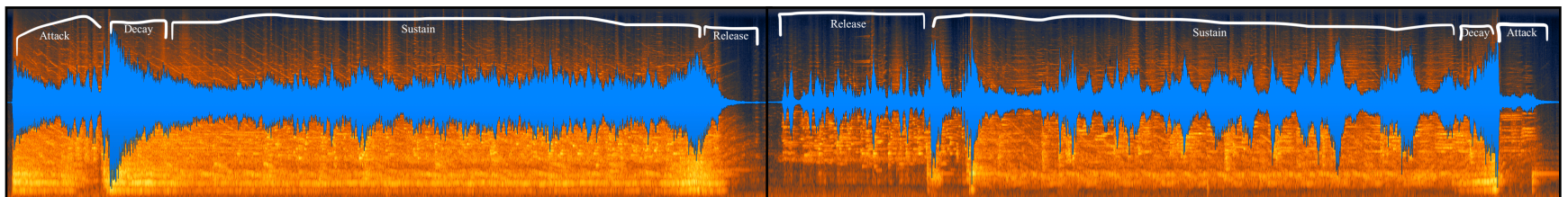


SOUND AS A SOURCE FOR CONCEPT

One of the seeds at the root of WARP & WEFT was sown during the course of my studies at Northern Illinois University, where I completed my M.M. in composition, where I encountered Salvatore Sciarrino's UN'IMMAGINE DI ARPOCRATE. Later during my time at the University of Iowa I came across Arshia Samsaminia's BEYOND THE AUTONOMOUS SENSORY MERIDIAN RESPONSE. These two pieces each make their own approach to using ideas from the study of sound to inform their compositional choices.

SCIARRINO, UN'IMMAGINE DI ARPOCRATE

Consider Salvatore Sciarrino's UN'IMMAGINE DI ARPOCRATE, and the waveforms taken from a performance of the piece by the Bavarian Radio Symphony Orchestra (shown below).



Figures 1 and 2: Waveforms from UN'IMMAGINE DI ARPOCRATE

This piece features two large-scale passages in which the large ensemble of instruments work together to simulate a single sound, stretched over a great length of time. The waveform on the left is of the first of these two passages, found around twenty minutes into the piece and lasting for around three minutes and twenty-two seconds. The annotations in the image demonstrate the way the waveform approaches the shape of the simulated sound's envelope.

A sound envelope is a theoretical structure used in the study of sound to describe how a sound changes over time, and it is made up of four distinct components: the beginning of the sound, called the attack; an initial decay in intensity of amplitude, called the decay; a period of sustained energy and tone, called the sustain; and a final diminishment in energy that fades to silence, called the release. This passage opens with an initial blast that builds to a dynamic peak, the attack; this peak decays into a prolonged period like the sustain; and then the prolongation reaches its conclusion in a release. And as mentioned above, Sciarrino's creative move here goes further than illustration as he's also stretched that illustration out over more than three minutes.

Later, around the 38 minute mark, we find a similar passage. It's different than the first, punctuated by several crests in dynamic intensity. But it all builds to the moment at the end, a moment of intense crescendo that is broken off suddenly. If the listener compares this passage to their memory of the first they may determine that it also is inspired by the sound envelope. But more than being stretched out over time, this sound envelope has been retrograded, reversed in time. This passage is about five and a half minutes in length.

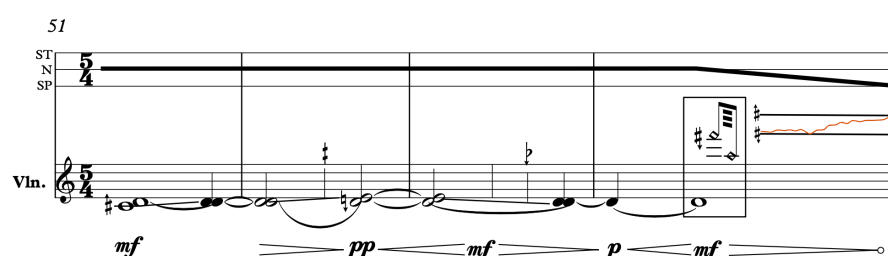
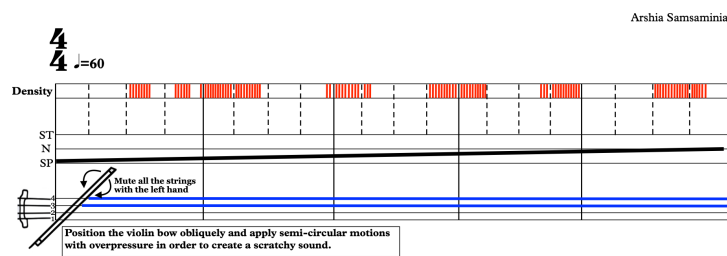
To summarize, it seems to me that in UN'IMMAGINE DI ARPOCRATE Sciarrino approaches the sound envelope as an idea and uses it to shape these two large sections of music. He does this creatively, not only stretching his envelopes out over time but even retrograding one of them. These creative expansions on the sound envelope as an idea were the most striking features of Sciarrino's piece to me, because they grounded the creative and poetic ideas of his work in the study of music itself.

