

STORYTELLING THROUGH ELECTROACOUSTIC
MUSIC & SOUND DESIGN

by

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A THESIS

Presented to the Department of Music
and the Robert D. Clark Honors College
in partial fulfillment of the requirements for the degree of
Bachelor of Arts

June 2026

An Abstract of the Thesis of

Sophia Turek for the degree of Bachelor of Arts
in the Department of Music to be taken June 2026

Title: Storytelling Through Electroacoustic Music & Sound Design

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Acarridewithmymomin2009 is a piece of electroacoustic music that uses sound to tell a story. My intention with this piece was to create a shared sonic experience that could transcend personal background and implicitly communicate themes of nostalgia and the sensitivities of humans as auditory creatures. In this paper, I've detailed my technical process using the Kyma sound design system as well as my creative process that involved storyboarding events drawn from my life experience. I've also provided a brief description of electroacoustic music and the works that have influenced me over the years.

Acknowledgements

My thesis would not have been possible without the support of several individuals. My deepest thanks go to my Primary Thesis Advisor, Dr. Jeffrey Stolet, whose expert mentorship and critical eye guided me through the development and strengthening of my piece. I am equally grateful to my CHC Representative, Professor Brian McWhorter, for his steady encouragement and valuable input in developing my project as a whole. I also owe special thanks to Oliver Kwapis, a graduate student who taught me the primary technical knowledge necessary for my work and took the time to help me troubleshoot and stay motivated. This team provided me with the unwavering academic and personal support I needed to complete this project.

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Introduction

Acarridewithmymomin2009 was crafted within the context of the history of electroacoustic music that dates to the mid-20th century as well as the music I've listened to throughout my life. For this piece, I recorded, gathered, and created complex sounds that are meaningful to me and can function effectively as narrative auditory devices. I then processed and transformed these sounds in various ways. After creating a personalized sound library, I organized these reborn sounds chronologically to produce a methodical 10-minute musical composition that expresses both emotion and narrative.

Background

Electroacoustic music is a genre of art music whose composers manipulate acoustic sound with recording technology and audio signal processing.¹ This genre of music was developed around the middle of the 20th century succeeding the introduction of tape editing technology into acoustic compositions. Many people in this field recognize the work of a group of artists from France, *Groupe de recherches musicales*, as the template for electroacoustic music. By 1949, this music was widely known as *musique concrète* (Palombini, 1993) which was mainly produced by physically manipulating tape to alter raw recorded sound.

One of the pioneering artists during this time was Pierre Schaeffer, who defined *musique concrète* as “[an intention] to point out an opposition with the way musical work usually goes. Instead of notating musical ideas on paper with the symbols of solfege and entrusting their realization to well-known instruments, the question was to collect concrete sounds, wherever they came from, and to abstract the musical values they were potentially containing” (de Reydellet, 1996). One of Schaeffer's notable works, *Etude aux chemins de fer* (1948) or “Railway Study,” samples sound from trains running on railroad tracks. In this piece, Schaeffer uses

recognizable train sounds, drawing our focus to individual elements through looping and splicing. Through this piece, Schaeffer established how a narrative could be told through the listener's ability to create a mental picture of the presented sounds.

Another canonical artist, German composer Karlheinz Stockhausen, puts us in a completely abstract realm of distorted voice and sound waves through his piece, *Gesang der Jünglinge* (1956) or "Song of the Youths." Stockhausen's piece presents a boy's voice singing the biblical canticle, the "Song of the Three Youths in the Fiery Furnace" with swelling and distorted electronic tones. In parts of this piece, the voice is filtered, layered, fragmented, and spatialized across five channels. Stockhausen creates narrative through rewiring our perception of existing narrative by adding elements to produce a new perspective.

