, Phill Niblock exists free of narrative. The work ebbs of movement that produces abstraction—not in editing, but by presenting time and events in unfettered, almost non-compositional, shots. Niblock's film leaves the viewer scavenging for meaning, and finding only movement. This unfiltered honesty exists in front of the camera, in post-production and in exhibition, and it is this honesty allowing the movement to tap (directly) into our psyche—a spirit brought to life through movement.

The system dynamics of video and cinema lie at the center of the work of Steina and Woody Vasulka. The Vasulkas use the apparatus as an instrument to explore alternate depictions of the world (figure 10, 11). Technology is the material to develop images through organization, composition, and modification using the camera as the documentation of time. In my films the camera serves as the arbiter of time, while I create a complex system for auxiliary perception. I explore the formal visual motifs and sonic, sensorial experience of time and space through musical composition in the form of experimental cinema.

My body of work *The Partitas in Infrasound* unfold through the interaction between light and shadow moving before and as a result of the cinema apparatus, and immersing the viewer into the composition—a delicate projection, strobe-like and flickering with a rhythm directed solely by the sonic oscillation. *The Partitas in Infrasound* envelope a meditative silence, while performing a complex and hypnotic musical composition challenging the sensorial perception of sound, space, and time. The fluid rises to a wave's crest catching light and producing a glimpse into the amplitude, and casting shadows into the corresponding valleys. From the first delicate movement to the assaulting exposition of the *fugue*, the work oscillates between physics and composition, real and abstraction, presence and absence, addition and reduction.

THE PARTITAS

HOGAN 22

Part III: THE PARTITAS

The Partitas in Infrasound

The Partita is a variation form of classical composition traditionally for a single instrument. I use this form to explore a pallet for composition that lies completely outside the human hearing range. Through the physical laws that govern sound, I am able to produce physical movement, shifts in elevation, direction, and rhythm through the sonic variation of the composition. *The Partitas in Infrasound* are captured using digital filmmaking technology. Film allows the ability to expose the complex and intricate phenomenon otherwise unnoticed. As a cinematographer I deliberately choose a shot and focus that remains completely stationary for the duration of the piece. The digital cinema apparatus (digital cinema camera and digital projector) is a silent witness to the unfolding of the composition, but in no way interferes with the Partita (leaving them completely unedited). The composition is presented as the physical activity that unfolds as a result of the ephemeral vibrations of a memory that is otherwise lost to our ears.

The Partitas in Infrasound began as an investigation into the physicality of sounds that lie out of reach to our perceptive hearing, and as a formal look at the underlying physics that dictate sound's presence within space. Infrasound presents unique challenges as a medium for creation, our inability to hear it being a formidable one. To

explore this range of sonic activity, I developed a wave-generating system that has the ability to harness the elusive low frequencies and provide a channel for the infrasound to exist within by using the actual energy of sound to transfer the ephemeral vibrations into a fluid medium. This performance medium demanded experimentation and improvisation.

Through the use of sine waves and test signal oscillators, I was able to examine sonic motifs and the corresponding visual and physical effects (which were recorded mathematically and visually). Wave cancellation, phase, frequency, and amplitude, all possess distinct physical implications resulting in the development of a visual language produced physically by sounds we cannot hear.

I studied the work of J.S. Bach extensively as a musician developing an intimate relationship with the works composed for lute (a plucked instrument Bach was not as familiar with as other instruments he composed for) transposed for performance on classical guitar. Bach's organizational structures inspired my composition *Partita No. 1 in Infrasound*, the first of my suites in an attempt to develop a meditative and contemplative piece, to challenge the perception of sound, space, and time through mathematical composition. The second suite I composed uses an architectural structure reminiscent of Bach's *Partita for lute in C minor* (the suite only resembles Bach in structural theme: the rhythms, motifs, and voicing are unique). *Partita No. 2 in Infrasound* (2014, figure 12, 13, 14) is considerably more complex compared to my

first composition, and serves as an investigation into physics, composition, and perception; a mathematical intervention into cinema and subsequently space.