SAMSAMINIA, BEYOND THE AUTONOMOUS SENSORY MERIDIAN RESPONSE

Consider next Arshia Samsaminia's BEYOND THE AUTONOMOUS SENSORY MERIDIAN RESPONSE— a piece for solo violin and fixed media. As the title suggests, the piece is informed by an interest in ASMR, which Merriam-Webster's dictionary defines as "a pleasant tingling sensation that originates at the back of the scalp"¹, often triggered by particular kinds of sound. In recent years ASMR has become an increasingly popular subject of interest on the internet, and there are entire swaths of creators devoted to producing content meant to induce this sensation. Samsaminia's piece is inspired by this subject, and features a variety of sounds one might hear in the ASMR content found on social media. In addition to ASMR, however, I see something else as well.

The left-hand image below shows an excerpt from the beginning of the piece. It begins with clusters of granular clicks, produced by the violinist through overpressure bowing and accompanied by similar sounds in the fixed

¹Merriam-Webster.com Dictionary, s.v. "ASMR," accessed November 30, 2023, <https://www.merriam-webster.com/dictionary/ASMR>.



Figures 3 and 4: Score excerpts from Samsaminia's BEYOND THE AUTONOMOUS SENSORY MERIDIAN RESPONSE

media. Samsaminia's careful work with the fixed media materials is immediately apparent. The clicks are extremely minute in substance, yet presented in the space so well that it is indeed as if they are right next to your ears.

The passage shown on the right is taken from the very end of the piece. When I considered the form and trajectory of this piece— subtle and proliferating clicks leading toward sustained sound— I realized that Samsaminia may be making be a music-poetic reference to the way sound production on a violin works. This is characterized by a kind of friction created by drawing a bow's hairs across a violin string, and the use of rosin increases this friction to produce a stick-slip-stick-slip motion in the string. If viewed in extremely slow motion, this might seem that the bow hairs are repeatedly plucking the string.²

Like Sciarrino in his UN'IMMAGINE DI ARPOCRATE, Samsaminia has used his musical forces to create a sonic illustration of a single sound stretched out over a great deal of time. And where Sciarrino goes a creative step further by retrograding one of his envelope illustrations, Samsaminia goes a creative step further by choosing sounds that represent the nature of that single violin stroke as it unfolds in slow motion.

² "Bows and Strings," The bowed string, accessed November 30, 2023, <http://www.phys.unsw.edu.au/jw/Bows.html>.

EVOCATIVE ENCOUNTERS WITH ELECTRONICS

The next source of inspiration was found in electronics. Prior to coming to the University of Iowa, my experience with electronics was rather limited. I’d mostly only used Digital Audio Workstations (DAWs) for mixing self-produced recordings of vocal music or to dabble in conventional methods of electronic song writing. Then during the course of my first year at the University of Iowa I took a couple electronics courses with Dr. Sivan Cohen Elias, who strongly encouraged me to take electronics more seriously. Observing the way my imagination worked, she said she believed electronics could open a new realm of possibilities for me. I’m so very glad I took her advice.

Below I will discuss four different electronic devices: Robert Henke’s GRANULATOR II, THE NOISE SCULPTOR (a device I developed), and two devices from Benjamin van Esser’s UPSHOT package for Max called FREEZE and ENDLESSREVERB.

ROBERT HENKE’S GRANULATOR II

One of the first tools to spark my imagination was the GRANULATOR II by Robert Henke. This is a Max for Live device patched by Henke, which he has described as “a synthesizer based on the principles of quasi-synchronous granular synthesis. It creates a constant stream of crossfading sections of the source sample — the grains—, and the size, pitch, position, and volume of each grain can be modulated in many ways to create a great variety of interesting sounds.”³



Figure 5: Henke’s GRANULATOR II

Henke’s granulator has been a source of inspiration and material generation for at least half a dozen pieces that I’ve composed in the last four years. It presented me with new possibilities for sample manipulation, and the ease of its controls allowed me to quickly work toward a degree of fluency that made creative exploration of the device both exciting and rewarding. But more than this, the granulator carved open the banks of my imagination and cut a course for new ideas about material and form.

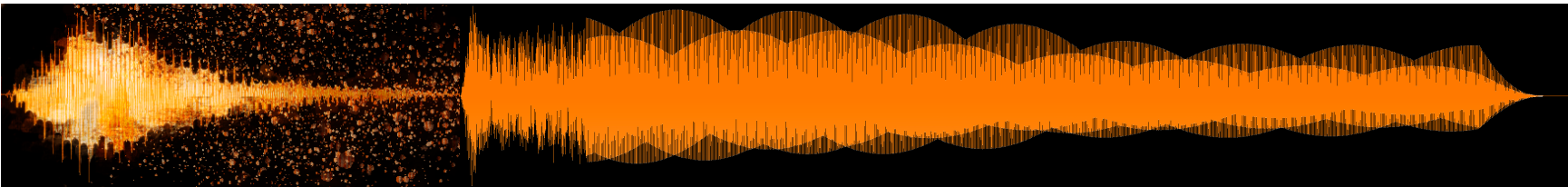


Figure 6: Granulated sound, illustration (left) — Figure 7: Closed loop drone waveform (right)

While I explored the granulator, images began to form in my mind along the lines of those above. I imagined the sampled sound being exploded into hundreds of tiny grains and smeared across the stereo field as well as time. Or when the sampled sound’s looped selection is small enough, I imagined those tiny grains broken apart and then reconstructed into an entirely new sound— a sustained drone. It didn’t take long for me to begin to ask how I might explore these ideas in an acoustic environment.

