

ACT IV: ON SOUNDS



Fig. a. PREVIOUS FACING PAGE:
Site Plan 1940-1943. Self.
November 2017.

This axonometric drawing illustrates the development of a street grid on Government Hill, with 300' blocks and 60'-wide street right of ways. This development and subdivision of the land forced the Alaska Communications System to move Building #2 to the north of the original structure, in its current position.

Fig. b. CURRENT PAGE:
Station 5. Self. March 2018.

This watercolor shows the fifth of twelve stations on the journey to the Wireless Station, the steep climb to the original road bed.

When the WAMCATS took over operation of the Wireless Station in 1924, they worked hard updating the technology. Over the next several years, they installed a radiotelegraph transmitter and expanded the station. The transmissions now were sounds, not just bursts of energy, and the received messages played the voices of operators hundreds of miles away. As the town grew outward from the first few blocks and more would-be residents arrived, the Wireless Station recorded those sounds and stored them in its fabric.

Soundsⁱ are the energy that preserves a past event. They carry the memory of a collision through air and matter in rhythmic and three-dimensional waves. Materials either absorb or reflect the sound waves, which interact constructively and destructively to produce tones. Stories are sentences of sounds, and behave like any other sound. They recall a past and transport the present to

that past time and place. Buildings and natural features like trees absorb portions of these stories, and retain them in their matter.

Physicists understand the ability for materials to remember sounds, and retain them. Glass provides an easy example. Glass is essentially a suspended fluid, and so ripples in sound waves. The result is that the glass records the vibrations, and produces an actual sound wave, frozen in its medium. Materials appear solid, but the reality is they are tightly bonded atoms with space between. Scientists know little about the relationships between energy and matter, and some theorize that energy exists because matter vibrates. Such a condition is mysterious, and the realm of theory. What appears to be a dent or scratch in a wall or floor is really a complex matrix of both matter and energy that is large enough to see, even if it is too minute to understand.

The physical damage or blemishⁱⁱ relates to a less-visible effect, the invisible sounds and stories that the building retains as well. Each fallen card and shard of glass underwent an action that transported it from one location to another. This transfer of energy, from potential to kinetic, was unequal, as the difference was the sound of the collision from the object and the floor. Although this example of a sound is not very romantic, the sound itself lacked importance in much the way the object does. The sound came from an action, and the building retained that action, both physically and ineffably. The sounds around that action, before, during, and after all create an episode of history that no written word or

curation could relate. Those sounds occupied the physical elements of the building, and continue to do so. Their echoes and reverberations continue indefinitely.

SOUND ARCHITECTURE

These sounds are of collision and movement, but there are also sounds of narratives in the buildings. The spoken or sung word is nothing but a series of collisions and reverberations beginning in the throat and ending at the lips. The buildings contain these words and silent observation of the space tunes in those stories. In the caves of Cappadocia, I had a metaphysical experience of understanding that the sounds I made in the caves reverberated in the same way those of the ancient inhabitants had. The sound the wind made through the windows was the same as in the past as well. At the time, I had the theory that the room retained the stories of its former residents in the resonant frequencies of the room, and that by discovering and voicing these tones I could arouse the memories of the space. There was something extremely powerful about singing the resonant tone and feeling the living stone sing back. These were borrowed spaces, carved out centuries and millennia ago, and occupied over the epochs by different peoples with different cultures, lives, and voices. They had not designed or tuned the spaces to fit their voices or stories, but the rooms they carved out of the stone did the reverse. The architecture tuned the occupant; it imbued a quality to the person that transcended generations. The residents sought out the resonant frequencies and used them to amplify their voices. That



i. Note:
Several pertinent definitions of sound are: 1) n. vibrations in air, 2) v. emit sound, 3) v. convey an impression, 4) adj. good condition, 5) v. ascertain depth or volume, 6) n. a probe, 7) n. a narrow stretch of water.

ii. Reference: *Forensic Architecture*. Weizman. 2017.

Fig. c. PREVIOUS PAGE, ABOVE:
Original Building Interior. Self. December 2018.

The south addition to the original building of the Wireless Station.

Fig. d. PREVIOUS PAGE, BELOW:
Cave Interior. Self. May 2015.

A cave interior in Cappadokia.

experience was what started the fascination with the special memory of sounds, but not only human sounds.

This process does not require radio, however. This realization shifted the Thesis to a new direction. I concluded that sound, especially stories, also transported people to different places and times, not only metaphorically, but also physically and spiritually. Sound has a source and a sink,ⁱⁱⁱ a speaker and a receiver. The sink absorbs the sound sometime after the source emits it, as the sound waves must travel through a medium, at a specific speed, before reaching the sink. Whereas radio waves do not require a medium to pass through, sound does. A pressure wave relies on forcing particles in oscillating densities. Physical properties have effects on sound. Either an object reflects sounds, absorbs it, or allows some combination of the two. The latter is the most common outcome, and in that way, the materials and bodies sound interacts with absorb and retain the sound.

The Wireless Station is not a cave in which refugees sought protection. It is however, an architecture not designed for its acoustics, but whose acoustics shaped its use, albeit less obviously. The operators probably did not change their voices to meet those of the building, but they did wonder at, and understand the significance of, reverberation and resonance.

