

Still and Moving Lines of Silence: The Music of Alvin Lucier

Ensemble Realizations of Un...
directed by Charles Curtis

Still and Moving Lines of Silence The Music of Alvin Lucier

November 20, 2009

November 20, 2009 - UCSD Conrad Prebys Concert Hall

Joe Bigham, Paul Bowman, Bryan Cristian, Chen-Hui Jen, Batya MacAdam-Somer, Jacob Sudoi, Ashley Walters, Scott Worthington

Still and Moving Lines of Silence in Families of Hyperbolas
for cello and pure wave

Still and Moving Lines of Silence in Families of Hyperbolas
for soprano and pure waves

Hommage to James Tenney
for contrabass and pure waves

Still and Moving Lines of Silence in Families of Hyperbolas
for violin and pure waves

Still and Moving Lines of Silence in Families of Hyperbolas
for two acoustic guitars, electric guitar and voice

"On the Carpet of Leaves Illuminated by the Moon"
for acoustic guitar and pure wave

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One's position in the space will affect the sound. It is possible to be sitting or standing in a node, where the sound is an antinode. Conversely, there are positions where you will experience a node. Please feel free to move to a node, if you wish, and experience the minimal possible sound. Please hold your applause.

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pure wave = sinusoid

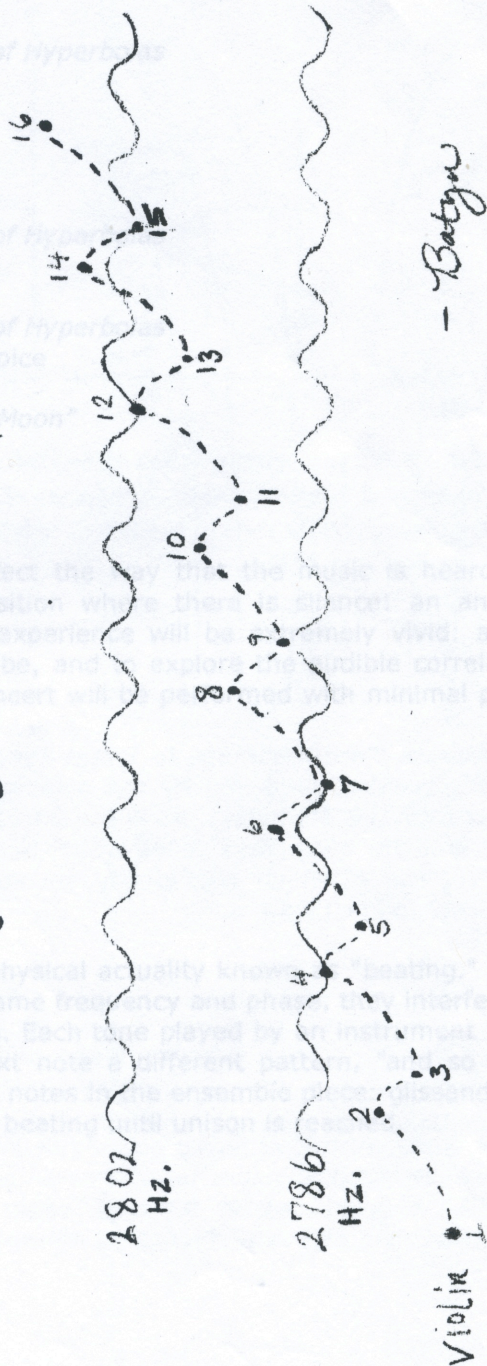
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The music performed tonight is based on physical equality known as "beats". As two tones are played which are not very far apart, one frequency will interfere with each other in identifiable, repeating patterns. Each tone played by itself would produce one of these patterns. If the two tones are played together, the result will be a new pattern, one that is a combination of the two original tones. A notable group of exceptions to this rule are the notes of the chromatic scale, which are played a few times -- a smooth, constant beating with unison.

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• = Sustained pitch held by violin

--- = silent trajectory of sustained pitch line



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One's position in the space will greatly affect the way that the music is heard. It is possible to be sitting or standing in a position where there is silence: an antinode. Conversely, there are positions where the experience will be extremely vivid: a node. Please feel free to move to a node if need be, and to explore the audible correlates of various locations in the space. Tonight's concert will be performed with minimal pauses. Please hold your applause.

