WHAT WOULD TINNITUS MUSIC BE?

By

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Introduction

September 30th, 1978. In a studio loft in SoHo, an illegal immigrant from Taiwan named Tehching Hsieh shaves his head and locks himself in a cell built from pine planks and dowels. He is an artist, and this is his artwork. He issues a terse statement, stating that he will remain in this cage for a year; that he will refuse television, writing, radio, and conversation; and that his studio mate will bring him his food and take care of his refuse. He seals the door to his cage with a paper seal, notarizing the integrity of this seal with an attorney, who will return a year later to verify that the cage indeed has remained locked for the duration of the performance. The artwork is called *One Year Performance 1978-1979*, or simply abbreviated, “Cage Piece”.

Tehching Hsieh performed four more *One Year Performances*, each titled by their date. His next work consisted of punching a time-clock hourly—24 hours a day—for a year, and photographing this act each time. Hsieh only missed 133 of the total 8765 hours. In his next piece, “Outdoor Piece”, he resolved to stay outdoors for a year, never entering a building, any means of transportation, or even a tent. The rules of this piece were only broken once as a result of an arrest, and later the judge acquitted him of his crime in order to allow him to continue making his artwork. Next, Hsieh tied himself with an 8-foot rope to the performance artist Linda Montano, and tied its ends with a lead seal, never to be opened for the year. They resolved to never physically touch. For his last One Year Performance, Hsieh resolved to not
make or see or think about art. After these five pieces, Hsieh made a final work, a “13 year plan” to make art once more, yet not to reveal it to the public. The work began in 1986, ended on December 31st, 1999, on his 49th birthday, and after its conclusion, Hsieh stopped making art entirely.

What does it mean to invent and cultivate the practice of a lifework? Hsieh’s pieces are a part of the history of long durational art occurring in the latter half of the twentieth century, alongside such other artists as Marina Abramović, On Kawara, Roman Opalka, and also musicians such as La Monte Young. These pieces may be characterized through extended duration, but also through conceptual approach. Hsieh’s pieces are always governed by a simple set of principles that must be upheld at great cost to the body, and duration itself is a medium and organizing principle, not the core of the piece in and of itself. Before beginning the One Year Performances, Hsieh made many smaller works that pushed his body to great extremes, such as Jump Piece, where he filmed himself jumping off a second story window, breaking his ankles in the process. In conversation with Adrian Heathfield, Hsieh discusses the distinctions between the longer work with these shorter exercises: “My earlier pieces are experimental. They are not mature. The risk is manifested intentionally, but in my One Year Performances this risk dissolves into life and is not particularly emphasized” (Heathfield and Hsieh, 324). In his final two pieces, the “No Art Piece” and the “13 year plan”, duration is not incidental, but it poses no risk for the body. Nevertheless, they are not merely ideas for pieces—Hsieh needed to actually perform them for the concept to have any meaning. These pieces seem to be about art itself,
about collapsing boundaries between life and art, and about the transformative properties of the aesthetic domain of art.

When I first came across Tehching Hsieh in 2010, I was looking for a creative solution for my tinnitus. My ears had started to ring continuously, and all the doctors I went to see told me there is no cure, so just get used to it. I had first attempted to find this solution through experimental music. I sat down to perform Cage’s 4’33”, and tried to listen to the ambient sounds surrounding me. Instead, I heard my own internal sounds—a high-pitched swirling noise that I couldn’t pin to any note. I had just begun assisting Maryanne Amacher on her final commission, placing twenty loudspeakers throughout a five-story theater. Amacher’s music rejects the “middle range,” for the loudest and quietest thresholds of hearing. Maryanne played her music for hours while I listened eagerly for the magic. However, during the forte passages, I clutched my ears in pain, and during the pianissimo moments my tinnitus rang out over the music.

In lieu of immediate sonic solutions, Hsieh’s lifeworks struck me deeply. My tinnitus was immovable. All music I could hear or play seemed now incompatible, out of tune harmonically and spiritually with these sounds that just went on endlessly. But Hsieh had formed an inclusive practice based on long durations—everything he did during the years a One Year Performance was part of the piece. In the spirit of Tehching Hsieh’s unflagging commitment to his project, I resolved to make a musical work about my hearing damage. But rather than represent my tinnitus as a musical motif, I wanted to begin a process that would unfurl on the same timescale as my
ringing ears. I resolved to begin a work about tinnitus, which would last as long as my ears continued to ring.

What would it mean to consider Tehching Hsieh’s work not as performance art, but as music? Hsieh was not a composer, but his work is composition. His pieces don’t actively live in the statements, flyers, pictures, films, and artifacts left behind by his *One Year Performances*; they were moments in time, and therefore we no longer have access to them, only their documentation. Yet despite this disjuncture between performance and document, these artifacts suggest strong formal components that align him to the text-piece tradition of Fluxus. Each of Hsieh performances were preceded by written statements, in which he clearly states the “rules” of his piece that he must uphold. In “Rope Piece”, for example, this reads:

**Statement**

We, Linda Montano and Tehching Hsieh, plan to do a one year performance. We will stay together for one year and never be alone. We will be in the same room at the same time, when we are inside. We will be tied together at waist with an 8 foot rope. We will never touch each other during the year. The performance will begin on July 4, 1983 at 6 pm and continue until July 4, 1984, at 6 pm. (Heathfield, 230).

At the bottom of the flyers to his early pieces, Hsieh would provide an address to a location where a viewing would be scheduled. His later pieces, such as the “Outdoor Piece” or the “No-Art Piece”, have no precise locations, and so Hsieh simply wrote “New York City” to indicate where the piece was happening. These locations seem to echo the convention of a composer writing on their score the place where the piece is finished.
Thus, when I found Tehching Hsieh’s work, it seemed like music to my ears. In order to understand Hsieh’s performances, we look for the governing principle, the external discipline that turns the process of life into art material. In Hsieh’s work, these are explicit distinctions, coming in the form of a statement or score, which must be adhered to for the piece to exist. This is an elective choice by the art maker. At the end of the year, the piece is done. However, in creating my own lifework based around tinnitus, I had no need to create an explicit statement to create musical discipline. My condition itself functions as a discipline, which is not elective. Tinnitus constantly orders my activity. In doing his 13-year plan, Hsieh created a situation that could not be shared—he must make art but not share it publicly. Like tinnitus, the 13-year plan is an artwork that cannot be shared and has its own immutable logic. Speaking of the piece, Hsieh says, “It is better to get a thirteen-year sentence than to get a life sentence” (336). But tinnitus is a life sentence. Unlike Tehching Hsieh, I can’t stop the external discipline that governs my lifework.

Though Hsieh developed his works in the hotbed of the SoHo art scene, he didn’t actually arrive to America until 1974, before which he asserts, “he had very little knowledge of the Western contemporary context in which he found himself (Heathfield, 12). Rather than owing his durational aesthetic to the Fluxus movement of the 60s, Hsieh often alluded to Dostoevsky and Kafka for inspiration and early influence. In an interview with Deborah Sontag, Hsieh explicitly mentions an oft-quoted phrase of Kafka’s to describe the severity underlying the Outdoor Piece: “You have to make the art stronger than life so people can feel it. Like Franz Kafka says,
you have to take an ax to the frozen sea in people’s hearts” (Sontag, web). Kafka’s original quotation came via a letter to his classmate, Oscar Pollack: “I think we ought to read only the kind of books that wound and stab us. If the book we're reading doesn't wake us up with a blow on the head, what are we reading it for? A book must be the axe for the frozen sea inside us” (Kafka, 16).

Kafka was an early influence of my work, but in a completely different manner. Kafka exemplified the beauty and promise of an unsullied aesthetic realm. In a letter from Kafka to his publisher, written 100 years ago, Kafka pleaded against the inclusion of an illustration to accompany his work The Metamorphosis.

Dear sir, you recently wrote that Ottomar Starke is going to do an illustration for the title page of The Metamorphosis…It occurred to me that Starke might want, let us say, to draw the insect itself. Not that, please, not that! I don’t want to restrict his authority, but only to make this request from my own naturally better knowledge of the story. The insect itself cannot be drawn. It cannot even be shown at a distance…If I myself might make suggestions regarding the illustration I would choose scenes like these: the parents and the chief clerk in front of the closed door, or better yet: the parents and the sister in the illuminated room, while the door to the adjoining completely dark room is open (16).

For Kafka, representation seems to be a great crime. Kafka resists representation because it collapses the imaginary space around the work itself. Kafka’s Ungeziefer is unheimlich in its capacity to never quite be represented by a concrete physical description. He doesn’t even tell the reader that it’s an insect. There are some musical works that do attempt to represent tinnitus musically, for example, Smetana’s string quartet, which captures his tinnitus as high notes in the violin part. This seems to be a contradiction in formal terms. The phantom of tinnitus is not an acoustic sound, and thus attempts to represent it give it phase and acoustic dimension. Even if we
attempted represent tinnitus and failed, could we even trust the ear to hear it? If tinnitus is a symptom of damage, then, no—we cannot depend on the observations of a damaged body, because the ear has become unreliable. In attempting to transcribe my tinnitus, I became continually perplexed by its impalpability. I tried to match it with hi-frequency sine tones, and as I neared it, I would lose track of it.

A more literal musical situation of tinnitus might not explicitly involve transcribing its pitch, but rather creating a situation that resembles what it’s like to hear a sound that no one else can hear. Tinnitus situations can be staged that are explicitly contextual rather than sonic. For example, if each member of the audience received a unique concert program before the concert, they would have a private experience that could accompany the public acoustic experience of the music that would follow. I considered these possibilities for my work, but ultimately I have proceeded intuitively. Listening to tinnitus is listening to the instability of your own listening. A personal practice is paramount to expressing Tinnitus Music, because tinnitus itself is highly individualized. As a composer I do have preoccupations and formal interests—instrument building, feedback, improvisation, and the pleasure of particular sounds or situations. My experiments in these domains occur at different time scales. On a macrocosmic scale, my tinnitus manifests itself with the gravitational pull of a star. It pulls me back from my experiments and qualifies them, asking me if they harmonize aesthetically along with it. It simply continues, on and on.
Chapter 1: Critical

In 2008 I discovered that I had hearing damage. My ears had begun to ring, unremittingly, and the loud sounds that I had grown to love unconditionally were now painful to my ears. These symptoms were identified as tinnitus, the perception of sound that has no acoustic antecedent, and hyperacusis, or sensitivity to acoustic sound. My diagnosis followed: the cause of these symptoms was noise-induced hearing loss. Since there is no known cure, I can expect to hear my ears buzzing forever.

Although this diagnosis was crushing at first, I was an experimental musician, and thus perhaps uniquely prepared to adapt to my new reality—a continuous ringing woven into all subsequent musical experience. My understanding of music had long since exploded. In my natural enthusiasm for the works of my favorite composers, I had developed an inclusive understanding of the way these composers conceive of their own musical worlds. John Cage’s silent 4’33” shows the listener the unintended music inside their acoustic environment. La Monte Young’s Composition 1960 #5, in which a butterfly is released into the audience, directs the ear towards the microsonic beating of the insect’s wings. These simple pieces provoke complex interpretations; in order to even hear the music, the audience must adopt an active disposition, and try to listen for artistic content outside of typical boundaries. This activation allows the audience to ask deeper questions about the extra-musical meaning of the creative act—these pieces can be seen as performance art, theatrical interventions, or manifestations of the composer’s philosophical grounding.
Of course, encounters with differing ontologies of music don’t begin and end in the experimental community. We can look outside the sphere of composition to the many identities of music in a global context. In his introduction to *World Music*, Bohlman explores cross-cultural variations on the ontology of music, and in doing so argues for diverse studies of music. He begins:

The basic ontological question is simply, What is music? If the question is simple, the answers are not. In fact, world musics have very distinctive and contradictory ontologies. Western ontologies of music, for example, privilege the organization of pitches according to specific systems, in other words, the scales and modes we learn while practicing a musical instrument. When we insist that recitation of the Qur’an, however, is music because it makes extensive use of the modes (maqamat) of Arabic classical music, we impose a western ontology where it does not belong (Bohlman, 6).

The situation becomes even more complex among speakers of Hausa in Northern Nigeria, for whom there exists vocabulary for musical instruments, practices, and even musicians, without a word for music itself. The question “what is music?” reveals a different answer depending on who is asking it, and who is asked.

Instead of asking what music is, I ask, how are we listening? To consider listening is to describe how music happens, which is inherently subjective. I will look through a personal lens, and follow the work of three modern composers who explicitly explore listening as a musical practice: John Cage, La Monte Young, and Maryanne Amacher. Listening is paramount in the musical worlds of these composers—it is a precursor to each musical act in their lexicon. Yet, each approaches the mode of listening from a different vantage point; Cage was concerned with listening to *nothing*, while Young was concerned with listening to *something*, and Amacher was involved with listening to *listening* itself.
My intent is to situate these composers within my own frame of listening experience, in which the unintended sounds of my damaged ears are inextricably copresent. With tinnitus, a real problem emerges as to whether it is even possible to experience these works on the composer’s terms. If these composers are engaged in defining a personal practice of listening as a prerequisite to experiencing their sonic corpus, do these personal practices function in a non-ideal, or non-functioning aural reality? More simply stated: if your ears are always ringing, can you even hear Cage’s 4’33”? My inquiry is rooted in critical advocacy, for these composers serve as the building blocks of my own musical framework; they are like family to me and I want to preserve that care. That said, my family has grown considerably since the onset of my tinnitus to include the community of sufferers at large. My project is to search for a music that accepts physical defects as a part of listening. We need a new way of listening that can account for the defective and the monstrous.