Partita No. 2 in Infrasound (17:14)

prelude (03:14)

The *prelude* serves as an introduction to the motifs I present in the following movements of *Partita No. 2 in Infrasound*. I use a simple ternary form for the composition, ABA for the *prelude*. In the tradition of the prelude, it is the shortest portion of the suite. The composition is an introduction and warm-up to more complex and intricate movements to follow.

fugue (05:42)

Traditionally, the fugue is a contrapuntal form however in structure it can vary. Symmetry between subject and echo in the compositional structure of the fugue makes it a recognizable form. Multiple melodies overlap and develop beyond the original subject each presented in the exposition; the staggering overlapping parts develop an intricate phrasing. The phrasing is then mimicked or echoed in other voices or positions.

The *fugue* presents several overlapped motifs, visibly reflective of the symmetry one would expect to traditionally find. In *Partita No. 2 in Infrasound: fugue*, the reflective qualities of the fluids surface and the visual structure create a visually assaulting intervention into the original motif.

sarabande (04:30)

A sarabande is a classical Spanish dance composition commonly found in dance suites. In the parlance of the 18th century this would traditionally be the third or fourth movement found within a suite, structurally a balance between restraint and climax. My third movement, the *sarabande*, exhibits deep constraint both architecturally and dynamically within relation to the other movements; varying from ultra delicate undulation to dynamic vertical movement restrained in voice and pattern.

gigue (03:48)

The gigue is a Baroque dance movement, traditionally lively and in many cases contrapuntal in structure. With distinct dynamic accents across the two sections of the dance: the structure mimics a fugue in the first, then the inverse in the second section. This lively contrapuntal method of composition is evident in the final movement of my suite *Partita No. 2 in Infrasound*, closing the suite with complex, dynamic, mathematical silence.

Conclusion

“...stillness in the midst of the fullness of acoustic stimulation...as well as the reverse.”²²

Sound carries the movement of space, grounds time, and escapes to collapse these structures within its reverberation. My meta-sensorial films are brought to life through musical composition, silently challenging the relationships between our perceptual experience, memory, and the world we physically occupy. Working with sound creates a piece living within the environment, developing in public space individual connections echoing in our collective consciousness.

Through a musical definition, I see the world as oscillating between composition and improvisation. Improvisation extends not the ability to react to sounds within space, but the responsibility to predict the subsequent movement and act accordingly. Through composition my work seeks to expand the conscious scope, to challenge the standing sensorial and physical structures. Integrating space, physics, and time to produce work that is always moving and continuously reflecting.