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pure wave = sinusoid

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The music performed tonight focuses on a physical actuality known as "beating." As two tones are played which are not exactly the same frequency and phase, they interfere with each other in identifiable, repeating patterns. Each tone played by an instrument tonight will produce one of these patterns, the next note a different pattern, "and so on." A notable group of exceptions to this are a few notes in the ensemble piece: glissandi occur a few times -- a smooth, constant slowing of beating until unison is reached.

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The pure wave oscillators used in these pieces represent sounds that are a single frequency (i.e., have no overtones), something that does not occur in nature (although it has been theorized since the early 19th century, and perhaps even earlier, that a sum of sinusoids at different phases and amplitudes can reproduce any sound). Because instruments and voices cannot produce these mathematically perfect oscillations, true unison (i.e., no beating) is an impossibility, a limit.

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8.4 Pure Tones with Slightly Different Frequencies: Beats

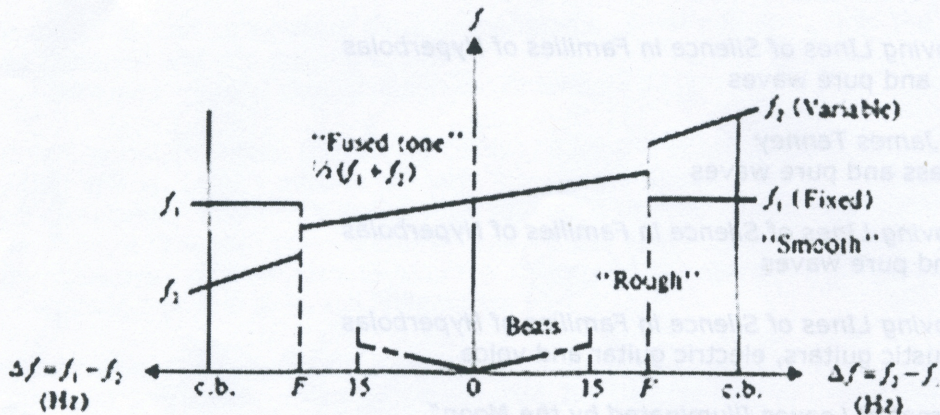


FIGURE 8.7 Schematic representation of frequencies heard when pure tones of frequencies f_1 and f_2 are superimposed. Note that the disappearance of beats occurs around $\Delta f = 15$ Hz regardless of the values of f_1 and f_2 ; the critical bandwidth (c.b.) and the fusion frequency (F) increase with f_2 and f_1 . (After Roederer 1975.)

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The double bass piece, "Homage to James Tenney," shows this process in a series of five octaves, beginning around 500 Hz (an octave above middle C) and descending to 30Hz (the lowest C on the Steinway). As in the Soprano and Violin pieces, two sinusoidal tones are heard and the bass plays tones which beat against the sinusoids -- seven tones in each octave, two of which are, ideally, unison. These seven tones are presented in a different order in each octave.

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When the fundamentals of two timbres fuse one occasionally perceives various upper partial(s) isolated and cycling in phase with the beats.

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These works of Alvin Lucier invite us to explore and enjoy the acoustic phenomena of beating. Celebrating these pieces and the new acoustic environment of the Conrad Prebys Concert Hall, we invite the audience to find a variety of experiences by quietly moving within the space throughout the concert. One may find a node of silence or crest of vivid activity by standing or simply turning one's head. In doing so, we answer the composer's call to "... hold up shells to their ears and listen to the ocean again." (Lucier & Simon, *Chambers* 14). Like the sounds of the ocean, tonight's concert will be performed with minimal pauses so please hold your applause.

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A Ripple Song
by Rudyard Kipling

Once red ripple came to land
In the golden sunset burning--
Lapped against a maiden's hand,
By the ford returning.

*Dainty foot and gentle breast--
Here, across, be glad and rest.
"Maiden, wait," the ripple saith;
"Wait awhile, for I am Death!"*

"Where my lover calls I go--
Shame it were to treat him coldly--
'Twas a fish that circled so,
Turning over boldly."

*Dainty foot and tender heart,
Wait the loaded ferry-raft.
"Wait, ah, wait!" the ripple saith;
"Maiden, wait, for I am Death!"*

"When my lover calls I haste--
Dame Disdain was never wedded!"
Ripple-ripple round her waist,
Clear the current eddied.