THE NOISE SCULPTOR

The next tool that informed my imagination is one of my own devising. During the course of my applied composition studies with Dr. Cohen Elias, I began to develop an idea about building a complex spectrum from highly filtered strands of noise. More than this, I wanted to see if I could build a spectrum based on the profiles of sampled acoustic instruments— strings, church organs, etc.— and then interpolate that spectrum’s states back and forth between those various models. The result of this experimentation was the Noise Sculptor.

The Noise Sculptor is, basically, a very elaborate and intensive fleet of filter banks based on the [fffb-] object. There are forty-eight individual filter banks, and each is situated around a conventional musical note within the range of concert C2 - C6. The Q value for each "note" can be calibrated such that tones of varying clarity can be produced.

Every filter bank within the fleet is programmed to put out not just one but twenty individual “tones” mathematically arranged according to the overtone series, so that the output resembles a complex tone of twenty

³ Henke, Robert. “Granulator II.” Granulator by Robert Henke. Accessed November 30, 2023. <https://roberthenke.com/technology/granulator.html>.

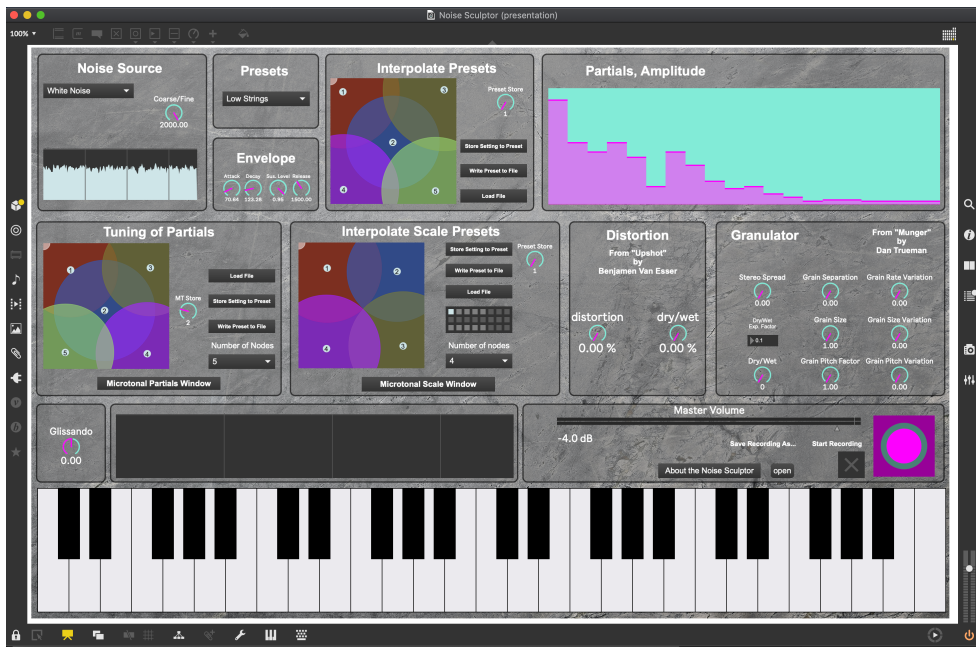


Figure 8: The Noise Sculptor

partials. The amplitude of each partial can be calibrated, allowing the user to produce sounds of varying timbres. These two features are the core of the instrument: intensively filtered noise that can be sculpted to produce complex sounds with up to twenty partials. Sculpt the noise as you see fit! Hence the name, Noise Sculptor.

The instrument has several other features as well, including settings for the tuning of the partials and the tuning of the chromatic scale. The tuning of the partials can be altered by raising or lowering the multiplication factor of the fundamental frequency for each individual partial. And in addition, the notes of the chromatic scale can be raised and lowered by the cent without limit.

I have been largely very pleased with the results of my work on the Noise Sculptor. As one might expect, the ability of the device to recreate the spectral profiles of acoustic instruments is limited– there’s more to it than the amplitude and tuning of partials, or the details of envelope. Even so, some of the states do recognizably approach the models they were based on. The “organ” state is the most aurally similar to its model, followed by the “electric guitar” (timbrally more than the envelope with its particular attack transients). The “strings” setting bears similarities to samples found in other synthesizers, but is a good deal further from its model than the “organ.”

Beyond this, the settings can be arranged freely as well, not based on any existing model but calibrated according to the user’s ear. The user can interpolate not just linearly but multi-dimensionally, using the [nodes] object paired with the [pattrstorage] object’s preset configuration. This means that the user can produce sounds at various positions between multiple states as well.

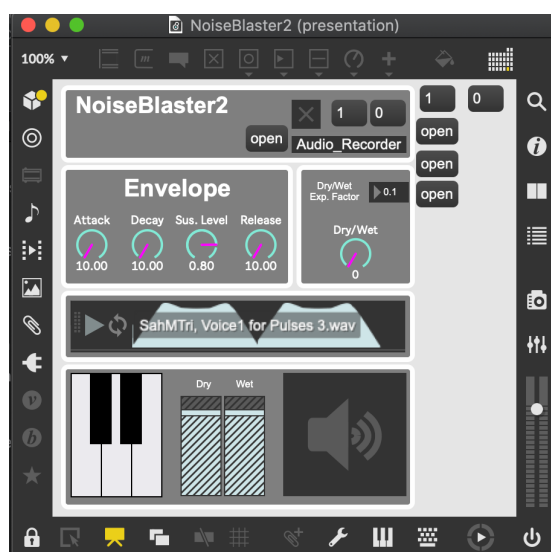


Figure 9: The Noise Blaster

The Noise Sculptor also inspired another device of mine, a simpler offshoot of the originally patch called the Noise Blaster. Instead of a fleet of filters, three filters are used to partition a sound into three more or less aurally equal bands. These bands can then be enveloped, individually or in varying combinations. This allows the user to play back an audio file of their choice and “play” it across its spectrum. If the sample used is a noise drone, then the output is blasts of noise at differing spectral positions, i.e., a Noise Blaster.