These artists demonstrated how narrative can be forged from both the recognizable and abstract materials which exist outside of traditional musical and instrumental sensibilities. Many artists to this day work with increasingly modernized technology using this same philosophy of taking acoustic sound and transforming it to create new, contextualized points of view. Throughout the decades, electroacoustic music has continued to broaden with artists from many backgrounds creating pieces that cut across language, cultural, and social barriers. My piece is a result of this heritage. My aim is to engage with these foundations while implementing my personal experience to offer a unique perspective on how narrative can stem from the intersection of real, recognizable sounds and abstracted, manipulated sounds.

Methods

This musical composition is made up of sounds I've recorded, sounds I've pulled from other sources, and artificial sounds I've built. The digital environment I used to construct, synthesize, and arrange these sounds was Kyma 7. The making of this composition consisted of three different processes: collection, production, and arrangement.

Kyma

Kyma is composed of a software and hardware system with a visual, modular environment. It is used for analyzing, synthesizing,² and manipulating data and audio. Through Kyma, this can be done in real time and is often used to create artistic pieces and interactive performances, fine-tune sound effects, and produce data-driven or "information art."³ There are other sound synthesis environments that are used in this field, however Kyma provides its own processor specifically for producing, evaluating, and synthesizing sound. This makes Kyma very efficient at comprehending a large amount of information with ease and is therefore why I used it for this project.

Collection

I collected my sounds using a few different methods. The primary method was through recording them using my phone via the Voice Record Pro app. Approaching the sound collection this way, I gathered many different everyday sounds, such as a door closing or a radio ad, as well as background ambient sound.⁴ Although I was able to record many interesting sounds using my phone, there were certain sounds which, for technological and logistical reasons, I was not able to capture myself. Therefore, the secondary method was pulling pre-recorded sound from other sources. For example, I used recordings of my own compositions from GarageBand and sounds

from the BBC Sound Effects Library. The third method focuses more on the ambient sounds in this piece. These sounds were mostly artificially produced by manipulating sound waves or using granular synthesis.⁵ These environmental sounds helped fill the negative auditory space in between shorter sounds and tie everything together.