ACOUSTICS

The study of acoustics in buildings is an entire discipline of architecture. Designers for thousands of years have employed many different methods of both enhancing and negating sounds in spaces. Some have even encouraged their celebration. The design Theatrons of ancient Greece included placing bowls that resonated at different pitches in the music.^{iv} This behavior amplified the voices of the performers and instruments throughout the venue. This practice reappeared in the Gothic churches of Europe. In this case, the bowls were placed within the walls or in niches, called resonating chambers, to amplify the sounds of the service, and later the organ. The designers created acoustic nodes with chapels along the nave and the changing ceiling height modulated the sounds.

The acoustic qualities of buildings, especially churches, have inspired pieces of music. Each pipe organ is unique to the building that houses it. Many composers of organ music have used this intimacy between the instrument and architecture as inspiration. Other performances of these pieces are never as rich as those within the original space, where the architecture can add its own voice to the music. Il Duomo in Florence is particularly special because it inspired a musical piece.^v The composer of the piece included imagery and details about the building and into the lyrics, and used the geometry of the building to create the tonal structure. Marvin Trachtenberg describes certain proportional relationships of the music existing in the architecture. The "chain" of proportions connects the motet on the cathedral's ceiling to the building itself to the bible. This trinity reduces basically to a

constructive relationship between music, architecture, and story. Not only did the building serve as the performance hall for the music, it is also the canvas for its written transcription. The piece adorns the wall that witnessed and remembers the music.

In contemporary architecture, especially spaces devoted to sound, the practice is to muffle ambient sounds and avoid resonance or echo. The work of Yasuhisa Toyota is extraordinary, especially at Disney Concert Hall in Los Angeles, because he creates spaces of such sublime silence and clarity of tone, that they actually influence the audience to be stiller and more silent. The trouble with this is it removes any signature of the space in the sounds.

Historic musical recording, made without the benefit of studios, provide an entirely different acoustical experience. The recordings include the reverberation of the hall, the sounds of the audience; these are the signatures of the architecture, and the absorptive qualities of the bodies of the spectators. In this way, the recording seems authentic.^{vi} Contemporary music halls with their specific acoustic design, universalizes the concept of a music hall. The same is true for recording studios. The architectural techniques are all standard, as are the technology for recording. Although the spaces may be universal, the recordings are generic.

RESONANCE

The research suggested that the relationship between architecture and sounds always was one-sided. Architecture either welcomed the sounds or stifled them, but always the architecture preceded the sound, or music. The initial driver for this Thesis, however, was the belief that it could work reciprocally. Sound could inspire architecture, and the sounds of an existing building could inspire new harmonious designs. The concept of resonant frequencies arose as an area of further inquiry. To design a space using the resonant frequency of another as counterpoint was the logical extension of the initial questions.

Sound is the result of a past event. Sound travels at different speeds through different media, but always requires some period between its emission and its reception. It is a record of a past event. It manipulates bodies as well, and can induce standing waves in objects, called resonant frequencies, that amplify the sound. The pressure waves build on each other in constructive interference, increasing the amplitude of the wave while the frequency remains constant. This property of space is particularly interesting, and the work of Tanya Harris^{vii} and Alvin Lucier^{viii} explore this phenomena.

Tanya Harris is a young artist in London, who endeavored to produce “architecture” from resonant frequencies. Using the maxim that architecture is frozen music as polemic, she literally converted sound into sculpture using a complex process that was inspiring. Although it was not her intention, the sculpture documented the spaces, in a way, by

iii. Note:
Here, “source” and “sink” derive their meanings from Fluid Mechanics principles wherein the relationship between the two derives a streamflow. Specifically, a source radiates and a sink absorbs. A musical example would be an instrument and a microphone.

iv. Reference: *De architectura*. Vitruvius. Book 5, Section 8.

v. Reference: “Architecture and Music Reunited”. Trachtenberg. 2001.
The paper describes two approaches to understanding the relationship between the “Nuper Rosarum Flores” motet and the Florence Cathedral, as well as the ancient Temple of Solomon.

vi. Reference: *Auditions*. Stone. 2015.
Rob Stone describes a history of classical music recording techniques of the Twentieth Century, especially of opera. He recognizes a “spacial complexity” that live recordings give, and highlights the importance and empathy of the audience. The book suggests that inclusion of audience sounds and performers gives an added sense of “atmosphere” and authenticity to the sound. As well the placement of the microphone (or multiple) is crucial to the “acoustically convincing fiction” of place.

Fig. e. CURRENT PAGE, ABOVE:
*Christchurch in Spitalfields
Sound Glyph. Harris. 2013.*