Both the Sculptor and the Blaster represent an exploration of synthesis, and they have gone on to inspire my ideas about compositional choices in an acoustic environment. Conceptually, they are about both breaking down and building up, about destruction and creation, and about transformation.

BENJAMIN VAN ESSER’S UPSHOT

The last batch of inspiring electronics brought me back to the first set of ideas I’ve described in this essay— sound as a source for concept. Benjamin Van Esser’s Upshot package is a suite of patches and abstractions across various functions, audio effects, data and signal tracking and routing, midi data generation, sequencers, some complete synthesizers, and some very curious odds and ends. I’ve played gleefully with the GLITCH, GLITCHCHORUS, and GLITCHLOOPER abstractions. I’ve also spent a good deal of time exploring some of the midi and synth abstractions, and look forward to continuing to do so. But most pertinent to my work here are the FREEZE and ENDLESSREVERB abstractions.

The FREEZE is based on Dr. Jean-Francois Charles’ own stochastic freeze. Esser’s abstraction around it produces that sustained freeze at the push of a button. In playing with this abstraction and freezing different samples, I came to conceptualize this as an alteration of envelope. Attack and decay proceed as usual, but the sustain phase never acquiesces to release. That is, not until you hit the button to cancel the freeze.



Figure 10: FREEZE, from Esser’s UPSHOT

Esser’s ENDLESSREVERB is based on the [yafr~] abstraction. I have been able to find little information about this particular item, though I did manage to find the abstraction itself and a bit of information on Randy Jones, who I believe designed it. The [yafr~] reverberator is already something special and can produce a surprising variety of sounds. Although he’s rearranged them slightly, Esser has mostly preserved the guts of the original in his abstraction, and has also taken some of the more variable mathematical functions and fixed them to specific values in pursuit of a particular sound. The resulting reverb seems to have a larger room size, and it goes on and on and on.



Figure 11: ENDLESSREVERB, from Esser’s UPSHOT

While using this device I have imagined something of an altered aural experience, although with some stipulations. To me, depending on the sound itself and the space in which it is sounded, I might imagine the “release”— and please humor my somewhat liberal illustration— as one in which the audibility of what we might think of as the sound’s “reverb” surpasses the audibility of what we might think of as the “original sound.” We might conceptualize the release phase as one that centers a sound’s residue in space.

Esser’s ENDLESSREVERB sustains a sound’s residue indefinitely. The longer you let it go on, more and more of the sound’s original spectral profile seems to disintegrate. What remains is spectrally or “tonally” more and more indeterminate. In other words, the further you get from the original, the more its residue seems to become something else entirely.

A SUMMARY OF THE GERMINATING CONCEPTS

In Sciarrino’s UN'IMMAGINE DI ARPOCRATE and Samsaminia’s BEYOND THE AUTONOMOUS SENSORY MERIDIAN RESPONSE, I see a poetic illustration formed through ideas taken from acoustic analysis. Both have stretched envelopes across time, allowing us to occupy the different phases of the envelope for an extended period. Unique to Samsaminia is his attention to the phases of the envelope– the materials for each section are chosen carefully. Unique to Sciarrino, on the other hand, is that he not only stretches the envelopes across time; as described previously, the second one is retrograded.

The various electronic tools explored above gave me further space in which to develop my interest in these ideas. Henke’s GRANULATOR II was like a grenade on the terrain of the envelope, shattering and rearranging it into entirely new forms. Esser’s FREEZE and ENDLESSREVERB similarly altered the envelope, or at least the experience of it. My Noise Sculptor and Noise Blaster, on the other hand, represented creative uses of construction and destruction across the frequency spectrum rather than the field of time and presented me with possibilities for entirely new and unusual synthetic timbres.

TO PLAY IN THE FABRIC OF SOUND

At its heart, my work with WARP & WEFT has been about several things: an inventory of inspiration; a search for a mode of conception, a desire to mobilize some of the disparate elements of my musical journey in a concerted creative effort. Sciarrino and Samsaminia imagined envelopes stretched across time and even reversed, then took these as guides for gestural and formal choices. I wanted to go a step further, rearranging an envelope’s discrete elements to produce different sequences of intensity and texture. Henke’s granulator allowed me to scatter sound’s substance into a cloud of effervescing densities the fractals of which are united in reflecting their origin. My noise synths let me shape envelope, tone, timbre, and spectrum. I wanted to bring all of this to WARP & WEFT.