**Listening and John Cage**

Chronology alone suggests that we begin with Cage; he precedes the other composers in this paper by at least a generation. Aside from chronology, Cage is a logical starting point because his major revolution in composition—silence—emerged from a redefinition of listening practice as a prerequisite for music. As early as 1937, Cage attempted to define a new vision of music in his *Future of Music: Credo*. The polemic of his essay is decidedly strident, almost confrontational, in its tone. At this time Cage was primarily a percussion composer, and a stridency permeates his
writing that is distinctive of a percussionist engaged in banging on objects, like the brake drums and tabletops that roamed his early music. If his work at this point didn’t belong to the musical community, it could be called “organized sound” (Silence, 4). Despite the radical growth of Cage’s compositional and philosophical framework that would follow, the modality with which Cage hears these sounds was already quite developed, musical or “unmusical.” It even opens his Credo: “Wherever we are, what we hear is mostly noise. When we ignore it, it disturbs us. When we listen to it, we find it fascinating” (Silence, 2).

This quotation could have been said at any time in Cage’s life. Cage would later quiet down. His music would change; it would slow down, lose its rhythmic structure, explode with countless novelties and inventions; it would incorporate chance and later indeterminacy; it would hush to the inaudible. “In 1937 he dreamed of ‘a quartet for explosive motor, wind, heart beat, and landslide’; by 1948 his dream was of a piece made of pure silence” (Pritchett, City Wears a Slouch Hat liner). The silent piece is Cage’s starting point, his ground zero. To say nothing of its global and historical impact, his preference for it is a salient detail (“I think of it before I write any other piece”). In 4’33” we can see Cage’s attitudes toward listening and music dovetail. In thinking through these two facets of aesthetic sonic experience, I mean to delineate between music or sound on the one hand, and the listener on the other. In Cagean terms these are framed as the object and the subject, respectively.

From where does this dichotomy emerge? Cage makes his study of Indian music plain. His studies with Gita Sarabhai and helped reformulate music’s utility
and purpose to him: the Western model of music as communication had failed him, whereas the Indian model of music serving “to sober and quiet the mind, thus making it susceptible to divine influence” provided fertile ground for him (Pritchett, 36). Cage continued to study these ideas through the writings of Ananda Coomaraswamy. Cage turned towards non-intention to quiet down the demands of the subjective ego, first with a study of structured chance and later though open indeterminate practice. Using the *I Ching* as a method for chance operations allowed Cage to forgo psychological preference in favor of randomly determined information—he would later say that he asked questions with his compositions, and allowed the *I Ching* to give him answers. The silent piece is a pure distillation of non-intention. Cage mentions Rauschenberg as the predecessor to his silence (“The white paintings came first”) but 4’33” is more of a translucent overlay than a blank page. It suggests a frame, through which the unintended sonic content of the situation becomes transformed. “I would think quite a lot of people in India feel that music is continuous, it is only we who turn away. This is a cliché in Indian thinking and, surely, in Indian experience. My affirmation of this is within the context of twentieth-century art music” (Duckworth, 13–15). Despite this clear influence, Cage’s appropriation of Indian music (or later, Zen never breaches into religious territory. “You needn’t bother sitting in the lotus position” (Revill, 157). It is grounded in reality, not divinity. Perhaps in Indian music, “turning away” from music is an act made by the musician in between performances who disconnects from the cosmic
thread of continuous music; for Cage, it is an action of the listener, turning away from the ever-present allsound of our immediate surroundings.

However, the subjective experience is where listening takes place. We need to listen to hear music. Cage needs interpreters to turn his scores into music. Cage alludes to this paradox in subtle ways. In *Lecture on Nothing*, he quips, “what we require is silence. But what silence requires is that I go on talking” (Cage, 109). When Cage was showing the music of *Concert for Piano and Orchestra* to his colleagues, he was asked to describe what they sounded like. He replied, “‘You’re not listening to it, you’re looking at it’” (Revill, 111). Perhaps this is no paradox, but a kind of compartmentalization in order to allow Cage to wrestle with complex ideas discretely. “Composing’s one thing, performing’s another, listening’s a third. What can they have to do with one another?” (Silence, 15). It all comes back to listening. Listening is where these actions triangulate and create the music. The crux of Cage’s musical world always concerns music as an objective force, but it is the subjective ear of the listener—be it the listening composer, performer, or audience—that shapes the allsound and renders it to be music.

The genesis of Cage’s masterpiece of listening deserves further elaboration. While *Silent Prayer* had been imagined in 1948, it wasn’t until Cage’s legendary visit to the anechoic chamber that he could compose 4’33” as a formulation of silence as non-intention determined by an acoustic reality. The story goes that Cage entered the silent room, and expecting to hear silence, heard two sounds, which the technician explained were being made by his circulatory and nervous systems. In *No Such Thing*
as Silence, Kyle Gann offers a critical perspective on Cage’s favored origin story for 4’33”:

There is some questioning of the facts so confidently given to Cage by the anechoic chamber technician. Peter Gena, a composer who has based much of his music on data drawn from medical research, has confirmed with several doctors that no one can hear the operation of his or her own nervous system, which is merely a series of electrical impulses. It is possible that Cage had tinnitus, which many musicians develop and which often remains masked until the afflicted person is in an extremely quiet environment (Gann, 163-4).

Gann’s identification of tinnitus in Cage’s mythology is crucial, and we need not look far for corroboration. Only a year after Cage’s revelation in the anechoic chamber, the field of neuroscience would essentially mirror the avant-garde with its own landmark experiment. In the classic Heller-Bergman study of 1953, 100 “normally hearing persons” (tinnitus-free) were placed in an anechoic chamber and asked to describe the sounds they heard; 93% of test subjects reported hearing “buzzing, humming, or ringing sounds” (Heller and Bergman, 78). The study concludes: “The kinds of head noises described by patients with impaired hearing as a symptom associated with their deafness and those sounds described by normally hearing healthy adults, elicited while in a sound-proof room, appear to be similar. Tinnitus, which is subaudible, may be a physiological phenomenon in an intact auditory apparatus” (82).

Considering the similarities between these two silent tests, a question emerges: is Cage’s ontology of listening affected by the location of tinnitus in his sonic mythology? At first glance, the core of 4’33”—acoustic experience—still functions. “Medical fact leaves Cage’s basic point unscathed: our bodies do produce sounds of their own, and in the vast continuum of human experience true silence is
virtually unknown” (Gann, 164). Gann’s assertion is that the conceptual foundation of 4’33”, the embrace of non-intentionality, is undisturbed in the face of tinnitus, which is an unintended consequence of the body. What might Cage be leaving out?

The Heller-Bergman test is perhaps so often cited because of its therapeutic benefits to tinnitus sufferers. The attribution of tinnitus as a symptom of all human experience, not only those with hearing damage, effectively de-pathologizes the condition. This could offer relief, and relief was certainly important for Cage. In 1943, during an interview for Time magazine, Cage reported, “People may leave my concerts thinking they have heard ‘noise,’ but will then hear unsuspected beauty in their everyday life. This music has a therapeutic value for city-dwellers” (Joseph, 144). Especially after the introduction of Zen into his lexicon, the quintessential image of Cage is his incredibly joyous smile. Perhaps the problem is not the test, but the test condition.

The great oversight of these silent tests is that they are tests of normalcy. They do not account for the disabled or the damaged. The Heller-Bergman study is a survey of “normal” people, and Cage’s experience in the anechoic chamber is not identified by the composer as a symptom, but rather a sign of ordinary bodily function. You have to be able to hear in order to hear the ambient sounds; the potential dilemma, then, is that Cage’s entire compositional project may hinge on a normative, able-bodied experience. Could his way of listening then be redeemable for the non-ideal listener? Joseph Straus, a scholar of disability studies, has devoted critical effort into locating disability as a facet of the most seminal works of Western
music. He writes, “Disability is a pervasive and permanent aspect of the human condition. Like people in all times and places, most of us have been, are now, or will be people with disabilities” (Straus, 113). The universality of disability makes it salient, yet disability itself is a study of disenfranchisement. The experience of living with any condition puts one painfully outside the context of normalcy. In her personal account of developing Crohn’s disease, author Carolyn Lazard clearly locates the marginalization of the disabled through assessing the inadequacies of the healthcare system: “Since we associate illness with old age, it’s no surprise that we view the elderly as the ultimate refuse of our capitalist system. Just look at how we treat them” (Lazard, web). We should pay attention to these disabled voices, for non-normative experience affords a fantastic vision outside the boundaries of what is regularly conceivable.

Gender and sexuality studies have demonstrated that sexuality does not exist in a male/female or gay/straight binary, but rather can exist along a spectrum—the symbolic rainbow flag. Disability studies, with its inherent relation to the limits of mortality, might be described more aptly as a grayscale. Straus, making a bold claim as to the necessity of disability studies, states: “If disability is understood as culturally stigmatized bodily difference, then femaleness, non-whiteness, and gayness can all be understood as forms of disability, and that is how they have often been described in the history of Western thought. In this sense, disability is the fundamental form of deviant Otherness of which gender, race, and sexual orientation are specific manifestations. Disability is ‘the master trope of disqualification’” (121).
Hearing damage is not just a problem for an audience member trying to hear the music, but it’s also a problem for the composer conjuring up musical solutions amidst an impaired aesthetic. We might then return to Cage’s trichotomy once more—“Composing's one thing, performing's another, listening's a third. What can they have to do with each other?”—and ask, what does it mean to be a composer, performer, or listener, and have tinnitus?

For the listener with tinnitus, 4’33” is troubling not because of the intrusion of unintended bodily sound, but because of the marring of the aural apparatus. Cage’s notion of silence is as an acoustic distillation of non-intention. A deaf person cannot hear acoustic silence, thus it cannot serve as a medium for transcendent listening. The composer JG Thirlwell articulates this problem plainly in his essay, An Occupational Hazard: at any performance of 4’33”, his tinnitus is the soloist. In the majority of cases, tinnitus is a subjective phenomenon, i.e., not an acoustic sound, but a phantom perception—almost like a hallucination. One can never accurately describe or represent what is heard, since it is heard only by that particular listener; it is not truly even “heard.” Or, if 4’33” is a sonic frame for experience, tinnitus is like the conscience—copresent, always insisting itself. I want to deliberate on the subjective for a moment, for it is in the subjective mode that the disabled, non-ideal listener enters into encounter with Cage’s philosophy. The delicious contradiction of Cage’s ontology of listening, as stated previously, is that although he was striving towards “objectivity” through taming the ego, the act of listening to his music—which is actually where the music takes place—is an inherently subjective phenomenon. Only
upon hearing do Cage’s compositional drawings become three-dimensional. Cage’s project hinges on a subjective listener, and subjectivity is compounded for the non-ideal listener.

Before embarking on an analysis of the next composer’s listening practice, I want to take a detour and consider a new vantage point: Jacques Attali, poetic economist and author of Noise. It begins, “[…] The world is not for the beholding. It is for hearing. It is not legible, but audible. […] Our science has always desired to measure, abstract, and castrate meaning, forgetting that life is full of noise and that death alone is silence.” For Attali, 20th century music might finally be the music to bring forward the essential conditions of existence in artwork itself. Noise, in Cage’s world, becomes not incidental, but the center of content. Music is a prescient force: “Mozart and Bach reflect the bourgeoisie’s dream of harmony better than and prior to the whole of nineteenth-century political theory. Janis Joplin and Jimmy [sic] Hendrix say more about the liberatory dream of the 1960s than any theory of crisis” (12). Noise—as unintended sound—here is not the emancipatory force of Cage’s silence, but a mirror and prophecy reflecting the inequity of class and capital structure. Music might reflect, but it can also compel. “Make people Forget, make them Believe, Silence them…When [power] wants to silence [people], [music] is produced, normalized repetition” (Attali, 21).

I hope that this excerpt might trouble the waters. For Attali, the way out of the sonic prison is self-agency, i.e., composition against control. If you want to transcend oppression, compose yourself a way out. Yet the social tyranny previously
mentioned—controlling the masses through a conflation of silence and repetition—are signature compositional features of the composer previously mentioned, and the one to follow. Silence was emancipatory for John Cage; repetition is central for La Monte Young. But these tenets, when considered outside of the compositional sphere, might suggest more of a tendency for social control, in opposition to the openness and beauty that these composers’ intend for their musical worlds. The dissonance found here might suggest contradictions in the very foundations of these composers’ ontologies of listening.

La Monte Young And Fear Of Silence

From Cage’s empty stave, let us move to one chord. The logical succession from Cage to La Monte Young was even suggested by Cage himself, who noted that they were “two sides of the same coin” (Grimshaw, 70). Young was a generation younger than Cage, but already by the early 60s he had demonstrated to his reigning elder (and the avant-garde community) that he was not merely carrying the torch, but breaking new ground. Or, where Cage stood for nothing, Young represents one thing.