Fig. f. CURRENT PAGE, BELOW:
*"I am Sitting in a Room"
Album Cover. Ukn. 1969.*

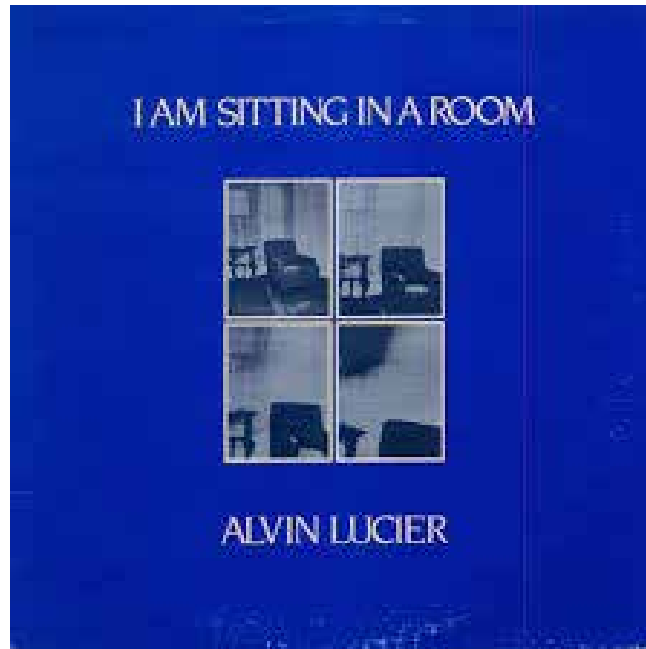


Fig. g. FACING PAGE, ABOVE:
Sony TC-630. Self. May 2018.
The threehead solid state reel-to-reel tape recorder belongs to Jenifer Moran. Although in its day it was portable, the equipment is unbelievably heavy.

Fig. h. FACING PAGE, BELOW:
*T-Shaped Building Stem. Self.
March 2018.*

Heavy snows had blanket-ed Anchorage in the weeks before, and warm weather had caused all the snow to slide off of the roofs of the Wireless Station buildings. As a result, the snow on the site was very deep.

preserving a specific and unique quality of each. She recorded each space in multiple senses of the word. Travelling to four Hawksmore churches in London, she set up a microphone and recorded the ambient sounds of the sanctuaries. With sound editing software, she isolated the resonant frequency for each building. Next, she played the tone from a speaker that had a pool of water suspended over the speaker head. She photographed the resulting standing waves, which were all unique geometric patterns, and CNC routed them into stone to make square sculptures. Finally, she installed each stone tile in the corresponding church. The concept of eliciting the embodied sound of architecture and converting that into new architecture was an exciting prospect, and drove the early concepts of the Thesis.

Alvin Lucier is a composer who pioneered early electronic music. He was a longtime professor at Wesleyan University, and during his time there, became increasingly interested in the practice of looping. The process is simple to explain, but hard to implement, as I later discovered. Looping requires a tape pass by a recorder head and travel some distance to the play-back head. The speakers project the sound from the play-back head, and this played sound is rerecorded on the tape. There is a complicated process of switching tracks to avoid a feedback loop, wherein the microphone records its own sound escaping the speakers, which results in intolerable screeching. Lucier sat in a room with a recorder and read a short statement. He then played back the recording of himself reading while still recording, and set up a loop. After about forty minutes of decreasingly perceivable words, all that remains are the resonant

frequencies of the room. His work demonstrated the technological abilities of tape recording, as well as provided a transcendental appreciation of the human voice in architecture, and he often performed it in front of a live audience.

I attempted to recreate Lucier's art piece, but had never played with recording, nor knew anything about tape recorders. One of my classmates was generous enough to lend me her father's old reel-to-reel, and I set to work resuscitating it, which was no easy task. It lacked a power cord, belts, and some of the jacks were not working. Through a lot of tender, loving, and brute force care, I revived the recorder, and was able to make some recordings. When I set forth to test Lucier's method, however, I forgot to factor in feedback, and quickly realized my error. After several minutes of thought, I believed the solution lay in using the two channels of the tape, Left and Right, to oscillate between the broadcast and recording. However, this proved too cumbersome, especially because I had to force the capstan into position with a screw driver every time. I had no control over the tape, and this process required a great deal of precision. Determining the resonant frequencies and mapping the spaces of the Wireless Station would be difficult, but I remained hopeful.

Unfortunately, my technology continued to fail me. I attempted making recordings with an iPhone, but the cold temperatures ceased its function. Additionally, the microphone was too weak to pick up ambient sound. I wanted to use a reel-to-reel tape recorder, but getting power at the site proved a hurdle. Although I managed to remedy that problem



vii. Reference: "The Architecture of Sound". Harris. 2013.

viii. Reference: "I am Sitting in a Room". Lucier. 1969.

ix. Note:
The auditory horizon describes an escape of self, for example singing in a chorus, and the auditory threshold describes an escape of place, for example passing through an exterior door of a building.