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5

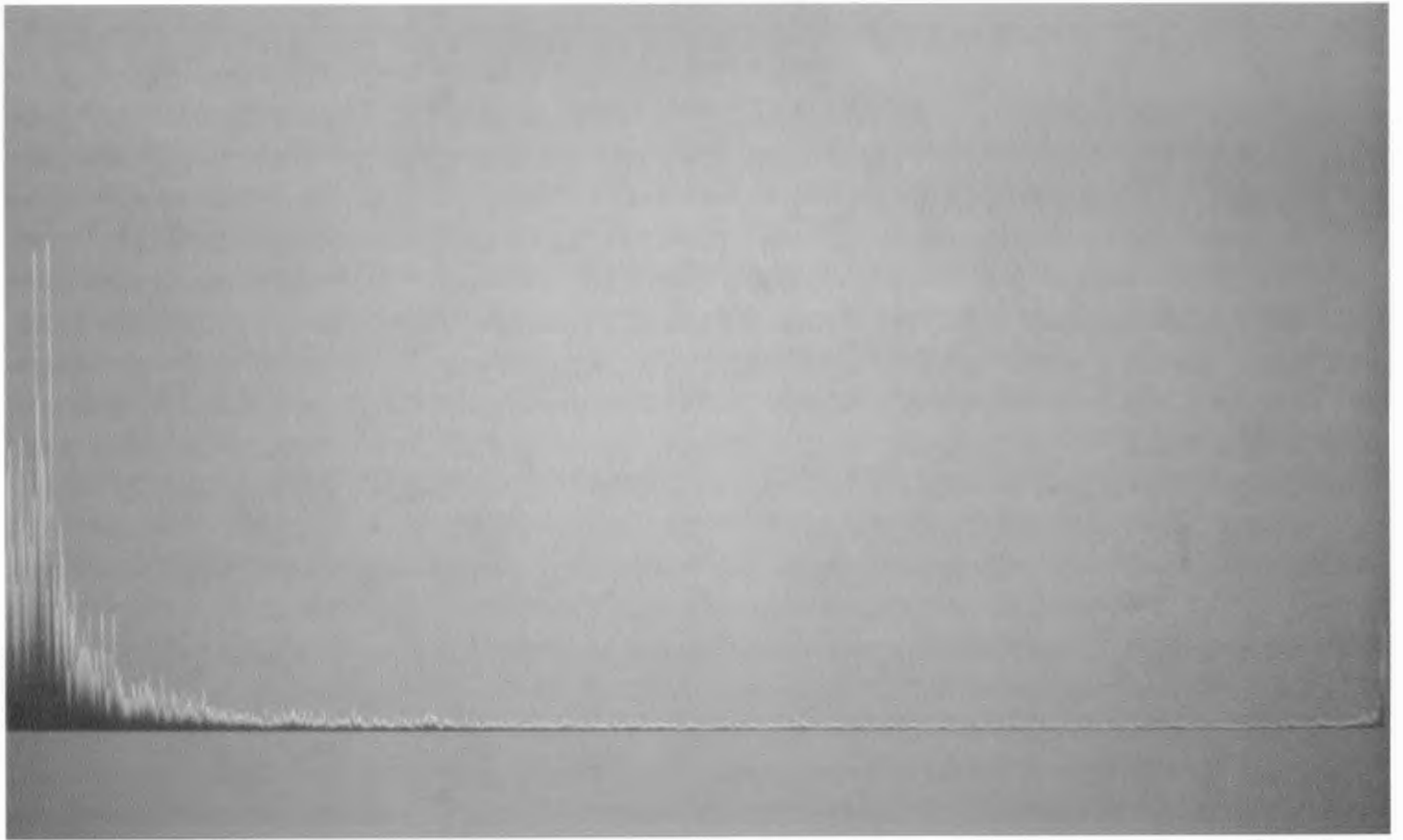


Figure 6



Figure 7



Figure 8



Figure 9



Figure 10

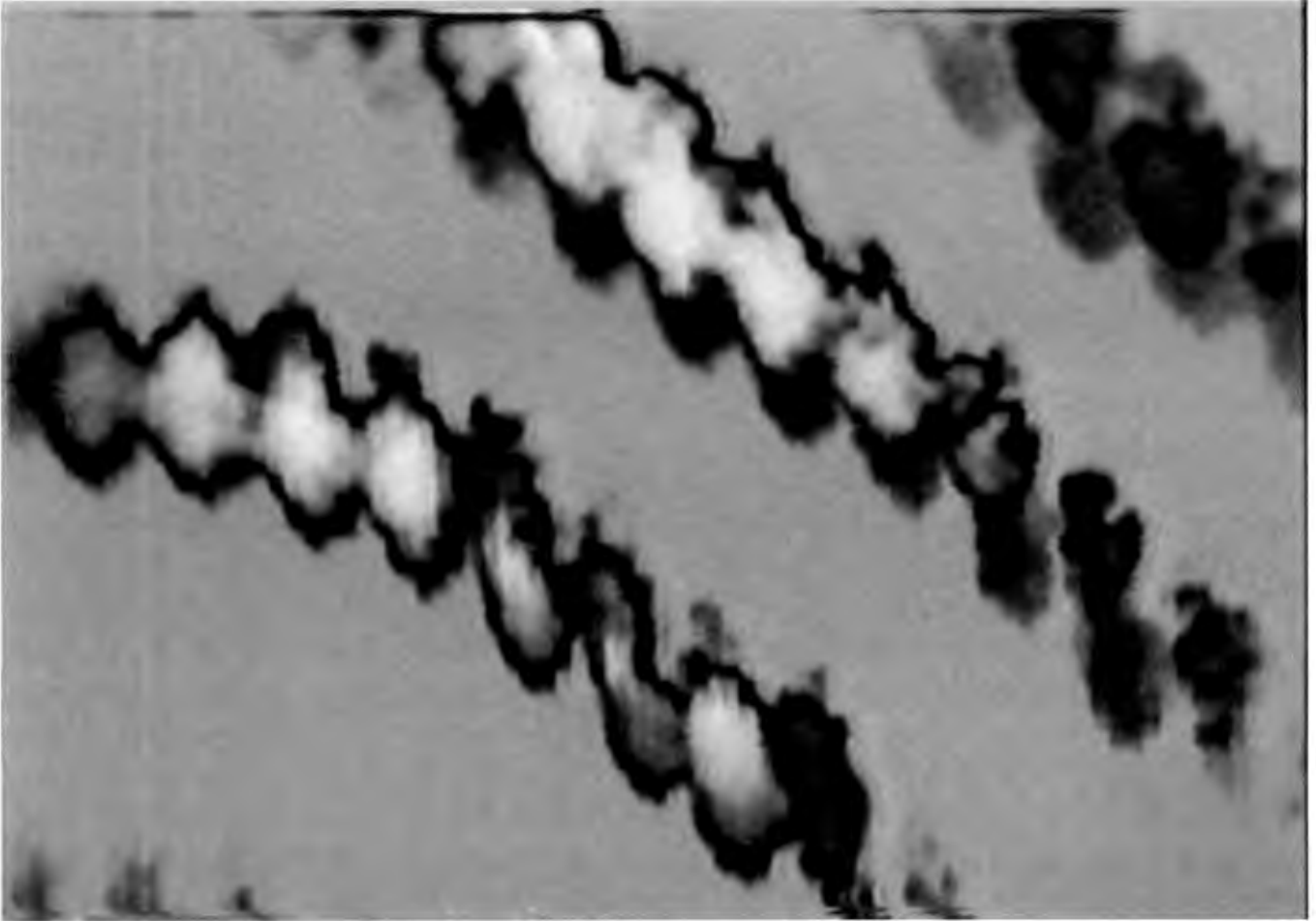


Figure 11

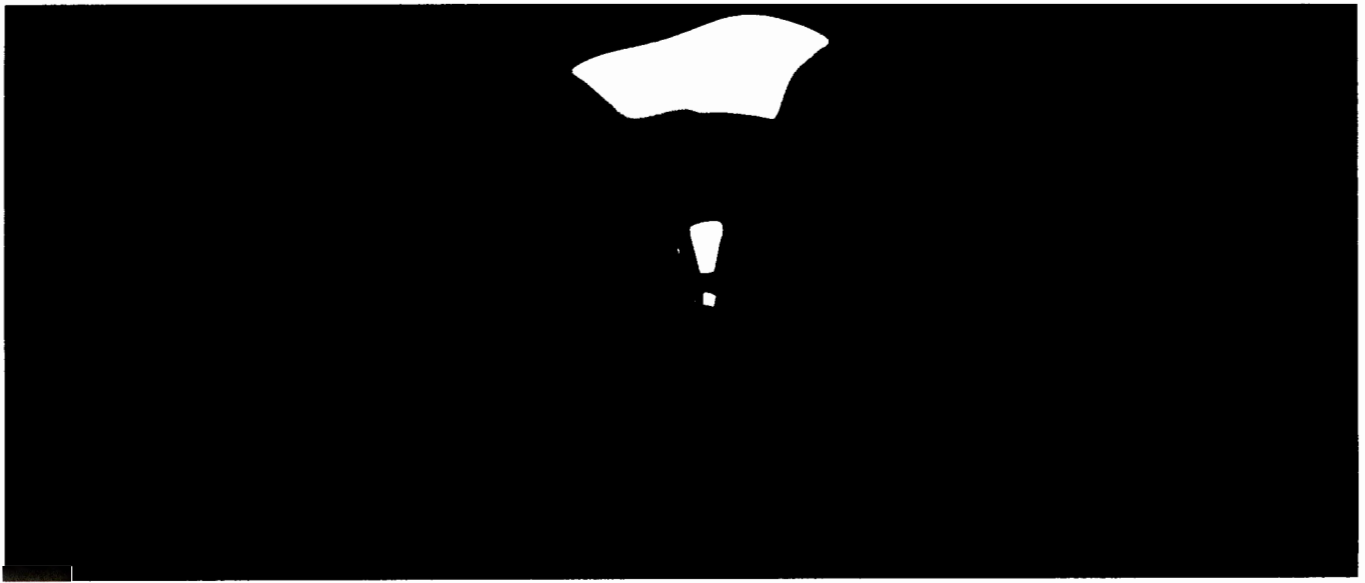


Figure 12

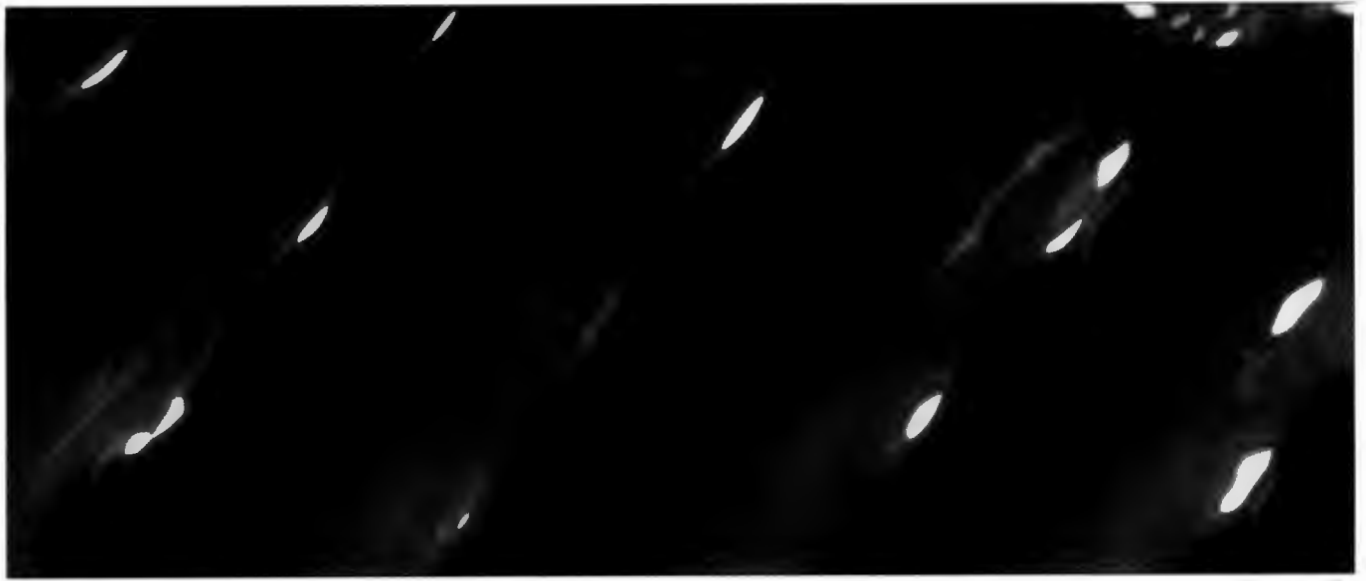


Figure 13



Figure 14

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Figure 1: Adam Hogan, *The Listening Can*, 2013

Figure 2: Adam Hogan, *4 by 6*, 2012

Figure 3: Janet Cardiff, *Words drawn in water*, 2005, www.cardiffmiller.com

Figure 4: Janet Cardiff, *Whisper Room*, 1991, www.cardiffmiller.com

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Figure 8: Richard Garett, *Light, Motion, and Radio Disturbances*, 2011,
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Figure 9: Phill Niblock, *The Movement of People Working*, 2003 (released),
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Figure 10: Steina and Woody Vasulka, *Descends*, 1970, www.vasulka.org

Figure 11: Steina and Woody Vasulka, *Descends*, 1970, www.vasulka.org

Figure 12: Adam Hogan, *Partita No. 2 in Infrasound*, 2014

Figure 13: Adam Hogan, *Partita No. 2 in Infrasound*, 2014

Figure 14: Adam Hogan, *Partita No. 2 in Infrasound*, 2014