In contrast to Cage’s pursuit of indeterminacy, Young’s compositional framework is maniacally specific. Young’s manifesto could be found in Composition 1960 no. 10, a text piece consisting entirely of the sentence “Draw a straight line and follow it.” Young makes no secret about the significance of this piece, and even noted that his entire life might be seen as a performance of it. Repetition and consistency are central to Young’s oeuvre. Indeterminacy here, in contrast to Cage’s panoply of
sound, only refers to duration of focus, and suggests that any of these pieces might continue forever. *Composition 1960 no. 7* is a perfect 5th “to be held for a long time.” How long? Into eternity! As such, we find no Cagean silence in Young’s work; there is hardly any silence at all. His Dreamhouse sound installations are continuous, unchanging blocks of purely tuned sine waves, running for decades. Even the custom-designed Rayna synthesizer that generates its just intoned ratios is guaranteed not to drift its frequency ratios further than one beat per year.

How do we approach a music that does not change? Walking into the Dreamhouse, one is confronted by a swirling harmony that seems to explode from the walls. At the four corners of the room stand four 8 foot subwoofers bellowing the 9:7:8 sub-bass drone that grounds the piece, and above it glares a microtonal cluster of closely tuned upper-partials. As one walks around the room, these harmonies go in and out of phase, and the ear latches onto whichever tone resonates. The effect is that walking around the room creates an aural filter—the music seems to change as one moves. In fact, the music is not changing. *You* are changing. The magic here is not metaphoric; it is an acoustic experience. Grimshaw describes a similar situation upon hearing Young’s perfect 5th for a whole 2-hour concert: harmonic beating patterns slowly unraveled, and inside that 5th a whole world can be heard. “Whatever other ‘statement’—aesthetic, political, or ideological—that might be embedded within Young’s sustained B and F#, or read into it, the primary statement is ontological: listen to what this sound *is*” (Grimshaw, 50).
For Young, listening allows music to become three-dimensional. The human experience of these hyper-specific constraints is where the art happens. Listening, in Young’s formulation, is a fusion of the dialectic of object and subject. That long sustained chord is the object, which must be heard. Upon hearing (and hearing, and hearing, and hearing) this object, its true nature will continue to unfold. Thus, listening is the practice that transforms the object from a note on a staff, or a sheet of arcane numbers, into endless material for musical fecundity.

Young stands at the center of this dialectic. We depend on Young—we cannot hear his magic without his guiding hand. His Well-Tuned Piano, an eight-hour long epic piano solo, doesn’t even have a score; thus it is impossible for any other musician to even attempt an accurate performance without passing through Young. Young borrowed from Indian Music much more than Cage did—his entire life and musical practice is deeply suffused with North Indian music, culture, practice and spirituality. Cage only needed to reject the Western musical model of communication; thus as an individual, he remained distinctly atheist, American. Young does sing Indian classical music, practices meditation, and holds a shrine to his teacher and guru Pandit Pran Nath in his Dreamhouse. Cage would ask questions in his compositions, and use the I Ching or indeterminacy to answer them. Young always has an answer, and the listening allows one to experience this answer.

Listening to and for Young is then the pursuit of the ultra-spiritual, the highest form, and the holy cosmos. Grimshaw’s thesis asserts that biography is essential to Young’s oeuvre. Despite aspiring to the cosmos, his is highly personal music. For
example, the 60hz hum that suffuses this music can be traced to one of Young’s first musical memories, the transformer near his cabin house in Bern. Thus aspirations to the universal are always couched in the personal, by the listener that listened—i.e., Young—and not by the audience. A problem emerges: how can listening retain its essential subjective component if the listener must always hear Young’s thesis enacted? We’re privy to Young’s listening. Or more precisely, we are subject to the coercion of his focus. How can we then listen on our own terms? Shades of Attali’s polemic begin to appear once more—the long durations that categorize Young’s music, when experienced, may also constitute a sort of aural brainwashing. Thus one’s subjective experience and perspectival emotions might be consumed by the endless sound. In 2009, upon first moving to NYC, I interned for Young’s MELA foundation, and had the task of monitoring the Dreamhouse as a docent. At the end of the night, I was instructed to turn off the installation. After turning down the faders on the main mixer and switching the lights off, I confronted the silence of a cramped room with dirty white carpets. It was more like coming out of hypnosis than waking from a dream.

In her landmark essay, *Towards an Acoustemology of Detention in the ‘Global War on Terror,’* Suzanne Cusick describes the horrific implementation of music used as a weapon deployed against political prisoners in Guantanamo Bay and Camp Cropper. Prisoners were forced to listen to music not of their choosing—for example, heavy metal—at extreme volumes for long durations in the dark confines of their cells. Cusick argues that the violence perpetrated upon these prisoners is much more
complex than merely bombarding them with loud music; it integrates sheer volume with surveillance and control of the acoustic environment to rob the prisoner of any semblance of personal agency. She writes:

The destruction of prisoners’ subjectivities partly depends on the acoustically and philosophically salient fact that manipulations of the acoustical environment always produce the somatic effect of sympathetic vibration. Always compelled by the physical properties of sound to vibrate in their very bones with those sounds, the prisoners subjected to the music programme [of Guantanamo] have no choice but to become, themselves, the characteristic sounds of their captors. This is, I argue, an ultimate violence that batters prisoners’ bodies, shatters the capacity to control the acoustical relationality that is the foundation of subjectivity and blasts away all sense of privacy (Cusick, 276).

The most striking thing about this essay is how closely these torture environments resemble sound art installations. Careful attention is given to speaker selection and placement, timing of the duration of the music, and extra musical decisions such as lighting and temperature (287). It’s no exaggeration to claim that these environments are composed. Aside from the technical similarities, we can trace a conceptual identity in La Monte Young’s work, whose use of pure immersion may silence the listener through sheer repetition. While it would be a stretch to compare the sound-torture of the music programme to Young’s Dreamhouse, this comparison gets to the heart of the issue: what is different about these two sound environments?

The difference appears to hinge on agency. One can leave the Dreamhouse at any time, but prisoners of music torture cannot. On a more topical level, consider the vast difference between a heavy metal concert and the music programme—a metal fan delights in the loud volumes and abrasive content of this music, and will often cite it as a transcendent experience. It seems at this level that the sonic context might
matter more than the sonic *content*. Does tinnitus complicate this conclusion? If I find the presumed godhead of La Monte Young problematic, I can leave his concert; however, I cannot leave the concert that plays in my ears continuously. The deepest violence of the music programme, according to Cusick, is that through sound torture and acoustic control, the prisoners lost any hope for maintaining personal agency over their acoustic and psychological presence, which she refers to as depriving them of subjectivity. The paradox here is that tinnitus is a subjective experience that deprives the listener of his or her own subjectivity.

What does it mean to be a *composer* with tinnitus? Tinnitus, after all, is a risk that accompanies the high volume sound exposure so essential to Young’s music—and furthermore, the transcendent experiences of many avant-garde composers and experimental rock ensembles. Doctors warn musicians and concertgoers alike to take care of their hearing by wearing earplugs to reduce sound pressure levels, and to limit length of exposure. *Degree*, then, must play some crucial factor in the aesthetics of tinnitus. Previously I mentioned the grayscale of disability, which could account for some slippage between 4’33” as a silent test functional for able-bodied listeners, yet problematic for disabled listeners. On a material level, to ask what it means to be a composer with tinnitus, is essentially asking what does it mean to be a composer with disability. As a composer who has spent his life playing loud, ecstatic music, Young now has deep hearing damage. This fact had been long known by word-of-mouth, but has been made clear in interviews (Duckworth, 265). Young’s own aesthetic doesn’t leave any space for disability—or even doubt—in his entire artistic oeuvre.
Among Young’s contributions to music is a radical emphasis on stasis. Marian Zazeela, speaking of her artistic union with Young, says, “We determined at a certain point that our medium was time.” What can be said of “the composer who more than any other has stopped Time” (McCroskey)? To stop time would be to stop mortality, to stop aging, to achieve immortality and to end the process of gradual deformity in which all humankind inextricably participates. To attempt to stop time, then, is to deny deformity.

**Amacher And Beethoven**

The next composer I will discuss here bears a markedly subjective frame of reference. Maryanne Amacher was my mentor and friend, and I spent the dawn of my post-collegiate composition career drinking wine in the dusk of her dilapidated Kingston mansion. Though she was notorious, Amacher’s work didn’t share the same widespread acclaim as Cage or the financial support as Young received. While Young created the MELA foundation to promote his musical exploits and legacy, Maryanne’s imagined business, Additional Tones was nothing more than a ghost company. In another world, Additional Tones, might have had a spot on the NASDAQ.

It is difficult to categorize elements of Amacher’s music—mostly because her work was nearly impossible to experience without witnessing a live performance of it. A thorough investigation of Amacher’s compositional lexicon is beyond the scope of this paper, but certain patterns can be traced. She practiced live diffusion of sound
over multiple loudspeakers with great virtuosity through the mixing console; she did make two albums for release, but treated these pieces with disdain, lamenting the poor sampling rate of CD quality audio and lack of sound spatiality so essential to her practice. I assisted Amacher with work on her final commission at the EMPAC center in Troy, NY. Amacher arrived with suitcases full of DAT tapes, and spent weeks listening to mixes of her source material from decades past, minutely positioning speakers and sleeping in the performance space. Descriptions of her process are prone to include biographical details such as her red jumpsuit, long platinum blonde hair, cigarette rolling machines, and inimitable dietary practices. I favor this process-oriented description to a list of specific pieces; as will be made plain later, the music of Maryanne Amacher can be found in this process.

A central feature of Amacher’s musical lexicon is difference tones, or otoacoustic emissions. When the ear hears two pure tones, such as a sine or square wave, it produces a sum or difference tone, and a third tone emerges not in psychoacoustic perception, but actually produced by the ear as if it were a loudspeaker. Amacher told me once informally that when she first experienced this phenomenon, she was worried that she was losing her mind. She couldn’t stop listening to the sounds, and became obsessed with understanding their origin. Eventually she discovered the writing of physicist Thomas Gold, which explained that it was a normal auditory phenomenon. She couldn’t ignore these sounds, so she devoted herself to composing with them intentionally. “There are laboratories all over the world dedicated to this. Now see, this is what I think is funny about music—none
of us know this. What in the world are we doing? I mean really to compose consciously” (New Music Box, web). Who is “we”? Amacher must be referring to composers here. To compose consciously is to listen, and to allow the listening to predicate the subsequent work. Her rhetorical outcry is infectious—it is as if Amacher is suggesting that no self-respecting composer should be allowed to pen a chord without listening for its otoacoustic combination tone. When Amacher’s difference tone music, such as *Head Rhythm One*, is played at the correct volume, the music leaps into focus inside your eardrum.

We can trace some similarities to Young, not just in theoretical framework, but also in technique. Young’s work, of course, also deals with sine waves and their combinatory effects. However, while Young insists on imposing order on these tones, Maryanne uses square waves tuned in equal temperament. These early 3rd Ear pieces were produced on two Triadex MUSE machines, squarewave algorithmic pattern generators that she inherited from AI theorist Marvin Minsky. These machines produce dancing melodies that unfold according to a series of switches programmed on their front panel. They are not random, but the silicon inside the machine chooses the melodies. In every material sense is this opposite from Young’s otoacoustic exploration. Young used sine waves; Amacher used square waves. Young used just intonation to explore the harmonic series, and Amacher stuck with what she found in the machine. Young’s tones sustain at the same volume infinitely, and Amacher’s music swirls around you in lively rhythms. I assert that Amacher, in stark contrast
with Young, was not concerned with purity and determination—she was concerned with discovery, and subsequently, accuracy.

What does this mean in terms of her larger compositional project? Musicologist Volker Straebel describes an early piece of hers, Audjoins, for amplified percussion duet. This piece consists of a graphic score and lengthy textual direction, concluding, “the score sets up the possibilities for finding. Explore and reveal as much as you can of the contouring you hear WITHIN the interacting energy of the material.” The amplification of this piece allows different overtones, otherwise unheard, to rise above the fray as sonic focal points, as dictated by the listening explorers of percussion. Straebel writes:

This understanding of Composition as Process (John Cage, 1958) or Music as a Gradual Process (Steve Reich, 1968), where a musical situation or phenomenon was set up and observed without further intervention by the composer, was fairly common in the 1960s. However, Amacher's conception of music emerging in a self-organizing fashion, thereby understanding music as already present in the acoustic potentials of the sounding world, is clearly different. It especially differs from Cage’s listening aesthetics that integrates environmental sounds into the music experience. While Cage was interested in listening to sounds, Amacher was interested in experiencing the sounding (Straebel, 2).

In other words, according to Straebel, where Young and Cage deal with sounds as nouns, Amacher is a verb. In staging a performance, Amacher would bring the same CDs she had been listening to for decades into a room, and allow her personal context with the sound sources to shape the emerging piece. For Amacher, the music emerges out of this listening. As Young does, she stands at the center, but unlike Young, she makes no claims for divinity or purity. Modern neuroscience has indicated that otoacoustic emissions will vary in frequency from person to person (Gray)—thus this
objective phenomenon (i.e., the ears are actually producing tones like a loudspeaker) is inherently varied depending on the hardware involved (i.e., the ears belonging to an individual, not an abstract listener). More importantly, for Amacher, ear-tones represent a philosophically and phenomenologically attractive notion—they are the sound produced by listening itself. I can only dream of what notes Maryanne must have heard as she listened inside her music.