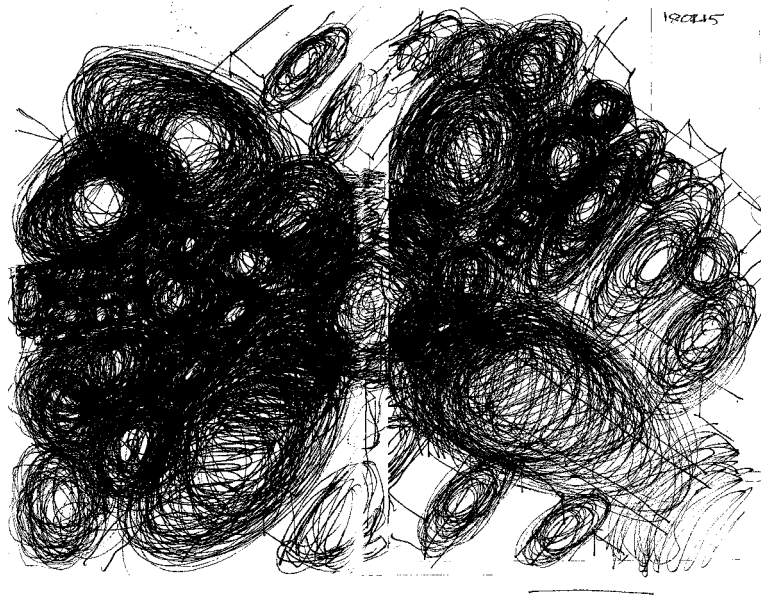
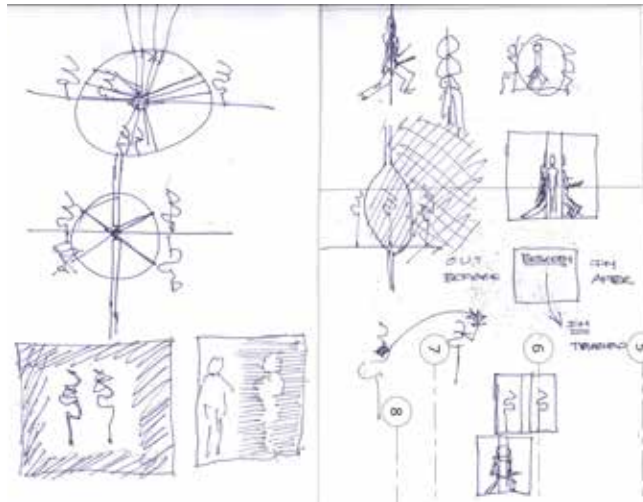


Fig. 1. CURRENT PAGE, ABOVE:
**Acoustic Node Diagram. Self.
February 2018.**

Instead of walls and roofs dividing space, all the spaces are geometrical acoustic nodes. The sphere in the middle is the intersection of Manor Ave and Boyd St. North is up and to the right.

Fig. 2. CURRENT PAGE, BELOW:
Acoustic Threshold/Horizontal Sketches. Self. February 2018.



thanks to the generosity of a friend, the reel-to-reel machine ceased working on the crucial day. The final obstacle was the weather. Anchorage had received high quantities of snowfall in March and the drifts were above the windowsills of the Wireless Station. The spring sun was melting the snow, which froze again in the portico to the Wireless Station. I could not get into the original structure. It seemed that nature was suggesting I look at the sound question from a different position.

Although a readaption of Harris' project became less important, the ideas behind the work remained cemented in my concept. She had identified sounds that inhabited the architecture, and created a new, albeit visual, way of engaging them. What became obvious to me about Lucier's piece was the power of his statement opening, "I am sitting in a room, different from the one you are in now." He was introducing not only his voice, but also his voice in the room, to a new room. The piece connects the listener with the performer across time and space, and his own awareness of this power appears in his words.

REDRAWING SPACE THROUGH RESONANCE

What my exercise in futility resulted in was another realization. The work I had done in the previous month, identifying resonant nodes and practices, was the direction I should push. Through a series of diagrams, I explored the concept of what the spaces of resonance were on the site. I speculated that geometries of buildings and trees must create nodes in which sound waves resonated, and that these nodes, and the separation between them, were more important than the

actual pitches that may resonate within. Rooms were particularly easy to render, and the trees created other boundaries for the sound. These acoustic thresholds^{ix} had the densest soundwaves, as the sounds in either space were intersecting here. To cross over one of these thresholds was to enter a new acoustic experience. Through this diagramming, I was able to divide the site into polygons of nodes. One particular node was that of the intersection of Boyd St and Manor Ave. I populated these nodes with specific uses of interacting with sound.

This notion was not without precedent, as Niall Atkinson had produced a very interesting book on the subject, albeit in Medieval Florence.^x She describes the city as “a network of sonic nodes transmitting messages across the urban landscape.”^{xi} During that period, churches, public buildings, gates, and palaces all had bells. Atkinson postulates that these bells territorialized the city, and controlled its inhabitants. Each bell was unique, and its pitches and patterns constructed a complex soundscape. The campanile that housed the bells provided a vertical marker of the “coordinated sonic regime”, “but also in the horizontal plane as a symbolic enclosure of space, mimicing in an ideal, abstract way, the [...] central acoustic node [...]”.^{xii} Additionally, the bells evoked memories of the past. She quotes Jacques le Goff on the subject: “[Bells] maintained the past as something lost, the present as something temporary, and the future as something not guaranteed.”^{xiii} Like Florence, a regular pattern controls Government Hill, and creates an acoustical environment. The bugle calls from

the Base intersect with the horns of the trains, and the boats. In the neighborhood, however, are smaller nodes that divide and specify space.

INTERACTIONS WITH SOUND

Along with the question of nodes was one of interaction with sound. I thought about different ways humans engaged with sound, and how the acoustics of a space might shape an impression of self. The body and the space would sing as one entity, and that process would erase a certain sense of self. Thinking on the rituals that involve sound, I devised several actions that synthesized the two actors, the human and the architecture, and utilized sound as they unifying quality.