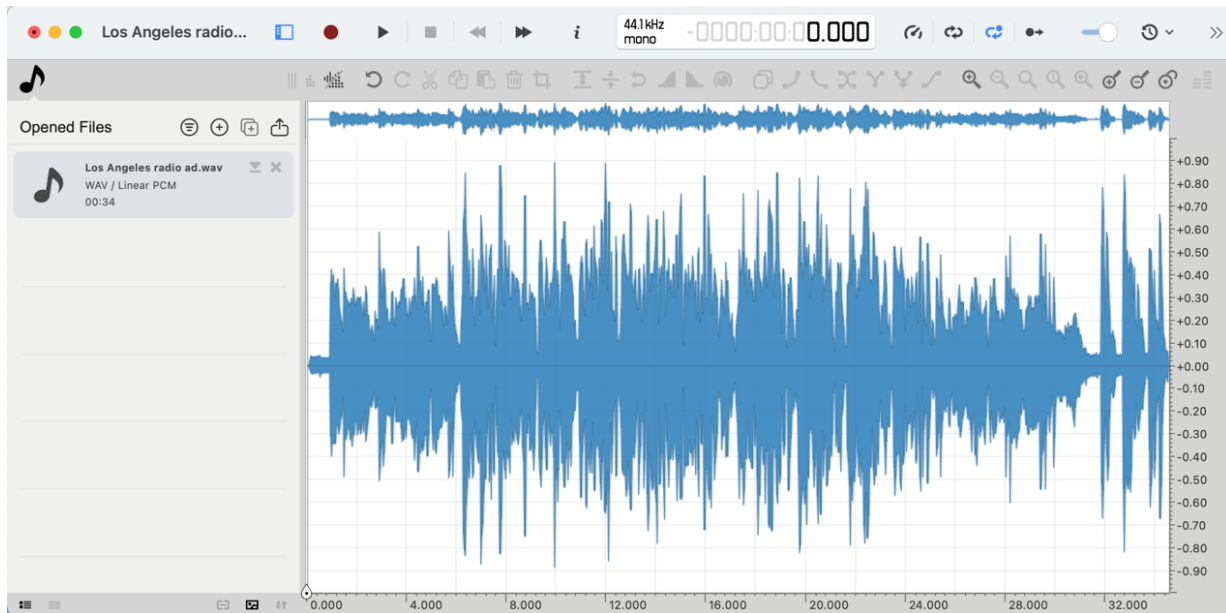


Figure 1: a .wav audio file in Ocenaudio

After I finished collecting my recordings, I took my raw files and opened them in Ocenaudio, a computer application for basic sound editing (Figure 1). In this software, I picked out the specific moments I wanted to keep within a longer waveform. I then normalized the amplitude of these sounds to -1 decibels (dB) to maintain volume consistency amongst all my audio files. I also edited in extremely short fade-ins and fade-outs at the beginning and end of each sound to make sure it fully arrived back at complete silence to prevent clicks, pops, or other harsh transitions that can be caused by abrupt waveform changes.

Production

After preparing my sounds in Ocenaudio, I moved them into Kyma to begin the transformation process. Figure 2 shows one of my sound files where I first placed my sounds. These files later act as menus where I pick which sounds I want to drop into my piece. When I click on one of these icons, I open a Kyma Sound object (Figure 3). This is the environment where I combine sounds together to get my desired outcome. The edits I made were based on the five basic sonic attributes: (1) amplitude or loudness, (2) pitch, (3) duration, (4) spatial location, and (5) timbre.⁶ The sound object in Figure 3 depicts the first sound presented in my piece, two people walking together. On the left half of the image, we have the same sample layered and mixed into one signal. I then added a “Panner” object and “EUVerb Reverberation” object to produce these sonic effects.