A crucial element of Amacher’s work that is missing from the Straebel thesis is the intentionality with which she organized her work. Besides live-diffusion, the spatialization of her music over many speakers, and the psychoacoustic and otoacoustic phenomenon inside her work is the work’s content itself—a highly individualized lexicon of sounds—recordings she had made and processed—which she mixed between; or, in the words of Ronald Kuivila, “good old fashioned composition.” Curiously, this is the most difficult aspect of her music to locate with any degree of certainty. It is only through personal experience with Amacher that I was able to locate the Triadex MUSE as the sound source for much of her ear-tone music—many of the other sounds remain a mystery even among her closest cohort. After a workshop with the Amacher Archive in Berlin in 2012, I received access to her source materials. On a DAT Tape called Extension 2, I found a very long recording of deep, droning, romantic harmonies, selections of which could be traced to many different live performances. From where did these sounds come? To what Sound Character was I listening? No one knows. Amacher did not initiate a younger generation of composers in her personal lexicon, and thus these questions have
remained unanswered. The deeply personal nature of Amacher’s sonic research suggests a new angle on my perpetually unanswered question, what could it mean to be a composer with tinnitus?

At the heart of Amacher’s compositional project is the deep belief that music itself could be a mode for aesthetic transcendence—a gateway into higher consciousness, or a utopian society. Though explicitly difficult to locate Amacher as a disabled composer\(^1\), this utopian aspiration places her in relation to the most influential tinnitus composer of all time: Beethoven.

Do all paths end in Beethoven? Amacher herself referenced Beethoven constantly in texts and conversation; he was clearly an idol and inspiration to her. But make no mistake—I avoided Beethoven for at least two decades. After discovering my tinnitus, I did not even look to Beethoven as a personal model of a composer functioning with damaged *auris*. Beethoven’s model of composition seemed so thoroughly different from the experimental approach that I found so stimulating. Beethoven is a unique model in the scope of this essay. He *was* functionally disabled; most of his late work occurs during a period in which he could not hear the notes on the piano where he composed. Therefore Beethoven’s compositional project does *not* emerge from listening, but rather his musical imagination.

It is well embedded in our cultural consciousness that Beethoven lost his hearing—this is not an incidental fact, but an essential component in our conception

\(^1\) Maryanne is the first female composer I’ve discussed in the scope of my argument. According to Straus’ thesis, her gender itself is as disenfranchising as a disability, for to be a woman in the field of music is to be subjected to prejudice and sexism. While this notion is crucial, its discussion lies beyond the scope of this paper.
of a composer who overcame the limitations of his mortal body to create timeless art. By the age of 26, Beethoven had begun to lose his hearing. In addition to difficulty hearing, his ears began “to hum and buzz day and night” (Mai, 44). Although a word for it didn’t exist at the time, it is clear that Beethoven had tinnitus, a symptom accompanying his hearing loss. In 1802, he was advised by doctors to take the summer off in the country, and during this time he thoroughly detailed the extent of his hearing loss and its emotional impact in a document now called the *Heiligenstadt Testament*:

> If at times I decided just to ignore my infirmity, alas!, how cruelly was I then driven back by the intensified sad experience of my poor hearing. Yet I could not bring myself to say to people: ‘Speak up, shout, for I am deaf.’ Alas! How could I possibly refer to the impairing of one sense which in me should be more perfectly developed than in other people, a sense which at one time I possessed in the greatest perfection, even to a degree of perfection such as assuredly few people in my profession possess or have ever possessed… (Mai, 47).

Beethoven’s experience of shame and isolation is not uncommon among many sufferers. Deafness is social isolation—for Beethoven had to withdraw from many social occasions where a prerequisite to human interaction is simply hearing; deafness is also a spiritual crisis, for a great composer would be expected to have a supernatural gift of hearing. As a result of his disability, Beethoven withdrew from concert performance and teaching and began to focus exclusively on composition. Disability, then, provided the world a window into the inner life of this composer. After 1818 he relied on the use of “conversation books” where visitors and friends could write down their words to him—thus this abundance of primary sources about
this composer exists solely because of his disability. Beethoven generally responded verbally, so his replies in these conversations are unheard.

Mai, in his analysis of the composer’s many medical maladies titled *Diagnosing Genius*, notes that after an initial depression following the realization that his hearing loss was permanent, Beethoven began to focus on the proliferation of other bodily disorders, such as his gastrointestinal problems and eye strain. How could deafness, the most aesthetically fraught malady for a composer, go unmentioned? In his explication of Beethoven as a “model of disability overcome,” Straus suggests that Beethoven had gone beyond the point of *habituation*. According to Straus, the beginning of Beethoven’s heroic period coincides with Beethoven’s conception of the artistic project as a *triumph* over disability. “Just as you are plunging yourself into the whirlwind of society, and even as it is now possible for you, despite all obstacles, to compose operas—let your deafness no longer be a secret—even in art” (Straus, 52). If Beethoven could continue to compose in spite of his hearing damage, he would then triumph over this adversity. The merits and meanings of this compositional project remain difficult to parse. Beethoven did use novel technology such as ear trumpets and bite plates to hear what little sound that remained for him. It is clear, however, that the majority of the notes of his music were conceived inside his musical imagination rather than through aural experience.

Of the aural experience, what remained for Beethoven besides that humming and buzzing? I believe the heart of Beethoven’s success is not a triumph over his adversity, but an artistic symbiosis with it. In other words, Beethoven was not
composing *against* his disability, but *inside* it. To explain this, let’s juxtapose Cage and Beethoven. If the ultimate realization of 4’33” is a pure *listening*, through which intentionality and ego is disciplined in order to hear the allsound surrounding the listener—then what is the *opposite* of 4’33”? The opposite of silence is *silence*—the complete loss of acoustic sound in the form of deafness. You cannot *hear* 4’33” in your head—it is ontologically impossible; however, Beethoven can hear the tonal relations of his music in his mind’s ear through acoustic imagination, not aural experience. Thus composing inside his disability was entirely possible, if not perhaps ideal. Beethoven’s silent reality, in which no accidental environmental sounds could intrude, provided a chilling but effective template against which he could dream of his structural harmony. So, while tinnitus as a disability phenomenon would threaten to assert itself over the ambient allsound of 4’33”—as Thirlwell reports—a composer like Beethoven can turn inward to focus on his internal harmonies. Beethoven can thrive against the grain of tinnitus precisely through a process of filtering, because he is not focusing on the sounds that he hears, but rather, the content of the music he composes.

We need Tinnitus Music. It doesn’t exist yet, and so there is space for it, like there is space to invent a cure to an unsolved problem. In the spirit of advocacy and creative agency, I am compelled to wrest words from my imagination to formulate a mode of thinking that supports the aesthetic, and emotional reality, of living inside a sound I cannot control. In order to carve out this aesthetic intentionality, I have grouped composers that might illuminate unique directions in listening; startlingly,
I’ve ended up discussing a composer I never thought I’d consider: Beethoven. It would appear that Tinnitus Music needs Beethoven just as much as it needs John Cage. But to return to Straus’ formulation of Beethoven’s “model of disability overcome”, it’s salient to mention that Beethoven’s triumph over his deafness is, of course, a fiction. This victory only occurs in the realm of aesthetics. I believe a critical eye must be taken to this sort of representational narrative turn towards heroism—it’s as insidious as a Hollywood love story or battle of good against evil. Disability is a universal constant for humanity, but overcoming it is not a universal experience—or even possible, as there are no cures for noise-induced hearing loss. Straus accounts for these other possibilities in *Extraordinary Measures*, by locating three other models: disability that is accommodated for, balance lost and regained, and “narratives of the fractured body”. True Tinnitus Music could incorporate disability, rather than casting it as a villain that needs to be defeated.

Some of my analysis of the composers I have discussed has been polemically narrow, in order to lodge a critique. A less strict interpretation of these composers might find more similarity than difference. While Amacher’s specific aural proclivities had nothing to do with tinnitus, the way in which she listened was clearly informed by a process of listening to her own body sound interact with musical content. Young’s long tones can’t be tinnital; their purpose is to provide static unchanging content in which the ear can get inside a sound, to unveil what’s lurking inside a particular ratio. As was suggested by Ron Kuivila in a conversation, when one hears tinnitus, this listener is not merely hearing a tone, but also hearing the very
instability of the actual experience of listening. Amacher’s interest in otoacoustic emissions fall perfectly along these lines—the sonic material transforms the experience of listening, and thus the music takes place not in the air, nor precisely in the body, but in their interaction. Her use of extremely loud sound wasn’t purely to envelope the body through sensory overload—it was also to utilize the property of after-sound, or aural illusions, when you’re not sure if you’re hearing music in your head or in the loudspeakers. In Perceptual Geographies, Amacher writes "Do we perceive the sound in the room, in our head, a great distance away: do we experience all three dimensions clearly at the same time? Is there no sound in the room at all, but we continue to hear "after-sound" as our mind is processing sonic events perceived minutes ago?" (161). Amacher clearly prided herself as a virtuoso listener; her music couldn’t exist without her being there to hear for the audience. However, unlike the rationality of Young’s just-tuned installations, this state is highly combustible, fragile, on the verge of collapse. This is why she took such care, such anxiety in placing her speakers and manipulating volume levels. The unstable work hinges on the interaction of sonic content with a listening ear. Amacher’s highly individuated listening experience may not have been predicated on damage, but certainly her music resided inside her, and needed her to hear it first, before an audience could grasp it.

In researching these composers, tinnitus had to be found, unpacked, discovered, and rescued. There were no papers about music and tinnitus for me to consult—it was lurking in the margins. Or, I’d hear about a specific composer who
had tinnitus verbatim, and the limitations it posed on their musical livelihood. Of course, for rock musicians, tinnitus is like herpes—everybody has it, but nobody wants to talk about it. I can’t blame any sufferer for not disclosing private information, but I’ve grown increasingly skeptical of the impulse to consider this condition something to be embarrassed about. For a listener, tinnitus is copresent, accompanying all the sonic phenomenon of the vibrating world. For a modern musical community, tinnitus seems to be culturally copresent, an unconsidered byproduct of a lively engagement in an amplified world.

In light of its co-presence, wouldn’t we benefit from a music that incorporates tinnitus on a structural level, rather than merely alluding to it? Or: if instead of tinnitus merely exerting its subterranean or subconscious power over music makers, what would it look like if tinnitus were analyzed in the same context as harmony or rhythm? What remains to be done is a specific exploration of what different types of tinnitus and tinnital experiences there are. Perhaps if we explore the formal and relational aspects of tinnitus, and erect signposts within the nascent field of Tinnitus Music.
Chapter 2: Techné

The Oscilloscope / Dead Lion

I began playing the Serge Modular Synthesizer in 2007. I had been involved in jazz, improvisation, and instrument building, but learned very little about electronic music in my first two years as an undergraduate. The Serge sat like a totem in the electronic music studio, dusty and arcane. After a semester off from school, I devoted myself to understanding this instrument. This was before the era of Eurorack synthesizers, before modular synths made a comeback, before getting tactile circuits under one’s fingertips was easy. The Serge was not easy. I had to bang my head against the wall for a long time for it to make sense. Many parts of the machine, having been neglected for years, were broken, and didn’t make sound until I took the thing apart and started repairing wire connections, replacing components. I was searching for sound, but I discovered a process, a whole way of working, of making sonic connections. If it had been easy, it wouldn’t have held my interest.

I did not—and still don’t—actually have a synthesizer of my own. Synth acquisition seemed, at first blush, prohibitively expensive. The Serge at Bard would cost over ten thousand dollars to acquire today. But money is only part of the reason for my ambivalence. I never wanted to become just another customer, another user. I considered building my own system, even to the point of building several components of a modular synthesizer—a few oscillators and filters, some trigger sources, an electronic kick drum. But these circuits weren’t mine, and assembling them into a synthesizer would just be another unlabeled aluminum box of knobs. While I’m
skeptical of authenticity, I value originality, and I wanted my assemblage to be unique.

How could I make a "modular" system of my own? One day in my workshop, I was playing around with photodiodes. A photodiode creates a voltage in proportion to the light it receives. I connected it to my oscilloscope and pointed it at the sun. I saw a corresponding increase in DC voltage shown on the scope screen. I wondered about the possibility of feedback. When I pointed the photodiode at the oscilloscope beam itself, it showed a vertical spike around the sensor. I then realized that the green CRT beam of my oscilloscope is a very stable saw-tooth waveform.