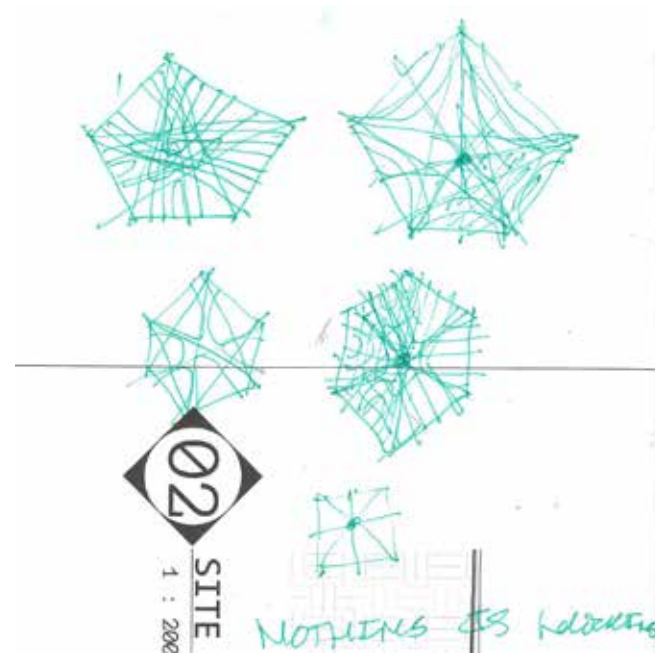
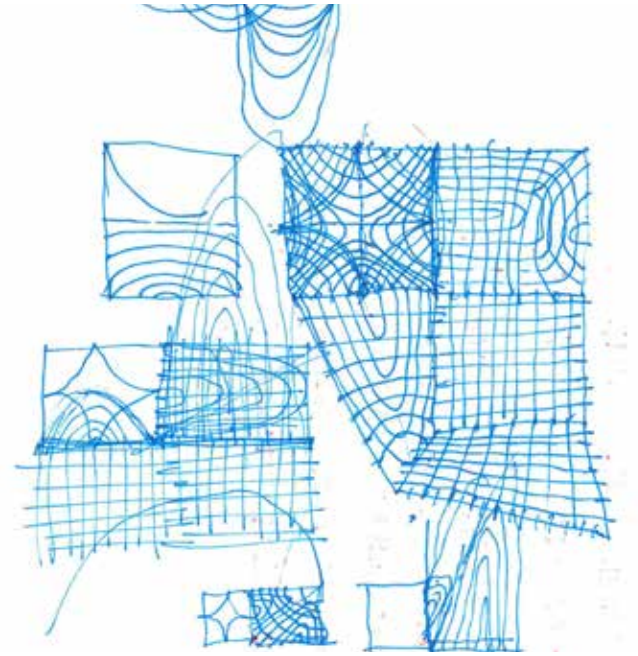
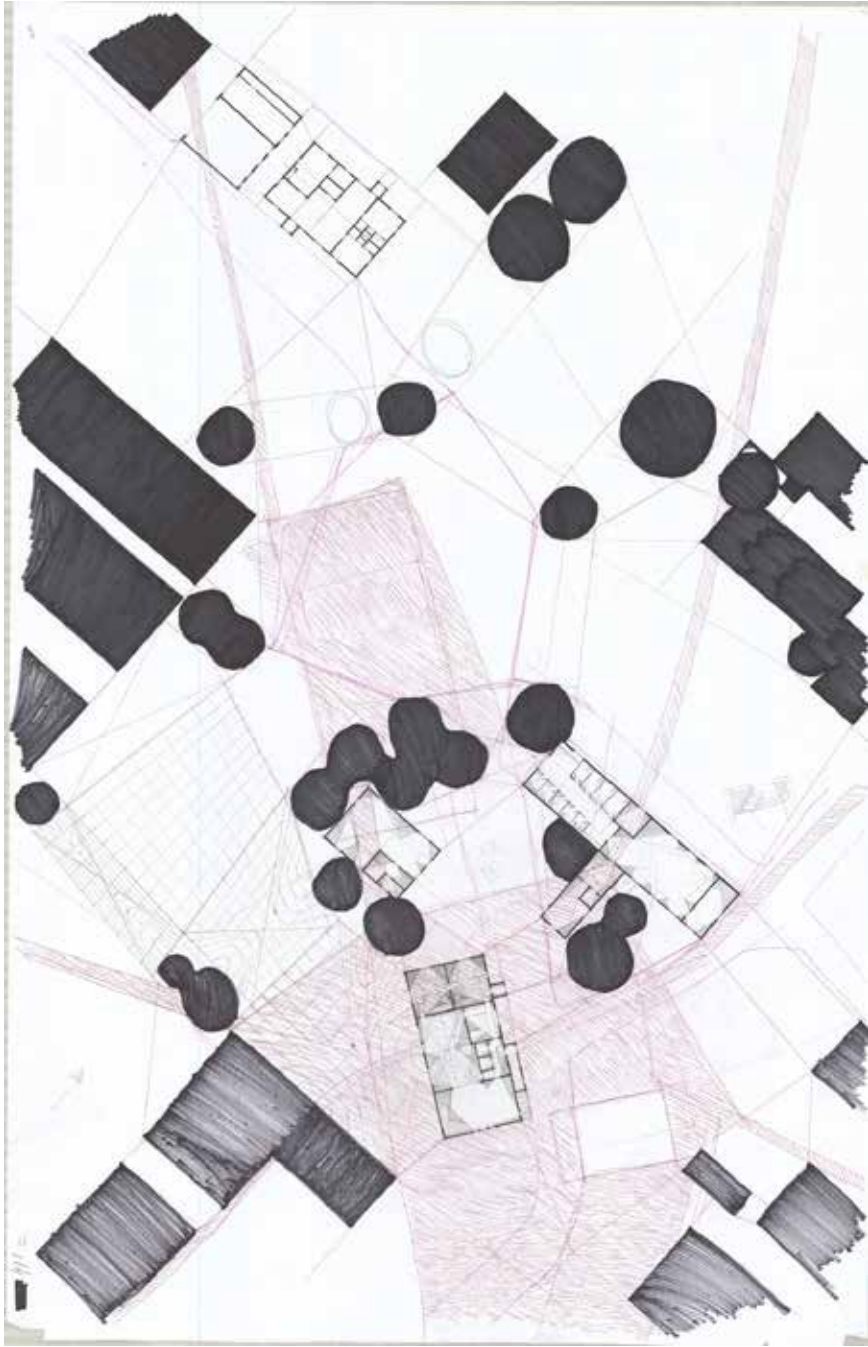
The concept of these interactions was that through some means of hearing the sound, it transported the participant to a different realm, a realm without time. Sound was a memory, and engaging that memory connected the participant with a past event. The main actions were transmission, recitation, oration, and audition. Through one of these actions, the individual transcended the present and entered the timeless world of the stories stored in the structure. Beneath the Wireless Station site was a resonating chamber that collected all the stories occurring above ground and translated them into a resonance, or the memory of sound. These memories of sound were really memories of the interaction, and in that way, were in fact place spirits.