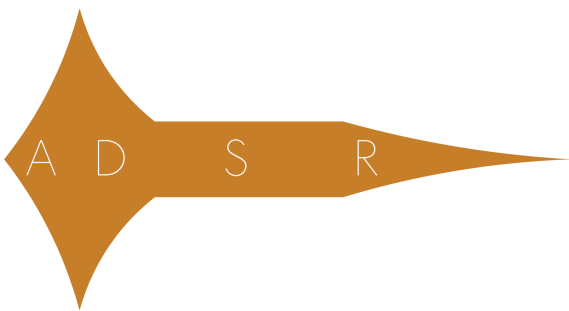


Figure I2: Waveform illustration

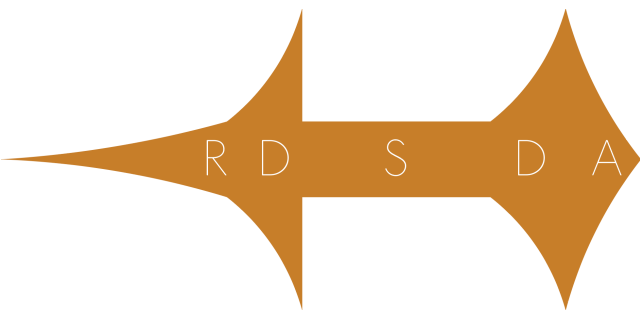


Figure I3: Waveform illustration

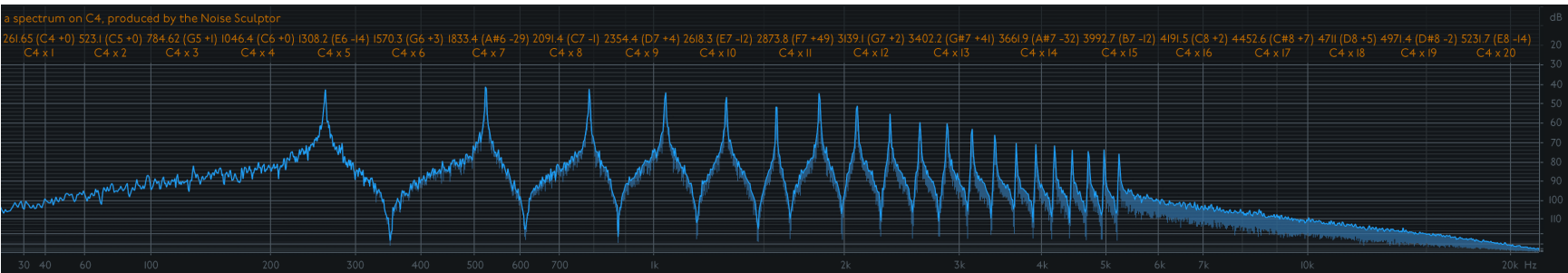


Figure I4: Spectrum of a sound produced by the Noise Sculptor

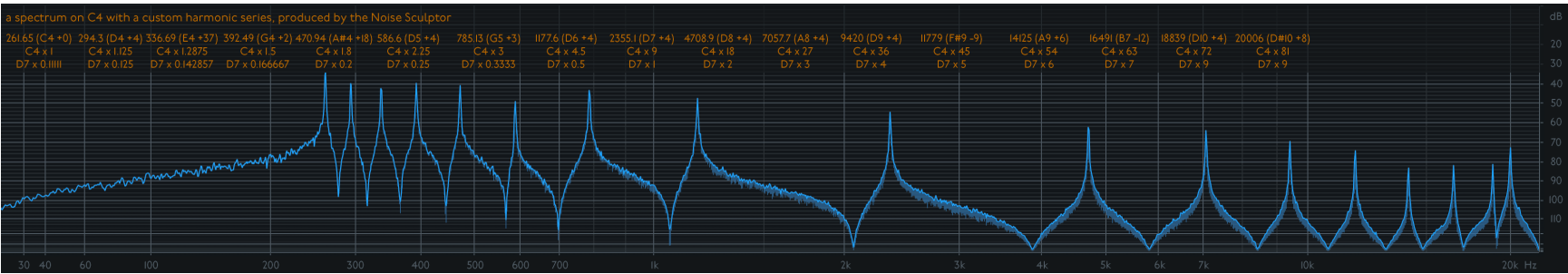


Figure I5: Spectrum of a sound produced by the Noise Sculptor

I saw in the pieces and tools described here a creative dialogue with what we know about sound, in which we explore what a sound is to both magnify and transform it— as well as our experience of it. I wanted to do the same. Warp & Weft is grounded, chiefly, in an interest in playing in the fabric of sound.