I soldered a photodiode onto an XLR cable to create a “balanced” light microphone. I then used this photodiode pickup to listen to the signal of the scope—but routed the aux send of this signal into the vertical amplifier of the oscilloscope. First, I could change the pitch in intervals by varying the Timebase or "Sec/Div" knob. Through "rampant misuse of the calibration knob" (to quote my old boss, Todd Bailey), I could achieve a smooth glissando. I controlled volume by moving the photodiode away from the beam. Thus I could achieve the classical "theremin" control of an electronic instrument: one hand for pitch, one hand for dynamics.
But why not just play a theremin? The situation became more fruitful when I investigated the vertical amplifier input while simultaneously listening with the photodiode. As before, I found that the beam runs away from the photodiode sensor. But when pointed slightly away from the beam, the photodiode catches onto lower harmonics of the original sawtooth waveform. Like all types of feedback, embellishments in the signal path create different sonic results. Increase the bass, and the scope beam starts stuttering rhythmically. Increase the treble and the noise on the line comes out over the sawtooth sound.
I built an entire synthesizer system out of four oscilloscopes and a mixer. By sending the same signal into both mixer & oscilloscope, a feedback path is made entirely in the domain of light, between the screen of the CRT and the photodiode microphone. A synthesizer has indicator LEDs, which are passive representations of the sound being produced. In my system, the oscilloscope shows its own sound, and as I manipulate it, I learn from its light in order to predict its music. Initially I considering modifying the oscilloscope for voltage control, in order to interface with modular synthesizers, but I realized that the scopes contain so many esoteric inputs and outputs, all of which can be exploited for sound. Each oscilloscope seems to behave uniquely, and thus a mixing of scopes forms a lively ensemble. I use two made by Tektronix and two by Hitachi.
I began performing with a system of four oscilloscopes, mixer, and microphone in 2013, in the summer before arriving to Wesleyan. When called to perform and to develop new works for composition seminar, it became abundantly clear that a larger sound installation would be a bureaucratic and logistical nightmare: I hadn’t yet begun to understand the red tape involved with reserving space at Wesleyan. So, I turned to the oscilloscopes, which, while heavy and clumsy, were much more portable in comparison.

My roots are in punk rock; it seemed natural when arriving onto the college scene to go to shows on campus, to get to know the temperature and viscosity of what was happening after classes. My intention was to stage an intervention with this scene in the form of participation—to play undiluted experimental music at a frat party. That year, I wrote in my journal, “Play the same set at a frat party as a concert hall”. The oscilloscopes provided me a portable solution.

In 2013, I was invited to perform in a series called the Modular Synthesizer Solstice, but the idea of an exclusively Modular Synthesizer event simultaneously attracted and repulsed me. In an otherwise introverted and technical practice, I thought a community could evolve together. But I had been to these type of events before, and rather than an open situation based on the discovery of new sounds, they seemed to be just another type of frat party—a hazy, testosterone-filled dungeon in which greasy users seemed only interested in showing off their gear. When performed at the Synthesizer Solstice, the oscilloscope yet again intervened, and broke a commonly understood narrative. By definition, synthesis is the combination of ideas.
to form a system. A true synthesizer isn’t constrained by specific products or fads. By repurposing lab instruments as musical instruments, I was able to show a different perspective on synthesis.

**Composing The Tinnitus Suites**

To date, the *Tinnitus Suites* project has centered on the composition and construction of an electroacoustic feedback system named *Lady’s Harp*. Through this system, I have developed a music about tinnitus, that can contribute to increasing awareness and advocating for research for a cure. While the different versions of this project have always involved a direct musical interaction with tinnitus staged on the *Lady’s Harp*, this need not be the case. Future versions of the project could, for example, incorporate conventional musical instruments, or simply be a lecture.

![First Lady's Harp, Transducer Detail (2011)](image)

Figure 3: First *Lady's Harp*, Transducer Detail (2011)
During a residency at the Elsewhere Museum in Greensboro in 2011, I created a system of tensioned twenty-foot long piano wires activated by mixer feedback. I had purchased 100 “frog” exciters from Parts Express on clearance for $1 each, affording me the chance for heavy experimentation without worry of destruction. I wondered how these transducers might be used in conjunction with long wires, so I drilled string-posts into the sturdy pine of a fabric shelf spanning 30-foot long wall. I wanted to see how the transducers would react with the strings, and since this shelf lacked any resonance, I coupled the string to the transducer through a small wooden bridge. Elsewhere was across the street from a piano repair store, and the owner of this store was very generous in sharing his techniques and scrap wood with me. Using contact microphones to amplify the string did succeed in getting the transducer to howl, but it made the sound intrinsically raw and uncontrollable. I made a series of single coil pickups from surplus air solenoid valves that I found in the residency “machine room”, ripping up the cheap frogs to use their magnets for these pickups.
Figure 4: Air Valve Pickups for *Lady's Harp* (2011)

The signal path was pickup→mixer→amplifier, with another set of pickups just there to listen to the sound. In this system, I could sustain a tone indefinitely, guiding the string through a cascade of harmonics via manipulations of the mixer EQ. I called it *Lady's Harp*, named in tribute to Ellen Fullman, Maryanne Amacher, and the ancient Greek Aeolian harp, whose strings are set into vibration by the wind. The allusion to Greek mythology is figurative, however—Lady’s Harp has nothing to do with Aeolus, the god of wind. But without feedback occurring in an acoustic or electronic dimension, countless pieces of the experimental canon wouldn’t function, including my own. So, Prometheus, who stole fire from the Gods, might serve as a better origin story for my instrument. Lady’s Harp only works by stealing fire from
the electrical company to power the amplifiers.

I have since made five iterations of *Lady’s Harp*. Before Wesleyan, all of these versions were short-term installations where I connected the strings to the walls or floors, turning the room into the instrument’s resonant cavity. While architectural intervention like this remains alluring and appealing as an artistic process, it imposes serious practical limitations—I had only been able to mount the piece when offered unlimited access to a space over a lengthy installation period. These previous versions were always slightly improvised—parts of the *Lady’s Harp* were mostly built in order to fit the specific needs of installation. During these lengthy experimental periods, I would use the instrument for recordings, rehearsals, and sometimes performances. But de-installation always entailed the instrument’s destruction, as it was reduced to nothing more than a box full of mismatched coils and damaged transducers.
I came to Wesleyan with the desire to rationalize and revitalize the *Lady's Harp*. This began in a process of problem solving, as matters of practicality were crucial. But at the same time as I developed techné behind the *Lady's Harp*, I wanted to continue expanding the conceptual field of my project, continuing to ask the question, “What Might tinnitus Music be?” During my time at Wesleyan, I made five distinct articulations that might provide an answer: 2014 *a*, 2014 *b*, 2014 *c*, 2014 *d*, and 2015.

**Nothing Space**

In January 2014, I organized an installation and performance series with Joel Clark at Nothing Space in Brooklyn. I worked with my visual collaborator, Oliver
Jones, with whom I had previously built an iteration of the *Tinnitus Suites* in 2012. For this version of the *Tinnitus Suites*, I wanted to create less trash. I approached Spencer Wright, a talented engineer with a background in metalworking and industrial design. He told me about 8020, a proprietary (and expensive) system of machined aluminum extrusion. We designed a flexible system that would allow me to attach pickups and transducers to the frame with laser-cut Plexiglas, and then configure the pieces in whatever way I desired. In this system, the positions of tuning hardware and electronics can be changed easily. In previous versions of the Harp, each string used slightly different pickups and transducers—this was the first instance of standardization. I used identical pickups, Chinese humbuckers from eBay, and I designed the various hardware attachments to accept specific transducers.

Figure 6: The Third *Lady's Harp* Transducer Detail (2014)
Like previous Lady’s Harps, this version began with a “parasitic” approach—attaching onto existing shelves and walls and using those limitations to determine the string length, position, and aesthetics of the instrument. Nothing Space was a big white room, except for a steel I-beam that ran vertically through the floorboards into the center of the gallery. I glued together a chunk of wood to sit inside the I-Beam and function as a soundboard, and then anchored the harp-modules onto it. Thus I anchored the strings into the building itself. I had tried to mount another four strings across the room, on a drywall partition, but the tension of the strings destroyed the wall. I was running out of time and needed to finish installing in time for the first weekend of performances, so I screwed the remaining four modules right into the floorboards.

Figure 7: Composing the Tinnitus Suites: 2014 Installation Detail (2014)
This was the first time I ever mounted the strings horizontally, which immediately suggested a new way to approach the instrument. The metal slide mallets that we used to play the harp in earlier versions had felt too guitar-like, and the music that came from these "big frets" was noodly and uninspired. It didn’t have the sustained presence of tinnitus, nor did it feel like the Tinnitus Suites. It sounded like a bunch of people plunking around on long strings. This time around, my collaborator Oliver had brought in a cache of old wood that he pulled from the rotting windowsills of his house, and hung them on the wall as a component of his visual work. While we were talking, one of us lifted a hunk of wood and rested it on the strings. It wobbled back and forth, making beautiful rhythms and patterns. It could be placed gently, and could function more like a capo, moving the “open string” resonance without the constant activity that defines a guitaristic sliding. In combination with feedback, this super-capo would slide up and down, accentuating certain rhythms or resonances, dancing along with the energy of the vibrating string.

Was this our “eureka!” moment? Fred Frith mentioned in an interview that turning the guitar horizontally allowed him to treating the guitar less as an instrument and more of a sound source (Todd, 201-201). I was not specifically treating the Harp as an open sound source, but by placing objects on the strings, we were able to walk away from them and listen to their subtle shifts amidst the feedback. It felt more like hearing what the system is doing, rather than trying to coax sounds out of it—less like playing, more like placing.
The Lady's Harp is not a self-playing sound installation—a performer must give the feedback its shape. I organized a series of 6 performances with other performers (see Appendix). On the Sunday following the first two performances, my curator found an *Eviction Notice* from the landlord, who had received *fourteen* noise complaints from other tenants in the building. The concert series was far too loud and our only way to avoid eviction would be to cancel all future events in the gallery. It was a disaster, but not irrelevant or inappropriate to the project at hand—If only I could evict my tinnitus on similar noise complaints!

Back at Wesleyan, I went to work in the metal shop. I knew that my problems were at some level related to mobility. After Nothing Space closed, I thought I could have moved the installation to another venue, but the amount of labor the installation required made this transition impossible in a timely manner. At some basic level, it’s completely impractical to work with a 20-foot instrument that has to be drilled into the walls or floor of the concert venue. It needed to be portable.

With the help of Bruce and David Strickland at the Wesleyan Metal Shop, I created a new version of the Lady’s Harp as a 20-foot long collapsible frame of aluminum extrusion, set on top of four sawhorses. I tested this freestanding version in Zelnick Pavillion and found it could be assembled in 48 hours. All the logistical problems of the previous 3 versions had been solved.

However, I must confess that I am not fully comfortable with this shift from installation to instrument. In fact, I prefer nearly every aspect of the version. I love the slow hand that installation forces. During a lengthy install, I spend more time
building the instrument than playing music. For Tinnitus Music, this is composition. I can only make loud sound for an hour at most before my ears start hurting. But when I build, I build in silence, which allows me to spend over ten hour-long intervals shaping the sonic machine. And, of course, I’m never actually in silence—I always have my tinnitus there for inspiration or company.

**Sanctuary**

My thesis work for Fall 2014 was divided into two focal points, Sanctuary, a commission in Philadelphia, and Transcriptions, a concert including works from other composers that took place in the World Music Hall.

When the gallery shuts down, or when an install period is dauntingly small, practicality may override the aesthetics. In June 2014, I was awarded a residency by Bowerbird and the Knight Foundation to stage a new version of the Tinnitus Suites in my hometown of Philadelphia. Five sound artists were invited to stage new works in the 7-story chapel of the Rotunda, a seminal DIY space connected to University of Pennsylvania. The residency lasted for 4 months and concluded in a weekend of concerts. The Sanctuary was sprawling and sounded amazing. Previous installations of the Lady’s Harp had occurred in small rooms and art galleries. In the sanctuary, the harp finally had a space large enough to make it seem normally sized by comparison. I initially considered making a new harp from some of the hundred derelict church pews that adorned the walls of the dilapidated sanctuary, but the building manager declined to let me make modifications to the historic wood. So, I returned to
my modular construction. The difference here was, although I had to construct a freestanding version, the extended duration of the residency ensured I was still able to treat this instrument as an installation.

![Figure 8: Composing the Tinnitus Suites 2014c Detail of Freestanding Instrument](image)

Even though I had proven to myself it could be done quickly, I took time to build this version of Lady’s Harp at the Sanctuary. In its previous instantiations, strings broke and transducers exploded constantly. At a showing in Zelnick Pavillion, a string breakage almost blinded my advisor Ron Kuivila, but luckily the wire only hit his shoulder. I wanted to understand the situation. I fixed the problems of strings breaking by paying careful attention to the bridge pieces, using zither hitch pins to anchor the strings where I had previously simply used Philips head screws. By
considering the angle of the string as it tensions over the bridge, and drilling in the hitch pin at this corresponding angle, I was able to eliminate the problem of breakage.