x. Reference: *The Noisy Renaissance*. Atkinson. 2016.

xi. Reference: *The Noisy Renaissance*. Atkinson. 2016. p. 10

xii. Reference: *The Noisy Renaissance*. Atkinson. 2016. p. 24

xiii. Reference: *The Noisy Renaissance*. Atkinson. 2016. p. 126-7.



The idea was that by either transmitting stories, recording music or speech, reciting a tale – like a prayer – orating, or pontificating, in essence story-telling, or listening to the story-telling, an individual’s conscious would transcend reality, cross over the acoustic horizon, and enter another realm. The acoustic horizon describes the moment when the sense of self is lost when interacting with sound. When an individual voices the resonant frequency of a room, and maintains that pitch, the sound of the resonance reaches the ears of the individual matches the perception of the voiced pitch. The sound the individual produces becomes the exact same the individual perceives. At this point, the individual loses the sense of self, and the room and source merge into one voice, once entity. This is the acoustic horizon, beyond which the conscious leaves the body of the performer to enter another realm. Alternatively, when several instrumentalists play in unison, the individual sound disappears and the several voices join into one. Listening to a story or reciting a prayer with several others achieves the same result. The individual feels transported to a timeless place when performing these actions.

PROGRAMMING SOUND SPACES

Given these core programs, I adopted a ritualistic nomenclature for the spaces. The Transitory, the Oratory, the Auditory, and the Recitatory would be the main drivers of the occupation of the architecture. I developed supportive programs as well, such as the Offertory, and the Administratory. All of these related to sound and stories, and the power those had to split the conscious from the

physical individual. The body might pass through the acoustic threshold, but the spirit would pass through the acoustic horizon.

This programing included the location of the spaces in the nodes I developed, including the resonating chamber, which by necessity was subterranean. The concept of the resonating chamber came from the work of Phil Spector in the 1960s.^{xiv} Spector was a music producer, famously for the Ronettes and the Chrystals, and later George Harrison, who developed the “wall of sound”. Although Deadheads^{xv} might recognize the term, this was a different concept entirely. Spector devised a studio recording technique that relied on monophonic (single-mic) tracking. He would orchestrate the supporting instruments to double voices. The trumpets, saxophones, and strings would all play the same notes in the same register, in unison. This effect erased any characteristic timbers unique to each instrument. He would pipe this music into a concrete chamber in the basement with one suspended microphone that would record the sound coming from the speakers and reverberating in the chamber. The result was that the music achieved a thrumming omnipresence, a constructive muddiness that was the “wall of sound”. My resonating chamber achieved the same result, with a single element recording the stories resonating from the adjacent rooms, and transmitting them into the earth.^{xvi}

I explored the resonating chamber retroactively as well. I identified its current position was in between all three structures, but if the resonating chamber were always present, the location must

xiv. Note:
Some famous songs were “You’ve Lost That Lovin’ Feeling” by the Righteous Brothers, “Chapel of Love” and “Be My Baby” by the Ronettes, “Da Doo Ron Ron” and “He’s a Rebel” by the Chrystals.

xv. Note:
The band the Grateful Dead had their own wall of sound, an enormous array of stacked speakers.

xvi. Note:
It is important to note at this point that the resonating chamber is a metaphor, and not literally a space. It allows me to think architecturally about how a site might retain a story and sound.

Fig. k. PREVIOUS FACING PAGE, LEFT:
Site Plan. Self. March 2018.
Over the site plan of the Wireless Station I had attempted to draw the acoustic nodes and their flow nets. However, the process was inconsistent with a constructive direction of the Thesis, so I stopped.

Fig. l. PREVIOUS FACING PAGE, ABOVE RIGHT:
Acoustic Flow Net Sketches. Self. March 2018.
A flownet is a drawing that divides a medium through which a streamline flows. Each geometric unit represents a unit of equal stresses and density.