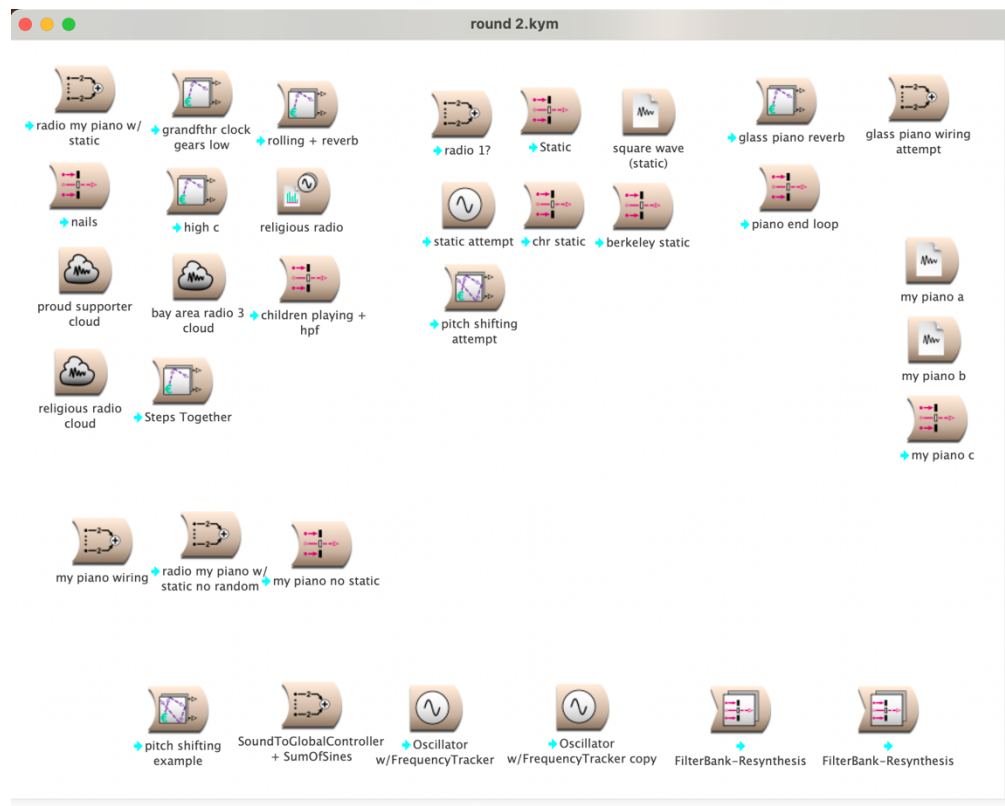


Figure 2: a Kyma sound file

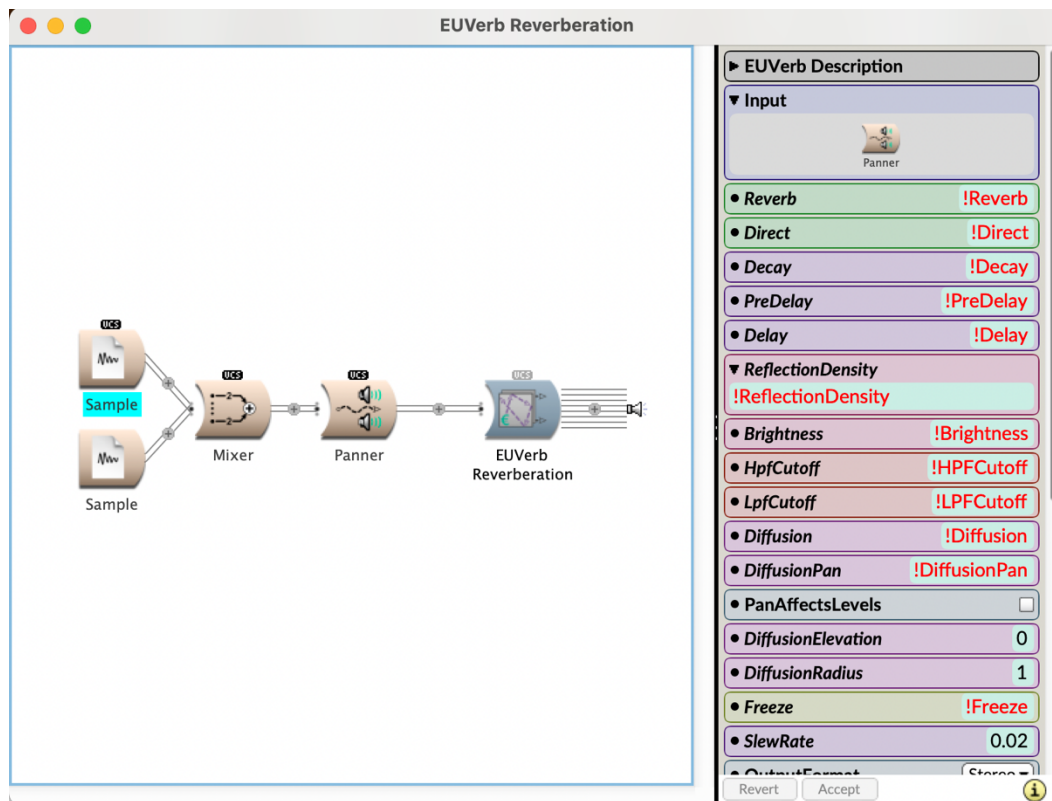


Figure 3: a Kyma Sound object

On the right side of the image, we see all the different parameters within the Reverberation object that I chose to edit. For almost every parameter, I didn't put in a specific number but rather typed in an Event Value, a Kyma-specific syntax which allowed me to change each parameter in real-time. Consequently, once I played the sound, another window opened that included all these parameters with faders so that I could change their levels instantaneously. This separate window is called the Virtual Control Surface (VCS). In Figure 4, we see the VCS with a layout of the attributes I chose to adjust while listening to the sound. This system helped me fine-tune my sounds in unlimited ways to develop highly specific outcomes and sound qualities. Once I found combinations of fader positions I liked, I bookmarked them within the sound object to reference later. This is the last step before bringing my sounds together for my piece.