*Foolish heart and faithful hand,
Little feet that touched no land.
Far away the ripple sped,
Ripple-ripple running red!*

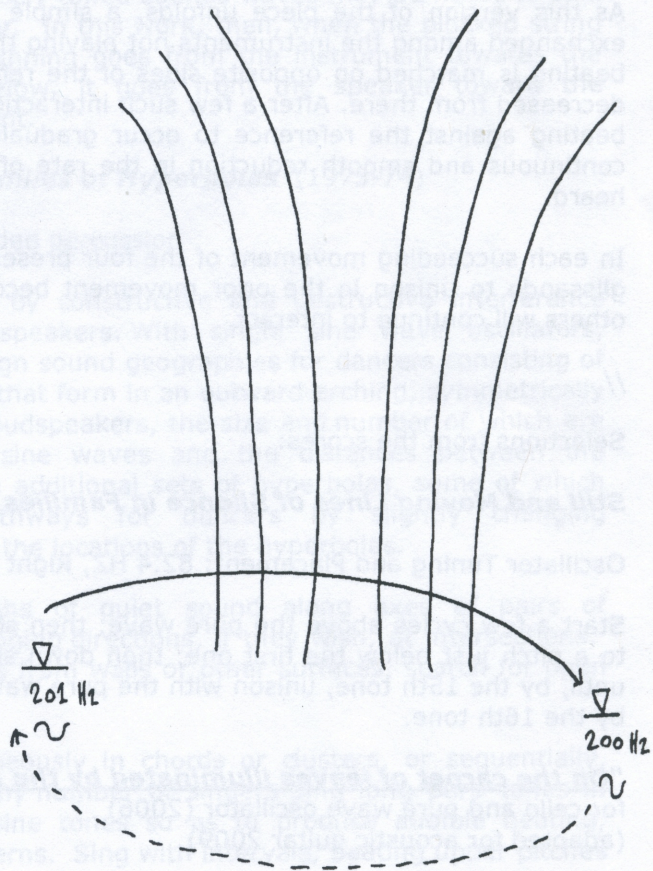
Rudyard Kipling

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Still and Moving Lines of Silence in Families of Hyperbola
Version for Two Acoustic Guitars, Electric Guitar, and Voice

Still and Moving Lines of Silence in Families of Hyperbola exists in two versions. Many of the works tonight are from the second version, where Lucier more explicitly describes the interaction between the musicians and sine tones. The first version, however, allowed a much wider margin of freedom for the interpreters by providing simple instructions such

Hyperbolas



as "create a near-unison above or below the given sine tones so as to produce audible beating, forming continually variable rhythmic patterns."

By creating beating alongside a stable reference tone, our interpretation creates standing waves in the same way as many of the works from the second version. Yet, the difference lies in that a sine tone is not used. Rather, the musicians become the reference tone for one another. This version is performed by two acoustic guitars, electric guitar, and voice. Instead of plucking the strings of the guitar, an Ebow is used to activate the string's vibration through the induction of an electromagnetic field. This allows an attackless and sustained sound to be created by the guitars. To perform a similar feat with the Ebow, the vocalist underwent extensive vocal surgery, replacing his vocal cords with thin metal sheets. He was devastated to find that the surgeons accidentally used sheets of aluminum foil, thus preventing his new vocal cords from responding to the magnetic field of the Ebow. He has filed a malpractice suit and hopes to retire in the Swiss Alps by the age of 26.

As this version of the piece unfolds, a simple alternating pattern of "near-unisons" is exchanged among the instruments not playing the reference tone. Sometimes the rate of beating is matched on opposite sides of the reference and sometimes it is increased or decreased from there. After a few such interactions, the first instrument that allowed the beating against the reference to occur gradually glissandos to unison, thus creating a continuous and smooth reduction in the rate of beating until virtually no beats may be heard.

In each succeeding movement of the four presented here, the instrument that made the glissando to unison in the prior movement becomes the new reference, with which the others will continue to interact.

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Selections from the scores:

Still and Moving Lines of Silence in Families of Hyperbolas for cello:

Oscillator Tuning and Placement: 82.4 HZ, Right Channel.

Start a few cycles above the pure wave; then step down slightly down below it; then up to a pitch just below the first one; then down slightly below the second one, and so on, until, by the 15th tone, unison with the pure wave is reached. Stop a few cycles below it by the 16th tone.