Fig. m. PREVIOUS FACING PAGE, BELOW RIGHT:
Acoustic Flow Net Sketches. Self. March 2018.
The method I used was fine for rectilinear spaces, but pentagons and hexagons were impossible to draw. Thus the inscription “nothing is working.”

Fig. n. FACING PAGE:
Moment of Resonance Sketch. Self. February 2018.
A sketch of the interaction between a voice and a resonating room.

not be stagnant, to reflect the modifications on the site. When Building #2 was to the east of the original structure, the chamber would have been between those buildings. It was migrating as a volcanic fissure migrates. I projected this migration and identified that it was heading towards the intersection of Boyd and Manor. According to my polemic, this resonating chamber was the source of the site’s significance, and its location was not stagnant. It was shifting northwards, and I had the opportunity to anticipate its future locations with my designs. What continued to be important, however, was the concept that there was a corresponding space below ground for each one above. Any action that occurred above ground was duplicated below.^{xvii}

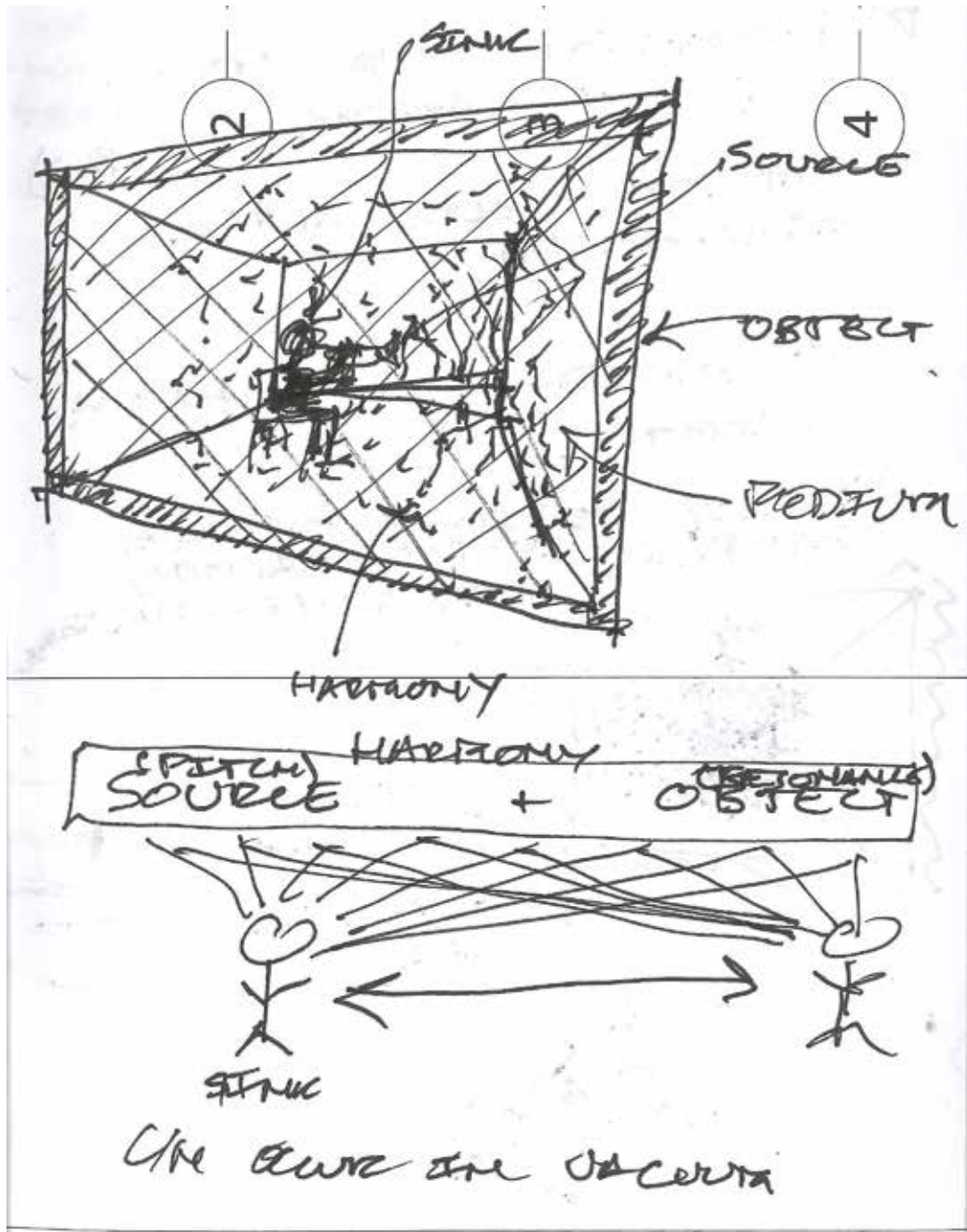
The trouble with the method of diagramming the different nodes arose when I attempted to draw the nodes in section. The interior rooms were easy enough, but the exterior spaces were more amorphous and inconsistent. Additionally, the separation between the physical and spiritual realms could be either an acoustic threshold, which did exist, or an acoustic horizon, which did not. I could not determine if a space such as the resonating chamber were two separate levels or one. There seemed to be different strata of sound, both subterranean and above the buildings but below the tops of the trees, but this was getting too complex to draw in two dimensions. I struggled with an effective method for rendering the nodes and thresholds as well. I tried ellipses, catenary curves, and grids, none of which followed consistent rules. Everything was arbitrary. Other issues

arose, such as how to treat windows and doors, and the process was manifesting in nothing good, as the uncompleted site plan illustrates.