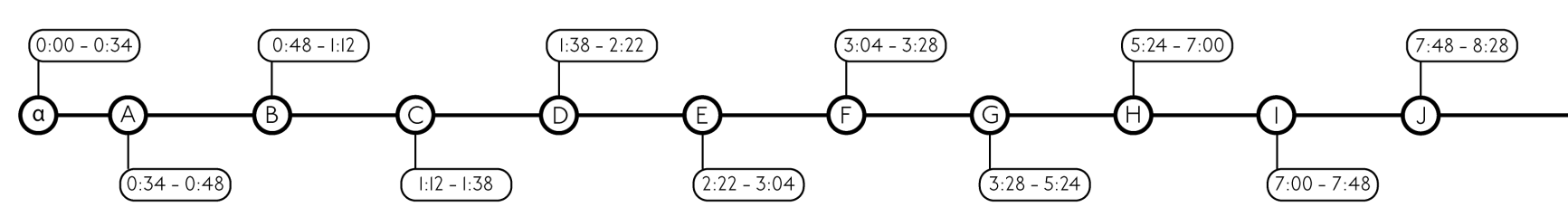
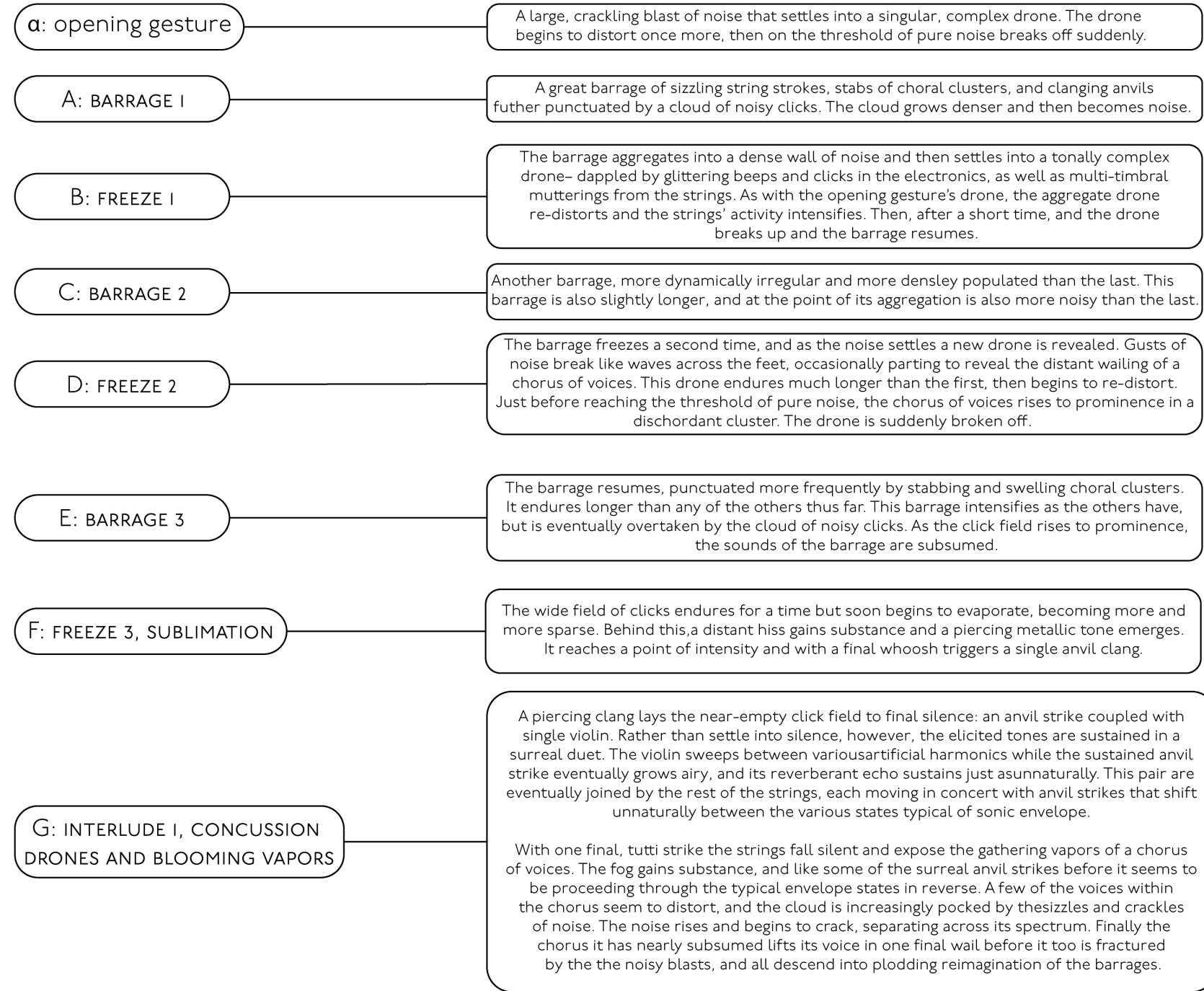
WARP & WEFT, NO. 1: FOR STRING QUARTET AND ELECTRONICS

MUSICAL TIMELINE AND ANNOTATIONS

The following is a timeline of the string quartet/electronics edition of the piece, and it includes a narrative commentary that details my conception of each part and section. While I do not believe it is necessary to review this timeline in order to listen to the piece, it does provide a window into my thinking that can illuminate the experience.