Figure 9: Composing the Tinnitus Suites 2014c Detail of Freestanding Instrument

Another notable aspect of my Sanctuary composition was speaker placement around the room. I spread 8 loudspeakers around the sanctuary at various angles and elevations, and through the output bus on my mixer I matched different strings to different locations inside the sanctuary. This built upon Maryanne Amacher’s approach to live-diffusion. A favorite speaker lived behind a slightly opened door on the organ closet; when it produced sound it seemed impossible to locate where it was coming from. Another speaker on the balcony projected a massive amount of low frequencies into the room.
The feedback of the Lady’s Harp is electroacoustic, but since the string is actually buzzing on a piece of wood, one always hears it in the acoustic dimension if a PA system doesn’t reinforce the sound. The Sanctuary had no chairs, only the aforementioned wooden pews, which I strung in a ring around the large, circular room. I took extra care to perform manipulations of volume. With a large, long decrescendo, I could direct people from walking around the space and exploring the difference tones they heard, to coming very close to the instrument, listening to its aluminum frame buzzing softly. Thus diffusion shaped the sound of the piece and the influenced the movement of the audience.

**Ensemble Formation Around a Lady’s Harp**

A 20-foot long instrument seems to invite others, whether they be musicians or simply curious, to play it. However, I was disappointed to find over and over that most people play it “wrong”—playing it like a guitar, or an expressive instrument for “non-idiomatic free-improvisation” When first developing the instrument in 2011, I devoted 3 weeks to subjecting it to rigorous testing with wildly different approaches and ensembles. In the middle of this work, it occurred to me that the feedback sounds of the Lady’s Harp might sit best if there were no audible strikes—no any evidence of the human hand. I recorded a session in which my fingers only touched the knobs of the mixer. Later, after the residency had completed, it occurred to me that these sounds might be the long-durational gestures I had been searching for—Tinnitus
Music. And so it was that *Composing the Tinnitus Suites* began retroactively. It was stumbled upon.

Though these efforts are not documented in the recorded artifacts of what I call *Composing the Tinnitus Suites*, I’ve always used installation opportunities to further explore what kind of ensemble is most appropriate for the instrument. My feeling is that an ensemble could play Tinnitus Music, but I just haven’t figured out how to lead it. In 2012, I spent a month working with an ensemble on the next iteration of the Lady’s Harp, and even performed a concert in ensemble formation, with the players manipulating the strings while I remained by the mixer to control feedback. But upon listening back to recordings of these ensemble performances, I realized that they did not capture the formal vocabulary or conceptual intent that accompanies *Tinnitus Suites*.

At the Sanctuary in 2014, I started working with Ensemble Feral (Adam Johnson, Gabriel Greenberg, Noah Rush), beginning with the “laying” techniques I had discovered earlier that year. These young lions, fresh graduates from Wesleyan University having just moved to Philadelphia, were eager to understand and willing to commit vast hours for rehearsal to make a concert-level work. My residency concluded with 3 concerts, and I devoted one concert entirely to working with this ensemble. The question that had perplexed me 2011 had remained unanswered: how could I make an ensemble version around Lady’s Harp feel like Tinnitus Music?

I returned to the “laying” technique of placing objects on the now horizontal Lady’s Harp. I created a new suite of objects out of scrap wood and plastic, planing
and beveling their edges so they would oscillate in interesting patterns when left alone in feedback orientation. I knew that I would need to discipline the ensemble in order to bring out these patterns, or else the young lions would resort to the expressive clichés inherent in my guitarlike instrument. But what would this discipline look like? There are no and have never been any consistent pitch relations on my instrument. The placement of the notes is always changing, along with the tuning of the string itself.

Ron Kuivila suggested engaging the performers in an internal task, such as being silent or sliding an object, slaved to an internal rhythm of counting. Because the task was about creating activity rather than unity in time, I allowed performers to pick their own unique tempo. I alternated silence and action in these counts, and at each repetition added to or subtracted from the phrase. A sequence might follow as such:

Silence: 1 2 3 4 5 6 7 8 9 10
Action: 1 2 3 4 5 6 7 8 9 10
Silence: 1 2 3 4 5 6 7 8 9
Action: 1 2 3 4 5 6 7 8 9 10 11

And so on. In shorthand I called this “algorithmic expansion”, and its capacity to provoke sound that was distinctly different from “noodling” provided a personal structure for structuring action in time, slowing down and de-emphasizing the temptation for personal expression. Composing in this formation remained contextual—we developed further mutations and unique names for them, such as “droppings”, “bent-wood long lever” and “static trio”.

Despite my interest in ensemble formation, two of the three performances were solos. At Sanctuary, I was able to develop my instrument technique and
compositional space to an incredibly detailed level. After the concert, I talked with many enthusiastic audience members. Some hadn’t read the concert program, and thus, they had no idea that my piece was about tinnitus! This was certainly a failure on some level. To make matters worse, a fellow tinnitus sufferer of my acquaintance had to leave the room because the volume levels were at times too intense for her to tolerate.

**Transcriptions**

In the fall, I signed up for a concert tutorial with my colleagues, Jason Brogan, Dina Maccabee, and Peter Blasser to fulfill the performance requirement of the graduate program. Professor Ron Kuivila’s only instruction for the tutorial was “you must play other people’s music”. I used this opportunity to stage my latest version of *Tinnitus Suites* alongside classical pieces from the experimental canon: Steve Reich’s *Pendulum Music* and John Cage’s *Ryoanji*.

*Pendulum Music* (1966) is a classic feedback piece from the early days of minimalism and process music. In it, microphones swing in pendulum motion by their cables over loudspeakers. Old pieces of the avant-garde can seem dusty, but feedback is unique in each resonant cavity in which it is found. It should never actually get old! I wanted to add another wrinkle in the story of this piece, and so shifted the medium from sound to light. Instead of speaker output, I used my oscilloscope’s cathode ray beam to convert voltage to lights; instead of a microphone, I used my photodiode pickups to convert light into a voltage. Besides this, the basic structure of the piece
was unchanged. Performers release the microphones from on high to start the pendulum, wait until the swinging of the microphones stops, and then pull the power cord to end the piece.

Ryoanji (1983) is based on the famous stone garden in Kyoto, Japan that contains fifteen stones of different sizes laid out on a bed of raked sand. John Cage wrote the piece for percussion obbligato, or an ensemble of twenty, and any number of soloists: oboe, voice, flute, contrabass, and/or trombone. The percussion part is a dry, stark, and metrical representation of the raked sand, while the solo parts are graphical scores derived from Cage’s tracing of various stones, so that all the solo parts exclusively produce glissandi. In the instructions, Cage describes each two pages as a garden of sounds, specifies that the glissandi are to be played as much as is possible like sound events in nature rather than sounds in music, and that the score represents a still photograph of mobile circumstances.

I was inspired by Ryoanji’s haunting glissandi, and wanted to adapt it for my first experimental instrument, the daxophone. Invented in 1986 by Hans Reichel, it belongs to the idiophone family, and is cousin to the musical saw and thumb piano. A thin piece of wood is bowed with a cello bow and modulated with a curved piece of wood (called the “dax”). The daxophone is resolute in its refusal to intonate precisely. Thus, the attempt to produce a linear glissando with the dax produces a notched gurgle, a broken curve that might resemble the outlines of the rocks in the score.
In attempting to read from the score, I distributed the bass, oboe, trombone, and voice parts freely, allowing my instrumentalists to gravitate intuitively towards specific daxophone tongues. The pitch ranges of Ryoanji are often very narrow—sometimes the line of the rocks for Cage’s tracings occurs around a major 2

In rehearsals, an intuitive process took over, and the specific demarcations of the score gave way to improvisation. Yet the spirit of this intuition was clearly in line with Cage’s use of improvisation vis-à-vis *Inlets*, in which performers navigate the internal corridors of water passing through a conch shell by simply listening to what the thing does, rather than commanding control of it as it were an instrument made for expression or calculation (eg, a violin).

The concert finale was an ensemble performance on the Lady’s Harp including Greenberg, Rush and Johnson: *Composing the Tinnitus Suites (2014 d)*. In this performance, I concluded the collaboration with these young sonic adventurers on their home turf of Wesleyan. The formal components of this piece resembled the Sanctuary performance, although I modified this specific articulation following a dialogue with Ron Kuivila after we listened to my Sanctuary concert recordings. My question had remained since 2011: how could I make the Lady’s Harp ensemble feel like tinnitus music? As a solo performer of the Lady’s Harp, I have control and facility over the feedback; though the sound is continuous, I can modulate through a wide terrain of dynamic range. As an ensemble, the young players would press and push on the objects until they began to excite resonances in the feedback, and it could often easily explode into saturation due to their eager fingers. Since I prefer to avoid
the use of dynamic compression, I would pull the faders down manually, leading to a kind of stop/start articulation that I found baffling.

More philosophically, the difficulty of explaining to an ensemble how to play tinnitus music seemed to be outside of the zone of language. If no one else can hear my own ears ringing, how could I explain it to an ensemble of players interpreting musical instructions? My own disability constantly confounds and conflates the boundaries of the contextual and the formal— it provides me formal stimulus (I hear a swishing sound, and, sometimes, concrete notes), and then it takes me out of a formal space by providing me with contextual experiences (no one else can hear this experience, and it is a sign of disability or malfunction).

The question that followed this concert was: did these diverse transcriptions have anything to do with tinnitus, or were they the natural outpouring of a broader creative project? Certainly, parallels abounded. After the long sustained diminuendo of 2014 d, my own ears were lit on fire, ringing away as I performed and listened to the stark silences of the Ryoanji daxophone quartet. As I set up Pendulum Music, I was able to tune the system carefully by eye without turning on the speakers. One of the most satisfying results of this transcription was the silence photo-feedback provided me. Once I found the most interesting visuals, I turned on the amplifier to listen to the music it was making. This was a boon, as my hearing damage necessitates that I marshal my sonic input, “saving my ears” for the concert so I can perform without aural fatigue.
These tinnitus thoughts were results and discoveries from a separate process. They were not intentions. Furthermore, what exactly made the performance of Ensemble Feral part of the *Tinnitus Suites*, besides a convoluted relationship to my own artistic discovery through a piano wire instrument? More succinctly put: was this Tinnitus Music only because I had willed it to be so? The music of *Tinnitus Suites* has an intuitive logic, but tinnitus itself has no logic to its presence. It is unexplained, and it remains an incurable mystery. In this project, I’m seeking a structural, taxonomical relationship to tinnitus, not merely allowing my tinnitus to function as a creative muse. Yet rather than operating inside a taxonomy, most of my decisions around the Lady’s Harp were formal and intuitive. Maryanne Amacher had developed particular sound material to such a degree that she called reoccurring motifs *Sound Characters*—suggesting embodiment, and an operation inside the narrative of her compositions. I have always imagined tinnitus as a character, a figurative angel or devil on my shoulder. However, at the end of the day, perhaps tinnitus is more like gravity rather than an embodied force: all these adventures in instrument building and transcription are more reflective of my personal preoccupations, but at the end of the day, I always come back to my tinnitus.

**Composing The Tinnitus Suites: 2015**

My senior recital, *Composing the Tinnitus Suites: 2015*, was intended to be a cohesive statement. I felt compelled to present a coherent vision (Ein Gesamtkunstwerk!) rather than an ambling tour of my musical interests and fetishes.
or a diluted collaboration. *Transcriptions* featured work by other composers, previous showings of the *Suites* (2014 b and d) were connected to other collaborations, and the Sanctuary project was ultimately a group show, as other artists presented that evening. I wanted to devote the whole evening, my entire thesis concert, to the tinnitus project. I wanted to answer the question, “What is Tinnitus Music?”

My colleague Cecilia Lopez had asked me in a critique, after *Transcriptions*, “How can you radicalize your project?” The question haunted me for months. On one hand, I realized that my project with the Lady’s Harp consisted of a very specific formal vocabulary, which, because I had developed so intuitively, I felt very attached to. At this point, these techniques were no longer very experimental. On the other hand, I felt completely ambivalent about keeping the project in an experimental space. One of the goals for this project is to find a creative solution to hearing damage. My tinnitus is subjective, but my artwork is not inherently personal. By publicizing this work, I contribute to the cultural context of tinnitus. Thus the work I do has to be tangible and culturally legible, even to the layman. I want this work to be accessible outside the context of experimental music.

The concert program included a text, *Thesis Poem*, which was intended to drive home the theme of the concert, just in case anyone might have missed the connection this time.
Thesis Poem

i have a thesis
i want to know what my hearing damage means
i don’t want to get used to it
i want to find out what Tinnitus Music is
i have lost some of my hearing, but i have gained something as well,
i hear something instead
i can’t describe it; i can’t show it to you; i can’t represent it
how can i describe something that doesn’t exist in the air?
an absence becomes a presence
the transformative moments—the lucid tinnitus dream, when the sounds were changing
on the verge of sleep, on the verge of music
and the dead moments, the phantom limb, the nerveless weight,
the numbness, the halo around my ears
the ear is unreliable

i sit in the music hall, my instrument assembled, wired,
all problems solved
speakers hissing,
surrounded by gongs,
nothing is happening
my ears blanking
i wait for my vision.

i want to listen to it, and i listen to all the ways it sounds
but one day i’ll hear only these sounds
i want to hear your music
the concert is too loud for me, now
i put in my earplugs and then i hear something else

your thesis is out there—i found it
i read it, i cared about it, i loved your ideas
i read your interview, you extol
Wagner’s absolute belief in the transcendent power of art
i read your suicide note
allies must be found
limits must be measured
“Who needs all this endless music?
My question is when do we begin to understand?”
(maryanne)
my audiologist trained me to filter, so i can live
but sometimes i let down this veil
and try to understand
all my endless music

you are a synthesizer, you are a container
you have all of these ideas and sounds inside you
is composition active or passive?
(when you do it, when it is done)
no compromise
no compromisers
no promises
comprised of it
i don’t compose it
i am composed of it
i am composing the tinnitus suites

Figure 10: Thesis Poem (2015)

_Thesis Poem_ is an explication of the ideas around _Composing the Tinnitus Suites_, and is also is the only durable composition I have ever penned to paper in the series of this project. Up until this moment, I was able to preserve the conceptual space of _Composing the Tinnitus Suites_ while developing the _Lady’s Harp_ in parallel, and letting the two projects influence each other in an intuitive way. With _Thesis Poem_, I sought to formulate something explicit about my creative project, and to radicalize the project by disembowing the Tinnitus Music from the sound world of the Lady’s Harp. This poem came urgently, the day before the concert.