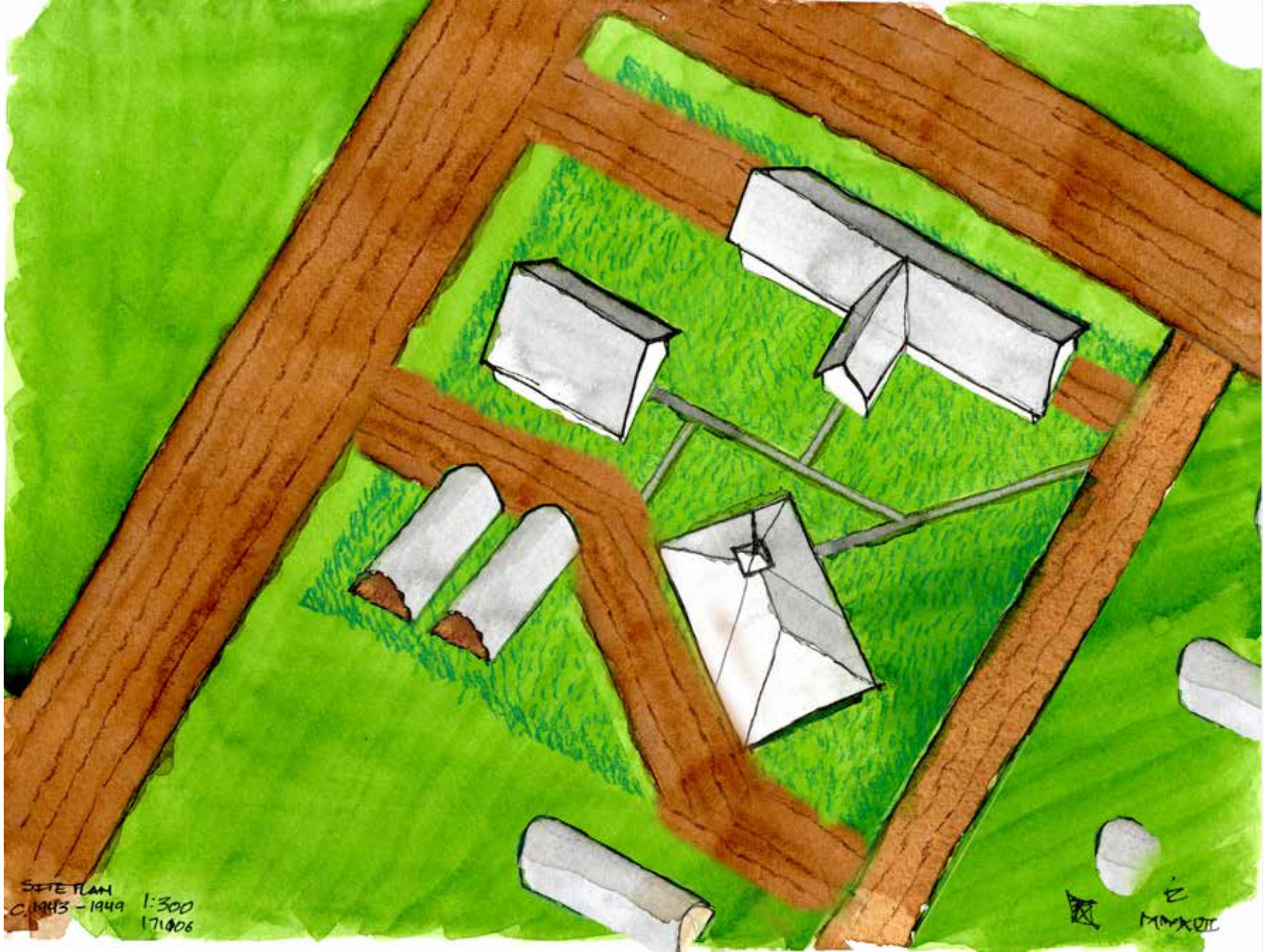
CONCLUSION

Stepping back from the drawings, I discerned what was most important about the nodes and thresholds: the concept that the corners and edges contained the densest sounds, and openings, like windows, served as areas of escape for sound. Simultaneously with this came the idea that the physical elements of the architecture and site were retaining the sounds of the past, and emitting them in a form of radiation. To retain the sounds in these areas of density, I would need to insert some medium that could preserve the stories that the decaying buildings were emitting, and absorb the new stories that would inhabit the spaces in my design.

Through sharing stories, transmitting them, and storing them, sound allows communities to preserve their heritage without relying on a physical building or monument. The memories of the ancestors join with the voices of the descendants and transcend concepts of time, place, and matter. The sounds that a place retains are memories of actions, both from humans and non-humans, that become place spirits.



xvii. Note:
 Again, this is a metaphoric method to explain architecturally the concept of how stories transport the spirit of an individual to a different place while the body remains.



SITE PLAN
c. 1943 - 1949 1:300
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