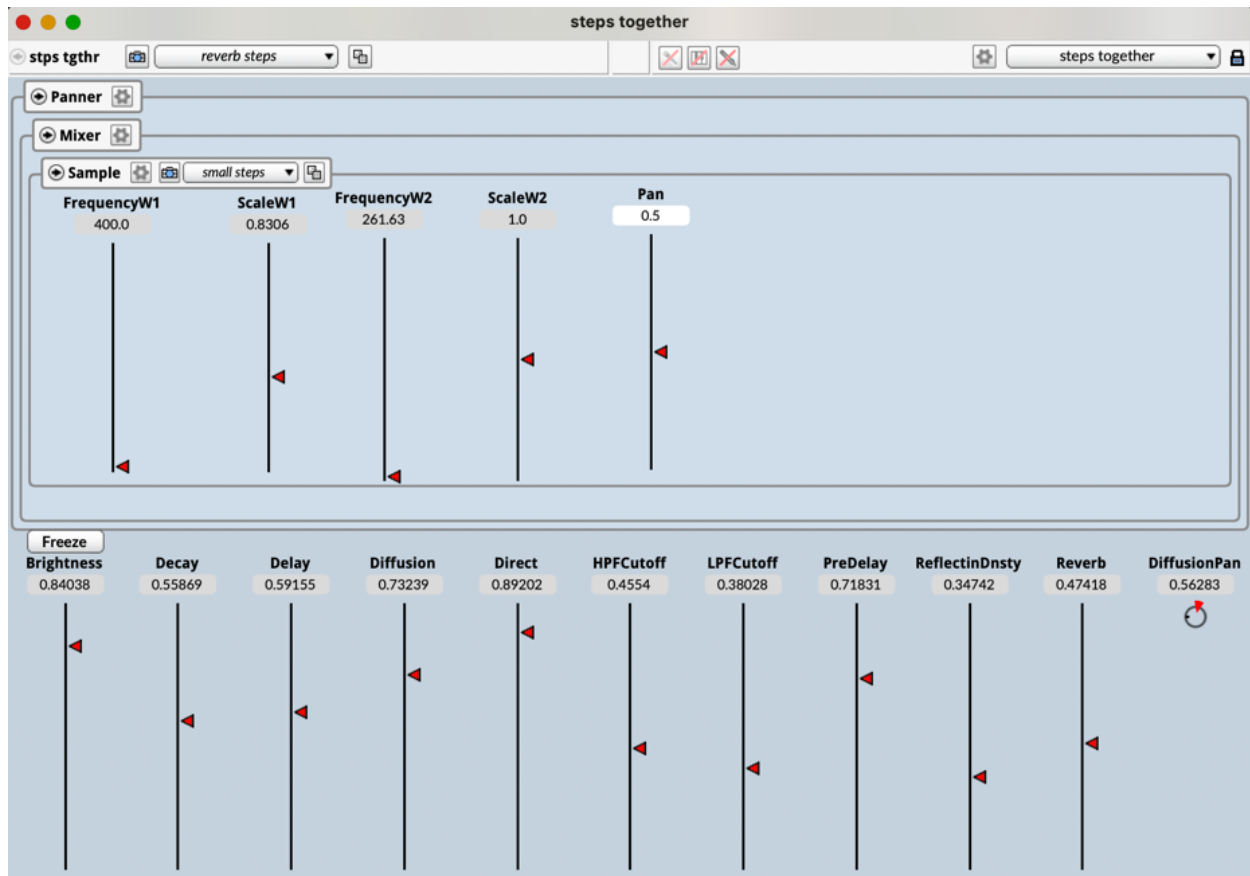


Figure 4: the Kyma VCS

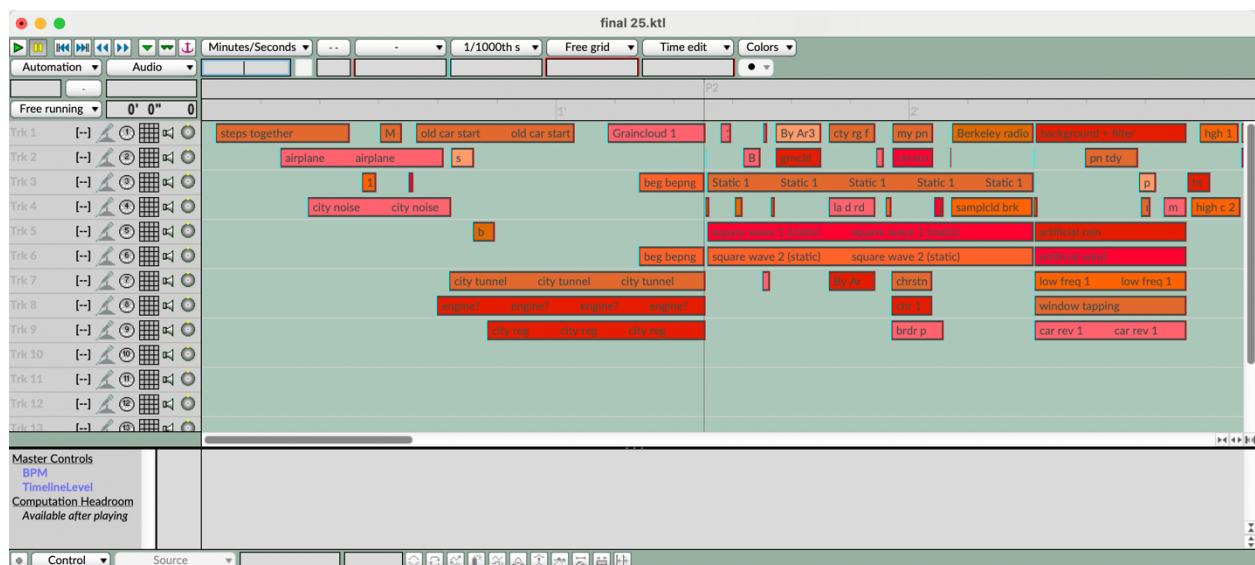


Figure 5: a Kyma timeline file

Arrangement

After I finished creating a sound, I put it into a Kyma timeline file. This system, similarly to a common digital audio workstation,⁷ allowed me to arrange my sounds in time to extend my piece. As seen in Figure 5, sounds were labeled and ordered to my choosing. At this point, I began to gauge where each sound would be positioned and how long I might stay in a single sonic environment before moving on to the next. In this network, I also created evolving data-streams to change each of my sounds' parameters over time. This can be done live within the sound object domains, but I preferred automating control streams using the drop-down time variant control (TVC) or "Parameter Control" window below my sounds (Figure 6). A TVC can largely be defined as a system, module, or algorithm that provides a control signal that can change over time. Although Kyma provides other TVCs, such as envelope generators⁸ and Capytalk, an internal coding language, the Parameter Control window displayed within the timeline helped me manually alter all the parameters of the sound on my timeline visually relative to other sounds in my piece. This attribute of Kyma was especially important as it was the basis for my sound evolution and therefore narrative progression.