The first stanza states that I don’t know what Tinnitus Music is, and to further trouble the waters, asserts that the representation of tinnitus is ontologically

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impossible. Since tinnitus isn’t a sound that exists acoustically, how could any acoustic sound capture its phase-less, phantasmal quality? This comes along with a claim about the necessity of this project. “i don’t want to get used to it” refers directly to the oft-heard admonishment from doctors, who in lieu of offering a cure, suggest habituation as though they were shrugging their shoulders. The 2nd stanza forms a poetic comparison of tinnital experiences. It conveys the fantastic moments, where tinnitus is engaging, dynamic and interesting; and also the moments where nothing is changing, when the tinnitus is completely untouchable, an obstinate totem of an incurable damage.

My thesis concert would take place in the World Music Hall, just as Transcriptions had. I planned to work all through the spring break, which offered a two-week window for exploration and installation in the space. I thought I would need an extensive window for set up, but I discovered that assembling the instrument had become routine, and the problems that had plagued previous installations had been addressed. Installation is a tactical choice brought on by practical considerations, and it enables me to work for long periods of time. When the installation is done, however, I can’t play music on the harp for very long, because my ears can’t handle loud sound in extended durations. With nothing left to do, no structural problems left to solve, I sat inside World Music Hall listening to my ears ringing alongside the ambient hissing noise floor of the PA system. In the 3rd stanza, I account for this vast expanse of time spent waiting inside the concert venue for a nascent epiphany.
The tone (of the poem, not the tinnitus) changes in the 5th stanza. “i read your suicide note” is a reference to the self-immolation of Willie Morris, a sheriff who committed suicide as a result of his tinnitus. Since the inception of this project in 2011, I have often referenced Morris as a seed and inspiration for my creative solution, for in his suicide note, he mentioned, “It is important that my death not be wasted.” Furthermore, the mention of suicide grounds a floating reference in the preceding stanza—“i wait for my vision” which at first masquerades itself as a trite pun, reveals itself to be a direct reference to Virginia Woolf, whose suicide was also born of an “incurable” (that is, misunderstood by the medical community) condition, her bipolar disorder. “My vision” is a harmonic unison with the breathtaking, oft-quoted conclusion of Woolf’s masterpiece, To the Lighthouse.

In Woolf’s novel, Lily Briscoe is an artist who develops an abstract painting in her mind and on the canvas over a ten-year period that spans the three sections of the novel’s chronology. As the novel begins, Lily Briscoe is painting Mr. and Mrs. Ramsey, on their summer home in Scotland, as their family is planning a trip to the lighthouse nearby. In the earliest stages, she is embarrassed for anyone else to even see what is on her easel. Yet, ten years later, the Ramseys later finally do go to the lighthouse, and the novel ends in painterly epiphany.

Quickly, as if she were recalled by something over there, she turned to her canvas. There it was — her picture. [...] She looked at the steps; they were empty; she looked at her canvas; it was blurred. With a sudden intensity, as if she saw it clear for a second, she drew a line there, in the centre. It was done; it was finished. Yes, she thought, laying down her brush in extreme fatigue, I have had my vision (Woolf, 200).
What happens here? What transformation finally occurs? Formalism looms large in this moment, for the text seems to suggest that a solution to the question of when an abstract painting is finished could merely be answered by placing the right paint in the right place. But this revelatory stroke is not born of a formal, painterly nature—it is contextually derived, for it occurs upon seeing the much-delayed trip to the lighthouse. Her vision is completed in an aesthetic realm.

What would Tinnitus Music be? The thesis poem is a hypothesis: the piece is not grounded in an intuitive system of workflow and instrument sounds, it is not grounded in a precisely formulated taxonomy of musical movements, metaphors, or representations. Because the ear is rendered unreliable through damage, musical solutions are not viable. A specific musical act of composing on the paper, or even rendered socially through improvisation could not function. The thesis poem is the only written composition, and it structures the place of Composing the Tinnitus Suites in a conceptual, aesthetic domain predicated on inhabitation and embodiment. The poem ends by shifting the notion of “composition” from active to passive sense. By stating “i am composing the tinnitus suites”, I intended to unveil a hidden meaning, for the line also can be read as “I am Composing the Tinnitus Suites”. It does not state “I do the idea” it states “The idea is me”. Thus instead of a series of works, Composing the Tinnitus Suites is a mode of composition, an attitude toward composition. Yet because tinnitus is not an aesthetic formation, it is a thing that happens, tinnital poesis could not be not the pure triumph of the artist imagining, but rather, an embodiment. Surely, the tinnitus will end someday. There would be two
outcomes here, a medical cure, or death. Just as I am a container for my tinnitus, I am a container for the framework that constitutes Tinnitus Music.

*Thesis Poem* was an expressive means to focus attention on the theme of my concert, and thus it takes a decidedly strong polemic. But, in reality, my project is more unresolved; it is more of a “hypothesis poem”. The end of Woolf’s novel is about closure; Lily Briscoe has an epiphany and finishes her painting. But while she states, “I have had my vision”, *Thesis Poem* only says “I wait for my vision”. There is no closure, for how could there be resolution for a condition with no cure? The poem really should end in the subjunctive mood: “I would like to be *Composing the Tinnitus Suites*”.

**Material**

My initial approach to making the concert was simply to combine elements—I picked up a daxophone soundboard and let it lay on the strings. It served amply well as a moveable capo, so all the previous harp techniques could still be accessed. To play the daxophone in this configuration required four hands—two to balance the instrument, and another two to operate the bow and modulate the pitch.

Placing the daxophone on the *Lady’s Harp*, I achieved two results. First, the pitch of the daxophone would vibrate the strings of the harp sympathetically. The daxophone is an instrument without resonance, but by placing it on a highly resonant harp strings, the sound of the wood would linger through the strings. This relationship could be tuned by moving the soundboard laterally on the string, or by modulating the
pitch of the tongue. It also provided stark contrast—the sound of the daxophone is frail and mammalian in comparison to the celestial wind of the strings sustaining. Second, this technique tamed the Lady’s Harp players by giving them a separate task from playing the strings. Their instructions were just to play daxophone, and this had an indirect sonic result on the Lady’s Harp.

I hit a conceptual problem as soon as I invited my Wesleyan cohort to enter the space of the Lady’s Harp. Cecilia Lopez, Cleek Schrey, Ron Shalom, and Peter Blasser joined me, and I explained to them the techniques of the Lady’s Harp in combination with the daxophone. But unlike the wild yet unfocused creative energy of Ensemble Feral, these individuals were deep composers who surprised me in their ceaseless questions and curiosity. They were not docile, and took nothing for granted. They wanted to actually know what it meant to say, “that isn’t Tinnitus Music” in response to a particular technique or gesture. I had to fess up to the fact that there were some formal considerations beyond tinnitus that were interesting to me in my work.

The final revelation happened on an evening where the ensemble failed to show up for rehearsal, save for Cleek Schrey. The daxophone sections could not be practiced as solos, because two people were needed for a four-hands daxophone, and I needed to manipulate the mixer. Cleek had his Hardanger Fiddle with him. Why not just improvise? The inclusion of acoustic instruments along with Lady’s Harp was new for me—I had opted out of this decision because I sensed a lurking conservatism
behind it. It was certainly not “radical”, to echo the suggestions of Cecilia Lopez. But it seemed like I was able to add to the Lady’s Harp without limiting its scope.

Schrey plays without being defined by any particular tuning, using continual scordatura to change keys and utilizing open harmonics to make the instrument maximally resonant. This matched with the harp, which sings its feedback relationships based on nodal points of the string. It would have been my worst nightmare if an improviser heard my harp and “soloed over the drone”. But Cleek produced sustained, subtle changes in his playing that could actually force the feedback of the Harp to change. By setting the strings just on the verge of feedback, Cleek’s playing would emphasize resonance in the room, and the instrument would sing along in harmony. The Hardanger fiddle is an instrument with 5 playing strings and 5 sympathetic strings that buzz along in response to whatever is played on the main strings. Cleek professed great affinity to the Lady’s Harp, suggesting it might be a larger cousin to the Hardanger fiddle.

This initial session was rich with discovery. The music was almost too beautiful. We wondered if the music we had made was no longer *Tinnitus Suites*; maybe this was the beginning of a completely different project that was more about the instrumental combination of our instruments.

I asked Ron Shalom to bring his upright bass, and we rehearsed as a trio, abandoning the techniques of “placing” and “laying” things on the strings, and playing as instrumentalists. Shalom’s presence balanced the situation. In comparison to Cleek’s natural enthusiasm for my instrument, Ron confessed to certain
confusion—sometimes he would hear the sound of the Lady’s Harp and just have no idea of how to respond. In these moments he would attempt to play, but then, having no idea how to play along with my long tones, he would just stop. This dialectic enthralled me, because it captured the depth of my tinnital experience: the condition can be both inspirational and confounding. By becoming lost in the sensuous beauty of music making, the compositional project about hearing damage might be compromised. Ron's confusion restored something in the piece that threatened to be lost when the piece goes into a formally beautiful dimension.

To cement the theme of the concert, and also to provide a sort of foil, I asked a neuroscientist friend of mine, Armen Enikolopov, to hold a Q&A about tinnitus, which was moderated by Roger Mathew Grant. Armen studies neural circuits in the auditory system, specifically the mammalian dorsal cochlear nucleus, which is an early relay station in the brain. The cochlear nucleus is a low level site, following the immediate transduction of sound to electrical signal. One theory suggests that tinnitus might originate in the cochlear nucleus, hence Enikopolov’s interest.

The structure of the concert was sonata form, A B A, beginning with the harp/daxophone quartet, then the Q&A, and concluding with the instrumental trio. Armen is a natural intellectual, and assumed a casual professorial air as he discussed with Grant the neural manifestations of a mind/body dichotomy. Besides organizing the Q&A, I intervened very little—I simply provided dinner for my distinguished guest academics, and allowed them a quiet corner in the concert hall to get to know each other and develop their conversation. However, right before the event, I pulled
Grant aside and insisted that he ask Armen “What is Tinnitus Music?” When asked on Stage, Armen simply said, “I don’t know.”

In the end of the concert, something occurred which seemed to be yet another new formal development. I attempted another long diminuendo as the lights faded to black. Fading out the feedback over a long timescale, the other performers also performed a long decrescendo, and then stood in silence. As I slowly pulled down the faders on my mixer, a very quiet sound became apparent—it wasn’t becoming quiet like the other strings. I continued fading out the rest of the strings, and this pianissimo sound, while not changing, became more detectable. Finally I realized which fader it was, and began to diminish it. As it left, I heard the ringing in my own ears. In the darkness of the Hall, the resonance of my Harp finally stopped, and I allowed the noise floor of the PA system to be heard. This unintended error pointed to a new strategy for formal movements in the Suites; by considering masking, I could make apparent that which lurks in the noise floor of a listener. My advisor Ron Kuivila once said of 4’33”, “Other excesses could be revealed”. Embedded masking suggested a completely different type of decrescendo than I had worked with before.
Conclusion

In mid-April 2015, I was working on my thesis, a little over halfway done, on a sunny spring Sunday in Philadelphia. The weather was beautiful, and with the thawing winter came a torrent of pollen and other allergens. Predictably, my sinuses swelled up like balloons; in addition to the seasonal congestion with which I regularly contend, my left Eustachian tube became blocked. Every 30 minutes or so, the pressure would build up to an impossible degree, and when finally my ear was able to release it, the evacuation would cause a long, rhythmic convulsion of my tensor tympani muscle. In contrast to the slowly evolving long tones of my phantasmal tinnitus, these new sinus sounds were palpably rhythmic! This spontaneous fluctuation came in a series of shutters, perturbing my equilibrium. My eardrum felt like it was pounding from the inside, thumping along to some inscrutable rhythm, and sounding something like a bass drum played by a gust of wind.

When presented with a condition like this, a normal person might simply heed common sense, and wait patiently for the aberration to pass, and for everything to “return to normal”. However, in the light of my hearing damage, such an event has the terrible promise to not only alter my way of living, but to completely upend the foundation of my compositional framework. Technically, this type of phenomenon could be considered objective tinnitus, which follows a distinctly different pathology than the noise-induced subjective kind, and yet is named tinnitus just the same. Like the other sounds I have adapted to accept, I expected to hear this new sound
forevermore. What would a *Tinnitus Suite* sound like, in light of this spontaneous, irregular ear rhythm?