"On the carpet of leaves illuminated by the moon"

for cello and pure wave oscillator (2006)

(adapted for acoustic guitar 2009)

Description

A single pure wave sounds throughout the duration of the performance. As it does so, a [guitarist] plays single plucked tones against it, creating interference patterns – audible beats – produced as the sound waves coincide. The speed of the beating is determined by the distance between the two sound sources: the farther apart, the faster the beating. At unison, no beating is heard. The shape of the patterns is determined by the decay characteristics of the plucked string.

Performance

Starting a half-step above the sounding wave play a series of plucked tones, stepping downward for each successive tone in the smallest possible increments by turning the fine tuning [mechanism] Let each sound decay to zero. Plucks should be separated by silences at least as long as the sounding plucks themselves. From time to time reverse direction, backtracking over pitches you have already played. Descend again past the point where you stopped to backtrack the first time. Continue descending toward unison and beyond, backtracking once or twice along the way. Stop a half-step below the sounding wave.

No changes in dynamics are necessary or other coloration of your tones need be made.

Note

Under certain acoustical conditions two closely tuned sounds waves may be heard to spin through space, the higher toward the lower. In this work, then, when the plucked string sounds are above the pure wave, the spinning goes from the instrument towards the loudspeaker. Conversely, when it is below, it goes from the speaker toward the instrument. At unison there is no movement.

***Still and Moving Lines of Silence in Families of Hyperbolas* (1973-74)**

For singers, players, dancers, and unattended percussion

Create standing waves in space caused by constructive and destructive interference patterns among sine waves from loudspeakers. With single sine wave oscillators, amplifiers, and pairs of loudspeakers, design sound geographies for dancers consisting of troughs and crests of soft and loud sound that form in an outward-arching, symmetrically mirrored hyperbolic curves between the loudspeakers, the size and number of which are determined by the frequencies of the sine waves and the distances between the loudspeakers. Add loudspeakers, creating additional sets of hyperbolas, some of which intersect. When necessary, clear pathways for dancers by slightly changing the frequencies of the sine waves, shifting the locations of the hyperbolas.

Any number of dancers discover troughs of quiet sound along axes of pairs of loudspeakers which they may follow, changing directions, if they wish, at intersections. If bumps of sound occur due to reflections from walls or other surfaces, search for open paths or wait for troughs to shift.

Play any number of sine tones, simultaneously in chords or clusters, or sequentially, through any number of loudspeakers. Any number of singers sing long pure tones in near-unison above or below the given sine tones so as to produce audible beating, forming continually variable rhythmic patterns. Sing with intervals, beating upper pitches at one speed, lower ones at another, creating double rhythms.

Closely tune any number of oscillators, causing hyperbolas between loudspeakers to spin in elliptical patterns through space at speeds determined by the tunings and in the directions toward the lower-pitched loudspeakers. Balance oscillator and amplifier volumes to achieve maximum and minimum amplitudes including silences, if possible, during beating cycles.

Play any number of brass and wind instruments in such a way as to create and spin hyperbolas toward and away from your instrument and sounding loudspeakers. Pluck any number of stringed instruments, including electric guitars, to create series of beats,

the speeds and numbers of which are determined by the tunings and amplitudes of the plucked sounds and sine tones.

Deploy any number of snare drums (metal snares) anywhere in space. Search for resonant frequencies of the drums and spin hyperbolas of those frequencies across them, the crests of which cause sympathetic vibrations, creating rhythmic patterns determined by the speeds of the beatings.

Parts of this work may be performed singly or in combination or in combination simultaneously, in any order.

* * *

Remarks of Alvin Lucier:

"The piece exists almost completely on a spatial plane. What's important is the making of simple to complex and still moving sound geographies with sine waves." (Lucier & Simon, *Chambers* 131)

"I am satisfied to not compose terribly much but to let the space and the situation take over. In other words, I don't intrude my personality on a space, I don't bring an idea of mine about composition into a space and superimpose it on that space, I just bring a very simple idea about a task that players can do and let the space push the players around. In that way I always learn something about a space and the never forget one in which I've done the piece." (Lucier & Simon, *Chambers* 23)

"...it's and extension of what you do when you're a little child at the beach and you put your ear and hear the ocean. Then you stop. You don't do that as you grow older. You ear stops doing that because you've got to think about other things, how to make a living and how to speak to people, how to communicate verbally. I guess I'm trying to help people hold up shells to their ears and listen to the ocean again." (Lucier & Simon, *Chambers* 14)