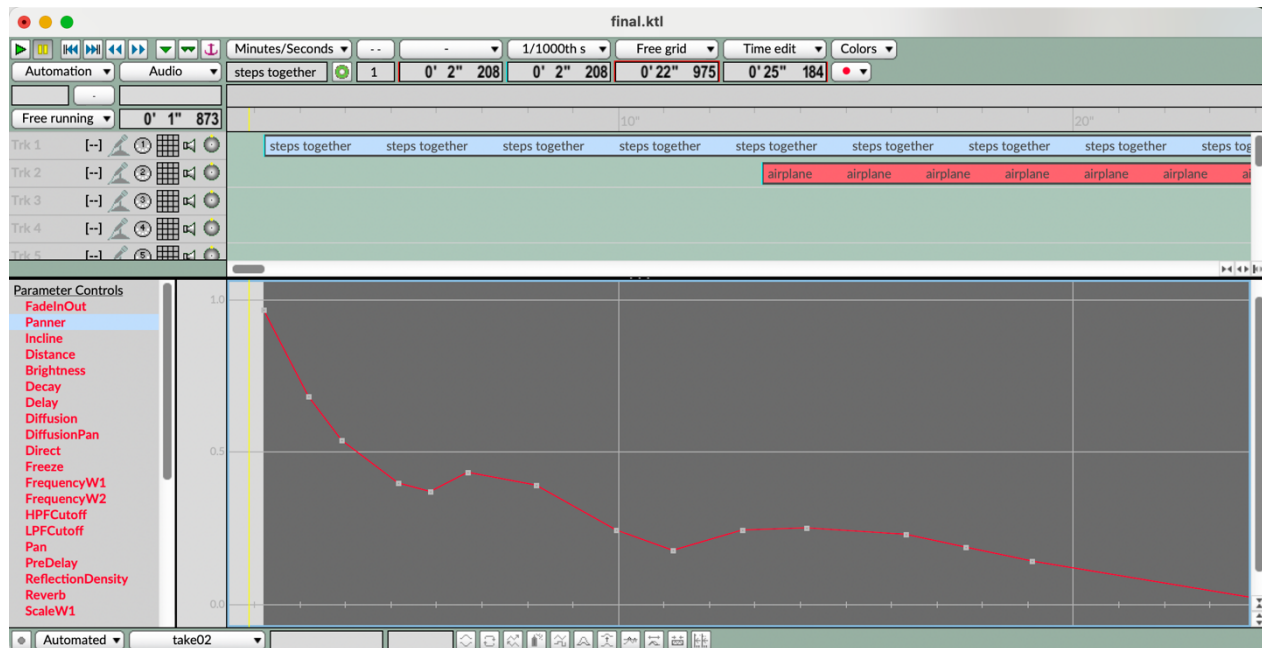


Figure 6: the manually automated TVC within the Kyma timeline

Influences

In my youngest years, most of my musical exposure was limited to the compact discs my parents made available to me. This usually consisted of Miles Davis circa 1950s-60s, John Coltrane, Dave Brubeck's arrangements for piano and flute, Bill Evans' *You Must Believe in Spring*, as well as Vince Guaraldi's *Peanuts*, to my tastes. Likely due to overexposure, jazz was not typically my first choice. Instead, I searched through other albums lying around the house and ultimately gravitated towards Chris Isaak, Marisa Monte, Michael Jackson's *Off the Wall*, and Imogen Heap's *Speak for Yourself*, the last of which I convinced my mom to buy during a grocery store trip when they still sold discs at the register.

During this time, classical piano was also a major part of my life, as I took lessons twice a week and practiced daily. Some of my least favorite memories were sitting at our grand piano and playing the same four measures repeatedly, but these practices instilled a form of aimless resolve that's been helpful throughout college. I was also an active participant in my local church choir which I believe inspired my love for using vocal timbres as a creative tool in my work. Beyond this, I had a significant observational hobby (or problem as my elementary teachers would point out) and a fondness for perpetual people-watching and listening.

Throughout my teenage years, I leaned into appreciating instrumentally focused music with minimal or vague lyrics and organic textures. Tricky, Thievery Corporation, Bowery Electric, and Ryuichi Sakamoto were among my favorite artists at this time. Additionally, I did indulge in some 1990s-2000s Madonna when the moment called for it. In high school, I continued practicing music through music production classes where my first assignment was to write and produce a pop song. Of course, I thought it would be compelling to create an electroacoustic-adjacent intro for this song. I ended up spending all my time on this intro, which

grew longer than the song itself. This introduction would ultimately be expanded into the current piece for this project.