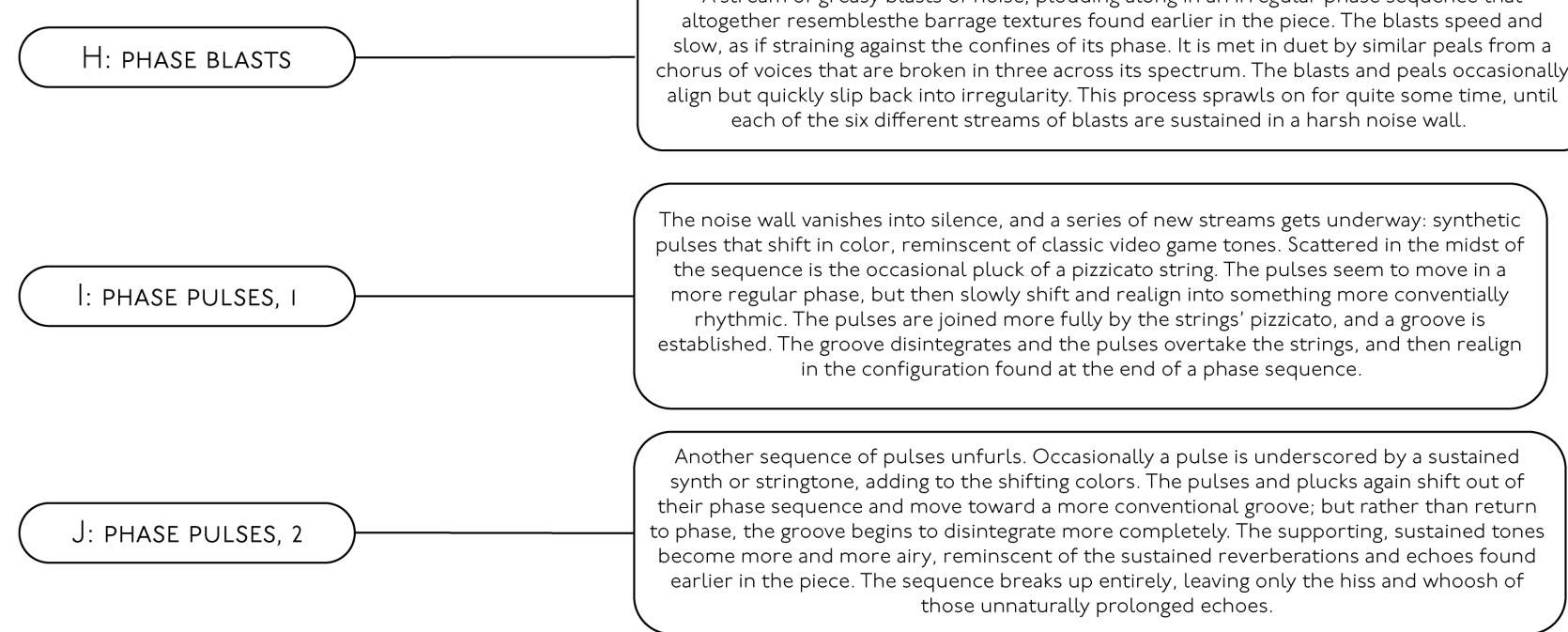
PART 1. WARP

IN WHICH THE MANY BECOME ONE



PART 2. WEFT

IN WHICH THE ONE BECOMES MANY



PART 3. WEB

A DESERT OF THE SURREAL AND THE VESTIGIAL

K: ENVELOPE BENDING, 1

Echoes of the pulses from the previous section are unnaturally prolonged, and like the anvil strikes pass into an airy state of endless reverberation. Meanwhile the strings gasp and sigh in gestures calling to mind a reverse of the pulses' and pizzicatos' pluckier waveforms. In the midst of this ghostly texture a single synth tone becomes clearer and more substantive, until with a sudden pop it snaps fully into a prolonged sustain phase dappled by microtonally shifting gasps in the strings. One of its partials rises in intensity while the rest of the tone then slips back into the endless reverberation.

L: ENVELOPE BENDING, 2

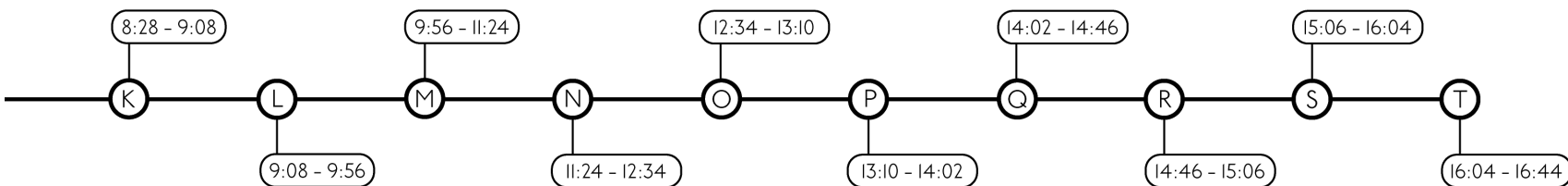
The renegade partial begins to distort, developing a more complex spectrum of its own, and the strings add to this a chorus of airy shufflings and huffs (bow-hair on muted strings). Then the renegade partial spills over itself into a fuller, metallic tone, and the strings add to this a microtonally shifting, unison harmony to the partial's evolving spectrum. And as before, a constituent tone within this texture rises above the others while the whole shifts back into endless reverberations and wispy shufflings.

M: ENVELOPE BENDING, 3

Before this next renegade partial can gather substance, it is overcome by a gushing cascade of noise—howling gusts much like wind. The strings occasionally slip into and out of microtonal clouds of glassy, unison harmonics. The gusts persist for some time, until a single, hollow gale remains.

N: INTERLUDE 2, DEPOSITION

The persisting gale is supported by the strings' airy shufflings and the occasional gasp of air like those in the previous section. Some of these gusts begin to crackle with noise, and then pepper the space with clicks. The strings add to this by intensifying their own airy gasps with overpressure. Each member of the quartet, in turn, rises above the texture, until the whole is a balance of crackling and airy noises, and clearer tones can sometimes be glimpsed within. This conglomeration maintains a modest level of energy for a time, then begins to drop off slightly. Before the energy can approach the threshold of silence, the crackling gusts rise up once more as greasy blasts of noise.



PART 4. WEAVE

THE MANY ARE ONE, THE ONE IS MANY;
A SHIFTING EDIFICE OF UNITY AND VARIETY

O: BLASTS, REPRISE AND CRYSTALLIZATION

A sequence of grungy blasts and sizzling peals from the strings that resembles the phase blasts earlier in the piece, arranged in a similar phase sequence. And like the previous blast streams, these push and pull at the constraints of their arrangement. But instead of forming a groove or simply resisting alignment, the streams gather force and speed and align until the electronics and strings, respectively, are each moving in homophony, producing a furious antiphony.