I heard my ear twitching and sputtering for two weeks. Quiet conversation was difficult, as I would often lose my focus when my ear would go into spasm. My typical tinnitus tends to become louder if I wear earplugs, but with this new ear rhythm, it was actually easier to wear them and to surround myself with music. Because this sound was acoustic, I could thus drown it out with other stimulus.

In spite of this terrestrial shift in my auris, the spasm did eventually stop. On the way to stopping, the rhythm would pulse more often. Sometimes a paroxysm would begin immediately after one ended. I began to recognize the sinus congestion that preceded these episodes, and dreaded them. Finally, without rhyme or reason, the shuttering ceased. In this absence between rhythms that no longer shook my ear, I found my tinnitus, my old friend, ringing as clear as the first day I heard it.
Appendix

Oscilloscope Concerns

It is important to detail the musical possibilities that from some of the more esoteric functions of the oscilloscope. The External Trigger switch, provided with an external signal, provided a wealth of sonic material. The internal trigger circuit of a scope matches the modulating waveform of the scope input with the sweep rate of the CRT beam. Without a trigger, or with a mismatched trigger, the waveform would not display properly, or it would slide horizontally. The photodiode feedback system I have detailed doesn’t seem to need an accurate trigger circuit, because it works in DC. However, By patching an un-modulated sinusoidal wave to the external trigger input, the variable sweep rate would latch on to harmonic intervals of the external waveform. In other words, instead of a glissando, by using this input, I was able to achieve a stepped melody. Closer inspection revealed that the sequence of intervals I was hearing was the undertone series. This melody is actually common on modular synthesizers, and be achieved through “sync lock” inputs. By routing any signal to the external trigger, I can affect a crude sort of pitch following, but the register of each sweep rate holds.

Unlike my performance work with oscilloscopes via Dead Lion, the oscilloscopes for Pendulum Music operate in XY mode, which leaves some unresolved questions as what to do with the other axis in my transcription of this piece. In this version, each scope modulates each other scope, and the feedback pattern is inherently unstable. The visuals produced are a far cry from Lissajou patterns. Once I made this, I responded to Ron Kuivila’s suggestion of a “Youtube intervention” by posting the project online to Hackaday.com. It garnered a modest amount of traffic and a slew of bewildered comments. Thus, as the oscilloscopes function on two axes, the piece attempts a dual intervention—into the history of experimental music and also the world of engineering.

Here is a song-title poem for Dead Lion, mostly made up of technical terms from the front panel of the Tektronix 2235.

External Trigger
Seconds per Division
Automatic Intensity
Tek & Hitachi
Balanced Pickup
Vertical Limit
Calibrator
Trigger Holdoff
No Trace
The Festival at Nothing Space

My presentation of the Suites at Nothing Space was entirely self-organized. I booked six nights of performances to contrast my work with other artists I admired, working with the larger theme of disability and damage. In all honesty, this curatorial posing was nothing more than a strategy for stacking the deck—if I invited lots of different artists to perform in my festival, I could be sure to have a decent audience. But without further maligning my own ambitions around this festival, it was the debut of Composing the Tinnitus Suites as an independent enterprise, a thing—not just something I did in a studio and documented. Around the same time, my colleague Dina Maccabee had put me in touch with a writer for Nature Journal. My work was profiled in a Q&A piece in the January 2014 issue, and received international recognition for the first time. At the first weekend of the festival, sound artist G. Lucas Crane performed, and during his sound-check in the gallery, he sampled the sounds of the Lady’s Harp onto his cassette tapes.

When the gallery was evicted, we scrambled to find a replacement space, but the second weekend had to be cancelled—and then it became clear that the third weekend would have to be cut as well. I have to temper professionalism of this narrative—the “curator” is just my friend Joel, and Nothing Space isn’t a real “gallery”, it’s a drywall box studio inside a gigantic, overpriced Bushwick loft building. This whole thing happened floating on air. The same day that we found the eviction notice, I got a call from Al-Jazeera, asking to do a story on me.

On one level, this whole debacle was a disaster. I had to abort the project at the precise moment of revelation. But though I left the experience in artistic ruin, I was thrilled at the prospect of belief—I had the gall to construct an entire reality around the naïve notion of curing an illness through artistic engagement, and, in a way, it worked. The project had gathered mass, and strangers from all over the world began to email me, curious about the work. A story about me aired on KCRW and the Believer Podcast. A month later I was approached by the Deutsche Tinnitus-Stiftung to become an honorary “tinnitus ambassador”. I wanted to make a creative solution, and indeed, through poesis I succeeded in achieving a creative reality.

MATERIAL CONSIDERATIONS LADY’S HARP

The transducers in my installation break frequently. I thought I could solve this problem by buying more expensive devices, but the whole concept I had stumbled on was the problem. When I began experimenting with the Lady’s Harp in 2011, I placed the transducers in the middle of the string, or around two-third’s of the way in, in order to excite the feedback at resonant nodes of lower harmonicity. I freely played with placing the transducers at the ratios of 2:1, 3:2, 4:3, 5:4, 7:6, and 7:8—these intervals will not seem a stranger to anyone familiar with just-intonation. I wasn’t intending to explore tuning in any rigorous manner. I wanted to get the transducers to work robustly; situating them at nodal (null) points was a way of reducing their load. I did find that the string would tend to resonate clearly at the
chosen interval—a transducer at 2:1 would sing octaves easily, and a transducer at 5:4 would play more complex ponticello textures favoring 3rds.

In 2012, I moved the transducers very close to the end of the string. While still considering the ratio, a ratio of 2:1 now resembled something like 8:1 or even 16:1. This puts significantly more stress and tension over the transducer due to the increased resistance of the string at higher nodes. I wanted to break the easy harmonic relations I had established in 2011—it sounded “too beautiful”. By moving the transducer, I succeeded in introducing more noise and low frequency response into the feedback system. In 2014, I finally upgraded from the frogs, and tried a suite of different exciters for the string.

Here is a brief tour of transducers I’ve used since 2011:
1) “Frogs” bought on surplus ($1 per unit)
2) Dayton audio “pucks” HDN-8 ($11 per unit)
3) Dayton audio Flat Pack Exciter DAEX58SP ($15 per unit)
4) Tectonic Elements TEAX32C20-8 “balanced exciter” the good one ($20)
5) Tectonic Elements TEAX32C30-4 “balanced exciter” the bad one ($22)
6) DAEX32UT-4 Ultra Tripod ($20)
7) And lastly, the Hidden Audio HA-801 ($100)

The final qualification in using these transducers was ultimately not sonic but functional. The Tectonic Elements transducers sounded wonderful, but these 30 watt exciters would fail invariably fail due to overheating. The wattage rating as specified by the manufacturer is not very useful for long sustained tones produced by the Lady’s Harp, as the company specifications usually referred to peak power rather than continuous. I finally experimented with the revered H-801, an updated version of the classic Rolen Starr transducer that was essential to David Tudor’s Rainforest IV. I communicated with the sole salesman of these devices, Maurice Boughton, who informed me of using a “polyswitch” resettable fuse in line with the transducer, a technique to avoid overheating of the transducers. But even after integrating these hi-power rated devices, transducers would occasionally fail. By using the transducer as the bridge, the pressure exerted on the string actually inhibits the motion of the voice coil. In conclusion, it is not clear whether this problem could be solved without significantly changing the techné of the Lady’s Harp. In lieu of solving this problem, simply being careful and driving the string at lower gain settings could extend the life of the device. But, but by preserving the real risk of blowout or destruction as a possible outcome in my instrument’s ecosystem, I kept things dangerous, which seems to rhyme with the tinnital experience of being afraid of loud sounds. If the strings are played too hard, the transducers will break. I worry about my ears along the same lines!

Another technique that was part of the Sanctuary Concert was the development of my mixer performance technique. The fader knobs of the mixer provide a slow, legato way of starting the vibration of the strings, and changing this volume gracefully. The mute buttons of the mixer provide a route to shorter, more
rhythmic articulations. However, because the mute buttons of a mixer are *latching* rather than *momentary*, a performer of the mixer has to hit the mute button twice to form an envelope. I realized I could use momentary switches in the insert channel of the mixer channel strip. My old professor Bob Bielecki gave me a surplus of old cherry switches with long mechanical actuators. But this addition would render the channel permanently mute, unless the performer were constantly holding down the switches. However, by using a switch to switch the aforementioned switch, this crude device can alternate its function from “off-ON” to “on-OFF”—it can be a muting button, or just like keyboard.

![Mute/Stutter Keyboard for Lady's Harp (2014)](image)

I tested my circuit on my prototyping breadboard. Then, my colleague Peter Blasser designed a printed circuit board and cut it on his CNC router. The audio path of the circuit is completely passive, although LEDs are included to monitor the state of the channel, from “stutter” to “piano” mode. Because the keyboard switches are surplus parts, they produce an audible clicking when the played. In combination with the smoother sounding mute buttons on the mixer, these noisy clicking switchers added a wealth of rhythmic possibility on top of my sustained tones.

**Ryoanji**

I had a chip on my shoulder about Ryoanji ever since Laura Kuhn, director of the John Cage Trust, had complained in passing: “Ryoanji is a virtuoso piece. No one should ever attempt unless they’re willing to spend years on it.” I love and admire
John Cage; I didn’t want to want to devalue or sabotage this work. But I did feel that this piece was within the reach of the daxophone. Besides Hans Reichel’s own contributions to the field, not much music exists composed specifically for the daxophone. Hardly any music has been adapted for it—it is a modern invention, an outgrowth of piezo music and the free improv scene of the 80’s. Each tongue sounds unique, and you never really know where the notes are as you modulate the pitch. Ryoanji’s inclusive microtonality is not prescription, but interpretive. Furthermore, its inventive notation was not prohibitive to the daxophone, like conventional notation, but rather generative.

This transcription was, nonetheless, a deep undertaking, unlike Pendulum Music, which was an intellectual exercise conceived with very little trial and error. I invited my colleagues Dina Maccabee, Cleek Schrey and Ron Shalom to join me in a daxophone quartet, using the instruments I had built over a cumulative decade of experimentation. Each instrument was quite unique. In giving these instruments to improvising, thoughtful string players, I knew I would lose a lot agency over my instrument. At the same time, I knew I could trust them. It is very difficult to play specific pitches or melodies on the daxophone, and yet it is quite easy to let the daxophone speak for itself, to let it guide the player through the melodies inside the grain of the wood.

Daxophone Meets Lady’s Harp

“The daxophone is small” So begins Hans Reichel’s introduction to the liner notes of the world’s first daxophone operetta, *Shanghaied on Tor Road*. Indeed, Reichel’s version of instrument is über-minimalist: the resonant cavity that holds the contact microphones is no more than 2 inches wide by 5 inches tall. Even though the instrument is acoustic, its actual projection of acoustic sound is minimal. My version is somewhat different. My instrument building teacher, Mark Stewart, influenced my construction ethos early on in 2005, before I had developed my woodworking technique. Instead of a collapsible tripod, the so-called “butt-daxophone” is a soundboard cavity routed out inside a plank of wood that the player sits on. Sitting on the instrument ensures that the instrument is absolutely stable even during vigorous bowing.
After integrating the scrap wood capo technique into the formal vocabulary of Lady’s Harp, I began to wonder what it might sound like if actual instruments were used to slide up and down on the strings. I had the fleeting fantasy of using an acoustic guitar as a capo. However, my daxophones were in fact shaped perfectly for this task. This happened concurrently to my spring thesis concert, *Composing the Tinnitus Suites 2015*, which was meant to be a cohesive statement, including many of my influences and techniques in one piece. Initially I thought I might have to use another transducer to get the vibration of the daxophone into the long wires. But when played on a specific part of the tongue, the daxophone sounds a huge amount of low frequencies through the wooden soundboard. This was perfect—any more dangling wires in the already overstuffed Harp would have been a tripwire disaster waiting to happen. In the end, an acoustic daxophone mated best with the *Lady’s Harp*, and consequently, the traditional concept of the daxophone was thoroughly transformed.
Figure 13: Ensemble Playing Daxophone on Lady's Harp
This destabilized relationship appealed to me. For a long time I had lost interest in the daxophone as an instrument because it was too pure, too classical. In connection to his Idiophreneural Entrephonics Festival, Ron Kuivila located a particular dialectic in traditions of electronic instruments. One history suggests that an electronic instrument should be a pure, like a classical instrument, and excel at universal expression of melodies and rhythms. Another history of electronic music celebrates the idiosyncratic, where the synthesizer is a highly personal configuration of modules that express the unique vision of the player. In this version, the instrument is not universal, but almost like a composition in it of itself. This dialectic doesn’t merely concern electronic instruments; consider Harry Partch’s Diamond Marimba in constrast to the Spoils of War. The first instrument is a distillation of Partch’s tuning system, and many melodies can be played on it. The latter is more like a sculpture than an instrument. The other voices in my instrumentarium are the oscilloscope and *Lady’s Harp*. These are not classical, universal instruments, but rather highly individualized systems that express specific ideas and timbres. By merging the daxophone with the *Lady’s Harp*, my success was not merely a combination two major forces in my compositional universe. The success was the transformation of the daxophone from an instrument into a configuration.
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