In college, as a Popular Music major, I began stepping away from popular music altogether. I intentionally and unintentionally found myself avoiding filling every potentially present moment with music, often having headphones in with nothing playing as many musicians do. While working on this project, I did listen to more electroacoustic pieces which were somewhat of a newer form of music for me. Some of the more influential pieces that I listened to were:

Arturo (1998) by Elainie Lillios

Nuo Ri Lang (1996) by Zhang Xiaofu

Sheremetyevo Airport Rock (2002) by Jon Appleton

rare yet soft (2016) by Kyong Mee Choi

Testimonio Objetivo (2023) by Jeffrey Stolet

Cyclonic (2008) by Carla Scaletti, the creator of Kyma

These pieces changed the way I think about sound and how sound exists within the context and framing of other sounds. One of my main takeaways from these works was how they acted upon the listener—whether they were pulling me from one place to another, or I was still, and the sound was circulating and evolving around me. For instance, while listening to *Sheremetyevo Airport Rock*, I felt as though I was moving through an environment whereas listening to *Cyclonic*, I imagined myself stationary as events were happening atmospherically.

Another significant takeaway I had was the awareness of texture and how to use it to create tension sonically. In their works, Choi and Lillios created thin textures which allows the listener to focus on specific sounds and the feeling those sounds convey on their own. Along a

slightly different vein, *Nuo Ri Lang* and *Testimonio Objetivo* employed very full, metallic and percussive textures to create a sense of physical impact. This interplay between thin and thick, sparse and dense, and movement and stillness became compositional elements I wanted to explore in my own work to drive emotional tension and represent point of view.

Creative Process

While working on this piece has been undeniably fulfilling, the experience has been unlike any other. Although I have only been through my creative process a handful of times so far, I've roughly identified what it looks like with regards to this project. As previously mentioned, the idea for this piece grew from an introduction section to a pop song I made in high school. Because of this, the beginnings of my work felt very nostalgic and rewarding. I felt like I had finally circled back around to the kind of art I had always wanted to make but previously wasn't sure how or why. From there, I began to plot the purpose for this sequence of sound events and why they were so meaningful for me. I then finished the first version of the piece. In reality though, I was only about 38% done and the real work was just starting.

After taking a short break, I returned to my composition with greater ambitions. In order to understand the larger narrative of the piece, I began drawing out a story that I would (theoretically) follow. Next, I had to translate these more intangible ideas into concrete sounds that could effectively represent my desires. During this process I hit walls, rebuilt ideas, and sometimes on a good day, I laughed in satisfaction. And finally at one point, I saw the finish line, took a deep breath, and wondered why I hadn't just listened to my dad and stuck with being pre-med. Sometimes, you have to forgive yourself for choosing to make art and move on, so I submitted my piece. The one thought I've held on to through this experience is that my art is forever ongoing and I'm always actively revising even if I'm not. Overall, this process was something completely new but also oddly instinctual and very rewarding. This piece has taught me that some artistic works never end, they just get turned it. I hope you enjoy listening to where it was when I finally let it go.

Accompanying Materials

Sound Recording: *acarriedwithmymomin2009*

sophiaturek.bandcamp.com

Footnotes

[1] **audio signal processing** – the manipulation of an analog or digital sound output, to form, modify, or enhance a sound.

[2] **sound synthesis** – the digital generation and manipulation of digital audio signals to create, modify, or emulate sounds.

[3] **data-driven/information art** – a genre of art that incorporates or is inspired by raw data/statistics.

[4] **ambient sound** – background noise that can be specific to a location or event but can also be abstract. These sounds are recognized as the noise that occurs behind the primary sounds being monitored, such as someone talking directly to you and rain or wind that might be occurring in the background.

[5] **granular synthesis** – the process of breaking audio samples into tiny (typically 1-100ms long) segments called “grains,” to then manipulate them in different ways to create unique sound textures.

[6] **timbre** – referred to as a sound’s tone quality, or “color.” This is technically based on the differences in a sound’s overtones or harmonics, giving it a texture that is unique to its source.

[7] **digital audio workstation (DAW)** – a software used to record, edit, mix, and produce audio files, used commonly within popular music production.

[8] **envelope generator** – a common method to direct the different stages of a sound by creating a control signal to automate sonic elements over time.

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