P: BLASTS, ANTIPHONS 1

A powerful, lumbering blast of noise is met in antiphony by the strings in tutti scratch and half-scratch tone tremolos. The initial intensity of noise in the electronics lessens somewhat and reveal complex drone composed of complex synth tones, tuned noise, and sustained voices all blended together until it seems they have merged into one, hybrid sound. The strings lift in their fury for a moment's breath, then fan out from a unison into a microtonally complex harmony complementing that of the electronics. This texture is able to maintain a stasis for a short time until the strings gather up their fury once more and the electronics slip into a surreal reverberation.

Q: BLASTS, ANTIPHONS 2

The strings bite out once more in yet another blast of tutti, over-pressure tremolos met once more in antiphony by a lumbering blast of noise. Distortion once more gives way, on both sides, to a complex synthesis of voices, tuned noise, strings, and synthetic tones in a microtonally complex harmonic array.

R: BLASTS, CRITICAL MASS

The stasis gives way to reutterances of this second pair of antiphonal blasts, and these gather momentum until the two bodies finally merge in one, massive yawp of noise.

S: THE WEAVE, SONOROUS EDIFICE

The great blast screeches and rumbles for a time, but soon begins to gain clarity as the fractals of its fury widen. All opens and slows, and the strings and electronics separate once more into their antiphonal pairs. A new stasis emerges: a broad, open G that spans several octaves. Strings and electronics occasionally exchange places, moving between occupying a place of harmonic fundamental and mathematically divergent harmonic partials: spectrums blended, reflected, tessellated. A shifting tapestry, a swirling edifice composed of a unified variety.

T: FINAL SUBLIMATION

The tapestry begins to settle back into the broad, open G. The strings and electronics occasionally flush with color, but eventually the whole slips into a blend of surreal reverberations and wispy sighs from the strings. The texture thins, then passes into silence.

AN INDEX OF ELECTRONIC SAMPLES AND TOOLS BY PART AND/OR SECTION

Below is a list of electronic instruments and tools as well as samples used in the electronics component of Warp and Weft, no. I. This list is organized by the names of the major sections within the four parts.

Part I, Warp (m. I – F: FREEZE 3, Sublimation)

SahM, a max patch by Stephan Carlson

Noise Sculptor, a max patch by Stephan Carlson

Anvil strikes, samples taken from freesound.org

GENERATIVE LOOPS, an example patch from Benjamin Van Esser's Upshot package

Vocal samples, recorded by Stephan Carlson

MUNGER, a max external object by Dan Trueman

Iris, a sample-based synthesizer by Izotope

GRANULATOR II, a max-for-live instrument by Robert Henke

DOT.INTERPOLATE4~, a max external object from the Digital Orchestra Toolbox by Joseph Malloch, Stephen Sinclair, and Marlon Schumacher

G: Interlude I, Concussion Drones and Blooming Vapors

BOWED PIANO, an Ableton Live sample pack by Soniccouture

Anvil strikes, samples taken from freesound.org

US.FREEZE, a max abstraction from Benjamin Van Esser's Upshot package

US.ENDLESSREVERB from Benjamin Van Esser's Upshot package

Vocal samples, recorded by Stephan Carlson

IRIS, a sample-based synthesizer by Izotope

Part 2, Weft | H: Phase Blasts

IRIS, a sample-based synthesizer by Izotope

Noise Blaster, a max patch by Stephan Carlson

BITCRUMBLER, a max-for-live effect by Guillaume Bertrand

Vocal samples, recorded by Stephan Carlson

Noise Sculptor, a max patch by Stephan Carlson

I: Phase Pulses I – J: Phase Pulses 2

IRIS, a sample-based synthesizer by Izotope

SahM, a max patch by Stephan Carlson

GENERATIVE LOOPS, an example patch from Benjamin Van Esser's Upshot package

US.ENDLESSREVERB from Benjamin Van Esser's Upshot package

Part 3, Web | K: Envelope Bending, I – N: Interlude 2, Deposition

US.ENDLESSREVERB from Benjamin Van Esser's Upshot package

US.FREEZE, a max abstraction from Benjamin Van Esser's Upshot package

SahM, a max patch by Stephan Carlson

Noise Sculptor, a max patch by Stephan Carlson

GRANULATOR II, a max-for-live instrument by Robert Henke

BITCRUMBLER, a max-for-live effect by Guillaume Bertrand

Part 4, Weave | O: Blasts, Reprise and Crystallization – T: Final Sublimation

Vocal samples, recorded by Stephan Carlson

Noise Sculptor, a max patch by Stephan Carlson

GRANULATOR II, a max-for-live instrument by Robert Henke

DOT.INTERPOLATE4~, a max external object from the Digital Orchestra Toolbox by Joseph Malloch, Stephen Sinclair, and Marlon Schumacher

SahM, a max patch by Stephan Carlson

More than one, an example patch from the ACToolkit package by Johan van Kreijl, Sohrab Motabar, and Jeyong Jung

Anvil strikes, samples taken from freesound.org

IRIS, a sample-based synthesizer by Izotope

BOWED PIANO, an Ableton Live sample pack by Soniccouture

US.ENDLESSREVERB from Benjamin Van Esser's Upshot package